2020 Edition

Analysis and Vision

Kigali Master Plan 2050

UMUJYI WA KIGALI

Serivisi zinoze kandi zinoze

KIGALI YACU! OUR KIGALI!
The Centre of Urban Excellence

DOCUMENT INFORMATION

Report Title:	ANALYSIS & VISIONING REPORT
Project Title:	Consultancy Services for 2013 Kigali Master Plan Update
Project Ref No.:	C-RW-000011
Client:	City of Kigali, Rwanda
Submission Date:	AUGUST 2020
File Name:	20181120_KMPU_Analysis & Visioning Report

Approvals	Name	Role	Date
Author	Ruchi Bhatia	Project Co-ordinator	
Author	Latha Chhetri	Urban Planner	
Author	Kaifu Ren	Urban Planner	
Author	Shu Ting Goh	Urban Planner	
Author	Gerna Van Jaarsveld	Transport Planner	
Author	Bernadina Da Silva	Civil Engineer	
Author	Mandy Westwood	Transport Planner	
Author	Dickson Malunda	Senior Urban and Social Economist	
Author	Gabriella Robba	Participation and Communication	
Reviewer	Deon Du Plessis	Infrastructure Team Lead	20-11-2018
Reviewer	Michael Vander Mullen	Infrastructure Planner	20-11-2018
Reviewer	Enrico Morriello	Resident Project Manager, Urban Planner	20-11-2018
Reviewer	Anandan Karanukaran	Project Director	20-11-2018

Number of copies issued: 01

Version NO.	Date Issued	Details	Approved For Issue
1	20-11-2018	Draft Report	Anandan Karanukaran
2	21-10-2019	Final Report	Anandan Karanukaran
2	15-08-2020	Final Approved	Anandan Karanukaran

This page has been intentionally left blank.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

This page has been intentionally left blank.

Preface

Project Background

As stated in the 2013 Kigali Master Plan Implementation Report, the first update to the Master Plan shall be undertaken after 5 years from its adoption. This is even more important for a city like Kigali, which is rapidly evolving towards a world-class urban centre, and needs updated and real-time information on the master plan implementation status to promptly identify and apply corrective measures as needed. Surbana Jurong and SMEC have been selected as the ideal candidates for this important task that will shape, once more, the future of Kigali and Rwanda in general.

The core objective of this assignment is to update the 2013 Kigali Master Plan with a new methodological approach based on two key elements:

1. An intense participatory process aimed at deeply involving a large base of stakeholders, capable of providing valued inputs and feedback during the review process.
2. Support this review with new and enhanced information and data coming from additional studies. This represents an unprecedented opportunity to improve the existing Master Plan with new primary and secondary data coming from detailed socio-economic analysis, household and market surveys, and a long-needed citywide transport plan and modelling.

The updated master plan for Kigali, is envisaged to integrate all previous plans and reports and will provide corrective measures and provide updated direction to the growth of the Capital of Rwanda. Surbana Jurong believes that the aim is not just to draft and updated Master Plan for Kigali but sees it as a key opportunity for improving and adjusting Kigali urban development strategies to support the city economic green growth and individuals' well-being, integrate all previous plans, improve local capacity through training and involvement of local planners, and establish a new platform from which the country can position itself as the centre of excellence for innovative and inclusive urban planning in Africa.

Project Commissioning & Objectives

In the beginning of 2018, Surbana Jurong Consultants Pte Ltd and SMEC International, were awarded the "Consulting Services for 2013 Kigali Master Plan Update". Surbana Jurong and SMEC (part of the Surbana Jurong Group) have been working as one team to implement all technical activities required for this master plan update.

The local team in Kigali and team leaders identified for each macro work component (Urban Planning, Infrastructure, Transportation, Environment, Community Engagement and Socio- Economics) are coordinating well between different work streams and also with the local authorities and agencies for regular updates on the master plan.

The specific objectives of the master plan update are as below:

- Collect, integrate and incorporate all new data, plans, projects and regulations elaborated after 2013 Master Plan adoption, including green growth strategies, transport studies elaborated and planned and upcoming developments for Rwanda.
- Integrate baseline studies with primary data collection and update Project Programming with refined forecasts on population, income, employment, services and transport demand.
- Review 2013 Master Plan Implementation Status, assessing the progress of the capital improvement plan and catalytic projects, highlight delays and issues in the implementation, paving the way to the updated Implementation Report
- Integrate a new transportation analysis and modelling into the planning process to further reinforce the Transport Oriented Design approach in 2013 Master Plan
- Involve key stakeholder groups and re-shape the plan to address most critical issues, but without losing track of the overarching Vision. Effectively communicate the project to the community, ensuring ownership of and compliance to the Update Plan.
- Update Nyarugenge CBD Urban Design Plan, incorporating all recent projects and aligning it with market trends.
- Involve City of Kigali technical team in all stages of the project, requesting them to actively contribute in the preparation of draft deliverables (E.g. Interim Master Plan Update)
- Update the entire Master Plan GIS database and coordinate with ESRI for its publication on the new web portal.
- Update the Implementation Plan with a revised Capital Improvement Plan, catalytic projects list and implementation strategies.

Project Organisation & Schedule

The planning process elaborated to update the 2013 Master Plan will be developed in 10 months and it will be further organised in six stages, corresponding to key outcomes and deliverables.

Stage 1: Inception
Stage 2: Visioning and Programming Update
Stage 3: Transport Plan Update
Stage 4: Interim Master Plan Update
Stage 5: Final Master Plan Update
Stage 6: Updated Implementation Plan

Parallel to the six stages, there will be two sets of activities which will be conducted along the entire duration of the project:

1. Participatory process and outreach campaign
2. Training for City of Kigali Technical Team

The current report is part of the Stage 2: Visioning and Programming Update which includes update on the existing physical context analysis, forecasts on expected socio-economic and market performance and updated information to refine goals and objectives as part of the Visioning Report.

Project Deliverables

Various reports, corresponding to the various task orders are to be submitted, which include:

Stage 1: Inception
- Inception Report
- Stakeholders mapping and Communication and Participatory Plan
- Socio-Economic Analysis and House Hold Survey Methodology

Stage 2: Visioning and Programming Update
- Implementation Status Report
- Updated Visioning and Programming Report

Stage 3: Transport Plan Update
- Transport Master Plan Report

Stage 4: Interim Master Plan Update
- Report on Comments Collected
- Updated Master Plan Interim Report: Master Plan, Zoning Plan, Infrastructure and Transport Plan for Kigali

Stage 5: Final Master Plan Update
- Updated Master Plan, Zoning Plan and Maps
- Nyarugenge CBD Updated Urban Design Report

Stage 6: Master Plan Implementation
- Master Plan Updated Manual
Updated Implementation Plan

For the current Stage 2, the following deliverables are submitted as part of the Visioning and Programming Update

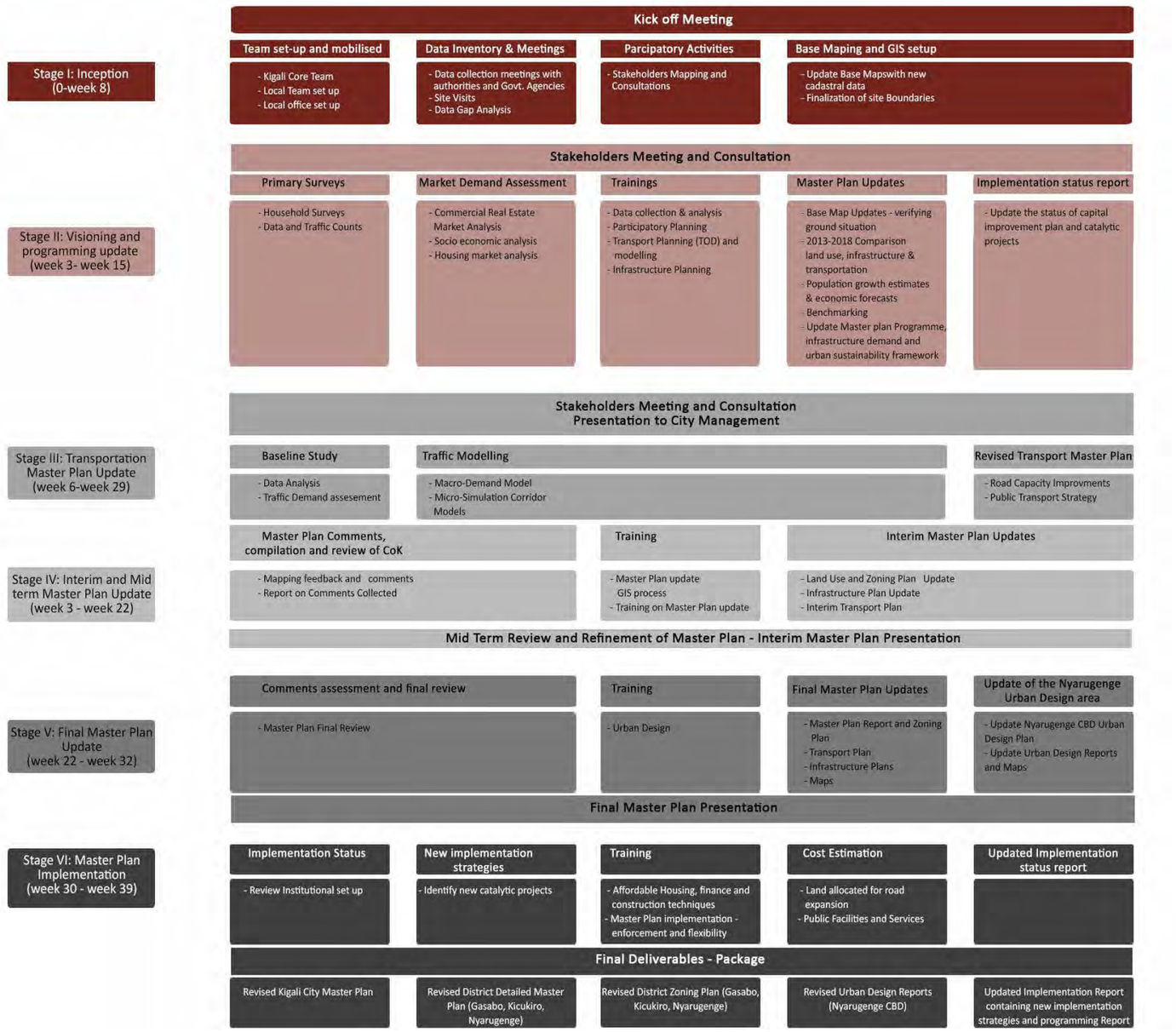
1. Updated Visioning and Programming Report
2. Implementation Status Report
3. Comments Collected Report

The Updated Visioning and Programming Report includes update on the existing physical context analysis, forecasts on expected socio-economic and market performance, updated benchmarking and vision formulated through engagement with different stakeholders.

The Implementation Status Report includes the status of the different catalyst and Capital Improvement projects suggested in the 2013 Kigali Master Plan.

Since the fundamental approach to this master plan update is the intense participatory process followed to collect information and connect with various stakeholders at all levels, we have prepared a seperate report for the comments collected during different stakeholders engagements such as Focus Group (FG) Meetings, Technical Advisory Group (TAG) Meetings, Meetings with GoR Ministries, Agencies, Authorities, various private agencies and NGOs, social media via Twitter, Facebook, WhatsApp, SMS and Email.

The figure illustrates the project process including various stages, schedule and key deliverables of the master plan update.



Acknowledgements

We would like to acknowledge and thank the following organizations for their invaluable insights and contributions to the preparation of Kigali Master Plan Review.

City of Kigali (COK)
Ministry of Infrastructure (MININFRA)
Ministry of Agriculture and Animal Resources (MINAGRI)
Ministry of Trade and Industry (MINICOM)
Ministry of Environment (MoE)
Ministry of Lands and Forestry (MINILAF)
Rwanda Housing Authority (RHA)
Rwanda Agriculture Board (RAB)
Rwanda Water and Forestry Authority (RWFA)
Local Administrative Entities Development Agency (LODA)
Rwanda Environment Management Authority (REMA)
Rwanda Association of Local Government Authorities (RALGA)
Rwanda Land Management and Use Authority (RLMA)
Rwanda Development Board (RDB)
Rwanda Transport Development Agency (RTDA)
Rwanda Utilities Regulatory Authority (RURA)
Sector Executive Secretaries
Gasabo, Nyarugenge and Kicukiro Districts
Rwanda National Police (RNP)
Rwanda Defence Force (RDF)
Rwanda Women Network
Rwanda Institute of Architects (RIA)
Rwanda Civil Society Platform (RCSP)
Rwanda Green Building Organization (RGBO)
Rwanda – National Climate and Environment Fund (FONERWA)
Rwanda Association of Professional Environmental Practitioners (RAPEP)
Global Green Growth Institute (GGGI)
UN-HABITAT Kigali
Swiss Resource Centre and Consultancies for Development (SDC/SKAT)
Strawtec Building Solutions
Private Sector Federation (PSF)
Institute of Policy Analysis and Research (IPAR)
International Growth Centre (IGC)
Water and Sanitation Corporation (WASAC)
The Integrated Polytechnic Regional Centre (IPRC) Kigali
National Institute of Statistics Rwanda (NISR)
University of Rwanda (UR)
Institution of Engineers Rwanda
Rwanda Energy Group (REG)
Energy Development Corporation Limited (EDCL)
Development Bank of Rwanda (BRD)
Laterite Ltd.
Department for International Development (DFID) Rwanda
VNG International
World Bank Group
Rwanda Hospitality Association (RHA)
Nyamirambo Women's Center
Institution of National Museums of Rwanda
Youth Engagement in Agriculture Network (YEAN)
Rwanda Youth in Agribusiness Forum (RYAF)

This page has been intentionally left blank.

Executive Summary

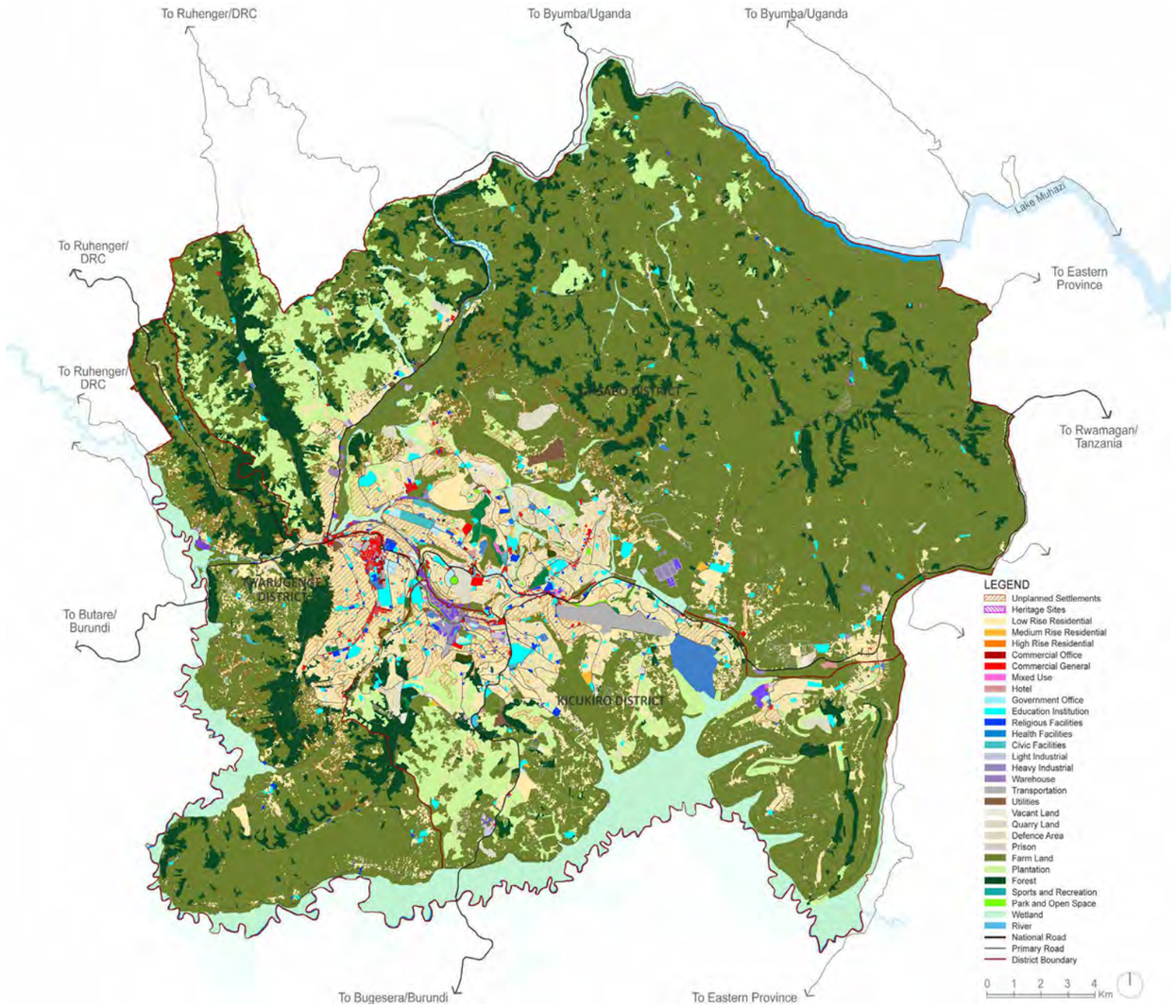
KIGALI CITY MASTER PLAN REVIEW

Kigali is the centre of transformation in Rwanda. The rapidly evolving urban centre requires an updated Master Plan to ensure that the city has the capacity to meet changing demands. In ensuring that the development goals of the Master Plan of the city of Kigali are in line with the overall national strategy, eight themes of development that resonates with the four NUP pillars are proposed for the Master Plan update. The current conditions in 2018 are analysed according to these themes to provide a more holistic review of the Kigali Master Plan 2013 and urbanization challenges that the city faces.

One of the key rationale behind the update of Kigali Master Plan 2013 is to improve the existing Master Plan and make it more inclusive in bringing the people of Kigali and Rwandans in general to the review process. Various participatory tools involving large base of stakeholders including stakeholders meetings, focus groups discussion organised according to the eight themes of development, as well as social media have been employed during the master plan updating process, to collect and share valuable inputs and feedback on the master plan review and aspirations for Kigali city.

UPDATES ON EXISTING LAND USE IN KIGALI CITY

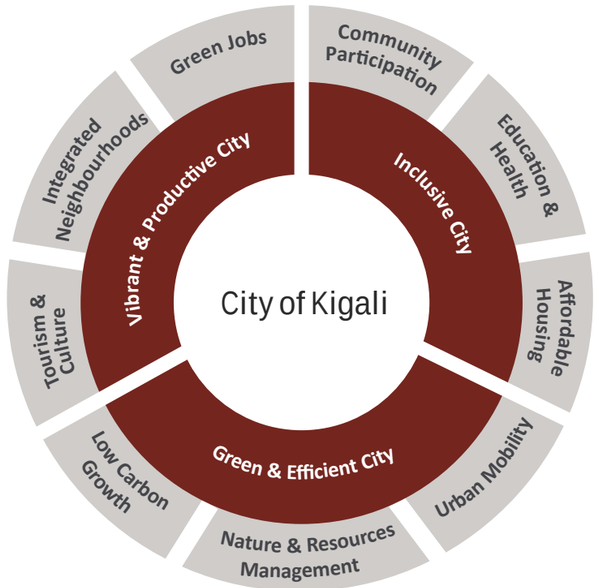
Broad Land Use	Existing Land Use 2013 (sqkm)	Existing Land Use 2018 (sqkm)	% Change
Agriculture	477.55	457.95	- 4.1
Commercial	3.00	3.32	10.6
Industries	4.14	4.25	2.7
Infrastructure	21.25	27.99	32.3
Mixed Use	0.19	0.26	36.5
Nature Area	124.78	123.61	- 0.9
Open Space	1.91	1.81	- 5.5
Public Administrative, Institutional and services	14.07	15.17	7.8
Residential	67.07	80.87	20.6
Special Use	13.26	9.51	- 28.3
Water Bodies	2.73	5.13	87.6
TOTAL	729.86	729.86	



Kigali City Existing Land Use Plan 2018

UPDATED URBAN SUSTAINABILITY FRAMEWORK

With reference to the reviewed analysis of the existing ground conditions of Kigali, national growth directions as well as the United Nations Sustainable Development Goals, the following issues are identified that will form the basis for the updated Urban Sustainability Framework to better suit the revised growth directions and development goals of the city. The aspects highlighted in the framework will be addressed by providing guiding principles for the subsequent planning processes of Kigali City that will ensure its long-term sustainability.



Updated Urban Sustainability Framework for City of Kigali

Components	Key Issues	Direction	Challenges	Recommendations
ENVIRONMENT Green & Efficient City	Nature areas • Urban areas prone to land slides and flooding • Unplanned developments on steep slopes • Deforestation • Encroachment of wetlands	• Clearance of development in Steep Slopes and Wetlands and acquire land for relocation • Restoration of steep slopes and wetlands • Afforestation	• Implementation mechanism and cost of land acquisition & relocation • Cost for programming and implementation restitution of nature areas	• Conserve all slopes above 30% • Conserve all wetlands • Prepare redevelopment schemes to relocate people from steep slopes and wetlands • Prepare strategies for rehabilitation and for management of slopes, forests and wetlands • Explore possibilities for sustainable exploitation of nature areas for economic gain-creation of green jobs
	Resources & Carbon footprint • Sprawling low rise development • Expanding urban areas • Need for extended infrastructure/ transportation facilities • Increasing pressure on energy and resources • Increasing carbon footprint	• Green Growth development • Compact city development • Sustainable resource management	• Affordability of intensified and densified development • Cost for high capacity transport infrastructure • Efficient use of resources	• Limit urbanization boundaries • Identify potential high density mixed use zones • Reduce sprawling development and hence reduce infrastructure/ transportation cost • Explore possibilities for green mobility and city greening to counter increase in carbon footprint • Explore integrated management system for energy, waste, water etc.
SOCIAL Inclusive City	• Large disparity in quality of living environment between the high and low income groups • Poor living quality in unplanned settlements with lack of physical and social infrastructure	• Inclusive development that considers the needs of all including gender, youth, vulnerable groups • Create Integrated Neighbourhoods • Community Engagement in implementation and local design	• Need for large funding resources • Balancing the needs of various groups of citizens • Brownfield developments • Implementation of integrated neighbourhoods	• Create good affordable housing/ home improvement schemes • Develop integrated neighbourhoods with a mixed of housing, commercial, recreation, transport facilities and employment opportunities • Ensure improved living quality for commoners and minimize the gap in terms of living quality • Conduct regular stakeholders meetings for city and local level project implementation
ECONOMY Vibrant & Productive City	• Lack of well-serviced attractive areas for investment • Need for more employment opportunities for the increased natural and migrant population • Promote green economic growth	• Create dedicated areas for businesses and regional commercial activities • Greens jobs creation • Promote tourism development	• Need to make strategic land acquisitions for a well-monitored commercial development • Balanced and complementary development for Kigali city and 6 secondary cities • Attract green economic investments	• Anticipate various investment possibilities in consideration of the latest regional development • Safeguard land for economic expansion at key areas (CBD / commercial centre, industrial areas, tourism spots) • Promote green economy investments and green jobs creation • Increase vibrancy and activities, promote tourism with preservation of culture and heritage

ENVISIONING KIGALI 2050

With the review of new Master Plan will show, lead and manage new development of the Kigali City up to 2050. Therefore, there is the need to review the vision of Kigali to match the current development and needs of the city in striving for continuous progression and improvement. A new vision is proposed in the Master Plan review based on a consensus of the stakeholders and local authorities. This new vision expresses its unique local identity and succinctly represents the aspirations and sense of ownership of Kigali city by its citizens to be an inclusive city for all.

8 GOALS FOR KIGALI

To achieve the long term vision for Kigali, a set of goals covering the 8 themes of development is proposed with key planning strategies and approaches. These key goals will thus guide the review of the physical master plan of Kigali city.

Kigali Vision 2050

Kigali Yacu!
Our Kigali

The Centre of Urban Excellence in Africa

Unique, Green, Dynamic for All

CITY OF EXCELLENCE

- Implement land consolidation and readjustment model
- Updates on existing land use and review zoning with socio-economic and real estate market analysis
- Alternative zoning models
- Upgrading of informal settlement to improve quality of life
- Financial models & public-private partnerships
- Review of Institutional set up for better coordination and capacity building

CITY AT WORK

- Review provision of employment sectors as per market demand
- Provide relevant sites to support new key economic drivers for economic development
- Develop framework for informal economies and formalising of informal housing
- Providing microlight industries with worker dormitories within mixed-use neighbourhoods
- Introduce flexible zoning regulations

CITY ON THE MOVE

- To become a transit-oriented City
- Develop a high-quality mass transit system
- To establish a Comprehensive Strategic Road Network that supports the mass transit system
- Develop a city-wide NMT network which includes cycling and connectivity
- Integrate Rail and Air Transport with the Road Network

CITY FOR CITIZENS

- Promote integrated, affordable development with access to social infrastructure and facilities for all
- Develop mixed use, mixed income development through alternative zoning
- Promote participatory planning/ bottom up approach
- Support upgradation of informal settlement to provide quality living environment

CITY OF INTEGRATED NEIGHBOURHOODS

- Promote development of mixed-use neighbourhoods with quality affordable housing and public open spaces and facilities
- Introduce flexible zoning regulations
- Promote low cost, local materials for construction of affordable housing
- Review proposed FAR for all zones
- Set up minimum and maximum guidelines for specific zones

GREEN CITY

- Leverage protected natural resources for economic activities
- Preserve fertile agriculture lands and use land consolidation method to increase food productivity
- Restoration of wetlands encroached for urban uses
- Compact and Integrated development
- Protect steep slopes and eco fragile areas

EFFICIENT CITY

- Improve water supply network in city ensuring minimum leakage and water loss.
- Adopt sustainable rainwater harvesting
- Provide Sanitation and Sewerage coverage for the entire city
- Develop efficient flood control system and proper stormwater management
- Ensure solid waste collection and management and sustainable energy usage

CREATIVE CITY

- Review and incorporate heritage and cultural sites for tourism and suggest related economic activities
- Support balanced development of natural resources for economic activities
- Encourage activity generating land uses to create a vibrant 24 hour city
- Identify key nodes for mixed uses and entertainment activities

FUTURE OUTLOOK OF KIGALI

	KIGALI 2018		KIGALI 2050
Population	1.3 million	→	3.7 million
Employment	0.58 million	→	1.76 million
Gross Density	1780 p/km²	→	6000 p/km²

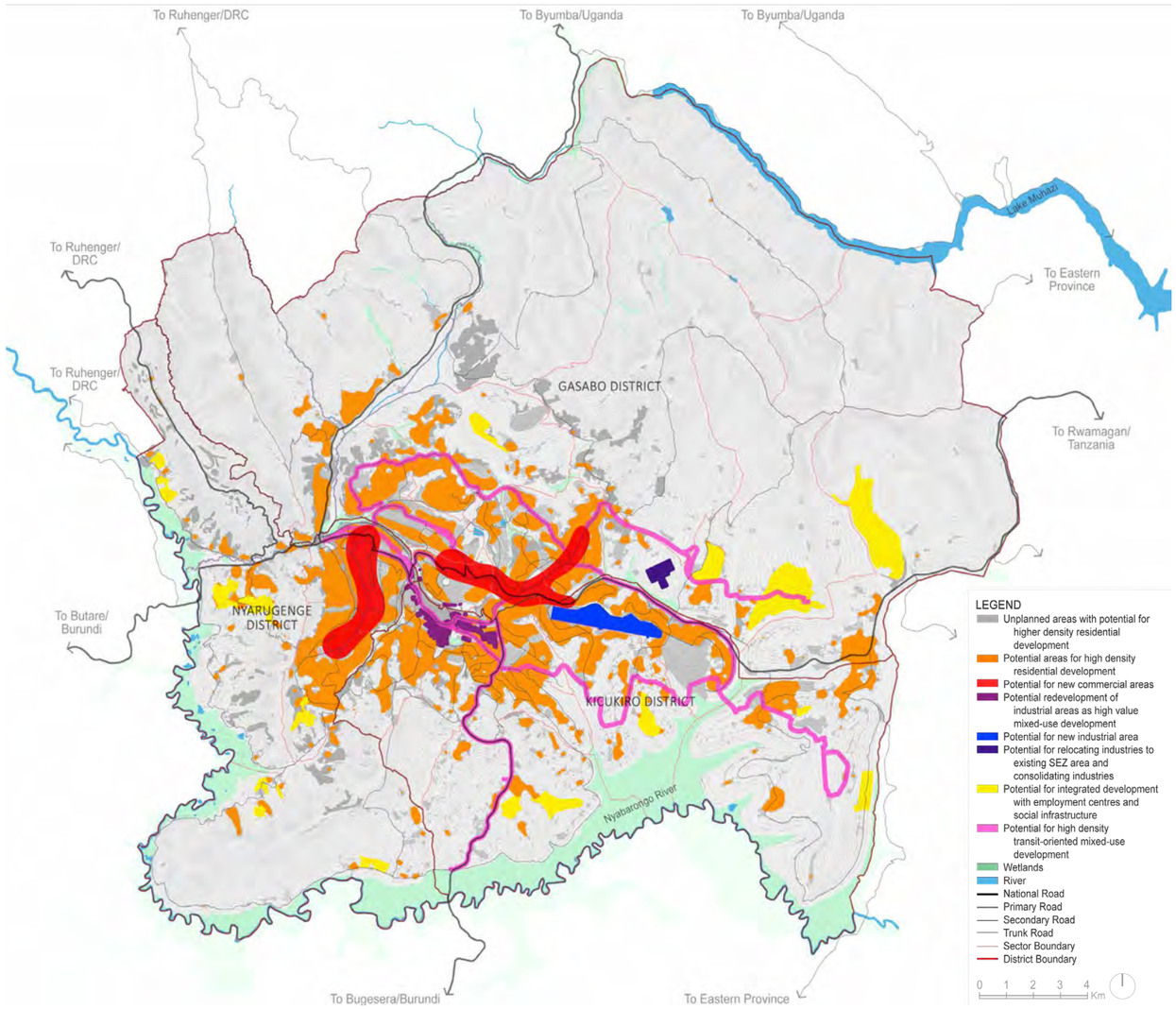
DEVELOPMENT STRATEGIES & OPPORTUNITIES

To realise the new proposed development vision, goals and strategies for the city of Kigali, development opportunities have been identified from the existing land use that will bring about updates of the proposed Kigali Master Plan 2013 in the subsequent stage of the Master Plan Review.

The City is blessed with a scenic naturescape and a pleasant salubrious climate which provides good opportunity for tourism and sustainable development. Sizeable areas of land are free of development and available especially in the Gasabo and Kicukiro districts for the urban expansion.

The key development opportunities are:

- Ample strategic areas for new development
- Opportunities for urban redevelopment and affordable housing
- Revitalization of Central Business District
- Opportunities for New Employment Nodes
- Consolidating industrial areas and integrated development
- Potential for adequate use and preservation of urban wetland
- Potential for mixed-use corridor along BRT network
- Immense Potential for Recreation and Tourism



Kigali City Opportunities map

This page has been intentionally left blank.

This page has been intentionally left blank.

1

Introduction

1.1. Project Background & Objectives
1.2. Methodology
1.3. Organization of Report

1 Introduction

1.1 Project Background

As stated in the 2013 Kigali Master Plan Implementation Report, the first update to the Master Plan shall be undertaken after 5 years from its adoption. This is even more important for a city like Kigali, which is rapidly evolving towards a world-class urban centre, and needs updated and real-time information on the master plan implementation status to promptly identify and apply corrective measures as needed. Surbana Jurong and SMEC have been selected as the ideal candidate for this important task that will shape, once more, the future of Kigali and Rwanda in general.

Having completed the inception stage including data collection, data gap analysis and updating of base map in Stage 1 of the project, Stage 2 of the project involves the update of visioning and programming for the City of Kigali. The Visioning and Programming Report consists of the update of physical context analysis, socio-economic projections, programming and development vision for Kigali.

Presented below is a list of reports due for this project:

Stage 1:
- Inception Report

Stage 2:
- Updated Visioning and Programming Report
- Implementation Status Report

Stage 3:
- Updated Transport Master Plan Report

Stage 4:
- Updated Master Plan Interim Report

Stage 5:
- Updated Master Plan, Zoning, Urban Design Report and Maps

Stage 6:
- Updated Implementation Plan Report

1.2 Report Objectives

This stage of works is critical in the updating process of the Master Plan as most of the primary and secondary data collected will be analysed and elaborated during this phase, which will serve as the basis to guide the directions of the revised development strategies and updated Master Plan.

The objectives of this report are to:
- Elaborate on existing context analysis including review of relevant national strategies and update of physical context conditions
- Reassess the future outlooks and forecasts on expected Kigali socio-economic and real estate market performance
- Update master plan programming in view of the revised future land and infrastructure demand required till 2050
- Refine the Urban Sustainability Framework, development vision, goals and objectives proposed for the City of Kigali in consideration of the inputs received from the stakeholders
- Review of development strategies and Kigali Concept Structure Plan 2013, and demonstration of new proposed concept in light of the updated demand and goals.

1.3 Methodology

In order to develop an updated Master Plan that is relevant and reflects the current situation faced by Kigali city, in-depth analysis of various planning issues affecting the city have been undertaken.

The process adopted during this stage of the project can be elaborated as below:
- Conducting a primary household survey with approximately 3,600 questionnaires with the objective to provide sector level information on current socio-economic, market conditions and trends, housing needs and affordability, as well as transportation patterns data
- Reviewing the current national level policies, strategies and initiatives and incorporating into the updated Master Plan
- Updating the detailed analysis of existing physical context and conducting comparative 2013 – 2018 analysis of Kigali development to identify the prevailing key development issues and challenges
- Updating the socio-economic study including demographic and economic outlook for Kigali, housing market and need analysis, as well as commercial real estate market analysis to determine the projected land and infrastructure demand 2050
- Revising the Urban Sustainability Framework for Kigali to address the current key economic, social and environmental issues
- Benchmarking of relevant and comparable international best practices on development models and projects proposed for Kigali City
- Determining and updating the broad land requirements for accommodating various future land uses
- Refining the development vision, goals and objectives for Kigali City
- Reviewing the city development strategies and Conceptual Master Plan 2013 to update the growth directions of the city
- Conducting Stakeholders Meetings, Focused Groups Discussion and Technical Advisory Group Meetings in parallel during the project stage to engage the communities in data collection, ideas sharing, master plan updating progress, comments and feedback.

1.4 Organisation of Report

In addition to this chapter, the report consists of other following chapters:

Chapter 2: Review of National Strategies

This chapter presents a summary and review on the key national strategies of Rwanda that have an impact on the urban development of the country and cities. These include policies and reports that outline the national growth directions in urbanization, green growth and climate resiliency, housing and unplanned settlements, sustainable tourism and planning regulations that guide the land use planning of the cities etc.
This review is to ensure that the update of the Kigali Master Plan takes into consideration the macro growth strategies and is aligned to the national objectives set for Kigali.

Chapter 3: Planning Initiatives for the City of Kigali

The past and current physical planning initiatives that have been undertaken for the city of Kigali are summarized and reviewed in this chapter. This include understanding the National Land Use and Development Master Plan, Conceptual Master Plan for Kigali City, and Kigali City Master Plan that has been adopted in 2013. The planning strategies and planning implications of each Master Plan are analysed which will then provide guidance for the development of the updated Master Plan.

Chapter 4: Eight Themes of Development

This chapter organizes the update of the existing context and ground conditions based on the new approach of eight themes of development established for this update of Kigali City Master Plan. The key sectors that were focused in the Kigali Master Plan 2013 including economic, social and demographic growth, employment, nature and environment, housing, transportations, utilities and infrastructure will be updated based on the eight themes: City of Excellence; City of Integrated Neighbourhoods; City at Work; Green City; City on the Move; Efficient City; City for Citizens; and Creative City.
The changes from 2013 as well as issues and challenges facing each topic are presented.

Chapter 5: Development Constraints & Opportunities

The key outcomes and insights received from the updated existing context analysis are summarized and presented in a revised opportunities and constraints map for Kigali that reflects the current conditions. This forms the basis for reviewing the detailed physical planning of the city as proposed in Kigali Master Plan 2013.

Chapter 6: Dimensions of Growth

In order to ensure that the revised Master Plan for the city of Kigali are reflecting the changing market demands of the population, a separate socio-economic and real estate demand study was undertaken to understand the future growth potentials of the city to year 2050 with respect to the current market conditions. The socio-economic study profiles the short, mid and long term indicators for Kigali's economic, employment and demographic growth. This data is the key input to estimate the quantum of land and resources that need to be prepared for and reserved to secure a planned future for the city, which will serve as the basis to update the Kigali Master Plan. This chapter presents the key highlights of the socio-economic study.

Chapter 7: Urban Sustainability Framework and Development

During the Master Plan updating process, a multi-stakeholder engagement approach is adopted to develop the vision of the city and shared ideas for the revised Master Plan, which will be summarized in this section. The Urban Sustainability Framework (USF) for Kigali targets on the key triple-bottom line – economic, social and environmental issues for Kigali and sets the broad direction and recommendations targeted at resolving these key issues. The USF forms the first broad matrix which would set the overall planning direction.

This chapter presents the updated USF to address the changing issues and accommodate new growth directions of the city and subsequently the updated vision, goals and strategies of Kigali 2050 that would direct the city's development and progress. To help achieve the realization of the vision and master plan, benchmarking exercise was conducted on international cities with successful models of development that will serve as useful lessons for Kigali to implement the Master Plan.

Chapter 8: Broad Land Use Requirements

In order to guide the physical planning works, the strategies, recommendations for the USF and development vision are translated into quantifiable land requirements for different future land uses in the city with reference to the updated socio-economic projections. This section elaborates the total land requirement and land development programme for Kigali by 2050.

Chapter 9: Approach to Update of Master Plan

This chapter concludes the vision report with the illustration of the planning strategies and approach taken for the update of the Master Plan. A demonstration site is chosen to show how the proposed zoning tools are being utilized to create a quality urban environment, which can be a potential development framework to be adopted by the Kigali Master Plan for the upgrading of unplanned settlements.

This page has been intentionally left blank.

2

Review of National Strategies

2 Review of National Strategies

To understand government priorities, challenges and directions on urban development, the following strategic reports and documents guiding sustainable urbanization of Rwanda have been reviewed.

Significantly, there have been several policy updates since the development of Kigali Master Plan 2013 such as National Urbanization Policy 2015, Vision 2050, 7-years plan 2017 -2024 and more. It is thus important to understand and take into consideration these recent updates. Salient points captured from the review shall be considered appropriately for the update of Kigali City Master Plan.

Figure 2.1 summarizes the key policies and guidelines that are highlighted in this review. The summary review of each report followed by salient points relevant to the scope of this assignment are provided below.

2.1 Vision 2050 - Chapter 3: Faster Urbanization, Greater Agglomeration

Vision 2050 highlights the importance of a rapid and well managed urbanization to achieve Rwanda's aspirations for growth. It emphasizes on generating higher productivity through faster urbanization and greater agglomeration economics.

VISION 2050

Elevate Rwanda beyond high income to high living standards by the middle of the century.

Income targets are to attain upper middle-income country status by 2035 and high-income status by 2050 to provide high quality livelihoods and living standards by mid-century.

Source: 7-years Government Programme [National Strategy for Transformation (NST 1)] – 2017- 2024

Salient points from Vision 2050:

1. Pursue **faster urbanization** and **greater agglomeration**;
2. Emphasize and **regulate development density based on market demand and price based allocation**;
3. Create **high density urban settlement**;
4. Re-emphasize Master Plan's proposal on **urban mobility (public transport)** and investments;
5. Highlight **connectivity of Kigali with other Rwanda cities** (especially secondary cities) for cross-district coordination and economically connected districts;
6. Master Plan to emphasize on **institutional strengthening** to unite economic and spatial planning and **coordination amongst agencies** to avoid coordination failures in urban development;
7. Review Master Plan for **minimum plot sizes and maximum ground cover ratio;**
8. Study and a**nalyze informal settlements for possible legalization** of the structures built and extending urban facilities for an improved living condition;
9. Increase the density by **providing quality infrastructure** servicing for central areas;
10. Provide **grids for the urban expansion** area to avoid unplanned settlements;
11. Support **inclusive urbanization** by mobilizing rural-urban linkages through coordinated development model;
12. Fiscalize **public investments** in cities through **land value capture**; and
13. Strengthen **urban planning capacity** and institutions for stakeholder engagement and participatory planning

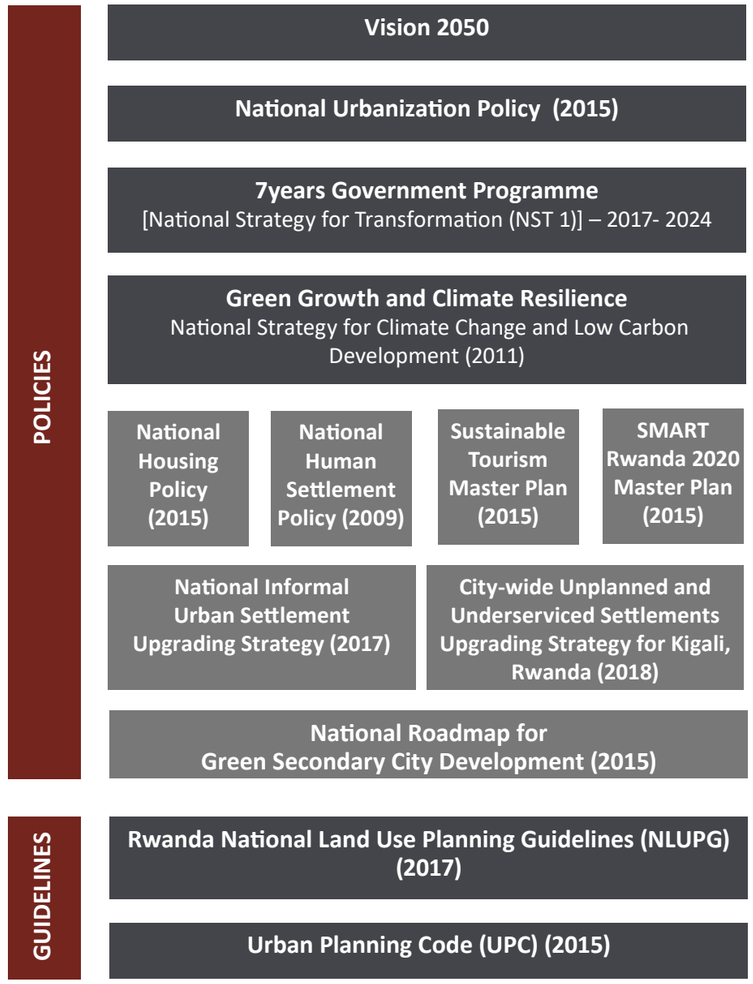


Figure 2.1 Key National Policies and Guidelines on Urban Development

2.2 Rwanda National Urbanization Policy (2015)

The policy addresses all aspects of cross sectoral actions in urban development and governance for sustainable development.

The aim is to enhance collaboration and cooperation between all stakeholders and communities to improve service provision and support a continuously growing local economy.

VISION

"Urbanization, an engine of economic development and sustainable human settlement"

GOAL

Well-coordinated urban settlement and development positively transform the economy of the country, improve the socio-economic conditions for all, and preserve resources to sustain the life of future generations.

Salient points from Rwanda National Urbanization Policy (2015):

The overarching policy pillars:

Coordination
Ensure multi-level institutional coordination, good governance and effective urban planning management, with appropriate tools ensuring coherence between different urban planning interventions.

Densification
Use land efficiently to achieve urban compactness (through cluster housing and mixed-use neighborhoods), well-structured functionality and connectivity within and in between urban areas by integrating green principles and strategically phasing investments.

Conviviality
Assure quality of life with social inclusion and cultural preservation as integral parts of urban planning interventions and urbanization.

Economic Growth
Achieve sustainable economic growth guided by green economic criteria (resource efficiency, clean production, (resource efficiency, clean production, green infrastructure) to enhance urban areas to become centers for innovation and entrepreneurships for socio-economic opportunities and job creation.

Core principles guiding the policy:

Sustainability and Resilient
Low carbon, safe and healthy environment

Integrated Planning
Attention on Inclusiveness of Economic, Physical and environmental planning.

Decentralized Urban Governance
Effective urban governance rather than only enforcement measures

Participatory Planning
Planning with all stakeholders/all sectors of the community (including vulnerable and low-income groups) for quality and inclusive decision making.

Flexibility and market responsiveness
Understand market demand and be aware of the dynamics of informal sector for opportunities.

Sustainable land use
Promote integrated and compact urban areas.

Appropriate tools for urban management
Strategic and effective tools to guide the decision-making process to ensure balanced economic development.

Social Inclusion and Cultural Preservation

2.3 7 years Government Programme

National Strategy for Transformation (NST 1) 2017- 2024

This is an implementation instrument for the remainder of Vision 2020 and for the first 4 years of the Vision 2050 journey.

This document highlights some of the pillars and their goals from the vision document and elaborates on the objectives, priority areas for 7 years and key strategic interventions to achieve the goals. The objectives relevant to the scope of this assignment are reproduced below under each pillar:

Economic Transformation Pillar
"Accelerate inclusive economic growth and development founded on the private sector, knowledge and Rwanda's natural resources"

Social Transformation Pillar
"Develop Rwandans into a capable and skilled people with quality standards of living and a stable and secure society"

Transformational Governance Pillar
"Consolidate good governance and justice as, building blocks for equitable and sustainable national development"

Salient points from 7 Years Government Programme (2017-2024)

1. Create **1,500,000 (over 214,000 annually)** decent and productive jobs for economic development;

2. Accelerate **urbanization from 17.3% (2013/14) to 35% by 2024** – the interventions highlighted under this includes:

- **Updating master plans** for secondary cities and other key urban areas;
- Promoting and developing **local construction materials**;
- Improving **rural-urban transport services**; and
- **Developing basic infrastructure - services** to 250 km of new residential zones and construction of 288 km of urban roads

3. Establish Rwanda as a **globally competitive knowledge-based economy**;

4. **Promote industrialization** for **high-value goods and services**
Some of the key interventions included are:

- To **double tourism revenues** by positioning Rwanda as a **world class and high-end eco-tourism destinatio**n; by accelerating **MICE tourism growth**;
- To develop a **vibrant aviation sector**; and
- To **grow agricultural exports**

5. Transition Rwanda **towards a carbon neutral economy** through sustainable management of natural resources and environment;

6. Enhance demographic share through ensuring access to quality health for all and education;

7. **Move towards a modern Rwandan household:**

- **Scale up access** to water, sanitation, electricity, broad band coverage;
- Develop and facilitate decent settlement including relocation of settlements from high-risk zones - **10,209 households to be relocated from high risk zones** and **205,488 households** to be mobilized to **relocate from scattered settlements**;
- **Affordable housing fund** to be operationalized to construct **15,000 new dwelling units**; and
- Continue to **mainstream Disaster Risk Reduction and Management** into all development sectors

8. Ensure **safety and security** of citizens and property;

9. **Increase citizens' participation, engagement and partnerships** in development; and

10. **Promote recreational activities** and sports for all;

2.4 Green Growth and Climate Resilience *National Strategy for Climate Change and Low Carbon Development (2011)*

The document covers its vision for green growth and climate resilience; guiding principles; strategic objectives followed by programmes of action; enabling pillars to support their implementation and road map for Implementation. The adjacent strategic framework figure outlines various headings/chapters of the report.

PURPOSE

1. To guide national policy and planning in an Integrated way;
2. To mainstream climate change into all sectors; and
3. To position Rwanda to access international funding for climate resilience and low carbon development

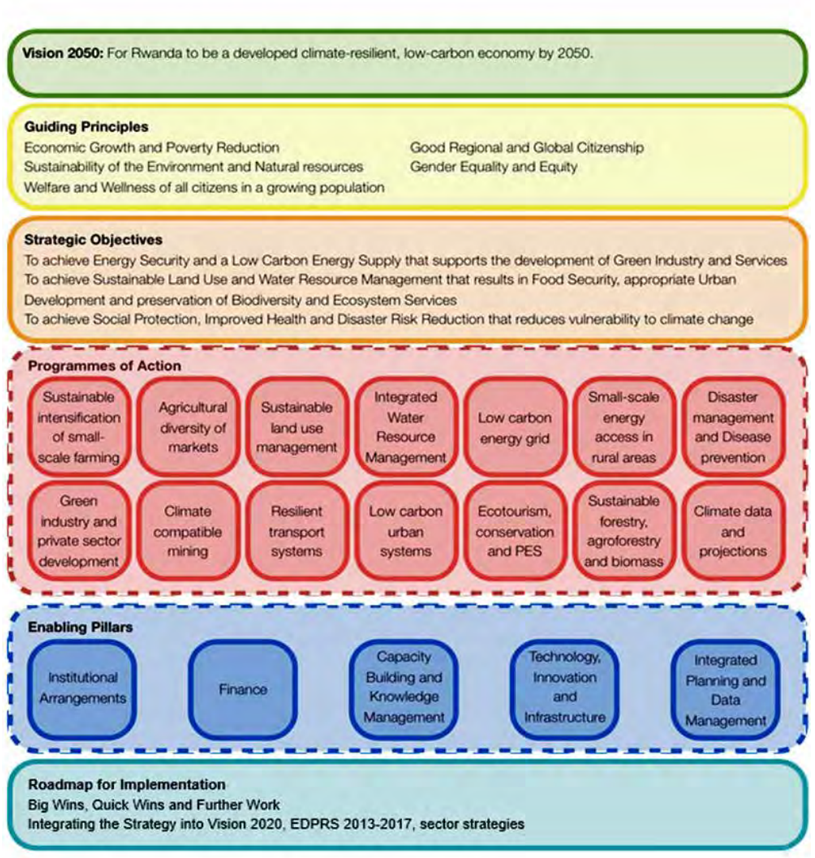


Figure 2.2 Strategic Framework for Rwanda's National Strategy for Climate Change and low Carbon Development.

Source: Green Growth and Climate Resilience Report

Salient points from Green Growth and Climate Resilience National Strategy for Climate Change and Low Carbon Development (2011):

1. **Mainstream** agroecology techniques as in **agroforestry**, **water conservation** to maximize sustainable food production;
2. Land use may need to change as the climate changes - **integrated approach to planning** and sustainable **land use management**;
3. **Integrated water resource management** and planning to ensure sustainable water resource;
4. Government targets **1,000MW by 2017** through **geothermal power**, **methane, peat, solar PV** and small and large-scale **hydropower**;
5. For the Green Industry Initiative, **scale up resource efficiency**; establish **Climate Innovation Centres** to support investments;
6. **Climate compatible mining** to be encouraged and supported for mining operations;
7. Target for **efficient resilient transport systems** – increase investments on roads;
8. Target low carbon development - **high density urban areas, efficient buildings, appropriate zoning, mass transit, waste recycling**;
9. Effective **protection and sustainable management** through **conservation and eco-tourism**;
10. Utilize available **international climate financing** opportunities; and
11. **Clearer tax and import duty exemption rules** for all efficient energy technology components

2.5 National Human Settlement Policy (2009)

The document outlines the policy principles, objectives, strategies and programmes for a sustainable human settlement in Rwanda. It aims to ensure decent housing to all Rwandans and make human settlements, in both urban and rural areas, economically viable and socially integrated through a participatory approach.

The document builds on its history of human settlement in Rwanda, highlights major challenges in human settlement sector, and proposes its guiding principles, objectives, strategies and programmes for urban and rural areas.

2.6 National Housing Policy (2015)

The Policy document includes :

1. Sector overview highlighting guiding documents;
2. Constraints on housing, land and government framework pertaining to low purchasing power, limited accessibility of financing models, high construction and sales costs etc.;
3. Key challenges and opportunities for improvement to the housing framework;
4. Vision and principles assumed and pursued by the government in supporting housing development; and
5. Policy objectives, policy statements and activities under each policy pillars and implementation strategy

Salient points from National Human Settlement Policy (2009):

Strategies:

1. Assessment of the socioeconomic as a precondition for thorough understanding of the problems of city dwellers;
2. Development of urban planning systems to establish the conditions of land use, the distribution of amenities, and define specific investment programmes in the short, medium and long term;
3. Rehabilitation of residential areas prioritizing home security for the residents, by means of various solutions including rehousing;
4. Development of mechanisms for producing sufficient building;
5. Development of mechanisms for producing sufficient building plots in terms of quantity and quality;
6. Land improvements and provision of facilities in residential areas to be developed at suitable costs to avoid anarchical occupation;
7. Enforcement of the principle of urban development costs recovery where costs of land improvements in residential areas will be met by the beneficiaries of the building plots, by communities for secondary infrastructure and by the government for primary infrastructure;
8. Establishment and strengthening of institutions involved in human settlement financing such as Human Settlement Fund and the Human Settlement Bank of Rwanda;
9. Giving responsibilities to local communities in the management of human settlement by strengthening their role, through establishment of local structures for real estate promotion and establishing human settlement commissions;
10. Promotion and organization of the participation of the beneficiaries of human settlement programmes for planning and management and the organization of development procedures; and
11. Promotion of the production and sale of building materials to support the building sector and to facilitate access to locally produced materials

Salient points from National Housing Policy (2015):

1. Enable variety of **housing schemes that address all beneficiary groups** including **Integration of informal housing units** by **upgrading existing housing**, where feasible.
2. Government to **collaborate with private and finance sectors** to finance housing
3. **Promote land pooling and re-plotting** for sustainable use of land - **Public participation and collaboration** to be an integral part of housing development.
4. **Efficient Master Plan phasing** for implementation and strategic land acquisition as per the investment plan.
5. **Developable land and under utilized government land** to be availed for **social housing projects**.
6. Develop and implement **guidelines to manage unproductive** urban lands.
7. **Zoning** to be in support of **high density developments** and **affordable housing**.
8. Government responsibility to **provide basic trunk infrastructure**.
9. Neighborhood level infrastructure maybe provided to those who **fulfill affordable housing criteria** – **Incentives** for affordable housing developers.
10. **Affordable housing Infrastructure Fund** that could include cross-sectoral resource for infrastructure.
11. Promote production and use of **local construction materials**.
12. Focus on **resource efficiency** such as **land densification, green energy, cost efficient construction materials**.
13. Give attention to the **livability and social wellbeing** for the high-density housing schemes. Settlements shall **support mix of occupants** inclusive of all social, religious; age, gender etc.
14. Focus on **resource efficient** and **effective investment planning**, **high housing densities** and **compact development**. **Historic buildings** to be treated as valuable and integral part of the urban fabric.

VISION

"Everyone independent of income, base of subsistence, and location is able to access adequate housing in sustainably planned and developed areas reserved for habitation in Rwanda"

2.7 National Informal Urban Settlement Upgrading Strategy (2017)

This document is guiding the implementation of countrywide informal urban settlement upgrading in Rwanda. It follows the provisions of the National Housing Policy (2015), which stipulates "Existing informal housing units shall be upgraded and integrated into the formal housing stock to the highest degree feasible.

The document includes informal situation in Kigali, principles when planning. Urban upgrading, strategic investment prioritization criteria and five project implementation options.

GOAL

To effectively guide the inclusion of existing, informal housing stock as part of the formal housing stock.

Salient points from National Informal Urban Settlement Upgrading Strategy (2017):

The report identifies five options of implementing an upgrading project:

Option 1: Urban upgrading collaboratively initiated by the land holders in a settlement area through pooling of land, financial and physical resources for the benefit of all. This is also flexible for participation by tenants.
Highly feasible in little developed urban areas with zoning that allows intensification and, where majority of owner households have mid-range income.

Option 2: Implementation in the form of partnership between the land holders in a settlement and real estate investor/ developer.
Land of collaborating land holders are pooled, and project financed by the investor. Land holders keep shares in the project.
Applicable to those areas that are underutilized, are under development pressure and which does not match with the requirements of Master Plan zoning. The option is feasible where owner households have low to very low incomes.

Option 3: Implementation initiated by the Government, in close collaboration with the land holders and committed tenants, based on investment prioritization following city wide upgrading implementation strategy.
This option is feasible for areas requiring basic infrastructure and where the community alone is not capable to upgrade.

Option 4: Kind of Option 2 but, with participation of established institution such as Social Investment Trust. with the capacity for expansion and roll-out of investment.
Feasible for those areas that are underutilized; are under development pressure, which does not match with the requirements of Master Plan zoning; and, where owner households have low to very low incomes.

Option 5: This is a conventional form based on available external funding through development partners/NGOs/leading institutions. This option works best for most underserviced areas with high population densities and low or very low-income population.

1. All options require a well moderated community planning process and technical assistance;
2. Level of land owner contribution, compensation and financing of infrastructure improvement differs, depending on the options stated for project initiation;
3. Specific Land Development Plan for urban upgrading shall be prepared as per the related Ministerial Order ;
4. Urban upgrading /renewal may include:

    - Re-plotting or plot readjustment to combine small plots to form a larger plot;
    - On-site improvements on public infrastructure, facilities and services;
    - contribution of land towards provision of public infrastructure, facilities and services, where needed and feasible;
    - Improvements to building structures; and
    - Infill development to achieve optimum urban densities in compliance with the urban planning regulations

5. Involuntary resettlement must be minimized to the highest degree feasible, well consulted and Resettlement Action Plans (RAP's) prepared; and
6. Urban upgrading shall not be pursued for un-suitable or hazardous land, i.e. prone to flooding; weak soil; sloped terrain steeper than 450

2.8 Sustainable Tourism Master Plan (2015)

Tourism sector is one of the main contributors of the economy in Rwanda. The following documents were reviewed: Rwanda Tourism Policy, Sustainable Tourism Development Master Plan for Rwanda, Revised Sustainable Tourism Master Plan (STMP) - Volume 1 (Strategic Plan), Revised Sustainable Tourism Master Plan - Volume 2 (Action Plans), National MICE Strategy.

VISION

"Through well managed marketing, development and public/private partnership, Rwanda will be a major international tourist destination and will be a regional conference hub for Central and Eastern Africa, continuing to be a nature destination of global significance with a high quality diversified tourism product, that contributes significantly to the overall socio-economic development of the country".

Salient points from Sustainable Tourism Master Plan (2015):

1. Development of business tourism, cultural and religious tourism and the creation of an events-based tourism are some of the ways identified in which tourism revenues can be expanded;
2. The Tourism Development Concept and Structure Plan - identifies creation of Kigali City as the 'hub' and other tourism corridors/linkages as 'spoke'for product development;
3. The products identified, that anchor and integrate the development areas are the:
    - Heritage corridor – Kigali Hub to Nyungwe DMA;
    - Eco-Agro corridor – Kigali Hub to Volcanoes DMA; and
    - Scenic corridor – Kigali Hub to Kibuye DMA
4. Kigali identified as the hub for MICE industry with a focus on the bigger international and regional meetings and conventions. This is an important driver for the creation of jobs;
5. Other major cities such as Ruhengeri/Musanze, Gisenyi/Rubavu and Butare/Huye need to further develop their infrastructure for events and meetings for the reduction of regional disparities;
6. ICT infrastructure to be enhanced/provided to enable the MICE suppliers to offer hybrid conventions and meetings;
7. Kigali and other identified cities should have facilities and venues to host regional and international conventions and meetings at any size;
8. The Kigali Conference Centre (KCC) is identified as the main MICE venue and it is envisaged to be embedded in a lively neighborhood to keep the place vibrant even when there are no events. This can evolve over time to be a second city centre;
9. The Tourism Master Plan emphasizes the importance of creating a great image in the first 30 minutes of entering the city;
10. The District Development Plans (as stated in the Tourism Master Plan) for Kigali Hub emphasizes on the following facilities:

    - Establish Kigali as the conference hub of East Africa;
    - Kigali Cultural Village, in Kigali;
    - Cultural museums;
    - Nature tourism development at Muhima wetland;
    - Mount Kigali Recreation Facilities;
    - Sports tourism development (Kigali Regional Stadium and National Stadium Amahoro in Kigali);
    - New hotels in Kigali Hub;
    - Hospitality Training School; and
    - Major flagship attraction in the capital to extend length of stay such as National Medical Tourism and National Sports Tourism Initiative to be studied as new niche market – nationwide but with a focus on Kigali

2.9 SMART RWANDA 2020 Master Plan (2015)

ICT is recognized as a key driver for economic growth in Rwanda. SMART Rwanda Master Plan (SRMP) aims to help improve citizens' quality of life while also developing capability of the private sector key industries to achieve a sustainable socio-economic growth.

VISION

"Towards a knowledge based society"

GOALS

1. Economic transformation;
2. Job Creation and increase in productivity; and
3. Accountable governance

Salient points from SMART Rwanda 2020 Master Plan (2015):

Key expected outcomes have 3 focus areas

1. The Business and Innovation Area:

Focus on promotion and harnessing opportunities for foreign direct investment to position Rwanda as Africa's ICT hub with projects such as Kigali Innovation City and nurturing home-grown ICT businesses.

2. The National Economic Digital Transformation Area:

Underpinned by flagship projects covering 7 SMART pillars: SMART Agriculture, Finance, Trade and Industry, Health, Education, Education, Government, and Women & Youth Empowerment in Technology (WOY-Tech) 3 SMART enablers: ICT Capability & Capacity, Secure & Shared Infrastructure as well as Governance & Management.

Key Focus:

- Government Digital Transformation by 2018;
- Broadband for all by 2020; and
- Digital Literacy for all

3. The Future Planning Area:

Focus on R&D and leverage global technology trends such as smart cities and smart communities, the Internet of Things (IOT), Big Data and Analytics, drone technology, 3D printing, creative industries and cyber security.

The Core Objectives:

- Expand medical and health services to enhance citizen's quality of life;
- Utilize ICT for Education as a tool to enhance teaching and learning;
- Transform agricultural practices to enhance productivity, and increased commercialization and industrialization;
- Expand financial infrastructure to increase access to financial services;
- Promote trade and industry development by enhancing value of products and services;
- Promote Women and Youth's social economic empowerment through ICT; and
- Build a secured, shared robust and resilient infrastructure to underpin service delivery and support national ICT initiatives

Enhance the National ICT Governance Structure for effective implementation of ICT programs.

Transform digital government through e-Governance and provide effective public service delivery to empower rural and urban communities.

SRMP Execution Model

Private Sector Participation (Public- Private Partnership).

Private Sector Development Strategy with focus on:

- Grow Existing Indigenous ICT Businesses
- Cultivate New Local ICT Enterprises
- Transform Non-ICT Businesses with Technology
- Export & FDI Expansion

2.10 National Roadmap for Green Secondary City Development (2015)

This document is a guide for the Government of Rwanda for planning the six secondary cities that have been identified in the Second Economic Development and Poverty Reduction Strategy (EDPRS 2). It is also an operational tool for the National Strategy for Climate Change and Low Carbon Development.

GOAL

"To ensure more balanced urban growth for the country by encouraging the emergence of secondary economic poles of growth, while keeping the leading role of Kigali"

Salient points from National Roadmap for Green Secondary City Development (2015):

Urbanization and Green Growth
Need to anticipate and respond to the complexity of urbanization, enable cities to operate sustainably and mature to a green growth pathway.

All planning instruments must comply with the provisions of the Urban Planning Code (UPC).
No 'business-as-usual' approach. Rapid expansion and redevelopment of urban centres should be realized following a green growth approach.

Pillars of Green Urbanization:
1. Building and construction;
2. Energy production and consumption;
3. Urban mobility;
4. Water production and distribution;
5. Water sanitation; and
6. Waste management

Strategies and guidelines to be integrated in the planning and the development process of secondary cities:

Strategies:
1. Adopt a spatial structure strategy and anticipate urban land needs;
2. Preserve ecosystems and biodiversity;
3. Promote density and mixed land use;
4. Integrate transport and land development;
5. Plan sufficient green spaces;
6. Design efficient and pedestrian-friendly streets;
7. Mainstream gender perspective in city planning;
8. Plan a resilient city;
9. Manage resettlement responsibly;
10. Invest in urban infrastructure and create green jobs; and
11. Facilitate and improve the quality of life of urban families

Guidelines:
1. Promote the design of green buildings;
2. Build with local and sustainable construction materials;
3. Provide accessible and affordable basic public services in cities;
4. Promote green technologies;
5. Implement renewable energy source for the main grid;
6. Develop off-grid energy to offset pressure from on-grid energy;
7. Plan urban development to reduce the need for commuting;
8. Plan a walkable city;
9. Plan and phase-in the implementation of a public transport system;
10. Design an efficient and hierarchized road network;
11. Preserve and protect water sources and ensure access to all;
12. Improve sustainability of water treatment and efficiency of the water distribution system;
13. Plan a system, not only its technological components;
14. Choose the right collection technology based on the context;
15. Prepare and adopt a waste management plan;
16. Design green and efficient sanitary landfills; and
17. Improve the collection of waste in low-income areas

2.11 City-wide unplanned and underserviced settlements upgrading strategy for Kigali, Rwanda (2018)

The report identifies categories of informal settlement in defining a city-wide strategy to upgrade underserviced and unplanned settlements in Kigali to achieve positive socio-economic impacts and counter-balance socio-territorial segregation trends. It also proposes a financial mechanism and an institutional set up to support the implementation of the strategy in line with the national strategy.

City-wide upgrading strategy includes two major components:

1. Systematic and coordinated actions on infrastructure development and land management at the city level; and
2. Specific and tailor-made upgrading interventions in the different categories of informal settlements

Settlements Categories (using different criteria related to the location, associated environmental risks and area size):

1. Central overcrowded areas – 34%
2. Uphill sloped settlements -19%
3. Downhill settlements- 11%
4. Inaccessible areas- 13%
5. Small-pocket settlements- 2%
6. Peri-urban areas – 9%
7. Settlements located in high risk areas (highly steep slopes and flood prone -13%

Salient points from City-wide unplanned and underserviced settlements upgrading strategy for Kigali, Rwanda (2018):

1. **Central overcrowded areas (100-250 ppha):** Most common informal settlement category. Overcrowded and lack of adequate sanitation facilities. Most of the residents are tenants. High densities as proposed by Kigali Master Plan can only be achieved through vertical development, which would require removal of existing informal settlements. If in-situ upgrading for urban renewal-need to carry out land negotiations to open roads and create public spaces.

Current Agatare upgrading approach – With the current upgrading approach, high density/vertical densification proposed by Master Plan cannot be achieved as effort like this will simply improve the physical conditions. To generate a real change, a different set of pro-poor policies, legal framework, financing systems and approaches need to be put into place. Replication of Agatare approach risks' to create a culture of dependency.

Interventions proposed for Tetero and Muhima (strategically located, close to a public transport hub)

Urban expansion projects: Demolition of existing structures that will be replaced by high density buildings (residential with commercial on ground floor).

Clustering and densification: Subdivide into cluster of houses to facilitate urban renewal operations to build high density affordable multi-storey housing through PPP.

Improving urban basic services provision: Opening internal roads and creating clusters of houses.

Public space and green areas: Creation of public spaces and urban gardens in environmentally fragile areas. Where suitable, can be used for social services (schools and health centers etc.).

2. **Uphill sloped settlements (between 80 and 100 ppha):** Upper parts of the hills, along the slopes, generally areas prone to soil erosion and landslides. Has balanced distribution of owners and tenants. Requires a series of specific and tailored interventions, case by case.

Combination of the following types of intervention is proposed:

Infrastructural improvements: Providing key infrastructure in these areas, especially by opening roads.

Land negotiation: Negotiation between land owners and actively involving tenants to create more space for opening roads and installing public facilities, thus progressively upgrading.

Regulating rental markets: Reinforcing cooperation between land owners and tenants, with a stronger regulatory role being played by the government.

Erosion control and environmental protection: Protection and planting of trees and natural vegetation. Terracing techniques for soil erosion control.

3. **Downhill settlements (Between 80-100 ppha):** Located close to wetlands and / in areas prone to flooding. They are underserviced with mixed land use. Inhabitants are mostly tenants. Where they are near or within prime real estate, these settlements face high pressure from land buyers and investors.

Proposed Interventions: Physical demarcation of the settlement's boundaries with surrounding roads, to prevent further expansion into the wetland areas. Improvement of sanitation conditions and environmental protection of the settlement.

Nyarutarama Interventions proposed: Subdivision into clusters of 10-20 plots by opening internal access roads and fostering collaborative action within each cluster for improving the area Participatory land readjustment which involves all stakeholders (land owners, tenants, informal residents, the municipal authorities, land professionals and community organizations) in planning and decision-making to build consensus and avoid evictions.
Complete urban renewal, to be applied only in extreme cases, where houses are in high risk areas.

4. **Inaccessible areas:** Generally located behind higher income neighbourhoods close to major roads.

Interventions proposed: Expropriation/purchasing of plots, preferably empty lots, to open access roads in critical areas located behind formal/ higher-class neighborhoods.

Improved access to water and sanitation and clear settlement's boundaries: providing a basic structure and circulation network with border road demarcating the neighborhood's limits.

Public spaces: As already discussed above.

Re-organise plots and manage densities by merging smaller overcrowded plots and resettling some households in affordable rental buildings located closer to the entry points of the settlement.

5. **Small-pocket settlements:** Mixed land use settlements showing low density occupation with most of the inhabitants being tenants. Mainly disrespectful of city planning regulations and housing structures are overcrowded and lack basic services, especially sanitation facilities.

Intervention proposed: pro-active engagement of land owners to stop the illegal plot subdivision process and Government intervention to provide housing alternatives for the low-income groups.

6. **Peri-urban areas:** mainly resettled by the government from high risk areas. They are mostly tenants. Good initiative, however lacks affordable public transport limiting access to better job opportunities, and high risk of losing fertile agricultural land, due to the city sprawling.

Proposed Interventions: Provision of improved irrigation systems to support households in enhancing their agricultural activities.
Establishment of efficient and affordable public transportation services along the main roads connecting these peri-urban areas to the city.

7. **Settlements located in high risk areas:** As per the law, those occupying these areas of high risk will be relocated and will rapidly transformed into public spaces, protected green or recreational areas.

Provision of social facilities such as schools, health, police posts etc.

Security of land tenure for strengthening these communities. Land leasing system could be introduced.

Agri-business and small industry opportunities: packaging and manufacturing of agri-products to support local development schemes.

Implementing the Strategy: Alternatives for implementation

- Alternative A: Fully subsidized housing and infrastructure development;
- Alternative B: Targeted subsidies to cover basic needs / initial investments;
- Alternative C: Establishment of PPP for infrastructure development; and
- Alternative D: Privatization where the State privatizes the land in informal settlements and transfers the responsibility of upgrading/ urban renewal to the private sector

Financial mechanisms

- Public infrastructure development/improvement;
- Special Loans/lines of credit for land owners to improve their property in terms of basic services and infrastructure;
- Loans/lines of credit for tenant associations, working as a cooperative/ commercial scheme, to allow buying land and developing affordable housing;
- Credits for associations of tenants and land owners, where land owners provide land to these associations/cooperatives in exchange for housing units; and
- Lines of credit for urban renewal joint-venture, where commercial firms in association with land owners can apply for special lines of credit for implementing urban renewal

Individual micro-loans for families living in informal settlements with a regular income to buy land and develop/ improve their homes up to a certain limit.

For effective implementation of most strategies, negotiations with land owners, provision of public funding, subsidies mixed with banking loans and subsidized rental housing (specially for low income) through PPP etc. would be required.

Stakeholders engagement
The participatory approach comes out as the key for upgrading without segregation of societies. A special purpose public corporation is proposed to be established to engage with various stakeholders.

Additional guidelines for implementation proposes cost analysis per household for upgrading works in the different categories of informal settlements, based on specified densities, interventions on land, infrastructure and housing.

2.12 Rwanda National Land Use Planning Guidelines (NLUPG) (2017)

This document is to guide efficient land use and management and to standardise land use plans preparation and development in Rwanda. It covers the following areas:

1. Guidelines on the land use planning process and environmental considerations;
2. Guidelines on densification and mixed-use;
3. Land subdivision, replotting consolidation guidelines;
4. Guidelines for zoning, rezoning and land use change;
5. Guidelines for urban renewal and Informal settlements upgrading;
6. Guidelines for industrial location;
7. Guidelines for establishing petrol and gas stations;
8. Land use planning guidelines for airports and airstrips;
9. Guidelines on the preservation of agricultural and pastoral lands;
10. Guidelines on mining and quarrying;
11. Guidelines on hazards and disaster management;
12. Guidelines on the protection of ground water, rivers, lakes and wetlands;
13. Guidelines on the protection of historic and cultural resources;
14. Guidelines on the protection of hilltops, hill sides, mountains and forests;
15. Guidelines on the conservation of biological diversity;
16. Guidelines on energy management;
17. Guidelines on transport and Information Communication Technology (ICT);
18. Guidelines on conversion of land and on land recovery by the government; and
19. Socio economic facilities (establishment of schools, hospitals, places of worship, prison and cemeteries)

2.13 Urban Planning Code (UPC) (2015)

The UPC is a tool for the preparation and implementation of physical plans. It includes principles for sustainable human settlement and management of urban land. This document is complementary to the provisions of the legal framework regarding urban planning and building, and the use of land in Rwanda.

Key action taken after review of NLUPG and UPC:

There were some discrepancies noted upon review of the Rwanda National Land Use Planning Guidelines and Urban Planning Code, while comparing with provisions of the 2013 Master Plan.

The discrepancies list (prepared as a sample for discussion and may not be exhaustive) were presented to the City of Kigali (CoK) and the larger group of stakeholders to seek clarification/ guidance in updating the Master Plan.

Key action taken after review of NLUPG and UPC:

Upon review of the Land Use Planning Guidelines (which refers to Urban Planning code), and comparing with the provisions of the 2013 Master Plan, there were some discrepancies noted.

The discrepancies list (prepared as a sample for discussion and may not be exhaustive) were presented to the City of Kigali (CoK) and the larger group of stakeholders to seek clarification/guidance in updating the Master Plan.

The conclusions on the highlighted discrepancies are included in Annexure I.

Note: All other provisions in the code, where there are no anomalies, may be considered for Master Plan update.

3

Planning Initiatives for the City of Kigali

3.1. Kigali City in the Regional and National Context
3.2. Planning Area and Administrative Divisions
3.3. Existing Master Plans
Rwanda Land Use and Development Master Plan
Kigali Conceptual Master Plan
Kigali Master Plan 2013

3 Planning Initiatives for the City of Kigali

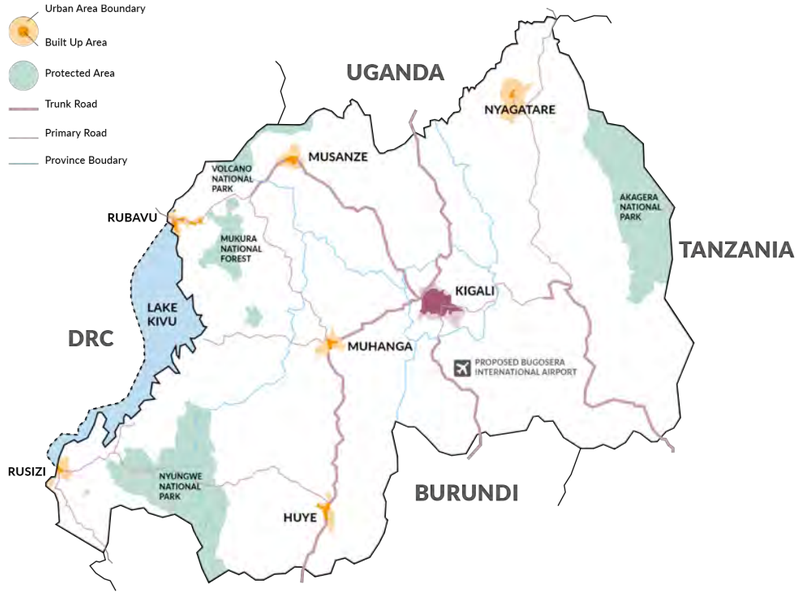


Figure 3.1 Kigali City Location and Regional Context

Source : National Roadmap for Green Secondary City Development, GGGI

3.1 Kigali City in the Regional Context

3.1.1 Location & Connectivity

Located amidst Central and East Africa, Rwanda is bordered by Uganda, Tanzania, Burundi and the Democratic Republic of the Congo. Kigali, located in the geographical centre of Rwanda is the administrative and commercial Capital and the largest City of the country. The city is bounded by the Nyabarongo River along the western and southern edge, and partly by Lake Muhazi in the north eastern edge.

The regional Northern Corridor comprises of the inter-country highway which connects Kigali City to Kampala, Nairobi and Mombasa. The Central Highway corridor connects Kigali to Dar-es-Salaam and Bujumbura. Kigali is globally connected by the existing Kigali International Airport which is situated in the heart of the City along the east-west national highway. This highway connects the City to the neighboring towns of Rwamagana in east, and Muhanga (Gitarama) in west, and to the other larger towns of Kibuye, Nyanza and Huye (Butare) in Rwanda. The northern highways connect the City to Byumba in the north and the tourist destination-Ruhengiri in the northeast and Gisenyi in the far-east.

In order to support the increasing air traffic, the new International Airport is proposed to be developed in Bugesera which lies about 26 km south-east of the City. The road connecting the City to Bugesera holds special significance as a potential growth corridor that has been identified as the suitable location for future City Centre by the 2007 Kigali Conceptual Master Plan (KCMP).

3.1.2 Role of Kigali in the Region

In the national and regional context, Kigali is envisioned to be the Regional Hub for Rwanda and a Continental Hub for Africa. The KCMP and the Detailed Master Plan for Nyarugenge further supports the vision for Kigali to become the regional economic hub. Hence as the capital city, Kigali will continue to play a leading role in terms of urbanisation and economic growth within the country.

In order to provide a more balanced urban growth and management, the National Land Use and Development Master Plan proposes a decentralized growth strategy for Rwanda which recommends growth to be focused in multiple district centres apart from the Kigali Urban Hub. This decentralisation strategy is further concreted under the EDPRS2 and the Urbanisation and Rural Settlement SSP, in which six secondary cities were selected as emerging secondary economic poles of growth while keeping the leading role of Kigali. These six cities identified are: Rubavu, Musanze, Huye, Rusizi, Nyagatare, and Muhanga. The intention is also to avoid pressure on peri-urban land of the Capital city Kigali and urban sprawl, including sprawl of urban functions into rural areas and provide socio-economic opportunities.

While it is clear that each city will have its own urban advantages and functions, the overall strategy is to promote synergistic developments between secondary cities and complementary growth to support Kigali City. Thus it is imperative to take into consideration of these secondary cities development in the review of the Kigali Master Plan.

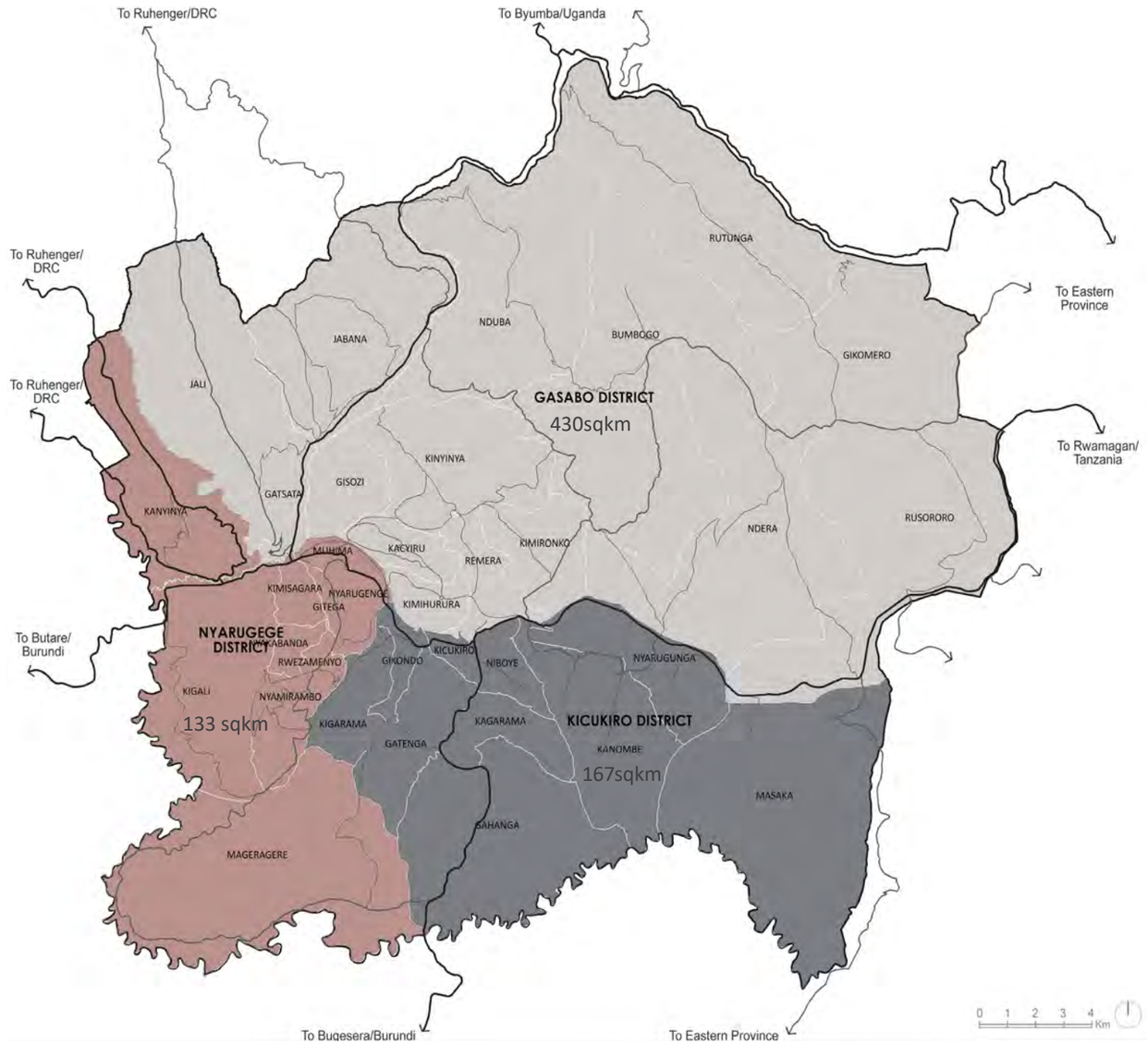


Figure 3.2 Kigali City Planning Areas

3.2 Planning Area Administrative Divisions

The City spreads over 731.28 sq km of land and comprises of three districts namely Gasabo, Kicukiro and Nyarugenge. The Gasabo District located in the north is the largest amongst three, followed by Kicukiro and Nyarugenge. The detailed planning of Nyarugenge District was completed in 2010. Detailed plans for Gasabo and Kicukiro were developed in 2013 to create an integrated detailed plan for the entire city of Kigali.

With the intention to ensure that the city-wide master plan is kept up to date and inclusive, the city of Kigali is embarking on the review of the Kigali City Master Plan, five years after its adoption since 2013. The planning direction and strategies for the whole of the Kigali City hence will be reviewed in the update of the Master Plan.

Table 3.1 City of Kigali Planning Areas

Planning Area	Size (ha)
Nyarugenge	**13,423**
Gitega	117
Kanyinya	2,465
Kigali	3,031
Kimisagara	320
Mageragere	5,502
Muhima	292
Nyakabanda	240
Nyamirambo	895
Nyarugenge	456
Rwezamenyo	103

Source : KCMP 2007

Altogether, the three districts comprises of 35 administrative sectors which are further divided into 161 cells as illustrated in Table 3.1.

3.3 Existing Master Plans

Planning Area	Size (ha)
Gasabo	**43,002**
Bumbogo	6,019
Gatsata	603
Gikomero	3,487
Gisozi	850
Jabana	3,651
Jali	3,758
Kacyiru	582
Kimihurura	489
Kimironko	1,146
Kinyinya	2,464
Ndera	5,026
Nduba	4,681
Remera	704
Rusororo	5,256
Rutunga	4,286
Kicukiro	**16,702**
Gahanga	3,669
Gatenga	1,133
Gikondo	352
Kagarama	968
Kanombe	2,460
Kicukiro	213
Kigarama	778
Masaka	5,240
Niboye	504
Nyarugunga	1,384
TOTAL	**73,128**

Recognising the importance of land use planning in driving sustainable development of the country, several planning initiatives have been developed for Rwanda, ranging from the scale of national to city and district levels. The key planning initiatives that influence the city of Kigali are discussed in this section to provide an background understanding of the existing urban planning context and its planning implications on the update of Kigali City Master Plan.

3.3.1 Rwanda National Land Use and Development Master Plan (2010)

The National Land Use and Development Master Plan has been a point of reference for sectors that deal with land management, land administration and housing aspects in Rwanda.

The plan presents binding directives for land use change of areas of national interest with national growth scenarios, and guiding principles for sustainable land use covering for different sectors such as environment, land use management, urbanization, housing, transport and infrastructure.

This document was thoroughly reviewed during the 2013 Kigali Master Plan formulation and its recommendations and implications were well considered and incorporated where applicable. The summary and key recommendations made pertaining to Kigali by the National Land Use and Development Master Plan including their planning implications are documented in the following section.

National Urban Growth Scenarios

The National Land Use Master Plan highlights the need for revitalization of secondary urban growth centres. Three urbanization scenarios namely Red, Yellow and Green Scenarios for the year 2020 are explored based on different population and GDP growth scenarios; and the share of urban and rural populations. The key objective is in line with the national vision to achieve middle income status and to halve poverty by 2020. The national plan presents the 'Green Scenario Plan' as a preferred path of urban development for Rwanda. The Green Scenario proposes decentralized development of attractive district centres to meet the expectations of citizens from rural areas and to control the rural-urban migration.

Key Recommendations

Some of the key recommendations made in the National Land Use Master Plan that are relevant to Kigali are:

1. Kigali is positioned as a regional hub with integrated transport and infrastructure that will attract international investments to Kigali;
2. The informal settlements in Kigali are proposed to be rehabilitated to medium density developments;
3. The specific development potentials are identified for the three Districts: potential for arts, craft and tourism in Nyarugenge district; potential for tourism and agriculture in Gasabo district; and potential for arts, craft and agriculture for Kicukiro district;

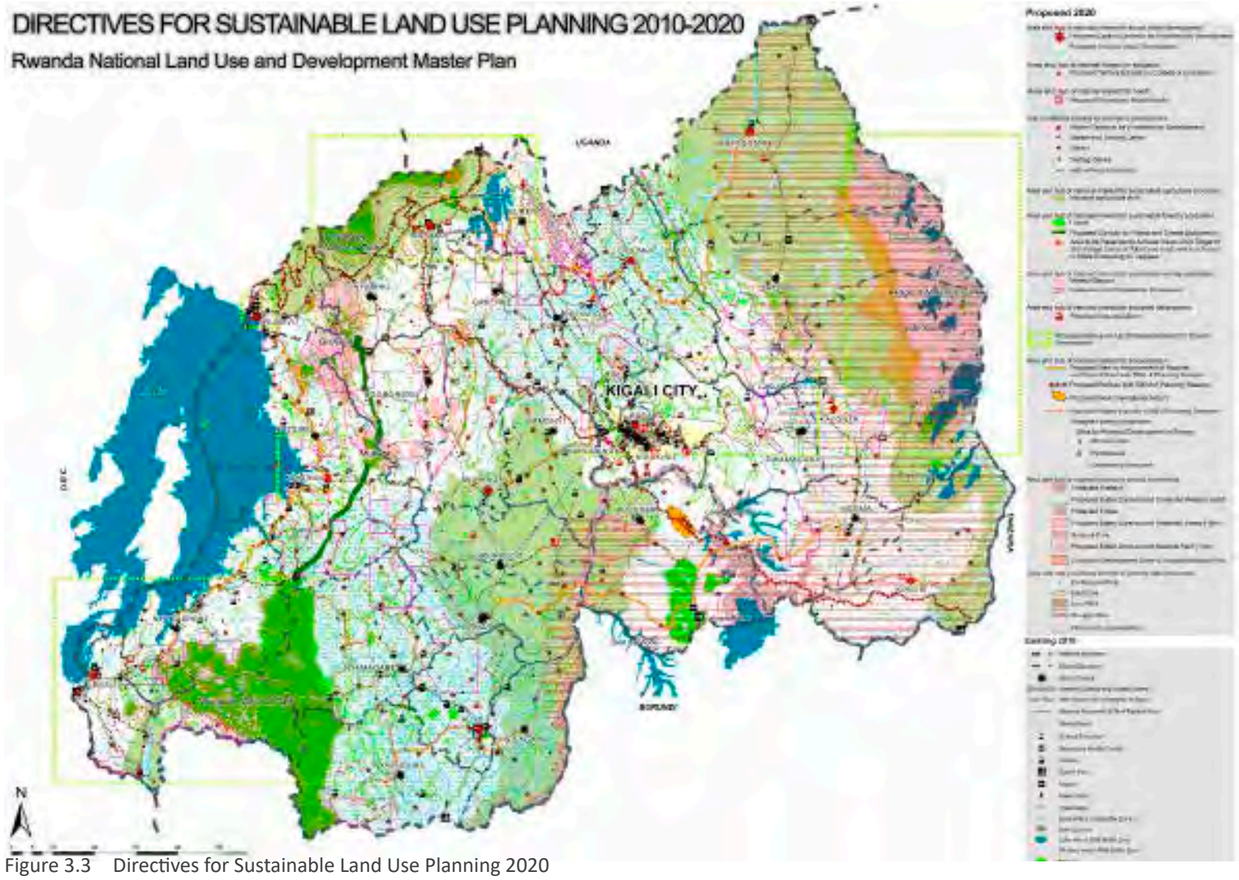


Figure 3.3 Directives for Sustainable Land Use Planning 2020

Source : National Land Use Master Plan

Table 3.2 National Land Use Master Plan Growth Scenario in the Year 2020

SCENARIOS	GDP Growth Rate	National Population in 2020	Share of Urban Population	Kigali's Share of Urban Population	Kigali's Population in 2020
Red	9.6%	14.1 Mil	50%	40%	5.18 Mil
Yellow	8.5%	13.8 Mil	40%	20%	2.59 Mil
Green	7.6%	13 Mil	30%	10%	1.29 Mil

Source : National Land Use Master Plan

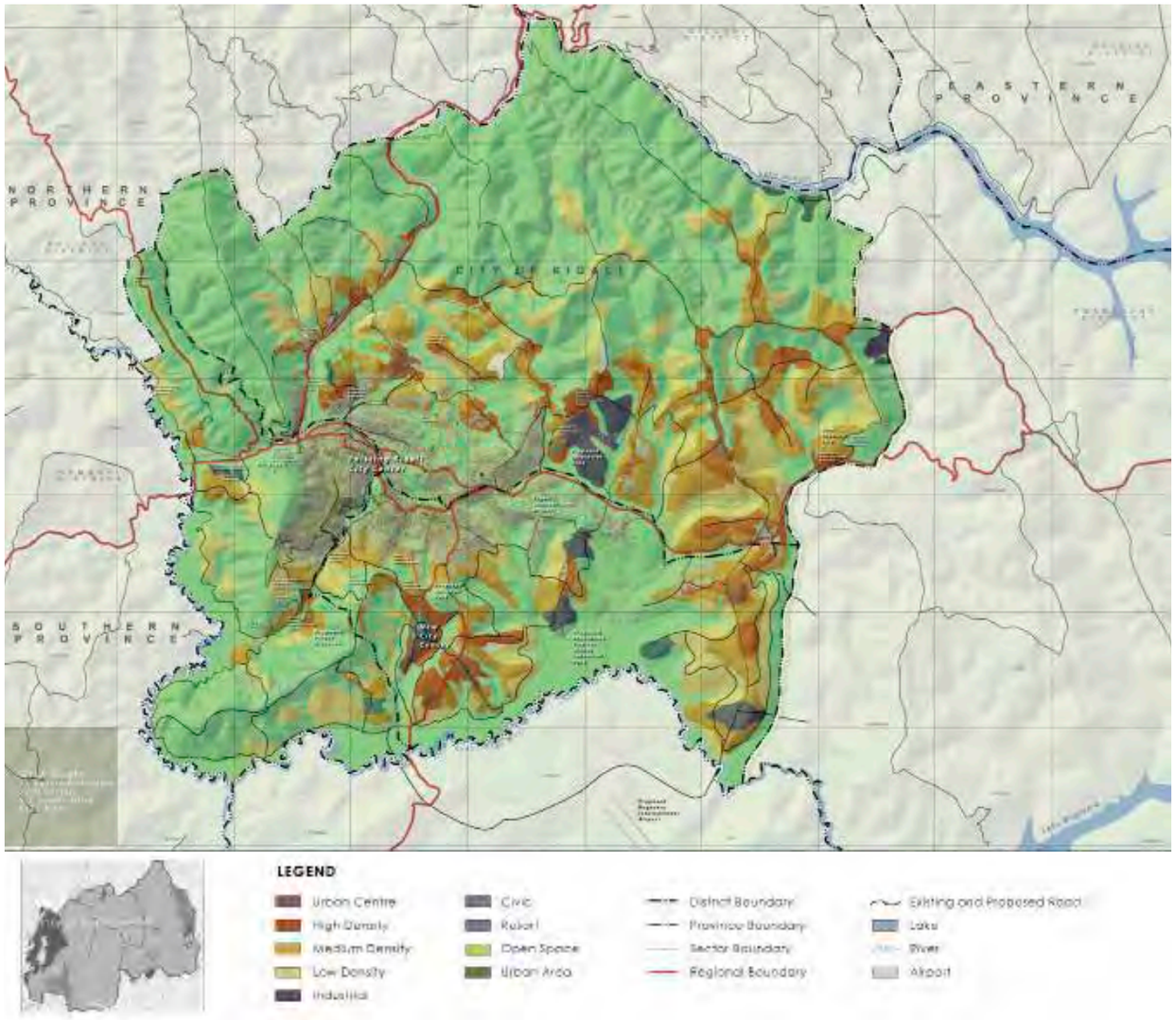


Figure 3.4 Kigali City Conceptual Masterplan Land Use Plan

Source : Kigali Conceptual Masterplan Report

4. Urban area in Kigali has tripled in 25 years and hence the densification measures are recommended for Kigali City;
5. Recommended densities include 5000 persons per sqkm for low residential, 10000 persons per sqkm for medium residential and 30000 - 50000 persons per sqkm for high residential; and
6. Recommended dwelling unit sizes include 30 sqm for the smallest unit, 60 sqm for medium size unit and 120 sqm for the larger units

Planning Implications

1. Apart from being positioned as the national regional hub, Kigali city's vision needs to be further elaborated to capture the long term potential and aspirations of the city;
2. The concept plan for Kigali looks at the long term planning horizon beyond 2020. Hence, updated and detailed city specific long term economic and demographic studies need to be conducted to assess the growth possibilities for Kigali for detailed master planning and city programming;
3. Some of the national level recommendations such as densities and dwelling unit sizes will vary for the capital city and may need to be intensified depending on the projected growth of the city;
4. Based on the estimated population growth, the city will require to be organized into structured urban areas with appropriate urban density management; and
5. Social and economic roles for the three districts need to be further elevated so as to help Kigali to position itself as the premier urban node of central Africa

3.3.2 Kigali Conceptual Master Plan 2007

The key objective of the Kigali Conceptual Master Plan was to move forward from the National Strategic Plan proposed in Vision 2020, and to develop a long range plan for the capital city that would guide the key infrastructure and systems required for the future growth of Kigali.

The Kigali Conceptual Master Plan was prepared for a long term horizon of 30 -

Table 3.3 Kigali Conceptual Master Plan Growth Scenarios

SCENARIOS	GDP Annual Growth Rate	GDP Per Capita *	Population Annual Growth Rate	Population 2025
Low Projection	9.6%	$243	2.31%	1,390,070
Base Projection	8.5%	$408	5.45%	2,568,960
High Projection	7.6%	$716	8.50%	4,500,594

Source : Kigali Conceptual Master Plan 2007

* Low projection of GDP based on population growth
Base projection of GDP based on comparison data and consensus estimates
High projection of GDP based on case studies and Vision 2020

40 years to accommodate two to three million people. Three different growth scenarios have been explored assuming different possibilities of socio-economic growth in Kigali City.

The Master Plan provides an in-depth analysis of the current situation and proposes the broad land uses addressing the need for different housing densities, infrastructure needs, the conceptual transportation network, management of natural features and the implementation strategies.

Similarly, this Conceptual Master Plan was thoroughly reviewed during the 2013 Kigali Master Plan formulation and its recommendations and implications were well considered and incorporated where applicable. The summary of its key strategies including their planning implications are as discussed below:

Key Planning Strategies

1. The Master Plan acknowledges the broad national vision for city of Kigali as a hub in new Africa. It further envisions the city as a leading model of a new, economically thriving, democratic, and progressive African city, redeveloped with integrated infrastructure and services; is economically sound; ensures personal safety and security; celebrates the country's rural/ agricultural heritage; and becomes a regionally and internationally integrated commercial and administrative hub;
2. The proposed urban growth is defined by natural features and environment based infrastructure;
3. The urban structure is organized in the environment friendly "Transect Concept" proposing different land uses and densities in response to the topography and to each other. Hence, the high density, medium density and key commercial urban areas are proposed along the ridges; followed by the low intensity uses such as rural residential, agriculture and reforestation, which are proposed along the wetlands and valleys; and
4. The Master Plan hinges on a decentralized urban growth strategy and proposes several regional urban nodes with clusters of residential, commercial, government, office and other institutional uses together. In addition to the Nyarugenge City Centre, a new city centre in Gahanga is identified along the highway connecting the existing city centre and the proposed Bugesera International Airport in the south

Planning Implications

- The Master Plan assumes the proposed population of 3 Million by 2030. The socio- economic conditions of Rwanda has changed over the last five years. The economy has grown faster than anticipated and hence, the socio-economic conditions need to be reviewed with an optimistic and longer term approach towards 2040 and beyond.
- The general Transect Concept needs to be contextualized based on some of the key planning principles such as available habitable zones; efficient distribution of urban nodes and transportation network; as well as the optimal overall city structure.
- The Conceptual Master Plan is limited to new growth areas and the existing urban area needs to be integrated into the new Kigali Concept Plan.

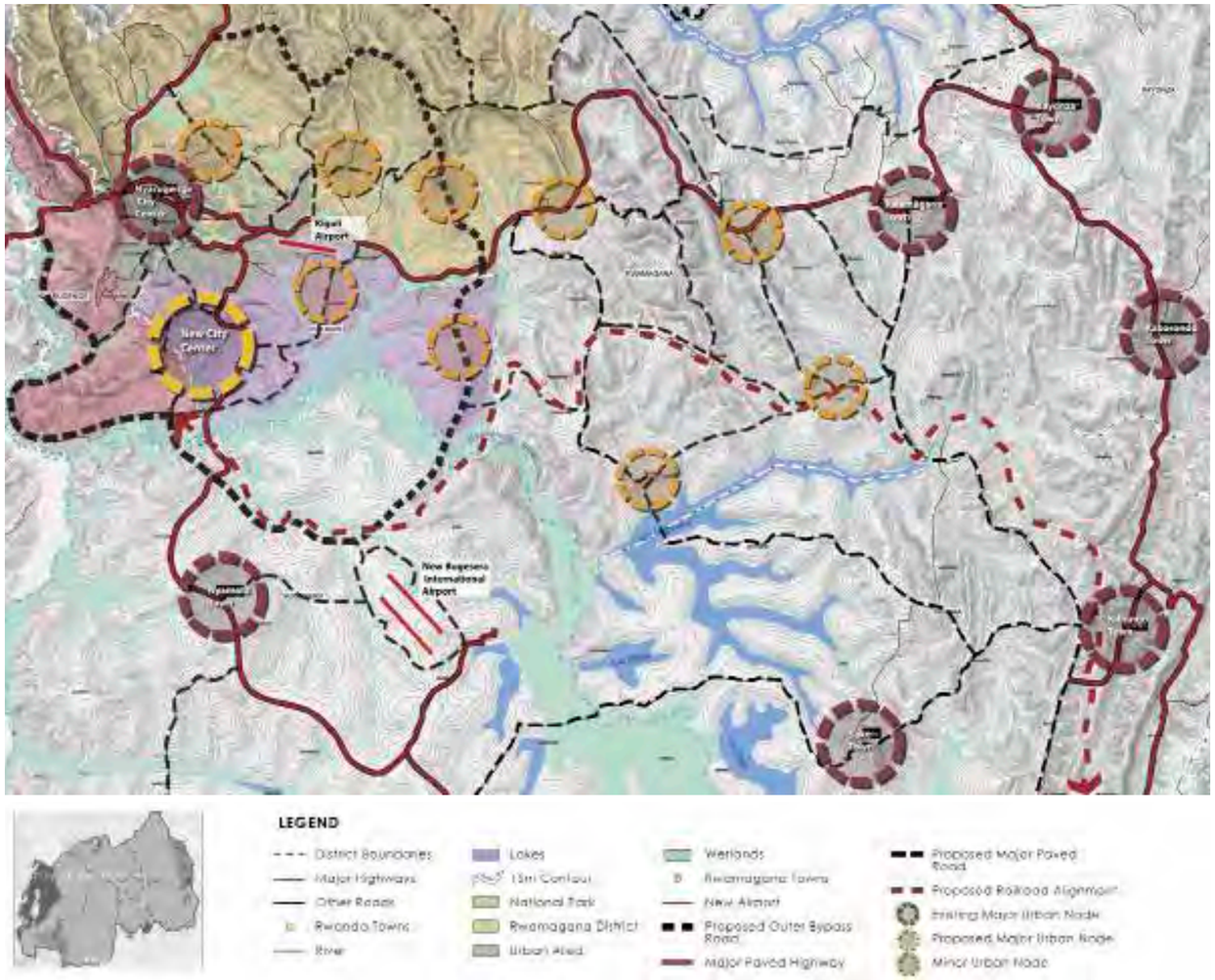


Figure 3.5 Kigali Conceptual Master Plan - Distribution of Regional Urban Nodes

Source : Kigali Conceptual Masterplan Report

"The Centre of Urban Excellence"

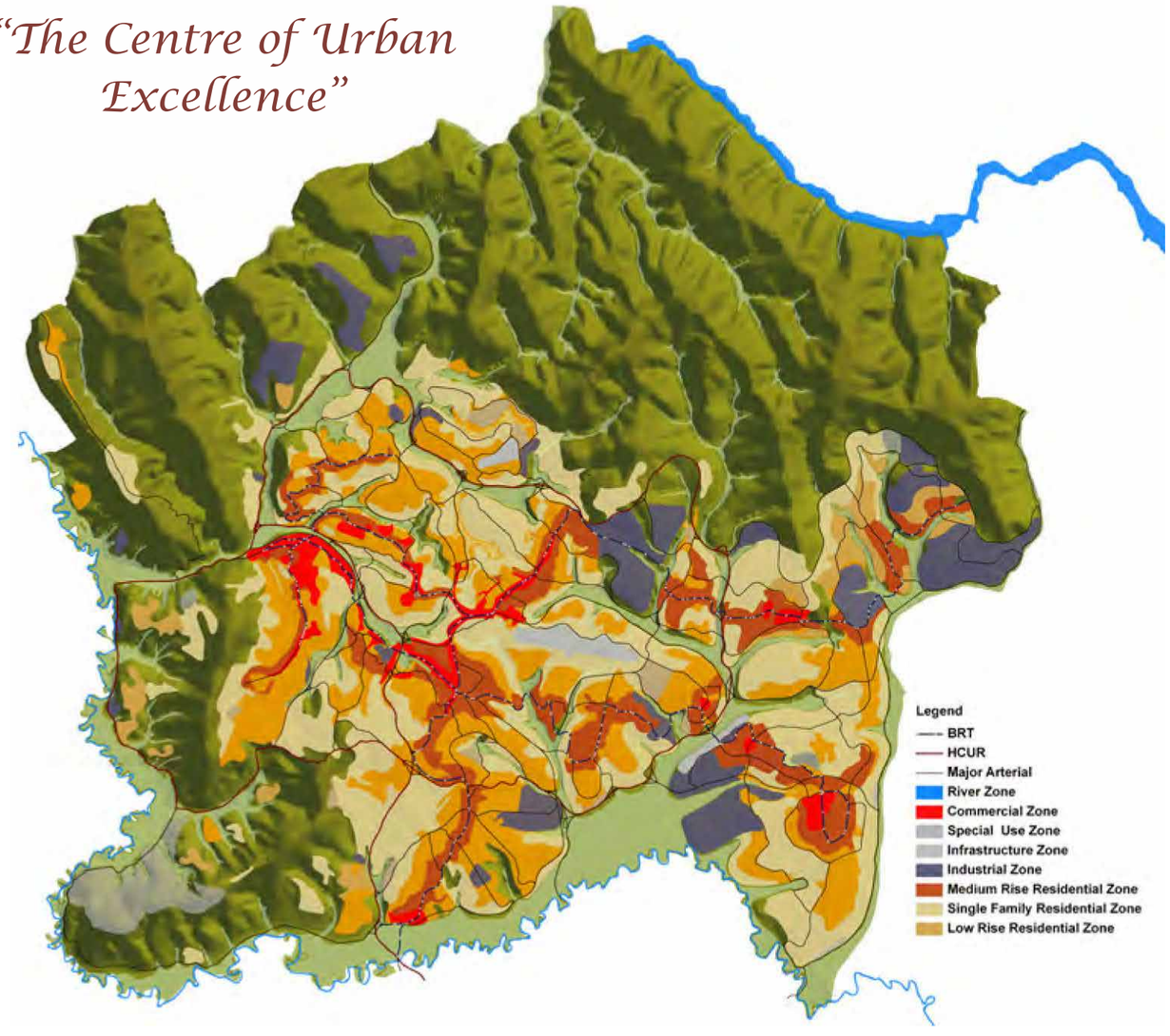


Figure 3.6 Kigali Master Plan 2013 - Proposed Conceptual Master Plan

- The Real Estate Demand needs to be analyzed and estimated to plan for the additional commercial nodes. Hence, the regional role of Gahanga needs to be re-examined.
- There is a need of detailed land use classifications and specific zoning guidelines in order to realize the Conceptual Master Plan.

3.3.3 Kigali Master Plan 2013

A Detailed Master Plan has been adopted for the City of Kigali in 2013, comprising planning and land use strategies as well as zoning regulations for Kigali's three Districts. It is integrated with the Land Administration Information System (LAIS) and the online building permitting system. In view of the changing market needs, the review of this Master Plan is timely after 5 years. The summary of its key strategies including their planning implications on the review are as highlighted below.

Kigali is envisioned to be "The Centre of Urban Excellence", with 3 different focuses for each district as follows:

- Nyarugenge: "Green Financial Hub and Vibrant Growth Centre'
- Gasabo : ''Diverse Employment Hub and Cultural Heartland'
- Kicukiro: "Knowledge Hub and Green Gateway of Kigali"

Three socio-economic growth scenarios are projected that guided the development of the land use plan. The population of Kigali City by 2040 is proposed to grow from the current population of 1.3 million to be 5 million as per the high case scenario and 3.5 million as per the low case scenario. Provision of land and reserves for infrastructure, housing and facilities need to be safeguarded for the ultimate population (high case scenario). However this ultimate population may not be achieved by 2040 and Year X is proposed as the stage when Kigali would have reached this ultimate population.

Key Planning Strategies

The overall key strategies proposed for the transformation of Kigali are:

- Establishing a range of employment centers in Kigali.
- Creating affordable and quality living environments in Kigali.
- To develop a compact, vibrant & transit oriented city

Table 3.4 Kigali Master Plan 2013 Growth Scenarios

SCENARIOS	Population growth rate 2012-2025	Population growth rate 2025-2040	Population 2025	Population 2040
Low Projection	4.1%	1.8%	2.3 million	3.5 million
Medium Projection	5.0%	2.5%	2.5 million	4.3 million
High Projection	5.8%	2.5%	2.9 million	5 million

Source : Kigali City Master Plan 2013 Report

- Managing and improving the environment & infrastructure
- To preserve urban heritage & enhance public greens
- To consolidate and reserve land for future needs

The proposed land utilization strategy focuses on the following key aspects:

- Identifying, strengthening and organizing of the existing City Centre.
- Identifying and organizing City Fringe Areas
- Defining the urbanizable new growth areas and organizing these as the Suburban areas
- Defining the un-buildable areas in the outskirts as Rural Area and developing relevant strategies

Thereafter, a broad land use plan is prepared for Year X for 5 million population showing the ultimate development envisioned for the Kigali City. The key land use proposals are:

- To expand and strengthen the City Centre by allowing high density commercial and vibrant mixed use developments.
- To introduce regional level commercial areas in Fringe and suburban areas. A total of 3 new Regional Centres, 3 Fringe Centres, 19 Town Centres, Neighborhood Centres and other commercial areas are proposed. The commercial plan aims to create 11.5 mill sqm of commercial space for 1.6 million service sector jobs.
- To safeguard land for consolidated Industrial Estates for general. 2900 ha of land are distributed among 4 large heavy industrial zones and 765 ha of light industries are distributed within townships. The Industrial Plan proposes to provide 30.5 sqkm of industrial space which will prove working space for 67,000 people.
- To establish an efficient highway grid and arterial system ensuring the long-term regional and local connectivity.
- To develop a public transit based City organization to connect to employment nodes and regional facilities (Max 1 hour travel time) and encourage 80% share of public transit.
- To redevelop existing unplanned settlements into medium-rise residential. The Residential Plan proposes to create 90% home ownership and 60% of homes to be affordable housing.

GOALS FOR KIGALI

1 **CITY OF CHARACTER, VIBRANT ECONOMY AND DIVERSITY**

2 **CITY OF GREEN TRANSPORT**

3 **CITY OF AFFORDABLE HOMES**

4 **CITY OF ENCHANTING NATURE & BIODIVERSITY**

5 **CITY OF ENDEARING CHARACTER AND UNIQUE LOCAL IDENTITY**

6 **CITY OF SUSTAINABLE RESOURCE MANAGEMENT**

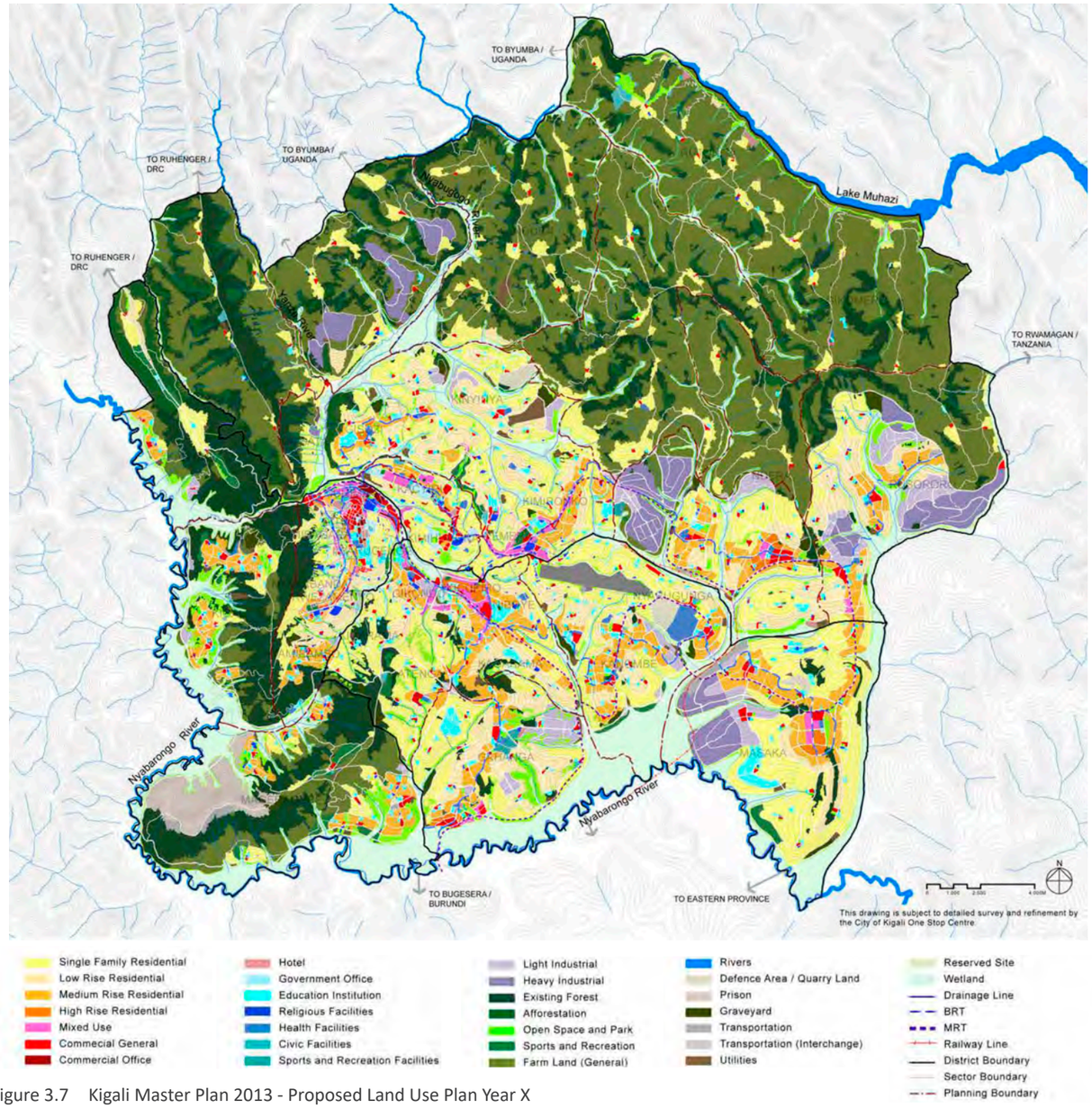


Figure 3.7 Kigali Master Plan 2013 - Proposed Land Use Plan Year X

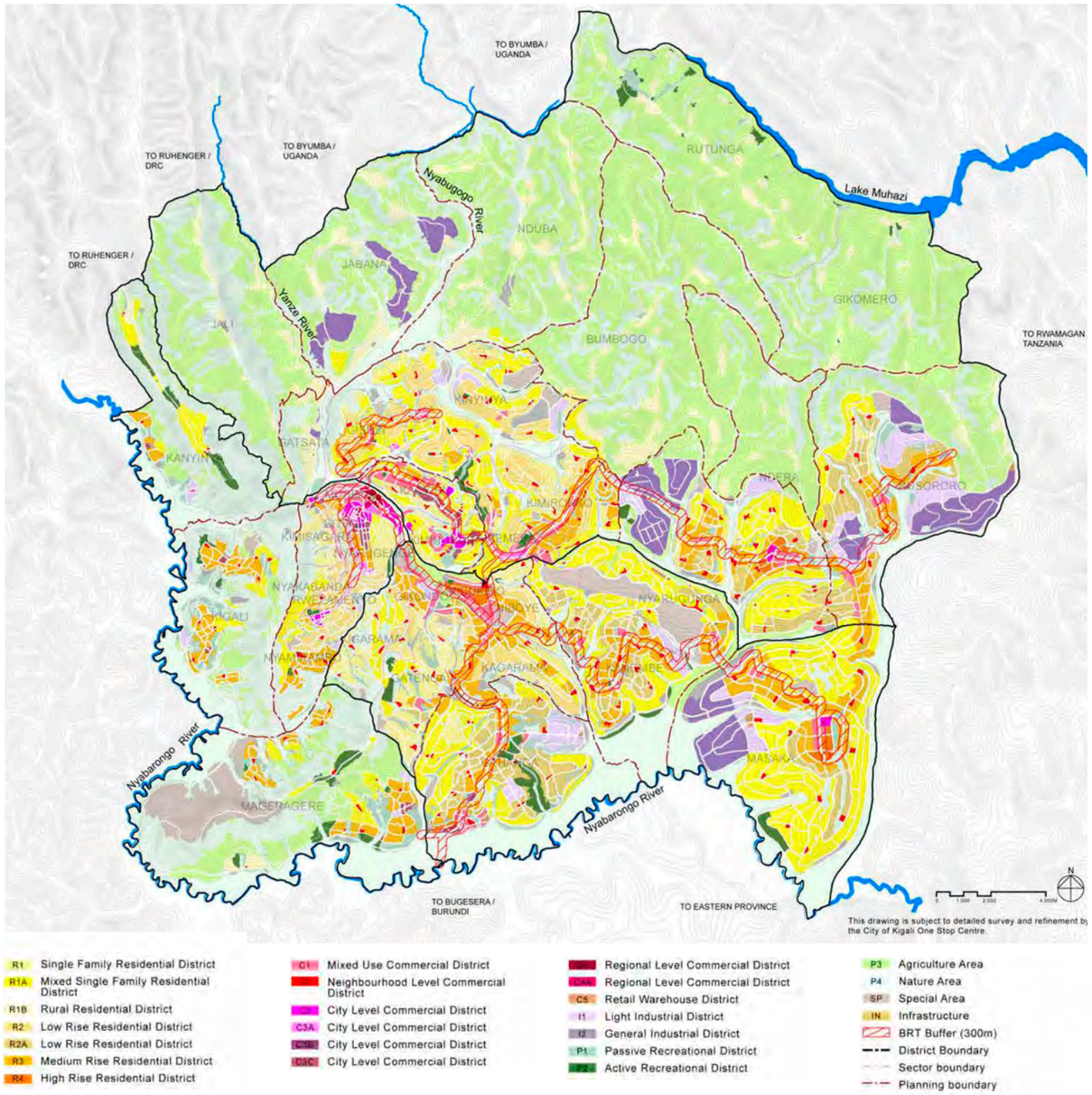


Figure 3.8 Kigali Master Plan 2013 - Proposed Zoning Plan

- To develop new integrated transit-oriented townships with variety of housing choices and easy access to quality, affordable facilities.
- To conserve nature areas such as forests, wetlands and to protect steep slopes.
- To encourage afforestation in steep slopes more than 40%.
- To provide variety of public parks and open spaces; classified as Regional Parks, City Parks, Town Parks, Local Parks and Park Connector Network.
- To introduce iconic regional recreation and tourism destinations.
- To provide land for farming in arable land along the unbuildable areas.
- To develop key infrastructure.

Following the development of the Detailed Master Plan for Nyarugenge District that illustrates all the potential areas and their land uses, Detailed Master Plans are also developed for Gasabo and Kicukiro District in 2013. As such, it provides the necessary base information for the establishment of the gazetted plan, a Zoning Plan and a legal regulatory plan which ensures land reservation for public facilities and infrastructure development. It also regulates how each land parcel could be developed in term of density (FAR), building height, setback, and allowable uses subject to compliance to various planning requirements.

Planning Implications

- The Master Plan assumes an ultimate population of 5 million by year 2040 based on the high growth scenario. The socio-economic conditions of Kigali City has changed over the last 5 years and it is found that the proposed zonings are not reflecting the existing conditions. Hence the socio-economic conditions need to be reviewed with a realistic and longer term approach towards 2040 and beyond in order to ensure that the Master Plan can be implemented successfully.
- The real estate demand needs to be analyzed and estimated to plan for the additional commercial nodes including regional and fringe centres. The housing demand and affordability will need to be assessed as well given the growing unplanned settlements sprawling in the city over the last 5 years and the need to resettle these population with the provision of affordable housing.
- The Detailed Master Plan for Nyarugenge District was first completed in 2010 before the 2013 Master Plan for the city was launched. It is necessary to review the land use plan in conjunction with the update of the Master Plan for the entire city to ensure that the plan remains relevant.
- Detailed land use classifications and specific zoning guidelines have been proposed in the zoning reports for each of the district. However, the regulations only provide a maximum density limit regulation for each land use, and existing conditions do not support the densities that the zoning regulations proposed.

- The lack of flexibility and extensive details of the zoning guidelines have rendered the administration and implementation of the zoning plan difficult. This suggests a review and improvement to be made to the proposed zoning plan after updating of the City Master Plan.

3.3.4 Sub-areas planning projects

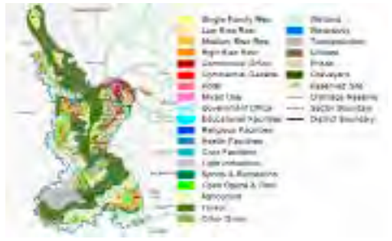
The City has undertaken several local area specific planning studies in the last few years before the Kigali City Master Plan 2013, most of which are completed and require careful examination before integrating it to the City Master Plan.

These projects includes the Detailed Master Plan for Nyarugenge District and CBD; and the Sub Area Plans for Kimihurura, Kinyinya, Rebero and Masaka prepared in 2010. In 2013, the Detailed Master Plans for Gasabo and Kicukiro Districts are completed in conjunction with the overall Concept and Master Plan for Kigali.

Nyarugenge District Master Plan (134 sq km)

Planning Proposal :

- 1 Million Population, 5 Compact and Integrated Townships (200 DU / Ha)
- Revitalized and expanded CBD (894 Ha)
- 2,000,000 sq m commercial space in CBD
- Detailed zoning guidelines
- Building height of upto 16 stories in residential areas and upto 30 in CBD



Planning Implications :

- The CBD is not able to achieve the proposed skyline based on upper limits of zoning guidelines. The demand for commercial space may be there but the local investors are under capable to fully optimize the commercial potential of the parcels in CBD Phase 1. Hence, the guidelines need to be reviewed.
- The planning proposals will be to be reviewed based on the update of the changing socio-economic conditions and real estate market demand.

Gasabo District Master Plan (430 sq km)

Planning Proposal :

- 2 Million Population, 9 planning areas, 8 self-sufficient Townships
- A new Regional Centre at Ndera, 1700 ha heavy industrial zone in Rusuroro, Jali, extension of the current FTZ
- Residential densities: High density - 200 DU/Ha; Medium density - 160 Du /Ha; Low density - 90 DU/Ha)
- Detailed zoning guidelines

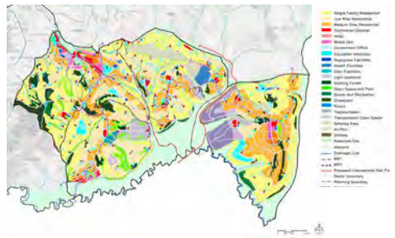
Planning Implications :

- The proposed zoning guidelines are not able to achieve based on the current market conditions. The planning proposals and hence zoning guidelines of the district will be to be reviewed based on the update of the changing socio-economic conditions and real estate market demand for the entire city of Kigali.

Kicukiro District Master Plan (167 sq km)

Planning Proposal :

- 2 Million Population, 4 planning areas, 11 self-sufficient townships
- 2 new Regional Centres at Gahanga and Masaka Sector, 800 ha heavy industrial zone in Masaka
- Residential densities: High density - 200 DU/Ha; Medium density - 160 Du /Ha; Low density - 90-35 DU/Ha)
- Detailed zoning guidelines



Planning Implications :

- The proposed zoning guidelines are not able to achieve based on the current market conditions. The planning proposals and hence zoning guidelines of the district will be to be reviewed based on the update of the changing socio-economic conditions and real estate market demand for the entire city of Kigali.

Kinyinya Township and Town Centre (205 Ha)

Planning Proposal :

- 11 Neighborhoods (8000 DU, 30000 population & 11 NC) Mixed Use, Civic Center, Education Complex and Social–Cultural Amenities
- 200,000 sqm commercial space
- Building Height of 2 to 10 stories

Planning Implications :

- Civic uses such as Government and Non government agencies could be strengthened around existing civic nodes at Kimihurura and Kacyiru.
- There is a need to redefine high and medium densities. The development potential of the site needs to be capitalized for much higher density.
- There is a need to contextualize the proposal based on existing road alignments.

Kimihurura Sub Area (89 Ha)

Planning Proposal :

- 800 DU Residential
- High-Density MU Commercial Center
- 1500 Hotel Rooms
- 220,000 sqm commercial space
- Building Height of 2 to 10 stories

Planning Implications :

- There is a potential to strengthen the Civic node.
- High and medium densities need to be redefined and untapped “Location Potential” needs to be capitalized for much higher density (ie. 15 – 20 Stories or more)
- There is a need to contextualize the proposal based on existing road alignments.

Rebero Sub area (76 Ha)

Planning Proposal :

- 500 DU Residential
- Resort & Conference Centre
- 1400 Hotel Rooms
- 10,000 to 15,000 sqm commercial spac

Planning Implications :

- There is a potential to strengthen Rebero Area as a tourism destination by introducing recreational Thematic Park.
- There is a need to contextualize the proposal based on existing road alignments.

Masaka Sector Sub Area (45 sq km)

Planning Proposal :

- 290,000 Population, existing Masaka Town & 4 new towns
- New Masaka Cultural Centre, Medical/ Research Center and a light industrial Innovation Center
- Building Height of 2 to 10 stories

Planning Implications :

- The location of the site offers the potential for logistics which could be capitalized.
- The high and medium densities needs to be redefined and untapped “Location Potential” needs to be capitalized for much higher density.
- There is a need to contextualize the proposal based on existing road alignments.

This page is intentionally left blank.

4

Eight Themes of Development

4 Eight Themes of Development

Aligning Eight Development Themes with the Four Pillars of NUP

As reviewed in Chapter 2, the National Urbanization Policy (NUP) outlines the urbanization strategy set out for Rwanda with the aim to create well-managed growth that generates vibrant urban environments and sustainable economic development. The four overarching policy pillars that illustrate the cross-cutting character of urbanization touching all aspects of life are identified:

1. Coordination
… Have good institutional capacities and regulatory framework to manage urban development in a coordinated manner at all levels of governance
2. Densification
…Have good integrated urban development and management in order to achieve resource-efficient public investments and compact growth
3. Conviviality
… Promote citizen's quality of life and socially inclusive urban and socio-economic development to reduce poverty
4. Economic growth
…Facilitate employment creation and off-farm productivity for local subsistence and regional competitiveness

In ensuring that the development goals of the Master Plan of the city of Kigali are in line with the overall national strategy, eight themes of development that resonates with the four NUP pillars are proposed for the Master Plan update. These eight themes encompasses the various urban development topics relating to urban planning, urban design, governance, housing, natural environment, social infrastructure, culture and heritage, transportation and infrastructure, and forms the basis to structure the focus group discussions, existing context analysis, development goals as well as the revised Master Plan proposals.

Each development theme is related to the pillars based on its individual characteristics as shown in Figure 4.1 and highlighted below.

1. City of Excellence emphasizes on coordination and densification to achieve good and integrated urban development management;
2. City of Integrated Neighborhoods focuses on densification and conviviality to create resource-efficient, compact and socially inclusive developments that enhances the overall quality of life of the citizens;
3. City at Work aligns with conviviality and economic growth in creating employment opportunities in industrial and services sector that promote economic productivity and hence socio-economic development;
4. Green City focuses on densification and economic growth that aligns with the national green growth strategy to scale up resource efficiency and clean production promoting compact and sustainable economic growth;

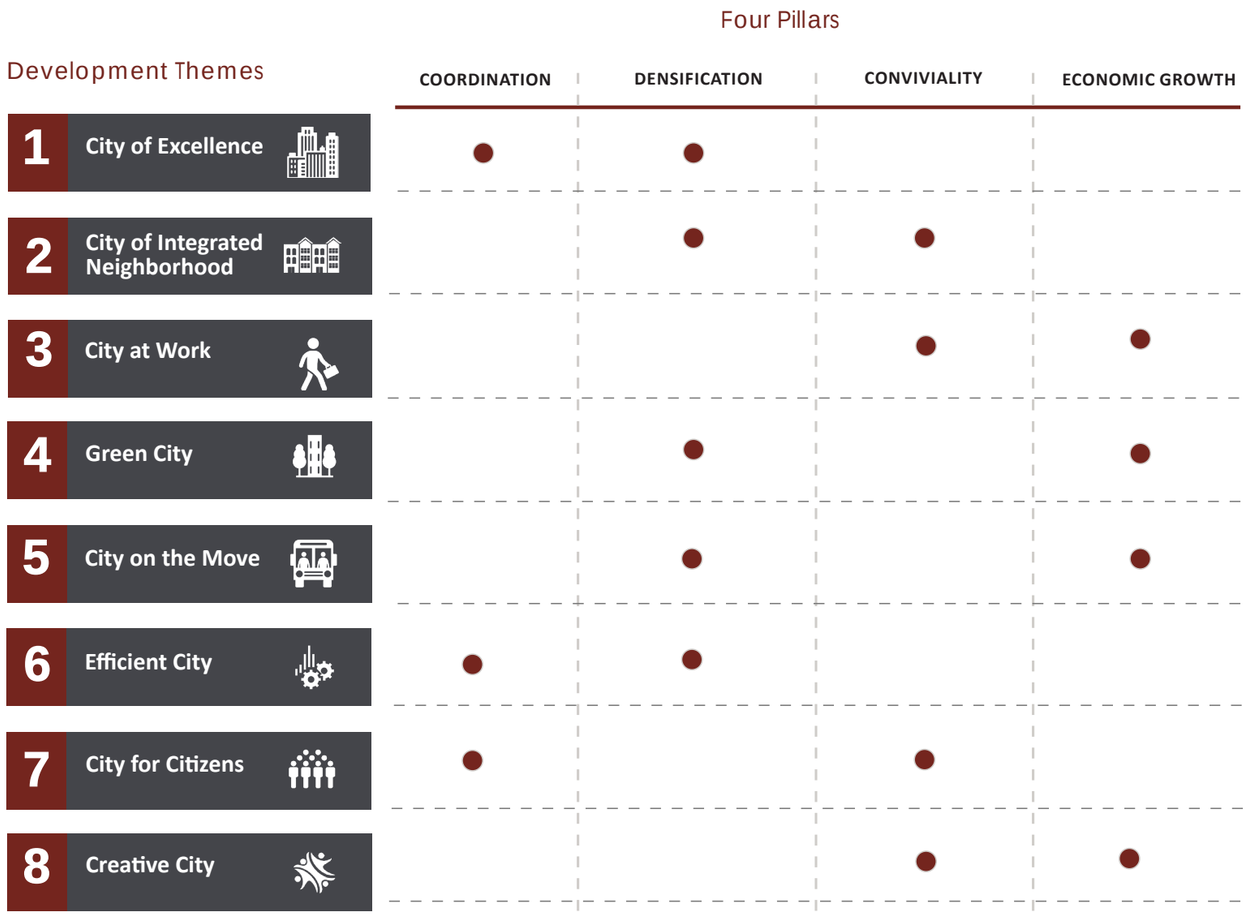


Figure 4.1 Eight Development Themes and Four Pillars of NUP

5. City on the Move aligns with the pillars of densification and economic growth to promote transit-oriented development, sustainable transportation and a comprehensive road network ultimately increasing labour market accessibility, supply efficiency and quality of living of the citizens;
6. Efficient City focuses on coordination and densification to promote integrated utilities provision and management, alongside to ensure the efficient use of resources;
7. City for Citizens emphasizes on the pillars of coordination and conviviality to ensure an integrated provision of community facilities as well as to create an inclusive society that promotes community engagement and participation amongst the citizens in shaping their city; and
8. Creative City focuses on conviviality and economic growth to advocate a culture of creativity and create a vibrant urban environment that celebrates its culture, heritage and identity, thereby to promote tourism development as an economic growth driver

The Focused Group (FG) discussions on each of the above mentioned 8 themes were decided to be conducted in order to understand and gather first hand information on the what is working and what are the issues and challenges faced by the stakeholders.

This page is intentionally left blank.

4.1 City of Excellence

"No country has grown to middle income without industrializing and urbanizing. None has grown to high income without vibrant cities. The rush to cities seems chaotic, but it is necessary." (World Development Report, 2009)
- National Vision 2050

As highlighted in the National Vision 2050 for Rwanda, rapid and well-managed urbanization is essential for Rwanda to realise its aspirations for growth. Urban planning and management hence serves as an important tool to achieve economic, social and sustainable growth. The Kigali Master Plan 2013 thus represents a significant milestone towards well-managed urbanization by providing a regulatory framework and guidance for urban development.

Well-known for its good governance and city management, the City of Kigali aims to become the "The Centre of Urban Excellence" to position itself as a regional leader in city development as reflected in the proposed vision in Master Plan 2013. Tapping upon these strengths and as one of Africa's fastest urbanizing economies, Kigali remains to have the potential capability to be positioned as a City of Excellence in leading urbanization in Rwanda.

In order to ensure that the Master Plan is implemented as intended, institutional capacity and coordination efforts amongst agencies play an important role to push for a coordinated urban development to truly uplift the socio-economic conditions and quality of living in Kigali. The importance of institutional capacity and coordination among various stakeholders were also highlighted by the participants during the Focused Group (FG) discussions. City of Excellence is therefore the primary and over arching theme of development for the City of Kigali that would drive the overall development and execution of the Master Plan to attain its growth aspirations.

The development theme of City of Excellence for Kigali would emphasize on the following key focus areas:

1. Urban planning;
2. Urban design;
3. Urban development;
4. Affordable city;
5. Quality of living; and
6. Governance

4.1.1 Commentary on 2013 Master Plan Implementation

Since the approval of the Master Plan, the studies and development of several identified catalytic projects have kick started, which have transformed the urban landscape of Kigali over the past five years particularly in the Central Business District (CBD) areas. Nonetheless, master planning is a dynamic process and challenges continue to persist in the long-term implementation of the Master Plan in view of the changes in market conditions that have an impact on the feasibility of the 2013 Kigali Master Plan.

One of the key purposes of the Kigali Master Plan update exercise is to review the existing implementation status of the Master Plan 2013 and to identify corrective measures as required.

In accordance to the theme of City of Excellence that is targeted at improving the overall urban development management and implementation of the Master Plan, the key issues and challenges facing the city of Kigali in its urban development and master plan implementation process currently are discussed in the following section.

Issues & Challenges

Urban Development

The issue of land acquisition and land management has been an ongoing challenge in urbanization. The lack of government-owned land in Kigali to enable the development of infrastructure and integrated projects is well-known. The extensive private land ownership and land subdivisions have rendered difficulties in land consolidation for the development of catalyst projects, in particular large capital improvement projects.

Similarly, there is a lack of incentives for land consolidation through land pooling mechanism, which requires a clear legal framework and management capacities to carry out the process. The high land prices and land speculation as a result from proposed zoning regulations has forced people to move to the city fringe. Together with the lack of guided development in these peri-urban areas, this led to many existing haphazard settlements.

Urban Planning

Critically, the issue of discrepancies between the existing land use and proposed zoning regulations in Master Plan 2013 is highly brought up. It is found that the proposed zoning regulations are not in line with the existing market conditions, and therefore needs to be reviewed accordingly. The updated Kigali Master Plan hence has to be guided by the latest socio-economic trends to meet the real needs of the population.

Another key issue identified in the Master Plan 2013 is the lack of flexibility in its implementation. The proposed zoning regulations for each land use are extensive and rigid, which has led to difficulties in implementation. In addition, the fragmentation or subdivision of the cadastral plan with small plot sizes also impedes the execution of development as per the zoning plan. Discrepancies between the proposed zoning regulations and the Urban Planning Code (UPC) are highlighted and have to be harmonized.

The lack of public participation and engagement of the stakeholders in the planning process is another key challenge identified in the FG discussions. The public has reflected that lack of understanding of the Master Plan 2013 and zoning system, which can be further improved to ensure that plan is socially inclusive and that the citizens are able to make informed decisions.

Affordable City

The high land prices in the city as mentioned in tandem with the rapid growth of population in Kigali with migrants seeking for economic opportunities have led to urban sprawl and development of large and congested unplanned settlements across the city and especially in the fringe areas. The shortage of affordable housing options close to the existing economic activities also resulted in the need to travel long distances to work. The issue of affordability and the need to have special zoning to address the unplanned settlements was highlighted in all FGs and TAG meetings. Affordability is therefore a pressing issue in Kigali that has be addressed to ensure inclusive development in view of the increasing population growth.

Quality of Life

Intertwined closely with the issue on affordability, the poor quality of life within the unplanned settlements is another challenge that needs to be overcome. Approximately 60% of the total urban households in Kigali are living in these unplanned areas, many of which are located in fragile ecosystems and hazardous areas where land is cheap such as steep slopes and wetland areas. These settlements also lack access to integrated infrastructure including safe water, proper sanitation, electricity, health services, waste management and proper roads.

Furthermore, as most migrants are largely unskilled, they often are engaged in informal business activities[1]. Hence recognising the informal economy, creating new economic opportunities and building up skills capacity in the master plan are key to better incomes and improvement in living quality.

1 National Institute of Statistics of Rwanda (NISR), Labour Force Survey August 2016 Report, June 2017

Governance

The underlying challenge towards the implementation of the master plan is identified to be the lack of coordination and effective communication among institutions and agencies. The lack of technical capacity also remains one of the most important causes of uncertainty for the successful implementation of the activities. A more centralised and coordinated approach has to be taken in order to manage the various development processes as already suggested in Master Plan 2013.

Correspondingly, financing and funding is a continuing challenge with the lack of financial capacity and support for key infrastructure projects that hinders the implementation of the Master Plan.

4.1.2 Governance and Institutional Framework

Urban growth in Kigali City is being guided by a well-developed policy and legal framework. This section discusses about the key institutional players involved in overseeing the overall development as well as managing the different aspects of urban development in the city. Changes to the institutional framework from Kigali Master Plan 2013 are also ascertained to identify any possible impact on the implementation of the updated Master Plan.

Land Management

Since the Kigali Master Plan 2013, several reforms have been made to the institutional framework including the land management framework.

Land management is now administered by Rwanda Land Management and Use Authority (RLMUA) that is positioned under the Ministry of Land and Forestry (MINLAF) and has the general mission to ensure sustainable protection, conservation and development of lands and forestry.
RLMUA is responsible for putting in place and operationalizing an efficient system of land administration, use and land management that secures land ownership in the country. The authority is a newly recreated agency from the Rwanda Natural Resource Authority in an attempt to streamline its operations and to implement the Land Tenure Regularization Policy.

In terms of spatial planning, RLMUA responsible for land administration, land mapping, land registration, and for harmonization of all spatial data related to land. A Land Management Information System has been implemented for the purpose of efficient management and updating of parcel, person and land right information to ensure ease of land management. Figure 4.2 shows the organization of RLMUA and land management process in Rwanda.

In terms of law and regulations, apart from Organic Law, there are many other national and city level land regulations in Kigali, for land resource management, and for safeguarding the rights of people and environment. Some of these key land policies are National Land Policy, Expropriation Law and Land Tenure Regularization Policy.

1. The "Organic Law" sets relevant fundamental principles to conserve the environment, people and their habitats;
2. It also sets the framework for a workable "National Land Policy";
3. The "National Land Policy" mainly deals with the rational use and sound management of national land resources;
4. "National Human Settlement Policy" is aimed for the urban areas to improve the settlement conditions of the urban population;
5. "Expropriation Law" allows the government to carry out expropriation of private land for public interest with prior and just compensation; and
6. "Land Tenure Regularization" aims at managing and administering the land through a systematic process that brings together all the land holders including the State for registration and titling of their land

Urban Planning & Housing management

Rwanda Housing Authority (RHA), is a new institution formed in 2010, and is responsible to implement the national housing and construction policy through coordination, conception, development, monitoring and evaluation. RHA is an implementing agency of Ministry of Infrastructure (MININFRA).

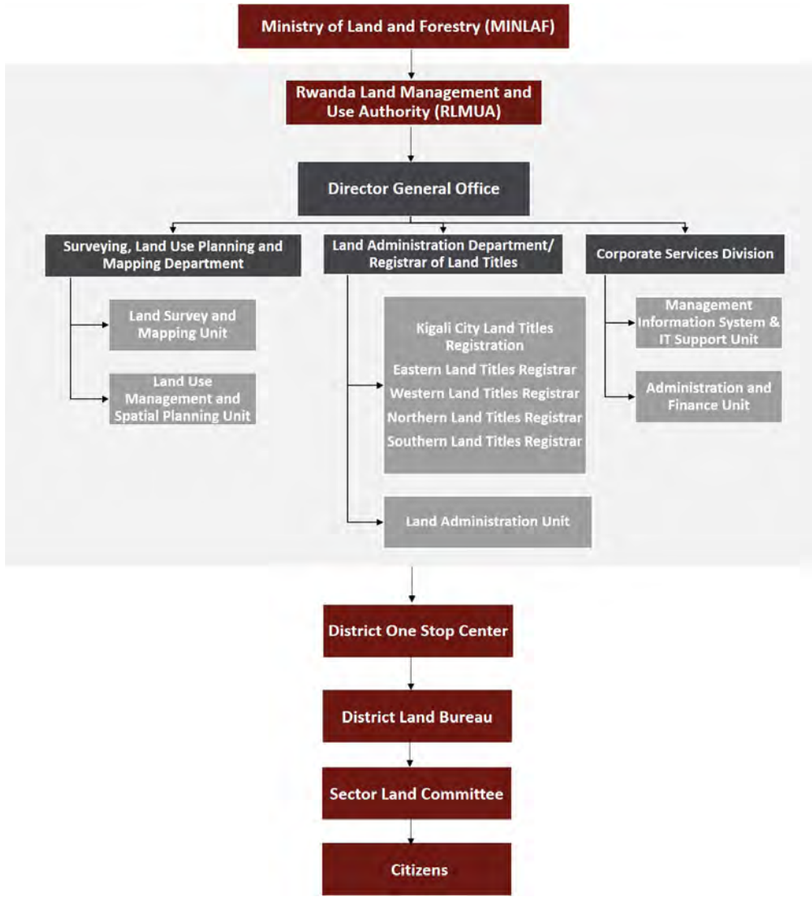


Figure 4.2 Land Management Organization in Rwanda

The key functions of RHA are:

1. To develop and manage State's housing and construction projects;
2. To advise government on policies related to housing, urban development and construction;
3. To assess the housing requirements in the country;
4. To promote and facilitate provision of urban housing;
5. To formulate systems, procedures and standards for urban construction;
6. To prepare and update data pertaining to urban construction including public assets; and
7. To advise government on mechanisms for improving urban settlements; and to promote group settlements

In comparison from 2013, institutional reforms have been made to RHA with the introduction of a new Urban Planning and Development Division, with the purpose to orientate the urbanization process of the country in a planned and organized manner to ensure future urban growth and development aimed at addressing the ongoing challenges.
This is a significant progression for Rwanda to improve its institutional framework towards the management as well as implementation of master plans and urban developments including affordable housing.

Some of the activities undertaking by this Urban Planning Division division by RHA include:

1. Elaboration and implementation of urban planning and development tools that include; conceptual and detailed physical master plans, local urban development plans (LUDPS), sector specific plans, layout plans;
2. Informal settlement upgrading and affordable housing projects; and
3. Secondary cities development

The updated organization structure of RHA is shown in Figure 4.3..

RHA works closely with other agencies in the cities and in the context of Kigali City, RHA is currently working as a partner with Kigali City's One-Stop Centre for planning, building, housing and public works.

City of Kigali

The City of Kigali is in charge of coordinating the governance in the three districts of Gasabo, Nyarugenge and Kicukiro which are made up of 35 sectors and 161 Cells[2]. The City of Kigali also coordinates the territorial administration of these three districts.

The City of Kigali is mandated to oversee the implementation of national policies and programmes in collaboration with other central government ministries and agencies, ranging from economic, social welfare, education, health, security and others.

Currently, majority of physical planning activities related to urban planning and development project approvals in Kigali City is managed by the City Urban Planning One- Stop Centre under the Kigali City Council (KCC).

2 City of Kigali, 2016

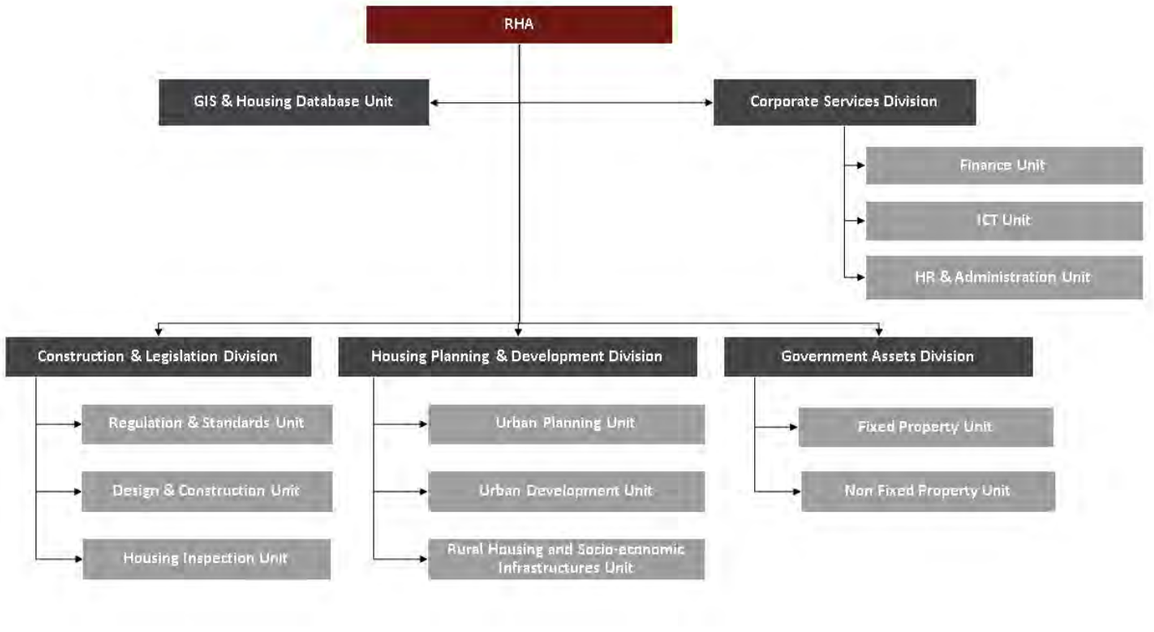


Figure 4.3 Organization Structure of Rwanda Housing Authority

The existing organization structure of KCC is shown in Figure 4.34.

The Kigali City's One-Stop Centre, is established as the Planning Agency for the city. Its key roles and functions include:

1. To ensure respect for safety standards in the construction sector;
2. To develop and review key area detailed physical plans;
3. To ensure quick service delivery mostly in building permit issuance; and
4. To monitor and advise Districts' land bureau for efficient service delivery

As compared to 2013, KCC has restructured its organization structure and streamline into four divisions by sectors. In 2013, the One-Stop Centre, and the Infrastructure Planning and Inspection Units are positioned under the "Office of the Director General of Infrastructure and Urban Planning" within the KCC. At present, the One-stop Center is positioned under " City Engineer", alongside Infrastructure and Master Plan Inspection.

The implementation of the Master Plan is carried out by Master Plan Inspection Unit that is in charge of pre-construction and construction inspections.

The roads, utilities, and public facilities in Kigali City are planned and managed by the Infrastructure Unit, which is responsible for transportation planning, road development and rehabilitation, road maintenance, water and sanitation planning. The main city roads within the districts are under the purview of CoK.

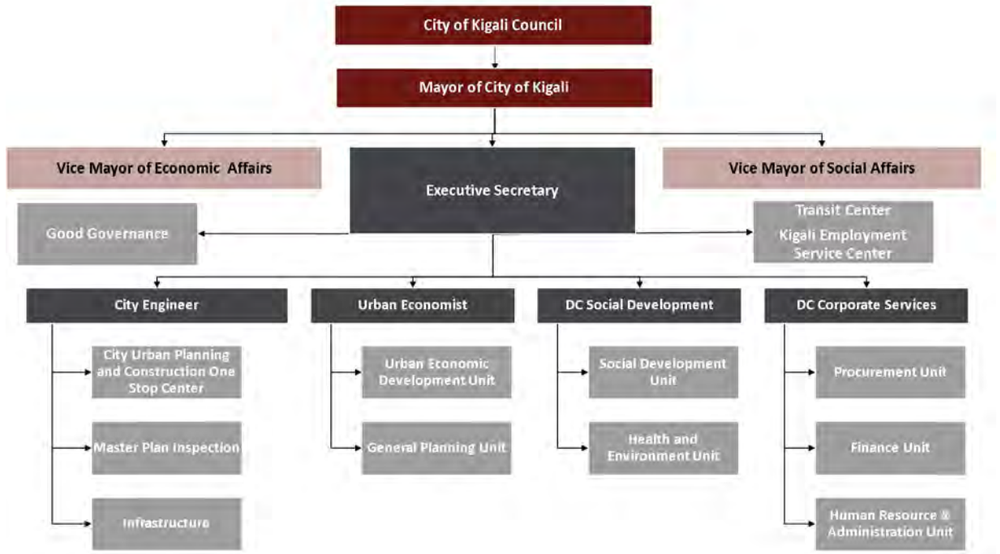


Figure 4.4 Kigali City Council Organization

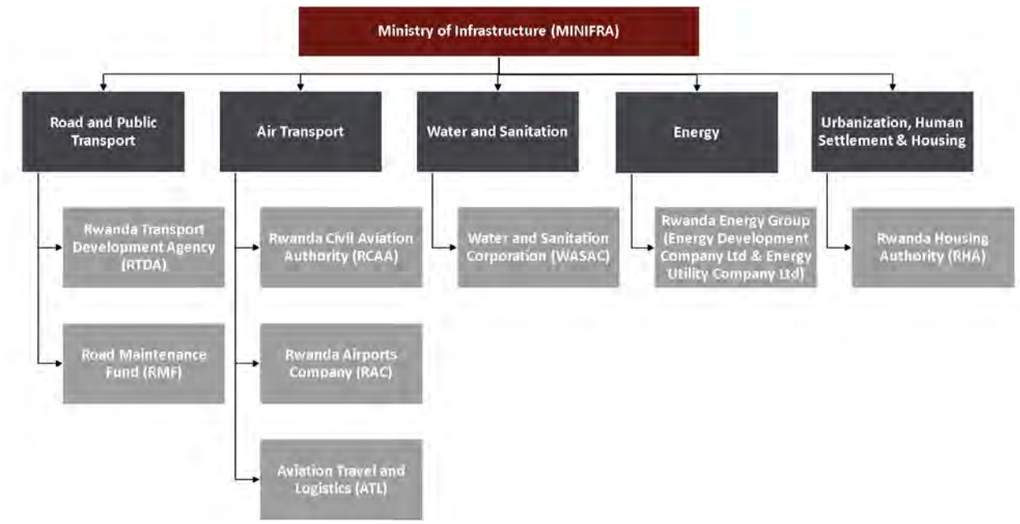


Figure 4.5 Institutional Set-up of Transport and Infrastructure Management

Roads / Traffic Junction

CoK plans, constructs and maintains all roads within the City. Junction improvements are part of the responsibility of CoK. Traffic Police assists CoK in identifying junctions to be signalized. Specific studies will be conducted to assess the need for signalization of the junction at roundabout. Currently, CoK installs, manages and maintains all the traffic lights within the City. CoK also coordinates the development and maintenance of main city roads with the districts.

Transportation & Infrastructure Management

The Ministry of Infrastructure (MININFRA) has the overall responsibility to orient and supervise the functioning and management of public institutions and agencies for transportation and infrastructure management in Rwanda. Based on the different major infrastructure areas such as Transport, Energy, Water and Sanitation, respective agencies are responsible for the implementation of its related planning and policies. The relevant public agencies are illustrated in Figure 4.4.

At national level, Rwanda Transport Development Agency (RTDA), is primarily responsible for the implementation of transport planning and policies.

Currently, there is no independent urban transport regulatory authority in the City of Kigali. Different institutions intervene in the course of the regulation of public transport. The central government is the main actors with a direct influence in the public transport sector.

Similarly, EWSA (Energy, Water and Sanitation Authority) is a national company that distributes power and water in Rwanda. Implementation and maintenance of water supply, sewerage and power supply infrastructure fall under the responsibility of EWSA. Whereas energy and power management and implementation falls under responsibility of the Rwanda Energy Group.

Environmental Management

Environmental management in Rwanda involves the working of various ministries and agencies for the different major environment areas including Environment and Natural Resources and Climate Change, Agriculture and Livestock, as well as Land Forestry.
The Ministry of Environment (MOE), formerly the Ministry of Natural Resources (MINIRENA), is responsible for environment, climate change and natural resources management at the local and national levels.

Under which the Rwanda Environment Management Authority (REMA), the implementing agency under MOE, is entrusted with the responsibility to coordinate the implementation of the national environmental policy, with the aim of ensuring appropriate management and rational use of environmental resources on the basis of sustainable production for the improved well-being of the people of Rwanda.

The Ministry of Lands and Forestry (MINILAF) ensures sustainable protection, conservation and development of lands and forestry. Under which the Rwanda Water and Forest Authority (RWFA), is a newly formed public institution that implements policies, laws, strategies and government decisions related to the management of forests and natural water resources.
The Ministry of Agriculture (MINAGRI) is the key leading institution to deliver on the implementation of the National Agriculture Policy involving agriculture livestock issues. Institutional integration in the agricultural sector was conducted in recent years with the aim to improve coordination and efficiency of service delivery.

The Rwanda Agriculture Board (RAB) was hence formed from three agriculture agencies namely: Rwanda Animal Resources Development Authority (RARDA), Rwanda Agricultural Development Authority (RADA) and Rwanda Agriculture Research Institute. It is tasked to develop agriculture and animal husbandry through their reform, and using modern methods in crop and animal production, research, agricultural extension, education and training of farmers in new technologies.

In Kigali City, the District Environment Protection Officer reports to the Director of the Public Health and Environment Unit. The responsibility of the Environment Protection Officer is to ensure the implementation of Organic Law N° 04/2005 of 08/04/2005 determining the modalities of protection, conservation and promotion of the environment and other environmental laws in Rwanda.

Overall, much progress and reforms have been seen in the governance of Rwanda to improve the delivery of services and management of urban development. One key initiative is the establishment of Single Project Implementation Units (SPIU) across various ministries, which allows for the grouping of all the different project implementation units within a ministry under one single umbrella. This helps to better coordinate work, retain staff expertise and reduce duplication of work.

The institutional framework will be analyzed in detail in the subsequent Implementation Report.

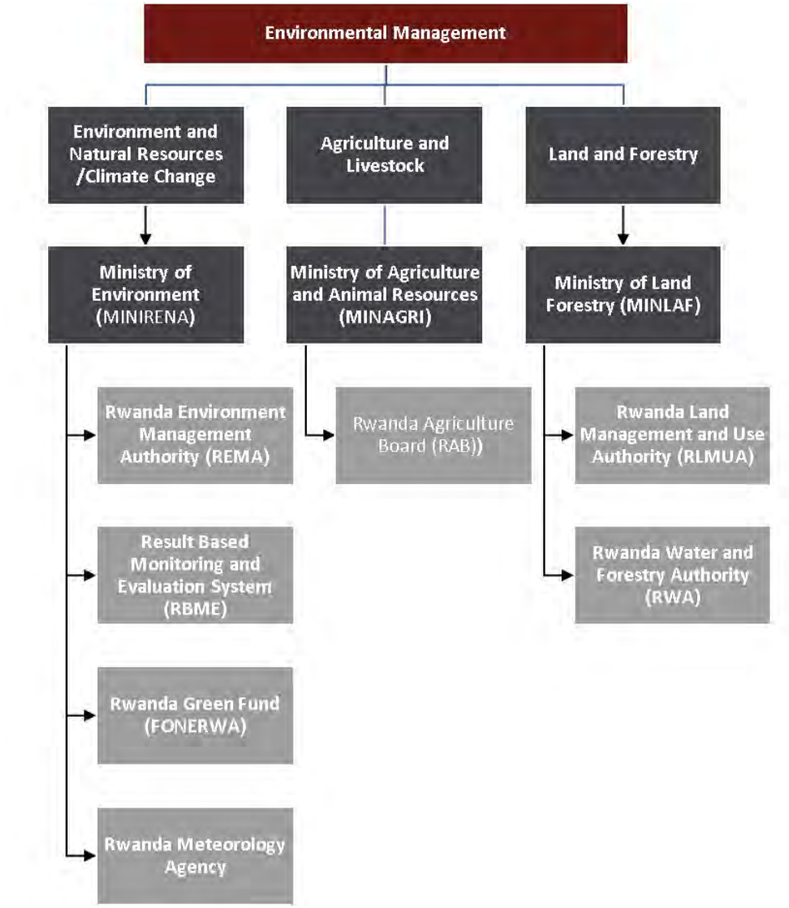


Figure 4.6 Institutional Set-up of Environmental Management

This page is intentionally left blank.

4.2 City of Integrated Neighborhood

"Integrated neighbourhoods create Socially Conscious Cities"

Integrated neighborhood planning essentially focuses on provision of mixed-income, mixed use housing options to diversify the residential population and create a vibrant and inclusive community, together with the development of public spaces and facilities which attracts diverse users to enjoy and liven up the area. As was also highlighted in the FG and other discussions, a mixed-use model approach aims to achieve a balance between residential, commercial, retail and public spaces. The model further aims to ensure inclusiveness, affordability and encourage diversity in the residential community. Public spaces and public facilities including parking are interspersed within the large developments for common public good.

The infusion of mixed uses in a socially inclusive manner is mainly achieved through the following planning principles:

1. Flexible long-term planning that allow developers to incorporate relevant suggestions from the community;
2. Community engagement to ensure project stays viable and relevant to the people's needs in the long run;
3. Provision of mixed-income, mixed use housing options to diversify the residential population and create a vibrant and inclusive community; and
4. Generating space for economic activities such as micro-industrial uses[3] (e.g. handicrafts, bakery, salon, etc.) compatible with residential uses

City of Integrated Neighbourhoods is one of the key themes of development for the City of Kigali that would not just transform physical spaces in cities, but also strengthened communities in the process, through socially inclusive planning and design approaches.

City of integrated neighbourhoods would focus on the following key aspects in Kigali:

1. Affordable city;
2. Housing;
3. Informal Settlements;
4. Informal Economies;
5. Land Management; and
6. Services at Neighborhood Level

4.2.1 Existing Land Utilization & Trends

Kigali housed 10.7 per cent of the country's population in 2012. It is the prime magnet for migrants seeking jobs and financial security. The infrastructure (housing, roads, sanitation and energy, among others) is currently unable to keep pace with this growth. Land is a prime resource, since much of it is too steep or too wet to build on. Almost 60 percent of the city's residents still live in unplanned settlements (Rwanda SOE 2017). There is lack of urban infrastructure in overcrowded informal settlements that has direct impact on urban environment and quality of life. There is an acute lack of quality affordable housing and public open spaces in the city which is deterrent to socially inclusive development intended for the future growth of the city of Kigali.

Since the implementation of 2013 master plan, the city of Kigali has been working to develop some significant infrastructure projects to improve services and public transport in the city. These include preparation of water and sanitation master plan that is being finalized, planning for a centralized sewerage system including a waste water treatment plant to improve collective sanitation services, feasibility study and preliminary design for a Bus Rapid Transit (BRT) system for the city of Kigali to improve public transport and planning for water treatment plants that are in progress to improve the capacity of water supply in Kigali. The city is also actively working to improve its tourism products and strategies to create new jobs and contribute towards revenue generation for its economy. It is also supporting the national green growth strategies with special attention to green urbanization and green technologies.

Kigali has also to benefit from national strategies towards its efforts of becoming a regional trade logistics hub in East Africa. Some key projects include the planned railway that would provide transit from Kigali to Dar-es-Salaam and serve the new state-of-the-art inland cargo handling facility planned in Kigali. The new airport proposed at Bugesera near Kigali is another key project that will positively impact city's growth in future. These projects shall also help Kigali to position itself as an important regional centre in Africa which brings the city a step closer to realising its vision set in the 2013 master plan.

While the 2013 Kigali City Master Plan and its associated District Master Plans laid the foundation for the physical growth of Kigali in an environmentally sustainable manner over the next 20–25 years, urban growth in Kigali city, in the past five years, is also being guided by some key national level policies and legal frameworks. These include the overarching Vision 2020, National Human Settlement Policy 2009, National Land Use and Development Plan (2012), National Urbanization Policy 2015 and the draft Informal Settlement Upgrading Strategy 2015, National Strategy for Climate Change and low Carbon Development, among many others.

The Government of Rwanda also collaborated with the Global Green Growth Institute (GGGI) to develop a National Roadmap for Green Secondary City Development to provide economic incentives to encourage urban growth away from Kigali by developing six secondary cities as poles of growth. Each secondary city will specialize in attracting development in several economic clusters that are most relevant to its natural potential (Rwanda SOE 2017). Going forward, Kigali's growth thus needs to be accompanied with a more calibrated approach toward developing a complementary set of secondary cities and small towns.

Figure 4.7 and 4.8 show the existing land use for 2013 and 2018 respectively.

The list of approved projects proposed by the City of Kigali since the implementation of Kigali Master Plan 2013 is provided in Annexure III.

3 https://www.quora.com/What-are-the-examples-of-small-scale-industry as example

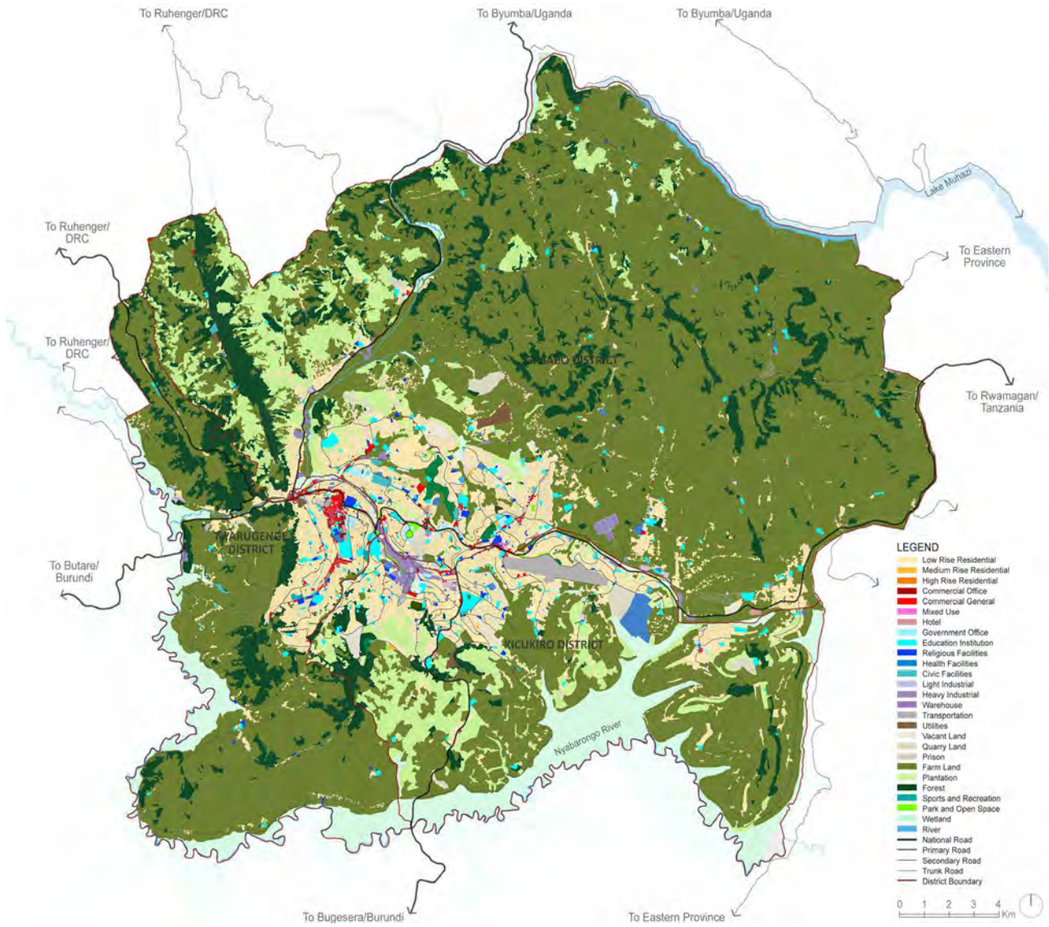


Figure 4.7 Existing Land Use 2013

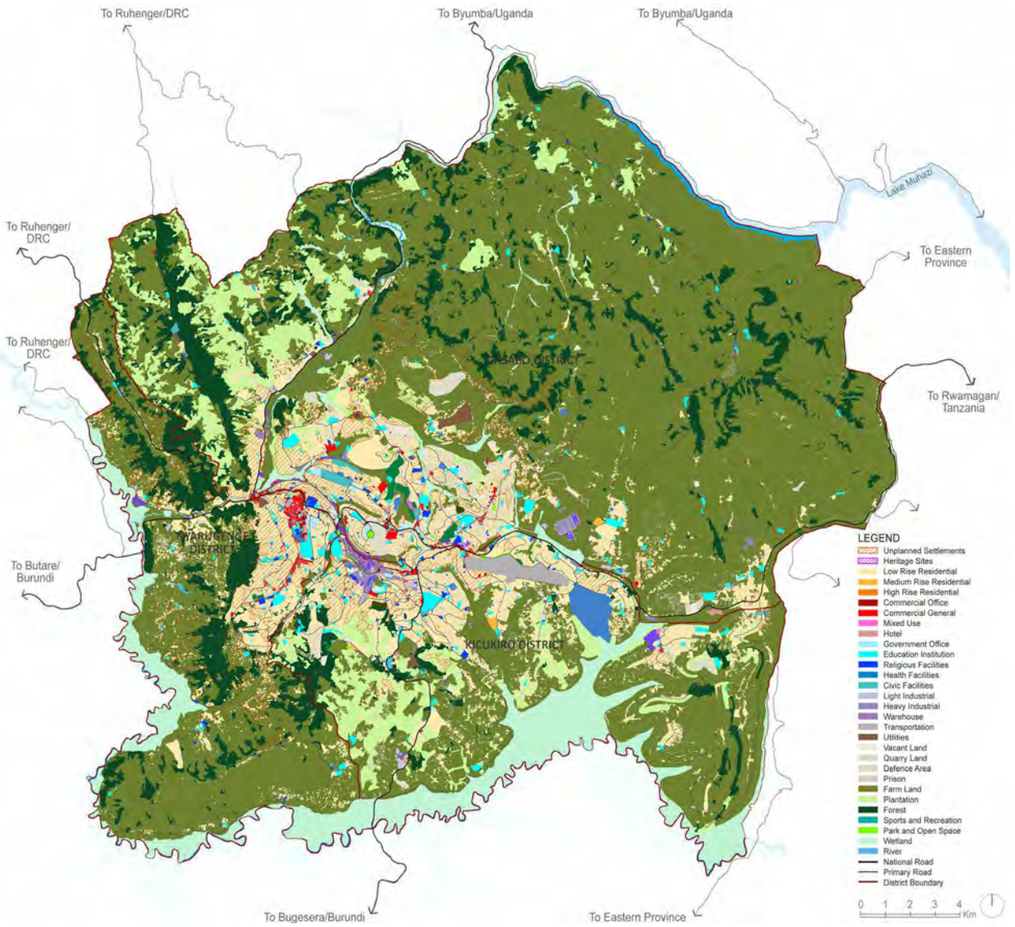


Figure 4.8 Existing Land Use 2018

Existing Land Use Distribution Comparison of 2013-2018

Table 4.1 Broad Land Use Comparison

Broad Land Use (L1)	Area 2013 (sqkm)	Area 2018 (sqkm)	ELU 2013 Vs 2018 (%)
Agriculture	477.55	457.95	(4.1)
Commercial	3.00	3.32	10.6
Industry	4.14	4.25	2.7
Infrastructure	21.15	27.99	32.3
Mixed Use	0.19	0.26	36.5
Nature Area	124.78	123.61	(0.9)
Open Space	1.91	1.81	(5.5)
Public administrative, Institutional and services	14.07	15.17	7.8
Residential	67.07	80.87	20.6
Special Use	13.26	9.51	(28.3)
Water Bodies	2.73	5.13	87.6
Total	729.86	729.86	

Notes for ELU 2018[1]

determining urban planning and building regulations"]
Urban Farming, Unplanned Settlements and Heritage sites are included as overlays on the 2018 ELU.

1 2013 ELU category Public Facilities have been renamed to Public administrative, Institutional and services in 2018 ELU following the land use categories and sub-categories provided in Urban Planning Code (UPC)
[Annex I under N° 04/Cab. M/015 of 18/05/2015 – "Ministerial Order determining urban planning and building regulations"]

2013 ELU sub-category quarry have been renamed to Mining in 2018 ELU following the land use categories and sub-categories provided in Urban Planning Code (UPC)
[Annex I under N° 04/Cab. M/015 of 18/05/2015 – "Ministerial Order determining urban planning and building regulations"]

Urban farming, unplanned settlements and heritage sites are included as overlays on the 2018 ELU

- Area under Agriculture land use includes area for urban farming 20.2 sqkm
- Area under Public administrative, Institutional and services land use includes area for heritage sites 0.21 sqkm
- Area under Residential land use includes area for unplanned settlements 39.60 sqkm

Table 4.2 Detailed Land Use Comparison

Broad Land Use (L1)	Detail Land Use (L2)	AREA 2013 (sqkm)	AREA 2018 (sqkm)	ELU 2013 Vs 2018 (%)
Agriculture	Farm Land (General)	420.50	405.80	(3.5)
	Plantation	57.05	52.15	(8.6)
Commercial	Commercial General	2.27	2.53	11.4
	Commercial Office	0.25	0.25	(1.5)
	Hotel	0.48	0.54	12.6
Industry	Heavy Industrial	2.31	1.83	(20.9)
	Light Industrial	0.78	0.90	15.1
	Warehousing	1.04	1.52	46.0
Infrastructure	Transportation	19.88	26.70	34.3
	Utilities	1.28	1.29	1.2
Mixed Use	Mixed Use	0.19	0.26	36.5
Nature Area	Existing Forest	76.08	77.75	2.2%
	Wetland	48.70	45.86	(5.8)
Open Space	Open Space and Park	0.55	0.39	(29.8)
	Sports and Recreation	1.36	1.42	4.4
Public administrative, Institutional and services	Civic Facilities	1.20	1.39	15.7
	Education Institution	7.00	7.56	8.0
	Government Office	1.33	1.08	18.6
	Health Facilities	2.58	3.54	37.3
	Religious Facilities	1.80	1.58	(12.3)
	Sports and Recreation Facilities	0.15	0.01	(93.5)
Residential	High Rise Residential	0.01	0.01	4.6
	Low Rise Residential	66.84	80.08	19.8
	Medium Rise Residential	0.22	0.78	257.2
Special Use	Defence Area	2.79	2.01	(27.8)
	Graveyard	0.23	0.26	12.2
	Prison	0.08	0.12	54.2
	Mining	1.24	1.31	5.2
	Vacant Land	8.92	5.80	(34.9)
Water Bodies	River	2.73	3.27	20.0
	Lake	-	1.85	
	Total	729.86	729.86	

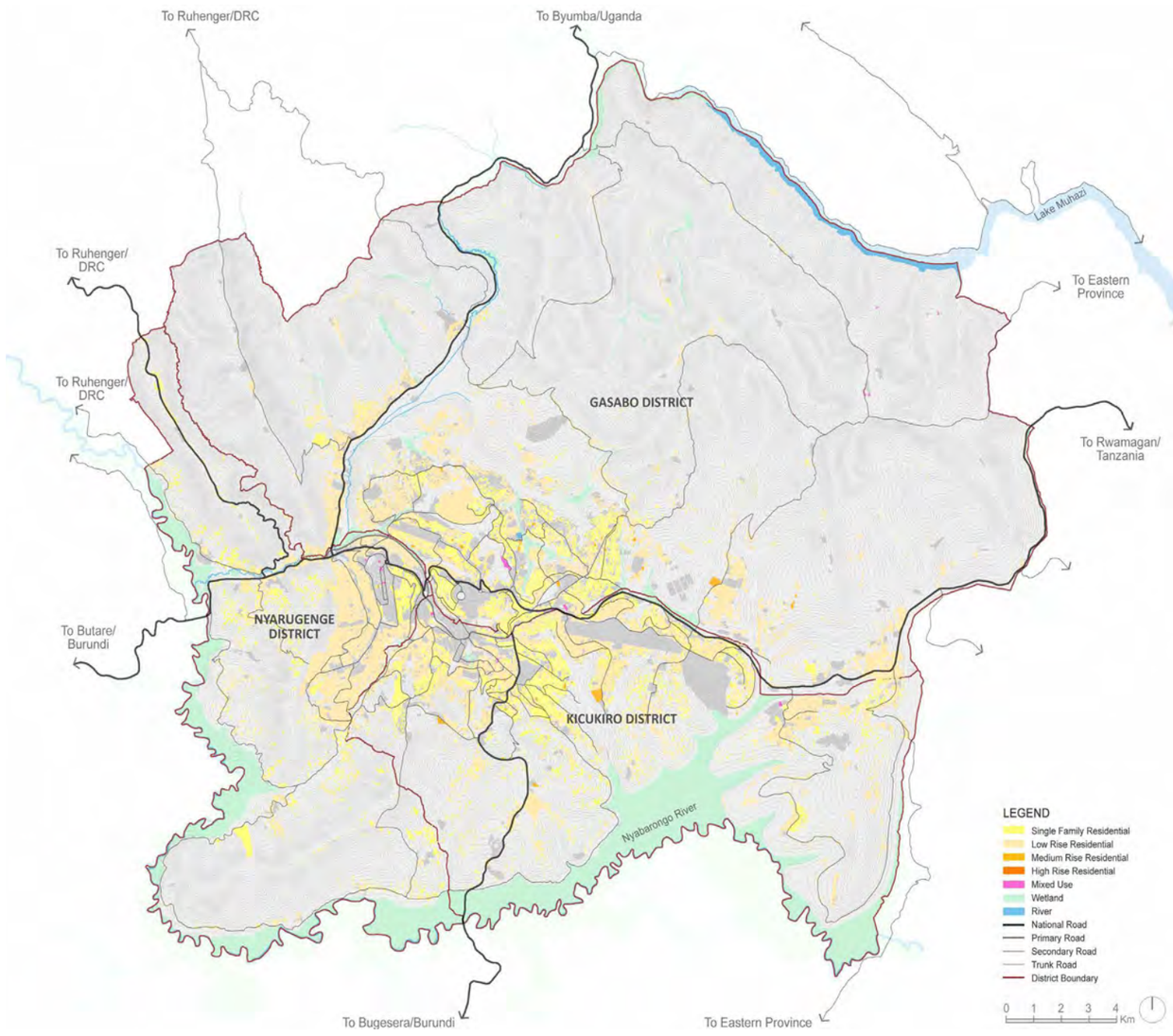


Figure 4.9 Existing Residential Distribution Map

4.2.2 Residential Developments

Vision 2050 – chapter 3: Faster Urbanization Greater Agglomeration sets priorities in housing sector:

1. Emphasize and regulate development density based on market demand and price based allocation;
2. Create high density urban settlement; and
3. Study and analyze informal settlements for possible legalization of the structures built and extending urban facilities for an improved living condition

The Focused Group discussions (FGD) also emphasized and agreed on the need for densification and incremental growth including implementation strategy for low cost housing.

The Social Transformation Pillar under 7years Government Program emphasizes on enhancing quality standards of living for Rwandans by:

1. Developing and facilitating decent settlement including relocation of settlements from high-risk zones- 10,209 households to be relocated from high risk zones and 205,488 households to be mobilized to relocate from scattered settlements; and
2. Affordable housing fund to be operationalized to construct 15,000 new dwelling units

The existing residential sector in Kigali is facing three major challenges:

1. Lack of quality affordable housing;
2. Low density urban settlement; and
3. Underserviced and unplanned settlements

Physical Context

Kigali's residential areas are spread over 17 urban sectors which include Gatsata, Gisozi, Remera Kimironko and part of Kinyinya in the Gasabo District; Gikondo, Kicukiro, Niboye, Kagarama and northern parts of Kigarama, Kanombe and Nyarugunga sectors in Kicukiro District; and Gitega, Kimisagara, Nyakabanda, Rwezamenyo and parts of Nyamirambo sector in Nyarugenge District (Figure 4.9).

Newer residential areas for apartments and high-end single family housing in urban areas are largely focused in Gasabo district in Kinyinya, Gisozi and parts of Ndera and Rusororo sectors along the EW regional road. A few approved projects for affordable housing are found in Kanombe, Masaka, and northern Kinyinya.

Poverty and Housing Quality in City of Kigali

Poverty levels in Kigali are generally low compared to national poverty rates that reduced from 44% to 39% in the period under review. Gasabo district has majority of the poor people. Although Nyarugenge and Kicukiro have low poverty levels, the proportion of people living in poverty increased from 2012 to 2015 reflecting a growing problem

of urban poverty ranging between 14% and 19% for the three districts. The Report states that the growth in poverty is due to high dependency ratio in the three districts, seasonal employment and meagre returns in addition to rural urban migration. The poverty hotpots in Nyarugenge District are Mageregere, Kanyinua, Nyakabanda and Nyamirambo sectors. For Gasabo District, they are Gikomero, Rutunga, Bumbogo, Jali, Nduba and Ndera and for Kicukiro Distict, the poverty hotspots are Gahanga, Masaka, Kagarama and Kanombe.

Over 60% of the households in City of Kigali reside in spontaneous housing structures (squatter/ unplanned housing) with Nyarugenge, Gasabo and Kicukiro having proportions of 76%, 55% and 66% respectively. This is an increase from 62%, 34% and 45% between 2002 to 2012 respectively.

The Master Plan update will propose strategies that recognizes informal economy and business activities, and supports formalising informal housing and incremental development with in-situ upgradation or complete renewal depending on the context and development pressure.

Housing Demand

Currently, a number of studies are being conducted in Kigali to estimate the rising housing demand in future. The ongoing study - Housing Need in Kigali being prepared by International Growth Centre (IGC) aims to estimate the quantity of housing required and to contribute to an understanding of market demand for housing in Kigali, Rwanda. This study provides an understanding of the housing profile in Kigali.

SJ-SMEC is partnering with IPAR to update existing socio-economic data and projections as well as to draft two additional studies: Affordable Housing Market Study and Commercial Real Estate Market Analysis, given in Chapter 6. IPAR is working with IGC to align their studies for population projections and housing demands for Kigali.

1. Housing demand in Kigali: According to IGC, under “medium” population growth scenario and a “medium” household size scenario, it is estimated that in 2015 Kigali had 302,164 households which will grow by around 400,000 to a total number of 717,156 households in 2032, multiplying by 2.4 in the 17-year period. In the “low population growth scenario”, Kigali will grow from 292,814 households in 2015, to 675,949 households, multiplying the number of households by 2.3. In the high population growth scenario, Kigali will grow from 317,226 households in 2015 to 783,799 households in 2032, a multiplication factor of 2.5. (Figure 4.10);

2. Household size: The Fourth Integrated Household Living Conditions Survey (EICV 4) found that in 2014 the average household size is 4.5, differing by income quintile because households with more people earn more. The average household size is predicted, according to IGC, to reduce slowly to a long-term rate of 3, reaching about 3.5 by 2032, as illustrated in Figure 4.11; and

3. Total current housing supply: EICV 4 gave a figure of 266,210 housing units in 2014

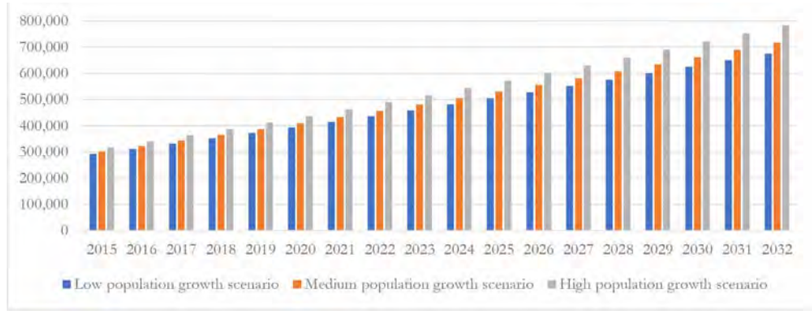


Figure 4.10 Total Number of Households, Medium Household Scenario

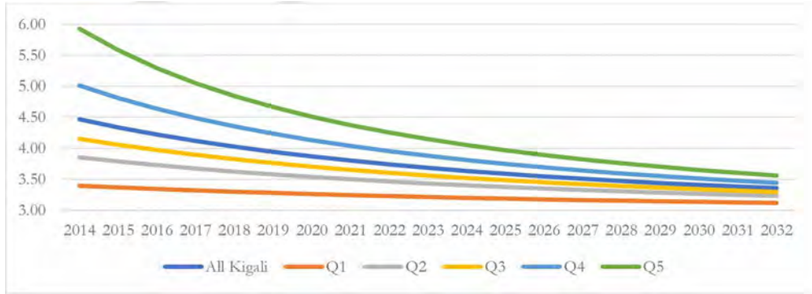


Figure 4.11 Mean Households Sizes over time by Households Income Quintile, Medium Scenario

Table 4.3 Residence by Quality of Housing City of Kigali Districts (%)

District	Year	Umudugudu (Old settlement)	Old settlement	Dispersed	Planned Urban housing	Spontaneous (squatter habitats)	Other type	missing
Nyarugenge	2002	0.02	0.05	0.21	0.06	0.62	0.03	0.01
	2012	0.01	0.02	0.18	0.03	0.76	0.00	0.00
Gasabo	2002	0.05	0.04	0.47	0.08	0.34	0.01	0.01
	2012	0.03	0.01	0.28	0.12	0.55	0.00	0.00
Kicukiro	2002	0.06	0.05	0.28	0.10	0.45	0.06	0.01
	2012	0.03	0.01	0.11	0.17	0.66	0.01	0.01

Source: IPAR

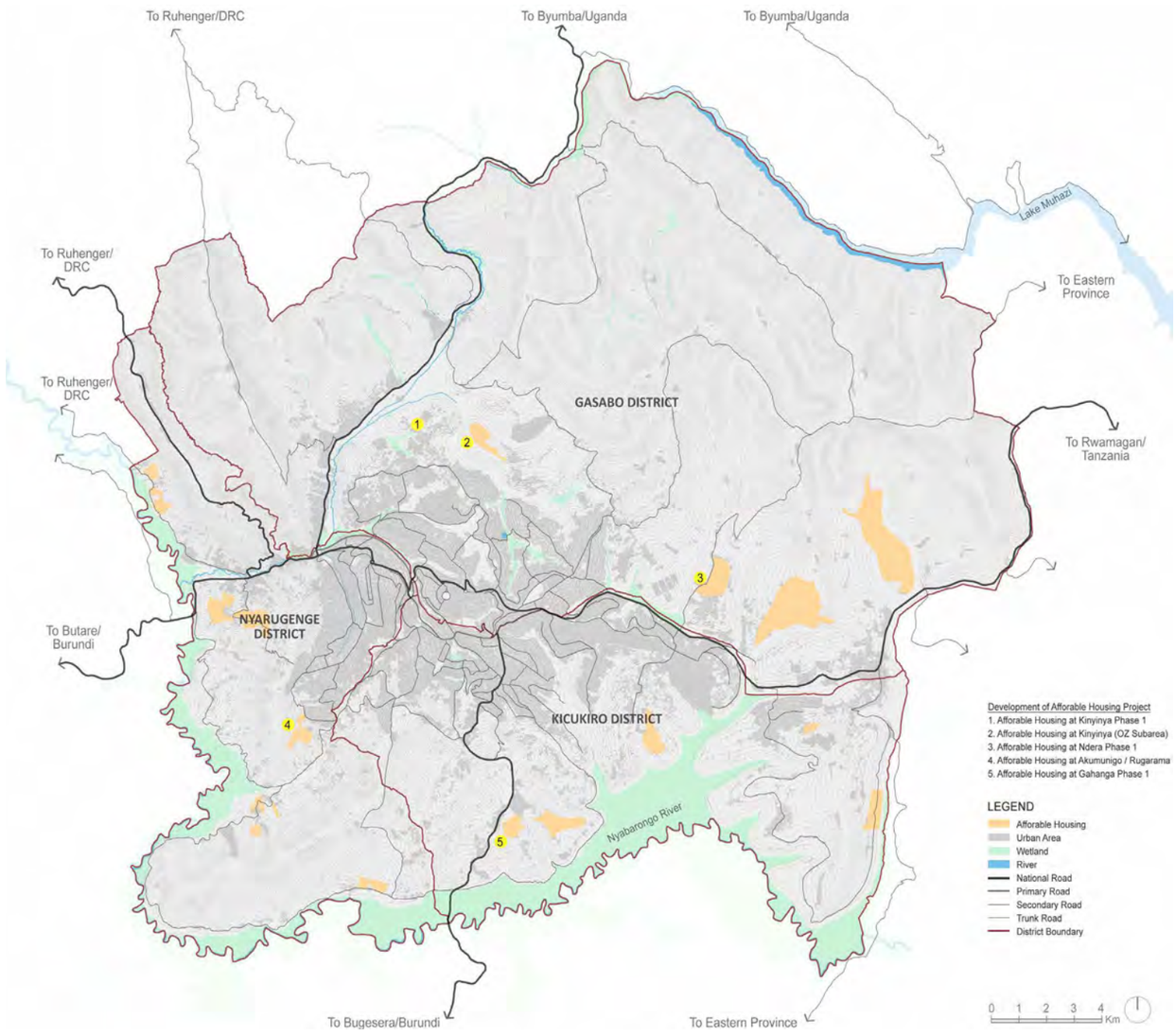


Figure 4.12 Affordable Housing Plans in Kigali

Affordable Housing

All studies and reports including the discussions in FGs and TAG meetings highlighted Kigali City faces issues with lack of quality affordable housing and open spaces. Meanwhile, because of the outdated manufacturing procedure and scarce sources, the production of construction material is costly for local houses. Under the circumstances, city faces severe urban sprawls that urban poor tends to escape from the high-cost city area and lives in unplanned settlements.

National Housing Policy (2015) establishes vision to "make everyone access adequate housing in sustainable planned and developed areas". It focuses on improving the financing models for people with low purchasing power by providing affordable housing infrastructure fund and cost-efficient construction materials, as well as promoting land pooling through public participation and developing underutilized government land for creating more social housing projects.

Representative findings of IGC are around 415,000 houses will need to be built in the period from 2015 to 2032 to provide dwelling units of adequate standard to all additional households in Kigali. In addition, in 2014 there was a housing backlog of 133,000 houses, representing almost half the housing stock, that need to be replaced according to criteria provided by the City of Kigali. A household at the median of the middle quintile can afford to rent a house worth 11.4 million RWF in 2020 or a mortgage of 6.1 million RWF if they can afford a 20% downpayment.

National Housing Policy (2015) focuses on achieving "resource efficiency such as land densification, green energy, cost efficient construction materials". SDC/SKAT Consulting Rwanda Ltd shall be responsible for designing and constructing the first smart urban low-cost house which shall serve as demonstration to everybody involved in the project. In addition, SDC/SKAT Consultant shall provide technical support and trainings to local masons during the construction of additional Smart Urban Low-Cost Brick buildings. SDC/SKAT proposed a list of brick production factories within the clay extraction zones under the wetland zone as per 2013 Kigali Master Plan.

In conformity with the National policies, Rwanda Housing Authority (RHA) enacts Affordable Housing Plans for improving the existing housing deficit (Figure 4.12). However, current locations for Affordable Housing Projects are away from urban area and decentralized in the city fringes and sub-urban areas. The master plan update should bring them closer to the city to refrain from urban sprawl.

Low Density Urban Settlement

There is a trend of building low and medium density single family housing in Kigali (Figure 4.13). However, the current trend of low and medium density developments is not sustainable in the long run and requires suitable density management strategies to promote a compact living environment. Majority of land with higher density potential is occupied by low and medium density developments.

Vision 2050 advocates to create high density urban settlement and regulate development density based on market demand. National Housing Policy (2015) suggests zoning to be in support of high density developments and affordable housing. National Roadmap for Green Secondary City Development (2015) promotes density and mixed land uses.

According to the national policies or strategies prepared by various consultancies, replacing the current low-rise unplanned settlements into high-density mixed-used buildings (eg. Residential with commercial on the ground floor) and high-density affordable multi-family housing has been the common proposal in different cases including the emphasis on alternate/ flexible Zoning during the FG and other meetings. This round of Kigali Mater Plan update will review proposed FAR for all zones especially in residential sector to meet the housing demand in Kigali.

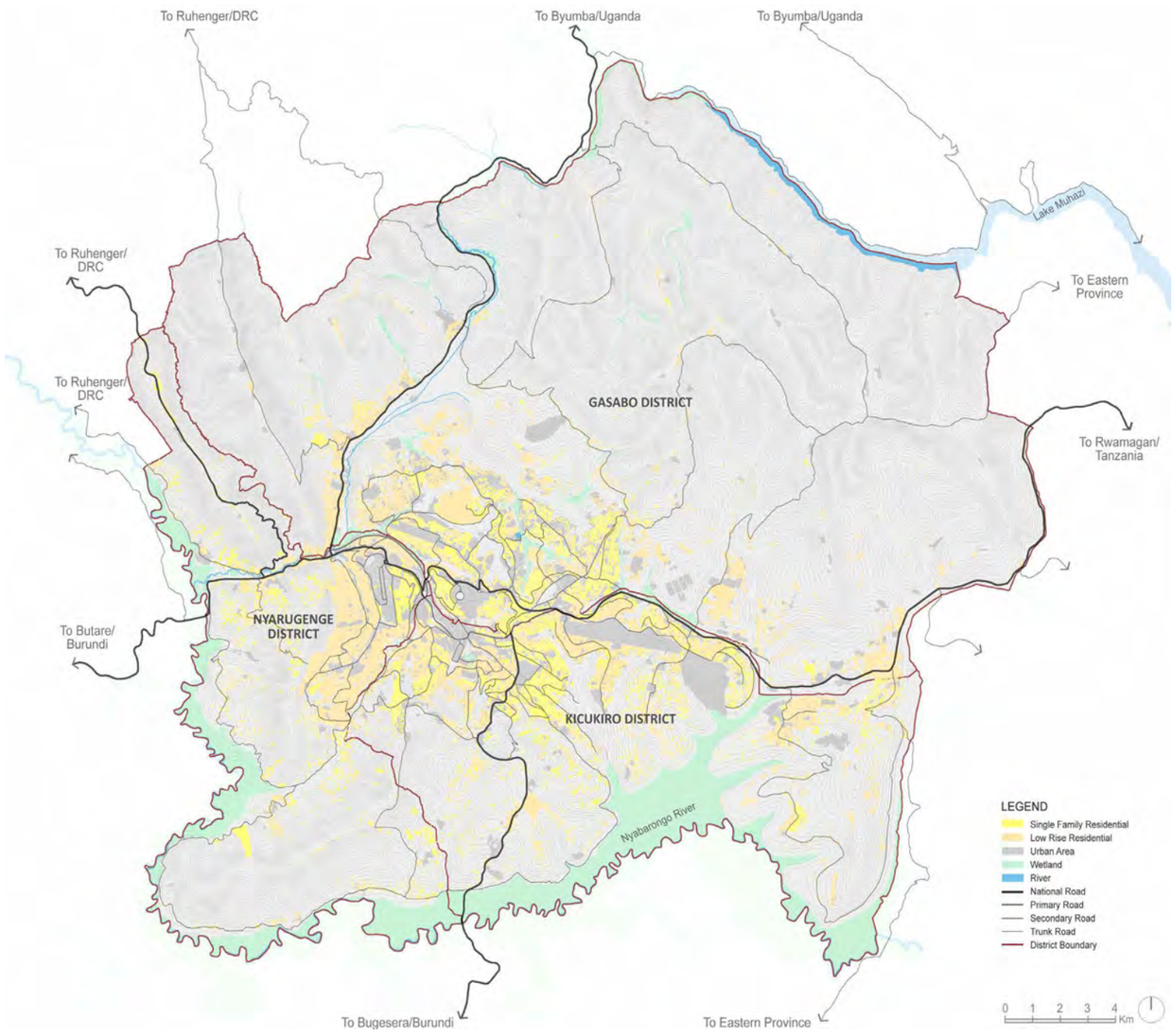


Figure 4.13 Low and Medium Density Single Family Housing in Kigali

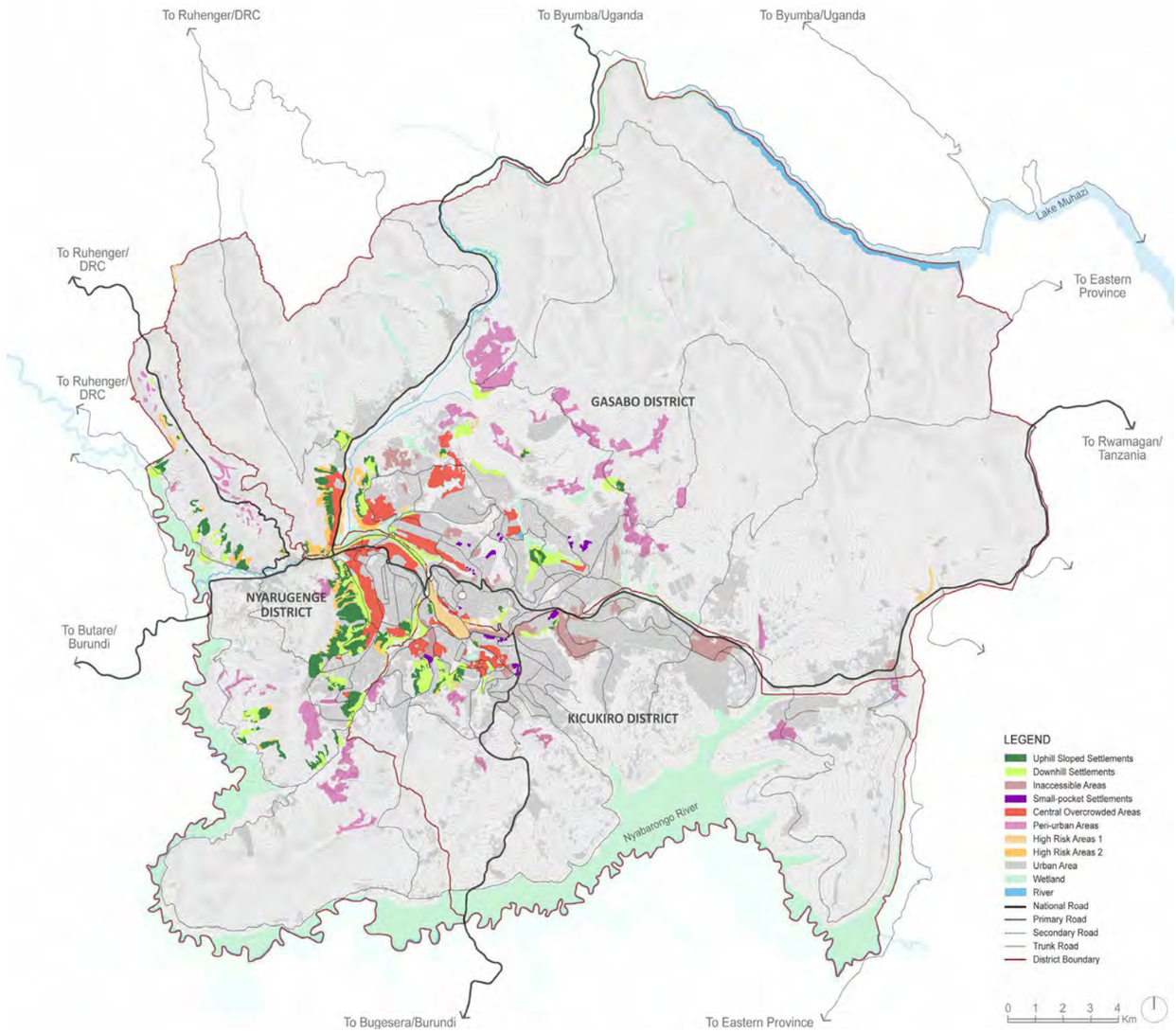


Figure 4.14 Location of Unplanned Settlements in different categories in Kigali
Source: UNHABITAT

Unplanned Settlements

Unplanned settlements represent a universal phenomenon, which many countries suffer from worldwide and Rwanda is no exception especially the City of Kigali. It is one of the major phenomena accompanying the accelerated urbanization process worldwide. There are a number of factors that lead to the formation of unplanned and underserviced settlements in Kigali. The prime cause is that the poor and non-employed come to the capital city looking for a job or an income opportunity, and they are ready to settle in inadequate conditions to make some savings. A schematic representation of the problem being addressed is presented in Figure 4.15, which illustrates the "vicious cycle" of the proliferation of this type of settlements.

National Informal Urban Settlement Upgrading Strategy (2017) prepared by the MININFRA is guiding the implementation of countrywide unplanned settlements upgrading in Rwanda. It follows the provisions of the National Housing Policy (2015), which stipulates "Existing informal housing units shall be upgraded and integrated into the formal housing stock to the highest degree feasible".

According to EICV 4, 49.7% of existing houses need replacing, which represents 123,094 houses. The percentage of people living in unplanned settlements in Kigali is estimated about 70 % (EICV4), but has significantly dropped compared to the 2007 estimate of 90 %. It is also estimated that 40.5% of the people living in unplanned areas are renting the accommodation.

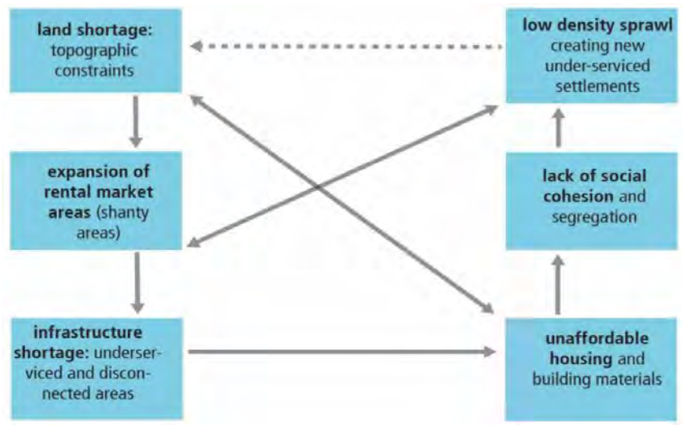


Figure 4.15 "Vicious Cycle" of the proliferation of unplanned settlements

City-wide unplanned and underserviced settlements upgrading strategy for Kigali, Rwanda (2018) supported by UNHABITAT identifies categories of unplanned settlement in defining a city-wide strategy to upgrade underserviced and unplanned settlements in Kigali (Figure 4.14).

1. Uphill sloped settlements -19%;
2. Downhill settlements- 11%;
3. Inaccessible areas- 13%;
4. Small-pocket settlements- 2%;
5. Central overcrowded areas – 34%;
6. Peri-urban areas – 9%; and
7. Settlements located in high risk areas (highly steep slopes and flood prone) -13%

UNHABITAT shows that the most dominant category is represented by the uphill sloped settlements (40%), followed by the old central overcrowded areas (20%), the downhill settlements and inaccessible areas (both at 15%), while the least represented categories are the small-pocket settlements (8%) and the peri-urban areas (2%) (Table 4.5).

Table 4.4 Main characteristics of informal settlement category

Informal Settlement Category	Average Size	Location	Predominance by district
i. Uphill sloped settlements	Large (more than 10 hectares)	Central	Nyarugenge
ii. Downhill settlements	Medium (ranging from 1 to 10 hectares)	Fringe	Gasabo
iii. Inaccessible areas	Medium (ranging from 1 to 10 hectares)	Central	Kicukiro
iv. Small-pocket settlements	Small (less than 1 hectare)	Fringe/ Peri-urban	Nyarugenge
v. Central overcrowded areas	Large (more than 10 hectares)	Central	Nyarugenge
vi. Peri-urban areas	Small (less than 1 hectare)	Peri-urban	Gasabo
vii. Settlements located in high risk areas	Large /Medium /Small	Central	Nyarugenge/ Gasabo/ Kicukiro

Source: UNHABITAT

Table 4.5 Population distribution per unplanned settlement category

Informal Settlement Category	Percentage	Households
i. Uphill sloped settlements	40	58000
ii. Downhill settlements	15	21750
iii. Inaccessible areas	15	21750
iv. Small-pocket settlements	8	11600
v. Central overcrowded areas	20	29000
vi. Peri-urban areas	2	2900
	100	**145000**

Source: UNHABITAT

Central overcrowded areas (100-200 inh/ha):
They are overcrowded and lack of adequate sanitation facilities. Most of the residents are tenants. High densities as proposed by Kigali Master Plan can only be achieved through vertical development, which would require removal of existing informal settlements. Interventions proposed to upgrade this settlements category are subdividing the land into cluster of houses to facilitate urban renewal operations to build high density affordable multi-storey housing through Public-private partnership (PPP); providing infrastructure and public space.

Uphill Sloped settlements (80-100 inh/ha):
These informal settlements are located in the upper parts of the hills, along the slopes, which are generally areas prone to soil erosion and landslides. Tailored interventions are providing key infrastructure; making erosion control and environment protection.

Downhill settlements (80-100 inh/ha):
These settlements are near to wetlands or within prime real estate. They face high pressure from land buyers and investors. Proposed interventions are making physical demarcation to prevent further expansion into the wetland zones; subdividing land into clusters of houses; making participatory land readjustment to build consensus and avoid evictions.

Inaccessible areas (60-80 inh/ha):
Many areas within the urban fabric lack of access roads for vehicles. They are described as "inaccessible" because only pedestrians can reach them. Effective interventions are reorganizing plots and managing densities by merging smaller overcrowded plots located closer to the entry points of the settlement, so that access roads can be provided.

Small-pocket settlements (60-80 inh/ha):
These areas result mainly from land owners creating backyard shacks or lower standards housing for rent, in disrespect of city planning regulations. Correcting this type of unplanned settlements needs pro-active engagement of land owners to stop the illegal plot subdivision process and Government intervention to provide housing alternatives for the low-income groups.

Table 4.6 Synthetic description of the different categories of unplanned settlements in Kigali

Informal Settlement Category	Social Profile	Urban Standards	Challenges
i. Central overcrowded areas	Mainly Tenants	High density (100-250 inh/has)	Overcrowding, Lack of sanitation
ii. Uphill sloped settlements	Balance between Owners & Tenants	Medium density (80-100 inh/has)	On going erosion, Landslide risks
iii. Downhill settlements	Balance between Owners & Tenants	Low-medium density, mixed uses (80-100 inh/has)	Groundwater contamination, Destroyed wetlands
iv. Inaccessible areas	Mainly Tenants	Low-medium density/ residential (60-80 inh/has)	Difficulties to access to services
v. Small pocket settlements	Mainly Tenants	Low-density, mixed landuse (60-80 inh/has)	Overcrowding
vi. Peri-urban areas	Balance between Owners & Tenants	Very low density, agricultural (less than 20 inh/has)	Loss of Fertile land
vii. Settlements located in high risk areas	Displaced and Migrants	Low density mixed uses	High disaster risks

Source: UNHABITAT

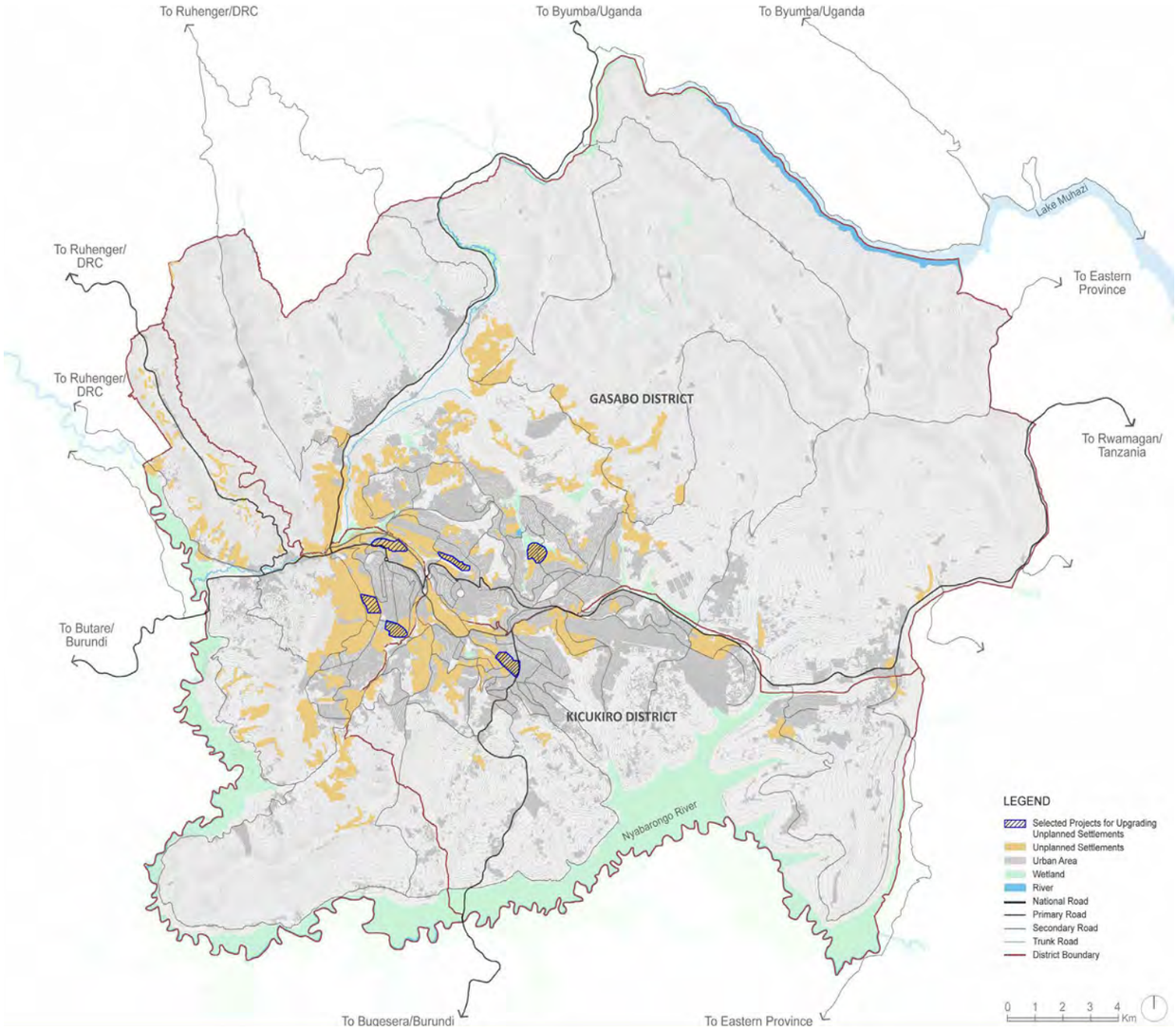


Figure 4.16 Selected Projects for Upgrading Unplanned Settlements

Peri-urban areas (less than 20 inh/ha):
They were resettled by the government from high risk areas prone to natural disasters, like landslides and flooding. Owners and tenants living in these settlements lack accessibility to public transport, have limited access to better job market, and face high risk of losing fertile agricultural land due to urban sprawling.

Settlements located in high risk areas (low density):
According to Rwandese regulation, people living in areas at risk, such as in steep slopes or in flood-prone areas, need to be relocated to safer zones. Once done, these areas should be rapidly transformed into public spaces, protected green or recreational areas, among other possibilities, to prevent newcomers.

Accepting the study by UNHABITAT and various parties for unplanned settlements, City of Kigali has approved six patches of land under unplanned settlements for enabling the upgrading projects (Figure 4.16). This round of Kigali Master Plan Update will show the demonstration work of the upgrading process for unplanned settlements in the later chapter.

Criteria for selection of Unplanned settlements for Upgradation

8. Along BRT Corridor : The first crietria to be selected is along or in proximity of 150 m buffer of BRT corridor.
9. The prioirty is given to settlements which are in proximity to proposed implementation projects and in proximity to active or passive recreation projects.
10. Unplanned settlements falling under Wetlands shall be eliminated from this process
11. Unplanned settlements falling under high risk areas ((highly steep slopes and flood prone) will not be considered for upgradation process.
12. Priority given to settlements in proximity to approved projects by Cok (RDB) projects
13. Priority given to settlements in proximity to exisitng infrastructure such as sewerage network or existing water supply
14. Land prices determine the selection process and should be ablove the medium range of prevailing land pricing in Kigali
15. Population within the settlements can be determing factor as well.

Process of Selection of Sites

The data received from the ground study for indenfication of Unplanned settlements based on (any IPAR STUDY ??) was overlayed with 1ha grid in GIS. Feeding in all the criteria as mentioned above, the sites were ranked based on priority listing. Each of them were given ranking in the Scale of (1-5) for evalution process. The most suitable sites were selected considering these factors are :

- **Gatega** - Kicukiro District
- **Kagugu** - Gasabo district, Kinyinya,Kagugu
- **Gitega** - Nyarugenge district, Gitega
- **Kamatamu** - Gasabo district, Kacyiru
- **Mu miyembe** - Gasabo district, Kimihurura
- **Inyange (Urukundo village)** - Gasabo district, Kacyiru
- **Camp zaire** - Kicukiro district, Gikondo
- **Nyagatovu** - Gasabo district, Remera
- **Inyamibwa -** Gasabo district, Kacyiru
- **Bukinanyana -** Gasabo district, Kacyiru

4.2.3 Commercial Developments

Over the last five years, the Kigali market has witnessed accelerated increase in commercial office space, changing the Kigali skyline, with developments such as M-peace plaza, Kigali city tower and Kigali heights among others. Additional 70,000 sqm of commercial area is in the pipeline for the next two years according to Knight Frank Africa report 2017. This has resulted in decline of rental prices and occupancy rates. The demand for commercial office is declining leading to increased vacancy rates due to increased supply over the last five years[4].

4 Kigali Real Estate Investment Opportunity, January 2018, Cytonn Real Estate

Real Estate studies suggests government initiatives, growth of SME's and entry of international players are driving the commercial office and retail sector in Kigali. The city is leading the urban regeneration drive in the CBD whereby old and low-density structures are being demolished to make way for modern, high density commercial developments. The city has also requested tenants currently renting residential properties for office use to relocate to newly constructed offices. This will therefore generate demand for some of the space currently on the market and in the pipeline. Government policy has also banned open air market in Kigali city, with all retailers encouraged to shift to the malls hence increasing occupancy rates in malls[5].

The growing SMEs in Kigali due to ease of doing business in Rwanda, ranked 2nd from Mauritius in Africa according to 2018 World Bank Doing Business Report. It is also attracting new companies to Kigali that is likely to drive the demand for office space[6].

Rwanda has seen increase in International institutions entry into the country creating a demand for offices in the Capital city around key commercial nodes such as Nyarugenge CBD and Kimihurura hosting companies like Delloite, KPMG, KCB-Rwanda among

5 Kigali Real Estate Investment Opportunity January 2018, Cytonn Real Estate

6 Kigali Real Estate Investment Opportunity January 2018, Cytonn Real Estate

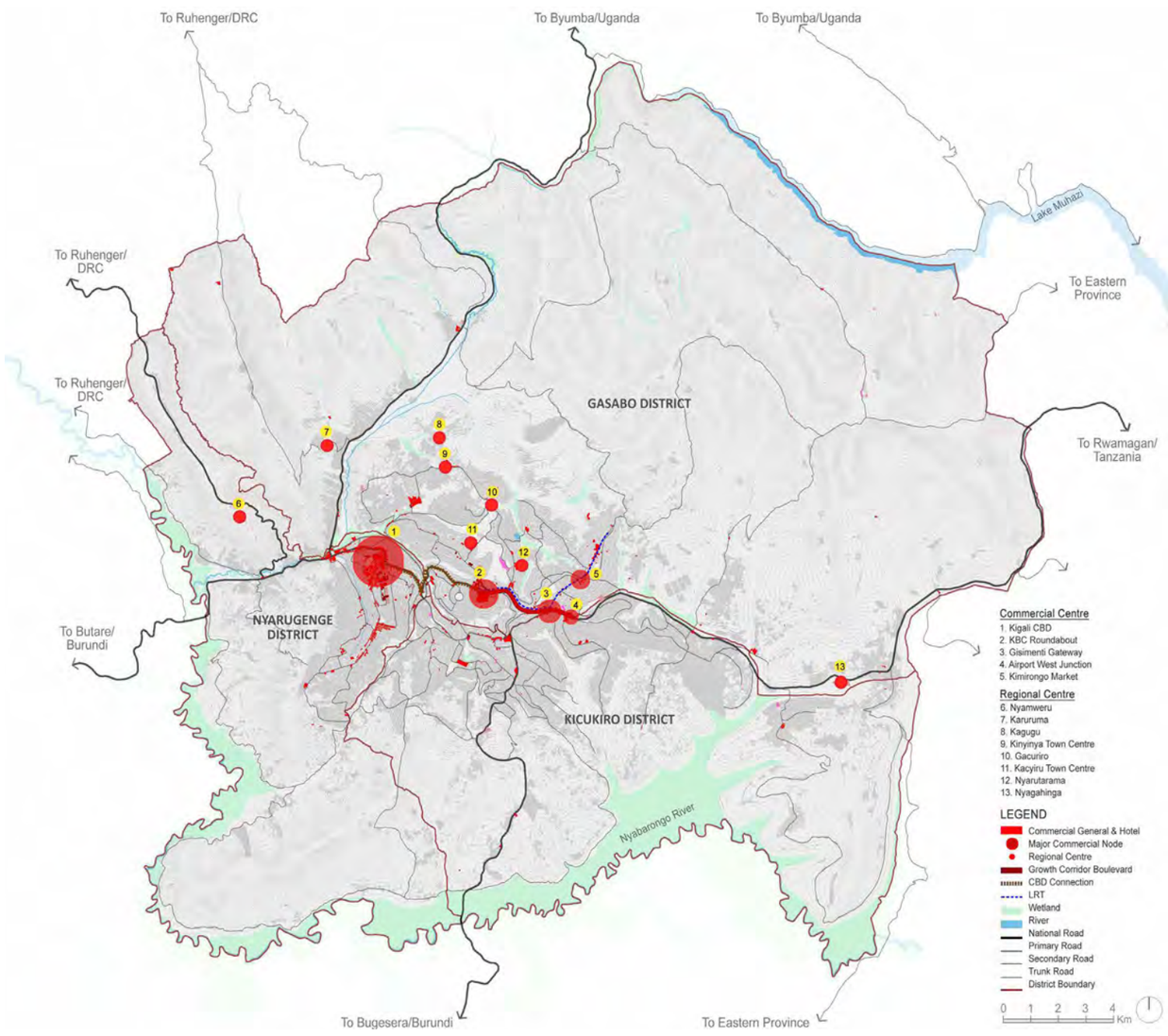


Figure 4.17 Kigali City - Existing Commercial Distribution and Key Approved Projects

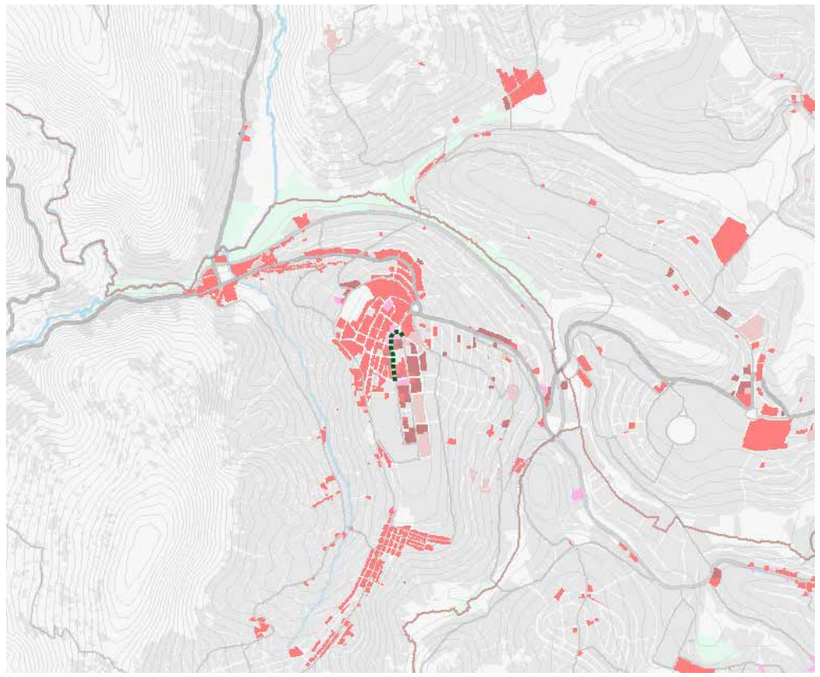


Figure 4.18 Location of Imbuga City Walk Project

Figure 4.19 Imbuga City Walk

others. Increase in Foreign Direct Investment(FDI) and infrastructure upgrades in the past five years have interested international retail brands such as Nakumatt, Mr. Price, Java House, and Carrefour looking into entering the market, hence creating demand for retail space in Kigali[7].

Hospitality industry have also increased its footprint in Kigali due to increase in tourism and MICE events (meetings, incentives, conferences and exhibitions) leading to increasing demand for higher quality star-rating hotels in the capital city. Demand for serviced apartments have also increased recently due to high number of expatriates in Kigali, given the city's good security and overall political stability of the country.

Issues and Challenges

Despite the above efforts and potential demand for commercial office and retail in coming years, the city of Kigali faces tough challenges towards growth of its commercial sector especially in the CBD area. Most commercial office buildings are concentrated in the Nyarugenge CBD that is proposed to become the commercial core of the country. Located in Muhima and Nyarugenge, in the Nyarugenge District, the CBD is envisioned to be revitalized as a "vibrant new growth area" with large plot sizes to allow for high-rise, large offices and mixed-use developments. The city authorities are actively working towards improving walkability, access and vibrancy in the CBD by introducing pedestrian car-free zones such as the Imbuga-City Walk project, a 500m pedestrian, car-free street designed within the CBD to enhance the walkability of the urban centre (Figure 4.18). But oversupply of commercial office in CBD without current market demand, high cost of land in city centre, high construction cost has slowed the commercial developments in the city centre. Most of the current office places are vacant, as high land price and rental fees force tenants to choose alternative locations for business away from the CBD. IPAR is conducting an ongoing study for Commercial Real Estate Assessment in Kigali.

Another key challenge faced by the city authorities is the increasing unplanned settlements surrounding the CBD area that is impacting the overall development of the proposed CBD as per 2013 master plan. Due to increasing migrant population coming to work in the CDB, lack of affordable housing around the CBD and limited public transport connecting CBD to surrounding residential areas, there is an increase in high-density, low-rise, unplanned housing settlements impacting the quality of urban environment in the city centre.

The city council faces tough challenges towards upgradation, redevelopment or relocation of these existing overcrowded unplanned settlements in the proposed CBD area because of the private land ownership and poor incentives for land pooling. The city is actively working with residents through public engagement for upgradation of these unplanned settlements and to also address the social impact of relocation to new planned residential hubs in various areas of the suburb such as Kinyinya, Akumunigo, Masaka among many.

Moving east of the CBD, the Kigali Business Centre (KBC) in Kimihurura is another key commercial and civic node surrounded by iconic Kigali Convention Centre and the Radisson Blu Hotel and Kigali Heights, an award-winning mixed-use project with grade-A office space. Retrofitted in 2016, KBC offers a wide range of options for shopping, dining, entertainment, living and working, and an administrative district housing, various government ministries and embassies, near the city centre.

Going further along the main arterial Boulevard L' Umuganda, connecting the CBD and existing airport, the city also sees the growth of the vibrant mixed use commercial areas in Gishushu and Gisimenti. There is further growth of finger-like commercial activities along the arterial road connecting Gisimenti junction to Kimironko market which is one of the largest traditional markets and housing suburbs of Kigali. This road is also proposed as a BRT corridor, which is likely to boost commercial and retail activities along this corridor. Due to existing catchment of vibrant mixed use neighborhood, good access, lower rentals than the CBD and variety of commercial offices and retail space in Grade B and C with cheaper prices, a lot of new businesses are thriving in this area. There is also a proposal to redevelop the existing Kimironko Market area as Kimironko Commercial Complex which shall improve existing infrastructure in this area. New commercial developments are also

7 Kigali Real Estate Investment Opportunity January 2018, Cytonn Real Estate

likely to come up along the new airport road linking Kigali city to Bugesera airport bringing new opportunities to the city of Kigali.

4.2.4 Industrial Developments

The National Industrial Policy from the Ministry of Trade and Industry Government of Rwanda estimates that close to 70 percent of industry in Rwanda is located in capital city of Kigali. Since the implementation of Master Plan of Kigali in 2013, the city has made progress in formalising and consolidating its industries and warehouses for logistics in few strategic locations as proposed in the master plan (Figure 4.20).

The Kigali Special Economic Zone located in Nyandungu, has been designated and developed to accommodate small- and large-scale industries including: heavy and light manufacturing industries, large scale users industrial plants, wholesalers, chemical, pharmacy and plastics, warehousing, tourism and service industry and telecommunications. The KSEZ was created through the merger of the former Kigali Free Trade Zone and the Kigali Industrial Park projects. It occupies 309 ha of land and is being developed in three phases. The first phase is built on 98 hectares of land, of which construction was completed in 2013 (Rwanda SOE, 2017). All plots are fully booked by 61 investors, and 32 industries and 15 warehouses are operational. Land expropriation had been done for SEZ second plase development on 70 hectares of land. Land in phase two has been sold to developers and most of the industries are in operation. At present, SEZ third phase owning 141 hectares of land remains empty.

The KSEZ has been growing with more industries from the industrial park of Gikondo, which remains one of largest clusters of heavy polluting industries and warehouses in the heart of the city sitting on and along the wetland protected area. The city is in the process of relocating these industries from the marshland areas to cease the pollution of the Nyabarongo River and wetlands by industrial effluent and waste (Rwanda SOE, 2017). Many industries from Gikondo are actually relocating to Gahanga industrial area or to Nyamata due to cheaper costs. However, still many industrial and warehousing units remain in the eco-sensitive wetland area and its buffer zone.

The Gahanga Regional Centre proposed in the 2013 Master Plan, which is well connected with the city centre as well as the proposed Bugesera International Airport, has also developed as one of the key growth nodes in suburban Kigali. The Gahanga industrial area is established in the light industrial zone of 2013 master plan to create a clean and light industrial environment near the surrounding residential area. East Africa's first automated fuel depot has also been developed in the proposed Rusororo industrial area in Gasabo district reserved for general heavy industries as per the proposed master plan 2013. Construction works of a new state of the art inland cargo handling facility in Masaka is near completion. First of its kind in Africa,

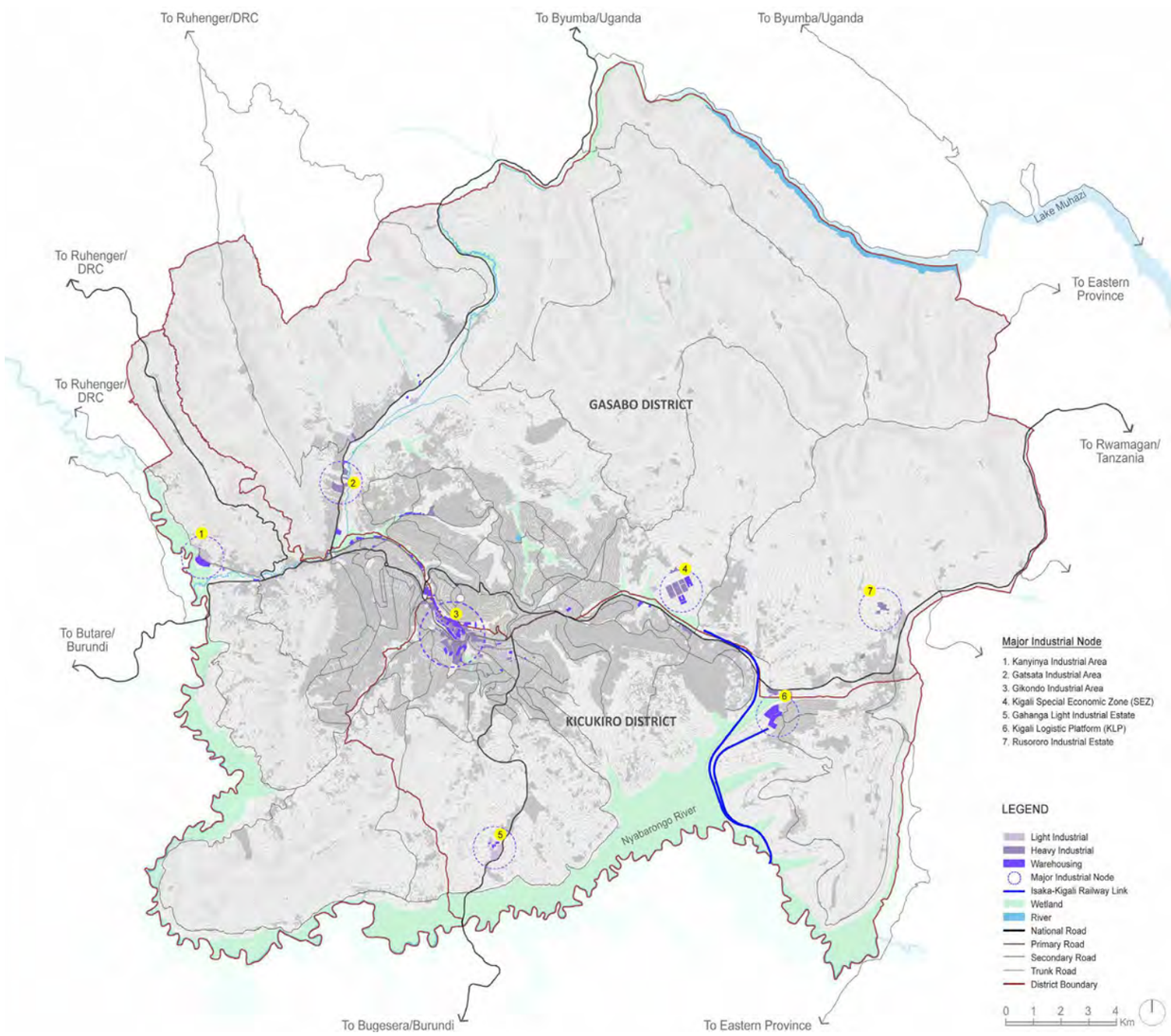


Figure 4.20 Kigali City - Existing Industrial Distribution and Key Approved Projects

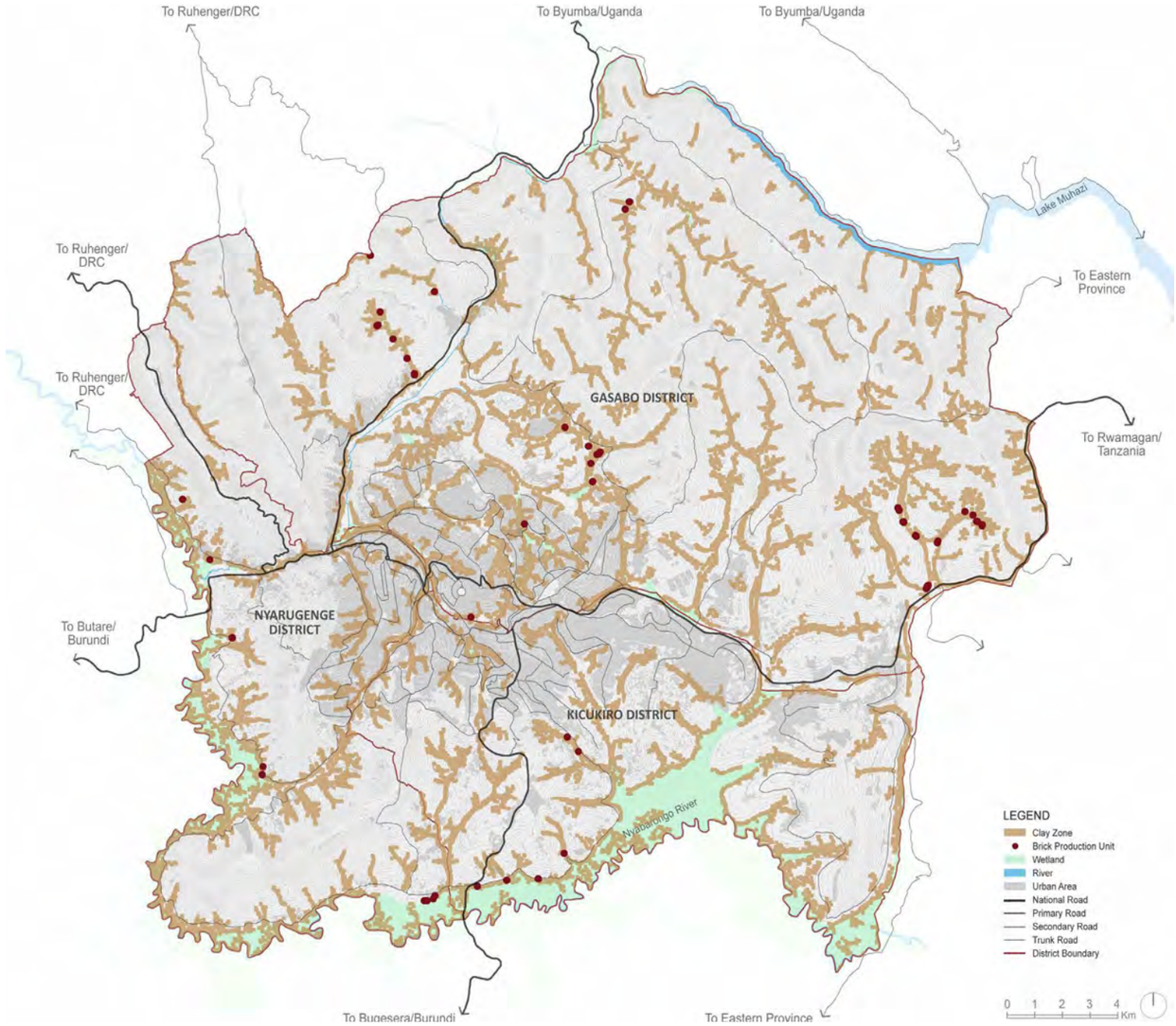


Figure 4.21 Clay Sites and Brick Manufacturing Sites in Kigali

the Kigali Logistic Platform (KLP) facility is planned towards Rwanda's efforts of becoming a regional trade logistics hub. It is expected to improve efficiency and reduce cost of logistics by embracing the use of modern machinery. The development is planned on 30 ha and include container and goods storage facilities, space for stakeholders such as freight forwarders, shippers and transport operators, customs inspection, tax offices, maintenance and repair, banking and IT infrastructure. Situated outside the city centre, the KLP will ease congestion in Kigali. The envisaged standard gauge Isaka-Kigali railway link is planned to link the Tanzanian port of Dar-es-Salaam to KLP. This shall have a positive impact on cost of imports and exports to and from Rwanda and Made-in-Rwanda (products) competitiveness on the global market. Currently the facility extends onto R3 medium density residential zone as per the 2013 zoning plan. The master plan update shall update the zoning of this area as per the land use plan proposed by the city.

Other than the key industrial sites planned in the city, some industrial clusters are also scattered along the Kigali-Gatuna Road in Gatsata, Gasabo district. These include heavy industries for petroleum storage, chemical and clay farm, light industries and warehouses. Some of these industrial units are falling within the protected wetland zone and they need to be relocated to other planned industrial clusters within Kigali. Some new warehousing facilities have also been established in the proposed light industrial zone of Kanyinya in Nyarugenge district.

The wetland buffer zones are key sites for extracting clay for clay brick manufacturing. These brick manufacturing sites are thus scattered along the wetland buffer zones in the city of Kigali (Figure 4.21). Looking at the current need for cheaper local material to meet the increasing demand of affordable housing, the city authorities are currently facing the challenge to create a balance between wetland protection and use of wetlands for economic development.

The city of Kigali is aiming to strengthen its industrial growth in the key planned industrial areas with focus on light industries – manufacturing and logistics. The heavy polluting industries are being planned to move outside Kigali to the six secondary cities reducing the demand for area for heavy industries currently planned in Master plan 2013. This is also adopted as an important strategy to boost the economic development of secondary cities. The master plan shall consider market study to adjust and update the zoning as per the market demand and employment projections.

MINICOM has also expressed another important concern regarding lack of affordable housing and social infrastructure for workers close to the planned industrial areas – KSEZ and other industrial parks. People are forced to travel longer distances to work in these areas as there is lack of housing and social infrastructure around these industrial clusters. While the master plan 2013 suggests the development of integrated industrial parks with worker housing and social infrastructure, the city has been facing many challenges

related to implementation that impacts the overall quality of urban environment for workers within these industrial areas. The current master plan update shall address these issues of planning and implementation to create safe 'live-work-play' environment within the industrial estates.

4.3 City at Work

Economic development is critical for a city that is striving for urban excellence and prosperity with good jobs opportunities and income growth. City at work is one amongst the 8 goals of development for the City of Kigali. These goals align with the overarching policy pillars stated in Rwanda National Urbanization Policy. The City at Work specially has close alignment with two of the four policy pillars, Conviviality and Economic Growth.

The main objectives under this goal is to understand:

1. The impact of Secondary Cities Development on Kigali economic growth;
2. Key economic drivers that facilitate economic development; and
3. Informal sectors

City at work would focus on the following key themes:

1. Economic Development;
2. Industries and Construction;
3. Commercial and Retail;
4. Productive City; and
5. Informal Sector

A socio-economic study of the existing context in Rwanda and Kigali is conducted to understand the existing economic and population trends, which will thereafter serve as the basis for review of socio-economic projections guiding the update of the Kigali City Master Plan 2013 in the subsequent chapters.

Rwanda aspires to attain upper middle-income status by 2035 and high-income status by 2050 through provision of modern infrastructures and high-quality livelihoods, to the citizens of Rwanda.

According to the stakeholders meetings including FG discussions and the IPAR study, the major economic generators in the recent years has been through investments on Meetings, Conferences and Exhibitions (MICE) sector. MICE tourism is one of the major drivers of economic growth and as a part of MICE strategy, Kigali City has made investments in infrastructures such as the Kigali Convention Centre, improvements of the airport at Kanombe, investments in the national fleet with increase in the number of destinations for Rwanda Air, investments in hotels, and support on the value chain of the conference tourism through private sector involvement (IPAR Socio-economic Report).

As per the study by IPAR (Institute of Policy Analysis and Research) Rwanda, the City of Kigali and Rwanda has high potential to develop vibrant services and knowledge based sectors building on major investments that have been undertaken. Kigali city is well positioned to be a major business and service hub and the update of Kigali Master plan will incorporate all ongoing projects and investments that are undertaken for the City of Kigali.

4.3.1 Existing Socio-Demographic Profile (Rwanda and Kigali)

Population Distribution

The IPAR study states that in comparison with the national population density of 415 inhabitants per sqkm in 2012, the districts in Kigali had a population density that exceeded the national density figure. Nyarugenge had 2,124 inhabitants per sqkm, Kicukiro, 1,911 inhabitants per sqkm and Gasabo had 1,234 inhabitants per sqkm, making Kigali city the most densely populated province in the country. Further, the population in Kigali are mainly settled in urban areas with Kicukiro having the highest urban population.

Kigali city's population is mainly comprised of young people with a median age of 22 years for all districts in the city. The population distribution in Rwanda and in Kigali City is as shown in Table 4.7.

The Master plan update will provide updated forecast for population in the city of Kigali which will guide the development of master plan update.

Table 4.7 Population of Districts in City of Kigali

Area	Total	Male	Female	Urban Area	Rural Area
Rwanda	10,515,973	5,064,868	5,451,105	16.5	83.5
City of Kigali	1,132,686	586,123	546,563	75.9	24.1
Nyarugenge	284,561	148,132	136,429	75.2	24.8
Gasabo	529,561	274,546	255,015	69	31
Kicukiro	318,564	163,445	155,119	87.9	12.1

Source: IPAR

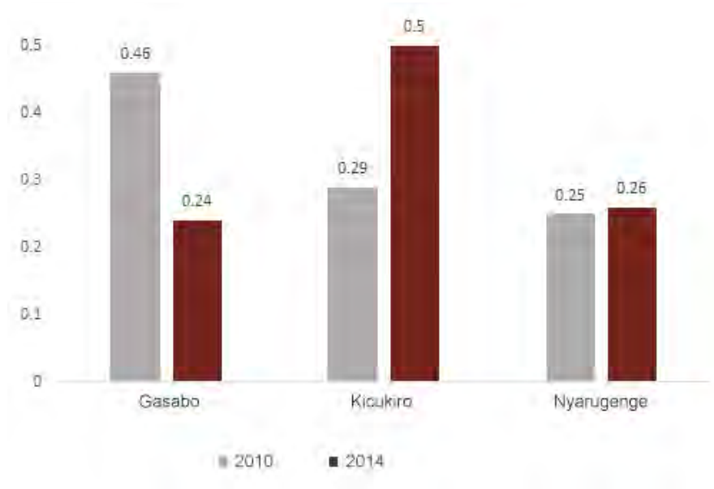


Figure 4.22 Change in Employment Proportions in City of Kigali Districts

4.3.2 Existing Economic & Employment Profile

GDP of the Districts in City of Kigali

The City of Kigali has experienced positive growth in the last decade averaging 6.5%. Among the 3 districts, Kicukiro district is the biggest in terms of GDP accounting for 42% of the total GDP, followed by Gasabo (35%) and Nyarugenge (23%).

The city is projected to continue growing between 6.5% and 10% for the next 3 decades pertaining to huge investments in the service and manufacturing sector. To continue growing at the stated growth rate, the city will need to generate proportionate employment for the growing labour force.

Table 4.8 Labour Market Features in City of Kigali

District	Gasabo		Kicukiro		Nyarugenge	
Period	2010	2014	2010	2014	2010	2014
Employment to Population ratio	72.8	73.3	69.2	69.2	65.7	66.6
Unemployment rate	9.1	9.8	12.8	11.4	12.6	12.9
Inactivity rate	19.9	18.6	20.6	21.7	24.8	23.5
Time related Underemployment rate	25.8	19.2	15	16.1	11.7	17.4

Source: IPAR

Table 4.9 Type of jobs in City of Kigali

District	Wage Farm	Wage Non-farm	Independent farmer	Independent non-farmers	Unpaid non farmer	Total
Gasabo	3.8	53.3	20.9	20.4	1.6	100
Kicukiro	1.9	62.8	9.5	22.5	3.4	100
Nyarugenge	1.7	55.2	10.1	29.3	3.6	100

Source: IPAR

Table 4.10 Total Employment and Establishment Employment in City of Kigali

District	Total Employment 2010	Establishment Employment	Total Employment in 2014	Establishment Employment 2010
Gasabo	203,983	27,091	137,427	52701
Kicukiro	128,907	21,713	289,308	57173
Nyarugenge	113,759	31,825	153,234	30478
City of Kigali	446,649	80,629	579,969	140,352

Source: IPAR

Labour Force

As per the IPAR study, the city of Kigali had a labour force (working age population of 16+) of 822,243 in 2014 which is about 30% increase from 2010 to 2014. However, as per the graph in Figure 4.22, there has been a change in employment proportions within districts between 2010 and 2014. The results indicate a decline in the proportion of employment in Gasabo district and an increase in employment in Kicukiro district and minimal change in Nyarugenge district.

As per Table 4.8, unemployment levels in the district ranged between 9.8% and 12.9% with Nyarugenge having the highest unemployment rate and Gasabo the lowest in 2014. The high unemployment rate is due to (i) high time related underemployment rate and (ii) the inactivity rate.

The jobs in Kigali City is dominated by wage non-farm jobs which ranged from 53% and 63% between districts (Table 4.9). The report states there is underutilization of labour force in the districts and are not efficiently contributing to district productivity. It will be crucial to recognize the informal economy and business activities for complete utilization of the labour force.

Quality of Labour

In comparison to the skill set at national level, the labour force in City of Kigali and the respective districts are highly skilled. However, in comparison to the total working age population and the labor force, the overall proportions of skilled labour force are largely with post primary and lower secondary qualifications. There is a need to emphasize on education and its infrastructure to create a knowledge based society.

Employment in Kigali City

In 2010, 46% of the workforce was employed in Gasabo district, 29% in Kicukiro district and 25% in Nyarugenge district. By 2014, there was an increase of 30% labour units in City of Kigali (Table 4.10).

There are several sectors of employment in Rwanda and Kigali:

1. Agriculture, Fishing, Forestry and Agro-processing;
2. Mining;
3. Manufacturing;
4. Services;
5. Construction;
6. Trade; and
7. Transport

According to the EICV survey findings included in the IPAR Report, Service sector provided the largest share of employment in Kigali city at 33% and accounted for about 207,000 jobs in 2014. The second largest was agriculture, agro-processing, fishing and forestry which employed 157,000 people in 2014. The third largest was trade sector which employed about 145,000 people in 2014.

Economic Activities

The city of Kigali had 32,619 establishments in total by 2014. Gasabo District accounted for 37.8 %, Nyarugenge 37.4% and Kicukiro 24.8%. In terms of economic activities, the number of establishments increased by 26% for Gasabo district, by 10% for Kicukiro district and decreased by 3.5% for Nyarugenge district. Against the total employment within the respective districts (as per EICV surveys reported in the IPAR study), a limited proportion of the labour units are employed within establishments. In Kigali City, only 24 % of the total workforce are working in establishments.

Construction and Services sector dominate the business establishments in all the three districts accounting for 93% in Gasabo, 92% Kicukiro and Nyarugenge 90%.

In terms of size, micro establishments dominate in all districts accounting for 95.4% in Gasabo, 95.2% in Kicukiro and 96% in Nyarugenge (Table 4.12). As per IPAR study, in terms of capital size, majority of the establishments are micro and small in nature with capital less than 500,000 Rwandan FRW.

Among establishments with capital size between 15m and 75m, Nyarugenge had a modest increase of 0.67%, Kicukiro had a significant increase of 15% while Gasabo had a decline of approximately 14%.

As per the study, the major growth of establishments occurred in Nduba, Gikomero and Bumbogo sectors whereas firm closure occurred in Kacyiru, Kimihura and Kimironko sectors within Gasabo district. In Kicukiro district, growth mainly occurred in Kagarama, Gahanga, Gatenga sectors and there were firm closures in Kicukiro and Masaka sectors. In Nyarugenge District, growth mainly occurred in Kanyinya and Kigali sectors, and firm closure happened in Muhima and Rwezamenyo sector.

The Master Plan update will provide relevant sites and proposals to support key sectors/ economic drivers for economic development.

Table 4.11 Total Employment and Establishment Employment in City of Kigali

City of Kigali Employment Distribution by Sector 2005/6 to 2013/14						
	2005/6		2010/11		2013/4	
Sector	Frequency	Percent	Frequency	Percent	Frequency	Percent
Agriculture forestry, Fishing & Agro-processing	4,314	2	26,218	10.3	157,452	24.68
Mining	1,140	1	2,774	1.1	8,450	1.32
Manufacturing	7,659	4	4,564	1.8	24,598	3.86
Services	121,433	64	160,672	62.8	207,699	32.55
Construction	24,656	13	31,119	12.2	68,733	10.77
Trade	16,047	8	15,435	6.0	144,956	22.72
Transport	15,487	8	14,725	5.8	26,160	4.1
Not adequately defined	-	-	151	0.1	-	-
Total	**190,736**	**100**	**255,658**	**100.0**	**638,048**	**100**

Source: IPAR

Table 4.12 Structure of Economic Composition in Districts in City of Kigali by Establishment size

Period	2011				2011 Total	2014			2014 Total
Economic Sector	Agriculture & Forestry & Fishing	Construction & Services	Mining & Manufacturing & Utility	#N/A		Agriculture & Forestry & Fishing	Construction & Services	Mining & Manufacturing & Utility	
Nyarugenge	43	11965	337	295	12640	8	10981	1202	12191
Large	1	5	1		7	1	17	6	24
Medium		25	7	2	34		67	13	80
Micro	38	11651	296	5	11990	5	10544	1142	11691
Small	4	265	32	4	305	2	353	41	396
#N/a		19	1	284	304				
Gasabo	25	9329	385	57	9796	15	11463	859	12337
Large		3	3		6		24	5	29
Medium	1	28	3		32	2	62	12	76
Micro	18	9040	348	5	9411	12	10972	794	11778
Small	6	242	27	1	276	1	405	48	454
#N/a		16	4	51	71				
Kicukiro	7	6848	221	281	7357	19	7460	612	8091
Large		9	3		12		11	4	15
Medium	1	16	7		24	1	37	13	51
Micro	5	6659	178		6842	13	7145	547	7705
Small	1	162	32		195	5	267	48	320
#N/a		2	1	281	284				

Source: IPAR

This page is intentionally left blank.

4.4 Green City

"For Rwanda to be a developed climate-resilient, low-carbon economy by 2050" – National Strategy for Climate Change and Low Carbon Development (2011)

The development theme of Green City arises from the national green growth and climate resilience strategy developed for Rwanda's urbanization. In the midst of rapid urbanization for a growing population and expanding economic opportunities, environmental aspects are often undermined. In alignment to the national direction, the Global Green Growth Institute (GGGI) Rwanda supports mainstreaming green growth strategies in the update of the Kigali Master Plan.

Green growth model refers to promoting growth that is compatible with protecting the environment; reducing carbon and other unwanted emissions; improving the rational use of natural resources; dealing with climate change; securing access to clean energy and water; and simultaneously targeting poverty reduction, job creation, and social inclusion. (National Roadmap for Green Secondary City Development, 2015, GGGI).

A green city is thus a city designed with consideration of environmental and ecological impacts, inclusiveness and enhances the well-being of citizens and society through integrated urban planning and management, which harness the benefits of ecological systems while protecting and nurturing them for future generations.
The development theme of Green City would focus on the urban environment relating to the following key aspects:

1. Natural Resources Protection;
2. Green Growth;
3. Climate Change;
4. Disaster Risk Reduction;
5. Resiliency; and
6. Agriculture

4.4.1 ENVIRONMENT, TOPOGRAPHY AND DEVELOPABLE LAND

Topography

Kigali City is built on hilly landscape sprawling across ridges and wetlands with an altitude varying between 1300-2100m. The Nyarugenge District is dominated by strong linear ridge running north-south with a maximum altitude of 1900m and softens towards the flat alluvial planes of the Nyabarongo River on the west. The Gasabo District constitutes of more aggressive relief due to the tight rectilinear ridges oriented northwest with a maximum altitude of 2100m to 1900m and gentle relief along the Nyabugogo River and southern part of the district. The Kicukiro District is composed of gentle slope plateaus, averaging less than 1700m of altitude and the slopes gently settle into the alluvial plains of the Nyabarongo River.
Due to the hilly topography, urbanization is constrained to mainly the developable land in the central areas of Kigali city covering the three districts. In Kigali Master Plan 2013, the maximum developable slope is stated to be 40%. However, it is found that the definitions of maximum developable slope vary across various sources mainly between 20% and 30%. A summary of the different standards is summarized in Table 4.13.

After comparison of the different sources and in agreement with the CoK authorities, the agreement is to use 30% as the criteria to determine the undevelopable areas that are not suitable for urbanization for the update of Kigali Master Plan. This is demonstrated in the slope analysis map (refer to Figure 4.23). About 17% of the total land area of Kigali falls under steep slopes of more than 30%. In Nyarugenge District 42%, Gasabo District 32% and Kicukiro District 25% of areas are occupied by steep slopes. The slopes of Kicukiro District are relatively gentle compared to other two districts with 12,520 ha land below 30% slope available for development compared to Gasabo District (29,228 ha) and Nyarugenge District (7,661 ha). With the change in criteria and enhanced protection of steep slopes, the developable areas are hence reduced in this review of the Master Plan.

Geology & Soil

The City of Kigali is underlain by granitic and meta-sedimentary rocks. The degree of metamorphism undergone by the sediments is generally low. Primary rocks observed in the city are schists, sandstones and siltstones. The surface of the city is dominated by lateritic soil along the hillsides and alluvial soil along the marshlands. There are four general types of soil found in Kigali; lateritic soils, arkosic sands, colluvium (slope wash) and alluvium (river deposits). Lateritic soils, rich in iron and aluminium, dominate the city's hillside surfaces while alluvial soils (fertile soil deposited in river valleys) and organic soils are found in the lowlands and wetlands[8]. The valley of Nybogogo and Nyaborongo River provide a fertile belt of alluvial soil suitable for agriculture where as the hilly slopes have undergone soil erosion for a long time, leaving them bare and less productive[9].

Kigali's soil also contains clay deposits that can be exploited for use as local building construction materials. Potential clay zones in Kigali has been identified by SDC/SKAT (referred to Figure 4.21), which can be extracted as raw materials to manufacture bricks for the construction of affordable housing.

Issues & Challenges

1. About 17% of the entire city land area is occupied by steep slopes of more than 30%. Some of the slopes are located within urban areas and encroached by unplanned settlements. As per the Rwanda National Land Use Development Master Plan (RNLUMP), Kigali City land area falls under medium to high risk soil erosion zone and soil present on more than 5% slope is susceptible to heavy erosion;

8 State of Environment and Outlook Report 2013, REMA

9 KCMP report, COK economic development strategy report

Table 4.13 Maximum Developable Slope Discrepancies

SOURCE	MAXIMUM DEVELOPABLE SLOPE
Master Plan 2013 - Vision Report	40%
MINIRENA - Rwanda National Land Use Planning Guidelines, 2017, Pg 25	58%
Ministry of Environment	30%
Ministry of Land and Forest	30%
City of Kigali	30%
UN Habitat - Upgrading Preventing Unplanned and Underserviced Settlements in Kigali City, Rwanda, Pg 31	30%
Rwanda Urban Planning Code (UPC), Pg 31	20%
MININFRA - National Informal Urban Settlement Upgrading Strategy, Pg 47	100%
MININFRA & RHA - Basic Housing Construction Instructions for Protection against Natural and Manmade Disasters in Rural Areas, October 2012, Pg 19	40%
MININFRA & RHA - Rwanda Building Control Regulations, 2012, Pg 31	20%

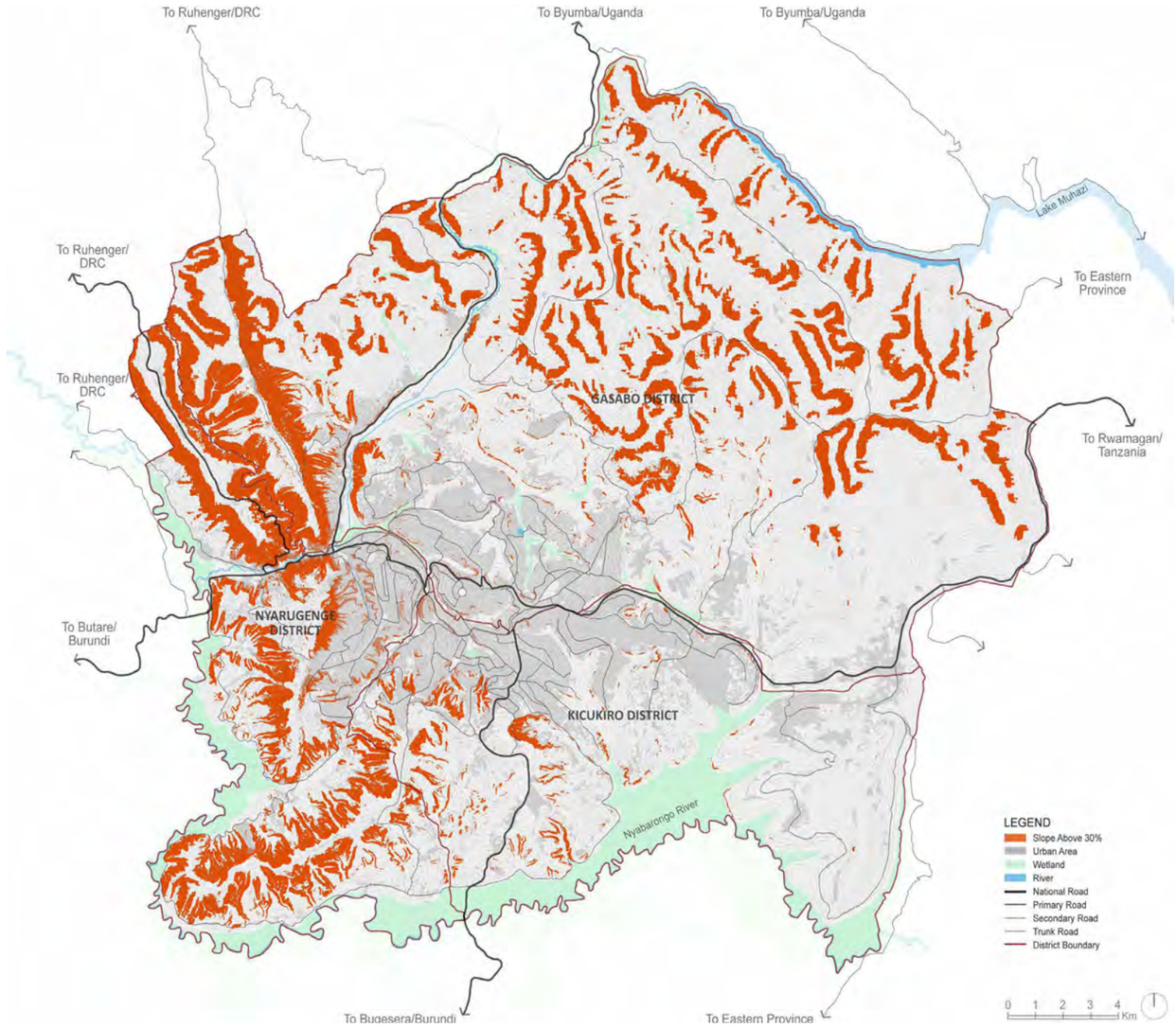


Figure 4.23 Slope Analysis Map

2. Land degradation is linked to widespread land clearance and over cultivation. Heavy soil erosion reduces soil fertility and heavy silt load depletes river and wetland habitats;
3. Inappropriate developments including unplanned settlements on Kigali's steep slopes has caused extensive soil erosion in some areas.
4. Exploitation of clay as local building materials may cause environmental pollution, especially in the case of from wetland sourced clay; and
5. Lack of sustainable slope management and coordinated erosion control policies in the city

In hilly areas of Bumbogo, Kinyinya, Jabana, Gihogwe etc agricultural land is managed by terrace cropping and agro-forestry techniques initiated by Ministry of Agriculture and Animal Resources (MINAGRI). Landscape beautification works are carried out to stabilize the steeps slopes. The Seven Year Government Programme 2010-2017 also established strategies for erosion control at 100%. Still the efforts observed in each environmental sector are piecemeal and there is a lack of a coordinated land management plan which identifies the priority areas for urban growth, agriculture and environmental conservation. Rwanda Land Management and Use Authority (RLNMUA) and MINAGRI are mapping agricultural land for Kigali to establish preliminary suitability study to guide masterplan update work.

Water bodies, Watershed & Drainage Wetlands

Major lakes and rivers surrounding Kigali City are, lake Muhazi which borders the city along northeast of Gasabo District and Nyabarongo River bordering Nyarugenge and Kicukiro Districts along the south west. There are also other rivers and streams, such as Yanze, Kibumba, Rwazangoro and Ruganwa which flow into the Nyabugogo stream, which in turn flows into the Nyabarongo River to the west. Many other streams from the southern hills of the city, flow directly down in the Nyabarongo River which finally drains into Lake Rweru, one of the sources for the Akagera River that feeds Lake Victoria.

Watershed & Drainage

The undulating topography divides the city into 25 watershed areas defined by hilltops, ridges, valleys and wetlands as shown in the Figure 4.24. The City of Kigali consists of terrain varying from very steep hillside slopes up to 45% to 50% and valley wetland areas with slope less than 2%. The watersheds from central and northern Kigali are relatively steep and drain north into Nyabogogo River, then to the Nyabarongo River in the west of Kigali City. The southern and eastern portion of Kigali is relatively less steep and directly drains into the Nyabarongo River.

Issues & Challenges

1. The turbidity of Nyabarongo River is very high due to significant sediment load, organic debris and other runoff contaminants. The quality of water in the Nyabugogo River is generally poor because it drains much of the Kigali City and receives pollutants from uncontrolled residential and industrial sources;
2. River flood plains and wetlands are extensively used for cultivation within the city, which damages the existing wetland vegetation. The use of pesticides and chemical fertilizers are further degrading its water quality;
3. Urban encroachment, heavy soil erosion, improper management of watershed areas lead to increasing localized flooding in the areas of Nyabogogo taxi stand, Gikondo Industrial Zone etc; and
4. The hilly topography, increasing urbanized areas, high precipitation and instances of high intensity rainfall has led to occurrence of flash floods. Flood risks are common in the valleys and wetlands, such as along the Nyabugogo, Gikondo and Nyabarongo Rivers

The water bodies and wetlands are protected by Environmental Law with a suggested buffer of 10m for rivers, 50m for lakes and 20m for wetlands. However, there are no policies and guidelines for the management of watershed areas. Currently, MINIRENA is in the progress of formulating and implementing a separate authority for integrated water resources management (IWRM) which will provide detail planning and management framework for all water bodies and watersheds[10]. To address urban encroachment and soil erosion problems REMA is currently developing programs for river and lake shore rehabilitation.

Wetlands The Wetland System in Rwanda:

Marshlands are the most physically and chemically heterogeneous of all aquatic ecosystems in Rwanda. They are in effect seasonal wetlands. The water table is near or above the lowest ground surface during the wet seasons and they do not have large flood plains or great length.

The inventory of wetlands conducted in 2008 by REMA through the Integrated Management of Critical Ecosystems

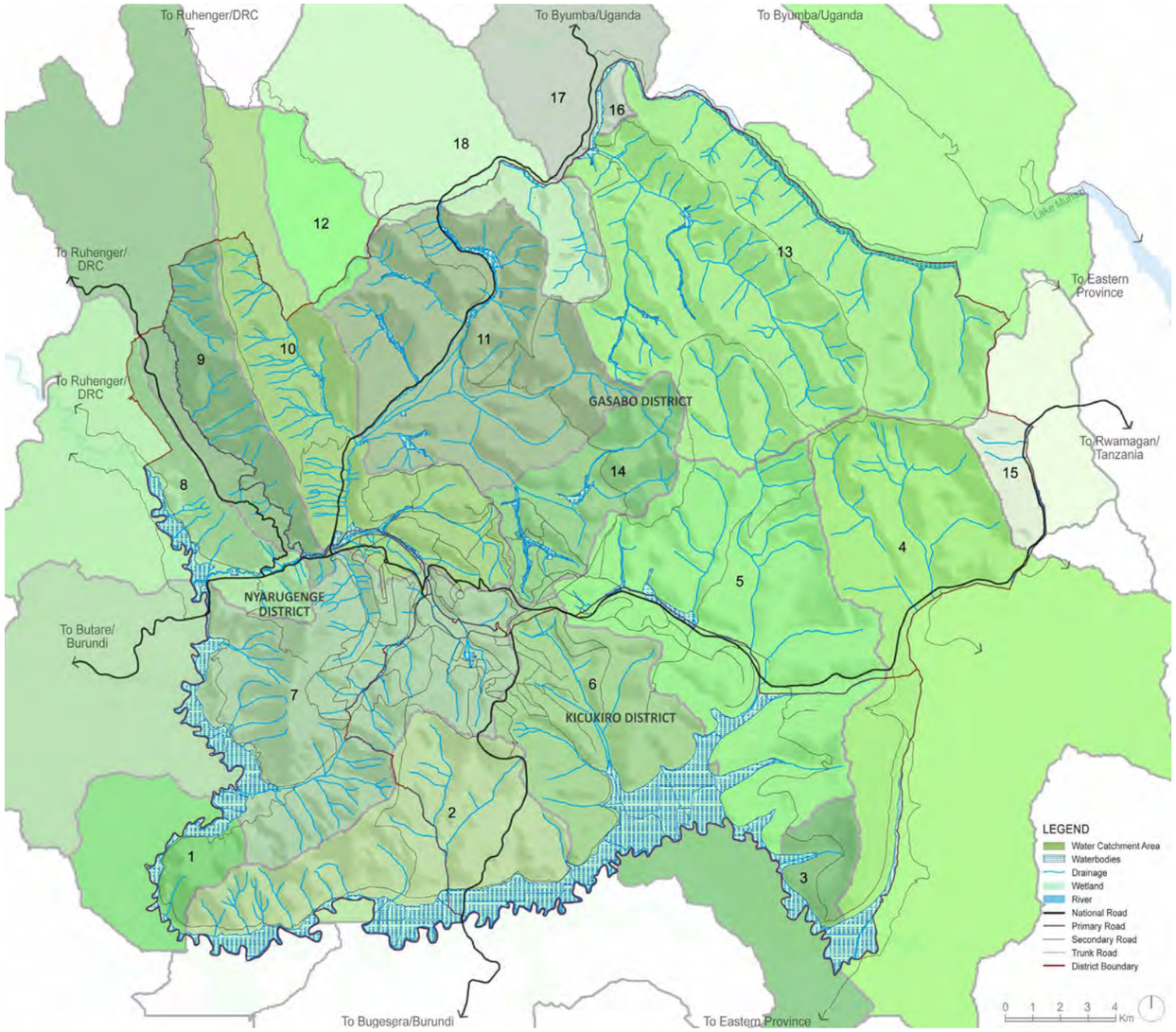


Figure 4.24 Water bodies, Watershed and Drainage Map

10 Rwanda National Water Resources Master Plan 2015, MINIRENA-RNRA

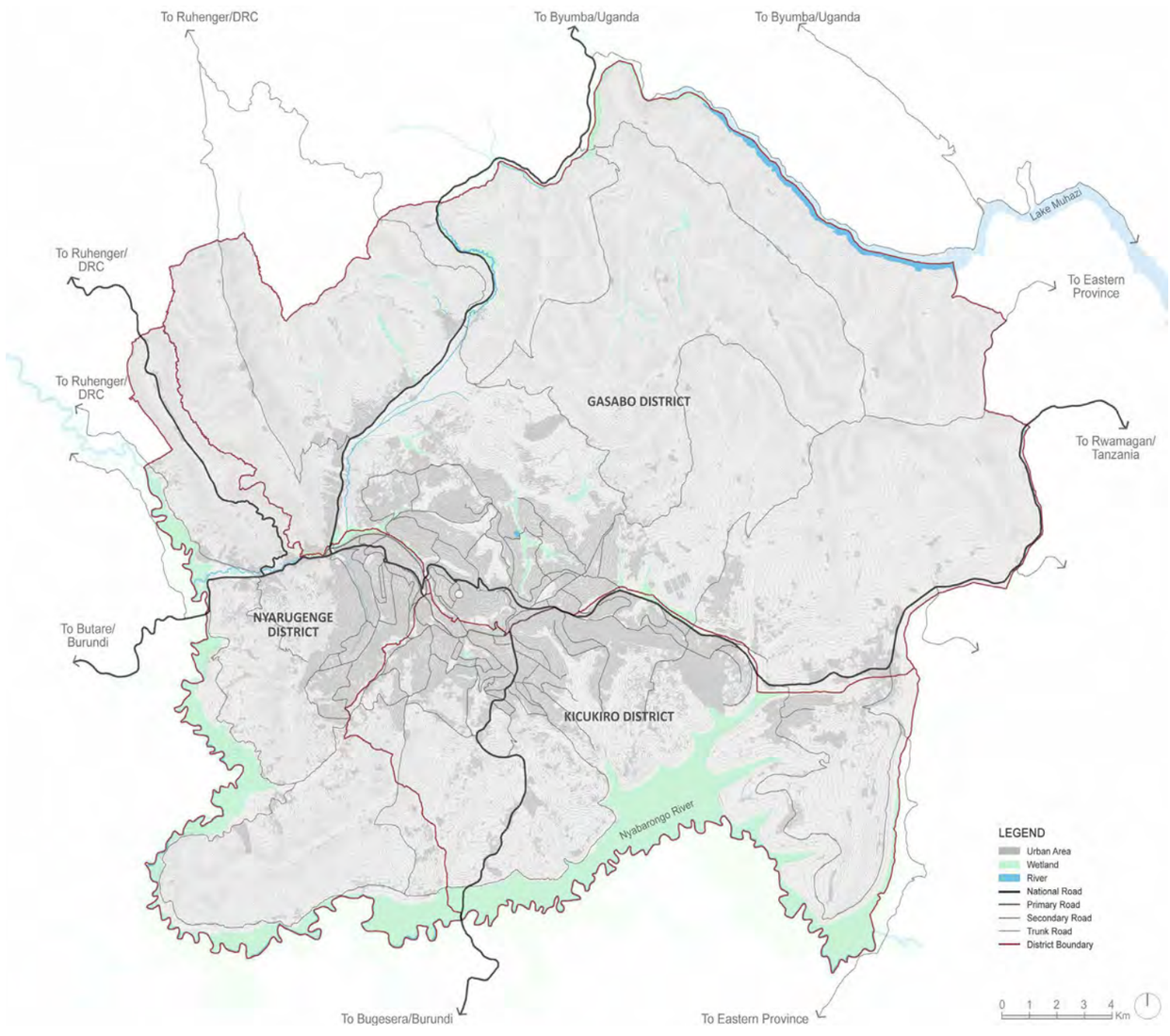


Figure 4.25 Wetland Boundary Map

(IMCE) project funded by GEF and World Bank has identified seven types of wetlands found in Rwanda namely;

1. High Altitude Swamps;
2. Volcanic Highland Swamps;
3. Central Plateau Swamps;
4. Swamps of Kanyaru- Nyabarongo and Akagera Basins;
5. Swamps in the East;
6. Swamps of Bugarama Depression; and
7. Swamps on the Edge of Lake Kivu

These wetlands are classified on the basis of; relief, altitude, soil type, vegetation, hydrology and size of the swamp, slope of the watershed and population density.

Wetlands in Kigali

The Kigali City contains a complex system of wetlands, present along the low-lying valleys adjacent to the rivers. These wetlands covers about 10.6% of the total land area of Kigali, which has observed a reduction in areas as compared from 14% in Kigali Master Plan 2013.

According to the IMCE classification explained above, wetlands of Kigali are the Central Plateau Swamps mostly present on the altitude of 1400m to 1800m. These wetlands possess mineralized soil type (clay sandy, limono sandy) and the dominant vegetation is Polygonum pulchrum, Cyperus papyrus, Commelina diffusa, Cynodon dactylon, Eicchornia crassipes, Pennisetum purpureum etc. The main function of wetlands within the city is to act as a water reserve and agricultural production.

In the City of Kigali, 50% of wetlands have lost their ecological character. A recent survey[11] conducted in July 2017 has indicated that over 2,078 establishments around the city encroached wetlands. Built-up areas consisting of commercial buildings, public facilities and residences make up 2.7 % of wetlands.

Issues and Challenges

1. Most of the wetlands are surrounded by densely populated steep slopes, intensively used for settlement structures, cultivation and grazing. These developments alter the watershed, increase soil erosion and siltation in the wetlands;
2. The principal threats to wetlands of Kigali are linked to agricultural (mainly rice and sugarcane), livestock activities, human settlements, industries and sand quarries. These also led to pollution from sources such as domestic effluents, waste leachates, industries, agro-chemicals and storm water. Sufficent distance of polluting industries from wetlands will need to be provided;
3. There are negative impacts on the wetlands ecosystem observed as biodiversity loss and disturbance of the ecological functions of wetlands. Alteration of these wetlands

11 World Wetlands Day: Rwandans urged to wisely use urban wetlands, REMA, 2018

significantly reduces the range of their ecosystem services, including flood control. A study conducted by REMA (2006) concluded that only below 24% of Kigali's original wetlands are remaining; and

4. Wetlands in urban areas can serve as mitigates of flooding during times of high rainfall and this poses threats to surrounding settlements and cultivation activities.

In Rwanda wetlands are protected and utilization is regulated by Organic Law, which categorises the wetlands into three zones based on their environmental values. This is to ensure better management and implementation of policy works.

TOTAL PROTECTION WETLANDS: protection at its natural state no agriculture and other activities will be allowed. There are no natural wetlands left within the Kigali City limits except for a few patches of Nyabarongo wetland.

CONDITIONAL USE WETLANDS: allows continuation of existing agricultural activities and conditional use for projects (farming, clay extraction, recreational, etc) with proper EIA assessment (wetlands mainly along the rural areas). Final authorisation of such projects would be granted by REMA.

UNCONDITIONAL USE WETLANDS: will not require environmental impact assessment but no development activities will be allowed. These wetlands could be used for recreation, parks, fishing ponds, horticulture etc. (wetlands mainly along the urban areas of Muhima, Kimihurura, Kicukiro etc.)

As such to maintain the integrity of wetlands and their biodiversity, four wetlands within Kigali City have been proposed for designation as RAMSAR sites (wetlands that are of international importance) under the Prime Ministers Order No.006 of 13/02/2017[12]. These include the wetlands of Kitagurizwa wetland (Within Gasabo and Kicukiro districts), Rugende- Isumo wetland (Within Gasabo and Kicukiro districts), Nyabarongo- Aval wetland (Within Nyarugenge and Kicukiro districts) and Nyabarongo- Amont wetland (Within Nyarugenge district).

In addition, among the efforts to protect wetlands in Rwanda, there is an ongoing government program to relocate settlers living close to wetlands across the country including the city of Kigali. Every year, priority sites are identified for relocation of vulnerable households that are exposed to the risks of living close to wetlands[13].

The master plan review will also take into consideration the potential of the wetlands and forests as source of income. This was highlighted by the participants during the FG and TAG meetings. However, all wetlands development will be coordinated with REMA. It is discussed for the Master Plan to incorporate latest wetland boundaries and to indicate the buffer of 20 m in the updated Master Plan.

12 State of Environment and Outlook Report 2017, REMA

13 MININFRA, 2016

Figure 4.26 Diverse Fauna in Kigali

Figure 4.27 Environmentally Sensitive areas in Kigali

Figure 4.28 Industries in environmentally sensitive areas in Kigali

Biodiversity and green cover

Vegetation

Kigali City was once heavily forested, but now native forests have been largely removed as a result of population growth and extensive subsistence farming. Today the natural forests are available in small scattered patches and the man-made forests are dominated by Eucalyptus plantations which are used for agro-forestry.

Natural vegetation is almost nonexistent in the city and subjected to burning under traditional agro-pastoral and subsistence farming system. However, some natural vegetation is present in small scattered patches and the wild plants exist in the marshes and small uncultivated corners. Low lying areas of river floodplains and wetlands are dominated by Rice and Sugarcane plantations with very little natural vegetation exists along the source of the Nyabugogo River and a few patches exist along the Nyabarongo River.

Wildlife

Rapid deforestation due to cultivation and urbanization has led to the serious destruction of biodiversity in Rwanda. Currently significant species of mammals, amphibians and reptiles are found only in the National Parks of Volcanoes, Akagera and Nyungwe. The Nyabarongo Wetland receivesan exceptionally large number of migratory and congregatory birds every year. Hence, the biodiversity of fauna in Kigali is relatively low and it is composed of species of birds and reptiles hares, jackals, few species of snakes and fishes.

Biodiversity Conservation areas

Nyabarongo River Wetlands which borders the Kigali City on Western and Southern sides are identified as an Important Bird Area (IBA) biodiversity conservation hotspot in the RNLMP, as it receives an exceptionally large number of migratory and congregatory birds every year.

Issues & Challenges

1. Increasing loss of biodiversity in various ways such as declining species population size, ecosystem degradation and reduced species richness. Main drivers of biodiversity loss in Kigali are found to be due to the high population density and pressure for urbanization[14];
2. Pollution of wetlands from agriculture, industrial and mining activities result in loss of biodiversity and regulatory function of wetlands to provide clean water and flood protection services;
3. Burning of forests under traditional agro-pastoral system;
4. Existing small patches of the natural forests in the city are highly fragmented and there are no stringent guidelines for the protection and management of these areas;
5. Attempts to address erosion and reduce illegal use of protected areas have seen the plantation of unstable slopes and forestry buffers with Pines and Eucalypts. Eucalypts and Pines are highly flammable and their proximity to native forests increases the risk of habitat destruction from wildfires; and
6. Conservation of the biodiversity areas and the lack of infrastructure to support the development of eco-tourism activities

Vision 2020 identifies Environment protection as an important crosscutting area and the suggested strategies recommend a 3 km development buffer for biodiversity protection areas and habitat corridors.

Over the last few years, there has been increasing efforts for protection and management of wildlife and biodiversity areas at the national level. A number of interventions for biodiversity and wildlife protection are being implemented including:

1. National Biodiversity Strategy and Action Plan (2016);
2. Rwanda Biodiversity Policy (2011) that includes conservation of biodiversity outside protected areas, agro-biodiversity and biodiversity knowledge management; and
3. Rwanda Wildlife Policy (2013) that addresses Rwanda's need for long-term management of wildlife, inside and outside protected areas, as well as provide for the establishment and management of National Parks and other protected areas

However on the city level, efforts in the Kigali City for an integrated conservation and management of wildlife and biodiversity areas is still not clear.

Agriculture

Agriculture remains the backbone for sustained economic growth in Rwanda, which constitutes about a third of the economy of the country.

Correspondingly, the agriculture, agro-processing, fishing and forestry sector remains a significant employment sector in the City of Kigali. In 2014, the sector employed 157,000 people, which represents about 25% of the total labour force[15]. Although the absolute numbers of persons engaged in primary agriculture has reduced over time, agricultural is still dominant in the rural sectors of Kigali. This increase in proportion has mainly been mainly attributed to increased agricultural production in the rural sectors of Kigali and the development of agro-processing industries within Kigali City over the 2005 to 2014 period.

The total agricultural land consisting of both general farmland and plantation areas in the City of Kigali is approximately 63% as captured in Master Plan 2013, and also in 2018. However, it is noted that the areas have reduced slightly for both farmland, particularly for plantation areas although the overall proportion remains the same.

The distributions of crops grown is mainly traditional food crops with sweet potatoes, bananas and beans being most dominant. Other crop grown include Irish potatoes, Soya beans, maize, cassava, vegetables and coffee in small amounts.

According to land suitability analysis from CoK, total arable land in Kigali is about 51,238 ha. Among which the Gasabo district has the highest amount of arable land at 32,189 ha, followed by 11,026 ha in Kicukiro and 8,023 in Nyarugenge[16].

The arable land available for agriculture could not be determined from the available data on agriculture but it is mostly located along the swamps and lowlands. The average land acreage per farmer households is 0.7 hectares of which an average of 0.68 hectares is cultivated.

In terms of livestock farming, the distribution of livestock is dominated by goats, poultry and cattle. There is a significant level of dairy farming and the land holding for dairy farmers is around 23.75 ha[17].

Issues & Challenges

1. High population density on the limited land resource puts pressure on agricultural productivity. This has led to land fragmentation and reduction of farm sizes, as well as encroachment of agricultural land. There is a need to preserve agriculture land as much as possible, intensify and develop sustainable production systems to ensure food security in the rapidly growing city;
2. As per the FG and TAG discussions, while the Sustainable Development Goals, National Policies and Government officials are focusing on preserving valuable agricultural land, limiting urban sprawl , a lot of pressure is coming from the citizens to develop in a low density sprawling fashion;
3. Intensive and over cultivation of land without restoration of soil nutrients, lack of appropriate farming practice and research services;
4. There is increasing soil erosion vulnerability to climatic shocks like drought or heavy rains;

14 RoR, 2014

15 EICV2, EICV3 and EICV4 household surveys from NISR

16 COK, 2017

17 COK development strategy, 2002

5. There is dependency on rain for irrigation. It is estimated only about 4% of total cultivated land in Kigali is irrigated[18];
6. The use of fertilizers and agricultural chemicals has polluted water; soil and mismanagement of the wetlands have further degraded and destroyed them;
7. The need to adopt sustainable agricultural land management practices to protect resources and enhance the productive capacity of land and soil; and
8. Increasing residential developments located within the agriculture areas, some of which included good houses. Agriculture land suitability has to be reassessed to determine the best use of the land

The modernization of agriculture has been an considered one of the six pillars of Vision 2020. In the latest National Agriculture Policy, it is also emphasised to ensure food and nutrition security of Rwandans by using modern agri-business technologies, professionalizing farmers and commercialization of outputs to create a sustainable agricultural growth from a productive, green, and market-led agricultural sector.

Government efforts in modernizing and improving productivity of the agriculture sector and has been evident. In partnership with Kigali City and MINAGRI, more than 700 ha of Kigali marshlands located in Gasabo, Kicukiro and Nyarugenge Districts were earmarked for urban horticulture farming to enable city farmers to increase their agricultural production for both local consumption and international markets[19]. One of the largest projects consists of the 250 ha marshland at Nyagisenyi-Rufigiza in Gasabo district that is selected to cultivate a variety of crops such as cabbages, beetroots, carrots, eggplants and frenchbeans.

Other agricultural management and improvement projects are in progress, such as the Land Tenure Reform Program (Immudugudu Village) to allow intensification and mechanization of farm land, has made an headway towards agricutural sector improvement. The establishment of the Kigali Agriculture Park, inclusive of silos and treatment plant in Kigali Special Economic Zone (KSEZ) in Gasabo District is a part of Rwanda Post Harvest Handling and Storage (PHHS) program. This is to support the provision of efficient and cost effective handling solutions for grain, seeds and fertilizers in the country, mechanization centre and fish processing plant.

On the national level, strategies and policy actions are laid out with the aim to improve technologies, skills development, productivity and sustainability, building inclusive markets and off-farm opportunities. However, it is identified that a holistic agriculture, environment and irrigation management strategy needs to be formulated and managed at the city scale rather than the piecemeal solutions.

Figure 4.29 Existing Agricultural Areas Map
Source: Kigali Marshland used for Urban Agriculture and Small Scale Irrigation, MINAGRI, 2017

18 EICV3 Thematic Report - Agriculture, National Institute of Statistics Rwanda

19 MINAGRI, 2018






Figure 4.30 Types of Existing Agricultural Areas in Kigali (plantations, farmlands, marshlands and forestry)



Figure 4.31 Environmental issues in Kigali : Erosion

Forestry

The forestry sector plays a key role in supporting the livelihood of the suburban population by providing food, medicines and energy, controlling soil erosion and protecting water catchments and supplying other goods and ecological services.

In Master Plan 2013, the natural as well as man-made forests cover a total area of 7600 ha. The total forest areas has increased by 2.2% in 2018 (Figure 4.32), which may represent the improvement of conservation efforts by the authorities.
Kigali city has the lowest forest cover distribution in Rwanda. Natural forests in the city are available but generally in small scattered patches as a result of urban development and deforestation due to pressures of subsistence farming.

In addition to these forests, according to F.A.O definition of forests; there are other forest resources consisting of small wood lots (with an area of less than 0.5ha) and other trees outside forest (generally referred to as agro-forestry trees).

Within the city natural forests are owned and managed by the central government, where as the forest plantations are owned by private as well as district government. They are mainly dominated by eucalyptus trees. The common trees used in forest plantations are for fuel wood, construction poles and timber are Grevillea robusta, Eucalyptus sp., Vernonia Amygdalina, Euphorbia tirucalli, Cupressus, Acanthus Pubescens, Ficus Thonningii, Euphorbia Tirucalli etc. and the food, fruit and spice plantation is dominated by Persea gratissima, Psidiumguajava, Coffee, Capsicum frutescens, Caric, Banana and Papaya trees.
With the introduction of the Kigali Master Plan, more awareness are raised towards protecting the value of these natural resources. There has been attempts to reserve some areas for urban afforestation. However, it is found that random species of trees have been planted across Kigali and other towns around the country with less regard to international standards for urban forestry[20].

Issues & Challenges

1. Mostly the agro-forestry is happens along steep slopes greater than 15% without proper soil stabilization methods. In low-lying areas, pressure for agricultural space has led to inappropriate marsh cultivation;
2. At higher elevation areas, deforestation has played a key role in decreasing the ability of watersheds to catch and restore water;
3. Forest encroachment by human activities due to the use of forests and woodland as a resource of income;
4. The lack of expertise of sustainable practices and management for urban afforestation; and
5. Protection and maintenance of these forests and capitalising on them for outdoor nature recreation activities such as hiking

20 The New Times Publications, 2016

In line with the national green growth initiatives, sustainable management of natural resources is one of the key priorities of Rwanda. Vision 2020 and the 7 years Government Programme 2017-2024 has set clear targets to increase national forest cover to 30% from 29.6% in 2017 and for the forestry sector to play an increasing role in the national economy. This will be supported by activities of forestation and reforestation in line with National and District Forest Management Plans.
However, due to the increasing urbanization in the Kigali City farming land per household is shrinking. There is also high competition for land between forestry, agriculture and other developmental activities.
In current forestry projects there is no control over the types of plantations or environment management guidelines. Also in the district forest lands, the projects are approved on case by case basis depending on the objectives established by community organizations and NGO's. While the Master Plan is available to serve as a physical guidance, the regulations and guidelines are critical in ensuring its successful implementation of sustainable natural resource management.

Forest conservation and management strategies are governed by the Forestry Law which is currently under modification.

Land availability for development Land exploitation

Currently Kigali is facing increasing urbanization and heavy development pressure. The population in Kigali and other urban centers has almost doubled since 1991, and this has drastically increased the demand for housing and other urban services. This poses a negative impact on the environment and natural resources. Only the city centre area is relatively urbanized with rapidly new suburban areas growing at the periphery. Furthermore, the urbanization situation has exacerbated over the last couple of years and the increasing urban sprawl with hazard settlements has not only led to poor living conditions, but also human encroachment to the natural environment.

Kigali City is built on the interlocking hills, which progressively converge, and are separated from each other by valleys and wetlands. The slope analysis map (refer to Figure 4.23) indicates that 22,723 ha land has more than 30% slope which is not suitable for development. With the change in maximum developable slope in the update of the Master Plan, more nature areas will be protected and conserved. Although lesser developable land areas are available for urban development as compared to 2013 Master Plan, sufficient land will be safeguarded in view of the review in population projections in 2050.

These land will most probably have to be dedicated for agro-forestry, forest plantation and steep slope conservation zone. The water bodies watershed and drainage map in Figure 4.24 indicates 327 ha land is occupied by water bodies and the large number of natural drainage channels which collects the water from respective watershed areas and drains into Nyabogogo and Nyaborongo Rivers.

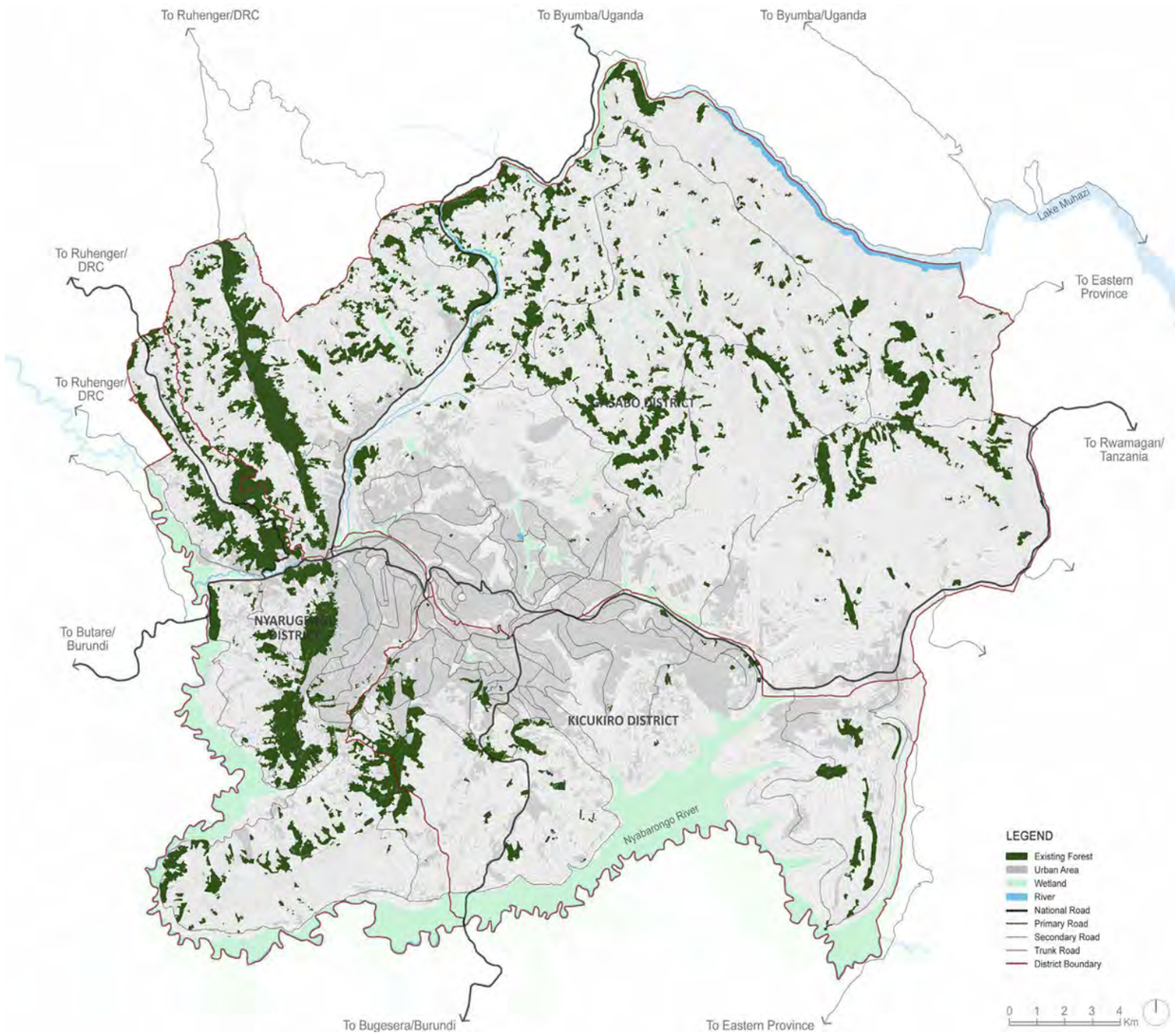


Figure 4.32 Existing Forests Areas Map
Source: Rwanda Water and Forestry Authority (RWFA) and CoK, 2017

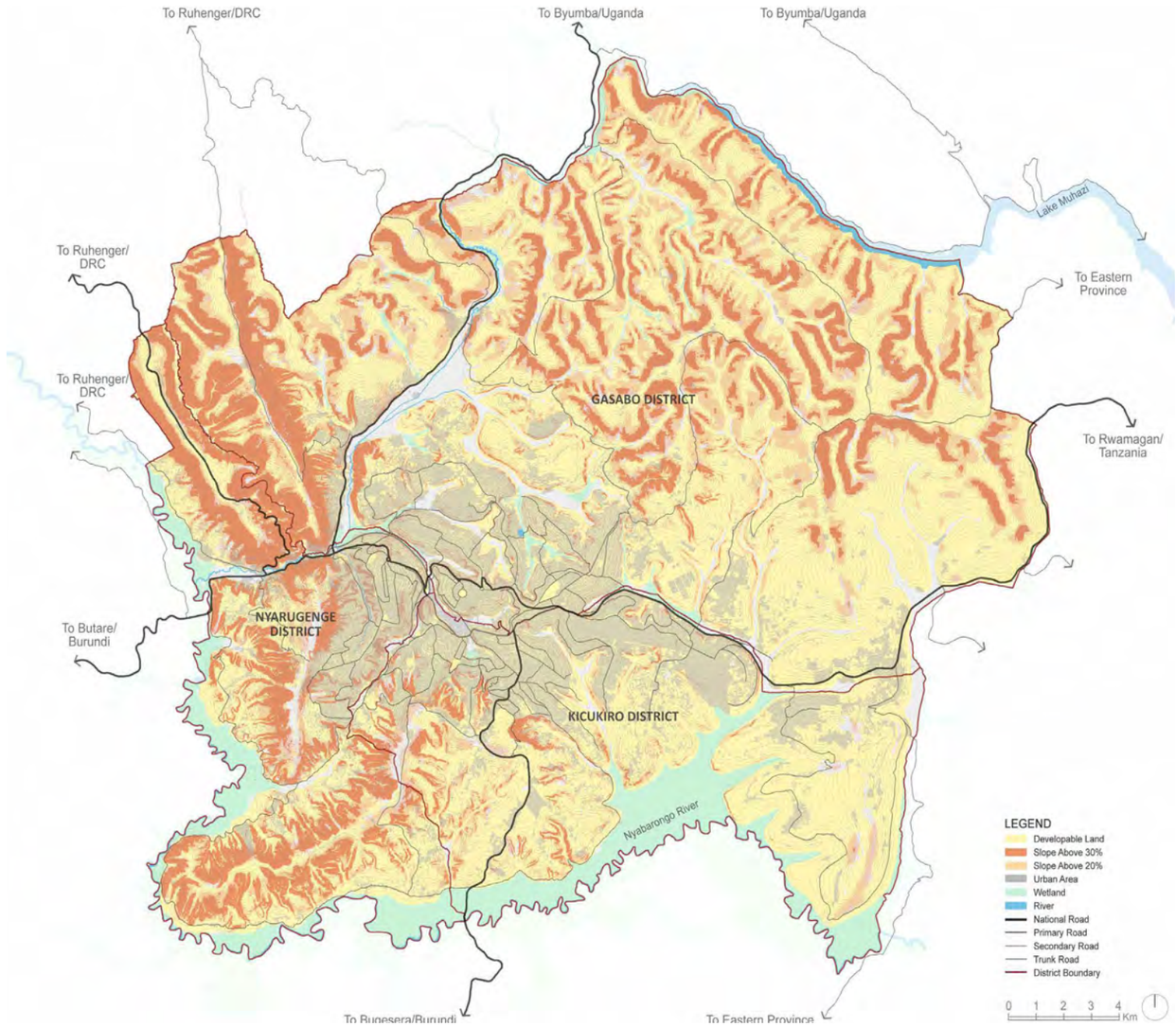


Figure 4.33 Developable Area Map

These natural drains plays important role in the storm water management of the city and have to be conserved along with the water bodies in the proposed Master Plan which can be further used for parks.

In the development of the Master Plan, the key challenge is to manage the balance between protection the natural resources including forest, wetlands and steep slopes while ensuring that sufficient land are safeguarded to contribute to urban development and economic growth. From the review of the existing conditions in the Master Plan updating exercise, about 49,200 ha of developable land (67.5% of the total land cover of Kigali City) are available for planning of future uses to guide the growth of the city.

GREEN GROWTH & CLIMATE CHANGE

The effects of climate change have been evident globally inclusive of Rwanda. Climate change studies for Rwanda has forecasted an increase in temperatures of up to 2.5°C between 1970 and 2050 and increases in average annual rainfall by up to 20% over the same time frame[21]. The main threats to Rwanda's urban areas from these changes in the climate system include flooding, landslides, heavy rainfall, extreme temperatures, heat waves and drought.

In the case of the City of Kigali, flood risks are common in the valleys and wetlands, such as along the Nyabugogo, Gikondo and Nyabarongo Rivers and flooding frequency has significantly increased since the 2000s. The situation is worsened with the hilly topography and rapid population growth. Apart from flooding issues, carbon emission and air pollution from bush fires and traffic congestion is also one of the key contributors to climate change. The impacts of climate change thus could affect water security and food security of the population resulting increase levels of poverty as well as economic losses in damage.

Recognising the potential disastrous consequences of climate change, efforts has been made by the government to steer the development direction of the country towards green growth.

As highlighted in the Green Growth and Climate Resilience National Strategy for Climate Change and Low Carbon Development (2011), climate mitigation strategies including low-carbon compact growth, green industry, efficient resilient transport systems, effective protection and sustainable management through conservation and ecotourism.

Demonstrating the country's commitment in building a green economy, the Fund for Environment and Climate Change (FONERWA) was launched in 2014, with aim of being the engine of green growth, mobilising and channelling domestic and international financing to public and private environment and climate change projects.

Aligning to this, the update of the Kigali Master Plan recognises the importance of environmental protection as the driver of national economic development which was

21 RoR, 2011

also emphasized during the FG and TAG meetings. Since there are many activities and studies ongoing related to Resiliency and Climate Change, the FG and TAG members highlighted the need for coordination and integration in the Master Plan update. The Kigali City Master Plan 2013 has already take into consideration of climate mitigation strategies. For instance, the City of Kigali has introduced a car-free zone as required by the Kigali City Master Plan in the attempt to reduce the pollution associated with traffic congestion.

Despite that, the existing initiatives for Kigali City towards mitigating climate change are fragmented and there is a need for a more coordinated city-level strategy to be integrated with the revised Master Plan.

Issues & Challenges

1. Promotion and implementation of green growth practices and resist climate change through low-carbon, climate resilient and sustainable approaches;
2. The need for coordination among various agencies and institutions for an integrated green growth plan as there are many activities and studies ongoing concurrently related with resiliency and climate change; and
3. Implementation of public open spaces in master plan

Disaster Risks & Resiliency

In addition to climate change, natural hazards is another environmental threat which may turn into disasters that severely impacts the society and environment. More often than not, natural hazards are also exacerbated by human activity that degrades the environment, resulting in heightening the intensity, severity and frequency of some natural hazards such as landslides and floods. Increasing resiliency towards natural disasters is thus a key aspect of the Master Plan for Kigali to become a green city.

Natural hazards in Rwanda can be categorized as geological, hydrometeorological; and biological and technological[22]. Over the past two decades, it is analysed that hydro-meteorological hazards such as floods and droughts have affected the most people in Rwanda. Figure 4.34 shows the hazard prone areas in Rwanda.

Centrally located within Rwanda, Kigali City is subjected to mainly to risks from floods and landslide. Landslides, loss of soil cover and declines in soil nutrients are common especially due to the hilly nature of this city. The exposure of housing settlements to landslides is very high even when the slope is moderate, which is of a particular concern as many unplanned settlements are located on the high risks steep slopes in Kigali at present.

22 UNDP, 2013

It is estimated that about 7,500 people could potentially be affected by landslides in the three districts of Nyarugenge, Gasabo and Kicukiro[23]. The risks level of landslides in Kigali are as shown in Table 4.14, which put forth that both the districts of Nyarugenge and Gasabo are highly exposed to the risks of landslides where most of the steep slopes are concentrated.

Flooding risks are also high in Kigali as mentioned, and flood prone areas cover a large percentage of Gasabo and Kicukiro districts. Flooding is found prone in the Mulindi catchment including the wetlands of Mwanana, Mulindi, Kitagurizwa, and Nyabarongo drained by the Mulindi stream itself[24]. Predominantly, agriculture land use is present in the area. Priority has been given to relocate the population living and working close to these wetlands.

Issues & Challenges

1. Reduction of disaster risks and increasing resiliency through better flood management, steep slope management and storm water management strategies and practices; and
2. Relocation of settlements from the high risks zones

23 MIDIMAR, 2015

24 State of Environment and Outlook Report 2017, REMA

Table 4.14 Percentage of Areas Exposed to Different Landslide Risk

District	Very High	High	Moderate	Low	Very Low
	Percentage (%)				
Gasabo	1	9	22	59	8
Kicukiro	0	1	5	83	11
Nyarugenge	3	9	27	53	8
Rwanda	6	13	23	49	10

4.4.2 Green Initiatives

Since the Kigali Master Plan 2013 and increasing promotion of green growth development in Rwanda, many initiatives have been introduced. Some of the green initiatives kick-started by GGGI, the leading institution in promoting green growth, are as follows:

1. Enhancement of green growth of secondary cities aimed at reducing the pressure of urbanisation of the Capital City;
2. Institutional capacity building on green growth and urbanisation;
3. Support in leveraging green growth financing; and
4. Integrated Planning and Data Management

Ongoing Efforts/Projects

Among which, some of the ongoing efforts and projects in the pipeline related to improving the green urban environment by GGGI as well as other institutions include:

1. Development of the 130 ha Nyandungu Urban Wetland Eco-tourism Park, which will restore and conserve wetland ecosystems and biodiversity while also serving as a recreational park;
2. Proposed master plan development for Lake Muhazi eco-tourism project;
3. Proposed waterfront development along Muhima wetland around the CBD;
4. Ecosystem Rehabilitation focusing on Urban wetlands (Nyandungu and Kimicanga);
5. Detailed Sub- Catchment Management Plans for Gikondo and Nyabugogo Wetland Systems;

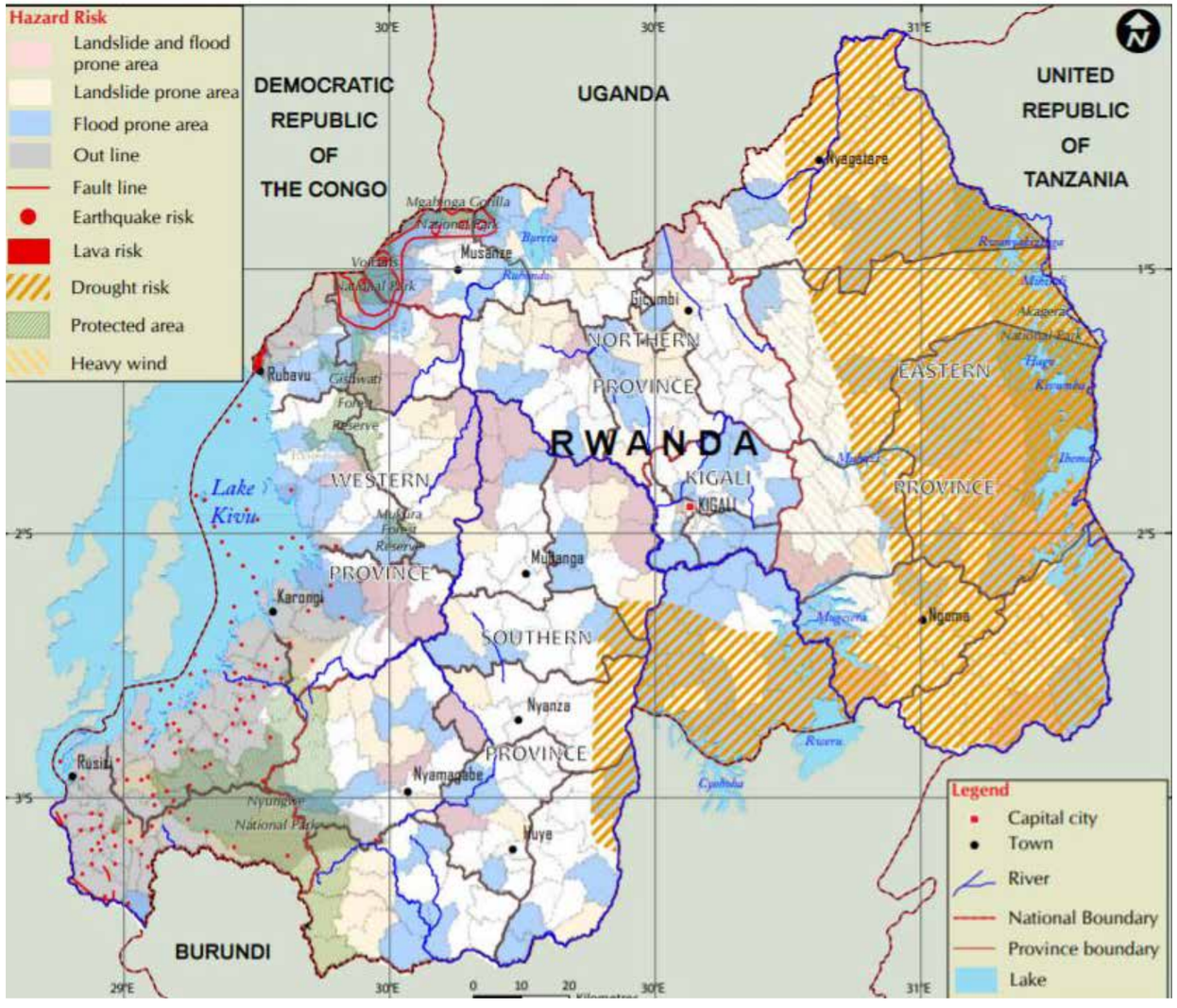


Figure 4.34 Rwanda Hazard Prone Areas

6. Inventory of illegal activities in all urban wetlands (mapping, identification, photos). Monitoring system to be designed;
7. Monitoring of urban wetlands using drones and establish drone based imagery-orthophotos of wetlands and their buffer zones;
8. Initiatives to establish a wetlands master plan;
9. Beautification and maintenance of existing green urban spaces and pedestrian corridors; and
10. Terracing and increased reforestations for protection of steep slopes and prevent landslides, erosion and flooding

4.5 City on the Move

An affordable and sustainable public transport system is a sector that the City of Kigali is striving towards in order to develop a compact and integrated city.

City on the Move is one amongst the eight themes of development for the City of Kigali and it aligns with the overarching policy pillars stated in Rwanda National Urbanization Policy. The City on the Move specially has close alignment with two of the four policy pillars namely, Densification and Economic Growth.

Some of the key objectives under this theme are to:

1. Develop a high quality mass-transit system;
2. Develop a road network that supports mass transit Systems;
3. Integrate Non-motorised Transport Infrastructure into Road Network;
4. Establish of Green Transportation Network and Pedestrian- Friendly Streets in Kigali;
5. Provide seamless Intermodal Ttransport Connectivity;
6. Integrate Intercity Freight routes infrastructure; and
7. Construct/Improve Urban Roads in Kigali to a minimum density of 6km/km²

Different FGs and TAG discussions related to City on the Move emphasised on the following key aspects:

1. Disabled people need to be catered for in the Transport Master Plan;
2. Kigali should be considered with the surrounding developing areas such as Bugesera;
3. Moto Taxis should be addressed and considered in the Transport Master Plan;
4. 7 Year Government programme should be consulted during phasing mechanism;
5. The parking (public car parking) has to be taken into consideration in the City;
6. Keep compact urban form in the City;
7. Recommendations should be made in terms of parking in the City;
8. Alternative routes to different areas should be provided;
9. Recommendations to prioritise the streets for people rather than vehicles should be made; and
10. Alternative modes such as cable cars should be considered in the Transport Master Plan

Based on the above inputs received, City on the Move would focus on the following key themes:

1. Transit Orientated City;
2. Complete Transport System - establish a comprehensive transport system; and
3. Sustainable Transport Network

4.5.1 Existing Transport Environment

The regional Northern Corridor comprises of the inter-country highway which connects Kigali City to Kampala, Nairobi and Mombasa. The Central Highway corridor connects Kigali to Dar-es-Salaam and Bujumbura. Kigali is globally connected by the existing Kigali International Airport which is situated in the heart of the City along the east-west national highway. This highway connects the City to the neighbouring towns of Rwamagana in east, and Gitarama in west, and to the other larger towns of Kibuye, Nyanza and Butare in Rwanda. The northern highways connect the City to Byumba in the north and the tourist destination -Ruhengiri in the northeast and Gisenyi in the far-east. In order to support the increasing air traffic, the new International Airport is proposed to be developed in Bugesera which lies about 26 km south-east of the City. The road connecting the City to Bugesera holds special significance as a potential growth corridor that has been identified as the suitable location for future City Centre by the 2013 Kigali Concept Master Plan (KCMP). Major paved roads only occur in the urbanized areas of the City and most of the roads in the rural areas are in the form of mud tracks.

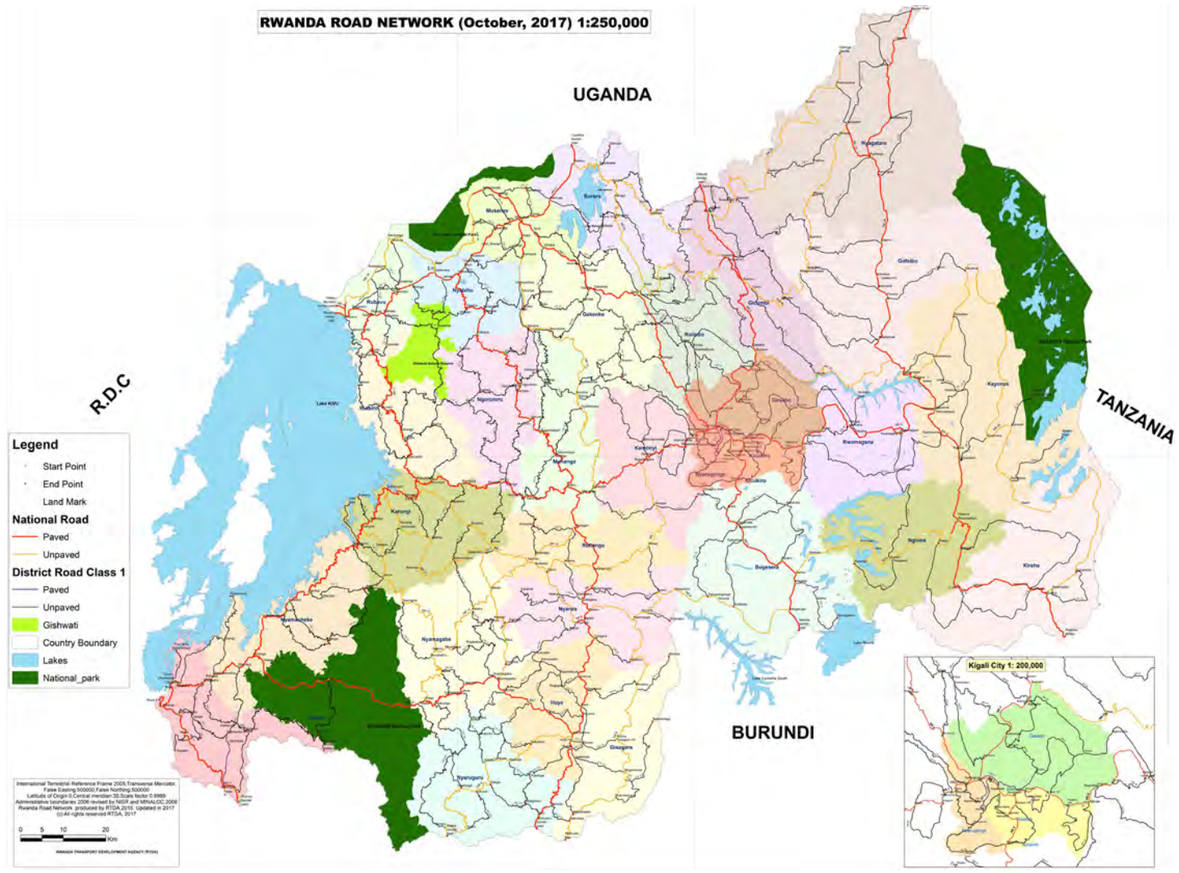


Figure 4.35 Rwanda Road Network

Source: Rwanda Transport Development Agency (RTDA)

Figure 4.36 Google Earth View of Bugesera International Airport under construction

The following image shows the final airport design.

Figure 4.37 Final Bugesera Airport Design- Source: http://www.ad-m.com/en/clients/nbia/

4.5.2 Air Transport

Overview

The Rwanda Civil Aviation Authority (RCAA) regulates and oversees civil aviation in Rwanda, including the Kigali International Airport. Kigali International Airport is one of two International Airports in Rwanda and is currently the principle passenger airport. It has one 3500m x 45m runway. In recent years, the airport has undergone major upgrades, however the topography in the area limits the expansion of the airport and instead, a secondary airport outside the Kigali City will be constructed to complement Kigali International Airport.

Bugesera International Airport is under construction and has been planned to have construction completed by 2020. It is set to become Rwanda's largest International Airport with one 4500m runway and a final capacity of 4.5 million people per year. The following image shows a Google Earth view of the airport under construction.

Summary of Key Issues

The following points list the key issues still relevant from the 2013 Transport Masterplan as well as new issues in relation to Air Transportation:

1. High speed link to new international airport (Bugesera) south of the CBD required (Recent BRT feasibility study aims to address this). The corridor needs to be reserved for this link. Current geometric design does not include BRT;
2. Freight and cargo rail link to the new international airport. The planned airport station is far from passengers to use the rail for passenger rail as well; and
3. There is road congestion along road leading to the existing Kigali international airport. This will be addressed with the micro simulation and traffic study

4.5.3 Road Network

Overview

Since adoption of the 2013 Master Plan, many road infrastructure projects have been implemented in Kigali. The roads network has been improved, upgraded and rehabilitated in the past five years but the city topography, consisting of mainly valley and hills, remains as a natural guide for the road network.

Some of the Primary roads rehabilitation development programs for Rwanda included the following projects (Figure 4.39):

1. Kigali – Gicumbi - Gatuna: Rehabilitation work completed 2015;
2. Kigali - Rwamagana - Kayonza: Recently resurfaced, east from the capital;
3. Kigali – Musanze - Rubavu: Rehabilitated
4. Kigali – Bugesera- Burundi: Paved

A majority of the roads in Rwanda and Kigali still consist of unpaved roads. Housing projects which have been constructed in and around the City of Kigali have come with paved roads sometimes including side pavements and street furniture. According to the Statistical Year Book 2017 for Rwanda, 22% of roads in Rwanda were paved in 2016. This is shown in the following graph. There has been an increase in the number of roads that have been paved in Rwanda and this trend has happened similarly in Kigali.

Road Classification

Rwanda maintains the road categories that where part of law number 55/2011 of 14/12/2011 which defines roads in the following categories:

1. National roads;
2. Districts and City of Kigali roads and that of other urban areas - Class I;
3. Districts and City of Kigali roads and that of other urban areas -Class II; and
4. Specific roads

The following table shows the specifications for different road types in Rwanda.

Geometric Design

In 2014, the Ministry of Infrastructure published the Rwanda Feeder Standards as part of the Rwanda feeder Roads Development project. The project saw funds being released by the World Bank to enhance crop productivity, improve roads and boost incomes in rural Rwanda. So far the project has managed to rehabilitate 242 km of feeder roads as of 30 June 2018, with plans to have covered 720 km of roads by 31 December 2022. The Rwanda

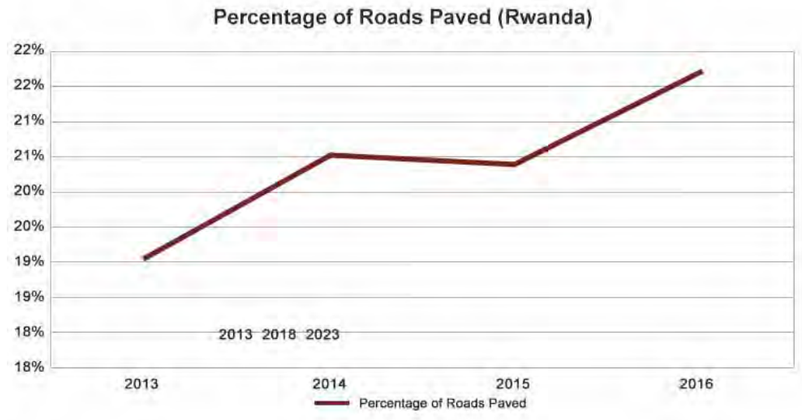


Figure 4.38 Percentage of Roads Paved in Rwanda
Source: Statistical Yearbook for Rwanda 2017

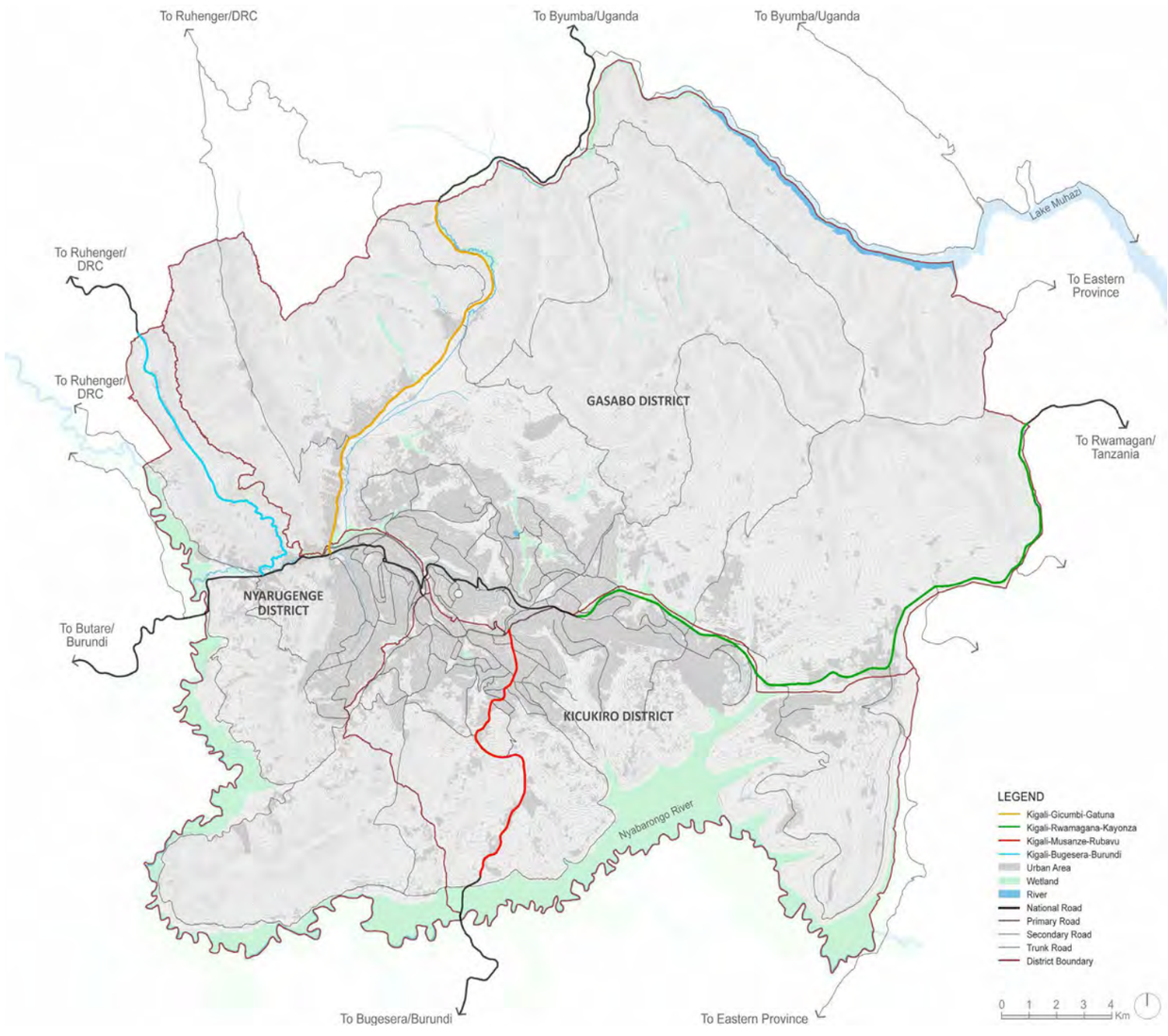


Figure 4.39 Rehabilitation Development Programs

Feeder Standards where drawn up in order to have a standardised method of geometric design across Rwanda. The AASHTO is still being used as an interim as guideline in urban areas. The following table summarizes the geometric design standards adopted for the project.

The challenges faced by the city because of the lack of standardised road markings is currently being rectified in order to reach of uniformity throughout the country. A report on the harmonization of standards and specifications for East Africa was published in 2018. The report covers the proposal of standards and specification of: road geometric design standards; pavement and bridge design standards; specifications for road and bridge works; road and bridge maintenance standards; road signs, traffic signals and marking; vehicle safety and fitness; driver testing and training; vehicle dimensions and combinations; and transportation of abnormal, awkward and hazardous loads. This document also recognizes that unlike other East African countries, in Rwanda vehicles drive on the right hand side of the roads.

On-Street Parking

The 2013 Transportation Masterplan recommended the development of a Parking Policy and Strategy for the City of Kigali and the BRT Feasibility Study and Preliminary Design Second Interim Report recommends parking strategies for the City of Kigali. Since 2013, some parking strategies have already been implemented. Parking in the CBD is now regulated by the presence of parking attendants who regulate public on-street parking. In 2017, the system moved from a paper based ticketing system to an electronic billing to ease payments for the staff and motorists because if the motorist fails to pay within 7 days, the fine is increased.

Traffic Management System

Road intersections in Kigali consist of stop controlled intersections, signalized intersections and roundabouts. In the Past 5 years, plans have been made to signalize previously stop controlled sections to signalize where the junctions warrant the upgrade because of the need to management traffic flow. In some instances there are problems with ensuring the signals are operational.

Table 4.15 Rwanda Road Classification Information

Road Classification as per the Road Act N0: 55/2011	Description	Minimum width lane	Minimum Carriage Way Width	Road Reserve	Embankment Slope
National road Paved or unpaved	Roads that link: International roads and Rwanda with neighboring countries Districts and the city of Kigali Areas of touristic and national/ International importance	3.5m	6m	22m	45%
District Road Class 1	Roads linking different sector's Headquarters within the same Districts or those road that are used within the same sector.	3.5	-	22m	45%
District Road Class 2	Arterial roads that link District roads to rural community centers that are inhabited as an agglomeration.	-	6m	12m	-
Specific Roads	National and district roads to Kigali city and other Urban areas to centers of private sector activities.	-	-	-	-

No.	Description	Unit	Value
1	Design Speed (both in settlement crossings and open countryside)	Km/h	40
2	2 Width of Roads		
	i) Main District Roads	meter	7.0
	ii) Secondary Roads meter	meter	6.0
3	3 Right of Way		
	i) 3.0 m off either side of the carriage way in villages,	meter	3.0
	ii) 5.0 m outside villages	meter	5.0
4	4 Cross-Fall		
	i) Carriageway Normal Cross-fall	[%]	6.0
	ii) Shoulder Normal Cross-fall	[%]	8.0
5	5 Horizontal alignment design parameters in general follow the existing road		
	i) Minimum horizontal curve radius	meter	20.0
6	Vertical alignment design parameters: alignment follow the existing natural gradient		

Signal optimization and synchronization is still a requirement for many of these intersections.

In efforts to control the unsafe high speeds in Kigali, the city introduced speed governors set to a maximum of 60 Km/h in public service vehicles and those transporting goods in 2016. The project continues to face difficulties in implementation as some of the fleet have yet to install the governors and others tamper or remove them. Vehicles that do not comply are stopped, suspended and face penalties. Speed governors have also been a part of the reason why public transport costs have risen early 2018.

Traffic law enforcement officers are very visible and maintain a good presence on the streets of Kigali.

Road Safety

Kigali city road based accidents remain higher then the rest of Rwanda. In 2017, 71% of total registered road accidents involved motorcycles, pedestrians and bicycles. The KN 7 road KN 5 RD and city circle junctions remain the hotspots for fatal accidents in the city as determined from a study done from the police database.

The government has continued to implement safer road programs to educate road users on effective and safe usage of the road. In 2017 the government reviewed laws on road safety to toughen penalties against traffic offenders.

The government has committed to implementing all possible strategies to enhance road safety measures as evident by a campaign launched by the Rwanda national police and minister of transport in 2017 to curb road accidents and promote road users respect road safety standards.

The police have been conducting road safety sessions among motorists, cyclists, members of the public and in schools from 21st May to 1st June 2018.

Freight

Kigali is located in the central of Rwanda, which places it in a good position as a stopping centre for freight travelling between international borders. Freight travel connectivity is shown in the following image. There are 5 points of entry into the City. The National Roads are well-developed in Rwanda, however at the moment runs through the City in an east-westerly direction. The National Route network is quite comprehensive and places Rwanda as collector point for goods in the surrounding areas. Once the Rail Network connection is complete, it would strengthen Kigali's position as a logistics hub to the East coast.

Summary of Key Issues

The following points list the key issues still relevant from the 2013 Transport Masterplan as well as new issues in relation to Road Transportation:

1. Inconsistent road hierarchy, access and mobility function, and associated typologies / cross-sections;
2. Many roads are not paved;
3. Fragmented development;

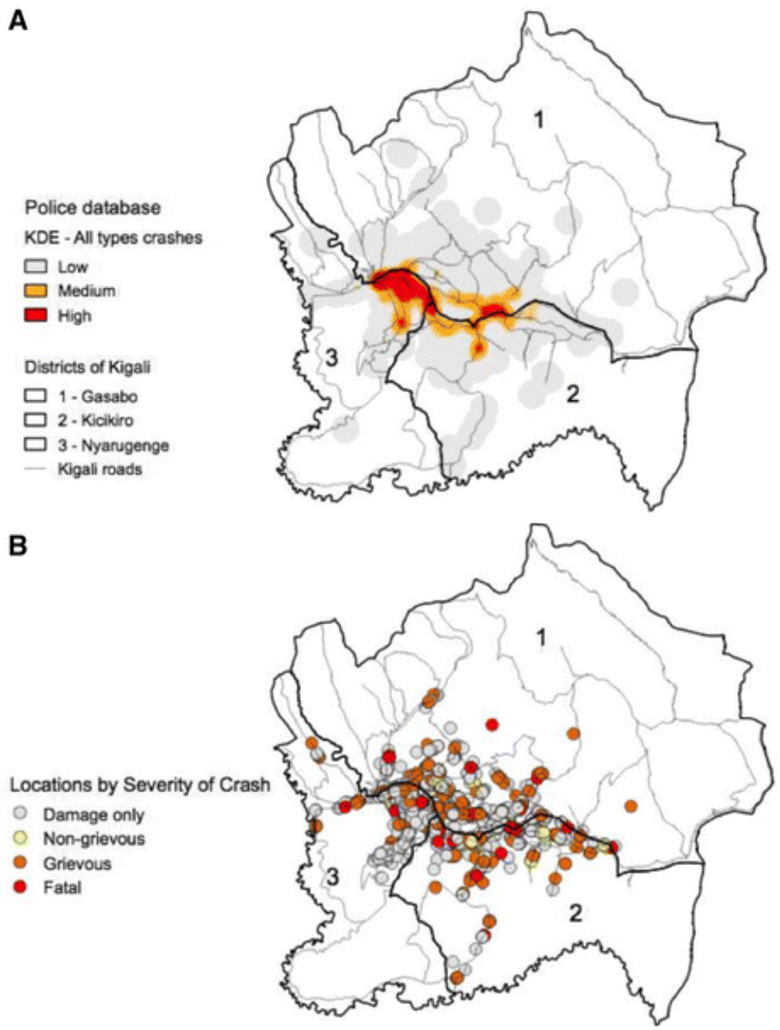


Figure 4.40 Accident Statistics for Rwanda

Source: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-3359-4

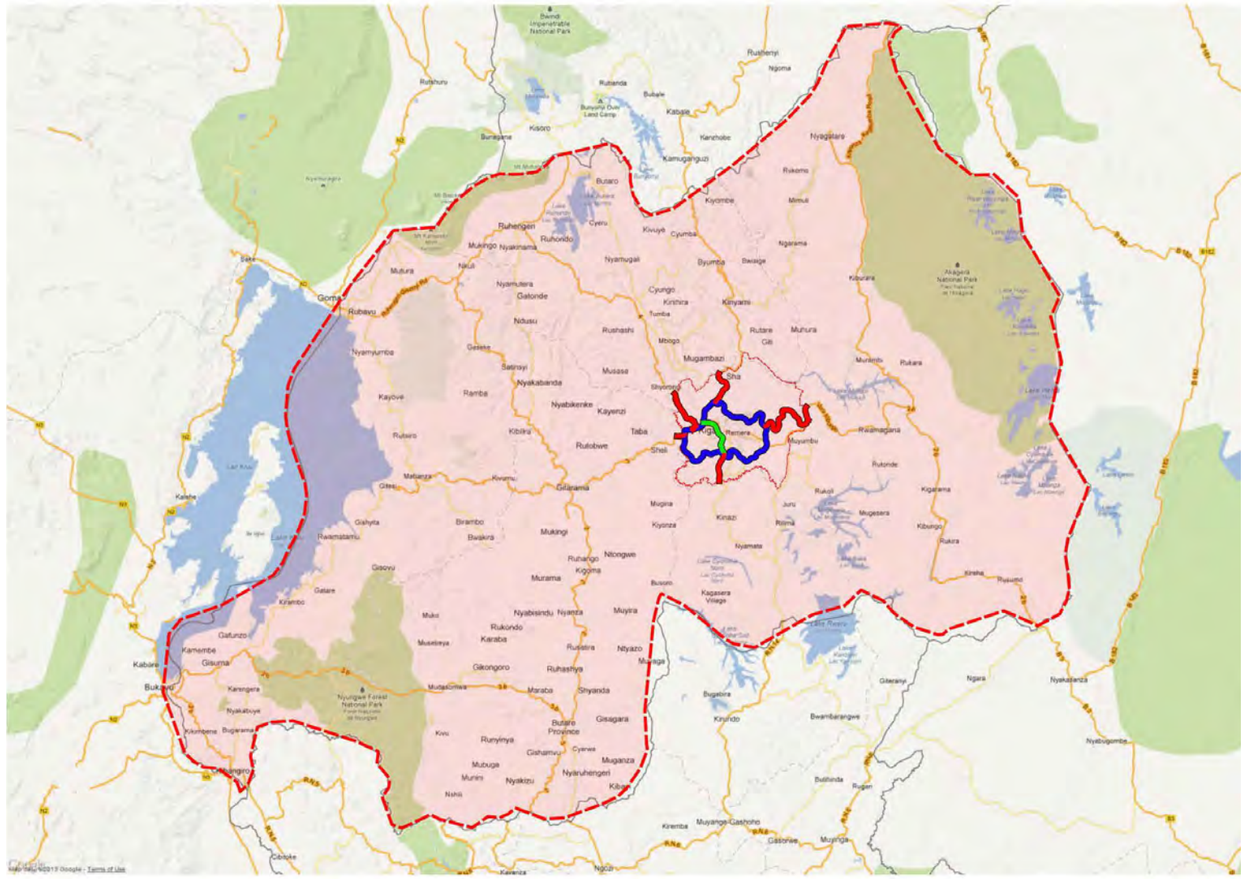


Figure 4.41 2013 Masterplan Proposed Freight Routes for Kigali

4. Hilly topography;
5. No formal guidelines to standardise the geometric design of roads (East African Community = left-hand drive);
6. Parking provision is not systematically enforced throughout Kigali;
7. Inconsistent intersection control (only few traffic signals, not optimised);
8. Various manufacturers of traffic signals cause problematic maintenance;
9. Poor design of traffic calming measures;
10. No formal guidelines to standardise road markings and signs specific to Rwanda; and
11. New land-use developments do not always consider the gradient when planning the access connection to the public road level

4.5.4 Rail Network

Overview

There are no existing railway lines in Rwanda. Several schemes and initiatives have been proposed for Rwanda, despite the mountainous terrain.

Kigali and Rwanda are in plans to construct a new railway line between the Dar es Salaam and the City of Kigali. In spite of the challenges that the topography of Rwanda bring, the feasibility studies verified Rail in Rwanda as a viable long distance transportation option that would ease the transfer of goods.

Rwanda and Tanzania have partnered up to lead the construction of the regional standard gauge railway which plans to connect Tanzania, Rwanda and Burundi. Although Burundi has put their phase on hold. The Isaka- Kigali Standard Gauge Railway phase which is 497 km long is planned to be launched by October 2018 and expected operation in 2022.

Summary of Key Issues

The following points list the key issues still relevant from the 2013 Transport Masterplan as well as new issues in relation to Rail Transportation:

1. Mountainous terrain makes implementation complicated;

2. Planning a rail line through the CBD will involve careful planning to ensure it does not sterilise large portions of land or form an additional physical barrier in the city;
3. Freight movement by rail to airport- is it viable?;
4. Reserving corridors for rail; and
5. Various proposals – to stimulate economy with East African Community. Most advanced is the proposed link between Dar es Salaam and Kigali (Standard Gauge Railway)

4.5.5 Non-motorised Transport Network

Overview

There are some formal pedestrian walkways and cycleways within Kigali, however these routes have been criticized for being poorly positioned or discontinuous. In some areas it is necessary for pedestrians and cyclists to use roadways.

Since the previous Masterplan was implemented, pedestrian crossings have become much safer due to supervision by traffic enforcement.

There is little to no universal accessibility with regards to provision of non-motorised transport infrastructure.

Summary of Key Issues

The following key issues have been identified:

1. Dedicated pedestrian and cycle routes are only provided in the city centre;
2. Lack of continuity; and
3. Hilly terrain (more than 5%) presents a challenge to successfully implement cycling

4.5.6 Public Transport System

Overview

The following Public Transport modes are currently available in Kigali:

1. Bus;
2. Moto Taxi;
3. Matatu Minibus Taxis; and
4. Bicycle Taxis

These are seen as insufficient to deal with the increasing demand for public transport in the city and as a result BRT is in the feasibility study and preliminary design phase. Smartcard systems for the buses of the Kigali Bus Services and Royal Express Limited in Kigali have been adopted. Other bus companies are expected to move over to these systems.

Summary of Key Issues

The following key issues have been identified:

1. Limited space and government owned land for public transport infrastructure;
2. Limited integration between public transport modes;
3. Limited consideration of universal accessibility in the design of public transport systems; and
4. Unpaved roads and steep gradients limits bus accessibility

4.5.7 Institutional Setup

Overview

The existing authorities responsible for Transport in Kigali are:

1. Rwanda Transport Development Agency (RTDA): Responsible for the national road and rail network
2. Republic of Rwanda Ministry of Infrastructure (MININFRA): Responsible for Public Transport Policy and Strategy in Rwanda
3. Rwanda Utilities Regulatory Authority (RURA): Responsible for regulation and licensing of Public Transport
4. City of Kigali- Infrastructure Department: Responsible for the provision of municipal services and ensuring the Kigali Transport Masterplan is followed

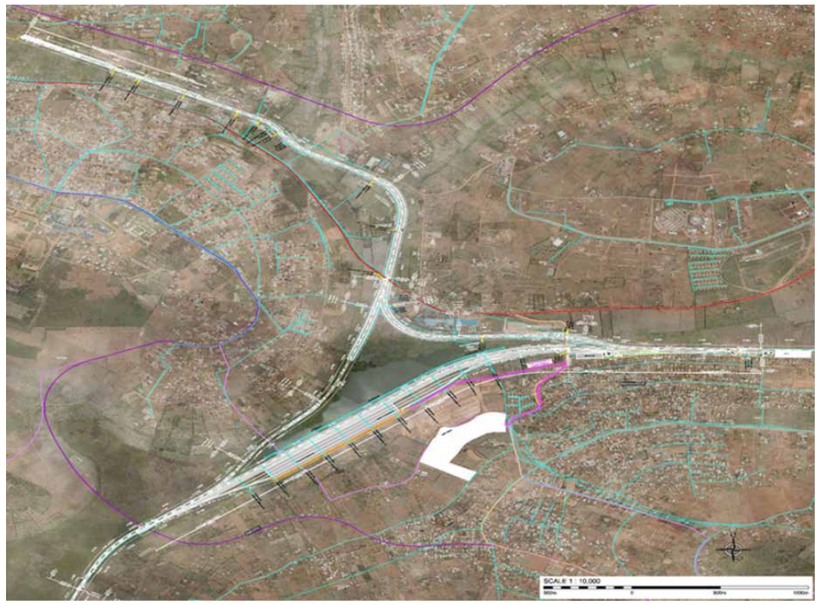
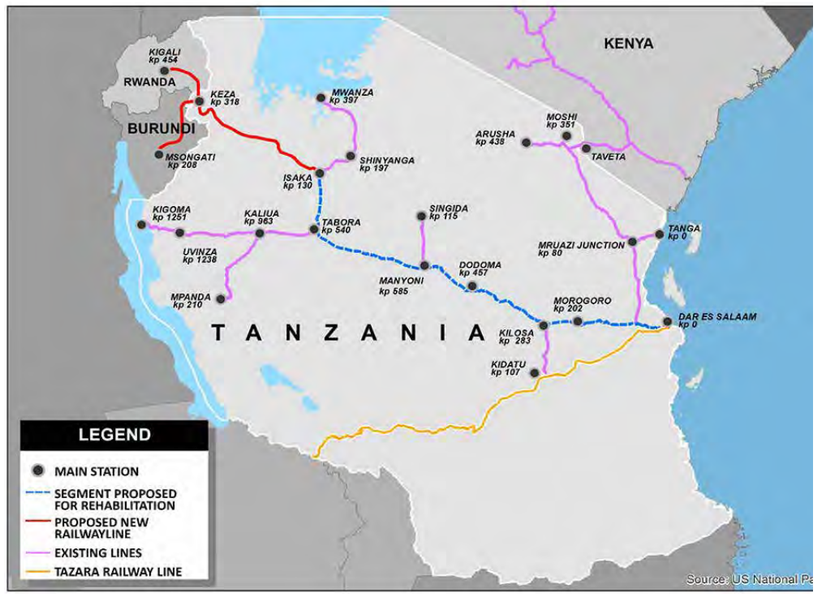


Figure 4.42 Kigali freight and passenger stations
Source: https://www.newtimes.co.rw/section/read/227911



The Mombasa-Kampala-Kigali Project has also been proposed.

Summary of Key Issues

Fragmentation in policy was mentioned as one of the key issues in addition to gaps in responsibility. The following institutional arrangement was proposed.

The lack of custodianship of the official multi-modal transport model for the city has now been identified as an additional key issue. A custodian for the model has to be identified to:

1. Protect its integrity;
2. Keep it accessible to third parties for planning purposes;
3. Ensure its continued maintenance; and
4. Update of comprehensive travel pattern database

4.5.8 Updated Development Vision

The Goals, Objectives and Strategies of the 2013 masterplan were based on an overarching benchmarking methodology that investigated Singapore, Cape Town, Curitiba, Bogota and London. This methodology is accepted and does not require any updating or revision.
In 2013 four enabling strategies were developed based on the 8 identified objectives, these being:

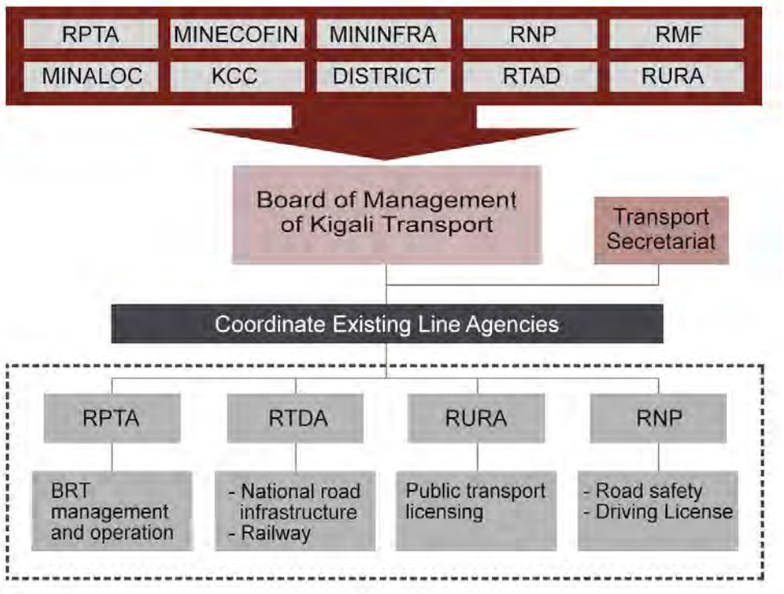
1. Road Network Strategies;
2. Public Transport Strategies;
3. Freight Management Strategy; and
4. Green Transportation Network Strategies

A 9th objective is now proposed that will speak to the 3rd Specific Goal, namely "Sustainable Transport Network". This objective will be "to implement transport policy effectively". Such an objective will then lead to a 5th enabling strategy, namely "Institutional Strategies". "Institutional Setup, Traffic Management and Policies" were already identified in 2013 Masterplan, but did not link to a specific strategy or objective.

4.5.9 Way Forward

The following tasks will be completed to update the transport masterplan:

1. Household Travel Survey and updated existing land use data will be processed and analysed to determine existing travel patterns;
2. The agreed forecast land use scenario will be processed and analysed to determine the envisaged future travel patterns through the application of a sketch planning methodology supported by spreadsheet and GIS based analyses;
3. The status of previously recommended implementation projects will be determined;
4. Previously recommended implementation projects will be reviewed against existing and future travel pattern information;
5. Alternative or additional implementation projects will be recommended;
6. Develop a multi-criteria analysis tool in line with the identified objectives;
7. The final list of recommended implementation projects will be prioritised through the application of a multi-criteria analysis tool;
8. A selected prioritised implementation project for each strategy will be benchmarked to inform implementation planning;
9. Test road network Implementation Projects and capacity requirements through the development of a road-based demand model; and
10. Develop micro-simulation models for 6 selected road network corridors to inform implementation of road network projects



4.6 Efficient City

The Kigali City faces extreme inadequacies in terms of making provisions for infrastructure such as energy and water. Further, in the midst of rapid urbanization and land scarcity, resource efficiency and sustainable management strategies becomes key to the development.

Efficient City is another theme amongst 8 themes of development for the City of Kigali and it aligns with the overarching policy pillars stated in Rwanda National Urbanization Policy. The Efficient City has close alignment with two of the four policy pillars, Coordination and Densification.

Efficient City would focus on the following:

1. Water;
2. Sanitation;
3. Storm water;
4. Electricity;
5. Solid Waste; and
6. ICT

4.6.1 Water Supply

The Water and Sanitation Corporation (WASAC) is responsible for potable water supply in the City of Kigali, covering 32 sectors. 3 sectors in Kigali are outside of WASAC's supply area, namely: Gikomero, Nduba and Rutunga. The reason for the limited supply is due to the sectors being far from urban areas and the supply networks not being sufficiently developed.

From 2010 to August 2014 the national parastatal responsible for water and electricity distribution was EWSA; The Energy, Water and Sanitation Authority. Following recommendations from the 2013 Master Plan a Ministerial Order was set up to create two separate entities, one for water and sanitation (WASAC) and another for electricity (Rwanda Energy Group - REG).

Water Master Plan

A Water and Sanitation Master Plan is currently being prepared by Lotti Ingegneria and was not available for use in this report. The Baseline Report is currently in progress and will be distributed mid October 2018 (to be confirmed). After which various other reports will be done leading up to the Final Master Plan that is due in April 2019.

Water Source

There are three main water sources that supply to the City. They are Yanze River, Nyabarongo River and Lake Mugesera, see Figure 4.43. In addition to these three main sources, there are seven well-maintained small-scale water sources using spring and groundwater. In a meeting with WASAC on 17 July 2018, it was confirmed that the Mutobo Spring Water project is no longer a priority as identified in the 2013 Master Plan.

There is currently no demand for this source and it will only be considered in 2030 to be complete by 2040. The water quality of the rivers is monitored by the Rwandan Water and Forestry Authority

Figure 4.43 Existing Water Sources (Source: 2013 Master Plan)

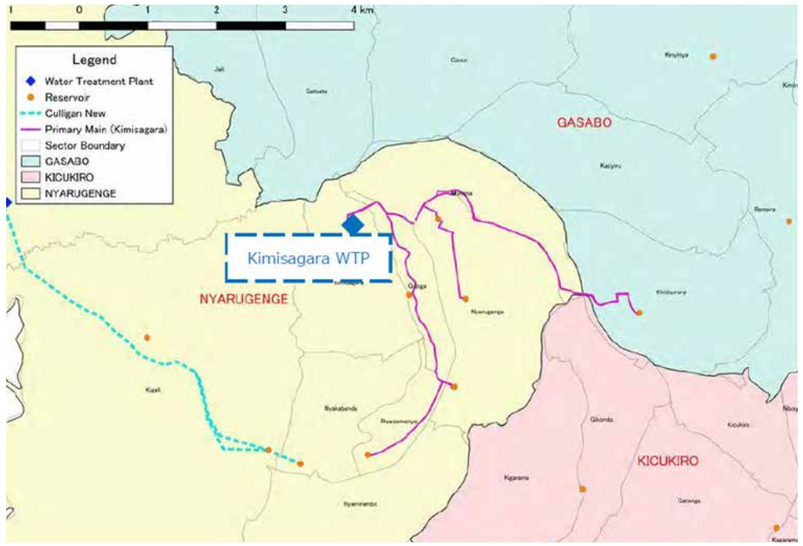


Figure 4.44 Kimisagara water supply system (Source: JICA)

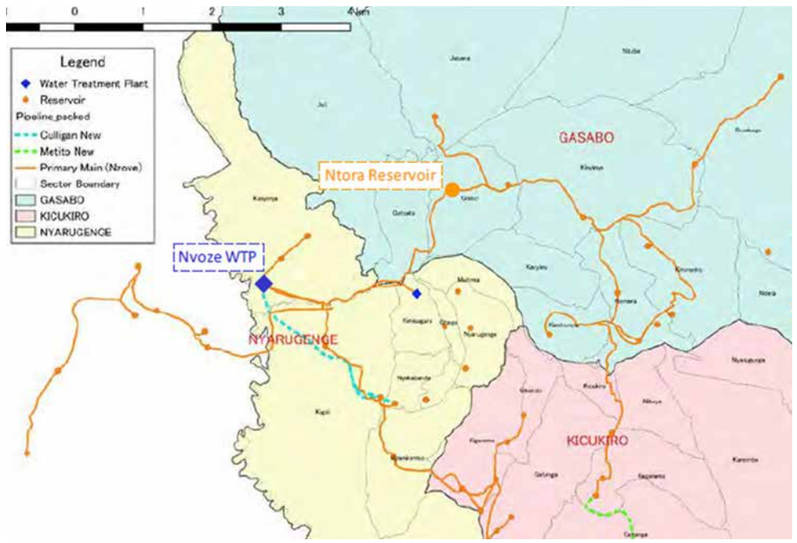


Figure 4.45 Nzove water supply system (Source: JICA)

(RWFA). Specific data relating to the quality of surface water, ground water and telemetry can be downloaded off the Rwanda Water Portal managed by RWFA.

Water Treatment Plants

There are 3 water treatment plants that supply potable water to the City. These plants are able to meet the City's estimated water demand of 143 000 m3/d, with a supply capacity of 145 000 m3/d. However the current average supply is 90 000 m3/d due to restrictions in the supply network and the power supply at Nzove.

1. Kimisagara Water Treatment Plant (WTP)

The almost 40-year-old plant is located in the Kimisaga Cell in the Nyarugenge District and draws its raw water supply from Yanze River (Figure 4.44). The complex treatment process, conventional filtration – chlorination system, involves a mixture of at least three chemicals to ensure the supply of high quality water. The chlorine used in this process is manufactured at the plant. Once the water is treated, it is stored in four reservoirs within the plant and then pumped out to reservoirs in different parts of Kigali. The two pumped lines are 300 mm and 500 mm diameter pipes. The third pipe is a gravity line supplying the Muhima area (due to its proximity and geographic location). The pumped lines supply the following areas of distribution: Town Centre, Gasyata, Nyamiramb, Kimihurura and Biryogo. Hourly quality tests are done at the laboratory on random samples taken from the reservoirs and distributing pipes to ensure clean water supply. The Kimisagara WTP produces 28 000 cubic meters of water daily, according to the WASAC website publication on 13 January 2017.

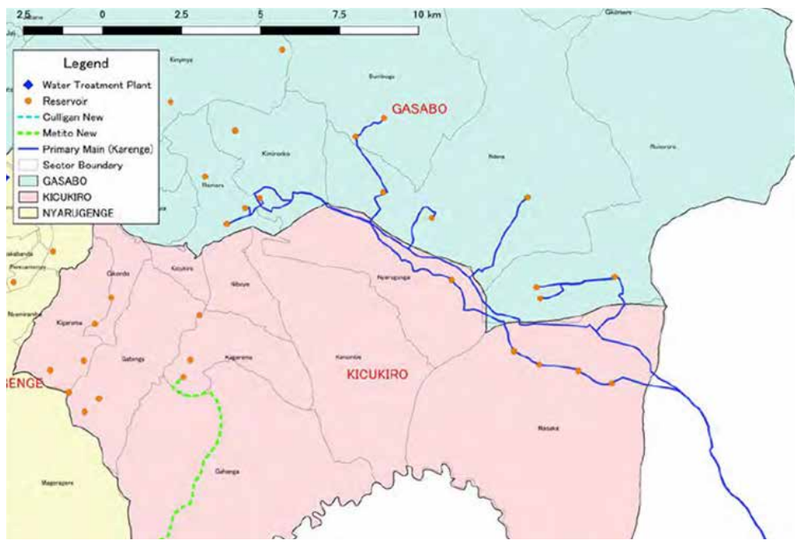


Figure 4.46 Karenge water supply system (Source: JICA)

2. Nzove WTP

The plant treats ground water from the well field in the flood plain on the east bank of the Nyabarongo River (Figure 4.45). It uses rapid filtration system followed by chlorination. The treated water from the plant is pumped from the Nzove 1 reservoir to the Ntora reservoir located at Gisozi. From there the water is then distributed to the following areas in Kigali: Kicuciro, Kagarama, Kahanga, Karuma, Runda, Mbweravura, Remera, Gisozi, Gacuriro, Kagugu, Kinyinya, Kibagabaga/Nyarutarama. The Nzove Treatment Plant provides 105,000m cubic metres of water per day.

3. Karenge WTP

The Karenge plant was commissioned in 1975 and draws its raw water supply from Lake Mugesera (Figure 4.46). It uses conventional treatment method that consists of aeration, prechlorination, coagulation, flocculation, sedimentation and clarification to treat the raw water. Water is tested at each treatment process step as well as at three zones in the distribution network. The Karenge WTP produces 15 500 cubic meters of water daily, 12 000 cubic meters per day supplied in Kigali. The plant supplies treated water to two areas: Kigali network (Remera,Kanombe. Kabeza, Masaka, Kabuga;Ndera; Free Zone & AZAM), and Rural area (Karenge Sector; Nzige Sector; Gahengeri Sector; Muyumbu Sector and Nyakariro Sector). Water is distributed by a series of pumping stations, taking the water from Lake Mugesera (1300m asl) to Kigali City (1660m asl).

Water Distribution

Potable water supply from the 3 water treatment plants is stored at various water storage tanks installed within the City. Kigali has 79 reservoirs, 72 are part of the major water supply systems. The total reservoir capacity is approximately 34 500m3, with 10 hours of water storage. Water is distributed from these reservoirs through WASAC's 494km piped water network to consumers. Asbestos pipes are not used; only steel, ductile cast iron, PVC and HDPE pipes. Both the number and the capacities of reservoirs in highly populated areas of Kigali are insufficient and need to be addressed.

Pumping stations are in place to maintain the optimum pressure in the water network. WASAC is aiming towards having SCADA monitoring systems at all pump stations by 2022, where no more manual readings will be taken. Water supply network expansion is planned and carried out by WASAC based on the demand from the users. New users will have to apply and pay for water connections directly to WASAC.
In the past, the water network extension was not planned according to the future land use or growth. Hence, there are many existing pipes that do not follow the road alignments and encroach into property boundaries. This has made maintenance work more difficult to carry out. The piped water network covers most of the built-up area in the City. Urban areas that are closer to the City Centre such as Muhima, Nyarugenge, Gitega, Kimisagara, Kimihurura, Gikondo, etc. have the most extensive piped water network.
Connections to households are available for the residents in this area. Residents without indoor plumbing connection get water from the public standpipes using jerry-cans. The standpipes are supplied from the municipal water supply network.

According to the Rwandan Vision of 2020 the target of the water sector in the plan is "all the people can access safe drinking water by 2020". In a meeting held with WASAC on 17 July 2018, the following was confirmed in terms of access to water in the City of Kigali:

1. Access to water within 200m = 86% of population; and
2. Access to water within households = 50% of population

Some sectors are situated far away from the existing water supply network, or have low population densities which make water network extensions uneconomical. The residents of these areas usually get water from kiosks, streams or boreholes.

The Table 4.16, taken from the "Basic Data Collection Study on Urban Water Supply Systems in the Republic of Rwanda" by JICA, outlines the major water supply systems in Kigali.

The purpose of the following Table 4.17 is to indicate the WASAC supply areas as well as whether there is a surplus or deficit in the supply vs. demand. The table will be updated once further information is received in the Baseline Report for the WASAC Master Plan.

Figure 4.48 shows the extent of the water supply network in Kigali. The map has been based on information from the 2013 Master Plan and will be updated once further information is received from WASAC and Lotti Ingegneria.

Table 4.16 Major Water Supply Systems

	Nzove water supply system	Karenge water supply system	Kimisagara water supply system
WTP	Nzove, Nzove II, New Nzove I	Karenge	Kimisagara
Distribution area	4 Districts	3 Districts	3 Districts
Pipe length	Aprox. 105.4 km	Aprox. 69.5 km	Aprox. 23.7 km
Pump station	6 places	1 place	4 places
Reservior	30 places (40 reservois)	16 places (22 reservoirs)	5 places (10 reservoirs)

Table 4.17 WASAC Supply Areas

District	Sector	Population (2012 Census)	wWTP	Supply	Demand (m3/d)	Surplus/ Deficit
Nyarugenge	Gitega	28 728			3447.36	
	Kanyinya	21 859			2623.08	
	Kigali	30 023	Kimisagara		3602.76	
	Kimisagara	46 753	Kimisagara		5610.36	
	Mageragere	23 407			2808.84	
	Muhima	29 768	Kimisagara		3572.16	
	Nyakabanda	25 666			3079.92	
	Nyamirambo	40 292	Kimisagara		4835.04	
	Nyarugenge	21 302			2556.24	
	Rwezamenyo	16 763			2011.56	
	TOTAL	284 561			34147.32	
Gasabo	Bumbogo	35 381			4245.72	
	Gatsata	37 110			4453.2	
	Gikomero	16 625			1995	
	Gisozi	44 003	Nzove		5280.36	
	Jabana	33 577			4029.24	
	Jali	25 057			3006.84	
	Kacyiru	37 088			4450.56	
	Kimihurura	21 672	Kimisagara		2600.64	
	Kimiromko	57 430			6891.6	
	Kinyinya	57 846	Nzove		6941.52	
	Ndera	41 764	Karenge		5011.68	
	Nduba	25 370			3044.4	
	Remera	43 279	Nzove/Karenge		5193.48	
	Rusororo	35 453			4254.36	
	Rutunga	17 906			2148.72	
	TOTAL	529 561			63547.32	
Kicukiro	Gahanga	27 808			3336.96	
	Gatenga	48 640			5836.8	
	Gikondo	17 146			2057.52	
	Kagarama	14 385	Nzove		1726.2	
	Kanombe	44 426	Karenge		5331.12	
	Kicukiro	16 450	Nzove		1974	
	Kigarama	43 907			5268.84	
	Masaka	39 548	Karenge		4745.76	
	Niboye	26 197			3143.64	
	Nyarugunga	40 057			4806.84	
	TOTAL	318 564			38227.68	
TOTAL		1 132 686	-		135922.32	

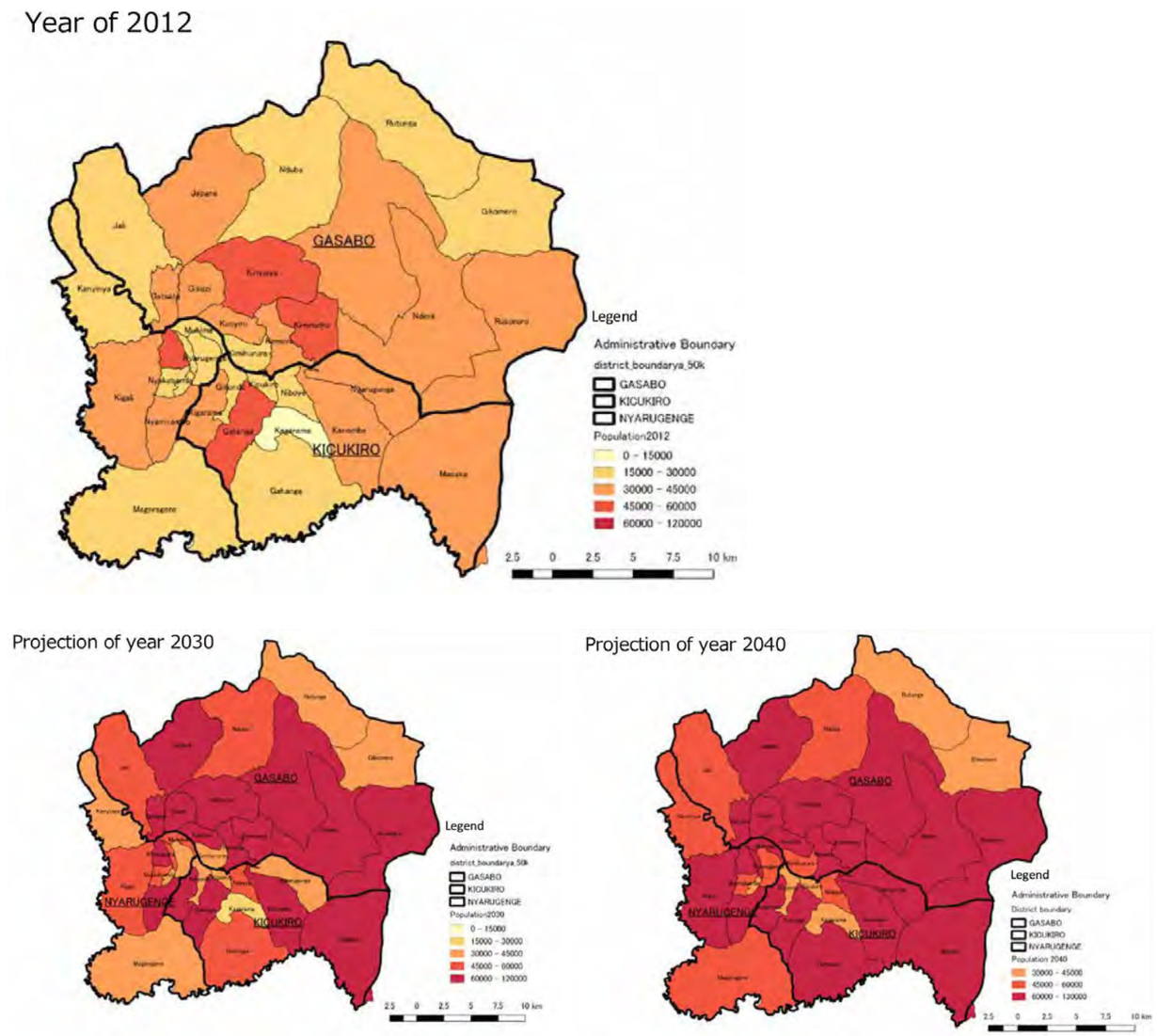


Figure 4.47 Population distribution prediction
Source: JICA

Water Consumption

The extensive water network and the existence of public facilities and new residential developments in the urban area encourage higher water consumption. Water consumption at larger homes, office buildings and tourism facilities could reach as high as 200 lpcd (litre per capita per day). According to the 2013 Master Plan; residents at the informal neighbourhoods with no access to indoor plumbing such as Kacyiru and Rusororo have lower water consumption that ranges from 15 - 25 lpcd. In view of the unbalanced water consumption rate in the City, the Ministry of Infrastructure (MININFRA) has initiated a city-wide goal of 80 lpcd.

In the article "WASAC to spend $300 million on water and sanitation projects", it is stated that the water demand in Kigali is 130 000 m3/d. According to WASAC, the treatment plants have capacity to meet this demand, the problem lies in the distribution.

According to a report by JICA titled "Basic Data Collection Study on Urban Water Supply Systems in the Republic of Rwanda", the water demand in 2030 will be 459 494 m3/d and 549 234 m3/d in 2040 (based on the growth rates in the 2013 Master Plan). Figure 4.49 has been extracted from this report and indicates the consumption per connection in different areas of Kigali.
The consumption map Figure 4.49 shows that central and eastern Kigali are the main and biggest consumers of water and reservoirs and water distribution networks should be constructed in these areas (Kacyiru Sector) with high demands.

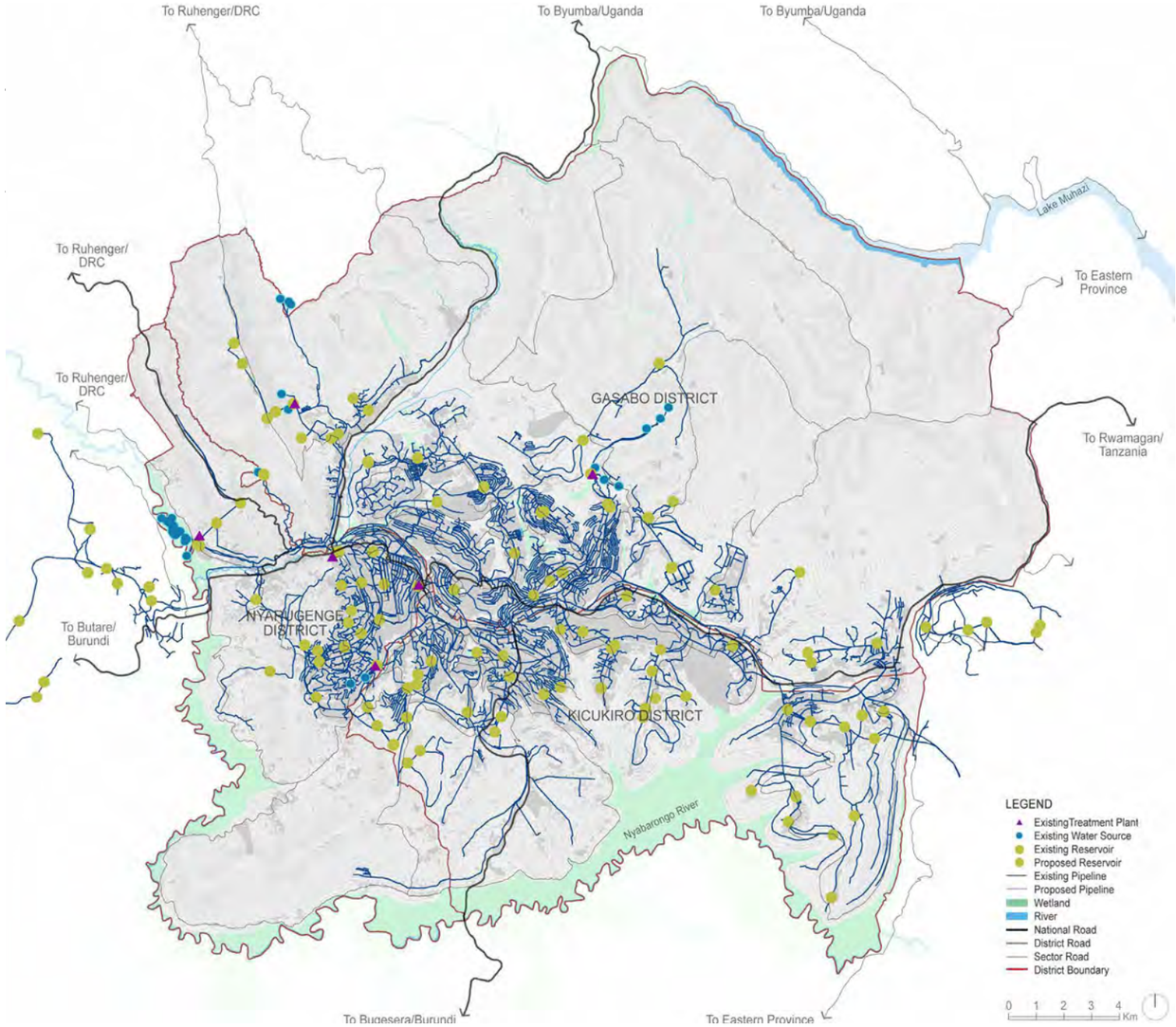


Figure 4.48 Water Supply System (Source: WASAC)

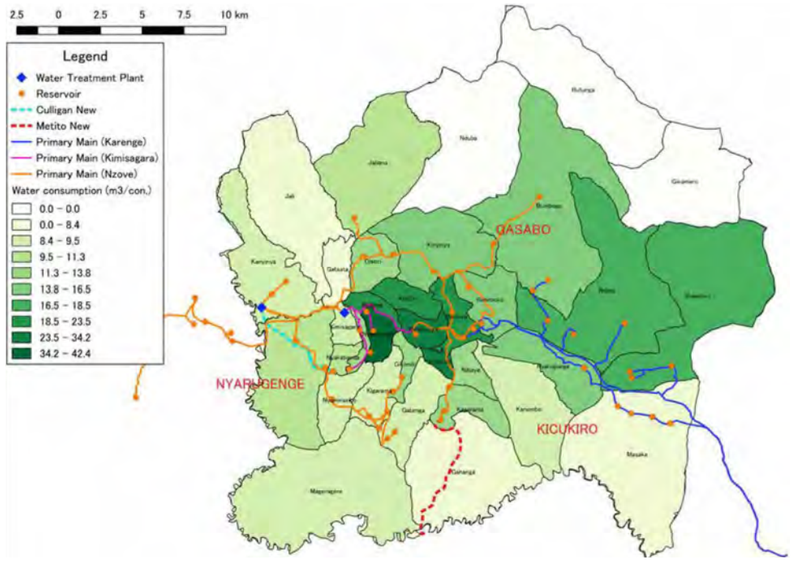


Figure 4.49 Water consumption in Kigali (Source: JICA)

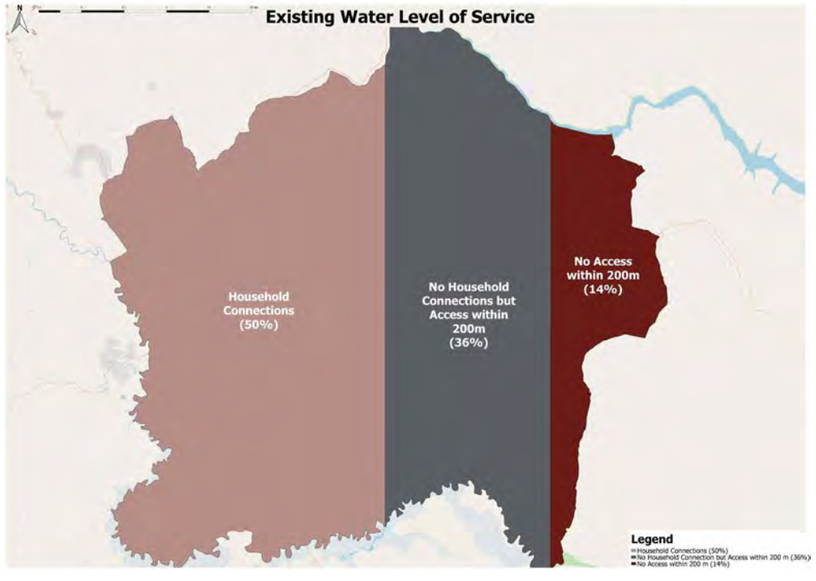


Figure 4.50 Water Level of Service

Tariffs

The following water consumption tariffs have been taken off the WASAC website. An exchange rate of USD 1 = RwF 884.70 has been applied for the rate in US Dollars.

Level of Service

In the article "WASAC to spend $300 million on water and sanitation projects" by The New Times, access to water services in urban areas stands at 85%, when compared to 47% in rural areas.

The following map Figure 4.50 is an indication of the levels of service that the population of the City of Kigali has access to. 14 % of the population still have no access to water.

Ongoing Projects

Since 2016, JICA has been collaborating with WASAC towards a "**Project for Strengthening Non-Revenue Water control in Kigali City Water Network** (2016 to 2019)" with the aim of improving the NRW rate in Kigali City. According to WASAC's 5 Year Strategic

Table 4.18 WASAC Water Tariffs

Monthly Consumption	Tariff Excl. VAT (18%) RwF/m3	Tariff Excl. VAT (18%) USD/m3
At Public Water Kiosk	323	0.37
Between 0 and 5m^3	323	0.37
Between 6 and 20m^3	331	0.37
Between 21 and 50m^3	413	0.47
Between 51 and 100m^3	736	0.83
Above 101m^3	847	0.96
Industries	736	0.83

The report by JICA suggests the implementation of the following projects to alleviate the existing water supply issues in Kigali. These have been selected with the WASAC future plan in mind.

1. The Project for Water Supply Capacity Strengthening of Nzove-Ntora Principal Pipeline (high priority for WASAC);
2. The Project for Water Supply Facility Expansion in Northeast Kigali City (high priority for WASAC);
3. The Project for Water Supply Facility Improvement in Town Area (high priority for WASAC);
4. The Project for Water Supply Facility Improvement in Peri-urban Area (high priority for WASAC);
5. The Study for Kigali City Water Supply Master Plan; and
6. The Project for Capacity Building of Water Distribution Management

According to an article in The New Times on 18 August 2018, WASAC is planning to invest 300 000 USD in the next 3 years to address the shortfall in water supply across Rwanda. This will include the implementation of 40+ water and sanitation projects.

Key Issues to be Addressed

Some of the key issues that are to be addressed by the City include:

Uncoordinated planning between future land use and infrastructure: Without proper planning, the existing infrastructure will not be able to meet the growing water demand. The City has to work closely with WASAC to determine the growth centre and the projected water demand. Sufficient land should be secured for the construction and expansion of water treatment plants and service reservoirs.

Shortage of water supply: The current supply is lacking behind the actual demand. The 80 lpcd city wide goal set by the MININFRA was due to limited water supply. In the long run, as the population and standard of living rises due to the urbanization, this goal has to be reviewed. The City also has to utilise the current resources more efficiently and identify new ones for long term planning.

Difficulty in expanding the water network: The undulating terrain of Rwanda poses a challenge in laying and expanding the existing water pipe network to cover the entire City. It is more economically viable to consider local water supply sources for areas that are inaccessible to the existing network. Expansion plans should also consider methods for appropriate pressure management due to the vast and varying ground elevations. On the other hand, the supply of water across varying elevations generates high amounts of energy that could be converted into power. This can lead to a cost reduction for WASAC when needing to provide power to their systems.

Age and coverage of existing network: The water treatment plants in Kigali have a dedicated supply area, which means that should there be a shortage in a certain area there is no redundancy in the system to prevent a water outage. WASAC also only supplies 32 of 35 sectors in Kigali, the remaining 3 sectors are covered by local systems. To meet the target of supplying water to 100% of the population, WASAC needs to implement projects to reach these areas. It is also essential to upgrade the aging facilities and networks (mostly laid in the 1970s or earlier) to pressure-resistant materials to reduce the amount of NRW.

Management of water losses: The cause of water losses in the system need to be identified, addressed and continuously managed.
Design guidelines and construction management standards: It is essential that guidelines are developed to ensure the quality of the future water facilities and ensure the integrity of the existing structures and systems that are in place.

Applicable Policies and Plans

The following section highlights some key points applicable to water supply from current policy documents:

1. The objectives of the National Water Supply Policy 2016 are:
    - Rural - coverage: “Raise rural water supply coverage to 100 per cent by fast-tracking implementation of a strategic investment programme”;
    - Rural - functionality: “Ensure affordable rural water supply services and sustainable functionality of rural water supply infrastructure”;
    - Urban: “Ensure safe, reliable and affordable urban water supply services for all (100 per cent service coverage by 2018) while striving for full cost recovery”;
    - School and health centres: “Ensure safe, affordable and reliable water supply services for schools, health facilities and other public places”; and
    - Institutional sector framework: “Strengthen the sector’s institutional and capacity-building framework”
2. The National Informal Settlement Upgrading Strategy by MININFRA 2015, states that there should be a water access point within 250m, to serve 2000 people in an upgraded neighbourhood

Smart & Green Initiatives

1. SCADA monitoring systems with automated control centre;
2. SMART Vision Project: Water management to monitor pipelines for leakages;
3. SMART metering systems;
4. Introduce rainwater harvesting;
5. Improve sustainability of water treatment by using renewable resources for the supply of energy;
6. Use of sustainable materials in the construction of public water systems; and
7. Water demand management – educate consumers on water efficient appliances and equipment

4.6.2 Waste Water

The Water and Sanitation Corporation (WASAC) is the responsible authority for waste water planning and management in Kigali. From 2010 to August 2014 the national parastatal responsible for water, sanitation and electricity distribution was EWSA; The Energy, Water and Sanitation Authority. Following recommendations from the 2013 Master Plan a Ministerial Order was set up to create two separate entities, one for water and sanitation (WASAC) and another for electricity (Rwanda Energy Group - REG).

Sanitation Master Plan

A Water and Sanitation Master Plan is currently being prepared by Lotti Ingegneria and was not available for use in this report. The Baseline Report is currently in progress and will be distributed mid October 2018. After which various other reports will be done leading up to the Final Master Plan that is due in April 2019.

Sewage Treatment Plants

Currently, there is no sanitary sewer network or a centralized sewage treatment plant (STP) in the City of Kigali. The construction of the Gitikinyoni Treatment Plant as well as the central sewerage system that is planned for the City is going ahead and tender documentation has been issued. It was noted in the 2013 Master Plan that the site that was being considered by for the plant is susceptible to flooding and could cause operational issues as well as potential sewer overflow into the

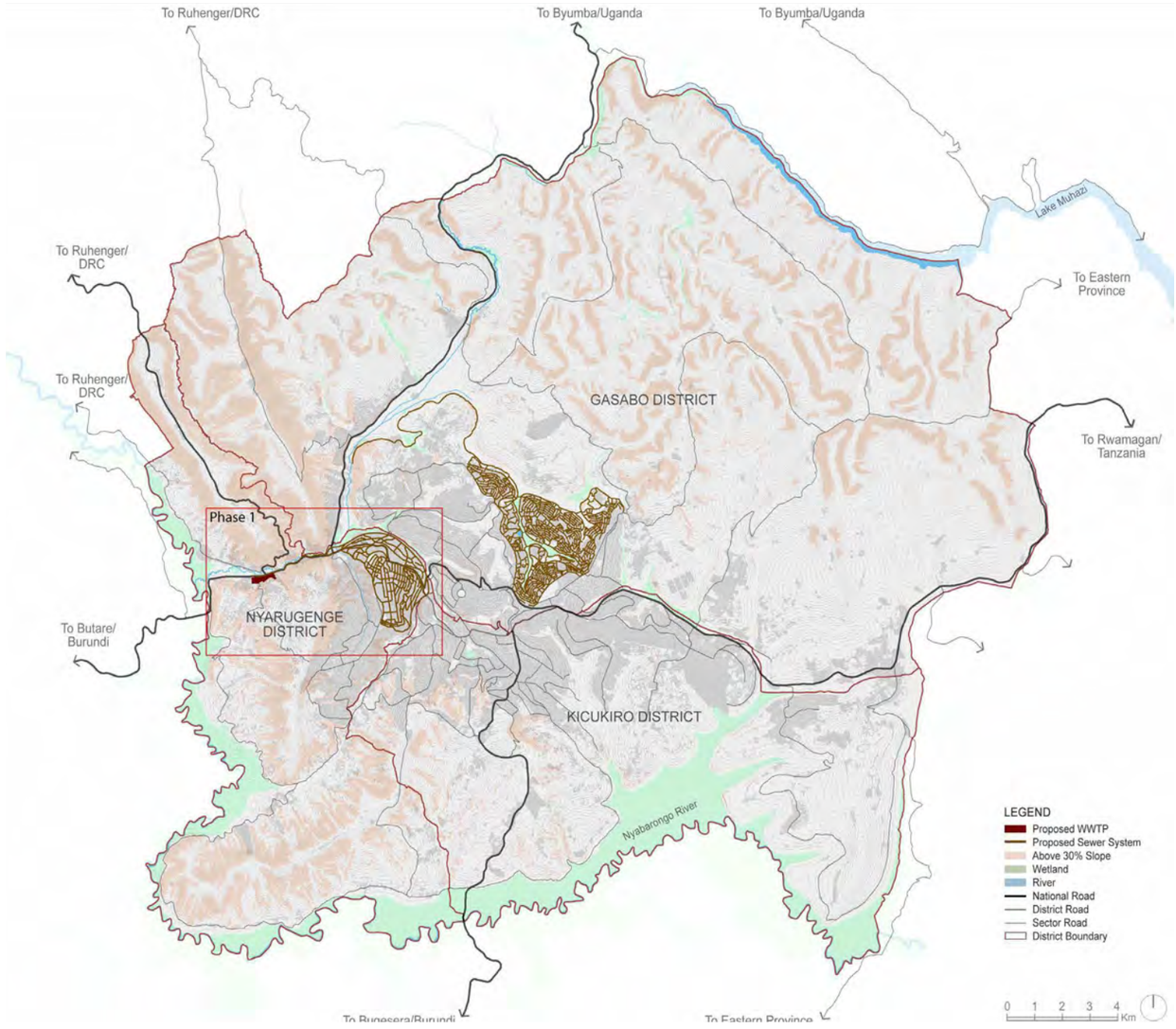


Figure 4.51 Proposed Sewer System

surrounding areas. According to the report by Mott MacDonald titled "Kigali Central Sewerage – Engineering Design and Preparation of Tender", the location has moved to the other side of the road adjacent to the quarry to reduce the environmental risks.

Phase 1 of this system will serve the following areas: Muhima, Nyarugenge, Kacyiru, Kimihurura, Kimironko, Remera and Nyarugunga, with a combined population of 51 000 people.

The plant (phase 1) will have the following operations to cope with projected 2020 flows of 12 000m3/day:

1. Preliminary treatment;
2. Enhanced primary chemical treatment;
3. Biological treatment through activated an sludge process;
4. Final settling; and
5. Mechanical dewatering of sludge

According to the consultants working on the WASAC Master Plan (Lotti Associati), construction of Phase 1 of the works (Figure 4.51) is said to begin in October 2018.

The Nduba landfill had a large pit to receive faecal sludge, this is no longer in use and all sludge is taken to the Pivot Plant, discussed in more detail below. According to the "Kigali Urban Sanitation Study" by Oxford Policy Management, there are plans for a Faecal Sludge Treatment Plant and another WWTP at a site in Masaka. Further details will be confirmed by the WASAC Master Plan.

Domestic Sanitation Systems

2 main domestic sanitation "systems" that are widely used in the City are:

1. Septic Tanks:
   - Septic tanks are widely used in urban areas. Effluent from the septic tank is directed into leach fields; and
   - The City operates vacuum tanker trucks to handle and dispose of the sludge from the septic tanks at the temporary Nduba landfill
2. Pit latrines:
   - Traditional soak away pit latrines and ventilated pit latrines are the most common types. Pit latrines are commonly used in informal settlements and rural areas without piped water supply;
   - In some areas with high ground water table, the use of pit latrines has been found to contaminate the ground water. EcoSan (Ecological Sanitation) toilet has been implemented in several public schools in the City. It provides an economical and hygienically safe system to separate and recycle the urine and faeces back into the environment through agriculture. The funding for the EcoSan construction comes from the NGO (Non-Government Organization) while the District Office provides the man power required. The long term goal is to equip all the public schools in the City with EcoSan; and

- Despite all the effort to treat the sewage at the household level, raw sewage discharge into the public drain and water bodies is still happening in the City

Due to the high number of septic tanks and pit latrines in the City as well as the absence of sewer networks, it would suggest that the demand for emptying services is very high. However, residents in Kigali have been able to work around using emptying services by constructing very deep pits and also closing up pits that are full and building new ones.
"Pit Vidura" is a pit exhausting service that operates in the dense settlements of Kigali. The demand for this service arose due to pit latrines not being accessible for traditional exhauster trucks. It is also said that some exhauster trucks refuse to service some accessible areas because of complications regarding the weak structural integrity of the pits as well as high volumes of solid waste.
Pit Vidura uses an eVac pump to remove sludge from households and transports it to the Pivot Works fuel factory at the Nduba landfill site. The faecal sludge is turned into biofuel after dewatering and drying. This is a demonstration plant that receives approximately 100m3 of sludge per day. Depending on government approval, Pivot aims to upscale their operations to a full-commercial plant. Pit Vidura is also aiming to develop a "pit-to-road" pumping system to enhance the efficiency of the emptying process.

On-site STP

There are currently 22 package treatment plants in Kigali. It must be noted that no verification and monitoring are done after the approvals and installation of these systems. According to the "Report on the assessment of the performance of semi-centralised sewerage systems in Kigali Estates" prepared by WASAC in 2017, there are currently various issues with the on-site STP's such as:

1. Clogging of sewers;
2. Broken aerators;
3. Disconnection from the sewer systems;
4. Lack of financial recovery for the user;
5. Regular maintenance; and
6. Quality of effluent discharge does not comply with national standards

WASAC investigated all the problematic areas and recommendations have been provided in the report to improve the current issues and difficulties encountered by the users.

Industrial Waste Water

According to the 2013 Master Plan, not all waste water from industrial facilities is treated. It many cases it is discharged into public drains which ends up contaminating water bodies such as wetlands and rivers.

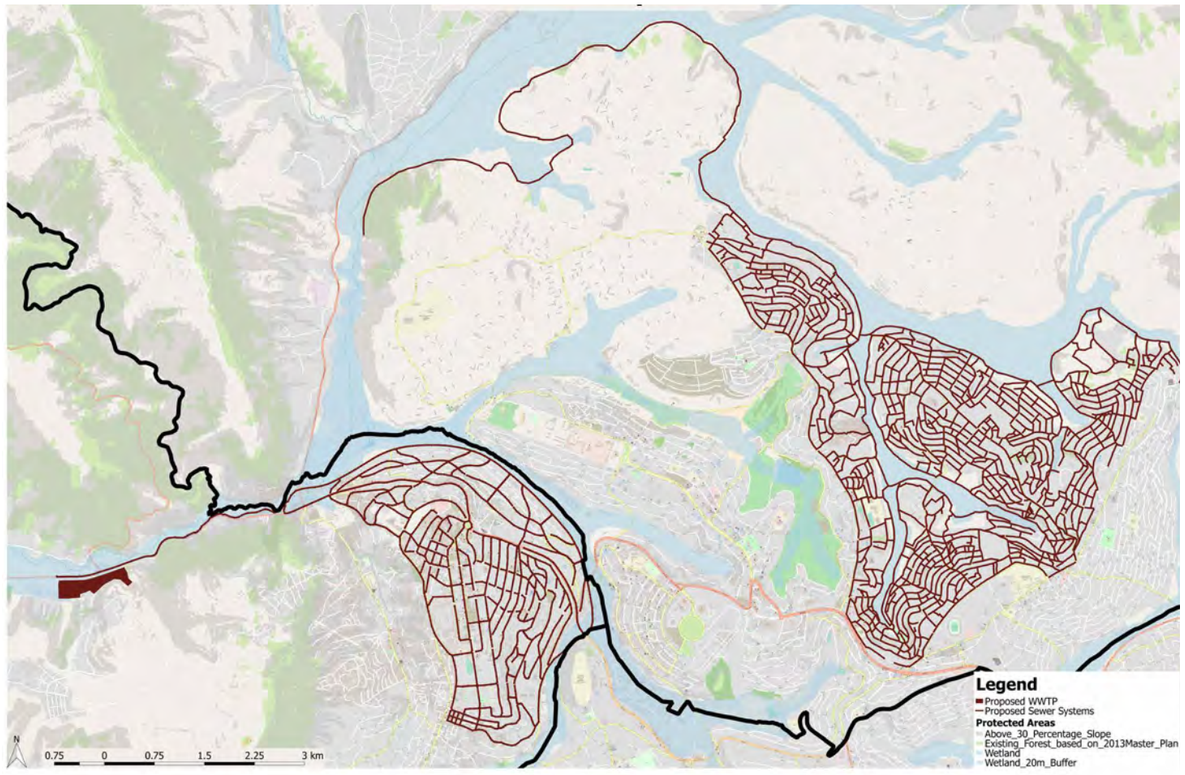


Figure 4.52 Proposed Sewer System Close Up

Level of Service

In the article "WASAC to spend $300 million on water and sanitation projects" by The New Times, access to sanitation services in urban areas stands at 84%, when compared to 72.2% in rural areas. The following map is an indication of the levels of service that the population of the City of Kigali has access to.

Ongoing Projects

According to the Economic Development and Poverty Reduction Strategy (EDPRS) II, Rwanda has committed itself to achieve 100% sanitation service coverage by 2017/2018. Waterborne sanitation systems have not been implemented throughout the country but some centralised sewerage systems have been developed within different estates in Kigali.

As discussed in section Sewage Treatment Plants, the proposed central sewerage network will collect waste the Gatenga Sector (Kicukiro), the Nyarugenge CBD and the Muhima Sector. This will include 86km of sewer network with a 3.1km bulk line construction is estimated to take 36 months. The waste will drain towards the proposed Gitikinyoni STP. Studies for these projects, including feasibility, environmental and social impact studies have been approved by WASAC and project is currently out of tender.

Key Issues to be Addressed

Some of the key issues to be addressed by the City are as follows:

Direct discharge of sewage into the existing water bodies: This not only contaminates the water quality in water bodies but also poses a threat to public health. The City needs to progressively phase out septic tanks in the urban areas and provide adequate STP and sewer connections to curb the problem of direct sewage discharge.

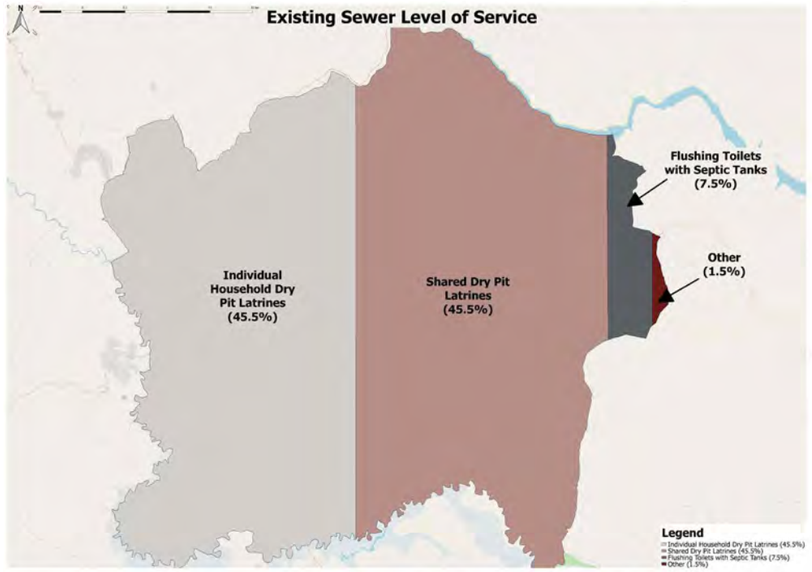


Figure 4.53 Sewer Level of Service

Contamination of ground water by pit latrines: As the sewage infiltrates the soil, it needs time to be treated by the organisms and cations in the soil. Most of the contamination cases usually occur at the areas with high water table or near the water bodies when the sewage has shorter retention time in the soil. The use of pit latrines at these areas needs to be prohibited in the future and be replaced with more environmental friendly system.

Semi-centralised sewerage systems efficiency: Many of these systems have functional problems such as; clogging, broken aerators and disconnection from the main sewer system. Other issues are lack of financial recovery for the users as well as the effluent discharge not complying with national standards.

Sludge Waste: The new WWTP should make provision for receiving sludge from exhauster trucks. The City should encourage converting the sludge into biofuels, as done at the Pivot Plant.

Faecal sludge management: Removal services should be improved in unplanned settlements by upscaling the eVac services and regulating manual emptiers to avoid illegal dumping of sludge. Standards should be established for containment, emptying and transportation of sludge.

Technical experience: A capacity development programme will need to be put in place to train CoK staff in terms of managing, operating and maintaining sewerage systems and waste water treatment plants.

Applicable Policies and Plans

The following section highlights some key points applicable to sanitation from current policy documents:

1. The objectives of the National Sanitation Policy (NSP 2016) are:
   - Individual sanitation: "Raise and sustain household sanitation coverage to 100 per cent by 2020, and promote hygiene behaviour change";
   - Institutional sanitation: "Implement improved sanitation for schools, health facilities and other public institutions and locations"; and
   - Off-site collective sanitation: "Develop safe, well-regulated and affordable off-site sanitation services (sewerage and sludge collection, treatment and reuse/disposal) for densely populated areas"
2. The National Informal Settlement Upgrading Strategy by MININFRA 2015, states that on-site sewer treatment is a minimum standard for developments and conventional sewers are only applicable if there is a centralised treatment facility

Smart & Green Initiatives

1. Decentralised technologies are more sustainable in the context of rapid urbanisation – septic tanks, biogas digesters, compost toilets, VIP's;
2. Implement groundwater quality monitoring system; and
3. Comprehensive strategies for sustainable sanitation systems – from collection to reuse (i.e.: converting sludge into energy sources, or fertiliser etc.)

4.6.3 Stormwater

The stormwater drainage system in the City of Kigali is constructed and maintained by the Infrastructure Department of the City. This City plays a reactive role by identifying flood-prone areas, but there is no existing Stormwater Management Plan and no modelling is done. Due to the rapid urbanisation in Kigali the land covered by infrastructure such as buildings, roads and other hard surfaces has increased dramatically over the years. In turn, increasing the surface stormwater runoff in the city.

Stormwater Catchments

The City of Kigali has an annual rainfall of approximately 1 000mm with April being the wettest month and July the driest. The City of Kigali catchment area is 730 km2, with three mountain ranges: Rebero, Kigali and Jali. Topographically, stormwater runoff from the City is divided into 2 major catchments – northern and

southern catchments. The northern catchment drains into Nyabugogo River then into the Nyabarongo River to the west of the City while runoff from southern catchment drains directly into the Nyabarongo River in the south. Catchment management is done on a national level by RWAF and catchment plans are available.

Existing Stormwater Drainage

The existing drains in the City of Kigali are usually constructed on one side of the road and the ones in the City centre are mostly covered. In general, the existing drainage network in the City consists of 3 types of drain structures:

1. **Open masonry channels** – mostly with cascades due to the steep slope;
2. **Covered masonry channels** – mostly with cascades due to the steep slope; and
3. **Unlined natural channels** – which are subjected to high erosion

Most of the existing channels are well constructed and have adequate drainage capacities. However, some of the channels are damaged and need to be rehabilitated. In some places within the City, the channels are located along steep natural earth slopes, hence, there is a high possibility that the soil might slide into the channel and be deposited further downstream in the natural wetlands and eventually the rivers. The eroded slopes and valleys in many areas could result in landslides which would threaten life and damage property. The lack of covers over drains allows residents to dispose of their waste water and solid waste directly into the drains. During a storm event, the naturally steep drains cause all the waste materials to be washed down and accumulated at the receiving water bodies.

The absence of a sewerage network and proper on-site treatment has prompted the discharge of sewage into public drains. This in turn, reduces the capacity of the drains and creates health problems for the residents. At areas where there is no proper drainage

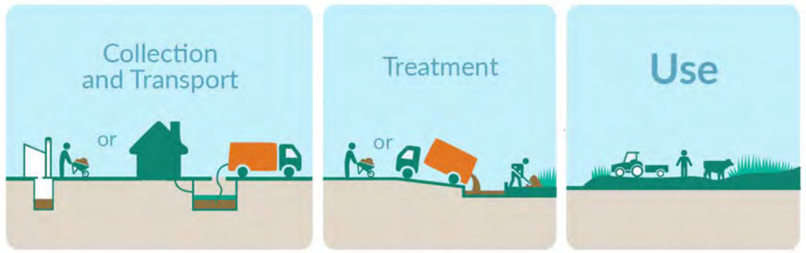


Figure 4.54 Sustainable sanitation cycle
Source: GGGI – National Roadmap for Green Secondary City Development

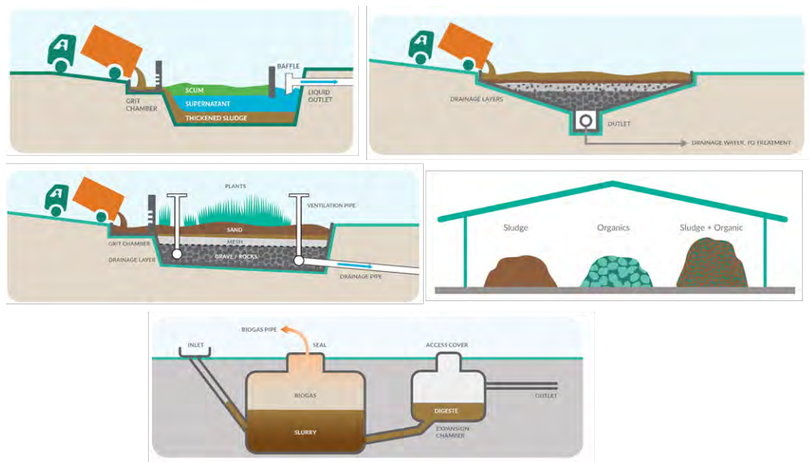


Figure 4.55 Sludge Reuse
Source: GGGI – National Roadmap for Green Secondary City Development

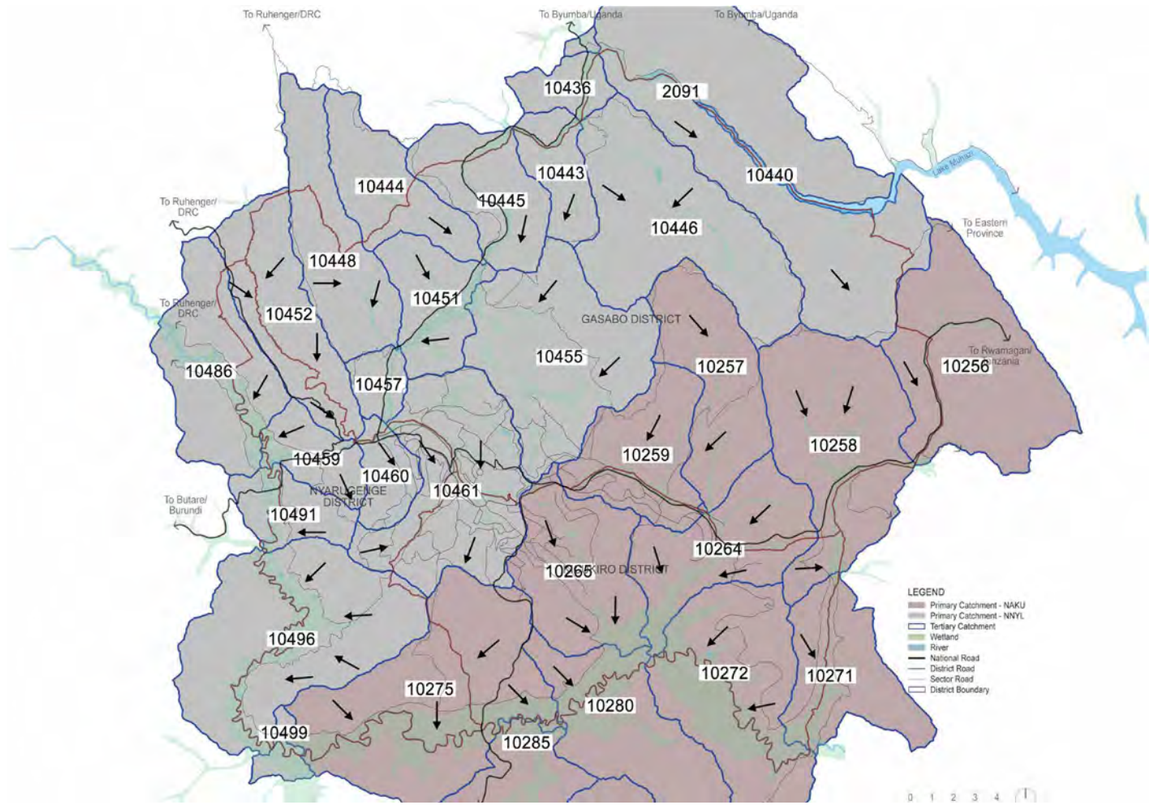


Figure 4.56 Stormwater Catchments
Source: RWAF

system, temporary ditches have been constructed to prevent stormwater from flowing into homes. Eventually, rapid urbanization of the City will cause higher stormwater runoff, and if proper stormwater management measures are not taken, this will lead to increased erosion and flood problems.

Stormwater Management and Floods

According to a report prepared by CoK titled: "Assessment of Current Storm Water Management and Flood in the City of Kigali Areas", flooding in Kigali has increased significantly since the 2000s due to climate change and rapid urbanisation. The following areas have recently been affected by flood events in Kigali and are still at high risk: Nyabugogo, Kinamba, Kanogo, Rwampara, Rugunga, Mulindi, Gikondo-Magerwa, Masaka and Utexrwa. This report makes reference to the effects of heavy rainfall from January to May 2018 based on MIDIMAR data.

Figure 4.57 Open masonry channel

The National Sanitation Policy (December 2016) states that urban stormwater planning and implementation are the responsibility and task of the municipalities (Districts and CoK), but no specific task force is in place at a national level.

Key Issues to be Addressed

Some of the key issues to be addressed by the City are as follows:

Lack of separation between stormwater and waste water: This is affecting the water quality in the public drains and eventually the receiving water bodies. To resolve this issue, close coordination with the implementation of the sanitation policy and proper sewage treatment system is necessary.

Figure 4.58 Covered masonry channel

Figure 4.59 Unlined natural channel

Maintenance and upgrading of the damaged channels: Damaged channels will not function at their optimum design capacity, which may cause localised flooding in the event of heavy rains. The City has to conduct regular checks and maintenance of the existing drains to ensure that they are in good condition.

Lack of stormwater management: Stormwater should be seen as a resource to be valued and not to be got rid of. As the City has a considerable amount of rainfall annually, with proper stormwater management, it could be harvested for non-potable use such as landscape irrigation and general area washing. Besides, providing an additional water resource, proper stormwater management (e.g. rainwater harvesting and stormwater retention) would also help to reduce flood risks.

Lack of proper drainage design guideline: Without a standard local design guideline, there is no common basis for designing drains in new developments or for verifying the adequacy of the drainage capacities of the receiving drains and canals. With the rapid urbanization process, and for proper development control; a local standard guideline with relevant rainfall data should be established.

Erosion at the areas with steep slopes: The Gikondo Industrial Area is an example of a problematic area. The government has been relocating the industrial zone since 2013 to the newly established SEZ in Gasabo, however this is not complete due to lack of funding. The slopes result in the eroded soil ending up in the water courses and water bodies, thus reducing the drainage capacity and polluting the water environment. Earth control measures such as afforestation, soil terracing, contour farming, etc. should be implemented to minimise soil erosion.

Need for policy: CoK should develop a policy to deal with on-site attenuation for short-duration, high-intensity storms. This policy should also deal with excess stormwater runoff that cannot be viably contained and how this should be accommodated by downstream land owners.

Building plan approval: The approval process should include a stormwater management plan that addresses how stormwater will be controlled on the site and points out the areas downstream of the site that could potentially be affected.

Table 4.19 Effects of heavy rainfall events

District	Deaths	Injuries	Houses Damaged
Gasabo	16	8	869
Kicukiro	8	6	52
Nyarugenge	7	17	1088
Total	**31**	**31**	**2009**

Relocation in high risk zones: It should be reinforced that people settling in high risk zones such as wetlands, flood-planes, and steep slopes (30%+) should be relocated. The following map indicates the undevelopable areas in the City. The areas that are shaded in dark maroon represent zones that are steeper than 30% which are seen as unsafe slopes for development.

Smart & Green Initiatives

1. Invest in a high resolution LIDAR survey for the entire CoK to provide a basis for all planning and design in CoK;
2. Hydrological modelling based on LIDAR survey;
3. Develop Early Warning Systems (EWS) for disaster management, hydrological model to be the basis of this system;
4. Water quality monitoring to be automated and linked to central control room in RWFA – information to be linked and shared with CoK; and
5. Rainwater harvesting and reuse

4.6.4 Solid Waste

Solid waste management in the City of Kigali is taken care by the Infrastructure Department of the City. Kigali is known to be one of the cleanest cities in Africa. This is due to the combination of good leadership, privatisation of waste collection and transportation and community participation "Umuganda". Management of the private companies is done as follows:

1. RURA – provides licences for companies to operate (According to a document titled "Perspective of Solid Waste Collection in the City Of Kigali" for the Africa Engineering Conference in 2017, over 18 companies and Community Associations have been licenced in CoK);
2. CoK – manages the private companies that collect and transport waste to the landfill; and
3. REMA – provides regulations and guidelines for waste and environmental management

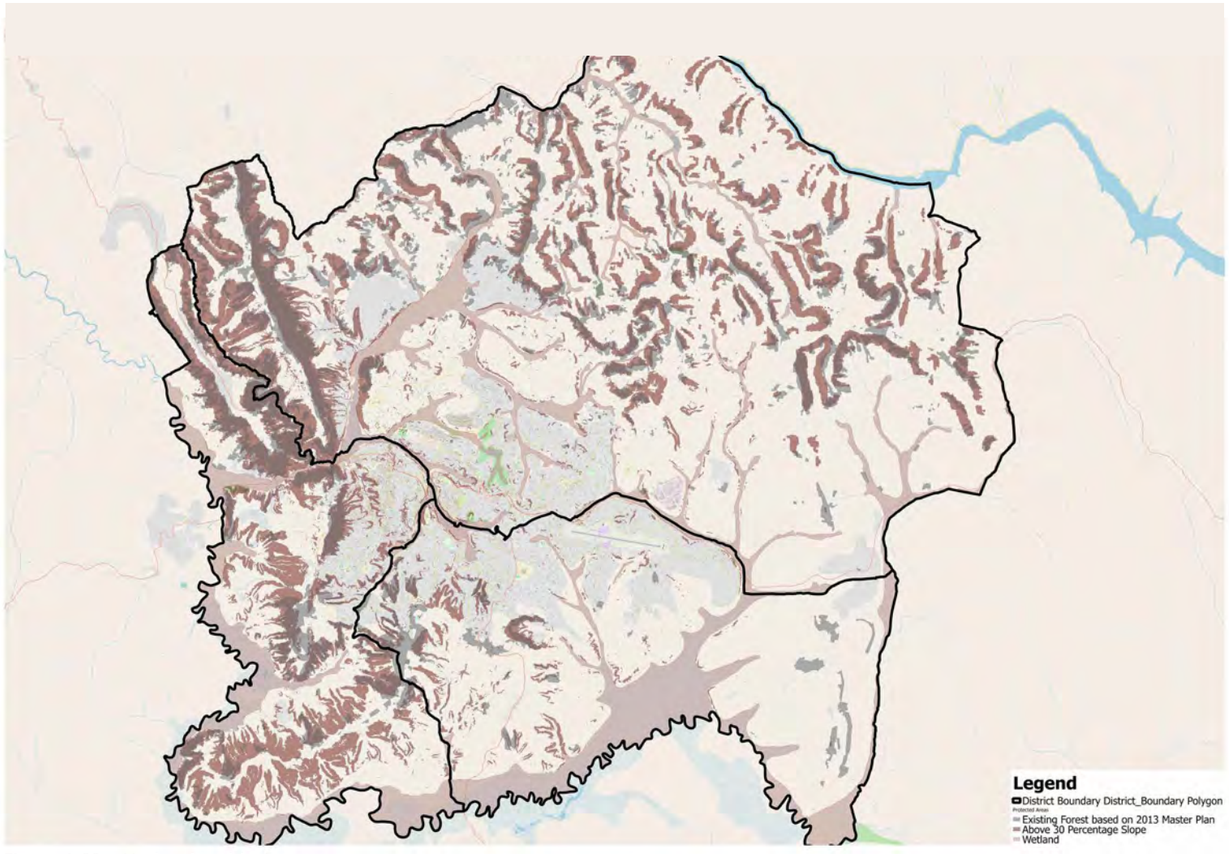


Figure 4.60 Undevelopable Areas

Waste Generation

The current solid waste generation the City of Kigali is approximately 900 tonnes per day, using a rate of 0.6 kg/cap/day and an estimated population size of 1 500 000.

There are 3 main categories of solid waste generated in the City:

1. **Organic Waste** – Biodegradable waste is the main type of waste generated in the City. Examples of organic waste are food waste, biomass and garden waste. They are usually disposed of directly into the landfill. Recycling and re-use of organic waste have been initiated although they are still at very low levels;
2. **Non-organic Waste** – Plastic, paper, glass, metal, and combustibles are the most common non-biodegradable waste. Recycling of non-organic waste is not common. However, the City Council had banned the use of plastic bag within the City to reduce the amount of plastic waste; and
3. **Hazardous Waste** – Any waste that poses threat to human health and the environment is classified as hazardous waste. They are mainly generated by hospitals, industries and other facilities. Currently, hazardous waste is disposed of at the municipal landfill together with other types of wastes. Some hospital and industries incinerate their wastes on site.

Collection and Transportation

The collection and transportation of solid waste in Kigali is done by the private sector. Billing is done directly from the service provider to the household. The reason for the involvement of the private sector is as a result of CoK not having the capacity to provide the service, as well as the enforcement of by-laws prohibiting the dumping of waste outside private properties. Various private companies have designated areas within which they operate, as indicated in the following figure.

Waste Disposal - Landfills

The following map Figure 4.61 shows the location of the existing landfills in Kigali. The Nyanza landfill has reached its capacity and is no longer in use, it was closed in 2014. The Nduba landfill is temporary, and not an engineered landfill site. According to the "Kigali Urban Sanitation Study" by Oxford Policy Management, the Nduba landfill does not treat waste to any standard, it only contains it. This is also the location of the Pivot treatment works site that was established in 2015. The long-standing faecal sludge dump site at Nduba has now been replaced by the Pivot demonstration plant. Funds are required to implement a new, engineered landfill.

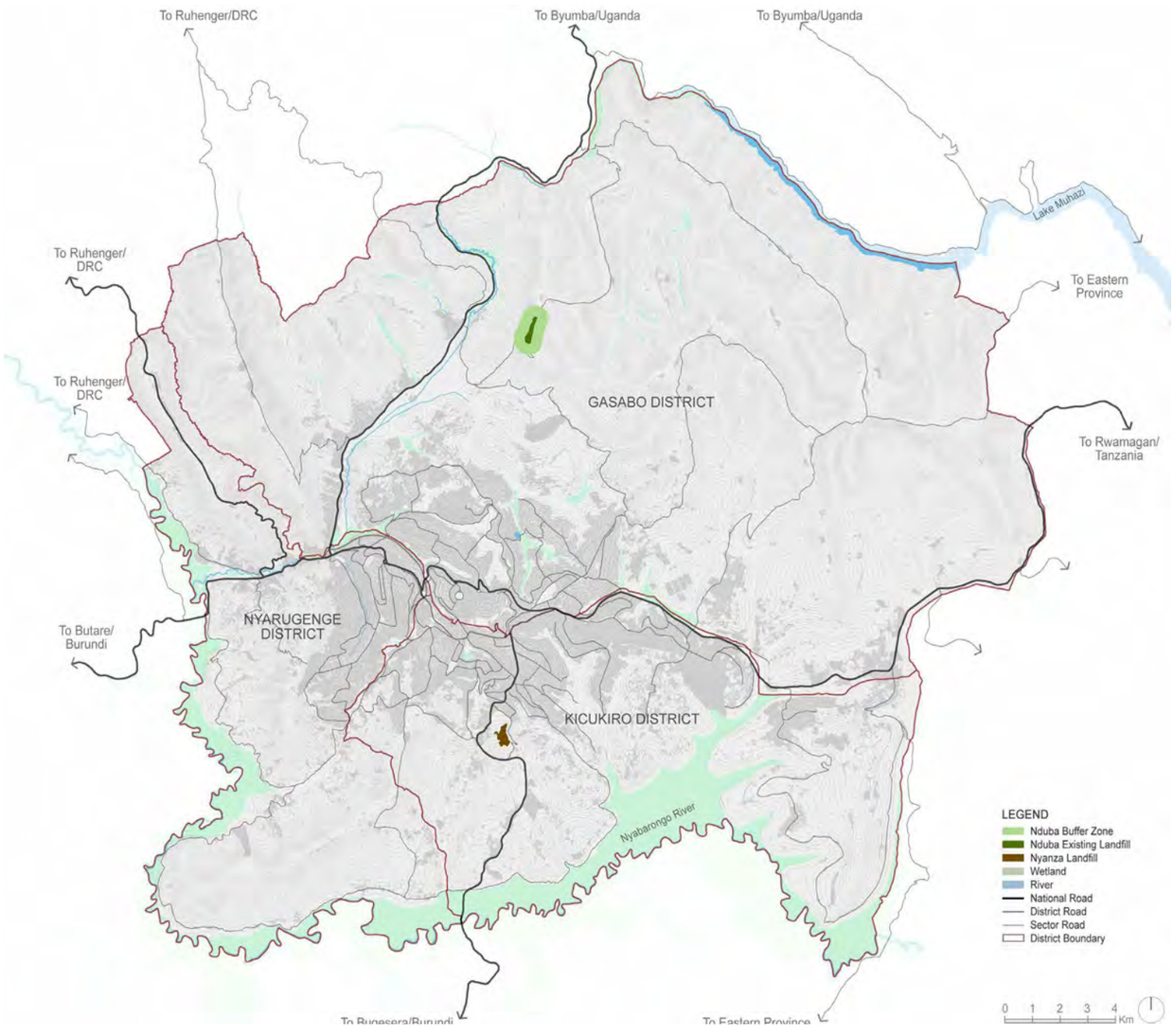


Figure 4.61 Existing Landfills

Ongoing Projects

The City of Kigali is planning to construct a regional sanitary landfill and recycling centre to replace the existing Nduba Landfill. The proposed 11-ha site is located 2.6km in the east of the brick factory Ruliba, Nyarugenge District. The new landfill will serve the entire City of Kigali. Various detailed studies and surveys have already been done for this landfill however funds are required for its implementation.

Key Issues to be Addressed

Some of the key issues to be addressed by the City are as follows:

Implementation of regional landfill and recycling facility: As raised in the previous Master Plan, the site that is currently being considered by the City has several limitations such as its proximity to the City Centre and Nyabarongo River, one of City's main water sources. Higher priority needs to be given to this project. Ideally the landfill site should be located away from the population. It should be properly lined to prevent the leachate from infiltrating and contaminating the ground, with a monitoring protocol. To increase the life span of the landfill, waste recycling should be encouraged at various stages before disposal at the landfill.

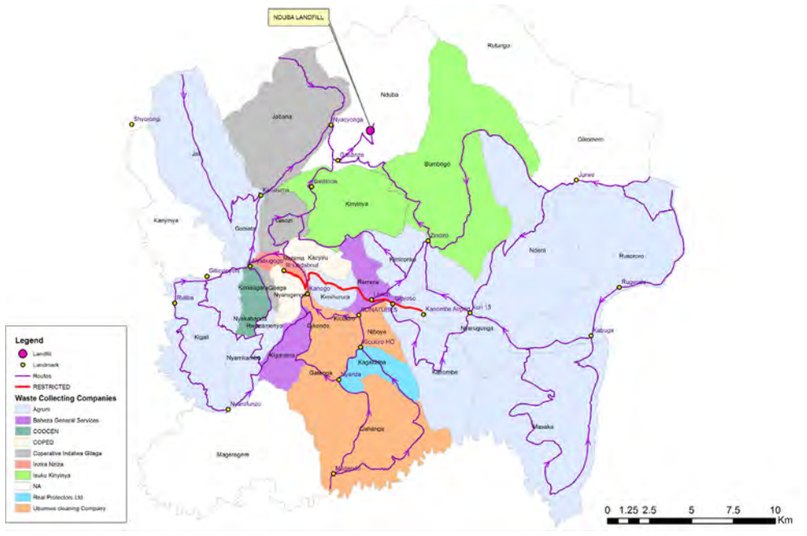


Figure 4.62 Waste collection & transportation companies in CoK

Source: Perspective of Solid Waste collection in the City of Kigali

Close Nduba landfill: The current Nduba landfill, which was only for temporary use should be closed and the appropriate rehabilitation steps taken.

Waste management plan: CoK to develop a waste management plan.

Waste unit: A waste unit department to be established in CoK to manage, monitor and implement the waste management plan.

Separation at source: A "separation-at-source" programme should be developed with supporting infrastructure.

Household collection issues: Frequency of removal is not in-line with the rate of waste generation. Transfer stations are required to reduce the collection time and increase frequency of collection. The types and sizes of collection vehicles are not always appropriate for the areas in which they operate. Vehicles are not monitored in terms of trips/ movement and weight.

Smart & Green Initiatives

1. Reduce waste generation;
2. Separation at source to enable efficient recycling; and
3. Landfill monitoring systems to ensure green and efficient sanitary landfills

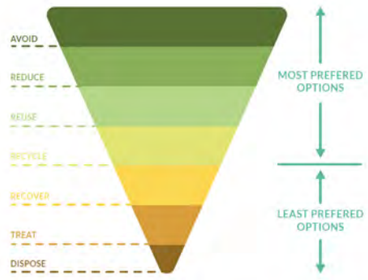


Figure 4.63 Green solid waste management hierarchy

Source: GGGI – National Roadmap for Green Secondary City Development

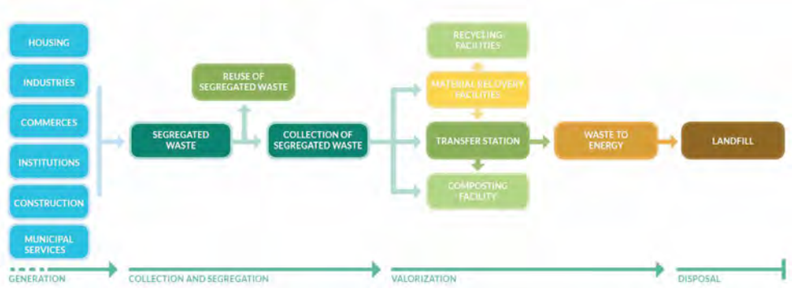


Figure 4.64 Waste flow in a Green City

Source: GGGI – National Roadmap for Green Secondary City Development

4.6.5 Power Supply

Institutional Framework

Law No. 21 of 2011, gazetted in July 2011, presents the legislative underpinnings of the Rwandan electricity sector. The law governs the activities of producing, transmitting, distributing and trading of electricity within the country as well as outside the national territory. The law holds specific reference to the licensing of entities for each of these activities, with the licensing handled by the utility regulatory agency.

The regulatory authority for the electricity sector is the Rwanda Utilities Regulatory Authority (RURA).The Rwandan electricity sector is guided by the strategic framework set by the Energy Sector Strategic Plan (ESSP) and the Rwanda National Energy Policy (RNEP), compiled and published under the auspices of the Ministry of Infrastructure (MININFRA). RNEP highlights the integral importance of "modern, sustainable and affordable energy services" to "Rwanda's economic development, poverty eradication and socioeconomic transformation agenda". RNEP "provides high-level direction on the longer-term goals, priorities, and approaches" for the energy sector. In conjunction with this high level plan, the "ESSP is a more focused action plan that measures short-term progress toward long-term goals and objectives".

RNEP identifies seven priority areas in the electricity sector namely: "hydropower, methane gas, geothermal, bioenergy, solar power, peat and efficiency and demand-side management". Each priority area will have an implementation action plan developed by the relevant ministries. These action plans will reside under the ESSP and shall be aligned to policy objectives.

According to information published on their website, "The Rwanda Energy Group (REG) was incorporated to expand, maintain and operate the energy infrastructure in the Country through its two subsidiaries the Energy Utility Corporation Limited (EUCL) and the Energy Development Corporation Limited (EDCL). The object of creating these subsidiaries amongst others was to ensure focused attention to enhancing efficiency in utility operations (by EUCL) on one hand and ensure more timely and cost efficient implementation of development projects (by EUDL) on the other. Moreover, the REG holding structure provides the overall coordination and ensures effective development of energy and investment plans".

EUCL has the following core business process:

1. Policies planning;
2. Marketing planning and development;
3. Distribution planning and development within already electrified areas; and
4. Operation & Maintenance of Power Plants and Transmission & Distribution Networks owned by the Utility

EUCL also plays a central role in the implementation of Power Purchase Agreements with Independent Power Producers and other regional utilities.
EDCL focuses on:

1. Increasing investment in development of new energy generation projects;
2. Develop appropriate transmission infrastructure to evacuate new plants and deliver energy to relevant distribution nodes; and
3. Plan and execute energy access projects to meet the national access targets

Generation Planning

REG presents the planning for power generation projects as the Least Cost Power Development Plan (LCPDP). The LCPDP focuses on the following aspects:

1. Meeting growing demand in the country;
2. Minimizing the cost and therefore achieve a lower electricity cost to customer;
3. Maximizing the use of renewable energy in the generation mix;
4. Maximize the generation availability through all seasons;
5. Maintaining available capacity at 15% reserve margin; and
6. Guiding the selection of appropriate technologies to meet energy demand at 10% growth

The latest iteration of the LCPDP finds that the balancing of demand and supply of electricity is best served by adopting an energy demand growth scenario with a growth rate of above 10%. The LCPDP indicates that generation projects currently in development will increase installed capacity to 544.07 MW by FY 2024/25.

Table 4.20 Current Generation Projects

Current Generation Projects				
Big 9 (MW)	Installed Capacity (MW)	Available Capacity (MW)	Technology	Commissioning date
Kivu Watt	26.4	25.08	Methane	2016
Jabana II	20	19	Diesel	2009
Gishoma Peat	15	14.25	Peat	2017
Nyabarongo	28	13.44	Hydro	2014
Ntaruka	11.25	2.5875	Hydro	1959
RUSIZI II	12	10.68	Hydro	1986
MUKUNGWA I	12	6	Hydro	1982
RUKARARA I	9.5	3.8	Hydro	2010
So Energy	30	28.5	Diesel	2017
Others	51.9	27.2	Mixed	1957-2017

Table 4.21 Ongoing and Planned Generation Projects

Ongoing and Planned Generation Projects				
Power Plant Name	Installed Capacity	Available Capacity	Technology	Commissioning/ Expected CoD
Kivuwatt I extension	8	7.6	Methane	2019
Hakan-Mamba	80	76	Peat	2020
Rusumo FHPP	26.7	25.37	Hydro	2021
SymbionI	50	47.5	Methane	2022
Symbion extension	25	23.75	Methane	2022
Rusizi III	48.33	45.92	Hydro	2023
Nyabarongo II	43.5	24.8	Hydro	2024
Small IPPs	46.49	17.13	Hydro & Biomass	2023

The generation infrastructure listed above presents a generation energy mix that moves from hydropower dominance in 2018, to dominance of thermal generation in 2024.

According to the current 2025 generation plan, the share of methane generation is to increase to 57.8%, supplanting hydropower as the largest contributor to generation capacity. In addition, diesel power plants are to be removed and left with only 1.6% of the energy mix share.

The latest LCPDP includes expansion of the planning horizon to 2030, focusing on the balance between the simulated

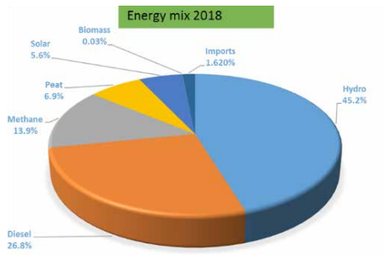


Figure 4.65 Energy Mix 2018

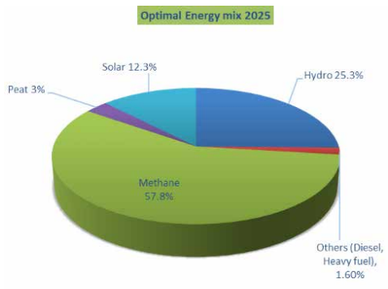


Figure 4.66 Optimal Energy Mix 2025

demand (at 10% growth) and the declared supply infrastructure. This comparison reflects that the dispatched energy (available generation less reserve margin) is able to match the forecast demand, with specific pressure during 2018 and 2019, with a return to a supply constrained situation possible during 2030.

The LCPDP identifies the effects of dry season availability of hydropower as a major concern prior to the commissioning of Hakan power plant. The LCPDP offers the importing of power as least-cost short-term solution. The LCPDP also makes recommendations on the coordination of economic

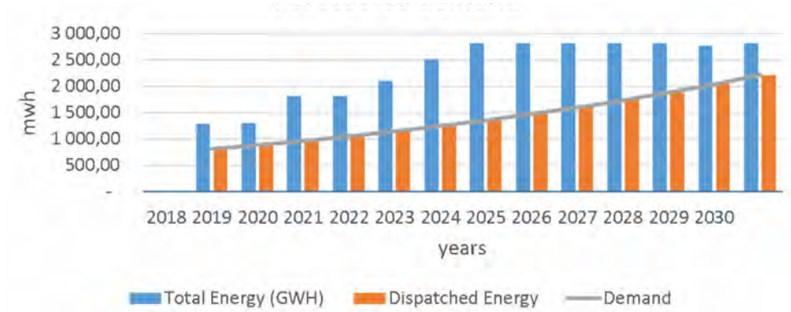


Figure 4.67 Available energy vs Dispatched energy vs Forecasted demand

development planning and generation planning, the introduction of new plant, as well as the terms of power purchase agreements.

Transmission Planning

REG prepares the Transmission Master Plan for Rwanda, with the latest version released during 2018. The transmission plan overs the evacuation of power from generation stations to major substations across the country, cross-border interconnecting transmission lines, network reliability, redundancy and contingency planning, as well as maintenance planning.

The transmission network is still challenged with being isolated from neighbouring countries' networks, lack of redundancy options at substations and generation plants and technical losses. The transmission plan criteria seek to address the challenges of redundancy and losses. The criteria include provision that disturbances at lower voltage levels must have the least possible effect on the higher voltage network. The planning criteria specifically provides minimum guidelines for the configuration of substations and lines for future implementation.

Distribution Planning

The latest iteration of the REG Distribution Plan reflects significant development of distribution networks (typically 15kV and 30kV voltage level) at centres of population and economic activity. The urban area of Kigali City presents the highest concentration of distribution networks in the country.

The Distribution Plan notes the technical challenges of long feeders (resulting in increased losses), lack of redundancy and flexibility, and network instability. It is feasible that the solution to these challenges may lie in the implementation of distribution expansion plans. These solutions include:

1. The introduction of new substations, thus reducing feeder lengths;

2. The introduction of new feeders, enabling transfer of loads;
3. Planning for redundancy (contingency measures); and
4. The phased implementation of future networks

The Distribution Plan depends on the same demand forecasting produced and presented under the Transmission Plan, ensuring coordination of planning between different infrastructure levels. The planning criteria specifically provides minimum guidelines for the configuration of substations and lines for future implementation.

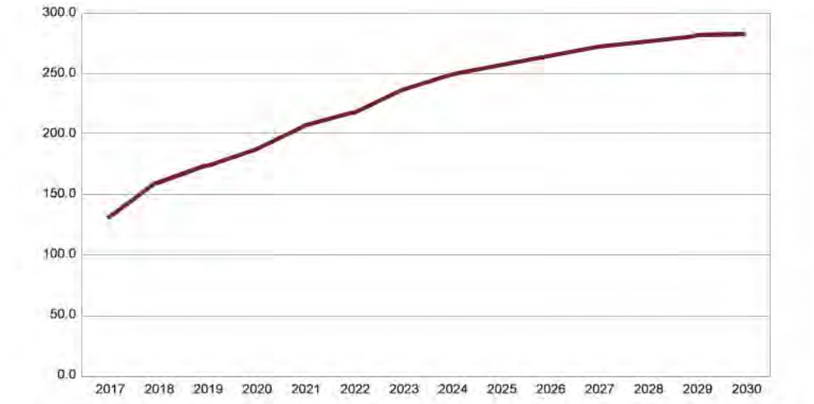
The Distribution Plan lists numerous projects focused on network reinforcement as priority for implementation. The reinforcement of the Kigali City network is given specific priority and attention as it is the largest load centre in the country.

Demand Forecasting

The REG Transmission Plan includes a load forecast that covers the entire country. The load forecasting methodology includes calculation of:

1. Growth on existing networks (existing customers and infill connections);
2. New networks (expansion); and
3. The introduction of bulk loads (step changes to growth curve)

The methodology provides for the identification and capturing of potential loads on geographical basis. Further to this, the methodology relies on assumptions concerning load saturation periods, and specific loads per connections (e.g. 80W per household ADMD).



Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Peak demand (MW)	130.0	159.7	173.9	188.2	205.1	218.0	236.5	249.5	257.2	264.9	272.5	276.6	280.0	282.7

Figure 4.68 Rwanda Grid Load Forecast after Modelling and Simulation with Power Factory

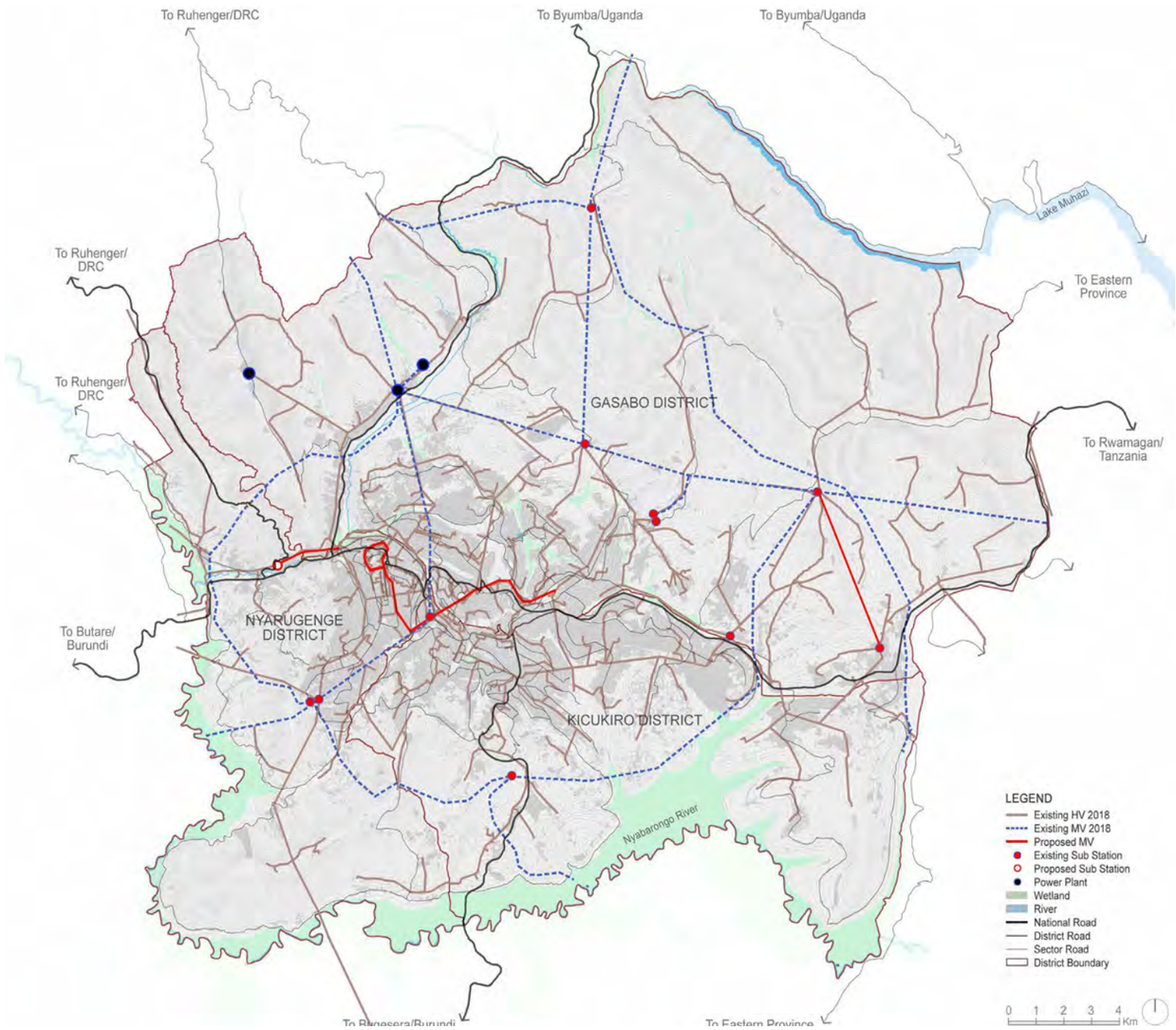


Figure 4.69 Electrical Supply

Critically, the methodology accommodates the reduction and clearing of universal access backlogs, as well as the continued demand growth that correlates with population growth. The targets for universal access indicate that 52% of all customers must be connected on-grid, with the remaining 48% off-grid. This situation drastically changes for the urban areas, where much higher figures for grid connections will apply. The figure below indicates the latest load forecast for the country, showing a peak at the 2030 forecast horizon of almost 283 MW, which is approximately double the current demand figure.

Electricity Supply Planning for Kigali City

Retrieving the granular information to assimilate the load forecast for the Kigali City region is the first step in reviewing the electricity sector master planning. Further steps include the identification of specific projects that relate to the demand growth and development needs of the Kigali City region. It also includes identifying and responding to gaps in the prior planning documents during the development of the updated master plan for the city. The focus will be on the correlation of the forecast and planned projects with the updated master plan.

The transmission plan encompasses a number of projects directly and indirectly related to the development of the Kigali City electricity supply, both at 110kV and 220kV voltage level. The 2018 Transmission Plan lists projects from 2018 up to 2024, with the following projects included in Table 4.22.

The Distribution Plan critically notes that Kigali City is currently supplied from a single source substation. This lack of redundancy and flexibility is detrimental to maintaining and nurturing growth and development of the economic sectors in the urban area; therefore, the Distribution Plan focuses on reinforcement of the distribution networks of Kigali City, as presented in the image below.
The city centre is directly serviced from three distribution substations: Kigali North, Kigali South, and Ministere Substations. The other areas of the city are serviced from the Abbatoir and Mont Kigali Substations.

The Distribution Plan presents the city's distribution network linkage to the transmission network at three separate points, namely:

1. Nzove Substation;
2. Mont Kigali Substation; and
3. Gikondo Substation

Nzove Substation is planned to be constructed to the west of the city, with upgrades planned for the Mont Kigali and Gikondo Substations. The Distribution Plan includes project planning for dedicated and multiple feeders between the substations:

1. Nzove to Abbatoir (2 dedicated feeders);
2. Abbatoir to Kigali North (1 dedicated feeder);
3. Mont Kigali to Kigali South (1 dedicated feeder); and
4. Gikondo to Ministere (2 dedicated feeders)

At distribution level, Kigali City was supplied from two highly loaded feeders, which in future will be improved to six moderately loaded feeders. The Distribution Plan indicates that adequate redundancy can be achieved with the configuration of these feeders. In addition, the cable sizes will be increased resulting in higher power transfer capacity.

The 2018 Distribution Plan lists projects from 2018 up to 2024, with the following projects included in Table 4.23.

Table 4.22 Ongoing and Planned Generation Projects

Project Name	Project Component	Length/ Capacity	Estimated Cost(USD)
110kV single circuit Gahanga-Ndera at KSEZ	Construction of Transmission line Extension of Gahanga S/S Extension of Gasogi S/S	17.8	9,150,400
110kV Gahanga-Bugesera	Construction of Transmission Line	17.5	5,323,203
220kV Mamba-Rwabusoro-Bugesera	Construction of Transmission line Construction of Mamba S/S Extension of Bugesera S/S	73	48,090,400
Nzove Substation	Construction of Substation	30MVA	7,000,000
110kV Single Circuit Gahanga-Gasogi	Construction of Transmission line Extension of Gahanga S/S Extension of Gasogi S/S	17.8	9,150,400

Figure 4.70 Reinforcement of network

Table 4.23 Distribution Projects

Project Name	Line Length/ Capacity	Estimated Cost(USD)	Start
Reduce stress on Kigali (Jabana) short term solution using Base Feeder		721,000	2018
30kV Double Circuit Line Bugesera to Airport	OHL 7.5km	1,012,500	2018
Interconnection of Byumba Feeder with Shango S/S (30kV Distribution Line)	7km	967,071	2019
Split busbars in Kigali North and Kigali South for more flexibility in supply		60,000	2019
Upgrade of Gahanda-Gikondo distribution line	OHL 15kV 7.2km	952,941	2019
Gikondo-Ministere feeders (underground 2 x 240mm^2)	2.4km	2,000,000	2019
Mont Kigali to Kigali South (120/20 ACSR)	6.7km	869,120	2019
Nzove Substation (To be considered in Transmission Plan)	5 feeders		2019
Nzove to Abbatoir Line (2x120/20 ACSR)	5.5km	750,000	2020
Abbatoir Upgrade		1,250,000	2020
Reduce stress on Kigali (Jabana) using Nzove Substation		200,000	2021

The Distribution Plan recognises the need for "urgent interventions" to maintain reliable power supply which will contribute to the development of the country. The networks in and around Kigali City, as well as those in the Bugesera and Rubavu areas, have been prioritised for reinforcement over the planning horizon (up to 2024).

Tariffs

The following tables indicate the electricity tariffs for various categories, effective August 2018 from the REG website.

Additional tariffs for industrial customers can be found on the REG website.

Table 4.24 Tariffs for non-industrial customers

CATEGORY	CONSUMPTION (KWH) BLOCK/ MONTH	FRW/KWH (VAT EXCLUSIVE)
Residential	[0-15]	89
	[>15 – 50]	182
	>50	210
Non Residential	[0-100]	204
	>100	222
Telecom Towers	All	185
Water Treatment plants and Water pumping stations	All	126
Hotels	All	126
Health Facilities	All	192
Broadcasters	All	184

Level of Service

Rwanda Energy Group plan to provide access to every person in Kigali by 2020, 52% of customers will be on the grid with the remaining 48% off the grid.

The following map is an indication of the levels of service that the population of the City of Kigali has access to per district. Kicukiro has the best current level of service with 89% of customers on the grid, 3% off the grid and only 8% having no access at all. Gasabo has 73% on the grid, 3% off the grid and 24% having no access at all. Nyarugene currently has 73% on the grid, 1 % off the grid and 26% with no supply at all.

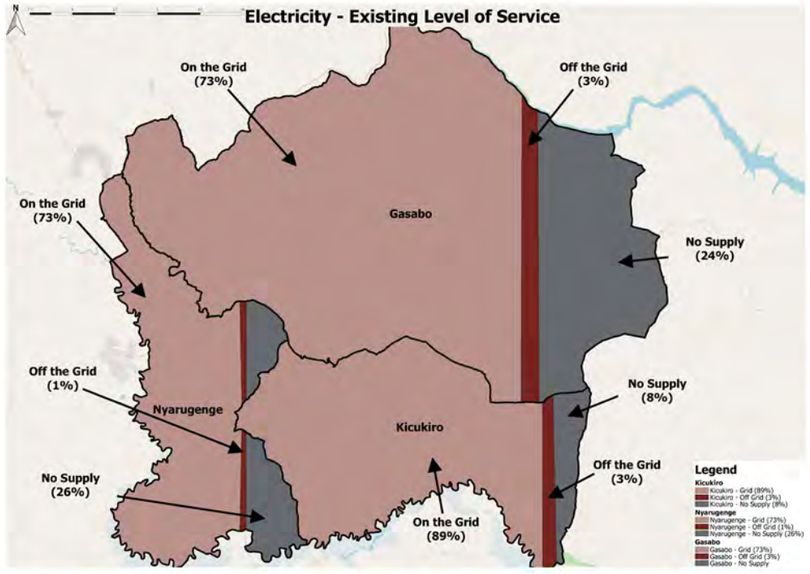


Figure 4.71 Electricity Level of Service

Key Issues to be Addressed

The implementation priorities of the electricity supply master plan have shifted from the plan prepared in 2013. Due to recurrent unplanned outages and demand growth in Kigali, the reinforcement of the electricity network has taken priority to ensure improved stability of the electricity supply. The update of the REG Distribution Master Plan is currently underway, with final validation and publishing expected by end 2018.

REG currently notes that the planned Bugesera airport location being further outside Kigali results in constraints on the provision of power. With the reinforcement of the electricity network taking priority, the expansion of electricity service to other peri-urban locations has been negatively affected. REG is addressing the power supply to the airport location with interim measures, which are to be coordinated and integrated with the planning of the surrounding areas.

Smart & Green Initiatives

1. Intelligent street lighting:
   - Replace high pressure sodium lamps with LED's; and
   - Adaptive street lighting
2. Telemetry with automated control of switching stations and transformers;
3. SMART metering systems; and
4. Implement the NEP for sustainable energy provision for all

4.6.6 ICT

In the City of Kigali, access to ICT infrastructure is "clustered", with a high concentration at the core which becomes more sparse at the periphery of the city.

Various documents such as: Vision 2020, ESPRS II, 7 year Government Program and Smart Rwanda 2020 Master Plan, all aim to transform Rwanda into a knowledge-based society. One of the main aims is focused on digital Government transformation driving a cashless and paperless economy. The Irembo platform has been developed as a one stop portal for numerous online government services.

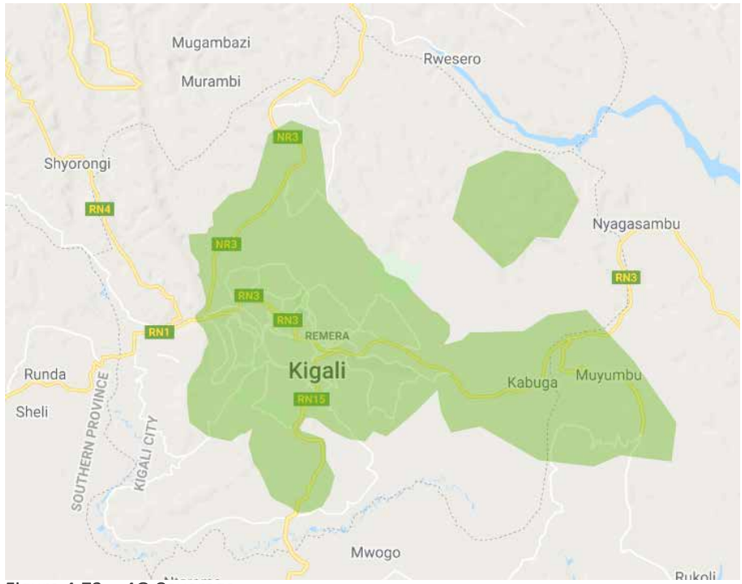


Figure 4.72 4G Coverage

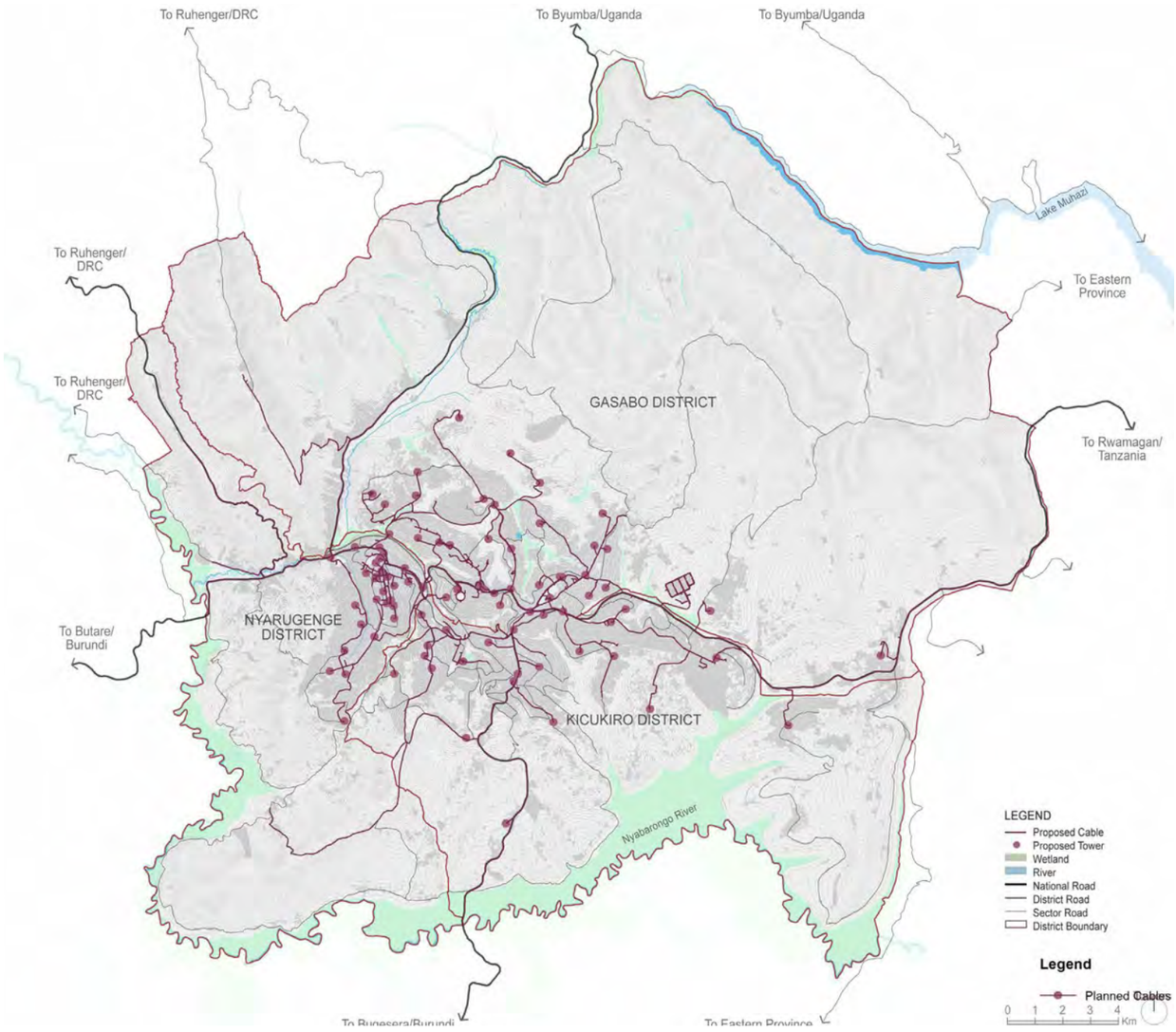


Figure 4.73 Planned fibre network

4G Coverage

KT Rwanda is the only 4G LTE infrastructure company in the country. Their mobile broadband coverage is widespread across Kigali and can be seen in the image below.

Fibre

Liquid Telecom Rwanda has embarked on a Fibre-to-the-Home (FTTH) rollout exercise around the country to delivering high-speed internet to Rwandans. Most households in the City of Kigali have been given access to fibre and Liquid Telecom is now moving towards the more rural areas. As of March 2018 the following areas were connected: Gisozi, Kagugu, Gacuriro, Vision City, Nyarutarama, Gishushu, Rugando, Kimihurura, Kacyiru, Kiyovu, Gikondo Estate, Rebero, and Kibagabaga. As a result of this bulk roll-out the cost of an individual household connection is only Rwf 50 000 (including taxes), as opposed to Rwf 5 million prior to Liquid Telecom beginning its operations in 2013. The aim is to connect more than 20 000 households by the end of 2018. The following map indicates the planned fibre towers and network.

Key Issues to be Addressed

1. Establish commercial & public building connectivity as a requirement in zoning regulations;
2. Free Wi-Fi areas in the City;
3. Fibre to key catalytic nodes;
4. Joint fibre planning bulk utilities;
5. Improve and expand access to ICT skills and innovation capacity;
6. CoK to appoint a “City Information Officer” to identify, promote and co-ordinate Smart City initiatives;
7. Build a shared robust and resilient infrastructure to underpin service delivery and support National ICT initiatives; and
8. Centralised GIS platform to prioritize, select & monitor projects (to then be extended for secondary cities)

Smart & Green Initiatives

The following initiatives have been taken from the Smart Rwanda Master Plan:

1. Real-Time Traffic Information System - Integrated Traffic Information System : Data collected from diverse sources, and the processed information provided to many sources of demand in real-time basis;
2. Public Transportation Information System - Integrated Information System on Public Transportations : Provides the general public with arrival & departure time of bus transit at each bus stop;
3. Smart Mobile Administration - Mobile devices with applications to enable public officials to work from outside home office; and
4. Pollution monitoring

4.6.7 Smart City

The definition of a smart city according to the Smart City Rwanda Masterplan is: "A smart city uses digitalization and technology to provide a high quality of life for its citizens, businesses and visitors. A smart city embeds technology and data across city functions to make them more efficient, competitive and innovative. Cities become smarter through a series of steps that enable them to become increasingly resil¬ient and able to respond quicker to new challenges. A smart city is also a sustainable city. Through innova-tion, openness and connectivity, smart cities ensure that they meet the environmental, social and economic needs of present and future generations."

The Smart City Rwanda Masterplan identifies 27 initiatives that can be used as a starting point for towns and cities to become "smarter". It must be noted that due to different cities having diverse challenges and goals, each local authority should select initiatives that meet their priorities. Discipline-specific initiatives have been discussed in this Visioning Report at the end of each relevant section.

Key Issues to be Addressed

One of the major issues that has been highlighted across all service sectors is the need for integrated planning. Due to the extreme topography and the limited developable space in Kigali, it is crucial that corridors are secured in order to make provision for all possible future services. In terms of ICT, the idea is not only to reserve the space required for future services but to actually already install a sleeve to allow for this. The CoK should be responsible to develop, control and co-ordinate all the utility space requirements. The following two figures show typical sections through the road indicating the space required for various services.

Figure 4.75 Securing of Service Corridors

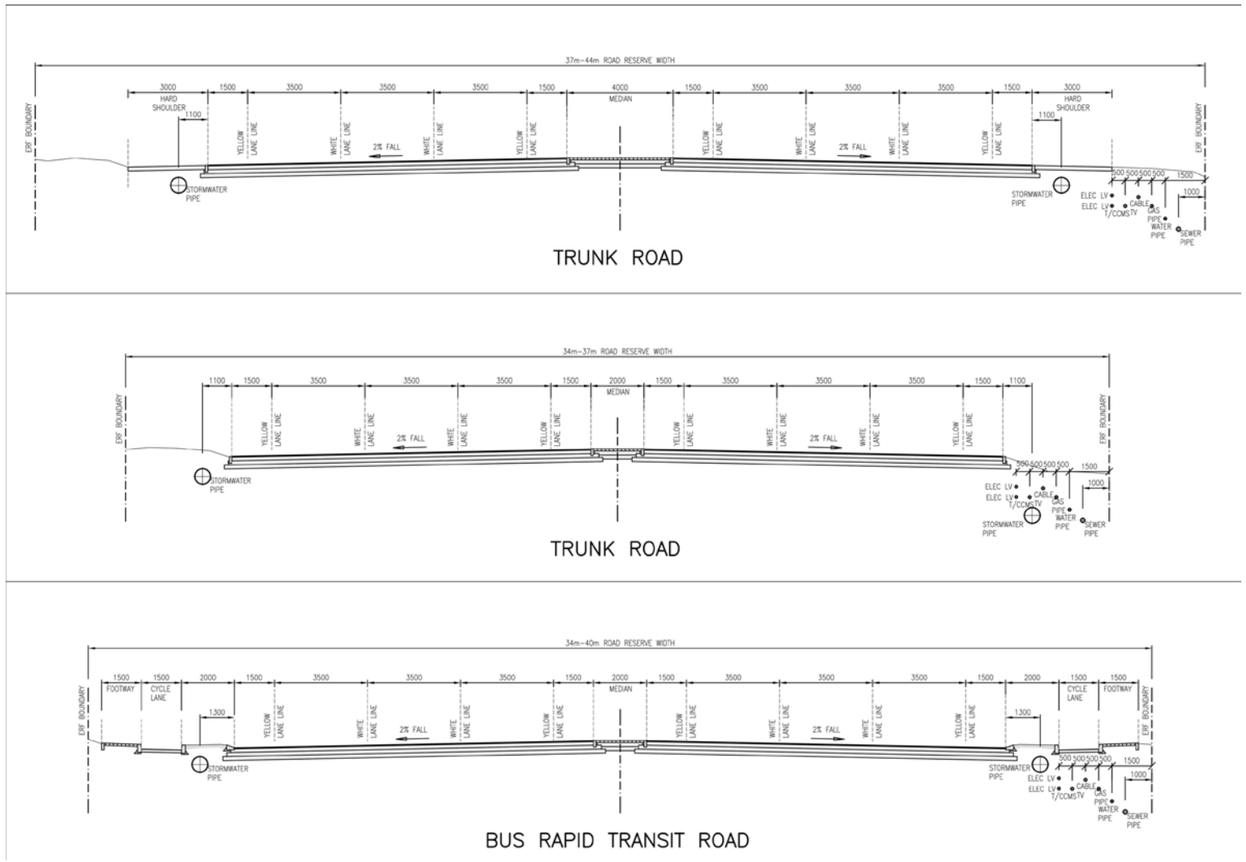


Figure 4.74 Typical Road Reserve 37-44m

This page is intentionally left blank.

4.7 City for Citizens

"One that values all people and their needs equally"

City for citizens essentially focuses on provision of integrated neighbourhoods, affordable housings, mixed uses, participatory rights to all its population to live in a vibrant and inclusive city environment, together with the development of public spaces and social facilities.

It is essential to understand that the concept of inclusive city involves a complex web of multiple spatial, social and economic factors[1]:

1. **Spatial inclusion:** urban inclusion requires providing affordable necessities such as housing, water and sanitation. Lack of access to essential infrastructure and services is a daily struggle for many disadvantaged households;
2. **Social inclusion:** an inclusive city needs to guarantee equal rights and participation of all, including the most marginalized; and
3. **Economic inclusion:** creating jobs and giving urban residents the opportunity to enjoy the benefits of economic growth is a critical component of overall urban inclusion

The vision 2050 supports inclusive urbanization by mobilizing rural-urban linkages through coordinated development model. It also strengthens urban planning capacity and institutions for stakeholder engagement and participatory planning.

In 7years Government Programme, "inclusive economic growth" in Economic Transformation Pillar, "quality standards of living" in Social Transformation Pillar, "good governance and justice" in Transformational Governance Pillar are all in conformity with the objectives for inclusive city. It can be reflected by various actions like "develop and facilitate decent settlement", "affordable housing fund", "increase citizens' participation, engagement and partnerships", "promote recreational activities and sports for all".

Embracing the vision and objectives set by various national strategies, city needs to solve the following issues and challenges:

1. Making Kigali an inclusive city for all, and equal opportunity to access all social infrastructure and open space;
2. Lack of quality affordable housing with inadequate social infrastructure and open space leading to unplanned settlements; and
3. Lack of government owned land and adequate funds for setting up social infrastructure and open space

City for Citizens would focus on the following key aspects in Kigali:

1. Education;
2. Health;
3. Open Space, Sports and Recreation;
4. Civic Facilities;
5. Other social facilities; and
6. Disabled People and Disadvantaged Groups

4.7.1 Education facilities

Education plays a significant role in building the skilled human resources that will be required to support inclusive urbanization.

The EDPRS (Economic Development and Poverty-Reduction Strategy) pillar on education aims to develop skills by making the curriculum relevant and responsive to contemporary policy, promoting technology and stimulating entrepreneurship and productivity. 7years Government Programme set goals to establish Rwanda as a Globally competitive knowledge-based economy. SMART Rwanda Master Plan (SRMP) identifies ICT as the key driver for economic growth and sets vision as "Towards a Knowledge based Society".

Universal Basic Education was introduced in Rwanda in 2009 with the aim of ensuring a free education for a total of nine years for all children (six years of primary and three years of secondary education). In 2014, the net attendance rate at primary school in Kigali for both boys and girls was 92 per cent, with little change between 2010 and 2013. For secondary school, the net attendance rate was 29 and 33 per cent for girls and boys, respectively; this represents an increase of more than 5 per cent since 2010[2]. Yet 10 per cent of women and 7 per cent of men in Kigali still have no education[3].

The literacy rate for people aged 15 and older is 89.5 per cent for Kicukiro district, 86.7 and 84.8 per cent for Nyarugenge and Gasabo districts, respectively[4].

Urban Planning Code (UPC) and Land Use Planning Guidelines (LUP), enacted after the establishment of 2013 Kigali Master Plan, have regulated the minimum planning standards for the public facilities nationwide. However, this report, after discussion with city authorities, will suggest on using the planning standards proposed in 2013 Kigali Master Plan, as the standards are more in line with the best practice around the world and the city itself. Comparison of planning standards for education facilities is provided in Annexure II.

Since the implementation of Kigali Master Plan 2013, there has been an increase in the number of education facilities at all primary, secondary and tertiary levels. Kigali Master Plan 2013 indicated that there were 175 primary schools in Kigali, with 163,483 enrolled students - 62 schools in Kicukiro, 79 schools in Gasabo and 34 schools in Nyarugenge[5]. Due to the high demand, there was a short fall of primary schools and the school's area were also overcrowded.

Currently, there are 235 primary schools in Kigali, with 202,644 enrolled pupils with 81 schools in Kicukiro, 110 schools in Gasabo and 44 schools in Nyarugenge[6].

Kigali Master Plan 2013 indicated that there were 110 secondary schools in Kigali City with over 49,000 enrolled students, while currently the number goes up to 130 secondary schools with over 55,861 enrolled students[7].

There were 31 tertiary education facilities in Rwanda which provided education to over 73,000 students in 2011. Of these tertiary institutes, 14 are private institutes and 17 are public. Most of these tertiary institutes are located in Kigali City, resulting in a lot of young people having to migrate to Kigali to pursue higher education. For Rwanda to be a knowledge economy, it will be necessary for more tertiary institutes to produce quality skilled and educated workers.

The number of tertiary institutions in Rwanda grows to 54 in the academic year 2016-2017, with total 91,193 enrolled students. Of these tertiary institutes, the number of private institutes quadrables public ones [8].

Approved Projects from 2013 to 2018

Key approved projects by City of Kigali (CoK) have been captured in the Table 4.25. For instances, a 4 million USD (RWF 3.4 billion) architecture faculty buildings in Nyarugenge Campus has been built recently and will be operated in the course of this academic year (2018-2019). The proposed extension project for existing Rukara Campus of University of Rwanda (UR) has been reflected by existing land use plan. These two projects related to the UR

1 World Bank: https://www.worldbank.org/en/topic/inclusive-cities

2 NISR, 2015

3 NISR, MOH and ICF International, 2015

4 Rwanda, State of Environment and Outlook Report 2017, Achieving Sustainable Urbanization

5 MINEDUC Department of Statistics 2011

6 MINIEDUC Department of Statistics 2017

7 MINIEDUC Department of Statistics 2017

8 MINIEDUC Department of Statistics 2017

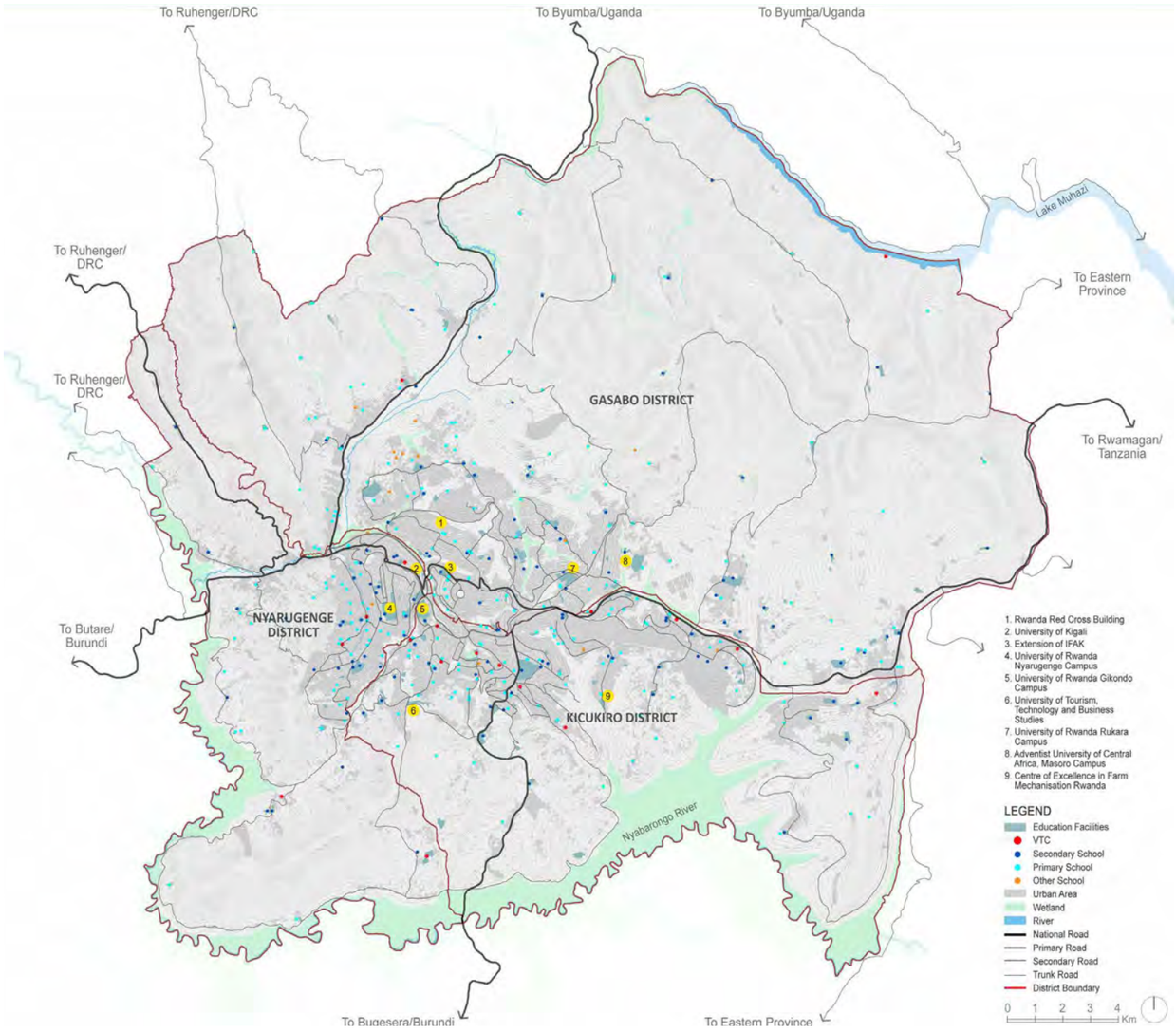


Figure 4.76 Kigali City - Existing Education Facility Distribution and Key Approved Projects

are in line with the vision for master plan update for Nyarugenge and Gikondo Campus of UR, carried out by the Government of Rwanda (GoR), Ministry of Infrastructures (MININFRA) and attached agencies (Rwanda Housing Authority (RHA), Rwanda Transport Development Agency (RTDA)) (Figure 4.77).

Being the largest University in the Country, UR accounts at least 40% of the entire higher learning education students' population in the country with around 32,000 students distributed in 14 campuses that compose six colleges. The college system is at the heart of the university's success, giving students and academics the benefits of belonging to both a large, internationally renowned institution and to a smaller, interdisciplinary, academic college community. The objective of the campus master plan is to renovate the existing unplanned campus infrastructure that lacked basic services, causing expansion of informal setting out of new buildings either academic, recreational, residential and common facilities, and increasing vulnerability of the students' community to climate change and natural disasters[9].

9 Development of master plans of Nyarugenge and Gikondo Campus, Interim Report, AUG 2018

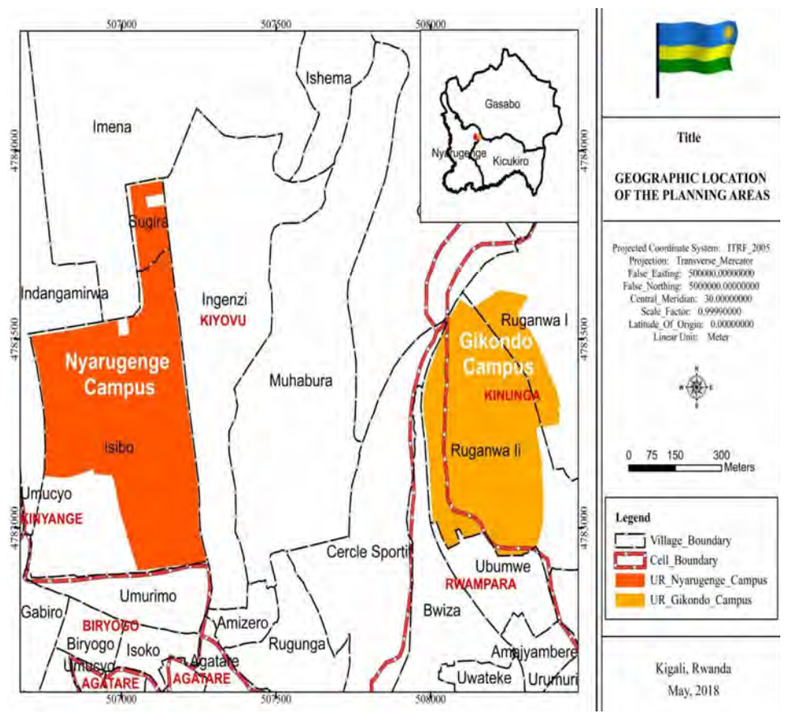


Figure 4.77 Planning Areas for Nyarugenge and Gikondo Campus of UR

Table 4.25 Key Approved Projects for Education Facility in Kigali

Approved projects	Objectives	Status	Location
Faculty of Architecture and Environmental Design in Nyarugenge Campus of University of Rwanda	A new building that will house the School of Architecture and Built Environment will open at University of Rwanda campus near the existing CBD.	CPMIS Archived Applications (CoK)	Nyarugenge Sector, Nyarugenge District
Proposed Extension of Rukara Campus of University of Rwanda	Development of Education Facilities		Kimironko Sector, Gasabo District
University of Kigali	Development of Education Facilities	CPMIS Archived Applications (CoK)	Muhima Sector, Nyarugenge District
Proposed Extension of IFAK School	Development of Education Facilities	CPMIS Archived Applications (CoK)	Kimihurura Sector, Gasabo District
Rehabilitation works for Rwanda Red Cross Buildings	Development of Education Facilities	CPMIS Archived Applications (CoK)	Kacyiru Sector, Gasabo District
Proposed Extension of Adventist University of Central Africa, Masoro Campus	Development of Education Facilities		Ndera Sector, Gasabo District
Establishment of Centre of Excellence in Farm Mechanisation, Rwanda	Development of Education Facilities	Permit Issuance (CoK)	Kanombe Sector, Kicukiro District
University of Tourism, Technology and Business Studies (Phase 1)	Development of Education Facilities	Permit Issuance (CoK)	Gikondo Sector, Kicukiro District

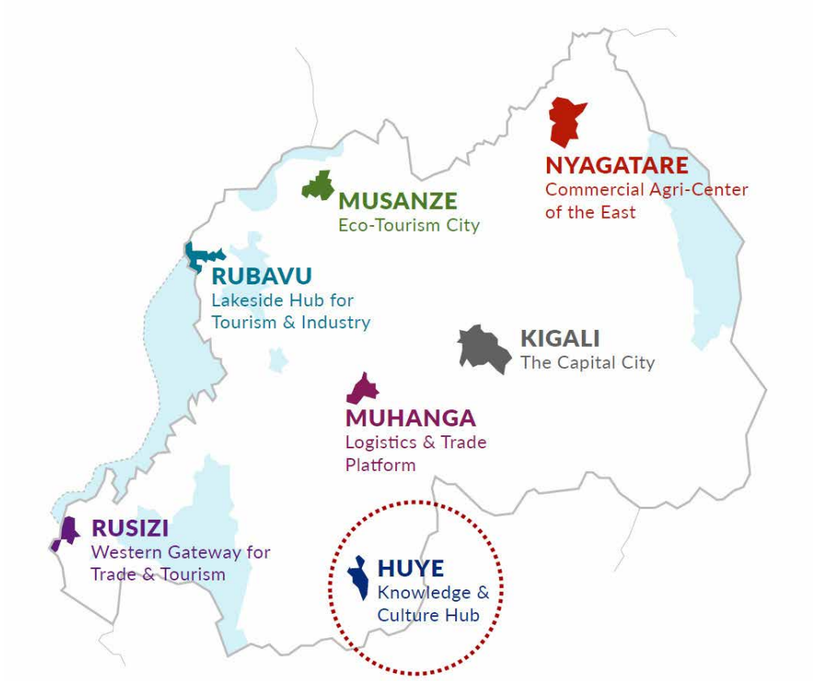


Figure 4.78 Branding Concepts for Secondary Cities

Educational Facilities in Secondary Cities

The current growth of the urban population is largely concentrated in the capital city, Kigali. In order to better distribute economic growth across the country and accomplish the national urbanization target of 35% by 2020, the Government of Rwanda has identified six secondary cities to serve as growth poles: Huye, Muhanga, Nyagatare, Rubavu, Musanze and Rusizi.

As one of the six secondary cities, Huye situated in the Southern province and is the former capital of Rwanda-Urundi. The city was previously called “Astrida” and is considered to be the intellectual centre of the country, where it has several academic institutions and the largest campus of the University of Rwanda. Therefore the city offers a masse-critique for education and scientific research. Moreover, due to the large number of university students and student-centered activities in the city, Huye is often regarded as a university town (NR). However, the branding concept for Huye as "Knowledge & Culture Hub" is under review.

After the implementation of Kigali Master Plan 2013, the City of Kigali has made remarkable progress in upgrading and increasing the quality and numbers of education institutions in various systems and districts. The government is also pushing for international market to attract talents from other parts of Africa and world. The master plan for Kigali will create a balance for education developments between Kigali and Huye. As the capital city of Rwanda, Kigali will provide higher education in multi-discipline studies, while Huye’s education sector is more specialized in agribusiness, pharmaceutical and tourism. The Kigali Master Plan will target to propose developments that complements with Huye’s education sector.

4.7.2 Healthcare facilities

Social Transformation Pillar under 7years Government Programme aims to ensure a quality healthy population by prioritizing in “enhancing demographic dividend through ensuring access to quality health for all”. Quality health care will be enhanced through providing adequate health infrastructure, skilled and motivated health workforce as well as enabling health systems.

The government’s health sector development strategy is based on decentralized management and district level care. Health services in Rwanda are provided through the public sector, government-assisted health facilities (GAHFs), private health facilities, and traditional healers.

Planning Standards

The public sector has two main categories: the secondary health centers and primary health centers. The secondary health center consists of referral hospitals with a catchment at a national level and the district hospital caters to the district population. The primary health centre consists of health centres at sector level, military/police hospitals, prison hospitals, privately run polyclinics, dispensaries and health posts.

1. Secondary Health Centre: Referral Hospital, Regional Hospital

As per the Urban Planning Code (UPC) and Land Use Planning Guidelines (LUP), national-level hospital would have coverage of minimal 600,000-1,000,000 population. A provision standard was developed as part of the 2013 Kigali Master Plan as per which one regional hospital was to be provided per 500,000 people, with 5 ha minimal lot size. (refer Annexure I)

2. Primary Health Centre: Poly Clinic, Health Centre

As per the Urban Planning Code (UPC) and Land Use Planning Guidelines (LUP), district hospital would have coverage of minimal 200,000-500,000 population. Similarly, one health centre would be provided per minimal 10,000-30,000 population. As per the 2013 Kigali Master Plan, one poly clinic would be would be provided for a catchment of 120,000 (or township) with an area of 5 ha. One health centre was to be provided per 15,000 people which would be part of the neighbourhood centre having a minimum area of 0.5 ha (refer Annexure I)

Health Care Facilities

The quantity of health facilities in Kigali has been gradually improving over the years. According to 2013 Kigali Master Plan, in 2010, there were 3 referral hospitals in Kigali, 4 district hospitals, 1 military hospital which provides for the public, and 1 police hospital. City faced a shortfall of health centres serving the sector level, with the number of only 29. According to Ministry of Health, there are significant increases in the number of health centres and private health centres during the years. The number of health centers (HCs) increased to 36 and represented 15.2% of all the facilities. The numbers of health posts represented 14.4% of all facilities. Moreover, the private health centres, clinics and dispensaries turn to play an important role in Kigali, representing 56.3% of all facilities. Together with public health facilities, they provide better health coverage to the population (Figure 4.79).

Improvements

1. The Kigali – State of Environment and Outlook Report 2013 (REMA, 2013) highlighted the improvements in the walking distance to the nearest Health Centre over the years;
2. Health indicators in Kigali show some improvements. For instance, mortality of children under 5 years old was 79 deaths per 1,000 live births in 2010, decreasing to 24 deaths per 1,000 live births in 2013/2014 (NISR, MOH and ICF International, 2015); (NISR, MOH, and ICF International, 2012); and
3. The number of people covered with health insurance services is rising: by 2013/2014, the proportion of people covered had reached 92 per cent in Kigali, with Kicukiro at 94.8 per cent, Gasabo at 70.5 and Nyarugenge at 75.4 (NISR, MOH and ICF International, 2015); (NISR, MOH, and ICF International, 2012)

Issues & Challenges

The following challenges face the health sector in Kigali, as drawn directly from the Kigali City Development Plan 2013-2018: (Rwanda, State of Environment and Outlook Report 2017, Achieving Sustainable Urbanization)

1. There is an imbalance in the distribution of health centres throughout the city. For instance, although there are 36 Sectors in Kigali City, there are only 29 qualified health centres (ten sectors have no public or licensed health centre);
2. The standard of health facilities per total population is 1:20,000. However, in Kigali the ratio is 1:40,000;
3. Geographic access to health facilities needs improvement, especially in the rural areas;
4. Health centres suffer from congestion and overcrowding; and
5. There is a lack of skilled personnel and medical equipment in the health facilities in the City of Kigali

Table 4.26 Number and Type of Health Facility in Kigali

District	Referral Hospital	District Hospital	Health Centre	Health Post	Public and Private Clinic/ Disp./ Polyclinic	Private Hospital	Total
Gasabo	2	2	16	22	67	4	113
Kicukiro	1	1	10	4	31	0	47
Nyarugenge	1	1	10	8	55	1	76
Kigali City	4	4	36	34	153	5	236

Source: R-HMIS Database, 2016

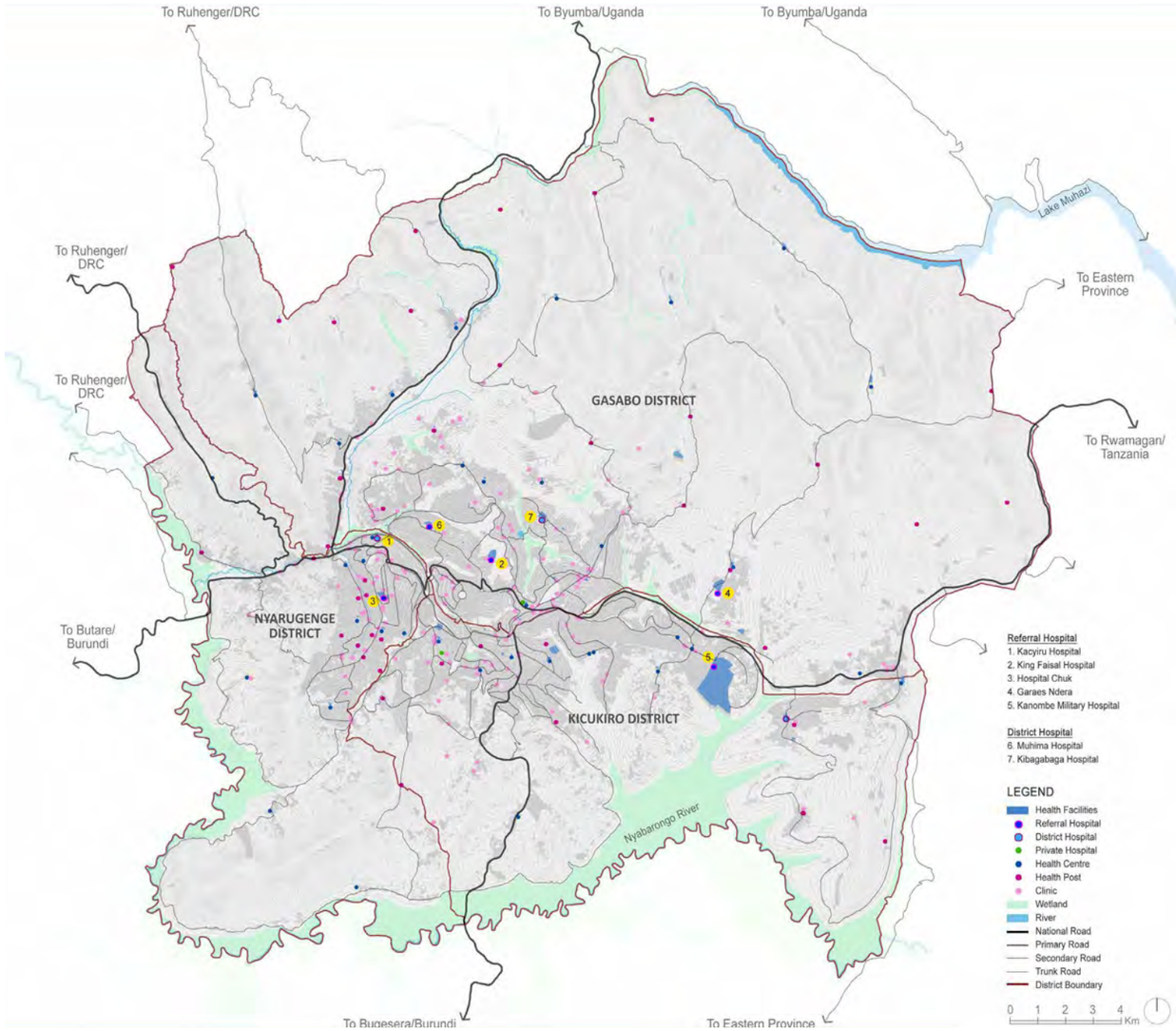


Figure 4.79 Kigali City - Existing Healthcare Facilities Distribution

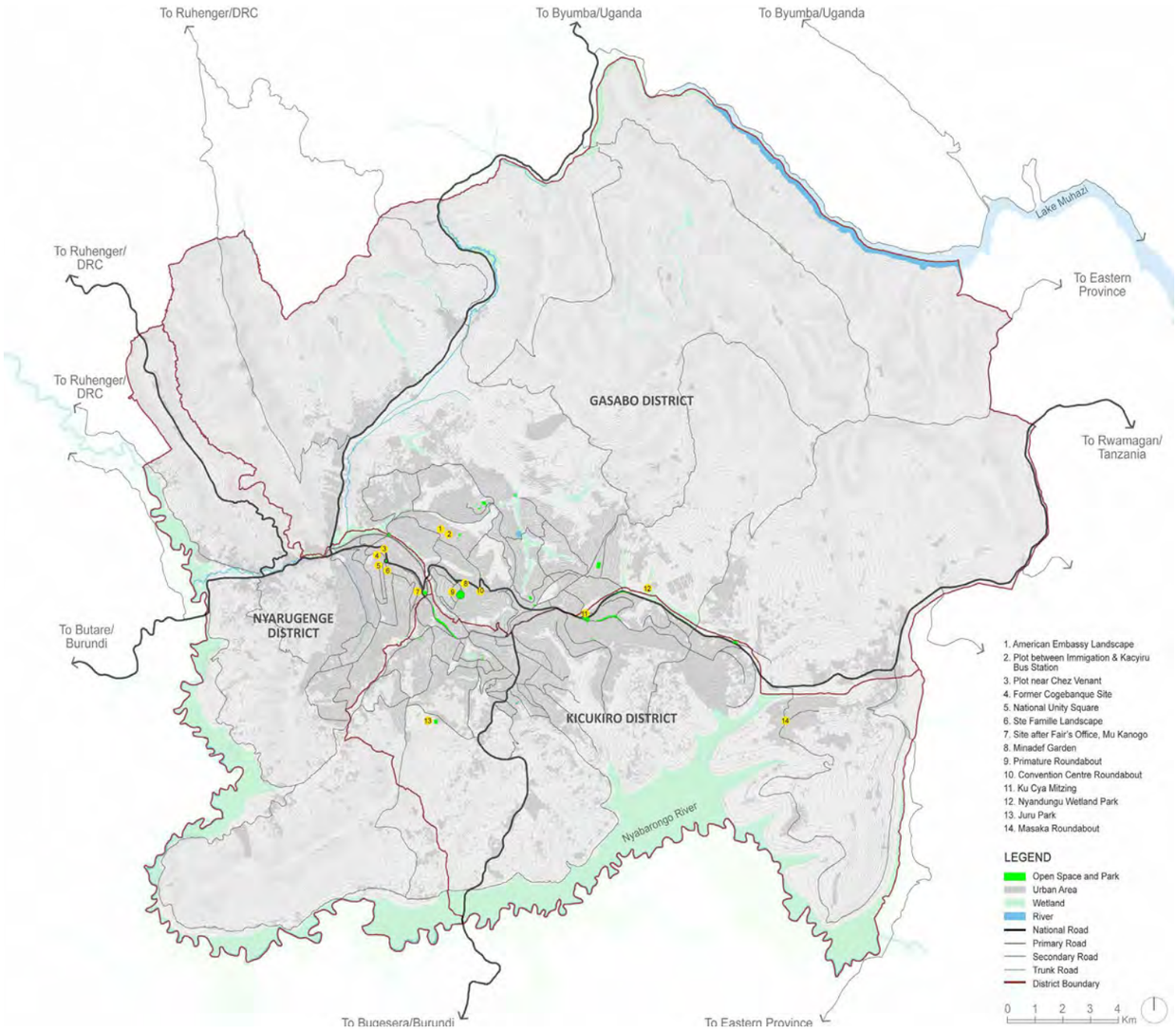


Figure 4.80 Kigali City - Existing Open Space Distribution and Key Approved Projects

4.7.3 Open Space, Sports & Recreational

It is both surprising and a matter of great concern that there is lack of parks and public green open spaces in the city that is surrounded by green forests, mountains and wetlands coming right to one's door step; but the city is actively working on strategies to change this and build more parks and public green open spaces for its residents; trying to integrate the increasing urban density in Kigali with the environment.

The World Health Organization (WHO) suggests that every city should have a minimum of 9 square meters of green space per person. National roadmap for Green Secondary City Development 2015 (NR) sets the minimum green space per capita[1] to be 15 square meters in the urban area. While the NR sets a strategy to "plan sufficient green spaces" in the development process of secondary cities, Kigali plans to play a leading role in the successful green urban development to see Rwanda become a role model for green city growth for Africa and the World.

For development of sports and recreation facilities in Rwanda, The Social Transformation Pillar under 7years Government Programme sets objective for "Transition to a Modern Rwandan Household in urban and rural areas" and takes actions to "Promote recreational activities and sports for all to increase the socioeconomic impact of sports facilities to the citizens". Engagement of private sector in the construction and management of sports facilities is also seen as a key strategy to develop new sports facilities including Gahanga Sports Complex, Ngoma, Bugesera and Nyagatare stadiums.

Sustainable Tourism Master Plan 2015 also sets vision to transform Rwanda into a major international tourism destination and takes actions to create major flagship attraction such as National Sports Tourism to extend length of stay in the capital city.

Open spaces in Kigali

Development of green open spaces for public recreation has been one of the key priorities for the city of Kigali. New public space projects have been planned in various locations in Kigali. Most of them have been added into city central areas or key commercial nodes, while only a small number are integrated with communities or neighborhoods.

Next to the National Unity Square in the existing CBD in Nyarugenge, three small parcels under 3000 sqm have been changed to open spaces from the commercial uses as per 2013 Kigali Zoning Plan. Near the Kigali Convention Centre and Ministry of Defence, three big patches of public space projects can be found to create the vibrancy and inclusiveness for the city's key commercial and civic node. One of the three, Primature Roundabout at the Prime Minister's Office is a favorite for evening joggers and the gardens within used to host weddings and musical festivals.

1 Sum of all public parks, recreation areas, and other protected areas accessible to the public, in m2 per inhabitant

With the idea of creating integrated developments with public open spaces and community facilities, Project 2020 in Kinyinya in Gasabo district, one of the city's latest upmarket housing project, has reserved sufficient public space for the community. Public parks, religious spaces and sports fields are being planned within those space to provide adequate social infrastructure for the residents.

Meanwhile, Kigali government is actively working on upgrading the underserviced and unplanned settlements to create public spaces and urban gardens in environmentally fragile areas (City-wide unplanned and underserviced settlements upgrading strategy for Kigali, Rwanda, 2018). Land sub division, private ownership and lack of public engagement to create new public open spaces within these overcrowded unplanned settlements have been some of the major challenges faced by the city in developing public open spaces.

The city is also discussing the strategy to use the natural assets of the city like forest and wetlands for eco-tourism and active/ passive recreation purposes. This shall help the city to advance in the green growth path which is one of the key focus area for Kigali. The city is already working on some of these projects. For instance, a new €2.7 million plan is being developed to create a large eco-tourism park just a short drive from the city's main international airport. The proposed Nyandungu Wetland park is another 130 hectares public park evolved from the existing abundant wetlands.

Sports and Recreation facilities in Kigali

There are two major venues for national stadium in Kigali, one is in-between Gisimenti Gateway and Kimironko Market, another one is Nyamirambo Town Centre. The Amahoro National Stadium is a multi-purpose stadium located in Gasabo district, with a capacity of 30,000. It is the largest stadium in Rwanda and hosts football matches, concerts, and public events. In 2018, Amahoro National Stadium has set for a major facelift that would involve expansion works and additional roofing to protect spectators from the extremes of weather. The Minister of Sports (Minispoc) has the intend to expand its capacity among other planned renovations[2]. Nyamirambo Stadium is a multi-purpose stadium in the Nyamirambo neighbourhood of Kigali, Rwanda. It is currently used mostly for football matches, with a capacity of 3000. According to the 2013 Kigali Zoning Plan, Kigali government has expropriated its neighbor land for sports hall expansion program.

Minispoc is also building one regional large-scale stadium in Gahanga and three regional smaller stadiums in Ngoma, Bugesera and Nyagatare to promote games and sports. 2013 Kigali Zoning Plan has identified the development of Gahanga Sports Hub as the catalyst project to stimulate recreation and tourism growth in Gahanga sector.

2 The New Times, 2018: https://www.newtimes.co.rw/news/amahoro-stadium-set-mega-upgrade

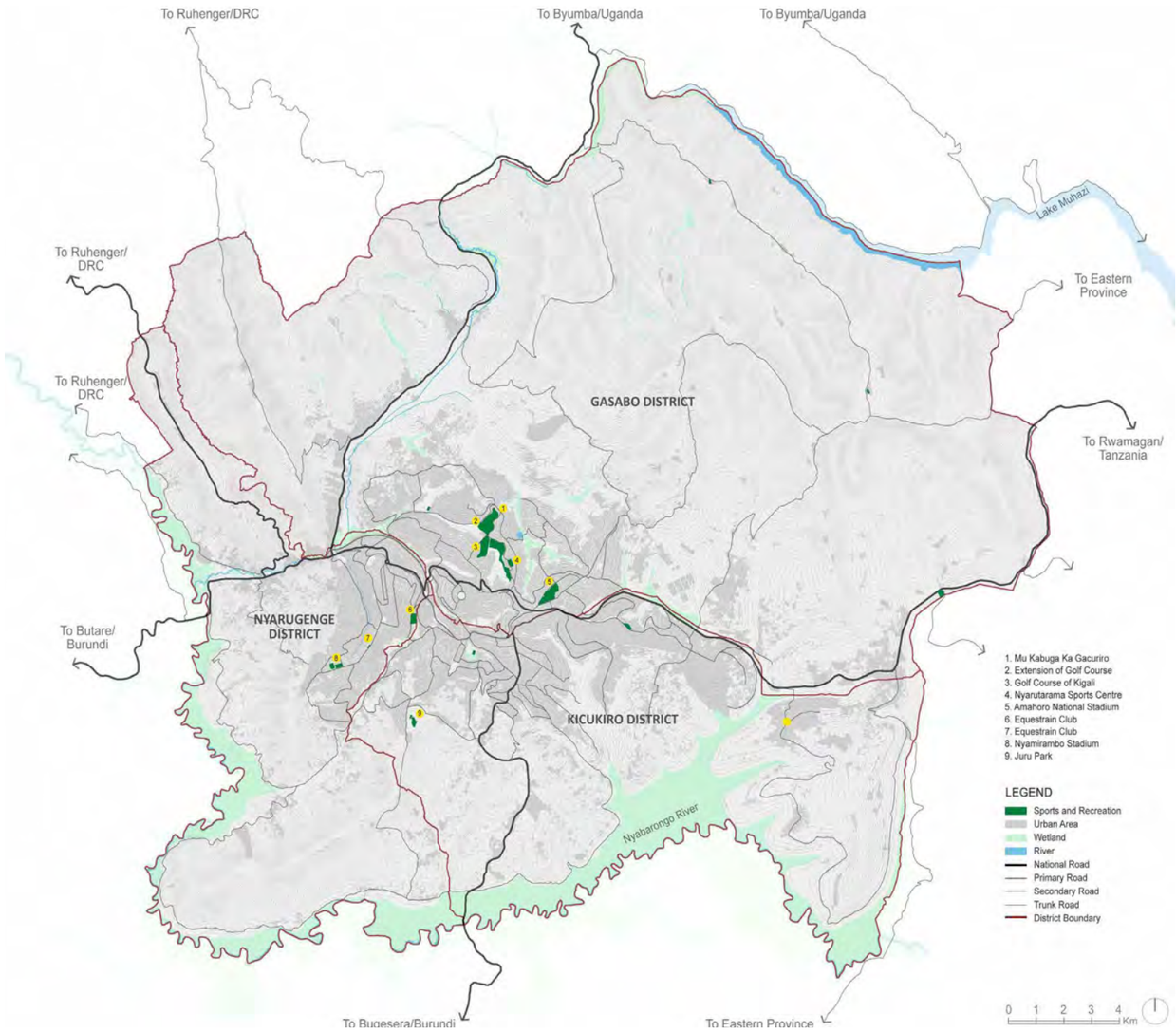


Figure 4.81 Kigali City - Existing Sports and Recreation Facilities Distribution and Key Approved Projects

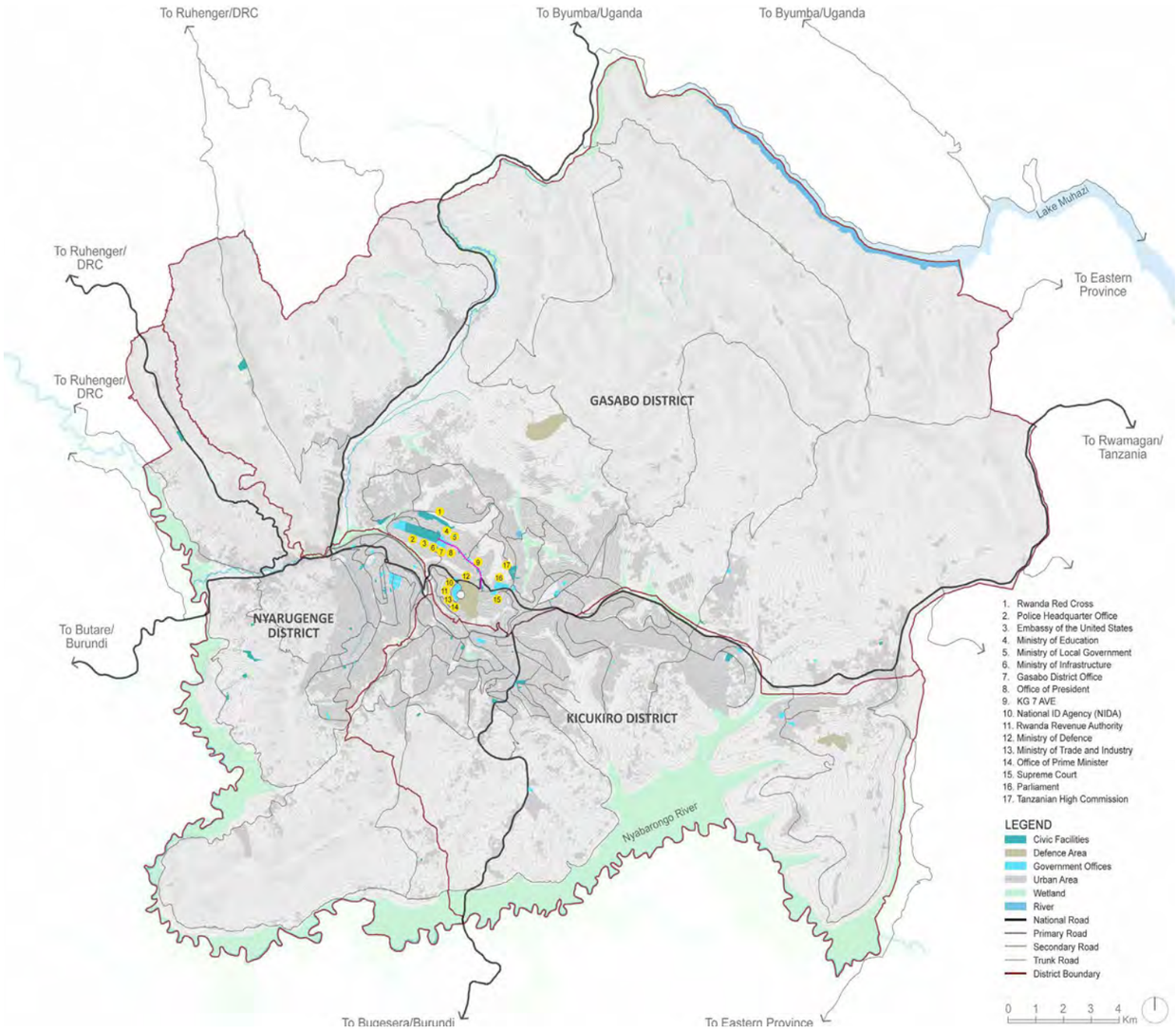


Figure 4.82 Kigali City - Existing Civic Facilities Distribution and Key Approved Projects

Sitting in the north of the existing Kigali Golf Course in Kacyiru, the $3million club house and a 9-hole golf course located in Nyarutarama, as the expansion project for the existing golf, has been under construction for the past three years with ROKO Construction Company. In 2017, Rwanda development board announced plans on boosting its tourism sector with the growth of potential of golf as a new tourism product[3].

Issues & Challenges

The city lacks open space in the existing commercial districts and unplanned settlements. Land sub division, private ownership and lack of public engagement to create new public open spaces within these overcrowded unplanned settlements have been some of the major challenges faced by the city in developing public open spaces. Creating green spaces in an already developed area requires robust and participatory approach that actively involves different stakeholders. Planning ahead of urban growth saves public money and provides a healthy foundation for a city to be sustainable and resilient; therefore, provision of adequate public space is crucial for future city upgradation works.

3 KT Press, 2018: http://ktpress.rw/2018/05/rwanda-opens-state-of-the-art-golf-course/

4.7.4 Civic Facilities

The National Roadmap for Green Secondary City (NR) will be anchored on good governance both at the national and secondary city levels. The first pillar of Vision 2020 is “Good Governance and a Capable State”. Vision 2020 stresses that “the State will ensure good governance, which can be understood as accountability, transparency and efficiency in deploying scarce resources”. Kigali being the capital city has a much larger civic and administrative role. There are requirements for national level institutes like the Parliament, Supreme Court, and various Ministries etc. Similarly, there are a large number of central & regional government institutes also located at Kigali. Besides the central government facilities, there are civic facilities necessary for the municipal, as well as district and sector level e.g municipal offices, district offices, sector offices etc. As per 2013 Kigali Master Plan, one civic facility area of approximately 1 ha would be provided per 120,000 inhabitants.

Due to Gasabo’s role as the administrative hub of the nation, it has secured land for the provision of more variety of institutional facilities. There is a distinct administrative zone at Kimihurura at Gasabo surrounding the Kigali Business Centre (KBC) Roundabout. Various national level institutes are sitting here including Senate of Rwanda, Supreme Court, Office of the Prime Minister, Ministry of Justice, Ministry of Defence, Ministry of Trade and Industry, National ID Agency (NIDA), Rwanda Revenue Authority, etc. Starting at the KBC Roundabout to the north, there are

more than ten embassies for different countries distributing along the Road – KG 7 Ave in Kacyiru sector. This corridor ends as a roundabout just in front of Embassy of the United States, where the roundabout is surrounded by city's secondary administrative zone at Kacyiru including both national level institutes like Office of President, Ministry of Education, Ministry of Infrastructure, Ministry of Local Government, Ministry of Public Service and Labor, etc. and municipal institutes like Gasabo District Office, etc.

In the light of Transformation Governance Pillar in 7years Government Programme, an inclusive city needs to "increase citizens' participation, engagement and partnerships in development". As the capital city, Kigali provides abundant institutional facilities ranging from national and regional level, to district and sector level. This provision provides a good foundation for achieving the "Good Governance and a Capable State" Pillar in Vision 2020, which points out that "people's participation at the grassroots level will be promoted through the decentralization process, whereby local communities will be empowered in the decision-making process, enabling them to address the issues which affect them the most".

4.7.5 Other Social Facilities

The city of Kigali currently has a variety of other social infrastructures facilities like public library, police station, fire station, cultural centres, community halls, etc. There are also a variety of religious buildings like churches and mosques. All these are vital for a vibrant and inclusive society and need to be provided in the new urban setting. As per the previous 2013 Kigali Master Plan, these facilities have to be distributed according to the catchment radius, within the township model.

Cemeteries are another such key public facilities required in Kigali. Currently, the government provides land for cemeteries which are given in the form of 20-year lease. Two such new cemeteries were provided at Mageragere in Nyarugenge and Rusororo in Gasabo. Such facilities are necessary for all three districts. However, with the impending shortage of land in the future, new types of cemeteries need to be developed. Similarly, for large scale social infrastructure which require a large land area, new developable spaces will have to be explored and secured by the government.

4.7.6 Disabled People and Disadvantaged Groups

The National Roadmap for Green Secondary City (NR) plans for a walkable city that is "safe for other groups with limited mobility such as the elderly or disabled". The Strategic Transport Master Plan for Rwanda prepared by Rwanda Transport Development Agency (RTDA) provides guidance for the development of integrated medium and long-term land transport programs for the next 10 years in conformity with Vision 2020 and the objectives of EDPRS 2. One of the initiatives is "Development of 100 km of High Quality footpath on both sides of roads with shade tree at 10 m interval including wheel chair access facilities for the disabled".

According to the NR, the urban environment must be easy to navigate, where walking routes are direct, and destinations and nodes are linked with easily viewed urban spaces. However, Kigali City is built on hilly landscape sprawling across ridges and wetlands. 35% of the entire city land area is occupied by steep slopes of more than 20%. Many of the unclassified roads are unpaved and criss-crossing hilly terrains with very steep gradient at various locations within the District. They are mostly of narrow single carriageway without proper road furniture and drainage provision. These hilly terrain and existing unplanned elements pose a great threat to the accessibility especially to the disabled and disadvantaged groups in the city.

Towards achieving a city accessible to all, city of Kigali is working on the direction where upcoming projects either for commercial or housing developments are barrier-free for disabled and disadvantaged groups.

This page is intentionally left blank.

4.8 Creative City

"By encouraging and legitimizing the use of imagination within the public, private and community spheres, the ideas bank of possibilities and potential solutions to any urban problem will be broadened"

Creative city reflects a new planning paradigm for cities that advocates a culture of creativity be embedded in how cities operate and grow. While cities must be efficient and fair, a creative city must also be one that is committed to fostering creativity among its citizens and to providing emotionally satisfying places and experiences for them. It must therefore identify, nurture and celebrate its unique culture, heritage, traditions, festivals with all its citizens and encourage 'play environment' in the city to make the city more vibrant, safe and appealing for citizens and tourists alike.

Creativity has become increasingly important for the development of tourism in cities. Creative cities attract travellers and explorers to its urban cultural resources that include the historical and artistic heritage of assets including architecture, urban landscapes or landmarks. Creative city also attracts and sustains talents of dynamic thinkers, creators and implementers.

Creative city is one of the key themes of development for the City of Kigali that would not only benefit from development of physical infrastructure for its citizens and tourists but also create a vibrant environment in the city.

Creative city would focus on the following key aspects in Kigali:

1. Tourism;
2. Culture;
3. Heritage; and
4. Vibrant City

Tourism in Rwanda

Rwanda, "the land of a thousand hills", is endowed with immense natural beauty wildlife and a temperate climate. Iconic tourism attractions like volcanoes and gorillas have helped establish a unique tourism identity for the country. Besides these, Rwanda is also gifted with lush green scenic hills, tropical forests, mountains, lakes, and a range of fauna. Rwanda's share of visitors coming to East Africa has been increasing since 2006 (STMP 2015). Revenues are projected to grow as a result of the investments that the country is making in developing tourism assets.

National Vision

Tourism in Rwanda has been identified as a priority sector to achieve the country's development goals as set out in the Vision 2020 strategy. It is projected to play a big role in job creation and revenue generation for the economy. The 7 Years Government Programme (NST 1) 2017-2024 aims to double tourism revenues to USD 800 million by 2024 from USD 404 million in 2016. This will be achieved through:

1. Positioning Rwanda as a world class and high-end ecotourism destination;
2. Increasing investments in tourism infrastructure including the development of the Kivu Belt tourism master plan;
3. Developing hospitality industry and building the capacity of the private sector to provide high levels of service delivery; and
4. Accelerating MICE tourism growth by attracting big events and conferences and developing cultural and religious tourism working with the private sector; ensuring the branding of Rwanda as a world class conference destination

The vision 2050 also suggests tourism as one of the key strategies to encourage 'economically connected districts'. As Kigali's bordering districts are also increasingly integrated with Kigali's economy, coordinated tourism infrastructure is required to develop cross-district 'corridors'.

The Urbanisation pillar of Economic Transformation also aims towards 'transformation for prosperity' by developing high value and competitive jobs and sectors. Improved productivity and competitiveness through diversified tourism, development of local industries e.g. handcrafts, high quality services in public and private sectors including hospitality are some of the key drivers identified to achieve objectives of the Economic Transformation pillar.

Rwanda Sustainable Tourism Development Master Plan

The "Rwanda Sustainable Tourism Development Master Plan" (STMP, 2009) was conceived, aiming at developing and positioning Rwanda as a major tourism and regional conference hub for Central and Eastern Africa. Since 2009, significant progress has been made, piloted by the Tourism and Conservation Department of the Rwanda Development Board (RDB), in developing and promoting Rwanda's product base along the strategic lines established by the master plan, in conserving and safeguarding iconic animals, developing alternative nature based tourism and eco-tourism, diversifying tourism products and sharing Rwanda's cultural and natural heritage with the world. However, tourism potential is still not fully realised and much still needs to be done in order to achieve the Government's long-term vision.

STMP 2009 was revised in 2015 to appraise results so far and review strategies to meet new national targets pertinent to tourism.

The revised STMP 2015 Strategies are grouped into six pillar areas, named after the following six imperatives selected for successful tourism development namely:

1. Ensure an appropriate institutional and legal framework;
2. Improve visitor experience;
3. Expand the product base;
4. Provide the necessary infrastructure and superstructure;
5. Provide marketing and branding of the destination; and
6. Ensure sustainability across the whole strategy

It also includes a robust set of five action plans that further expand on the above strategies namely:

1. 5-year product diversification action plan;
2. 5-year marketing and branding action plan;
3. Strategic plans for the Destination Management Areas (DMAs);
4. STMP implementation framework; and
5. Capacity development action plan

The Revised STMP 2015, further develops the "hub and spokes" tourism development concept set forth by STMP 2009 where the spatial organization of tourism in Rwanda has been articulated around seven DMAs, each encompassing one or more districts. While Kigali has been identified as the central tourism hub from which tourism corridors (spokes) and trails will link to the rest of the country (Figure xxx), the DMAs have been identified with a 'flagship' theme/ project to spread the benefits of tourism across the whole country by celebrating diversity in a way that should engage the interest of the international marketplace. STMP 2015 also identifies nationwide 'national initiatives' for tourism and three tourism corridors with focus on eco-agro, scenic and community tourism.

Following are the key tourism products:

1. National Initiatives;
2. Kigali Hub;
3. Volcanoes DMA;
4. Rubavu DMA;
5. Karongi DMA;
6. Nyungwe DMA;

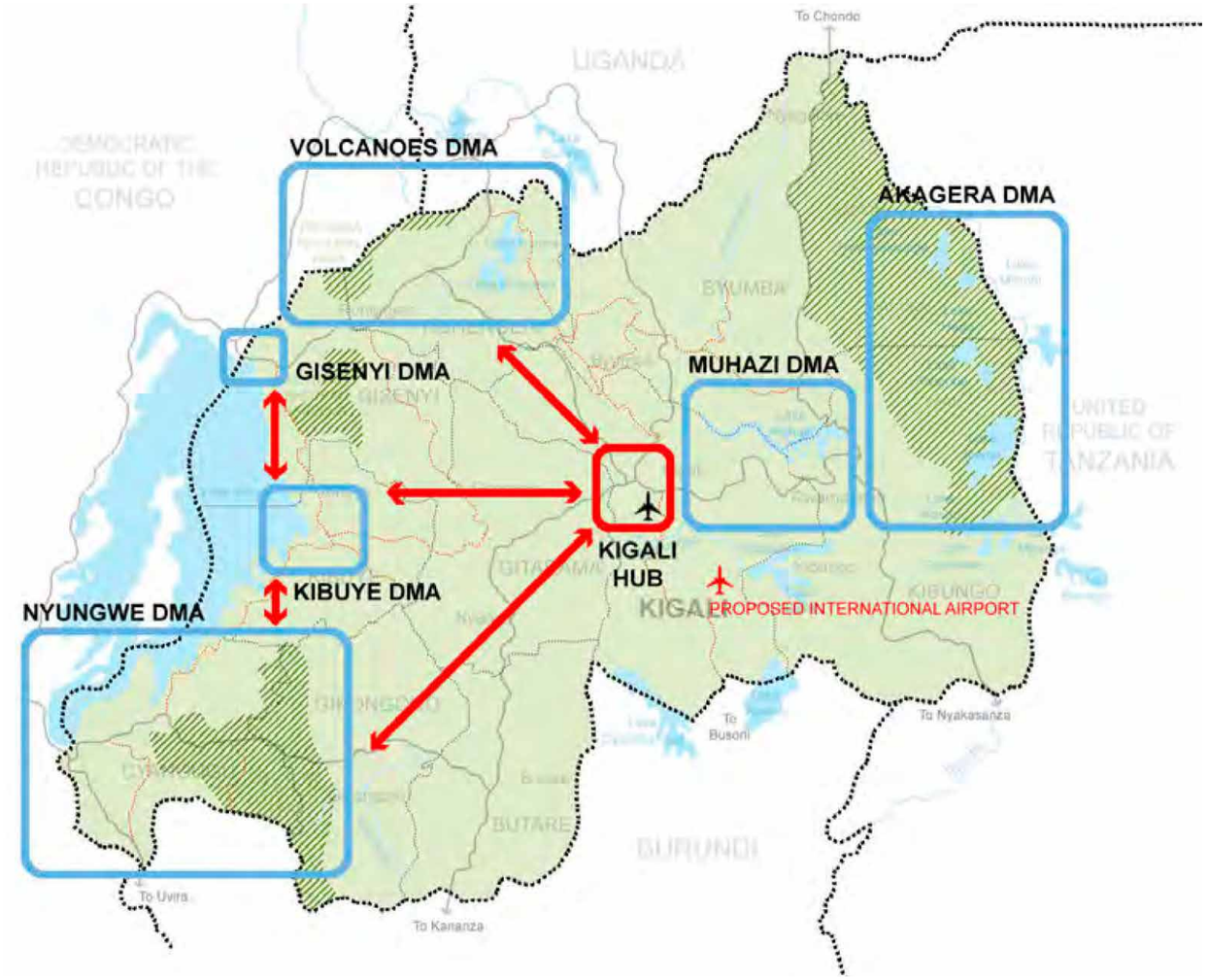


Figure 4.83 Kigali is the main Hub with 7 other Destination Management Areas (DMA)

7. Heritage DMA;
8. Muhazi DMA;
9. Akagera DMA;
10. Eco-Agro Corridor (Kigali – Volcanoes);
11. Scenic Corridor (Kigali – Kibuye); and
12. Community Corridor (Nyungwe – Rubavu/ Gisenyi)

The STMP 2015 also suggests establishment of a Tourism Marketing Task Force to guide and support RDB tourism marketing planning and delivery. Focus of marketing will be to achieve targets through seven main groupings of product listed below:

1. MICE and business tourism;
2. Leisure holidays (both family-orientated and luxury), including nature-based, family attractions, culture-based/heritage, tea and coffee plantations, etc.;
3. Short/city breaks;
4. Adventure;
5. Faith based/religious tourism & pilgrimage;
6. Events and sports tourism; and
7. Wildlife (including birding)

The Business, Heritage and Cultural Hub of Kigali

Kigali, besides being the capital city, is centrally located in the country, and remains the main international gateway into Rwanda. The city has thus been designated as the main tourism hub of Rwanda. Establishing Kigali as a Tourism hub inevitably requires that tourism facilities be established to improve the experience of the visitors, contribute in diversifying the tourism experience, and increasing the average length of stay. The main constraint for the sector has been availability of adequate infrastructure that can attract high end tourist. The city has been working towards developing various products to meet the challenges in the path of creating a creative and vibrant city for both locals and tourist.

The city has a variety of natural as well as cultural heritage sites. Besides tangible heritage, it is important for the intangible cultural heritage of the society to also be recognized and conserved. The variety of heritage of the city will help to enhance and develop a unique identity for Kigali.

Kigali itself is blessed with natural assets like the many hills and wetlands, which have immense environmental importance as well as harbouring tourism potential. Similarly, the city borders Lake Muhazi to the North and the Nyabugogo river to the south, which are important natural assets and provide immense tourism potential. Besides the natural assets there are several heritage areas in Kigali city, which mark the colonial heritage of the nation. There are also markets in the city's historic area, which should be conserved with proper urban design and economic strategies. There are several unique communities living in Kigali, like the Ukunundu Potter's village in Gasabo, which should be conserved as part of the cultural heritage of the city. There are several genocide memorial sites located at various areas in the city. Special strategy to conserve these important cultural and historic sites needs to be formulated. As Kigali is the capital city, there are several monuments and

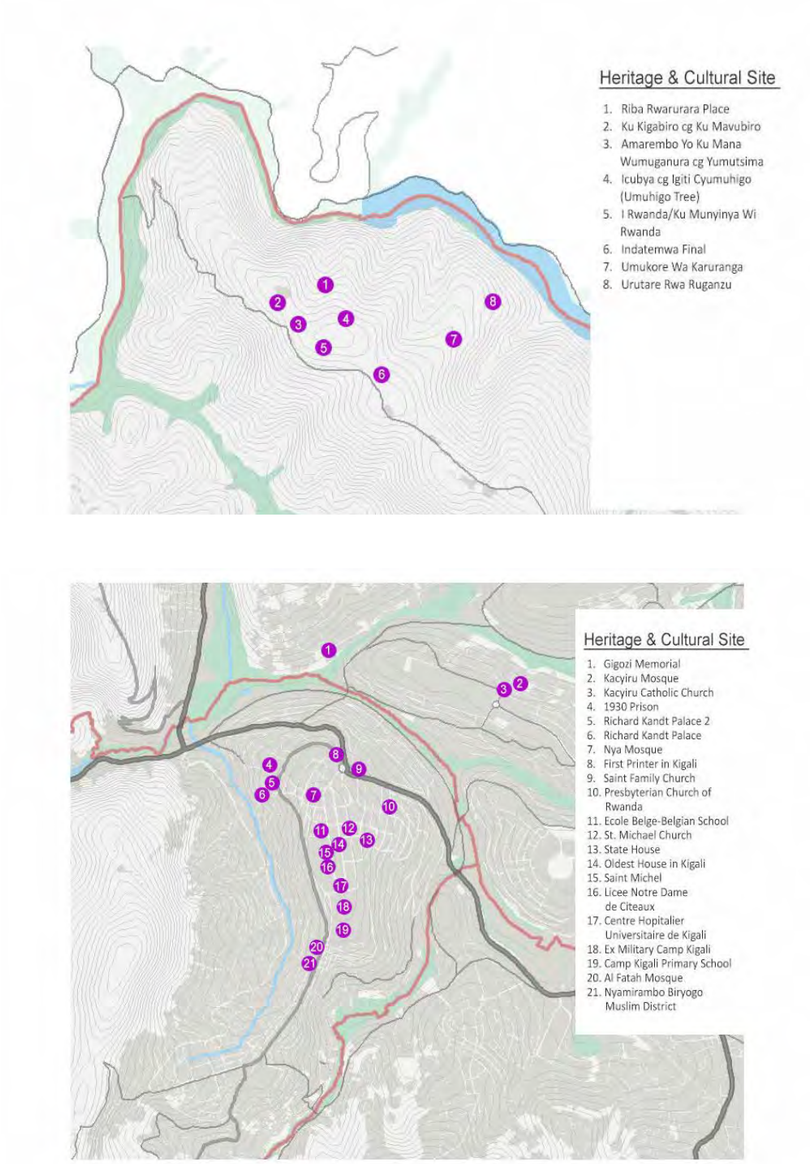


Figure 4.84 Location of Heritage and Cultural sites in Kigali

buildings of national importance which also need to be conserved. Besides theses local and city level precincts or areas, monuments, landmarks and open spaces, which have strong cultural link and local significance, will need to be conserved. Based on consultation with Districts, Sectors and RDB, and official data collection from MINISPOC in view of the Heritage Sites Management Law, the heritage sites and cultural sites are shown in Figure 4.84.

Tourism development in Kigali

Kigali with it variety of heritage and cultural assets has the potential to capitalize on its unique identity to develop variety of distinct destinations. Each district in Kigali has its own distinct geographic features and unique cultural heritage areas. Kigali also has potential for more community based tourism. The villages, like the Ukunundu Potter's Village in Gasabo, needs to be conserved and developed as cultural precincts in the city. There is also a need to develop more handicraft bazaars and centres to support local arts and handicrafts to promote local culture.

The Revised Sustainable Tourism Master Plan of 2015 suggests the 5-Year Product Diversification Action Plan for Kigali in Table 4.27.

MICE

The STMP 2015 is working towards positioning Rwanda as Africa's most interesting business and MICE tourism hub to boost tourism earnings. In 2013 RDB commissioned a Rwanda National MICE Strategy (STMP 2015). This outlines the vision for a Rwanda Convention Bureau (RCB) and identifies key segments to focus on. An important theme of the strategy is that: "Rwanda presents itself externally as one destination – whether for leisure or business travellers. Leisure tourism and business tourism stakeholders work hand in hand".

Investment in improving the MICE product is well underway, centred around the development of the iconic Kigali Convention Centre (KCC). In 2014 the RCB developed a forward MICE marketing plan. The Product to be marketed in future will centre around the following:

1. The KCC, ideal for meetings and able to seat 2,500 for events;
2. A widening range of tour options for delegates;
3. An increasing stock of branded hotels in Kigali some with good meeting facilities;
4. Other non-branded 4-star properties some with good meeting facilities;
5. The services of RCB;
6. Increasingly experienced incentive tour operators;
7. Future improvements in exhibition facilities; and
8. An increasingly business-friendly environment with interesting add-on options to encourage leisure-business combination

The MICE product shall target at conference and event organisers, incentive tour operators, exhibition organisers, larger companies, major international organisations such as the United Nations, NGOs and many other organisations.

The government has invested heavily in infrastructure including building inter-city roads, renovating the airport, facilitating the construction of five-star hotels and inking a deal to build Bugesera Airport, 25km outside Kigali. The airport is expected to handle 4.5 million passengers a year, which is seven times the current traffic. The aviation industry is critical to the growth of tourism and hospitality.

Kigali Cultural Village

Kigali Cultural Village (KCV) is aimed at making Kigali a tourism destination as well as a showcase for the overall tourism product in Rwanda to both local and international tourists. The development of Kigali Cultural Village is envisaged to open up new and demand oriented products in the direction of unique cultural and historical heritage, sports and agro-tourism. Most of all, Rwanda possess a distinguished African heritage, history and social activities a visitor will certainly wish to become familiar with and possibly participate in development and promotion of cultural tourism assets. KCV includes indoor and outdoor auditoriums, movie theatres and galleria, commercial centres, Eco-lodges and camp sites, traditional hut ensemble.

Eco-tourism and Waterfront Developments

There is also a proposal to develop a master plan for Lake Muhazi located in the north and waterfront development

Table 4.27 5-Year Product Diversification Action Plan for Kigali

Product	Opportunities	Anticipated benefits	Location(s)
MICE Tourism	National convention centre for business and events	National Convention centre attracts international conferences with regional hotels accommodating spinoff smaller events, seminars etc.	Kigali
Kigali Cultural Village		Major flagship attraction in the capital to extend length of stay by international tourists. May also host special events	Kigali
Cultural villages network	Development of network of cultural villages around the country, to share best practice in the preservation, interpretation and presentation of Rwanda's cultural heritage.	Enhanced visitor experience plus opportunities for local economic development	Kigali Cultural Village as lead site Mwima (Nyanza); Kitabi (Nyamagabe)
National Medical Tourism Initiative	cosmetic surgery and dental and eye treatment	Develops new niche market with potential long length of stay plus accompanying family/ friends/ escorts. May stimulate repeat visits	Nationwide but focus on Kigali
National Sports Tourism Initiative	Initial opportunities include soccer, mountain biking, road cycling	Another niche market that can be relatively high spending if national teams/ pro teams are attracted to the destination. Can lead to spin offs via international and national events which attract participants and spectators	Nationwide with focus on Kigali
Contemporary handicrafts product lines – "Treasures of Rwanda"	Work with selected group of craft workers to adopt contemporary designs that add value to existing product lines. Market products through top end lodges and hotels, also airport shop		
Cultural museums	Develop two small, high quality museums: 1: themed on palaeography and early man, linking in with story of emergence of mankind in the Rift Valley 2: themed on political history of the country and resolution of cultural differences	Supports development of cultural tourism to the country, and extends length of stay in Kigali. Also acts as focal point for niche tours of East Africa	Kigali
New hotels	Ensure sufficient sites are zoned for new hotels and that investment incentives are available	Delivers bed spaces required to accommodate projected increase in visitor numbers	Kigali
Nature tourism development at Muhima wetland	Development of wetland tourism resource for birding and fishing	Provides alternative excursion option for tourists overnighting in Kigali	Nyarungenge
Mount Kigali Recreation Facilities	Develop footpaths, viewing points and interpretation facilities	Provides alternative excursion option for tourists overnighting in Kigali	Mount Kigali

Source: Revised Sustainable Tourism Master Plan (STMP) 2015

along Muhima wetland around the CBD. The attractions need to be optimized to create a distinct waterfront and eco-tourism based destinations which shall also improve public open spaces and recreation zones in the city.

Kigali lies between the two mountains of Mount Kigali and Mount Jali. The city takes it's name from Mount Kigali which is one of the highest hills in Kigali. One can hike to the mountain to get abundant views of the city and thus it has great potential for developing recreation facilities around adventure tourism and eco-tourism.

Special Tourism Products

The city of Kigali is also exploring development of new tourism products like Health city, Education City, sports city to improve footfall of tourists coming to the city to get state of the art health treatments or higher education within the East African region or even develop state of the art sports facilities to host national and international sports events. This shall also improve quality of social infrastructure within the city of Kigali.

The master plan update shall integrate these key tourism products and strategies which will not only help develop the tourism potential of the city but also conserve the rich culture and heritage of Kigali. The plan will focus on developing facilities for international and local tourism by providing recreational and tourism features in various areas of Kigali, as well as identify and conserve local heritage assets and integrate them into future planning. All these features will enhance its character and unlock the potential of the area whilst developing the local economy and conserving the heritage.

Management of Heritage Assets

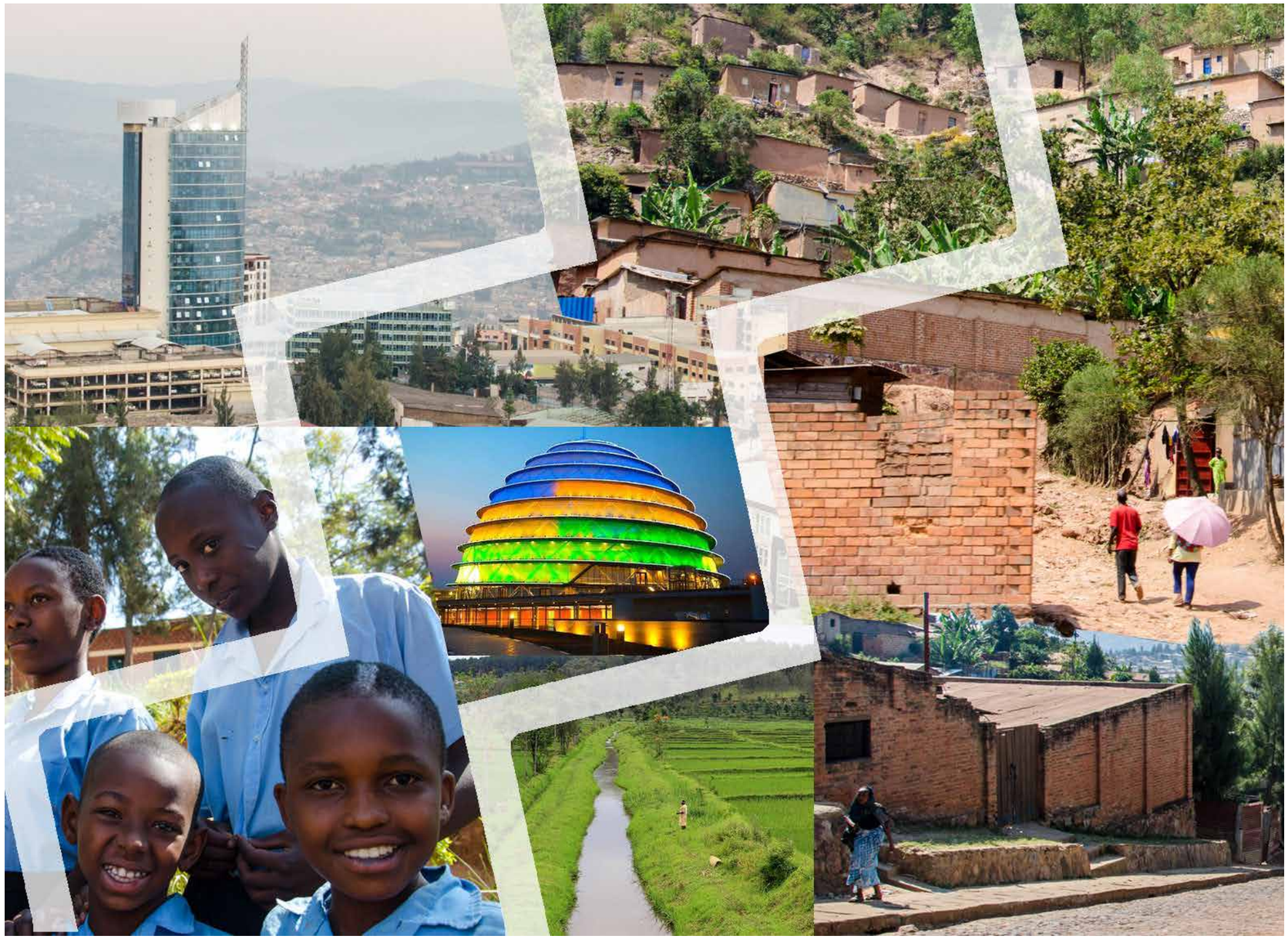
Kigali should develop a heritage strategy to manage its wide variety of assets. This heritage strategy should be an integral part of the urban development framework. As the city gears towards rapid urbanization, it should take stock, identify the heritage assets, and develop policies and incentives to promote heritage conservation and management. There is a need to develop a system to classify and grade heritage assets and develop appropriate heritage regulations, policies and incentives to manage them. A dedicated urban design & heritage conservation division should be part of the city's planning department This division will play the pivotal role in managing the cities heritage assets and deal with the related urban developments.

This page has been intentionally left blank.

5

Opportunities & Constraints

5 Development Opportunities & Constraints



Kigali's key physical constraints and opportunities are identified based on the existing context analysis. The key objective of identifying the Kigali's development constraints and opportunities are to understand the site constraints that are required to be respected as given site conditions, and to optimize the potentials offered by the site which shall be considered for the Master Plan update.

5.1 Key Development Constraints

More than half of the City's land area is constrained by natural limitations. Other physical constraints include some of the existing site uses and the recently approved projects especially around the urban areas.

Development constraints imposed by environmentally sensitive areas

Around 11% of the Kigali is occupied by the wetlands and these environmentally sensitive areas require to be respected. Large areas of these wetlands are spread along the southern and western boundaries of the City along the Nyabugogo river. As per the organic law, all wetlands and natural water bodies need to be provided with 20m buffer which is restrained from development.

The City is also constrained with geographical terrains largely in Gasabo and Nyarugenge districts. Around 17% of City's land falls under the "Steep Slope" Category, which is the land with a slope of more than 30%. This further leaves just about one-third of land available for development. These steep slope areas are environmentally sensitive and needs to be restrained from urban development.

Around 70% of the Kigali is occupied by the Agriculture and forestry. Agriculture land and forests needs to be preserved as much as possible to ensure food security and preserve natural resources.

Thus, protection of natural resources – forest, wetlands, steep slopes while contributing to economic growth are some of the major development constraints in the city of Kigali.

Development constraints imposed by Existing and Approved Developments

Currently, 6% of the City's land is taken up by unplanned developments without proper access to roads, infrastructure services and public facilities. While it is essential to either improve or redevelop these urban areas, some of it may remain as constraints due to limited City resources. A different urban strategy will be required to improve the living conditions within these unplanned areas.

Further to this, around 4% of the city area is occupied by good class single family housing mostly around the prime areas in proximity to the city core which potentially could accommodate much higher densities. These houses will require to be retained due to its well established high-end neighbourhood character.

Single family houses are further increasing since 2013 Master Plan in the sub-urban agricultural areas leading to urban sprawl.

There is an accelerated increase in office and commercial area supply, way more than the current market demand especially in the CBD area. This has resulted to decline in rental prices and occupancy rates.

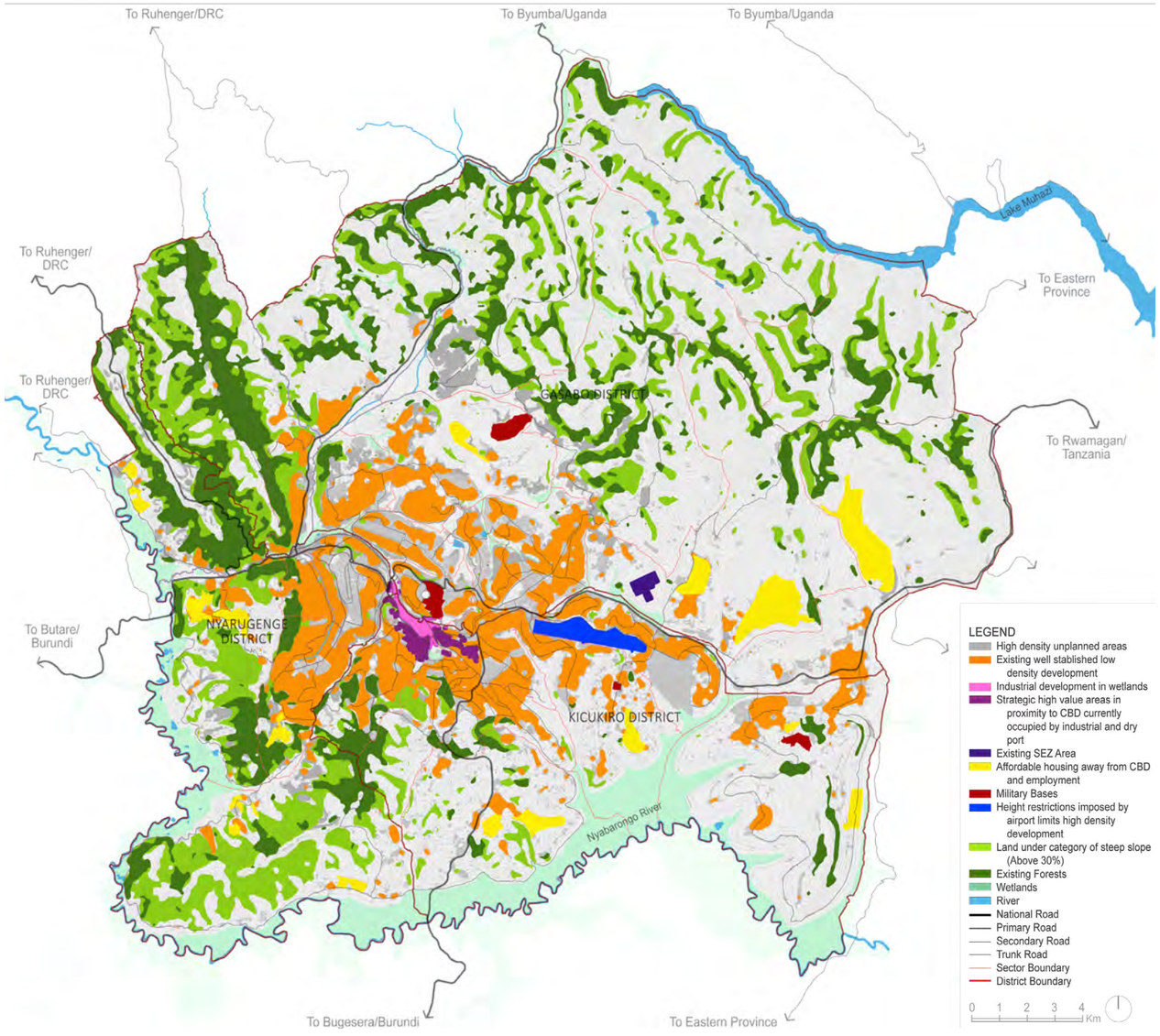


Figure 5.1 Constraints Map of Kigali City

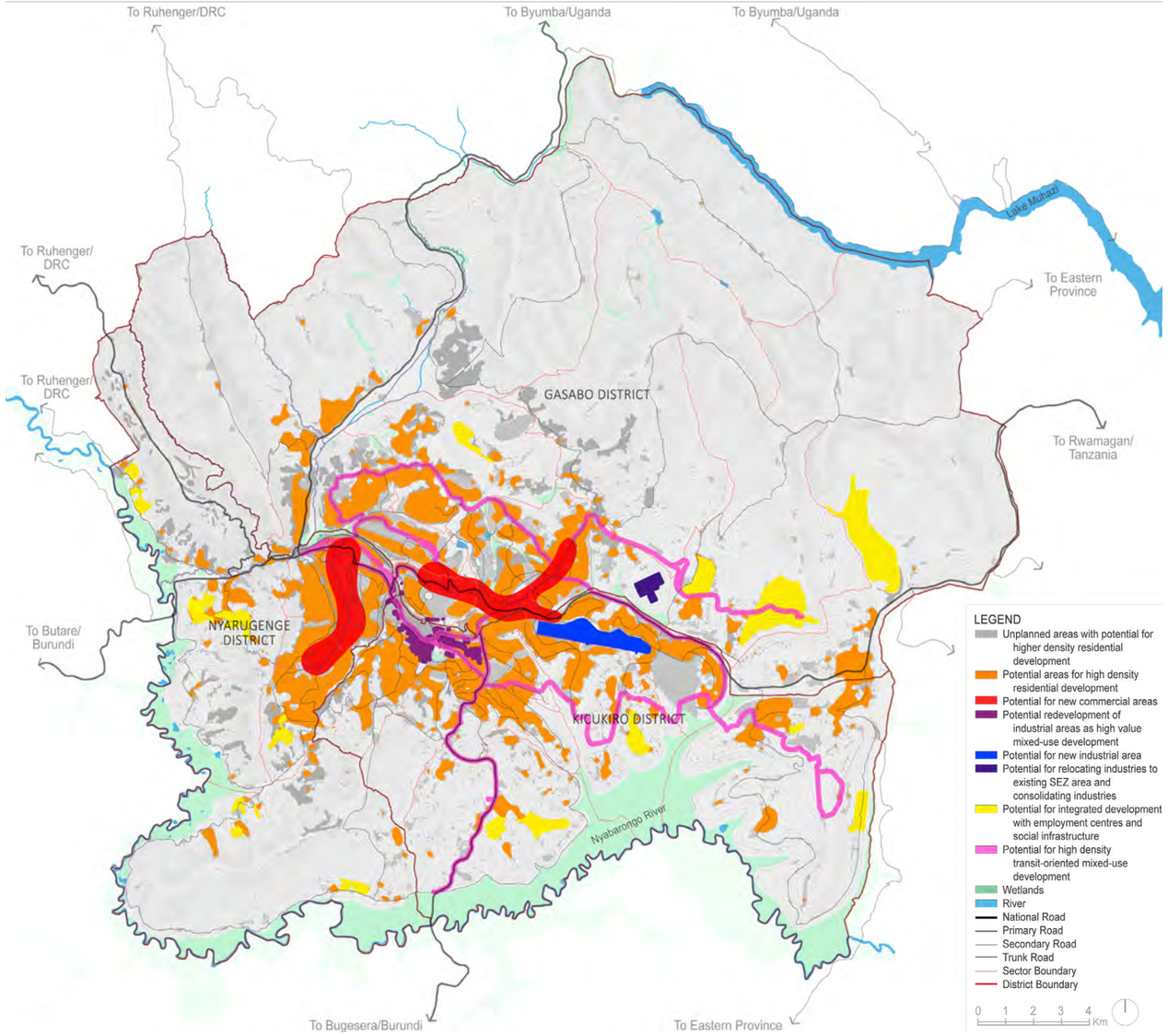


Figure 5.2 Opportunities Map of Kigali City

Other strategic high value areas in Gikondo are also occupied by pollutive industries and the dry port. These are in the process to be relocated but still a lot of land is occupied by industries and warehouses, also falling in the wetland area. These industrial units will need to be relocated in the long term to rationalize the use of such prime land near the City centre and to protect the wetland environment.

There is lack of worker housing and social infrastructure around industrial areas and new employment centres in Kigali. This is leading to growth of unplanned settlements around the CBD. Lack of physical and social infrastructure lead to poor quality of life and urban environment in these overcrowded unplanned settlements.

There is also short fall in supply of local, cost effective materials for construction of affordable housing in Kigali. The local authorities are trying different affordable housing models and techniques to increase the supply of affordable housing to meet the shortage and meet the future demand.

Though the new Bugesera International Airport (BIA) that is currently under construction in the Bugesera District, approximately 26km south-east of Kigali, will replace the existing Kigali International Airport, the existing airport shall be retained for military use and freight movement. Thus, the height constraints shall still apply in the urban area around the airport.

Special uses such as military land also restrict the new development in that area.

In the city with abundant natural resources, mountains, forests and wetlands, there is a lack of public open spaces for recreation and tourism activities. Agriculture land are also spread extensively in the periphery of the city and on steep slopes areas. The main challenge is to achieve a balance in preservation and use of natural resources, as well as preserving adequate farmland against urbanization.

5.2 Key Development Opportunities

The City is blessed with a scenic naturescape and a pleasant salubrious climate which provides good opportunity for tourism and sustainable development. Sizeable areas of land are free of development and available especially in the Gasabo and Kicukiro districts for the urban expansion.

Ample strategic areas for new development

A total of 490 sqkm or 68% of city's land is developable in the city of Kigali out of which 20% is currently occupied by the existing urban developments. A large area of virgin land along the north and south of the EW corridor is available for new urban developments.

Opportunities for urban redevelopment and affordable housing

Approximately 39.6 sqkm of land is currently occupied by unplanned settlements and low density urban areas and have the potential to be redeveloped as the comprehensive high density urban areas for mixed use mixed income housing and commercial developments with integrated public facilities and infrastructure services.
Lack of affordable housing and social infrastructure also provides opportunity to develop integrated developments for different income groups to improve quality of urban environment.

Revitalization of Central Business District

The tri-nodal existing CBD constitutes of Nyarugenge and Muhima (Commercial zone), Kacyiru (Administrative zone) and Kimihurura (Diplomatic zone) can be further strengthened as the premier business district of Rwanda.

Opportunities for New Employment Nodes

Approved international railway lines connecting Kigali to Dar- Es -Salaam provide greater opportunities for logistic and industrial activities in Kigali City. The rail line is planned to be extended further to the north towards Uganda in future.

Consolidating industrial areas and integrated development

The city of Kigali is in the process of consolidating its industrial areas into major employment and logistics centre. The existing industrial areas around wetlands and other environmentally sensitive sites can be further relocated to these industrial areas. The existing scattered industrial development around Gatsata along the Kigali- Gatuna Road in the northern part of Gasabo can also potentially be consolidated and safeguarded as expanded employment node with variety of industrial and logistics development.

Opportunities for integrated development around industrial areas with more affordable housing and social infrastructure to support industrial areas.

Potential for adequate use and preservation of urban wetland

Wetlands that run like green veins in the entire city of Kigali, bringing green open spaces and water channels right to the door steps of the residents, have the potential to be used in green sustainable ways for public use such as recreation and green economic growth, contributing to Kigali's green growth.

Potential for mixed-use corridor along BRT network

The BRT corridor is planned to pass through key urban areas, connecting existing and new residential areas and employment centres. There is a potential to develop this corridor as high density mixed use corridor for ease of connectivity between different uses.

Immense Potential for Recreation and Tourism

Hilly areas in Nyarugenge & Gasabo are potential for recreation & unique urban agriculture. The steep slope areas also offer potential opportunities for afforestation and expansion of green areas for the dense urban developments.
Large wetland areas could be transform into attractive wetland parks as also being proposed by the City in some areas.

The redevelopment opportunities also offer potentials for restoration of former wetlands.

This page has been intentionally left blank.

6

Dimensions of Growth

6.1. Positioning of Kigali City within Rwanda and the Region
6.2. Population Dynamics and Projections in Kigali City
6.3. Economic Activities in the Districts
6.4. Housing Quality in City of Kigali
6.5. Poverty and income inequality for City of Kigali Districts
6.6. Evolution of Human Development Index for Districts in City of Kigali
6.7. Determinants of Housing Demand in City of Kigali

6 Dimensions of Growth

6.1 Positioning of Kigali City within Rwanda and the Region

Rwanda's Vision 2050 aspires to take it beyond high income to high living standards by the middle of the century. Rwanda's income targets are to attain upper middle income country status by 2035 and high income status by 2050 with the intention of providing high quality livelihoods and living standards to Rwanda citizens by mid-century. As part of this plan Rwanda aims at developing modern infrastructure and livelihoods. This will be done through creating modern SMART green cities, towns and rural settlements, with well designed transport facilities and efficient public and private services.

In recent years, the government of Rwanda has been actively investing in the Meetings , Incentives Conferences and Exhibitions(MICE) sector in order to generate economic value for the country as well as raise its profile as a destination for business. In prioritizing MICE tourism as one of the drivers of economic growth , the city of Kigali is has been positioned as an important part of this growth strategy. As part of MICE strategy, Kigali City has had investments in infrastructures such as the Kigali Convention Centre , improvements of the National airport at Kanombe , investments in the national fleet which has seen an increase in the number of destinations for Rwanda Air. New destinations have been established with strategic trading routes including Dubai, West and Central Africa, Europe , London, South Africa and others all with the aim of position Kigali as regional business hub. In addition, the Government of Rwanda has invested in hotels, and attracted the private sector to support the value chain of the conference tourism. Complimentary policies to encourage tourism in Rwanda have seen complimentary policies like the issuing of visas upon arrival for all nationalities. In addition Rwanda Development Board has signed a the three year dael with Arsenal football Club in order to promote Rwanda as an attractive tourism destination under 'Visit Rwanda'campaign. These efforts have begun and continue to pay off. In 2017, Rwanda collected a total of $42 million (about Rwf36.3 billion) from 192 conferences and is poised to hit its target of $74 million (Rwf64 billion) in 2018.

In terms of trade and logistics, the City of Kigali has been positioned as a business transit hub through which goods destined for the Democratic Republic of Congo and Burundi pass prior to reaching their final destinations. These are mainly goods from regional ports such Mombasa and Dar-es-salam. All these strategies have been buttressed by a strong ICT backbone where innovative ICT technologies have been streamlined in all sectors of Rwanda to ensure that efficiencies are obtained while doing business. With respect to this, Kigali City has been positioned an ICT hub and a center of excellence with respect to ICT applications which will promote activities such as business processes outsourcing networking and other which are key to promoting the City of Kigali as a regional business hub.With the plans to decentralize government services and grow the six secondary cities,Kigali City will be a major business center which will also serve the secondary cities as they develop in the medium and long term.
In addition Rwanda Development Board has prioritized and implemented several reforms in doing business indicators over the past 10 years in order to make Kigali City and other parts of Rwanda a very competitive business environment. Three major reforms have been instituted in 2018 to decrease bureaucracy in construction, ensure timely electricity provision for investors, and reduce the amount of time exporters spend at customs. Today, export¬ers are able to obtain certificates of origin online. In addition exporters are able to apply for the phyto-sanitary certificate from the Ministry of Agriculture and Animal Husbandry online. This has facilitated businesses that export tea, coffee, and other agricultural products.

In summary, the City of Kigali and Rwanda as a whole has high potential to develop vibrant services and knowledge based sectors building on major investments that have been undertaken such as: Rwand Air expanding routes worldwide, a state of the arts conference facility in Kigali Convention Center, hotels and Eco-tourist facilities, country wide fiber optic and roll out of 4G network, 89% financial inclusion rate (2016), well maintained and expanding road network in urban and rural areas, fully developed special economic zones and fast adoption of ICT in service delivery through online services among others. This means is that Kigali city is well - positioned to be a major business and service hub in the medium to long terms and plans to update the Kigali Master plan have to incorporate these goals for the City of Kigali.

6.2 Population Dynamics and Projections in Kigali City

Against the national population density of 415 inhabitants per square kilometer in 2012, the respective districts had a population density Nyarugenge (2,124 inhabitants per square kilometer), Kicukiro (1,911 inhabitants per square kilometer) and Gasabo (1,234 inhabitants per square kilometer), making Kigali city the most densely populated province in the country.

By 2012, the resident population of City of Kigali was 1,132,686 people, (11% of the total population of Rwanda) with males accounting for approximately 51.7%. By geographical distribution, Gasabo was the most populated district with a proportion of 46.8%, Kicukiro 28% and Nyarugenge 25% of the total population.

In comparison to national figures, the populations are mainly settled in urban areas within the respective districts with Kicukiro having the highest urban settled population.

Population structure

In terms of age structure, Kigali city's population is mainly comprised of young people with a median age of 22 years for all districts in the city. Females are generally younger than males and have a median age of 21years compared to males whose median age is 23 years.

Table 6.1 Population of Districts in City of Kigali

Area	Total	Male	Female	Urban Area	Rural Area
Rwanda	10,515,973	5,064,868	5,451,105	16.5	83.5
City of Kigali	1,132,686	586,123	546,563	75.9	24.1
Nyarugenge	284,561	148,132	136,429	75.2	24.8
Gasabo	529,561	274,546	255,015	69	31
Kicukiro	318,564	163,445	155,119	87.9	12.1

Source: RHP

Table 6.2 Age Structure of Population in City of Kigali

	Mean Age			Median Age		
Area	Both	Female	Male	Both	Female	Male
Rwanda	22.7	23.5	21.9	19	19	18
Nyarugenge	22.6	22.3	23	22	21	23
Gasabo	22.6	22.3	22.9	22	21	23
Kicukiro	22.5	22.2	22.8	22	21	23

Source: Population census 2012

6.2.1 Population Forecasting

A number of methods can be used to forecast population. These include the following;

Exponential growth model: Presented by Thomas R. Malthus (1978), the model assumes population grows at a constantly growing rate. However, this model over-estimates the population and as a result its application has been very limited to human population growth.

Logistic growth model: As an improvement to the above model, the model takes into account the capacity of the environment to accommodate a given number of people. Whereas this method is better than the first one, it requires knowing the carrying capacity (environment's maximum load) for the area whose forecast is to be computed. Given the unavailability of data about the geographical sectors for the districts in City of Kigali, this method could not be used.

Non-Linear Regression Exponential Population Growth Model: This is the model used by most modern software i.e. Minitab and Matlab cftool, again due to data issues, it could not be applied.

Cohort Component method:
This method is based on the three components that drive population change namely; fertility, mortality and migration. With the above weaknesses, while taking into account the quality of data available at geographical sector level, the average growth rate generated for Rwanda through NISR[1] estimates was adopted and forecasted. National growth rates were used to project the population for the respective years. In addition to the above, population projections were computed using past growth rates (growth rates between the last two population censuses), the reason for this was to reflect the different dynamics associated with different geographical sectors in the past. We than consolidate sector level population projections to get district and Kigali City population projections.

Adjustments for internal migration
We draw our population projections based on the Cohort component method used by the National Institute of Statistics of Rwanda (NISR) based on the Rwanda National census data (2012). This method takes into account fertility rates, mortality rates and net migration rates. Given that NISR projections assumed net zero migration, we have adjusted the our projections in order to account for net internal and external migration which were positive according to EICV4 World bank analysis on urbanization trends in Rwanda.

Migration rates have been based on EICV4 migration trends which show that for every 1000 people, the three districts in the city of Kigali have net positive net migration rates distributed as follows;

Nyarugenge district, had a net migration of 32 new migrants for every 1000 inhabitants, Kicukiro had a net migration of 240 new migrants for every 1000 people while Gasabo had a net migration of 212 new migrants for every 1000people. We also assume conservative net migration growth rates of 2.5% in every 10 years to reflect the fact that growth in the secondary cities will suppress net internal migration to the districts of Kigali city in the medium and long term.

Our migration adjusted estimates show that in the medium population growth scenario, the resident population of Kigali City will reach about 3.5million by 2050. In the high population growth scenario, the resident population has been projected to reach about 3.79 million people by 2050 while the low growth scenario projects a resident population of 3.2million people by 2050.

Table 6.3 IPAR-NISR adjusted projections

Year	IPAR-NISR adjusted projections		
	Low growth Scenario	Medium growth Scenario	High growth Scenario
2012 (Census year)	1,132,686	1,132,686	1,132,686
2018	1,569,579	1,582,659	1,582,659
2028	1,960,047	2,044,282	2,084,897
2038	2,431,149	2,603,307	2,728,598
2048	3,040,986	3,349,960	3,575,300
2050	3,199,857	3,545,015	3,797,193

Resident vs Day Populations

Care should be taken to draw a distinction between the resident population and the day population. Our projections of those of resident population. We are cognizant of the fact that in rapidly growing cities it may be the case the majority of people who work in the city reside outside but commute from their homes every day. E.g Kampala which about four times the size of Kigali has a resident population of 1.5 million people today, and a day population of about 4 million people. Nairobi a much bigger city than both Kigali and Kampala only has resident population of 3.5 million people today. Therefore in terms of planning for affordable housing , it is important to plan for the projected resident population. In terms of infrastructure planning it is important to plan for both the resident population and the commuting day population.

Assumptions Underlying Population Growth Rates and Population Projections for the City of Kigali

The following are assumptions underlying our population projections for the City of Kigali

i. **Reproductive Health Policies and programs are contributing to declining fertility rates over time in Rwanda**

Based on past data, fertility change in Rwanda can be classified into three periods reflecting on three phases of implementation of the national policies and programmes put in place to mitigate the rapid growth of the population. These include a period of steady decline in fertility (1978-1992), a period of increase in fertility (the 1994 genocide aftermath) and a period of rapid decline in fertility (2005 to present).

The period between 1978 and 1992 was marked by a steady decline of the fertility rate following a proactive governmental policy to reduce fertility by implementing a vigorous family planning programs using all available means. The 1994 genocide had a catastrophic impact on health systems and households were affected severely by the loss of family members. Fertility declined slightly during this period but then recuperated between 2000 and 2005. However, the post-2005 rapid decline in fertility is attributed to increase in access to community-based health services, successful public campaigns promoting responsible parenthood and more importantly a steady increase in the level of education of females.

1 NISR uses the cohort component method which is based on the components of population change: fertility, mortality and migration (NISR, 2012)

ii. Health Policies and programs are resulting into to declining mortality rates in Rwanda over time

The current socio-health context of Rwanda is characterized by the increase in the availability of health facilities down to the lowest administrative level, universal access to health care through mandatory medical insurance for all, and significant improvement in family and environmental hygiene. These factors contributed to the decline in mortality as clearly illustrated by the increase in life expectancy at birth between 2002 (51.2 years for both sexes) and 2012 (64.5 years). It is assumed that these factors will continue to play a significant role in improving the health and living conditions of people, along with Vision 2050 agenda aimed at transforming Rwanda into a Middle Income Country.

iii. Growth of secondary cities will reduce net migration into Kigali City in the medium and long term

There are pro-active steps currently being undertaken by the government to ensure balanced growth and ease the pressure on the city of Kigali. These include the development of secondary cities , plans to move government departments such as RAB to Nyagatare and plans to move some industries to the six secondary cities. Already different faculties of the university of Rwanda have been moved to the districts and this is likely to reduce the influx of people coming to Kigali for better services and jobs.This will reduce net internal migration to Kigali City in the medium to long term.

iv. Migration of foreigners to work and live in the city of Kigali has been restricted to professionals with scarce skills in Rwanda and investors in order to increase available jobs for Rwandans

Therefore, foreign migration patterns are less likely to contribute much to population growth rates in the medium term and long term.

v. Medium to long term trends in internal migration into Kigali city are not dominated by rural to urban migration but my migration to the sectors surrounding the city of Kigali

The 2017 World Bank study on migration patterns in Rwanda shows that in contrast to popular belief, rural-to—urban migration is the least among all types of migration in Rwanda. Of all internal population movements between 2011 and 2014, 20 percent went from rural to urban areas, only slightly higher than the share in 2000-2005. Intra-rural migration remained the dominant form of internal population movements in 2011-14 at 34 percent. Urban-to-rural migration is the second most common type of migration, accounting for 27 percent of all internal population movements. Urban-to-urban migration increased slightly since the 1990s. Overall, rural areas were the destination for 61 percent of internal migrants since 2011. Another migration dynamic that is less obvious from the district statistics is the move towards the fringes of the City of Kigali rather than into the city of Kigali itself. Recent internal migrants make up 13 percent of the population in sectors that border Kigali City Province, compared to 8 percent of the overall populationSectors that border Kigali City are Runda, Rugarika, and Mugina in Kamonyi District, Ntarama, Mwogo and Juru in Bugesera District, Myumbu, Gahengeri, Nyakaliro and Fumbwe in Rwamagana District, and Shyorongi, Ngoma, Murambi, Masoro and Ntarabana in Rulindo District.

The Population in the sectors bordering Kigali increased by 40 percent between 2002 and 2012, compared to a 30 percent overall population growth (World Bank 2017)

vi. Topography, current prevailing conditions and housing preferences within the city of Kigali City

Based on the 2012 population census, the city of Kigali is a highly densely populated province. Compared to a national population density of 415 inhabitants per square kilometer in 2012, the districts in Kigali the following population densities in 2012; Nyarugenge had 2,124 inhabitants per square kilometer, Kicukiro had 1,911 inhabitants per square kilometer while Gasabo had 1,234 inhabitants per square kilometer. While it is true that densification has a potential in increasing population density per sq km, the topography of Kigali which consists of very steep hills and valleys puts limitations densifying the current available land within the city. Anectodotal evidence from our housing survey also indicates that there is low appetite for apartment-type housing among locals. This implies most of the growth in terms of resident population will take place in areas that are neighboring Kigali City including Masaka, Bugeseera and others. This is sprouting of semi-planned residential housing towns already happening in towns surrounding Kigali city.City of Kigali Labour Market Characteristics

Labour Force for City of Kigali

In terms of labour force, the city of Kigali had a total force of 651,350 working age adults , having increased by approximately 30% between 2010 and 2014. Among the individual districts, the labourforce increased by 43% for Gasabo district, 17% for Kicukiro district and 21% for Nyarugenge.

The increase in the labour force was in tandem with the change in the working age population that increased by 28.5% to 822,243 by 2014.

Table 6.4 Working age population and labour force in city of Kigali

District	Labour force 2010	Labour force 2014	Working age population (16+)	Working age population (16+)
Gasabo	224,517	320,569	280,258	394,609
Kicukiro	147,876	172,926	186,228	221,381
Nyarugenge	130,176	157,855	173,185	206,253
City of Kigali	502,569	651,350	639,671	822,243

Source: Integrated Household Living Conditions 2010, 2014

City of Kigali Employment Distribution by Sector 2005/6 to 2013/14

	2005/6		2010/11		2013/4	
Sector	Frequency	Percent	Frequency	Percent	Frequency	Percent
Agriculture forestry, Fishing & Agro-processing	4,314	2	26,218	10.3	157,452	24.68
Mining	1,140	1	2,774	1.1	8,450	1.32
Manufacturing	7,659	4	4,564	1.8	24,598	3.86
Services	121,433	64	160,672	62.8	207,699	32.55
Construction	24,656	13	31,119	12.2	68,733	10.77
Trade	16,047	8	15,435	6.0	144,956	22.72
Transport	15,487	8	14,725	5.8	26,160	4.1
Not adequately defined	-	-	151	0.1	-	-
Total	**190,736**	**100**	**255,658**	**100.0**	**638,048**	**100**

Source: EICV2, EICV3 & EICV4

Employment Trends in Kigali City (2005-2014)

In order to analyse and compare employment trends in Kigali City between 2005 and 2014, data from EICV2, EICV3 and EICV4 household surveys from NISR is used to disaggregate employment by economic sector and by province. To allow comparisons between the 3 surveys, the ISIC classification on economic activity in each of these surveys has been aggregated into seven major sectors namely;(i) Agriculture, Fishing, Forestry and Agro-processing.(ii) Mining (iii) Manufacturing (iv) Services, (v) Construction, (vi) Trade and (vii) Transport.

According to the EICV survey findings, services had the largest share of employment in Kigali city at 32% and accounted for about 207,000jobs in 2014 down from about 121,000jobs in 2005. In terms of job growth services have had the largest increase in absolute numbers between 2005 and 2014. The reason behind this shift is that as the economy transforms, labour moves from low productive agricultural activities into non-agricultural activities such as services and trade. Services include activities such as tourism, accommodation and food , hotels and restaurants, Information and communication , financial and insurance , real estate activities, professional, scientific and technical activities, administrative and support service activities, education, human health and social work activities and others.

Second in terms of employment was agriculture, agro-processing, fishing and forestry which employed 157,000people in 2014. Although the absolute numbers of persons engaged in primary agriculture has reduced over time, agricultural is still dominant in the rural sectors of Kigali. In addition jobs in agro-processing sector will continue to grow given the urgent need for value addition in the agriculture, sector. The employment share of agriculture, agro-processing, forestry and fishing grew from 0.02% in 2015 to about 25% in 2014. This increase has mainly been mainly attributed to increased agricultural production in the rural sectors of Kigali and the development of agro-processing industries within Kigali City over the 2005 t0 2014 period. The booming construction activity within the city of Kigali also increased employment opportunities for people dealing in forestry products such as timber(wood) which are used in both the construction industry and the furnishing of finished buildings.

The third largest sector in terms of employment is trade which employed about 145,000people in 2014 down from 16000people on 2005. In terms growth, the construction sector has had a threefold increase in employment between 2005 and 2014 due the on-going construction of both residential and commercial properties in the city of Kigali. In addition, there have been a significant growth in infrastructure projects such as roads within the last 10 years in the city of Kigali. As the need for affordable housing grows, employment in the construction sector is likely to grow in both the long and medium term.

Employment in the transport sector has grown from about 15,000jobs in 2005 to about 26000 jobs in 2014. As the resident population increases within the city of Kigali, employment in this sector will increase in the medium and long term.

The mining sector is the smallest sector in terms of employment and has had its share of employment increasing by 0.32 between 2005 and 2014.

6.2.2 Forecasting Employment by District in Kigali City (2014-2050)

Districts Arc Elasticity Method

The Employment elasticity of growth explains the change in employment resulting from changes in economic growth, this could be captured by either arc elasticity or point elasticity. Employment definition is adapted from the EICV studies and it refers to anyone that worked for at least one hour in the last seven days prior to the day data was collected.

The Arc Elasticity method on the other hand requires cross-sectional data of percentage change in employment (numerator) and percentage change in growth (denominator) for two periods.

$$\ell = \frac{(E_1 - E_0)/E_0}{(Y_1 - Y_0)/Y_0} \quad \text{----------(i)}$$

For this study period one refers to 2014 while period zero refers to 2011, E and Y represent employment and GDP in the respective periods. Employment data is from Household surveys of 2011 and 2014, while GDP Data is computed using the method explained in section 3 above.

Arc elasticity is computed using the method in equation (i) and indeed the results in table 25 were computed using this method. With an elasticity, Kicukiro is expected to experience both productivity growth and employment growth, while Gasabo and Nyarugenge are expected to have a positive employment growth but won't be in tandem with productivity growth, see table 25 for details.

Table 6.5 Interpreting Employment Elasticities

	GDP Growth	
Employment Elasticity	**Positive GDP Growth**	**Negative GDP Growth**
$\varepsilon \prec 0$	(-) Employment Growth	(+) Employment Growth
	(+) Productivity growth	(-) Productivity growth
$0 \leq \varepsilon \leq 1$	(+) Employment Growth	(-) Employment Growth
	(+) Productivity growth	(-) Productivity growth
$\varepsilon \succ 1$	(+) Employment Growth	(-) Employment Growth
	(-) Productivity growth	(+) Productivity growth

Table 6.6 Arc Elasticity for City of Kigali Districts

District	Employment 2010	Employment 2014	Employment growth rate	GDP 2010	GDP 2014	GDP Growth rate	Arc Elasticity
Gasabo	203,983	289,308	0.418	256,447,427,600	306,326,117,647	0.194	2.1546392
Kicukiro	128,907	153,234	0.189	276,183,247,500	370,357,564,235	0.341	0.5542522
Nyarugenge	113,759	137,427	0.208	179,511,702,000	197,894,880,000	0.102	2.0392157

Whereas it's easy to compute arc elasticity, Islam and Nazara (2000) and Islam (2004) found that employment elasticities calculated using this method tend to exhibit a great deal of instability and may therefore be inappropriate for comparative purposes, making the point elasticity method better than the arc elasticity.

Table 6.7 Random Effects Regression Elasticity

```
Random-effects GIS regression                   Number of obs      =         9
Group variable: District 1                      Number of groups   =         3

R-sq:  within  = 0.5912                         Obs per group: min =         3
       between = 0.4339                                        avg =       3.0
       overall = 0.2875                                        max =         3

corr(u_i, x) = 0 (assumed)                      Wald chi2(1)       =      8.18
                                                Prob > chi2        =    0.0042

------------------------------------------------------------------------------
 ln Employment |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
        lnGDP |   .2154837   .0753224     2.86   0.004     .678544    .363113
        _cons |   6.342295   1.962559     3.23   0.001    2.495751   10.18884
---------------+--------------------------------------------------------------
      sigma_u |  .36285331
      sigma_e |  .12273618
          rho |  .89733178   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Point Elasticity Approach: This is preferred because it irons out volatility associated with arc elasticity. This is computed using econometrically generated behaviours between variables, the random effects model was used because it accounts for three sources of residuals in a regression namely time related error, cross-section related error and white noise which in essence makes it obtain efficient estimates.

Using household survey data from 2005, 2010 and 2014 a pseudo panel was generated for the three districts and the above results and above random effects models were generated for the city of Kigali and the districts. There is a positive relationship between gross domestic product and employment and the magnitude lies between zero and one, this means generally in the city of Kigali there will be increase in both productivity and employment.

Individually, Gasabo district is projected to host most of the created jobs with the other two districts evenly sharing the remaining jobs.

City of Kigali:- $\ln E_{it} = 6.34 + 0.21Y_{it}$ ------(i)
Nyarugenge:- $\ln E_{it} = 6.34 - 0.188Y_{it}$ -----(ii)
Gasabo:- $\ln E_{it} = 6.34 + 0.398Y_{it}$ -----(iii)
Kicukiro:- $\ln E_{it} = 6.34 - 0.1615Y_{it}$ -----(iv)

Whereas overall in the city of Kigali, employment is projected to increase with economic growth, within the districts of Nyarugenge and Kicukiro, the growth in employment is expected to decrease with time, in other words, the jobs spilling off economic growth are projected to decrease as the economy expands.

Table 6.8 District Point Elasticities

District	Employment Elasticity
Nyarugenge	-0.1883353
Gasabo	0.3498203
Kicukiro	-0.1612849
City of Kigali	0.21

Total employment in City of Kigali is projected to increase from 661,665 in 2019 to 1,760,285 by 2050, Gasabo district is projected to generate majority of the jobs accounting for 45% in 2019 to 62% by 2015 o of the total jobs with Nyarugenge and Kicukiro accounting for 26% to 18% and 29% to 20% respectively, see table 28 for details.

Table 6.9 District Forecasted Total Employment

District	Actual Employment in 2014	Forecasted Employment in 2024	Forecasted Employment in 2034	Forecasted Employment in 2044	Forecasted Employment in 2050
Nyarugenge	137,427	200,559	255,076	300,976	320,185
Gasabo	289,308	409,829	655,884	939,020	1,096,629
Kicukiro	153,234	224,499	282,070	326,772	343,471
City of Kigali	**579,969**	**834,887**	**1,193,030**	**1,566,768**	**1,760,285**

6.2.3 Forecasting Employment by Economic Sectors in Kigali City

To forecast employment trends by economic sector we have used past trends in the shares of employment by sector to forecast future shares in employment. In order to allow comparison between EICV2, EICV3 and EICV4 household surveys from NISR, the ISIC classification on economic activity in each of these surveys has been aggregated into seven major sectors namely;

- Agriculture, Fishing, Forestry and Agro-processing
- Mining
- Manufacturing
- Services
- Construction
- Trade
- Transport

Given the volatility of employment numbers between the three EICV surveys, average annual growth rates in the employment shares of these sectors between EICV2 and EICV4 have been used to project employment shares between the four 10 year-periods, starting with base sectoral employment shares in 2014.

Findings on Employment Forecasts by Sector

Our forecasts show that services will continue to be highest sector of employment by 2050 and will account for about 653,000 jobs in Kigali city up from about 189,000 jobs in 2014. As the city of Kigali continues to transforms into a regional business hub and an important city for Meetings Incentives, Conferences and Exhibitions (MICE) tourism, services such as hotel accommodation, business process outsourcing, accommodation and food , hotels and restaurants, ICT , financial and insurance services will increasingly employ more people in the city of Kigali in the medium and long term. Other services that are likely to employ more people as the resident population in Kigali increases will include real estate activities, professional, scientific activities, administrative and support service activities, education, human health and social work activities.

Services will be followed by trade which has been projected to employ a total of 415,000 people by 2050. This is almost three times the employment rate of about 132,000 trade jobs in 2014. As Rwanda transforms from agriculture into a service based middle income economy, the majority of low-skilled people in the agriculture, fishing and forestry sectors of Kigali city will mostly move into the retail and wholesale trade.

Although employment in traditional agriculture is likely to reduce over the next 30 years, value addition through agro-processing in the food, fishing, and the forestry sector will generate the majority of jobs in this sector. The third biggest sector in terms of employment generation by 2050 has been projected to be trade which has been forecasted to account for about 274,000 jobs in Kigali city down from about 144,000jobs in 2014, a doubling of employment.

Although the construction boom saw a doubling in employment from about 25000jobs to 68,000jobs between 2005 and 2014, our projections show a 40% increase in the number of construction jobs reaching about 95000 construction jobs in Kigali city by 2050. Land limitations in the city of Kigali due to an already high population densities in Kigali city are already pushing more people to construct in fledging towns surrounding Kigali. In addition, we expect more construction to take place in the secondary cities which have less land limitations when compared to Kigali City.

Table 6.10 City of Kigali Employment Forecasts by Economic Sector (2014-2050)

	2014	2024	2034	2044	2050
Agro-processing, Agriculture, Forestry & Fishing	143,136	173,931	202,219	205,690	204,114
Mining	7,656	10,937	16,106	21,335	24,195
Manufacturing	22,387	40,909	70,389	108,107	132,021
Services	188,780	280,522	412,788	557,769	635,463
Construction	62,463	98,159	152,708	216,214	246,440
Trade	131,769	192,024	277,976	369,757	415,603
Transport	23,779	38,405	60,845	87,896	102,449
Total	579,969	834,887	1,193,030	1,566,768	1,760,285

Source: Authors Calculations based on EICV4 survey

Manufacturing, mining and industrial production are likely to shift to the secondary cities hence the lower employment projections when compared by other sectors in 2050.

Overall, total employment is projected to double within the city of Kigali from about 600,000 jobs in 2014 to about 1.2 million jobs in 2050.

Analyzing Labour Markets at District Level within Kigali City

Unemployment levels in the district ranged between 9.8% and 12.9% with Nyarugenge having the highest unemployment rate and Gasabo the lowest. In comparison to national unemployment rates that stood at 3.4% by 2014, NISR the rates are significantly high. The high unemployment rate is exacerbated by (i) high time related underemployment ranging between 16% and 19.2% in the districts and (ii) the in activity rates ranging between 18.6% for Gasabo, 21.7% Kicukiro and 23.5% in Nyarugenge District.

The type of jobs was dominated by wage non-farm which ranged between 53% and 63% for the individual districts, and independent non- farmers, see table 9 below for details.

In essence there's underutilization of labour in the districts with at 47.6% in (Gasabo) district, 49.2% in Kicukiro district and 53.8% in Nyarugenge District of the labour force not efficiently contributing to district productivity.

Overall Mean Years of Schooling by District

Education in districts has improved over the years by more than 100%. In 2011, the average number of years completed in school was 2.9 years, 2.7 years and 2.9 years for Nyarugenge, Gasabo and Kicukiro respectively. These increased by 90%, 82% and 101% respectively, this can partly be attributed to increased school enrollments arising from free public education in form 9-year basic education.

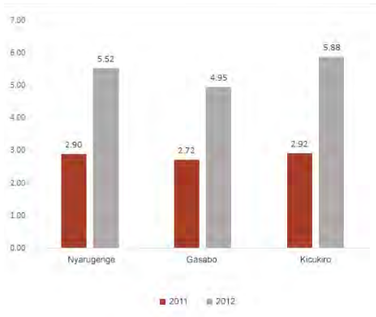


Figure 6.1 Completed Average Years of Schooling in City of Kigali Districts

Despite the substantive increase arising from increased school enrollment in City of Kigali and the country at large, the average number of years completed in school are still low compared to the international standards of middle income countries, Rwanda and the city of Kigali are aspiring to become.

Quality of Labour force by Education

In terms of completed years of schooling (in terms of years of schooling) the quality of labour force has improved for all districts and the country at large, the population that never attended school reduced from 4% of the labour force at national level, the same trend was experienced at district level, with Gasabo district reducing by 4%, Nyarugenge 3% and Kicukiro 1% of the labour force.

The same negative trend was manifested at primary school level, with a reduction of 3%, 2% and 1% for the Gasabo, Nyarugenge and Kicukiro districts respectively.

On the other hand, there was a positive increased in the proportion of labor units within the labor force that had either secondary or university education with an aggregate magnitude increase of 7% ,3% and 6% for Gasabo, Kicukiro and Nyarugenge respectively against a 5% increase at national level.

It's important to note that of the total educated labour force with university and secondary education in the country; 50%, 33%, 21% with university, upper secondary and lower secondary respectively are located in City of Kigali with Gasabo having the most highly educated labour force, see tables 10 for details.

In comparison to the skill set envelop at national level, the labour force in City of Kigali and the respective districts is highly skilled, nevertheless in comparison to the total working age population and the labor force, the overall proportions of skilled labour units largely equipped with post primary, lower secondary and upper secondary is low.

6.3 ECONOMIC ACTIVITY IN THE DISTRICTS

Attempts have been made to generate district GDPs in Rwanda by (i) the World Bank (2014) which used the lights intensity approach for individual districts to estimate economic activity in individual districts and (ii) ILO (2016) which used the Expenditure approach to estimate the individual economic activities.

The nature of Rwanda's economy, in particular the rural setting and informality components that are detached from existence of electricity in a given area limits the scope of the Light Intensity Approach. The expenditure approach which was used attempted to address this problem by using the consumption levels, investment levels and government expenditure when computing the district economic activities. However, it didn't take into account district exports and imports because of unavailability of data. And because the purpose of generating these values is to inform forecasts, single data points don't help much.

It's against the above background that a compromised income approach method was adopted, the word compromise is used to indicate deviation from the conventional method that sums up

Table 6.11 Labour Market Features in City of Kigali

District	Gasabo		Kicukiro		Nyarugenge	
Period	2010	2014	2010	2014	2010	2014
Employment to Population ratio	72.8	73.3	69.2	69.2	65.7	66.6
Unemployment rate	9.1	9.8	12.8	11.4	12.6	12.9
Inactivity rate	19.9	18.6	20.6	21.7	24.8	23.5
Time related Underemployment rate	25.8	19.2	15	16.1	11.7	17.4

Source: Integrated Household Living Conditions 2010, 2014

Table 6.12 Arc Elasticity for City of Kigali Districts

District	Wage Farm	Wage Non-farm	Independent farmer	Independent non-farmers	Unpaid non farmer	Total
Gasabo	3.8	53.3	20.9	20.4	1.6	100
Kicukiro	1.9	62.8	9.5	22.5	3.4	100
Nyarugenge	1.7	55.2	10.1	29.3	3.6	100

Source: Integrated Household Living Conditions 2010, 2014

Table 6.13 Education level of the Population in City of Kigali

Location	Never attended		Primary completed		Post primary		Lower secondary		Upper secondary		University		Total	
	2010	2014	2010	2014	2010	2014	2010	2014	2010	2014	2010	2014	2010	2014
Gasabo	0.11	0.07	0.22	0.16	0.06	0.05	0.07	0.11	0.11	0.13	0.09	0.11	224,517	320,569
Kicukiro	0.06	0.05	0.23	0.22	0.08	0.05	0.09	0.12	0.14	0.15	0.13	0.16	147,876	172,926
Nyarugenge	0.09	0.06	0.24	0.25	0.03	0.03	0.08	0.13	0.15	0.15	0.10	0.12	130,176	157,855
Rwanda	0.21	0.17	0.19	0.20	0.03	0.02	0.04	0.06	0.04	0.06	0.02	0.03	4,893,109	5,590,398

Source: Integrated Household Living Conditions 2010, 2014

incomes generated by different factors of production. The adopted approach sums up all income of labour units that reported to have been employed in the three household surveys of 2002, 2010 and 2014 and the following results are generated.

Whereas this approach generates values relatively similar to official GDPs, it falls short by assuming similar incomes across different employment units, this does over estimate labour units productivity.

Gross Domestic Product (GDP)

Findings

Despite the above limitations, the approach generates fair signals of activity in the districts, and within City of Kigali, whereas Gasabo district was the biggest in 2005 with a 42% magnitude, Kicukiro district has since become the biggest economy within the city accounting for 44% by 2015 because of the high growth 8.88% in comparison to the two districts, see table 11 for details.

In terms of per capita GPD, it ranged between $858 in Gasabo district and 1676 in Kicukiro district, despite the expansion of the economies, the per capita GDP decreased in 2015 ranging between 760 in Gasabo district and 1623 in Kicukiro district. The decline is attributed to the increased population in the city emanating from rural urban migration as the rest of the labor unit from across the country try to benefit from growth in the City of Kigali.

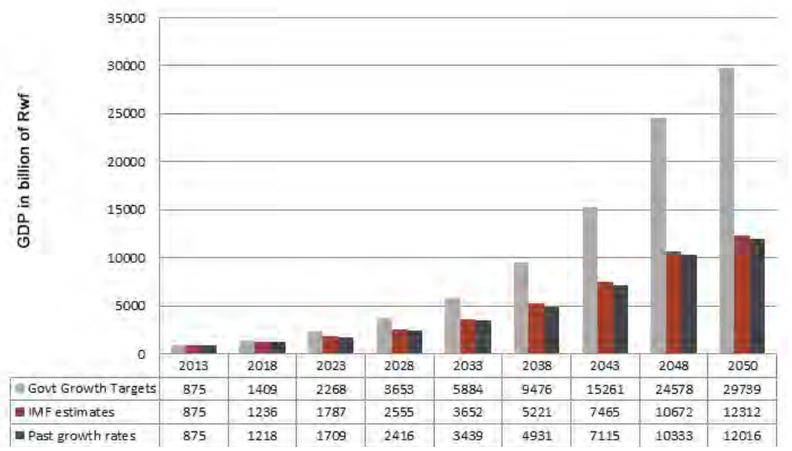
Forecasted GDP

The above generated results were subjected to past district growth rates, IMF estimated growth rates and government's desired growth rates to estimate forecasts.

GDP of the Districts in City of Kigali

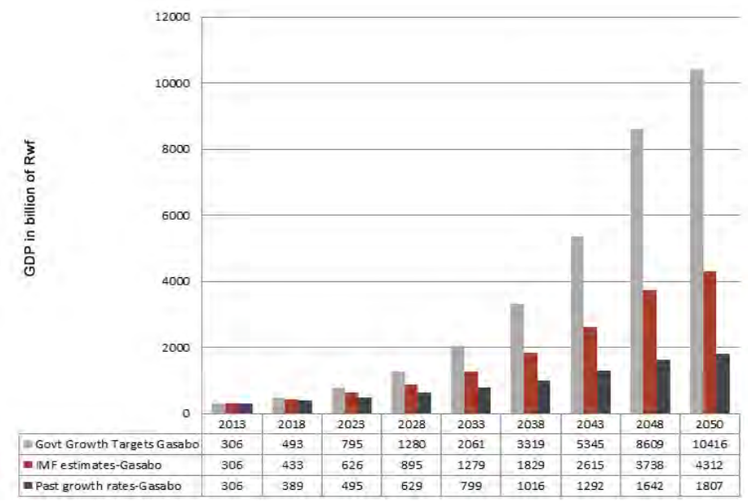
The economy of City of Kigali has experienced positive growth in that last decade averaging 6.5%, among the 3 districts, Kicukiro district is the biggest in terms of GDP accounting for 42% of the total GDP, this is followed by Gasabo (35%) and Nyarugenge (23%) respectively.

The three districts and the city at large are projected to continue growing between 6.5% and 10% for the next 3 decades because of the enormous investments taking place especially in the service and manufacturing sector, these however will have to generate employment for the growing labour labor force if indeed the above growth rates are to be realized.



	2013	2018	2023	2028	2033	2038	2043	2048	2050
Govt Growth Targets	875	1409	2268	3653	5884	9476	15261	24578	29739
IMF estimates	875	1236	1787	2555	3652	5221	7465	10672	12312
Past growth rates	875	1218	1709	2416	3439	4931	7115	10333	12016

Figure 6.2 City of Kigali Forecasted GDP (2013-2050)



	2013	2018	2023	2028	2033	2038	2043	2048	2050
Govt Growth Targets Gasabo	306	493	795	1280	2061	3319	5345	8609	10416
IMF estimates-Gasabo	306	433	626	895	1279	1829	2615	3738	4312
Past growth rates-Gasabo	306	389	495	629	799	1016	1292	1642	1807

Figure 6.3 GDP Forecasts Gasabo (2013-2050)

Table 6.14 GDP Estimates for Districts in City of Kigali

District	2005 GDP (billion Rwf)	2013 GDP (billion Rwf)	Population	Percapita (Rwf) 2013	Percapita GDP USD 2013	2015 GDP (billion Rwf)	Population 2015	Percapita (Rwf) 2015	Percapita GDP USD 2015	Average Annual Growth rates (%) (2005-2013)
Gasabo	115	306	552,919	554,016	858	3372	633,742	532,025	760	4.91
Kicukiro	85	370	341,992	1,082,942	1,676	4391	386,569	1,135,765	1,623	8.88
Nyarugenge	69	198	287,615	688,055	1,065	2215	301,852	733,677	1,048	5.79

Table 6.15 IMF GDP Forecasted Growth rates for Rwanda (%)

District	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Forecasted Growth rate	7.6	8.9	6	6.1	7.2	7.8	8	7.5	7.5	7.5

Source: International Monetary Fund 2018

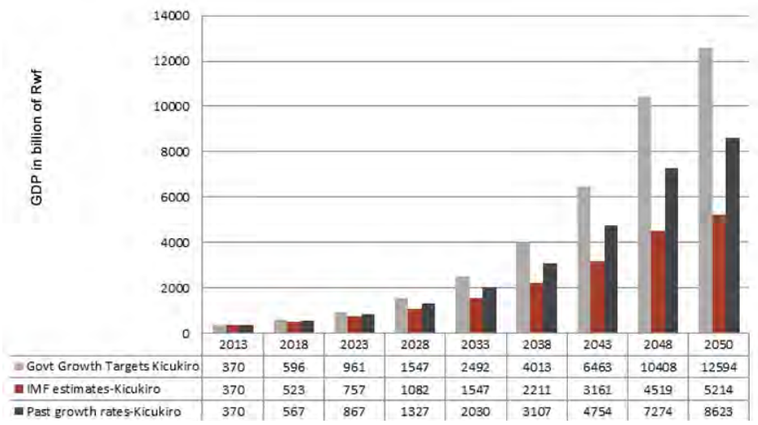


Figure 6.4 GDP Forecasts Kicukiro (2013-2050)

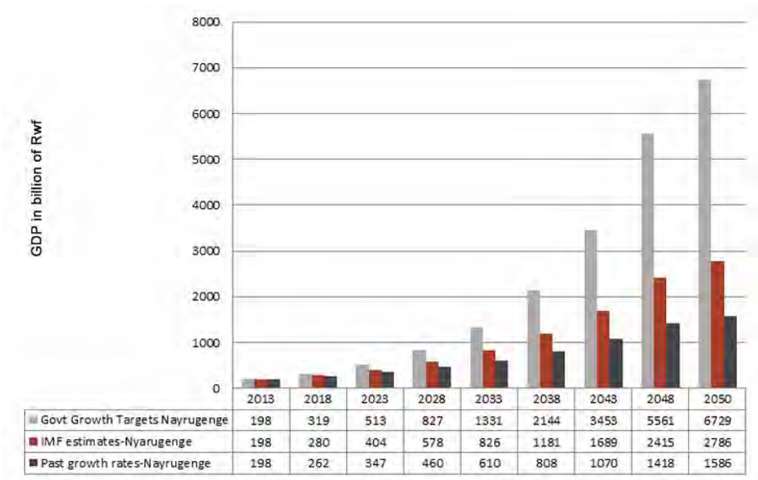


Figure 6.5 GDP Forecasts Nyarugenge (2013-2050)

6.3.1 Economic Activities by District

The city has 32,619 establishments[2], having increased by 9.5 % from 2011, Gasabo district accounts for 37.8 %, Nyarugenge 37.4% and Kicukiro 24.8%. In terms of economic activities, the number of enterprises (establishments) increased by 26% for Gasabo district, by 10% for Kicukiro district and decreased by 3.5% for Nyarugenge district.

Construction and services sector dominate the business establishments in all the three districts accounting for 93% in Gasabo, 92% Kicukiro and Nyarugenge 90%.

In terms of size, in all districts micro establishments dominate accounting for 95.4%, 95.2% and 96% in Gasabo, Kicukiro and Nyarugenge respectively. In Gasabo district, Large and Medium establishments increased by 176%, whereas micro and small establishments increased by 25% and 64.5% respectively. In Kicukiro district, the total number of establishments increased by 10%, with the major increase occurring among micro and small establishments by 12.5% and 64% respectively. In Nyarugenge district, whereas there as a reduction by 3.5% in

2 It is an enterprise or part of an enterprise with constant site, performing one or more economic activity under one administration. Holder of the establishment could be natural or nominal person or governmental body. Accordingly, elements of the establishments are: a. Constant site; b. Practice of economic activity; c. Holder (natural or nominal) (NISR, 2014).

Table 6.16 Structure of Economic Composition in Districts in City of Kigali by Establishment size

Period	2011				2011 Total	2014			2014 Total
Economic Sector	Agriculture & Forestry & Fishing	Construction & Services	Mining & Manufacturing & Utility	#N/A		Agriculture & Forestry & Fishing	Construction & Services	Mining & Manufacturing & Utility	
Nyarugenge	43	11965	337	295	12640	8	10981	1202	12191
Large	1	5	1		7	1	17	6	24
Medium		25	7	2	34		67	13	80
Micro	38	11651	296	5	11990	5	10544	1142	11691
Small	4	265	32	4	305	2	353	41	396
#N/a		19	1	284	304				
Gasabo	25	9329	385	57	9796	15	11463	859	12337
Large		3	3		6		24	5	29
Medium	1	28	3		32	2	62	12	76
Micro	18	9040	348	5	9411	12	10972	794	11778
Small	6	242	27	1	276	1	405	48	454
#N/a		16	4	51	71				
Kicukiro	7	6848	221	281	7357	19	7460	612	8091
Large		9	3		12		11	4	15
Medium	1	16	7		24	1	37	13	51
Micro	5	6659	178		6842	13	7145	547	7705
Small	1	162	32		195	5	267	48	320
#N/a		2	1	281	284				

Source: Establishment Census 2011, 2014

Table 6.17 Evolution of number of Establishments per sector in City of Kigali

Location	2014	Change from 2011%	Location	2014	Change from 2011%	Location	2014	Change from 2011%
Gasabo	12337	0.259	Kicukiro	8091	0.100	Nyarugenge	12191	-0.036
Bumbogo	449	0.927	Gahanga	281	0.301	Gitega	686	-0.003
Gatsata	806	0.088	Gatenga	1023	0.386	Kanyinya	267	0.723
Gikomero	152	1.027	Gikondo	601	0.066	Kigali	485	0.374
Gisozi	1865	0.961	Kagarama	181	0.521	Kimisagara	1942	0.049
Jabana	668	0.572	Kanombe	1150	0.184	Mageregere	374	0.206
Jali	324	0.261	Kicukiro	1162	-0.225	Muhima	2173	-0.319
Kacyiru	754	-0.088	Kigarama	1203	0.298	Nyakabanda	409	0.102
Kimihurura	535	-0.061	Masaka	1046	-0.047	Nyamirambo	753	0.104
Kimironko	2254	-0.010	Niboye	593	0.389	Nyarugenge	3922	0.054
Kinyinya	939	0.465	Nyarugunga	847	0.063	Rwezamenyo	1158	-0.121
Ndera	511	0.030	Didn't specify	4		Didn't specify	22	
Nduba	488	2.012						
Remera	1694	0.230						
Rusororo	641	0.051						
Rutunga	204	0.316						
Didn't specify	53							

the overall number of establishments, large and medium establishments collectively increased by 153%. The reduction in establishments occurred among micro establishments which reduced by 2.5%.

Generally, the total number of establishments within City of Kigali increased by, increasing by 0.256% in Gasabo district and 0.1% in Kicukiro district whilst decreasing in Nyarugenge district by 0.04.

Within the respective districts, the major growth of establishments occurred in Nduba, Gikomero and Bumbogo sectors whereas firm destruction occurred in Kacyiru, Kimihura and Kimironko sectors within Gasabo district. In Kicukiro district, growth mainly occurred in Kagarama, Gahanga, Gatenga sectors whereas firm closure occurred in Kicukiro and Masaka sectors. In Nyarugenge District, growth was mainly in Kanyinya and Kigali sectors, whereas firm closure mainly occurred in Muhima and Rwezamenyo sector, for details, see table 15 above. Gasabo registered 0.26% growth rate.

Capital size of firms

As already noted, majority of the establishments are micro and small in nature with 66%, 66% % and 62 % having a capital size of less than 500,000 Rwandan FRWS in Gasabo, Kicukiro and Nyarugenge districts respectively, see table 16 for details.

Within the period under review, the number of establishments with capital size of more than 75m decreased in all the three districts; Gasabo, Kicukiro and Nyarugenge by 53.5%, 62% and 26% respectively. Among establishments with capital size between 15m and 75m, unlike Nyarugenge where a modest increase of 0.67%, Kicukiro had a significant increase of 15% while Gasabo had a decline of approximately 14%.

Among establishments with capital size between 500,000 and 15m, albeit there was an increase in both Gasabo and Kicukiro by 18% and 18.5% respectively, Nyarugenge registered a decline of 13.9%. There was an increase in all districts among establishments with capital size of less than 500,000 with the highest proportionate increase registered in Gasabo and the lowest in Nyarugenge, for detail see table 17.

Conclusively the activity establishment growth in the establishments as mainly from medium and small establishments with modest and large establishments.

Strangely, despite having a significant capital size above 15m (Rwf), there are establishments profiled as micro and small, which raises questions on their operations, or the quality of data. Should the problem be associated with operations, the authorities will have to investigate the taxations records of these establishments, these mainly located in Nyarugenge and Kicukiro districts.

Table 6.18 Establishment Distribution by Capital Size

District	Less than 500.000 (Rwf)	500.000 – 15 million (Rwf)	More 15 to 75 million (Rwf)	More than 75 million (Rwf)	Didn't Specify
Nyarugenge	0.62	0.30	0.04	0.03	
Gasabo	0.66	0.28	0.01	0.02	0.03
Kicukiro	0.66	0.27	0.02	0.02	0.03

Source: Establishment Census 2014

Table 6.19 District Growth rate of Establishments between 2010 and 2014 (%) by capital size

	Less than 500.000 Rwf	500.000 - 15 million Rwf	More 15 to 75 million Rwf	More than 75 million Rwf	Overall
Nyarugenge	0.5	-13.9	0.7	-26.1	61.9
Large	-	50.0	-	180.0	-
Medium	-20.0	28.6	16.7	81.3	1900.0
Micro	4.4	-14.5	0.3	-36.1	56.0
Small	77.8	3.1	1.6	-12.1	1137.5
Gasabo	30.0	18.5	-13.9	-53.5	50.6
Large	-		-50.0	600.0	
Medium	-33.3	140.0	50.0	-4.5	3700.0
Micro	31.1	17.7	-20.1	-70.1	44.6
Small	69.2	42.0	3.7	-30.6	931.8
Kicukiro	7.7	18.0	15.3	-63.0	51.3
Large	-	-50.0	50.0	-37.5	
Medium	-	0.0	300.0	27.8	
Micro	13.9	17.4	2.4	-82.0	44.7
Small	166.7	34.8	42.3	-20.9	1233.3

Table 6.20 Establishments by Size and Capital in City of Kigali

Period	2011				2011 Total	2014			2014 Total		
Capital size	Less than 500,000	500,000 - 15 million	More 15 to 75 million	More than 75 million		Less than 500.000	500.000 - 15 million	More 15 to 75 million	More than 75 million	Didn't Specify	
Nyarugenge	7487	4223	447	483	12640	7528	3636	450	357	220	12191
Large		2		5	7		3	1	14	6	24
Medium	5	7	6	16	34	4	9	7	29	31	80
Micro	7173	4083	379	355	11990	7492	3493	380	227	99	11691
Small	18	127	61	99	305	32	131	62	87	84	396
#N/a	291	4	1	8	304						
Gasabo	6304	2870	209	413	9796	8193	3401	180	192	371	12337
Large			4	2	6		1	2	14	12	29
Medium	3	5	2	22	32	2	12	3	21	38	76
Micro	6215	2773	149	274	9411	8147	3263	119	82	167	11778
Small	26	88	54	108	276	44	125	56	75	154	454
#N/a	60	4		7	71						
Kicukiro	4967	1866	111	413	7357	5349	2201	128	153	260	8091
Large		2	2	8	12		1	3	5	6	15
Medium		5	1	18	24		5	4	23	19	51
Micro	4676	1790	82	294	6842	5325	2102	84	53	141	7705
Small	9	69	26	91	195	24	93	37	72	94	320
#N/a	282			2	284						

Source: Establishment Census 2011, 2014

Establishment Employment in City of Kigali

Table 6.21 Total Employment and Establishment Employment in City of Kigali

District	Total Employment 2010	Establishment Employment	Total Employment in 2014	Establishment Employment 2010
Gasabo	203,983	27,091	137,427	52701
Kicukiro	128,907	21,713	289,308	57173
Nyarugenge	113,759	31,825	153,234	30478
City of Kigali	446,649	80,629	579,969	140,352

In 2010, 46% of the workforce was employed in Gasabo district, 29% in Kicukiro district and 25% in Nyarugenge district. By 2014, after an increase of 30% from 2010, 579,969 labour units were employed in City of Kigali, with 50% employed in Kicukiro district, 26% in Nyarugenge district. and 24 in Gasabo district.

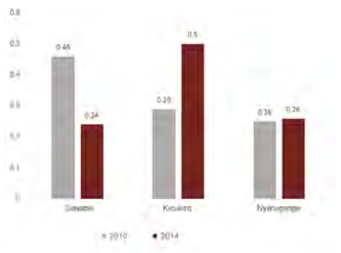


Figure 6.6 Change in Employment Proportions in City of Kigali Districts

The above results indicate a decline in the proportion of employment in Gasabo district and an increase in employment in Kicukiro district and a mild change in Nyarugenge district.

Against the total employment within the respective districts as was reported by the EICV surveys, a limited proportion of the labour units are employed within establishments, In City of Kigali 24 % of the total workforce or employed labor units are working in establishments.

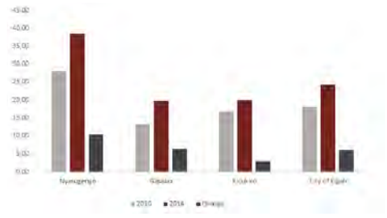


Figure 6.7 Establishment Employment as a Proportion of Total Employment in City of Kigali

Within the districts, 41% are employed in Gasabo district, 22 % are employed in Kicukiro district and 37% in Nyarugenge district, having increased by 111%, 40.4% and 65% respectively between the 2011 and 2014.

Approximately 88% of the workforce employed in establishments located in City of Kigali are employed in construction and service sector, having decreased by 4% in the period under review. This is equally depicted in the 3 districts within City of Kigali with more than 80% of the workforce employed in Construction and services for the individual districts. Between 2010 and 2014, there was an increase in the employment generated in the agriculture sector of 2% with majority of the increase taking place in Nyarugenge district. Mining Manufacturing and Utility sector registered a positive increase of 2% with all districts experiencing an increase in employment growth in the sector.

In terms of establishment size contrary to the 2010 scenario, the large and medium establishments employ majority of the labour units, despite a large number of small and micro establishments, see table 23 below for details.

Table 6.22 Employment in Establishment City of Kigali Districts

	2011				2011 Total	2014			2014 Total
Economic sector	Agriculture & Forestry & Fishing	Construction & Services	Mining & Manufacturing & Utility	#N/A		Agriculture & Forestry & Fishing	Construction & Services	Mining & Manufacturing & Utility	
Nyarugenge	534	28706	2333	252	31825	3853	42020	6828	52701
Gasabo	214	23659	3186	32	27091	309	51568	5296	57173
Kicukiro	111	18524	3078	0	21713	257	25276	4945	30478

Source: Establishment Census 2011, 2014

Table 6.23 Employment Growth Rate by Economic Sector in City of Kigali Districts

District	Agriculture & Forestry & Fishing	Construction & Services	Mining & Manufacturing & Utility	Overall
Nyarugenge	621.54	46.38	192.67	65.60
Gasabo	44.39	117.96	66.23	111.04
Kicukiro	131.53	36.45	60.66	40.37

Table 6.24 District Employment by Economic Sector (%)

District	Agriculture & Forestry & Fishing		Construction & Services		Mining & Manufacturing & Utility	
Period	2010	2014	2010	2014	2010	2014
Nyarugenge	1.68	7.31	90.20	79.73	7.33	12.96
Gasabo	0.79	0.54	87.33	90.20	11.76	9.26
Kicukiro	0.51	0.84	85.31	82.93	14.18	16.22
City of Kigali	1.07	3.15	87.92	84.69	10.66	12.16

Table 6.25 Employment (%) by Size of Establishment and Economic Sector

Period	2010	2014	2010	2014	2010	2014	2010
Economic sector	Agriculture & Forestry & Fishing		Construction & Services		Mining & Manufacturing & Utility		#N/A2010
Nyarugenge	1.7	7.3	90.2	79.7	7.3	13	0.8
Large	15.9	25.8	73.8	55.4	10.3	18.7	0
Medium	0	0	74.6	81	21	19	4.4
Micro	0.7	0.1	95.6	91.7	3.6	8.3	0.1
Small	1.2	0.8	84.1	88.9	13.1	10.3	1.7
Gasabo	0.8	0.5	87.3	90.2	11.8	9.3	0.1
Large	0	0	42.2	91.6	57.8	8.4	0
Medium	1.7	3.1	86.8	78.5	11.5	18.4	0
Micro	0.4	0.3	93.6	92.9	5.9	6.8	0.1
Small	1.6	0.2	87.9	90.2	10.2	9.6	0.3
Kicukiro	0.5	0.8	85.3	82.9	14.2	16.2	0
Large	0	0	70.6	68.1	29.4	31.9	0
Medium	3.9	2	70.9	70.5	25.2	27.5	0
Micro	0.1	0.4	94.7	91.8	5.2	7.7	0
Small	0.5	1.6	80.6	81.7	18.9	16.7	0
City of Kigali	1.1	3.1	87.9	84.7	10.7	12.2	0.4

6.4 Housing Quality in City of Kigali

There are five types of habitat for private households, these include clustered rural settlements (umudugudu)/ old settlements, dispersed/isolated habitats, planned urban housing (cadastre), and spontaneous or squatter habitats (Akajagari) (NISR, 2012). In the last decade quality of housing improved with more households moving into planned housing within the City of Kigali, this was partly due to a decline in the proportion of households staying in Umudugudu, Old settlement and Dispersed settings. However, despite the overall improvement in planned housing in the City of Kigali, there was a decline in planned housing Nyarugenge district.

Generally, over 60% of households in City of Kigali reside in spontaneous housing structures with Nyarugenge, Gasabo and Kicukiro having proportions of 76, 55 and 66 having increased from 62, 34 and 45 respectively.

In Nyarugenge District, majority of the population residing in spontaneous houses are located in Kimisagara, Nyamirambo, Muhima and Rwezamenyo whereas the dispersed are located mainly in Mageregere and Kanyinya those residing in Planned houses mainly located in Nyarugenge and Nyamirambo and Muhima.

In Gasabo district, the population residing in planned houses are mainly located in Kimironko, Kacyiru, Remera, Ndera, Kimihurura and Bumbogo. Spontaneous houses are mainly located in Gatsata, Remera, Kacyiru, Gisozi and Kimironko.

In Kicukiro District, the population residing in planned houses are mainly located in Nyarugunga, Niboye, Kagarama and Masaka, whereas those in spontaneous houses are mainly located in Gatenga, Kigarama, Kanomber, Masaka and Nyarugunga.

Table 6.26 Residence by Quality of Housing City of Kigali Districts (%)

District	Year	Umudugudu (Old settlement)	Old settlement	Dispersed	Planned Urban housing	Spontaneous (squatter habitats)	Other type	Missing
Nyarugenge	2002	0.02	0.05	0.21	0.06	0.62	0.03	0.01
	2012	0.01	0.02	0.18	0.03	0.76	0.00	0.00
Gasabo	2002	0.05	0.04	0.47	0.08	0.34	0.01	0.01
	2012	0.03	0.01	0.28	0.12	0.55	0.00	0.00
Kicukiro	2002	0.06	0.05	0.28	0.10	0.45	0.06	0.01
	2012	0.03	0.01	0.11	0.17	0.66	0.01	0.01

Source: Population Census 2002, 2012

Table 6.27 Residence by Quality of Housing in Nyarugenge District Geographical Sectors

Nyarugenge	Umudugudu (Old settlement)	Old settlement	Dispersed	Planned Urban housing	Spontaneous (squatter habitats)	Other type	Missing	Total
Gitega	610	760	240	0	27,600	0	250	29,460
Kanyinya	500	150	11,340	0	9,560	0	20	21,570
Kigali	560	290	18,800	80	10,850	50	20	30,650
Kimisagara	290	10	890	220	44,150	10	10	45,580
Mageregere	1,040	30	14,310	160	7,940	470	30	23,980
Muhima	0	150	500	950	24,770	0	70	26,440
Nyakabanda	0	20	250	190	24,140	60	110	24,770
Nyamirambo	650	1,330	4,260	4,050	30,410	70	0	40,770
Nyarugenge	30	1,360	200	1,920	17,160	80	110	20,860
Rwezamenyo	30	290	70	780	15,500	0	0	16,670
Total	3,710	4,390	50,860	8,350	212,080	740	620	280,750

Source: Rwanda Population Census 2012

Table 6.28 Residence by Quality of Housing in Gasabo District Geographical Sectors

Gasabo	Umudugudu	Old settlement	Dispersed	Planned	Spontaneous	Other type	Missing	Total
Bumbogo	800	180	18,540	4,820	10,570	50	10	34,970
Gatsata	610	40	340	1,780	33,270	110	180	36,330
Gikomero	110	0	16,430	80	440	10	0	17,070
Gisozi	10	230	2,710	2,340	37,990	20	160	43,460
Jabana	2,170	100	20,100	1,920	6,910	560	60	31,820
Jali	1,820	90	17,540	270	5,440	90	70	25,320
Kacyiru	90	650	760	4,050	29,850	0	90	35,490
Kimihurura	0	0	160	5,510	15,090	240	230	21,230
Kimironko	3,520	210	1,030	18,980	27,410	250	550	51,950
Kinyinya	1,190	460	5,350	4,660	46,060	230	350	58,300
Ndera	380	520	16,690	7,290	15,630	0	10	40,520
Nduba	1,230	210	16,710	80	6,300	30	10	24,570
Remera	1,020	550	440	6,990	32,800	100	160	42,060
Rusororo	2,230	340	14,610	4,730	13,410	200	130	35,650
Rutunga	950	0	15,400	560	780	20	10	17,720
Total	16,130	3,580	146,810	64,060	281,950	1,910	2,020	516,460

Source: Rwanda Population Census 2012

Table 6.29 Residence by Quality of Housing in Kicukiro District Geographical Sectors

Kicukiro	Umudugudu	Old settlement	Dispersed	Planned	Spontaneous	Other type	Missing	Total
Gahanga	1,290	120	13,840	1,350	11,370	0	60	28,030
Gatenga	180	1,310	3,860	3,530	38,170	350	1,000	48,400
Gikondo	120	90	270	3,010	12,360	140	230	16,220
Kagarama	730	30	1,160	7,370	5,210	370	20	14,890
Kanombe	1,890	360	4,120	3,850	33,530	370	80	44,200
Kicukiro	10	110	570	2,190	13,570	10	40	16,500
Kigarama	920	740	1,600	3,650	38,050	400	200	45,560
Masaka	5,080	100	9,310	5,330	21,230	110	0	41,160
Niboye	250	480	560	14,830	11,050	160	100	27,430
Nyarugunga	670	30	1,110	10,030	27,180	90	170	39,280
Total	11,140	3,370	36,400	55,140	211,720	2,000	1,900	321,670

Source: Rwanda Population Census 2012

6.5 Poverty and income inequality for City of Kigali Districts

Rwanda uses the nutrition based poverty lines to quantify the poverty magnitude at individual, household and national level, it's based on consumption per adult equivalent compared with a total poverty line of 159,375 RWF, or an extreme poverty line of 105,064 RWF, in January 2014 prices having been adjusted from 2001 estimates.

Poverty levels in City of Kigali are generally low compared to national poverty rates that reduced from 44% to 39% in the period under review, ranging between 4% and 9% for the extremely poor and between 6% and 19% for overall poverty that includes both extreme and relatively poor. Gasabo district has majority of the poor people within City of Kigali with minimal decline in the period under review.

Albeit Nyarugenge and Kicukiro have low poverty levels, the proportion of people living in poverty increased from 2012 to 2015 for the two districts reflecting a growing problem of urban poverty ranging between 14% and 19% for the three districts. In addition to rural urban migration, the growth in poverty rates are partly explained by high dependency ratio in the three districts, seasonal employment and meagre returns associated with employment opportunities existing in the respective districts.

The major poverty hotpots in Nyarugenge District are Mageregere, Kanyinua, Nyakabanda and Nyamirambo sectors, whereas in Gasabo District, they are Gikomero, Rutunga, Bumbogo, Jali, Nduba and Ndera and within Kicukiro Distict, the major poverty hotspots are Gahanga, Masaka, Kagarama and Kanombe.

6.5.1 Income Inequality

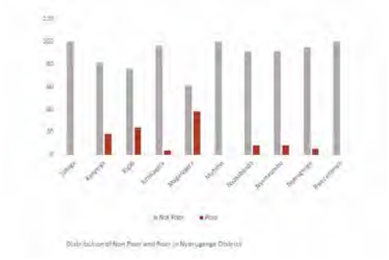
Inequality in both Nyarugenge and Gasabo reduced, the Gini coefficient reduced from 0.8776 to 0.4734, from 0.9234 to 0.466 in Nyarugenge and Gasabo respectively, though it increased and significantly remained the same in Kicukiro district having increased from 0.76 to 0.7966 from 2012 to 2015.

In conclusion, despite the positive growth and overall economic expansion in the districts of City of Kigali, poverty slightly increased in the three districts and income inequality remained extremely high in Kicukiro district though significant progress was registered in both Nyarugenge and Gasabo Districts.

Table 6.30 Residence by Quality of Housing in Kicukiro District Geographical Sectors

Period	District	Extremely Poor	Poor	Total Poor	Non Poor
2012	Nyarugenge	0.022	0.042	0.064	0.936
2015		0.068	0.102	0.170	0.830
2012	Gasabo	0.095	0.098	0.193	0.807
2015		0.090	0.100	0.190	0.810
2012	Kicukiro	0.019	0.034	0.053	0.970
2015		0.055	0.086	0.141	0.859

Source: Living Household Condition Survey 2010, 2014



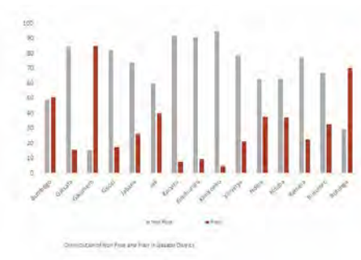


Figure 6.8 Poverty Hotspots in Districts within City of Kigali Districts

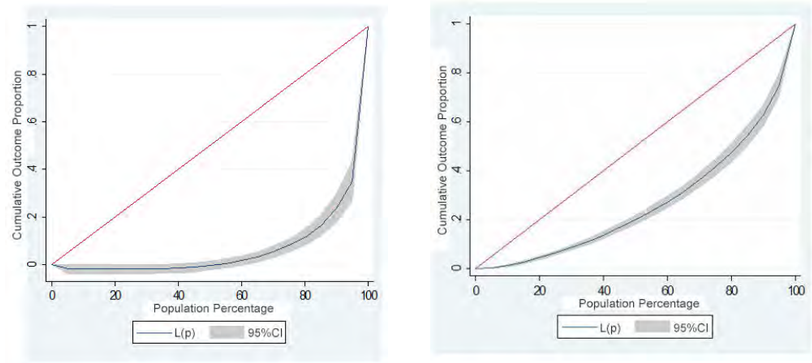


Figure 6.9 Income Inequality in Nyarugenge District from 2010 to 2014

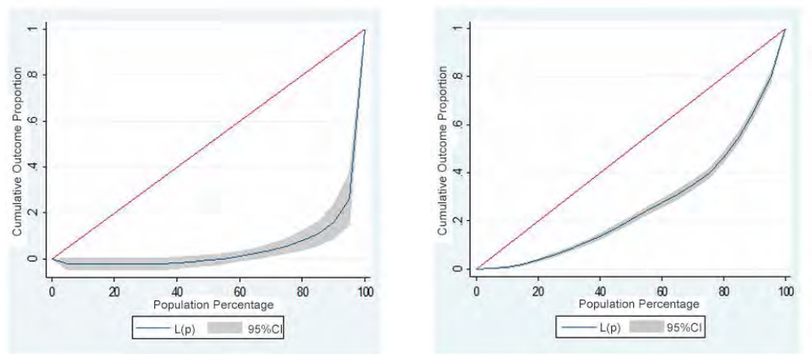


Figure 6.10 Income Inequality in Gasabo District from 2010 to 2014

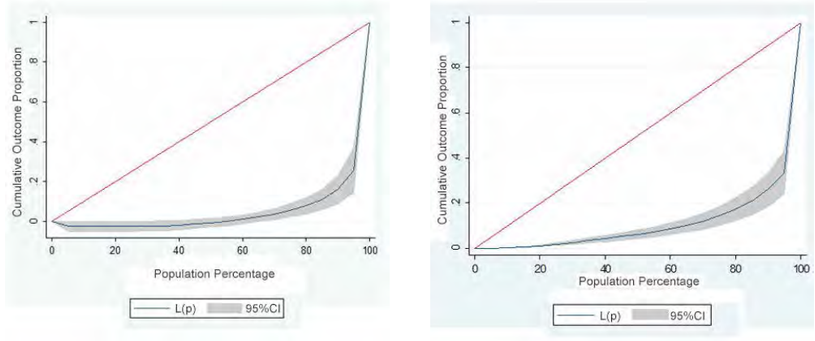


Figure 6.11 Income Inequality in Kicukiro District from 2010 to 2014

6.6 Evolution of Human Development Index for Districts in City of Kigali

The Human Development Index measures progress in development, owing to the work of Mahbub ul Haq and Amartya sen, this indicator has been computed for all economies since 1990 (Human Development Report 1990) with improvements in aspects of its measurement to ascertain trends in overall development. The index measures progress in life longevity, education and standard of living which are relevant to human choices.

The dimension indices for the respective indicators are computed using the following index

$$DI = \frac{AV - MinVal}{MaxVal - MinVal}$$

DI: Dimension Index
AV: - Actual Value
MinVal: - Minimum Value
MaxVal: - Maximum Value
The HDI Index is a geometric of the three dimension indices; health, education and income.

$$HDI = (I_{Health}.I_{Education}.I_{Income})^{1/3}$$

The boundaries used to generate the indices are adopted from the UN (Human Development Report 2016 Report) taking into account that Rwanda's development agenda is targeting to become a middle income nation.

As already noted in the previous sections, the years of schooling indicators, Per capita GDP Income have taken the following path. Mean Years of schooling measured by years of completion, were between 2.72 and 2.92 years among the city of Kigali with Gasabo having the lowest years in 2012. These improved by approximately 90% in the three districts by 2015 reflecting the tremendous government investment in 9-year basic education and the trend increased to between 4.95 years to 5.88 years.

Life longevity measured by life expectancy improved from 64.5 years to 67.3 years are national level and this was used to approximate the health status of all districts in City of Kigali because of unavailability of data at district level. Standard of living was measured using per capita GDP and this was generated using estimated GDP. Whereas overall district productivity increased significantly, percapita GDP decreased because of mainly population growth and macroeconomic adjustments in both exchange rates.

With the above improvement in overall health, education and income in the districts of City of Kigali, the HDI index increased for all districts from 0.510 to 0.545 for Nyarugenge, from 0.492 to .5414 for Gasabo District and from 0.541 to 0581 for Kicukiro district, see table 36 for details.

Table 6.31 Boundaries for Human Capital Development indicators

Dimension	Indicator	Minimum	Maximum
Health	Life expectancy (years)	20	85
Education	Expected years of Schooling (years)	0	18
	Mean Years of Schooling (years)	0	15
Standard of Living	Gross National Income per capita (USD)	100	75000

Source: Human Development Report (UNDP 2017)

Table 6.32 Human Development Boundaries for City of Kigali Districts

Indicator 2012	Nyarugenge 2012	Nyarugenge 2015	Gasabo 2012	Gasabo 2015	Kicukiro 2012	Kicukiro 2015
Life expectancy (years)	64.5	67.3	64.5	67.3	64.5	67.3
Expected years of Schooling (years)	16	16	16	16	16	16
Mean Years of Schooling (years)	2.9	5.5	2.72	4.95	2.92	5.88
Per capita Income (2011)	1065.1	1048.1	857.6	760.0	1676.4	1622.5

Table 6.33 Human Development Indicators for City of Kigali Districts

Indicator	Nyarugenge 2012	Nyarugenge 2015	Gasabo 2012	Gasabo 2015	Kicukiro 2012	Kicukiro 2015
Health Index	0.685	0.728	0.685	0.728	0.685	0.728
Expected years of Schooling Index	0.889	0.889	0.889	0.889	0.889	0.889
Mean Years of Schooling (years)	0.193	0.367	0.181	0.330	0.195	0.392
Education Index	0.541	0.628	0.535	0.609	0.542	0.640
Income index 2013	0.357	0.355	0.325	0.306	0.426	0.421
HDI 2013	0.510	0.546	0.492	0.514	0.541	0.581

6.7 Determinants of Housing Demand in City of Kigali

6.7.1 Methodology: - Analysis

Given the binary and standard normal cumulative distribution nature of the dependent variable a Probit regression model was used to examine the determinants of demand for housing in City of Kigali.

The binary outcome data the dependent variable y takes one of two values

$$y = \begin{cases} 1 \text{ with probability } p \\ 0 \text{ with probability } 1-p \end{cases}$$

Equation 1: Probit probability model: - $\Phi(X'B) = \int_{-\alpha}^{X'B} \phi(z)dz$

Equation 2: Probit Marginal Effects: -$\phi(x'B)\,\mathfrak{B}j$

The analysis examined both the probabilities direction and the magnitude of the impact of each explanatory variable on the demand for housing in City of Kigali.

As already noted, the dependent variable is demand for housing, this was proxied by type of residence i.e. Either renting or owning a house, while the explanatory variables include income, Gender, Employment status, Family size, level of education, Possession of residence outside Kigali, Migration intention and Ubudehe profile for the residents. Section 2 covers the descriptive statistics of key features of housing demand in City of Kigali section 3 details the direction and magnitude effects of the respective determinants of demand and Section 4 profiles the affordability ratios for the residents.

6.7.2 Housing Findings: Housing Demand in City of Kigali

Cost of Construction of houses in Kigali

The median cost of construction of residential houses is 12m Rwandan Francs with variation of approximately 3% in either direction, accounting for 60% of the total value of the property each of housing owners possess.

87% of residents profile their housing structures as whole house, these are averagely one roomed structures (see Table 6.35). 8% reside in what was profiled as "part of house under share" whereas 3.4% reside in bungalows, for details, see Figure 6.12 below.

Average size and Quality of houses for Residents in City of Kigali

22% of the residents would wish to expand their current residential places, 20% wish to shift to other sectors but within City of Kigali whereas 4% would wish to get out of Kigali, see Table 6.36 for details.

The major building material for houses in City of Kigali is soil pressed bricks, sand cement bricks and stones, see Figure 6.13 for details.

Corrugated iron sheets are the main building material used for roofs by residents of City of Kigali, see Figure 6.14.

Majority of residents in City of Kigali use either cement, tiled floors or earth for construct the floors of their respective houses, see Figure 6.15 below for details.

Table 6.34 Construction Cost and Value of Property in City of Kigali

Variable	Median Cost (Rwf)	Average Cost (Rwf)	Coefficient of Variation (%)
Cost of Construction	12,000,000	21,000,000	2.77925800
Value of Property (land and house)	20,000,000	54,200,000	

Table 6.35 Average Size of Houses in City of Kigali

Variable	Median size of Resident houses in Kigali City	Mean	CV
Size of house	1	1.25	0.6106

Table 6.36 Location resident plan to occupy in 5 to 10 years

In which location do you plan to build or occupy a house in 5 to 10 years	Percent
Expanding our current residential place	22.18
In another plot within same sector	13.82
In another district within Kigali City	6.77
Outside Kigali city	4.36
None	52.87
Total	100

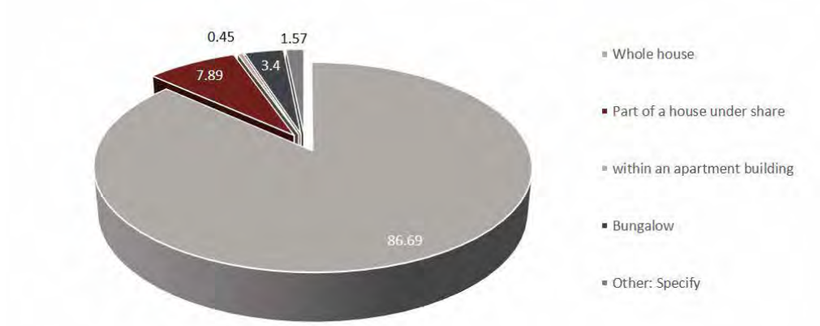


Figure 6.12 Size of houses in City of Kigali

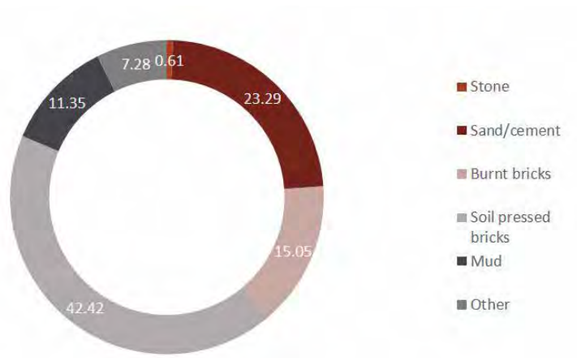


Figure 6.13 Type of Building Material on External Walls (%)

Land Ownership

In terms of land ownership, 78.75% of the residents in Kigali don't own land, with approximately 86% of those that own land having registered titled land as the document of ownership see Figure 6.16 for details.

Information Demand by Residents in City of Kigali

98% of the residents in the city reported a desire for more information about the overall city and District Master plans. The same proportion requested the district and City authorities to inform them about events, advocated for more sensitization and engagement with citizens at sector levels (see Table 6.37 for details).

Among those that receive information their main sources are local leaders, community meeting, radios and televisions.

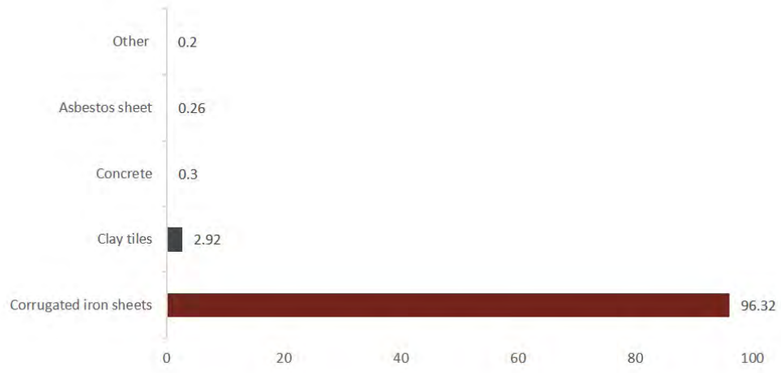


Figure 6.14 Type of Building Material on Roof (%)

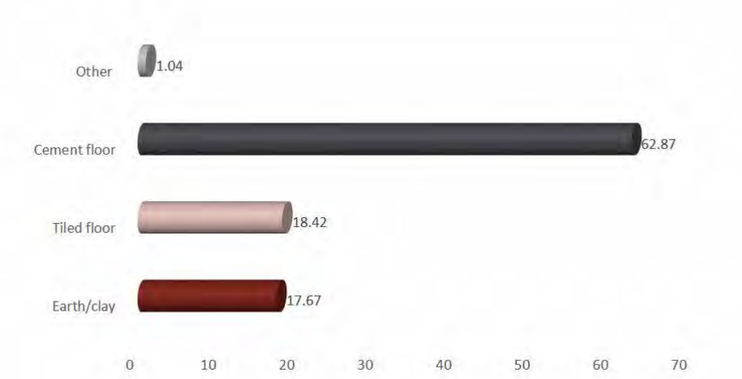


Figure 6.15 Type of Building Material on the Floor (%)

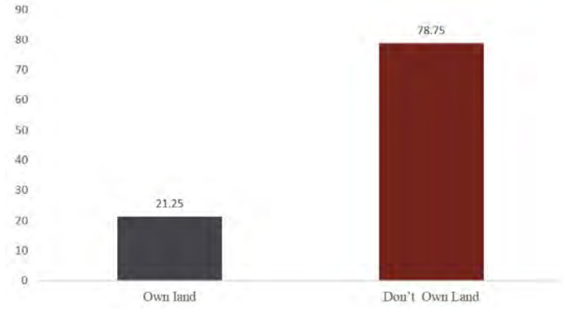


Figure 6.16 Land Ownership by Household Members in City of Kigali

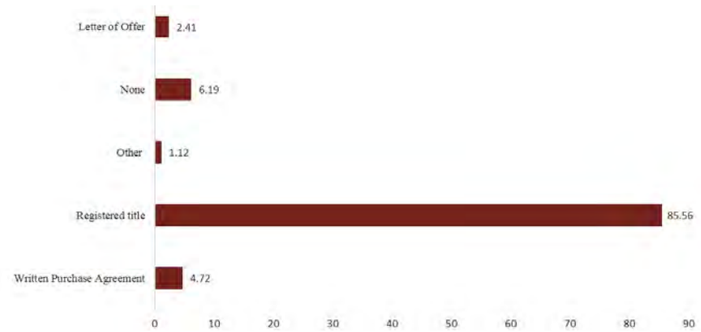


Figure 6.17 Type of Land Document (%)

Table 6.37 Information Demand in City of Kigali

Ranking	Would like to receive information about City and District Master Plan (%) Would like to receive information about City and District Master Plan (%)	The City of Kigali and District Master Plan are an important tool to (%)	In the case City of Kigali will organize events to inform above the City (%)	More efforts need to be taken in order to sensitize and engage local citizens (%)
Strongly Agree	39.98	38.89	40.6	38.2
Agree	58.53	56.51	58.05	59.56
Disagree	1.3	4.01	1.22	2.1
Strongly Disagree	0.19	0.58	0.13	0.13
Total	100	100	100	100

Table 6.38 Main Sources of Information

What are the main sources of information on public events	Percent
Radio	16.98
Television	13.63
Newspaper	0.58
Community meetings	25.77
Fellow citizens around my neighbourhood	4.97
Sensitization from Local leaders	29.99
City of Kigali enforcement officers	0.27
Social media	2.1
Billboards	0.05
Notice board	0.19
Internet	1.12
Other	4.36

Housing Demand Determinants in City of Kigali

Gender: - If the household is headed by a male, there's a negative relationship between renting and gender. In other words, male-headed households are less likely to rent compared to female headed households with a probability of 4%.

Employment: Self-employed individuals are less likely to rent with an Insignificant magnitude of 2%. The other types of employment Full time, occasional are all more likely to rent with probabilities of 7% and 3% respectively. This means self-employed people are more likely to own a house in Kigali than the counterparts.

Retirees: Retiring labor units are less likely to rent than working employees, with a proportion of 33%. The more individuals retire from employment, their chances to rent reduce by 33%. In other words, retirees are more likely to own a house in Kigali than none retirees.

Have children: - Households with children are less likely to rent compared to those without children; an increase in children by one leads to a decline in renting of 10%. In terms of house ownership, individuals with children are more likely to own a home in Kigali than those without children by a proportion of 10%.

Education: Irrespective of the level of education, there's a positive relationship between renting and education. In terms of magnitude of likelihood to rent, individuals that completed secondary school education have a likelihood of 21%, those that never completed secondary school education have a likelihood of 16%, University graduates by with Bachelor's education have a likelihood to rent of 16% while those with graduate education have a lesser likelihood of approximately 11%. The same magnitudes are reflective of the ability to own a house in Kigali respectively.

Residence outside Kigali: individuals with residences outside Kigali are more likely to rent in Kigali with a proportion of 7.4%. In comparison to individuals without residences out of Kigali City, individuals with residences outside are less likely to own a house in Kigali by a proportion of 7%.

Desire to Migrate out of Kigali: individuals willing to migrate out of Kigali are more likely to more likely to rent than those staying not willing to migrate by a magnitude of 17%. This means that an individual likely to migrate out of Kigali is less likely to own a house in Kigali by the above magnitude in comparison to a person not intending to migrate out of Kigali.

Ubudehe Categories: Individuals in categories 2 and 1 are more likely to rent than individuals in categories 3 and 4. The probability to renting a house reduces by 30% when a household moves into category 4, and by 3% when it moves into category three although this is not statistically significant at 5%. In other words, an individual in category 4 has a higher likelihood of 30% to own a house than an individual in the other ubudehe categories. This means as household's income improve their demand for better housing improves.

Table 6.39 Determinants of Housing Demand in City of Kigali (Direction)

Explanatory variables	Robust Coef.	Std. Err.	z	P>z
Annual Income	0	0	-0.44	0.658
Male (Gender)	-0.1325	0.0528	-2.51	0.012
Fulltime Employment	0.287	0.0918	3.13	0.002
Self-Employment	0.0206	0.0576	0.36	0.72
Occasional Employment	0.1419	0.0943	1.5	0.132
Retirees (Employees)	-1.476	0.2439	-6.05	0
have children	-0.4149	0.0535	-7.76	0
Education_ Primary Incomplete	0.3289	0.1109	2.97	0.003
Education_ Primary Completed	0.325	0.11	2.95	0.003
Education_ Secondary Not Completed	0.5747	0.1144	5.02	0
Education_ Secondary Completed	0.7714	0.1133	6.81	0
Education_ Vocational Training	0.3647	0.158	2.31	0.021
Education_ University (BA)	0.6025	0.1248	4.83	0
Education-University (Masters & PhD)	0.3767	0.2164	1.74	0.082
Have residence out of Kigali	0.2275	0.0966	2.36	0.018
Want to migrate out of Kigali	0.6308	0.0921	6.85	0
Ubudehe category 2	-0.0235	0.0906	-0.26	0.795
Ubudehe category 3	-0.1934	0.089	-2.17	0.03
Ubudehe category 4	-1.1438	0.2977	-3.84	0

Table 6.40 Marginal Effects of the following explanatory variables on House Ownership in City of Kigali

Explanatory variables	dy/dx	Std. Err.	z	P>z
Annual Income	4.83e-09	9.41e-09	0.51	0.608
Male (Gender)	-.0400667	.013591	-2.95	0.003
Fulltime Employment	.0753679	.0240448	3.13	0.002
Self-Employment	-.0021484	.0149671	-0.14	0.886
Occasional Employment	.0303596	.0236118	1.29	0.199
Retirees (Employees)	-.3293	.0694885	-4.74	0.000
have children	-.1010314	.0136832	-7.38	0.000
Education_ Primary Incomplete	.0988316	.0272434	3.63	0.000
Education_ Primary Completed	.094853	.0269292	3.52	0.000
Education_ Secondary Not Completed	.1625611	.0278447	5.84	0.000
Education_ Secondary Completed	.2155128	.0276061	7.81	0.000
Education_ Vocational Training	.1183536	.0390754	3.03	0.002
Education_ University (BA)	.1637899	.0302196	5.42	0.000
Education-University (Masters & PhD)	.1086477	.053936	2.01	0.044
Have residence out of Kigali	.0739962	.0248954	2.97	0.003
Want to migrate out of Kigali	.1743109	.0242959	7.17	0.000
Ubudehe category 2	.005394	.0234455	0.23	0.818
Ubudehe category 3	-.0342693	.0227179	-1.51	0.131
Ubudehe category 4	-.3065794	.0750602	-4.08	0.000

Affordability Dynamics in the City of Kigali (In terms of renting)

Among the households that rent, within the lowest income quantile, they allocated 88% of their incomes to rent, whereas those in the highest income quantile, they averagely allocate 20% of their income to rent, see Table 6.41 below for details.

Among households with property in the city of Kigali, the value of their residential properties (including land and houses) ranges between 10m francs and 400m francs.

In comparison to their income streams, the lowest quantile requires approximately 24 years to purchase the same property, while those in the highest quantile require 16 years to purchase the current properties they own.

In conclusion, given the major indirect relationship between income and the rest of the explanatory variables, ownership of houses can mainly be increased through improving household income.

Table 6.41 Affordability Ratio (Proportion of Renting to Monthly Household Income)

Income Quantile	Median Income	Median Rent	Affordability Ratio
1(25%)	20,000	17,500	0.88
2(50%)	70,000	30,000	0.43
3(75%)	170,000	50,000	0.29
4(100%)	500,000	100,000	0.20

Table 6.42 Affordability Ratio (Proportion of Property Value to Annual Household Income)

Quantile	Median Annual Income	Median Property Value Rent	Affordability ratio (Years Needed to construct a house)
1(25%)	420,000	10,000,000	23.81
2(50%)	1,200,000	25,000,000	20.83
3(75%)	2,640,000	50,000,000	18.94
4(100%)	25,000,000	400,000,000	16.00

This page is intentionally left blank.

7

Urban Sustainability Framework & Development Vision

7 Urban Sustainability Framework & Development Vision

7.1 Multi-Stakeholder Engagement Approach

One of the key rationale behind the update of Kigali Master Plan 2013 is to improve the existing Master Plan and make it more inclusive in bringing the people of Kigali and Rwandans in general to the review process. As such, a new methodological approach has been established for this review, which is to adopt an innovative process and engaging multiple stakeholders, approach aimed at deeply involving a large base of stakeholders, capable of providing valuable inputs and feedback during the review. The public engagement approach developed is as illustrated in Figure7.1.

Various participatory tools including stakeholders meetings and focus groups discussion organised according to the eight themes of development have been conducted during the Master Plan updating process. The stakeholders selected are from diverse backgrounds including both public and private institutions, as well as individuals from social media.

7.2 Summary of Collected Comments and Shared Ideas

The inputs of the comments, feedbacks and ideas are collected and will be addressed in development of vision, strategies and updated Master Plan for Kigali. A summary of the key collected comments is as shown in Table 7.1.

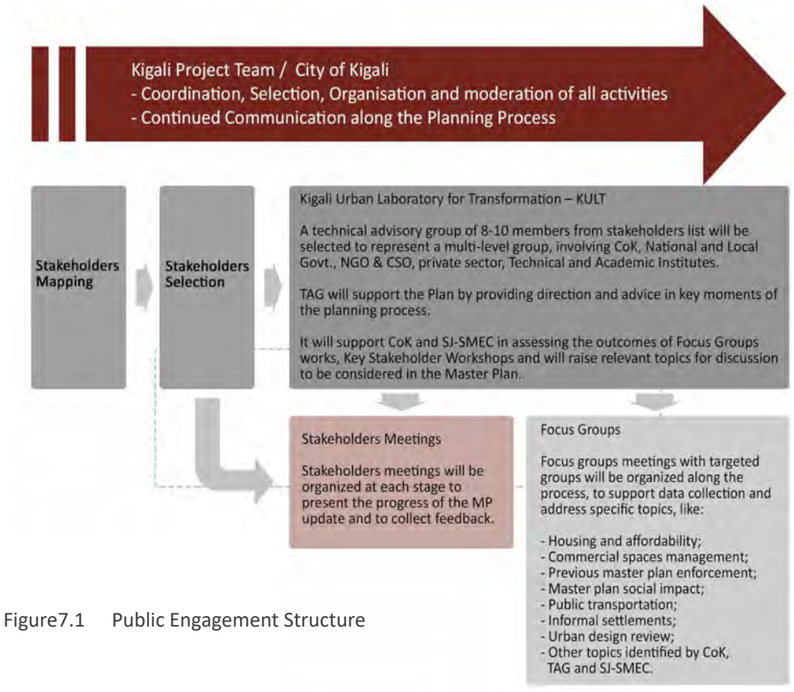


Figure7.1 Public Engagement Structure

Table 7.1 Summary of Key Comments Collected

Topics	Comments
City of Excellence	• Improve coordination among different institutions and agencies, and within the CoK • Align the review of the Master Plan including land use and zoning regulations with existing policies and regulations and facilitate improved market-responsiveness • Harmonize discrepencies in the zoning and planning provisions in Urban Planning Code (UPC), Conceptual Master Plan, Land Use Plan and Kigali Master Plan 2013 • Provide detail strategies for implementation of partnerships for funding of Capital Improvement Projects • Address land management issues of affected landowners who properties has been assigned for public and infrastructure land use in proposed zoning • Zoning regulations to be more flexible to allow for greater mix of use; allow for incremental zoning • Address discrepancies between existing land use conditions and proposed zoning plan • The need of indicators to measure how the city is performing
City of Integrated Neighbourhoods	• Align the review of the Master Plan including land use and zoning regulations with existing policies and regulations and facilitate improved market-responsiveness • Plan of areas available to mixed use neighborhood development and housing which is affordable • Prioritise issues of housing, affordability, informal settlements and their development models • The need of implementation strategy for low cost housing
City at Work	• Review of economic development of Kigali and Secondary Cities • Master Plan to capture and repond to the different needs and updated demands of the Kigali society effectively
Green City	• Coordination and integration of the many activities and studies related with Resiliency and Climate Change • Increase number of public parks in city centre • Addition of newly permanent water body in Masaka to be planned for suitable uses • Wetlands development need to be coordinated with REMA • Protect sufficient arable land from development to match location of existing farming demand
City on the Move	• Emphasise on smart mobility • Urban Mobility including non-motorised transport (NMT) and Bus Rapid Transit (BRT) • Provide paths for vehicles (cars and trucks), and pedestrians for walking and cycling in the updated Master Plan
Efficient City	• Improve and plan infrastructure towards equal development of the city • Identify how Kigali is integrated in the network of other cities
City for Citizens	• Promote inclusiveness of the city • Increase involvement of the community in the Master Plan review process
Creative City	• Improve sensitivity towards cultural identity and heritage preservation in the updated Master Plan • Promote services to support tourism attraction • Promote branding of Kigali and strengthen its uniqueness • Identify catalytic activities in CBD to attract investments

7.3 Updated Urban Sustainability Framework

7.3.1 Urban Sustainability Framework

Based on the specific and pressing issues in the city of Kigali , the Urban Sustainability Framework is established to address these aspects by providing guiding principles for the subsequent planning processes that will ensure the long term sustainability of Kigali.

With reference to the reviewed analysis of the existing context of Kigali and growth directions, the following issues are identified that will form the basis for Urban Sustainability Framework.

Environmental Issues

- Rapid urbanization and encroachment of nature areas
- Increasing pressure on resources and carbon footprint with urbanization and economic growth

Social Issues

- Large disparity in living conditions between “Rich” & “ Poor”
- Increasing urban sprawl with unplanned settlements lacking physical and social infrastructure

Economic Issues

- Pressing need for expanding the skilled workforce
- Need for employment opportunities to cater to the increasing population
- Push for green economic growth

The key strategies and recommendations to tackle the above mentioned issues and the challenges are indicated by Figure7.2 below and elaborated in Table 7.2.

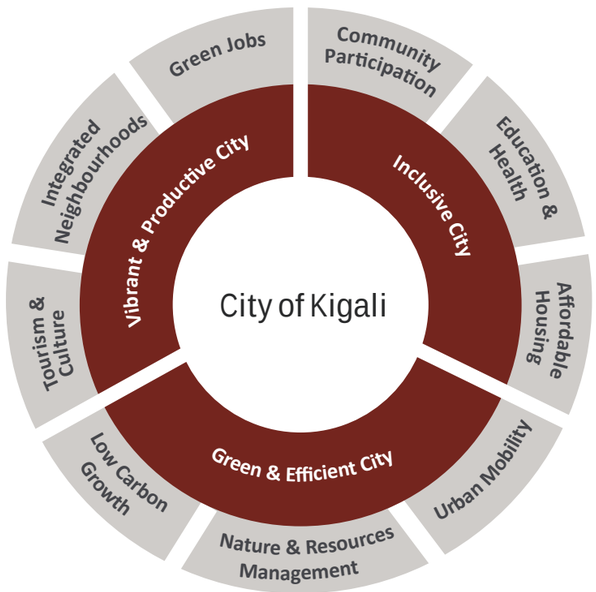


Figure7.2 Updated Urban Sustainability Framework for City of Kigali

Table 7.2 Updated Urban Sustainability Framework for City of Kigali

Components	Key Issues	Direction	Challenges	Recommendations
ENVIRONMENT Green & Efficient City	Nature areas • Urban areas prone to land slides and flooding • Unplanned developments on steep slopes • Deforestation • Encroachment of wetlands	• Clearance of development in Steep Slopes and Wetlands and acquire land for relocation • Restoration of steep slopes and wetlands • Afforestation	• Implementation mechanism and cost of land acquisition & relocation • Cost for programming and implementation restitution of nature areas	• Conserve all slopes above 30% • Conserve all wetlands • Prepare redevelopment schemes to relocate people from steep slopes and wetlands • Prepare strategies for rehabilitation and for management of slopes, forests and wetlands • Explore possibilities for sustainable exploitation of nature areas for economic gain-creation of green jobs
	Resources & Carbon footprint • Sprawling low rise development • Expanding urban areas • Need for extended infrastructure/ transportation facilities • Increasing pressure on energy and resources • Increasing carbon footprint	• Green Growth development • Compact city development • Sustainable resource management	• Affordability of intensified and densified development • Cost for high capacity transport infrastructure • Efficient use of resources	• Limit urbanization boundaries • Identify potential high density mixed use zones • Reduce sprawling development and hence reduce infrastructure/ transportation cost • Explore possibilities for green mobility and city greening to counter increase in carbon footprint • Explore integrated management system for energy, waste, water etc.
SOCIAL Inclusive City	• Large disparity in quality of living environment between the high and low income groups • Poor living quality in unplanned settlements with lack of physical and social infrastructure	• Inclusive development that considers the needs of all including gender, youth, vulnerable groups • Create Integrated Neighbourhoods • Community Engagement in implementation and local design	• Need for large funding resources • Balancing the needs of various groups of citizens • Brownfield developments • Implementation of integrated neighbourhoods	• Create good affordable housing/ home improvement schemes • Develop integrated neighbourhoods with a mixed of housing, commercial, recreation, transport facilities and employment opportunities • Ensure improved living quality for commoners and minimize the gap in terms of living quality • Conduct regular stakeholders meetings for city and local level project implementation
ECONOMY Vibrant & Productive City	• Lack of well-serviced attractive areas for investment • Need for more employment opportunities for the increased natural and migrant population • Promote green economic growth	• Create dedicated areas for businesses and regional commercial activities • Greens jobs creation • Promote tourism development	• Need to make strategic land acquisitions for a well-monitored commercial development • Balanced and complementary development for Kigali city and 6 secondary cities • Attract green economic investments	• Anticipate various investment possibilities in consideration of the latest regional development • Safeguard land for economic expansion at key areas (CBD / commercial centre, industrial areas, tourism spots) • Promote green economy investments and green jobs creation • Increase vibrancy and activities, promote tourism with preservation of culture and heritage

7.4 Development vision for Kigali City

7.4.1 Development vision for Kigali 2050

The City of Kigali is reviewing and updating the 2013 Kigali Master Plan which had "The Centre of Urban Excellence in Africa" as the Vision for 2030. The new Master Plan will show, lead and manage new development of the Kigali City up to 2050. Therefore the need to review the vision of Kigali to match the current development and needs of the City became quite obvious.

The update and review exercise for the whole Master Plan include Focus groups and Technical Advisory Group meetings. During those meetings, Master Plan Review Team set up a participative exercise for stakeholders to suggest a key word or a sentence which according to them should reflect Kigali, a vision for Kigali Master Plan 2050.

Many suggestions collected during the participatory exercise and some stakeholders clearly stated that the current Kigali vision is still suitable.

Among others we received the following suggestions: Inclusive, Inspiring, Green City, Innovation, Smart City, Kigali as a driver of Green Growth and Climate Resilient Development, Climate Resilient, Liveable and Friendly City, Evergreen City, A Carbone Free and Resilient City, Environment Friendly, City with Nature, City of Opportunity and Life, City of Sustainable Development, Heart of Excellence.

Starting from these inputs, the Master Plan Review Team together with CoK staff in an intensive brainstorming session developed 3 options for the 2050 Vision to present to the public during Stakeholders and TAG Meetings.

The 3 options are the following:

1. The Centre of Urban Excellence in Africa: some stakeholders expressed their preference to maintain the current Vision, so it has been proposed to keep 2030 Vision as it is;
2. Inclusive City of Excellence: this option tried to combine the current Vision with the strong request for inclusive and citizens-driven Master Plan Review;
3. Our Kigali! Kigali Yacu! This option has the strength of a short motto/slogan, very meaningful and rhythmed in Kinyarwanda and English, expresses the inclusiveness and sense of ownership required by people.

In order to include the other key words suggested during the participatory exercise, it was agreed to add a subheading, which incorporates and conveys other expectations for Kigali 2050 Development: Unique, Green, Dynamic, for All.

These 3 alternatives were presented at Stakeholders Meeting on 26th September and at TAG meeting on 28th September 2018. Participants were asked to vote for their preferences. In both meetings, the 3rd option for the Vision got few more votes with respect to the 1st one, expressing in case the need to find a 4th option to combine Vision 1 and 3.

Following the September meetings, an online poll has been set up on Twitter and Facebook page, requesting the general public to vote the preferred Vision.
Here below the final results, showing again a very slight preference for the 3rd option (refer to Figure7.3).

These results were shared with the Executive Committee of the City of Kigali, together with a 4th Option, which combines choice 1 and 3. This vision selected is still under review and will be finalised by the City of Kigali.

Figure7.3 Poll Results

To achieve this new vision, Kigali needs to focus on achieving the global standards for the eight development goals as established in the updated approach. The eight goals are described as follows:

CITY OF EXCELLENCE

To achieve urban excellence, it is of utmost importance to create a unique and vibrant city that can be identified by its world class business environment, distinctive regional destinations, quality affordable living and exciting recreational opportunities. These require good urban planning and development practices and governance, which the city has been aiming to achieve.

CITY AT WORK

Striving to be the center of urban excellence, economic development is critical for Kigali as the city urbanises into a prosperous society with jobs opportunities and income growth. New economic drivers in services and industries will be identified, creating employment and increasing productivity to drive an inclusive and green economic growth for its people.

CITY ON THE MOVE

Transport in Kigali is still in rudimentary stages and there is a great need for enhanced mobility. Due to lower income levels, the private vehicle ownership is still in lower limits. However with the increasing low rise sprawl, there will soon be huge traffic impacts. Affordable and sustainable public transport system is another urban sector that the City of Kigali can champion.

CITY FOR CITIZENS

Kigali city aims to become the city for citizens that respect the needs of various groups of people to create a home for all. It focuses on provision of integrated neighbourhoods, affordable housings, mixed uses, participatory rights to all its population to live in a vibrant and inclusive city environment, together with the development of public spaces and social facilities.

CITY OF INTEGRATED NEIGHBOURHOODS

Over 70% of Kigali's population live in unplanned housing. With rapid urbanization, it is an opportunity for the city to develop strategic model solutions of integrated neighbourhoods to provide affordable housing and access to quality services, amenities as well as employment opportunities for its people.

GREEN CITY

Kigali city is blessed with pristine natural landscape. It is aimed to maintain and enhance these natural assets including the rolling hills, vast wetlands and the surrounding lakes to create an excellent balance between nature and living. Climate change and disaster resilient green growth will be promoted as the key leader in driving sustainable urbanization.

EFFICIENT CITY

Although the consumption of energy and water usage are quite low in Kigali; the city faces extreme inadequacies in terms of making provisions for these infrastructure. The city could target to adopt excellent sustainable resource management strategies to manage the local resources and to contribute in global sustainability.

CREATIVE CITY

The interaction of landscape, built form, history, people and their local culture gives a distinct identity to a place. The continuance of the local character gives people a sense of belonging, celebrates its creativity while enhancing community life. This distinctness is attractive to tourists and investors, creating a competive edge by virture of its identity.

7.4.2 Vision Framework

To achieve the holistic vision of making Kigali the "Centre of Urban Excellence", the eight development goals which address the key themes and challenges after the updated analysis of the city have been set. These goals are elaborated with the key planning approach, strategies and targets that the city is recommended to adopt to realize the vision established.

The detailed strategies and key performance targets for each development goal will be developed in the next stage of Interim Master Plan report.

City of Excellence

Table 7.4 Goals and Strategies for City of Excellence

Key themes	Planning Approach & Strategies	Targets & KPIs
Urban Planning **Urban Development**	• Adopt participatory approach in planning and implementation • Implement land consolidation and readjustment models for land acquisition, especially for key public infrastructure/ capital improvement projects • Updates on existing land use and review zoning with socio-economic and real estate market analysis • Introduce alternative zoning models • Introduce incremental development model for flexibility • Introduce transparent yet flexible procedures to update the master plan regularly	• Update of proposed zoning plan and regulations for Kigali Master Plan based on masrket demand • Development of land consolidation/ land pooling framework • Collect feedback and comments from the stakeholders on the review of the Master Plan
Quality of Life	• Upgrading of unplanned settlement to improve quality of life and urban environment • Review all on-going initiatives for upgradation of informal settlements	• Establish resettlement development model • Provide planned integrated mixed-use neighbourhoods
Governance	• Develop financing models and public-private partnerships • Review of Institutional set-up for better coordination and capacity building	• Develop detailed implementation framework and financial models for key catalyst and capital improvement projects • Improvements to the existing institutional set-up to manage and implement the Master Plan

City of Integrated Neighbourhoods

Table 7.3 Goals and Strategies for City of Integrated Neighbourhoods

Key themes	Planning Approach & Strategies	Targets & KPIs
Affordable city	• Provide quality housing and public facilities • Introduce flexible zoning regulations • Promote low cost, local materials for construction of affordable housing • Provide accessible and quality recreation spaces	• City free of illegal / unplanned areas • 90% home ownership • 60% affordable housing
Housing & Densities	• Provide integrated developments e.g. industrial with worker housing and social infrastructure • Review proposed FAR for all zones • Set up minimum and maximum guidelines for specific zones	• Review proposed FAR and housing densities
Informal Settlements & Economies	• Introduce inclusionary zoning to upgrade informal settlements • Promote mixed use, quality affordable housing and public open spaces, services and light industrial opportunities in selected areas	• Establish resettlement / integrated mixed-use neighbourhoods development model • Provide employment opportunities and training of skilled labour
Services at Neighbourhood Level	• Master Plan phasing for provision of quality social infrastructure including health, education and recreation facilities • Review of public facilities provision standards	• Easy access to facilities within 500m walking distance • Minimum green space per capita to be 15 sqm (NR)

City at Work

Table 7.5 Goals and Strategies for City at Work

Key themes	Planning Approach & Strategies	Targets & KPIs
Economic Development **Commercial & Retail** **Industries & Construction**	• Create a vibrant business environment • Strengthen economy and provide for regional and local employment opportunities • Promote Kigali as the Tourism Gateway of Central Africa • Introduce flexible zoning regulations • Provide relevant sites to support new key sectors/ economic drivers for economic development • Enhancing productivity of Kigali through agriculture /forestry, construction and manufacturing as key employment sector • Providing microlight industries with worker dormitories within mixed use affordable housing for live-work integrated neighbourhoods • Review provision of service sector and other employment sectors as per market demand	• Making a modern Regional Financial Hub in Africa • Providing adequate and affordable working spaces for service and industrial sector jobs to cater to the projected sectoral employment • Promote high-value added agriculture and agro-based industries
Productive City	• Develop framework for formalising informal economies • Formalising informal housing • Introduce incremental development approach e.g. for on site upgradation • Enhance skills training and capacity building in the new economic drivers.	• Safeguard land for commercial/ industrial and institution use to create employment opportunities and training of skilled labour • Establish resettlement development model

Green City

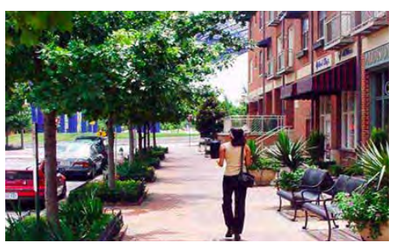
Table 7.6 Goals and Strategies for Green City

Key themes	Planning Approach & Strategies	Targets & KPIs
Natural Resources Protection	• Protect wetlands and forests allowing for recreational activities, agriculture and local material extraction in agreement with authorities • Leverage protected natural resources for economic activities • Restoration of wetlands encroached for urban uses	• No development on steep slope (conditional low intensity developments) • Relocation of unplanned communities in steep slopes and full restoration of slopes above 40% • A citywide Wetland Management Plan • Zero net-loss of existing forests and wetlands • 20 m mandatory buffer for all water bodies and wetlands (Organic Law) • 100% conservation of all water bodies • Encourage green growth development
Agriculture & Forestry	• Preserve fertile agriculture lands and use land consolidation method to increase food productivity • Reforestation to restore former forests	• Creation of innovative urban agriculture for slopes > 20% • Comprehensive management plan for agriculture and agro-forestry along steep slopes • Plan for management of agricultural practises in wetland areas • Afforestation in slopes > 60%
Green Growth & Climate Change	• Compact and Integrated development • Cluster and inclusionary zoning regulations to create more public open spaces • Include tax exemption and climate financing opportunities as incentives for all energy efficient development • Support existing green standards to encourage green compliance in Kigali	• Economic gain-creation of green jobs • A citywide climate change management plan with projects and guidelines
Disaster Risk Reduction & Resiliency	• Protect steep slopes and eco fragile areas • Incorporate Integrated Water Resource and Storm Water Management strategies	• Mandatory soil stabilization of all slopes (both public areas & private developments) • A citywide Watershed Management Plan • Flood free city for a 50 years of flood return period

City on the Move

Table 7.7 Goals and Strategies for City on the Move

Key themes	Planning Approach & Strategies	Targets & KPIs
Public Transport **Transit-oriented City**	• To become a Transit Oriented City • Develop a high-quality mass transit system which provides good coverage, and direct, fast and frequent services. • Develop a road network that supports mass transit systems. • Supplementary Public Transport / Feeder Systems which work in conjunction with the mass-transit systems. • Develop a high-quality mass-transit system which is easily accessible and segregated from road traffic. • Develop a supplementary public transport system which maximizes transit route coverage. • Adopt Intelligent Transportation Systems to enhance service reliability. • Locate Transport Hubs along Major Arterial Roads with BRT. • Integrate Rail and Air Transport with the Road Network. • Connect Regional Centers with Mass Transport Corridors. • Connect Intercity Bus Interchanges with Public Transport and BRT. • Develop a city-wide NMT network which includes cycling and connectivity. • Include Pedestrian and Cycling in the Arterial and Collector Road Networks. • Develop a strategic approach to providing pedestrian amenities such as trees and street furniture. • Develop a pleasant streetscape especially along Green Network routes.	• Public-Private Transport Modal Split of 70:30 • Average Transport Commuting Time of 60 min
Road Network	• To establish a Comprehensive Strategic Road Network • Develop a high-quality mass transit system which provides good coverage, and direct, fast and frequent services. • Develop a road network that supports mass transit systems. • Supplementary Public Transport / Feeder Systems which work in conjunction with the mass-transit systems. • Develop a ring and radial system of highways. • Develop a High Capacity Urban Roads Network. • Provide a Non-motorised Transport Network along Arterial and Collector Roads.	• Construction of Urban Roads to a minimum density of 6km/km2 • Seamless Intermodal Transport Connectivity • Construction of Intercity Freight Routes and Infrastruture
Freight Management	• Locate Logistics Hubs in the fringes of the City • Locate Intermodal Logistics Hubs where necessary • Provide High Capacity Urban Road Network around the City through freight	• Logistics Hubs to be located near High Capacity Urban Road (HCUR) in edge of City. • Intermodal Logistics Hubs to be located near Air and Rail Transit Links. • Alignment of HCUR to suit through-freight routes.
Green Transport	• Develop a city-wide NMT network which includes cycling and connectivity. • Include Pedestrian and Cycling in the Arterial and Collector Road Networks. • Develop a strategic approach to providing pedestrian amenities such as trees and street furniture. • Develop a pleasant streetscape especially along Green Network routes. • Develop a well-permeating public transport system into the urbanscape of Kigali. • The location of public amenities and facilities to be located within regional centers which are well served by public transport. • Develop a well-connected Green Transportation Network • Develop a pedestrian-friendly street design guidance manual for use in residential and urban commercial settings. • Pedestrianize urban core centers where possible.	• Integrated Non-motorised Transport Infrastructure • 100% of Amenities and Facilities served by Pubilc Transport • The establishment of Green Network and Pedestrian friendly streets • To implement Transport Policy effectively



Efficient City

Table 7.8 Goals and Strategies for Efficient City

Key themes	Planning Approach & Strategies	Targets & KPIs
Water Supply	• Ensure 100% safe, reliable and affordable water supply services • Strengthen the financial viability of all service providers • Adopt sustainable rainwater harvesting • Implement a demand management system • Develop a water master plan for the City of Kigali	• Reduce distance from residential stands to stand pipes from 280 – 250m • Consumption goal = 90lpcd • 20% lower water usage than world average • Water supply network coverage = 75% • Rainwater harvesting & water saving devices for new developments >0.4Ha • Water leakage loss 30% (2025), 15% (2040) • Water audits & maintenance programmes
Sanitation	• Raise household sanitation coverage to 100% by developing safe well-regulated and affordable off-site sanitation services for densely populated areas • Promote hygiene behaviour change for all the people • Implement improved sanitation for public institutions and locations to 100%	• Equip all public schools and rural developments with EcoSan toilets • All new developments to have temporary on-site STP >0.4Ha • Centralised STP for each sector 2040 • Sewer coverage 20% (2025), 75% (2040) • Separate sewer and stormwater: 20% (2025), 75% (2040) • Phase out all pit latrines by 2040
Storm Water	• Develop a stormwater management plan to mitigate impacts on properties, infastructure, human health and the environment • Enhance rainwater harvesting and management	• Revise local authorities' by -laws to effectively deal with stormwater runoff from all developments • Use swales and constructed wetlands for >0.4Ha developments • Minimize flood risk by on-site retention
Solid Waste	• Develop a solid waste management plan • Implement integrated solid waste management in ways that are protective to human health and the environment	• Build a new waste disposal site that complies with all environmental and regulatory requirements • Recycling rate: 15% (2025), 50% (Yr 2040) • Illegal dumping and open burning: 25% (2025), 0% (2040)
Electricity	• Provide access to electricty to all citizens by grid and aff grid means • Reduce feeder length and load • Construct new lines • Plan for contingency	• Use abundant sources: hydropower (333 potential sites), solar, geothermal, other renewable sources • 20% lower energy usage than world average • 20% Alternative energy sources • 52% of customers to be on the grid with remaining 48% being off the grid • 100% of customers to have access by 2020
Fibre	• Provide connection to all citizens	• 100% connection by 2040

City of Citizens

Table 7.10 Goals and Strategies for City of Citizens

Key themes	Planning Approach & Strategies	Targets & KPIs
Inclusive City	• Promote integrated, affordable development with access to social infrastructure for all • Develop mixed use, mixed income development through alternative zoning • Promote participatory planning/ bottom up approach • Support upgradation of informal settlement to provide quality living environment and affordable housing and infrastructure	• Establish resettlement development model • Easy access to facilities within 500m walking distance • Minimum green space per capita to be 15 sqm (NR)
Education	• Provide education facilities base on population catchment and densities by city, district, sector and cell levels to ensure easy accessibility	• Review minimum provision standards based on UPC and LUP and Kigali Master Plan 2013
Health	• Provide health facilities base on population catchment and densities by city, district, sector and cell levels to ensure easy accessibility	• Review minimum provision standards based on UPC and LUP and Kigali Master Plan 2013
Disabled people & Disadvantaged Groups	• Urban design guidelines to include universal design and barrier free environment	• To emphasize on barrier free designs for a minimum of 20% of the new developments • Introduce Incentives on zoning for housing with barrier free environment • Community design for locally based plans

Creative City

Table 7.9 Goals and Strategies for Creative City

Key themes	Planning Approach & Strategies	Targets & KPIs
Tourism & Culture	• Review and incorporate sites for tourism and suggest related economic activities • Support balanced development of natural resources for economic activities • Improve and extend ICT accessibility and connectivity to promote/ enhance digital marketing, online MICE conferences etc • Create more public open spaces to showcase cultural and tourist activities	• Enabling environment to double tourist arrival in Kigali by 2025 (as per the Sustainable Tourism Development Masterplan for Rwanda) • Develop at least 1 regional tourism destination in each district
Vibrant City	• Identify key nodes for mixed uses and entertainment activities • Improve accessibility to mixed use nodes • Encourage activity generating land uses to create a 24 hour city where people live-work-play-create	• Provide key areas in CBD as mixed use and entertainment precincts along main transit corridors • Develop urban design guidelines on key precincts to guide development of a vibrant and attractive environment
Heritage	• Including heritage sites in Master Plan • Provide guidance on further studies on mapping of heritage sites for preservation and tourism	• Develop three special precincts or heritage precincts in Kigali • Preservation of all historic and culturally important sites in master plan

7.5 Benchmarking

7.5.1 Urban Development Models

In the Kigali City Master Plan 2013, benchmarking studies was conducted on some of the leading global cities that sets the benchmark to achieve the vision of "Urban Excellence". These cities selected include Singapore, Curitiba and Vancouver for their comparable scales and similarities in aspirations with Kigali.

In view of the update of the Master Plan, it is ascertained that there is a need to look beyond the city-level but focus on the issues that the city is facing and what can be learnt from other cities to address these challenges. The benchmarking of cities based on successful implementation approaches and models will be more useful and relevant for the City of Kigali in this stage, whereby the implementation process is critical in realising the aspirations of the Master Plan.

To understand international best practices, various leading examples have been studied based on revised selected criteria. The criteria for selecting benchmark cities are as below:

- Successful Land Readjustment/ Consolidation models for land management/ land improvement.
- Leading programs /examples for upgrading Informal Settlement.
- Leading global examples in provision of various housing typologies including affordable housing.
- Successful global examples in provision of sustainable mixed use mixed income neighborhoods.

Land Consolidation/Land Readjustment Models

Town Planning Schemes (TPS) in Gujrat, India are well tested over many decades and it continues to be the key technique to assemble land for various types of development. The example of Magarpatta, India is selected to show multifaceted dimension of land pooling technique. This is a classic example of a successful and sustainable project carried out by the original farmers which turned out to be a win-win situation for the original farmers, citizens and the city. Medellin, Colombia offers us yet another pilot example of working with the communities in the development process through Land Readjustment but with more Participatory and Inclusive approach through extensive involvement of the communities.

The examples from Angola and Ethiopia are selected as successful African projects for comparison of their dynamics with other regions. The Angola example has two LR projects (one successful and other not successful) carried out by the same team of people with same if not similar strategies.

The key features and lessons learnt from these cases are presented in Table 7.11.

Initiatives on Upgrading Informal Settlements

Latin America has 25% of its population living in informal settlements with countries such as Colombia and Brazil having lengthy history of informal settlement upgrading. Colombia, Brazil and Morocco have used inclusive programs such as PRIMED/ Social Urbanism and Favela Bairro respectively in upgrading informal settlement in situ and they are well-known examples of 'integrated' slum-upgrading programmes. These examples demonstrate possibility of in situ upgrading of informal settlements as a practical solution in managing rapid informal growth inclusively.

These examples are innovative initiatives with strong government commitments that have successfully integrated informal settlements into the fabric of the city possibly with land readjustment models for some projects.

Ethiopia with its African context provides pragmatic solutions that has proved largely successful with Land Readjustment as a land improvement tool. Rwanda is benchmarked to see where it stands in its wake for upgrading informal settlements.

The key features and lessons learnt from these examples of upgrading informal settlements are presented in Table 7.12 .

Integrated Mixed Use, Mixed Income Neighborhood

Examples all over the world points focusing on incorporating mixed uses can be a powerful approach for urban renewal to achieve both physical regeneration and social goals. In this section, the cities/neighborhoods from different parts of the world are benchmarked in order to identify gaps and specially to learn from these successful examples, for Kigali's proposal for integrated mixed use, mixed income approach.

Toronto's St. Lawerence Neighborhood offers good lesson of inclusive 1970s housing development that remains a shining example of Toronto. It was born out of strong commitment of the City and its team.

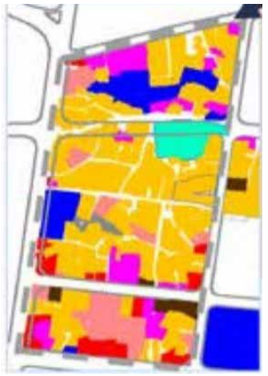
South Africa's Cosmo City is an award winner sustainable integrated project and the first successfully completed mixed income, fully integrated sustainable development in South Africa.

Singapore offers its world class urban solutions to address inclusive and integrated housing solutions.

Boston's Tent City is a World Habitat award winner example to showcase how a successful development can help change public policies towards an integrated approach to housing provision.

Different aspects such as Initiators/ Implementers, housing, financing models and key lessons are considered across the bench marked cities for analysis and learning in Table 7.13

Table 7.11 Land Consolidation/Land Readjustment Models

Countries/ Locations	Ahmedabad, Gujarat -India	Magarpatta, Pune- India	Medallin- La Candelaria, Colombia	Bairro Fátima and Camussamba, Huambo- Angola	Lidata, Wedera - Ethiopia
Layout plans					
Types schemes	Town Planning Scheme (TPS)	Land Pooling (LP)	Participatory and Inclusive Land Readjustment (PiLAR)	Land readjustment (LR)	Land Readjustment (LR)
Policies/ laws/ regulations supporting schemes	Gujarat Town Planning and Urban Development Act (GTPUDA), enacted in 1976 - Two tier process "Development Plan followed by Town Planning Scheme The Act allows a total of four years and one month for the preparation of a TP scheme, from the initial declaration of intention to the sanction of the final scheme.	Developed under Magarpatta Township Development and Construction Company Limited (MTDCCL) - company formed by the original farmers of the area and everyone became a shareholder in proportion to their land-holding.	Territorial Development Law (LDT) - Land Readjustments as one of the main tools to render the "social and ecological function of property"	No specific legal framework in place supporting such scheme	Reformed Pro-poor public policies and redevelopment process -2008 Government decided to experiment with land readjustment. Redevelopment plan - three levels—Local Development Plan (LDP), Strategic plan, and Action plan residents initiated the project
Purpose/Use	• Managing peripheral urban growth • City Level Infrastructure • Infrastructure in Unauthorized Colonies • Infrastructure in Dense Inner-City Areas • Social Infrastructure	To preserve/prevent lands from acquisition by the government or local developers.	Upgrading Informal/Poor neighborhood Urban expansion Urban renewal Infill and densification	Address informal peri-urban expansion To assemble land for planning new urban development	For Informal Settlement Upgrading
Leading Authority/ Body	Ahmedabad Municipal Corporation (AMC)/ Ahmedabad Urban Development Authority (AUDA)	Development and Construction Company Limited (MTDCCL)- formed by original farmers to tackle development themselves	Municipal Government/Municipal Administration. Medellin's Institute of Housing and Habitat (ISVIMED), Medellin's Department of Planning and also United Nations Human Settlements Programme (UN-Habitat) in this case.	Local government administration invited Development Workshop Centre-NGO	Woreda sub-city administration in charge of redevelopment management with Municipality providing overall guidance, coordination, and technical supports Project Office for Land Development, Banking and Redevelopment
Size of Project Area	100-200 Ha	162 Ha	3.8 Ha	About 8-10 Ha	26 Ha

Countries/ Locations	Ahmedabad, Gujarat -India	Magarpatta, Pune- India	Medallin- La Candelaria, Colombia	Bairro Fátima and Camussamba, Huambo- Angola	Lidata, Wedera - Ethiopia
Type of model	Public participation model Land retained and returned - % contribution calculated after layout is prepared. The usual ratio of land acquired to land returned is 40:60, with the landowner getting back 60% of land. No deductions of land for plots that are built 100%. The government owes each landowner some amount of money for the portion of land contributed by land owners based on the original plot values. The landowner owes the government betterment charge for the improvement/value appreciation of their land with infrastructure, amounting to 50% of the increase in land value/increment.	Co-operative Society Land/flat for housing and ut shares were provided on equity basis (in proportion to their land-holding). Every native peasant got parcel of land for house or flat within the Magarpatta City SEZ based on their land. Big landholding peasants got land and they build bungalow, whereas small landholding peasant got 3BHK flats in their apartment.	Participatory and Inclusive (putting Stakeholders (landowners, tenants, informal residents, municipal authorities, land professionals, community organizations etc. at the heart of planning /redevelopment process) The process ensures everyone shares benefits and costs fairly and equitably – Fairness and Equity are determined early in the project and agreed by all concerned to calculate the contribution each individual/household makes and the benefits they can expect.	Public Participation Model • 30 % land reserved for roads & infrastructure •35 % for redistribution to the landowners, •35 % for sale to cover basic infrastructure costs. Original occupants were given priority to provide allocation licenses (intermediary land-right document).	Residents petition to the City. Community engaged through survey: to express their views and preferences about the redevelopment project. to express their housing preferences and financial capacity, temporary resettlement during the redevelopment period etc. Various options were given as per households' status: • Receive an on-site readjusted plot of a smaller size to be developed by themselves; • Organize themselves into cooperative and construct apartment units on combined plot for cooperative members; • Receive on-site public housing (an apartment unit) with the rent-to-buy option; • Receive off-site public housing (an apartment unit) with the rent-to-buy option; or • Receive an off-site relocation plot to be developed by them. Plots and housing reassignments through a lottery system. Room-sharing families were given chance to jointly buy an apartment unit.
Financing model	Sale of land obtained through TP schemes. Betterment charges from land owners – Balance left after deducting the land appropriation cost for their contributed land.	Original owners of the land (which are farmers) are enjoying rental yields from their leased land till date. farmers still own parts of the land (as the commercial buildings are rented out) and most importantly, are the 100% shareholders of the company which runs the township. Land are leased out to various corporate houses and these lease rent received, is later distributed in the form of dividends among the land owners	Not much clarity in funding. The scheme in La Candelaria pilot project was supported by many organizations including UN Habitat, SIDA, etc.	Project sold 35% of the plots (to private individuals and families who had registered on the government's housing waiting list) to fund for road, service lines and boreholes for drinking water.	5.1 hectares (19.6 %) land was reserved for cost recovery to be sold to private developers for mixed use, rental property development. 2.8 ha land reserved for Administrative and social service facilities Families headed by elderly women were granted housing payment credit or business startup capital through collaboration between the Network of Ethiopian Women's Association (NEWA), Addis Credit, and Saving Micro Finance. Business tenants were organized into associations and provided land lease of 25Sqm each at affordable leasehold charges.

Countries/ Locations	Ahmedabad, Gujarat -India	Magarpatta, Pune- India	Medallin- La Candelaria, Colombia	Bairro Fátima and Camussamba, Huambo- Angola	Lidata, Wedera - Ethiopia
Key Lessons	This is a well-tested scheme and can be effectively used for: • Redeveloping older areas of cities • Managing peripheral urban growth • Providing Infrastructure in Dense Inner-City Areas The process can facilitate equitable and inclusive development as a portion of land can be appropriated to accommodate urban poor. The process has been a "win-win" proposition for both the landowners and the planning agencies—both gain from the appreciation in the land values. City can make good income out of selling reserved serviced plots to finance the infrastructure making it a self-financing scheme. TP schemes do not require the consent of the landowners to initiate which may make the process faster than other schemes requiring consent to commence. However, the landowners get opportunity to present their views on the proposals and the process has a built-in mechanism for dispute resolution.	Good cooperation and collaboration amongst stakeholders are key to success. This is a great model for development where the land owners got back land or flat for housing and became 100% shareholders (proportionate to their land holdings) in the company providing them sustainable income through dividends on shares. Apart from providing residential infrastructure to the residents, such scheme can also generate employment opportunities for the people (Jobs and contracts were guaranteed for Magarpatta City SEZ farmers [Magarpatta City SEZ was called as Farmers' Direct Investment (FDI)] making this a star approach to follow).	This is an alternative model for urban regeneration which is more equitable and sustainable. This participatory and Inclusive program has demonstrated successful Improvement in environmental restoration and housing conditions, both in terms of build quality and reduction of risk. This process can be used for any type of development such as for Urban expansion, Urban renewal, Infill and densification. However, the project size will have to be divided into manageable portions as it involves extensive public engagement/ participation making the process longer and challenging for bigger sizes. Such participatory processes will need to consider community knowledge, expert opinion and the city needs. It will be successful where governance have increased capacity and a mind shift for inclusive process involving community based groups, civil society, private sector etc. This program offers the possibility of creating new stock of public housing for relocating families which are under temporary tenancy situations. It also increases public spaces and facilities, social capital.	Land readjustment can be scaled-up provided there is 1.Appropriate governance structures. 2.Adequate community involvement. This is a good model to show how readjustment can reduce land conflicts by regularizing tenure status, thus knitting an informal settlement into the fabric of formally planned urban part of the city. Such models have the capability of changing the land market dynamics in the neighborhoods close to the project sites, making land in these previously neglected bairros much more valuable. Bairro Fátima was a success because there was a buy-in from the community (due to prospect of getting a legal title) and Implementers' had the fiscal powers to finance infrastructure through the sale of reserved 35% plots. Camussamba case became unsuccessful with lack of fiscal powers as an incentive to make good investment in the community through sale of plots. Although the same team and the same procedure were followed implementation wasn't as successful because of the new policy on decentralization where municipal administration had no fiscal power to generate revenue through sell of land. Good communications skills in local languages and a deep understanding of cultural and social norms are important for community trust and buy-in.	This scheme brought the government and community together in solving the issues. Neighborhood committee and the City signed a memorandum of understanding specifying boundaries of the project, objectives, implementation strategies, and the roles of the community and different local administrations. Participation of government institutions in the implementation process are crucial to attain complete success in the project. In this case, there was political will to support pro-poor approaches, but government institutions participation was weak in implementing activities due to lack of skilled staff, clearly defined responsibilities. and proper equipment in most institutions. For resettlement, site clearing in multiple phases would be better rather than moving everyone at once. This would have been the reason for the community to initially oppose the idea of temporary housing arrangements. This case offers an example how site clearance and relocation are possible in a timely manner where interventions are managed by a dedicated steering committee with no government force involved. Building owners were given the right to demolish the structure themselves and reuse or sell usable materials. Public buildings were sold to organized youths in the area to destroy and sell the recyclable materials in the market. This demonstrates creation of Employment opportunities for the residents in the construction sector, during the redevelopment process. Community acceptance of the project and buy-in becomes easier with community subdivided into focus groups with elected representatives to discuss community preferences, various issues and needs based on, gender, age, and tenure status. The rent-to-buy option provided to the residents is a good system in redistributing wealth and empowering the poor.

Table 7.12 Upgrading Informal Settlement

Countries	Morocco	Colombia	Brazil	Ethiopia	Rwanda
Location					
GDP per capita (2017)	$3,148.08	$ 7600.76	$ 9,821	$ 873	$765.20
Population and total Area	35.7 million Area - 710,850 km2	49.065 million Area - 1,141,748 km²	209.29 million Area - 8,514,215 km2	104.95 million Area - 1,000,000 Km2	12.21 million Area - 26,338 sq km
Population Density	80.1 P/ Km2	44 P/ Km2	19.3 P/ Km2	105 P/ Km2	495 P/ Km2
Location	Fes- Morocco	Medellin- Colombia	Rio de Janeiro -Brazil	Lidata, Wedera – Ethiopia	Kigali - Rwanda
					

Countries	Morocco	Colombia	Brazil	Ethiopia	Rwanda
Program/ Strategy	Comprehensive in Situ Upgrading as an Inclusive Growth Strategy that emphasizes participation, combines housing solutions and provides a safety net for the poor. Mutual Compromises between City and Citizens: • Citizens agreed to abide by certain planning norms to become integrated into the formal sector of Fes. They also agreed to abide by the established urban plan which was modified in a mutually agreed fashion by the city and the residents. • City accelerated land titling, conveying of legal title, and acceptance of some deviation from urban planning norms.	Upgrading as an Inclusive Growth Strategy through programs like PRIMED and Social Urbanism. Limiting habitat relocation, eradication of neighbourhoods, and encouraging community construction. Highly participatory process - residents of the outlying informal settlements (e.g. San Juan Bobo) were engaged in planning and prioritizing improvement plans and services to physically separated communities. Targeted Social-impact programs implemented primarily through “integrated urban plans” (IUP) that targeted investment in the City’s poorest and most crime ridden neighbourhoods. UN Habitat adopted and piloted Participatory and Inclusive Land Readjustment (PiLAR) approach as an Inclusive approach to land improvement.	Rio de Janeiro Favela-Bairro program (Slum Upgrading Program) The basic approach is to maintain the residents in the areas they occupied and bring services such as the ones available in more prosperous neighbourhoods. Organizing neighbourhood associations as medium of communication with the rest of the community. Involving community in the decision-making process from inception to completion. Education components on community development, sanitation, and environmental education were also included. Urban and Social Orientation Offices were set up to connect residents with architects, engineers and social workers, ensuring collaboration and participation.	Informal Settlement Upgrading Government decided to experiment with land readjustment implemented through Redevelopment plan. Community were engaged through survey: to express their views and preferences about the redevelopment project. to express their housing preferences and financial capacity, temporary resettlement preferences during the redevelopment period etc.	In formal settlement upgrading Apart from relocating settlements from high risk zones, the only upgrading strategy implemented thus far is the upgrading of Agatare Informal Settlement. Agatare Settlement- Opening of Roads, upgrading of drainage and water supply and paying compensation to land owners in accordance to the existing legal requirements for the partial or total loss of their plots during the process.
Enabling policies/ legislations	Government pursued Policy of slum resettlement – 1990’s and early 2000’s Government of Morocco (GOM) and the municipality of Fes took an initiative to actively engage with the community of Montfleuri (was an outlying area of the city of Fes) to make compromises between the illegal structures, informal settlement patterns and formal sector norms.	National government enacted legislation -1900’s Developed programs such as PRIMED (1993-2000) and Social Urbanism (2004) to be implemented by the Medellin government Integrated and inclusionary upgrading policies.	Brazilian policy shift toward slum upgrading instead of its eradication (1980s) 1950s, as the first policies to improve informal settlements were put in place.	Reformed Pro-poor public policies and redevelopment process -2008	National Informal Urban Settlement Upgrading Strategy National Housing Policy - Existing informal housing units shall be upgraded and integrated into the formal housing stock to the highest degree feasible. City-wide unplanned and underserviced settlements upgrading strategy for Kigali, Rwanda

Countries	Morocco	Colombia	Brazil	Ethiopia	Rwanda
Financing model	Combination of funding through public and private funding, contributions from slum households (either cash or through loans).	The sources of funding were various - the municipality of Medellín, the national government, community contributions, the GTZ (German government), Kfw. The programme also received technical assistance from the UN.	Some got IDB loans and the balance covered by and Rio municipality. There are self-help schemes in the favelas where people are given tools and training to contribute to the implementation of the upgrading activities in terms of labour force. Low-interest loans may be provided to help people fund these changes.	Financing through sale of land 5.1 hectares (19.6 %) reserved through land readjustment. Families headed by elderly women were granted housing payment credit or business startup capital through collaboration between the Network of Ethiopian Women's Association (NEWA), Addis Credit, and Saving Micro Finance. Business tenants were organized into associations and provided land lease of 25Sqm each at affordable leasehold charges.	Upgrading works in Agatare on-going, with World Bank support.
Key to Success	Government's commitment, the presence and work of a legitimate citizen association, participatory planning, and the incentive of regularized land title. Policy that includes, accessibility of services, Income and employment, and Safety net for Poor People.	Coordination with all the actors in channelling the resources, and articulating the physical actions was key to success. Big support - International agencies such as UNDP and KFW provided technical support and resources for various projects. The national and local bodies directed provided subsidies, financed community training in the improvement of housing, provided technical and human resources within the areas of their competence. NGOs, Communities, and private contractors all participated in the physical execution of the works. Program placed attention on the relationship with the community. Limiting the processes of relocation, and encouraging community construction, has positive impact on social capital.	The program addressed challenging and socially relevant issues. It was implemented efficiently with transparent selection criteria, and high degree of community/stakeholder engagement; Financial and technical support of the InterAmerican Development Bank played an important catalytic role for Favela -Bairro. The figures reflect the commitment from the municipal government, as it allocated nearly half the city's budget to its Housing Department and gave it a central management role in the programme	Neighborhood committee and the City signed a memorandum of understanding specifying boundaries of the project, objectives, implementation strategies, and the roles of the community and different local administrations. The site clearance process was completed in a timely manner as it was managed by a dedicated steering committee and there was no government force involved. Building owners were given the right to demolish the structure themselves and reuse or sell usable materials. Public buildings were sold to organized youths in the area to destroy and sell the recyclable materials in the market.	Government's commitment to upgrade and integrate the informal settlements into the formal housing stock to the highest degree possible.

Countries	Morocco	Colombia	Brazil	Ethiopia	Rwanda
Key Lessons	Effective and sustainable development can become a reality through integrated public policies. Well-coordinated program with strong political will to support inclusive growth helps incorporate informal settlement into the fabric of the city, benefiting both the residents and the city. Upgrading was accomplished with most of the costs being borne by the residents themselves. Excellent strategy to knit the informal communities into the fabric of the cities to which they are attached and to advance a policy of inclusive economic growth that will create greater equity. Current urban policies in Morocco contains a component for upgrading informal settlements in situ, that includes participatory planning, physical improvements, skills training and education and other service delivery.	Strong political will committed to address complex problems present in deprived neighbourhoods is the key for success. Bottom-up and participatory approach throughout the planning process. "negotiation and rapport, not imposition, was the most fundamental 'tool'. Maximum spending should be targeted towards social services aiming to build capacity within the community (3/4 of project spending went towards social services). This inclusive program got a buy in from the private sector and strategy helped implement projects such as environmental restoration, public spaces and social services (libraries) transportation system that links the informal settlements and the communities via cable cars and escalators to enable residents to travel to work and access public services. Some of these features became tourist attractions in the city. Upgrading with participatory and inclusive intervention brought about marked reduction in crime, increased resilience of the city, economic opportunity, enhanced cultural and social vitality by binding the communities into the overall fabric of Medellin.	The improvements brought about by Favela Bairro encouraged residents to invest their own resources in upgrading their homes as they became confident there will be no eviction. The program demonstrates the possibility of integrating informal areas into the fabric of the formal city where local communities take part in the upgrading process. Upgrading projects were selected through contest and bidding. Alternately, ranking based on poverty indicators, cost-effectiveness, and strategic aspects were carried out to avoid politicization. Combination of physical and social investments tailored to the requirements of the community will help elevate a settlement from informal to formal/regular settlement. As Rio took the lead in slum upgrading, increasingly municipalities throughout Brazil have moved from sectoral projects towards comprehensive and in-situ upgrading frameworks.	Participation of government institutions in the implementation process are crucial to attain complete success in the project. In this case, there was political will to support pro-poor approaches, but government institutions participation was weak in implementing activities due to lack of skilled staff, clearly defined responsibilities. and proper equipment in most institutions. This case offers an example how site clearance and relocation are possible in a timely manner where interventions are managed by a dedicated steering committee with no government force involved. Building owners were given the right to demolish the structure themselves and reuse or sell usable materials. Public buildings were sold to organized youths in the area to destroy and sell the recyclable materials in the market. For resettlement, site clearing in multiple phases would be better rather than moving everyone at once. This would have been the reason for the community to initially oppose the idea of temporary housing arrangements. This demonstrates creation of Employment opportunities for the residents in the construction sector, during the redevelopment process. Various rent-to-buy housing options were given as per households' status. This is a good system in redistributing wealth and empowering the poor. Community acceptance of the project and buy-in becomes easier with community subdivided into focus groups with elected representatives to discuss community preferences, various issues and needs based on, gender, age, and tenure status. It is important to design and implement income generating programs to minimize potential job or income loss for the affected families.	As segregation seems to be an issue in Kigali, bottom-up approach with local communities' engagement and education through inclusive process would be the key for success. For effective implementation, government subsidy, low interest loans or PPP arrangements would be required to help the residents in the development process. As per the categorization of Informal settlements in the UN Habitat's City-Wide Strategy, Kigali could adopt the learnings from other cities depending on the suitability for intervention. However, criteria for selection of upgrading projects are required for informed intervention. Where high density mixed use, mixed income developments are envisaged in existing informal settlements with no access to land, Ethiopian and Medellin examples could be the way for land management.

Table 7.13 Integrated Mixed Use, Mixed Income Neighborhood

Locations	St. Lawrence Neighbourhood, Toronto - Canada	Cosmo City, Johannesburg - South Africa	Toa Payoh New Town -Singapore	Tent City, Boston-USA
Location				
Size and Population	22.6 Ha of land houses approx. 10,000 people	1105 ha approx. 65 000 - 70 000 people	422 ha - 190,000 people	1.34 Ha – Approx.1000 people
Background	This mixed use, mixed income development came in the post-war era of urban growth, development, and decay; experiencing affordable housing crisis. It is a successful, fully-functioning, mixed-use, mixed-income high-density mid-rise precinct. Plan adopted Toronto's nineteenth century grid street plan, resulting in a community that is well integrated with its surroundings. Excellent example of how the public sector, in cooperation with the private sector, can work together to develop a successful new community.	This mixed-use mixed income development was borne out of an urgent need to create accommodation for the informal settlers of Zevenfontein, Riverbend and the farm workers of Cosmo City that illegally occupied privately owned land in the North-Western area of Johannesburg. The City is a thriving multiclass, multiracial and multinational city. It is the first successfully completed mixed income, fully integrated sustainable human settlement in South Africa. Cosmo City development has received three awards recognizing the success as a sustainable integrated project: • Best Housing Projects • Best Developer of the Year • Best Public Private Partnership of the Year	One of the first self-sustainable mixed-use neighbourhoods in Singapore, designed to meet the needs of diverse users. Developed based on the Neighbourhood Principle, several neighbourhoods are grouped around a Town Centre. It was once a big swampland littered with squatter huts. Toa Payoh has a mix of residents of different ethnicities due to the national Ethnic Integration policy.	Mixed-use, mixed-income Tent City originated over 25 years ago when a redevelopment programme cleared the site of existing low-income housing to make way for large scale commercial development. Tent City was designed with green standards -strict energy saving standards, high insulation standards for walls and windows and water conserving water closets.
Lead/ Implementors	City of Toronto Housing Department, in cooperation with the Federal and Provincial governments, the private sector, and the community. Private sector responsible for building the individual private and cooperative housing projects.	City of Johannesburg and the Gauteng Government. Public private partnership (PPP) between the Provincial Department of Local Government and Housing (province), the City of Johannesburg (the City) and CODEVCO (Developer), with CODEVCO having overall responsibility for most aspects of the development	Government initiative through Housing & Development Board(HDB), Singapore	Residents in the neighbourhood / local community City's urban renewal authority

Locations	St. Lawrence Neighbourhood, Toronto - Canada	Cosmo City, Johannesburg - South Africa	Toa Payoh New Town -Singapore	Tent City, Boston-USA
Inclusive Planning goals/aims	Provide housing for all income groups, especially for moderate to low income households Restore the character of the Old Town by integrating the existing neighbourhood and historical buildings with the St. Lawrence neighbourhood,	Relocate Zevenfontein illegal occupants into an integrated, mixed use development following policies of Sustainable development.	Meet the needs of current and future residents, self-sufficient with a wide range of uses and amenities. Estate Renewal Strategy – an integrated and systematic approach to rejuvenate older HDB towns.	Create an affordable, mixed-income, racially and ethnically integrated housing community to replace housing lost to urban renewal clearance. Create a mixed use residential neighbourhood which would become an integral part of the South End urban fabric, enabling affordable housing to be retained in wealthy inner-city districts.
Housing	4,310 Units Mix of tenure type: • 39% condominium apartments, • 30% non-profit co-ops and private non-profit rentals, 27% municipal non-profit rentals and • 4% ownership townhouses.	12 000 Units Mixed typologies: • 5000 low-income houses • 3000 credit-linked houses • 1000 social rental units • 3300 bonded houses	36,000 units • 87% three-room units • 3 % of the present flats are one-room flats and • 10% are two-room flats.	176 units – 12 story (one and two bedroom flats and 6,500 ft2 of ground level retail space) 93 units – 4 story townhouses (three and four-bedroom duplex apartments and one retail space). 25% of the households are low income 50% for four layers of income ranges. 25 % market rate rents.
Other facilities	Schools, health clinics, grocery stores, hairdressers, cleaners, recreation centre, and restaurants located at grade level facing main streets. St. Lawrence Neighbourhood has a pedestrian focus, and transit connections serve the area well. Bicycle use is another form of transportation.	12 schools, 3 shopping malls, health facilities, police stations, a community centre with a hall, 43 parks and recreational areas, a library, a cemetery and several churches. The area relies primarily on minibus taxis for public transport.	Parks, recreational facilities, community centres, various communal spaces, schools and commercial nodes, industrial land to provide employment for residents. The area has an efficient transit networks.	Neighbourhood shops, pre-school day care facilities and a community meeting room, all to serve both the Tent City Housing and the greater community. Tent City is walkers and riders paradise and the area is well connected by public transport system.
Financing model	Federal and provincial government subsidies and loans and grants received under the Community Services Contribution Program. Non-profit housing organizations developed 52% of the housing overall. The building became self-financing as land was sold and leased to the private sector.	Public private partnership (PPP) model A Land Availability Agreement was signed between the City and CODEVCO (Developer) The developers pay the City: • R2 per m^2 (net density) for every residential site sold • 50% of the net profit of the non-subsidised residential, commercial and institutional sites. Gauteng Department of Housing - provides Housing subsidies, Schools/institutions. City of Johannesburg is the land owner and provides - Bulk infrastructure, approvals, urban Management	The upgrading costs are shared with the resident. The percentage paid by the resident ranges from 7 to 23 % depending on the type of work carried out. The smallest flats have the lowest % cost to the resident. Most of the upgrading programmes are funded from the government's budget surpluses.	Complex financial structure, involving funds from more than 13 sources. Cross subsidy and subsidy programs provide rental subsidies to tenants to help keep the rents at affordable levels. Repayment out of permanent mortgage loan and syndication proceeds.

Locations	St. Lawrence Neighbourhood, Toronto - Canada	Cosmo City, Johannesburg - South Africa	Toa Payoh New Town -Singapore	Tent City, Boston-USA
Key Lessons	Leadership becomes key to succeed. It was leadership (Mayor) and spirit of co-operation not confrontation that made the project successful. This is an excellent example of how the public sector, in cooperation with the private sector, can work together to develop a successful new community. The community participation process played a key role in designing the St. Lawrence neighborhood. (The citizen's working committee included representatives from community groups, public housing projects, non-profit cooperative housing, and the private development industry as well as the planners and councilors from the wards affected). The Plan adopted Toronto's nineteenth century grid street plan, resulting in a community that is integrated with its surroundings.	Cosmo City project became successful as it has endeavoured to comply with integration and sustainability principles as per governmental policies and legislation. The project was successful in meeting the pressing demand for housing and assisted previously disadvantaged people to gain access to the formal urban system which was previously denied. This case demonstrates it is crucial for all stakeholders involved to have clarity in their role for implementation. Stakeholders involved in Cosmo City have clear roles to play and each of them has a contribution for the implementation of the project. All actions are done openly and are accounted for.	This is a great example of how Neighborhoods in Singapore became successful because of their strategies on social inclusion. The upgrading programmes proceeds only if 75 % of the residents vote in favour. This case showcases its inclusive and participatory approach in involving residents in the decision-making process (through information provision, meetings, residents' committees). When redevelopment is necessary, residents are moved collectively to larger accommodation within walking distance of their old flats. The new flats are completed before the old ones are demolished. This is a good practice to ensure social and community continuity. With homes made more suitable for older people and those with physical disabilities, this example demonstrates its inclusivity in trying to provide housing for all in true sense.	This demonstrates how the strength of the residents can change the scenario of the neighbourhood and also change the Government Policies/Plans towards inclusive and affordable neighbourhood. The scheme shows inclusivity in prioritizing the subsidised units to be given to people displaced by public action, then the South End residents and people living in sub-standard housing. The Tent City Housing shows how successful developments can change public policies from that of developing luxury housing towards an integrated approach to housing provision, with emphasis on retaining affordable mixed-income housing in inner city areas. This example demonstrates that Gentrification should not be an issue even when the property values increases if market rent flats are not invaded by wealthy professionals. They can be targeted to be occupied by short term residents such as students. It became an example/sustainable model for similar projects elsewhere in Boston, designed by the same architects and involving the same community builders who worked on Tent City.

7.5.2 Transport Benchmarking

As an integral component of the Kigali City Master Plan, various international best practices on transportation system have also been studied based on selected criteria. These leading successful examples will help to serve as guidance for the planning and development of the transportation system in Kigali City to acheive its vision as the Centre of Urban Excellence in Africa. The criteria for selecting benchmark cities are as below:

- Some of the Top Overall Transport Systems in the World
- Bus Rapid Transit in other African Cities

The BRT Feasibility Study and Preliminary Design Second Interim Report benchmarked Residential and Commercial Parking Standards.

Table 7.14 Transport System

Countries/Locations	Singapore	Paris	Hong Kong	London	Madrid
General Information					
Population (people)	5.6 million	7 million	3.3 million	8.4 million	3.2 million
Population Density (people per km2)	8 100	9 200	36 300	5 200	5 200
National GDP per Capita (USD) - PPP based	66 900	57 200	57 200	37 200	39 300
Transport System					
Public : Private	75: 15	-	88: 12	34:66 (Metro 2005) 55:45 (City 2005)	54:46 (Metro 2005) 66:34 (City 2005)
Cars /1000 person	101	530	63	213	563
Percentage of Paved Road	100	100	100	100	99
Average Commute Time (min)	84	64	73	84	62
Average Waiting Time (min)	12	12	14	13	11
Walking Distance (km)	0.56	0.74	0.73	0.53	0.59
Key Successes	• Efficiency: Currently developing predictive maintenance system • Affordability: Including discounts for low-wage workers; free travel for children and other concessions	• Developed roads with some being converted to accommodate more NMT • High levels of safety (37% of roads limited to 30km/h) • Real-time information screens	• 75% population and 95% workplaces within 1km of metro station (37% of trips by heavy rail) • Modern technology including card that works for transport payment, non-transport services, office access etc. • Improved sustainability with electric vehicles	• Success in public and private transport with efficient ITS driven systems and Transport for London focusing on reliable public transport • Unified way finding system for multi-modal travel • Safe transport	• Metro system with good coverage • Good public transport efficiency with improved maintenance, extended coverage, new infrastructure and increased workforce
Affordability of monthly public transport ticket compared to average income (%)	-	-	2.55%	6.14%	-

Table 7.15 Bus Rapid Transit

Cities	Johannesburg	Cape Town	Pretoria	Lagos	Dar es Salaam
Population	4.4 million	3.7 million	2.9 million	22 million	4.3 million
Density (People/km2)	2 696	1 530	464	7 759	3 100
BRT Name	Rea Vaya	MyCiti	A Re Yeng	Lagos BRT	DART
Date Operational	2009	2011	2014	2008	2016
Length (km)	43.5	31	14	22	20.9
No. of Stations	13	30	12	28	27
Position of Lanes	Median	Median	Median	Kerb and Median	Median
Fleet Size	277	-	30	220	177
Commercial Speed	30	30	-	30	23
Boarding Level	High	Low	Low	Low	High
Passengers per Day	42 000	66 178	3 400	200 000	180 000
Infrastructure Cost per km (Million USD) This includes construction and property expropriation costs, but excludes side lanes for mixed traffic. Infrastructure Cost per km (Million USD) This includes construction and property expropriation costs, but excludes side lanes for mixed traffic.	11 980 (2013)	-	-	1700 (2010)	8130 (2018)
Images	 Vaya - Johannesburg (Source Flickr - AfricanGoals2010)	 MyCiti - Cape Town (Source MIT - Anson Stewart)	 A Re Yeng-Pretoria (Source ITDP)	 Lagos BRT (Source Sustai)	Not Available

7.5.3 Infrastructure Benchmarking

A few international initiatives have been identified to serve as a benchmark in setting realistic targets for the City of Kigali. This aims to develop the future infrastructure to a higher standard in order to position CoK as a world-class modern and progressive City. A report by KPMG titled "Benchmarking city services, 2017" was used as a reference, with the following objectives in Figure7.4:

Building permit and enforcement

In order to ensure continuous development, an efficient and cost effective building permit system is required. The KPMG document refers to the following innovative ideas that are used internationally to make the permit process more efficient and cost-effective:

- "In Brisbane, the Suburban Construction Management Team has used the new Planning Act and Environment Protection Act to adopt a stronger compliance focus, including training to facilitate the implementation of Prescribed Infringement Notices."
- "Authorities in São Paulo have implemented a new Electronic Licensing System (SLCe) that should allow projects to be approved in less than five working days by unifying documents within a single permit."
- "Over the coming year, the City of Philadelphia will introduce a new customer queuing system (that will enable customers to schedule appointments) and a new IT system that should allow customers to submit and pay for permits online."
- "Having split their applications into sub-categories, authorities in Cape Town are now introducing electronic submissions and registering users as business partners with the city.

Water

One of the Sustainable Development Goals is access to safe drinking water. As populations grow, it becomes more and more of a challenge to provide water, not only from a supply and quality point of view but also from a financial perspective. The KPMG document refers to the following innovative ideas that are used internationally to make the water supply process more efficient and cost-effective:

- "In Kazan, authorities have undertaken a major plant reconstruction and implemented new electrolytic sodium hypochlorite production facilities, thereby enabling elimination of liquid chlorine improving overall organoleptic characteristics."
- "Philadelphia's Water Department has just started a new project to fully replace customer-owned lead service lines that still exist between the main and the property's water meter."
- "New automated and connected water meters are being rolled out in cities around the world, including in Toronto where authorities are engaged in a program to replace all outdated water meters and install new meters where flat rates had existed before."
- "Following a five-year capital investment program co-financed by the EU, the City of Warsaw has seen significant improvements in the quality of water and the reliability of the overall system."

Waste Water

Waterborne diseases are the cause of many deaths worldwide every year. For this reason, and other, safe methods of waste water disposal are crucial. The KPMG document refers to the following innovative ideas that are used internationally to make the waste water drainage and treatment process more efficient and cost-effective:

- "Moscow has seen significant investment into its water treatment facilities with the construction of one of the world's largest UV radiation disinfection facilities that boasts enough capacity to treat around 80 percent of the city's current sewage and waste water."
- "In Dresden, a newly installed fouling complex has helped the wastewater network achieve a high degree of power self-sustainability."
- "Last year, the Philadelphia Water Department met the first milestones of their 25-year Green City Clean Waters plan which aims to reduce the amount of storm water entering the city's combined sewer system through the use of green infrastructure."
- "In Toronto, authorities are taking aggressive action to fill the looming talent gap by creating focused talent and development plans for key staff and their future workforce."

Stormwater

The frequency magnitude and duration of flash floods in the City of Kigali have increased dramatically over the past few years. In order to protect the City's infrastructure and people, serious attention needs to be given to stormwater management. The KPMG document refers to the following innovative ideas that are used internationally to make the drainage and management of stormwater more efficient and cost-effective:

- "Supported by rebates from city council, more than 90,000 new domestic rainwater tanks were installed by Brisbane residents during the Millennium Drought event."
- "Authorities in Dresden have optimized their sewer system control to help better manage storm water during storm events."
- "In Mornington Peninsula, storm water authorities have implemented the Local Integrated Drainage Scheme (LIDS) to enhance and deliver flood

Figure7.4 Objectives of KPMG Benchmarking Exercise

mitigation works, and to reduce the risk of flooding to the population."

- "Toronto is considering a new storm water charge policy that would separate storm water services from water consumption in order to provide customers with greater fee transparency."
- "In neighbouring Mississauga, authorities have introduced a credit program that provides financial recognition for private, on-site storm water measures that deliver direct benefits to the city's storm water system."

Solid Waste Management

The management of solid waste is crucial from a health and environmental perspective. Citizens need to become more aware of their direct impacts on the environment. The KPMG document refers to the following innovative ideas that are used internationally to make the collection, management and disposal of solid waste more efficient and cost-effective:

- "In an effort to raise revenues and support broader waste avoidance and diversion efforts, the City of Dresden has instituted a pay-as-you-throw charge system for residential waste.'
- "The City of Belfast has implemented a new route optimization software platform that is already improving efficiency on refuse collection routes."
- "The Streets Department in Philadelphia is part of a multi-departmental task force aimed at creating a combined and comprehensive approach to reducing litter and increasing waste diversion at the street level."
- "Leveraging 'smart city' models, garbage collection authorities in Antwerp are using 'big belly' bins and real-time monitoring systems to improve waste management efficiency."
- "Authorities in Wyndham have installed recycling receptacles that dispense vouchers, competition entries or charity donations when recyclable materials are deposited."
- "Philadelphia's Streets Department has created targeted education and outreach initiatives aimed at residential multi-family structures in lower-performing areas of the city."
- "Moscow has developed a centralized solid municipal waste management system that rationalizes the number of providers in the city and encourages new investment using long-term contracts and agreements."
- "With recycling and organics collected weekly, the City of Cardiff has implemented restrictions on the quantity of residual waste that residents can present for collection every fortnight."
- "The City of Dresden has opened its eighth 'bring center' for the collection of waste and recyclables."
- "In Brisbane, authorities have launched the Rethink your Rubbish program supported by an integrated marketing and communications campaign and heightened focus on school programs."

Power Supply

Fossil fuels draw on finite resources that are expensive and damaging to the environment. There has been a shift towards the use of renewable energy sources as a sustainable way of power supply. The following innovative ideas have been adapted internationally to make power supply more efficient and cost-effective:

- Electric bikes – "In December 2016, the Mayor of London, Sadiq Khan, launched a campaign urging people not to drive. He announced plans to spend £770m on cycling schemes over five years. This level of spending will take London near to the per capita levels of cycle-friendly countries such as Denmark and the Netherlands.[1]"
- "Smart grids comprise a broad mix of technologies for modernising electricity networks, extending from the end-user to the distribution and transmission levels. Improved monitoring, control and automation technologies can help to enable new business models while unlocking system-wide benefits including reduced outages, improved response times, deferral of investment in the grids themselves and the integration of distributed energy resources. At the end-user level, smart grids can enable demand flexibility and consumer participation in energy systems, including through demand response, electric vehicle charging and self-produced distributed generation and storage. China is approaching full smart meter deployment.[2]"
- "Iceland generates the cleanest electricity per person on earth, with almost 100% of its energy coming from renewable sources that make the most of its unique landscape. It now derives all of its energy for electricity and home heating from geothermal and hydroelectric power plants. Its renewable power plants like the geothermal plant at Blue Lagoon even draw significant amounts of tourists every year.[3]"
- "The UK is a windy place and wind power is growing in importance. Using a combination of grid-connected wind farms and standalone turbines, the United Kingdom now generates more electricity from wind farms than from coal power plants. Some days, Scotland is able to produce enough wind power to supply over 100% of Scottish households. Neighbouring Ireland also continues to set new records, with enough energy to power more than 1.26 million homes being created on just one windy day in 2015.[4]"

1 Source: BRE Buzz, October 2018

2 Source: International Energy Agency, May 2018

3&4 Source: Click Energy, August 2017

ICT

Information and Communication Technology plays a large role in improving quality of life as it can be used as a medium for learning, communication and education. The following innovative ideas have been adapted internationally to make ICT services efficient and cost-effective:

- "Grameen Phone's Village Pay Phone project helps Bangladeshis without financial collateral to provide telecommunications services to their communities. They purchase mobile phones via lease, and pay for their investment by allowing villagers to make calls and send and receive messages. In time, other services such as email and fax will also be available.The initiative has shown that poor rural residents value telecommunications and are in fact willing to pay fair (and sustainable) prices for telecoms services. In addition to providing access for the community, the phones create microenterprises. Furthermore, by employing mobile phones that can be used anywhere in the community, problems arising from the location of fixed community phones have been largely avoided.[5]"
- "Red Cientifica Peruana, located in Peru, is completely self-sustaining, receiving no subsidies, governmental or otherwise. RCP has successfully set up a national network of 27 telecenters in Peru, which typically consist of 20 desktop computers with dedicated Internet access. The telecenters provide computer rentals, training, personal email accounts, World Wide Web page development and other services.What is most notable about RCP is its successful business model. They have devised a fee structure that covers costs and allows their organizations to grow while retaining profits. Additionally, RCP has become the largest provider of Internet access in Peru and the country's most popular portal with 20,000 hits per day (85% foreign). RCP recently signed an agreement with the US investment fund Westsphere to form a new communications company, dedicated to expanding current Internet services, with plans to expand into long distance telephony and television programming[6]."
- "It is becoming possible to split up parts of the business process in ways that were never possible before, gaining new cost savings and efficiencies. InterLink Communications provides offshore medical transcription services to the U.S. healthcare industry from its facilities in India. Doctors dictate their notes, and the recording is digitized, compressed and sent via the Internet to India, where workers who have been extensively trained in anatomy, medical terminology, and American diction transcribe the recording into text. The time difference allows return of the resulting transcriptions overnight at a lower cost.[7]"

5 Source: https://cyber.harvard.edu/readinessguide/examples.html

6&7 Source: https://cyber.harvard.edu/readinessguide/examples.html

This page is intentionally left blank.

8

Broad Land Use Requirements

8 Broad Land Use Requirements

As population in future grows and urbanization accelerates there will be more development pressure on the existing land in Kigali. The urban area will expand into the current peri-urban and rural areas to accommodate this growth. To achieve the vision for Kigali, the concept plan proposes the environmentally sensitive areas like the forest areas, wetlands, water bodies, and steep slopes be respected and protected from future urbanization.

In view of the revision of the socio-economic conditions of the city, broad land use areas are reformulated to ensure that sufficient land are safeguarded to respond to the needs of the projected population by 2050.

Planning standards are used to obtain the broad land use requirements to meet the projected population and economic growth while protecting the environment. The Kigali Master Plan 2013 has proposed a set of planning standards for Kigali based on the studies of standards set by the various government agencies in Rwanda, previous master plans like the National Land Use Development Plan, KCMP and the Nyarugenge Detailed Physical Plan and international planning standards and norms of Singapore and South Africa. Based on discussions with City Authorities, this review of broad land requirement hence will follow the planning standards in Master Plan 2013 to ensure consistency.

8.1 Hierarchy of Planning Area

In Kigali Master Plan 2013, the Concept Plan organized Kigali into a hierarchy of planning areas, which will guide the distribution of employment spaces, parks, and other public facilities within the city and with setting up the requirements for the broad land use.

The hierarchy of these areas is based on the population size. Based on detailed study of existing urban character and administrative setup and previous master plans and the future projected population, the proposed urban hierarchy for Kigali City and the relation between the city, town, neighborhood is explained in Table 8.1. This urban hierarchy will continue to be adopted in the updated Master Plan to guide the urban structure of the city.

In the high population growth scenario adopted by this review, the resident population has been projected to reach about 3.7 million people by 2050. Kigali Master Plan projected a population of 5 million by 2040. The current socio-economic study projects a lower population of 3.7 million for 2050 in comparison to the previous master plan estimates. The revised projected population and market demand and real estate analysis are critical to inform the master plan update.

Table 8.1 Proposed Hierarchy of Planning Areas in Kigali

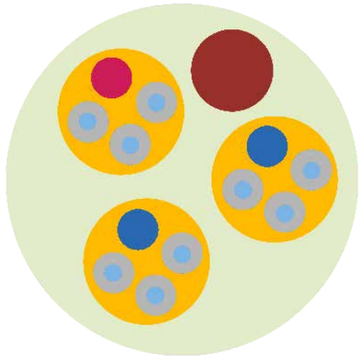
	Urban Area Hierarchy		Population	Corresponding Commercial Centre	
		City	3.7 million		International CBD
		Town	150,000-200,000		Regional Centre
					Fringe Centre/ Town Centre
		Neighbor-hood	15,000-20,000		Neighborhood Centre

Table 8.2 Broad Land Requirements for Residential Use

Broad Income Group	Housing Density	Development Type	Density Share	Housing Required (DU)	House Size (sqm)	Residential GFA (SQm)	Plot Ratio	Land Required (sqkm)
High Income	Low Density	Detached	15%	119,937	250	29,984,250	0.5	15.0
Medium Income		Semi-Detached	20%	63,966		15,991,600	0.5	8.0
	Medium Density	Multifamily		95,950	90	6,044,825 (70%)	1.4	8.5
Low Income		Terraced House	25%	79,958		7,196,220	1.4	10.1
	High Density	Multifamily		119,937	90	7,556,031 (70%)	2	15.1
EWS (Affordable)		Multifamily	40%	319,832		20,149,416 (70%)	2	40.3
TOTAL			100%	799,580		86,922,342		96.9

Expansion and densification are two important elements of managing urban growth in cities. The master plan update strongly supports advance planning to accommodate growth in an orderly manner to avoid sprawl and informal settlements. Taking into account the population projections and market demand assessment for the city of Kigali, the master plan update suggests phasing strategies for the proposed zoning to identify priority areas of urban development and expansion, keeping some areas for future phases of growth, also to provide flexibility for market demand coming into Kigali as the city exhibits new growth prospects for the future generations.

The other important aspect of managing growth is through promoting incremental densification strategies to align with the current market demand and again to allow flexibility for development in the different areas of the city. The master plan update shall manage both these aspects of urban expansion and densification through phasing and zoning regulations.

8.2 Kigali Broad Land Requirements 2050

8.2.1 Broad Land Requirements for Housing

Kigali currently has a population of 1.3 million. Currently 60% of the city lives in unplanned areas having a density of from 80 to 250 p/ha. There are also large areas with low density single family housing and new residential areas with compact development and higher densities.

Broad land use for housing in Kigali is calculated as per housing types (detached, semi-detached, multi-family) and housing densities (low, medium and high). The share of the residential distribution are determined with the consideration of the broad income groups of the population, taking into account the affordable housing needed for the resettlement of the unplanned settlements. With a projected household size of 4.6[1], a total of 799,580 dwelling units are anticipated by 2050, which requires about 97sqkm of land for housing (refer to Table 8.2)

As one of key strategies is to create more mixed-use integrated neighbourhoods, it is assumed that 30% of the total GFA of medium and high density multi-family residential will be distributed within the mixed use areas.

8.2.2 Broad Land Requirements for Commercial Use

The total employment in the City of Kigali is projected to increase from 661,665 in 2019 to 1,760,285 by 2050 as mentioned in Chapter 6.
Among which, employment for the various sectors are projected by 2050. It is anticipated that the employment share of commercial services will increase significantly as Rwanda transforms to a service based middle income economy and Kigali as the business hub of the country. A total of 749,000 jobs are expected to be created in the services sector in offices, retail and hotel facilities.

1 IPAR Study, 2018

Table 8.3 Broad Land Requirements for Commercial Use

Development Type	Area per person (sqm per person)	Employed Population	GFA Required (sqm)	Plot Ratio	Land Area Required (sqkm)
Office+ Hotel + Retail	15	749,261	7,867,238 (70%)	1.4	5.6
TOTAL		**749,261**	**7,867,238**		**5.6**

Table 8.4 Broad Land Requirements for Industrial Use

Development Type	Area per person (sqm per person)	Employed Population	GFA Required (sqm)	Plot Ratio	Land Area Required (sqkm)
Heavy Industry (Agro-Processing & Manufacturing)	40	110,002	4,400,067	0.7	6.3
Light Industry	25	51,251	1,153,143 (90%)	1.0	1.2
Trade & Transport	12	564,935	6,779,222	0.5	13.6
TOTAL		**726,188**	**12,332,432**		**21**

Table 8.5 Broad Land Requirements for Mixed Use

Development Type	Share of GFA	GFA Required (sqm)	Plot Ratio	Land Area Required (sqkm)
Residential	30% of Multifamily	14,464,402	1.4	10.3
Commercial	30% of Commercial	3,371,673	1.4	2.4
MicroLight Industrial	10% of Light Industry	128,127	1.4	0.1
TOTAL		**17,964,203**		**12.7**

These commercial land use requirement will be further distributed into the respective commercial centres hierarchy including the regional centers, city centers, town/community centers, and neighborhood centers, which will be detailed out in the next stage of the Master Plan review.

As one of key strategies is to create more mixed-use integrated neighbourhoods, it is assumed that 30% of the total GFA of commercial requirements will be distributed within these mixed use areas. A planning standards of 15 sqm/p is adopted to determine the overall commercial space required in Kigali by 2050 (refer to Table 8.3).

8.2.3 Broad Land Requirements for Industrial Use

Reflecting the trend of industrial transformation in Kigali, the share of employment in agro-processing and manufacturing industries are expected to increase considerably over the next few decades. Approximately 726,000 jobs will be created across heavy industry, light industry, as well as trade and transport industries given the increase in urbanization and economic development.

Planning Standard of 40 sqm/p is provided for the manufacturing sector, and 12 sqm/p for the trade and transport sector. Similarly, 25 sqm/p is provided for the light industries, and it is planned for about 10% of these micro-light industry employment to be distributed within mixed use integrated neighbourhoods to bring work opportunities closer to homes. A detailed description of the industrial land requirements is as illustrated in Table 8.4.

Table 8.6 Broad Land Requirements for Public Facilities

Development Type	Provision Standards	Site Area (Ha)	Land Required (sqkm)
Education			**8.6**
Primary School	1 per Neighbourhood (15,000 - 20,000 pop)	1.5	2.8
Secondary School	1 per 20,000-25,000 pop	2.4	3.5
Vocational/ICT Institute	1 per Town (150,000-200,000pop)	5	1.8
Higher Education Institute	1 per 500,000 pop	6	0.4
Health			**2.0**
Health Clinic	1 per 20,000-25,000 pop	0.5	0.7
Polyclinic	1 per Town (150,000-200,000pop)	5	0.9
Regional Hospital	1 per 500,000 pop	5	0.4
Socio-Cultural & Civic			**8.6**
Community Hall	1 per 5,000 pop	0.5	3.7
Regional Library	1 per 500,000 pop	0.5	0.0
Religious Facilities	1 per Neighbourhood (15,000 - 20,000 pop)	0.5	0.9
Museums/Cultural Center	1 per Town (150,000-200,000pop)	1.5	0.3
Fire Station	5 minutes response time	0.5	
Government/Municipal Offices	1 Sector Office per sector ; 1 District Office per district		
Recreation & Open Spaces			**58.8**
Neighbourhood Park	1 per Neighbourhood (15,000 - 20,000 pop)	1	1.8
Town Park	1 per Town (150,000-200,000pop)	6	1.1
Sports Field	1 per Town (150,000-200,000pop)	1.5	0.3
Sports Centre (With swimming pool and stadium)	1 per 500,000 pop	6	0.4
Open Space	15 m2 per capita		55

8.2.4 Broad Land Requirements for Mixed Use

With the intention to create a vibrant and inclusive city, mixed use neighbourhoods are highly encouraged in the review of Kigali Master Plan. It is planned for a proportion of total employment in commercial and light industries to be integrated with the medium and high density multi-family apartment to create a work, live and play environment. The broad land use requirements of mixed use areas are determined as such in Table 8.5.

8.2.5 Broad Land Requirements for Public Facilities

The standards for the provision of public facilities in Kigali is proposed after reviewing similar standards that have been proposed in the Singapore, South Africa and the previous Nyarugenge detailed physical plan. Certain standards such as the school and health centre provisions as proposed by the respective Ministries and National Land Use Plan were studied before the proposal in Kigali Master Plan 2013. Apart from education and health, other public facilities include civic, cultural and institutional facilities. Taking similar standards, the broad land requirements for public facilities are presented in Table 8.6. About 3% of land is provided for public facilities in Kigali given the lower population projections.

Open Spaces includes sports and recreation areas, and urban parks and open spaces, which are determined based on the planning standards in previous Master Plan. In terms of open space provision, it is proposed to be 15 sq/p in as recommended by GGGI in National Road Map for Green Secondary City Development 2015. This public accessible areas is exclusive of wetlands, nature areas etc.

8.2.6 Broad Land Use Requirements for Transport, Infrastructure and Special Use

The current provision for roads and infrastructure is low at 3% of the land use. However, in the future with population and economic growth,and implementation of proper planning the share will increase. The standard also considers the undulating terrain of the city. The standard for the provision of roads, infrastructure and special use in Kigali is proposed at 20% of total urban area in 2050.

8.2.7 Summary of Broad Land Use Requirements

The summary of total broad land requirements proposed for Kigali City by 2050, as well as comparison to existing land use in 2018 and proposed broad land use in Kigali Master Plan 2013 are as shown in Table 8.7.

With the revision of the socio-economic projects and lowering of population and employment figures by 2050, it is estimated that the total industrial land requirements are reduced significantly.

In accordance to the proposed new strategies and targets, more green open spaces are proposed, and more residential and commercial components are distributed into mixed used neighbourhoods spaces as compared to the previous proposal.

Table 8.7 Summary and Comparison of Broad Land Use Requirements

		Existing Land Use 2018	Proposed Land Requirements (Year X) in MP 2013	Proposed Land Requirements 2050
Protected Forest / Wetland/ Waterbody		126	75%	63%
Agriculture		458		
Urbanized Area (%)		20%	25%	37%
Area		730	730	730
Population		1.3 million	5 million	3.7 million
Gross Density		1781 p/km²	6850 p/km²	5096 p/ km²
Employment		579,969	2.33 million	1.76 million
Urbanized Area (sqkm)	Residential	80.9	113 (44%)	96.9 (36%)
	Commercial	3.3	5 (2%)	5.6 (2%)
	Mixed Use	0.3		12.7 (5%)
	Industries	4.3	51 (20%)	21.0 (8%)
	Recreation & Open Spaces	1.8	20 (8%)	58.8 (22%)
	Public Facilities/ Institutions	15.2	13 (5%)	15.2 (5%)
	Transport & Infrastructure	28.0	46 (18%)	53.5 (20%)
	Special Use	9.5	8 (3%)	3.7 (1.5%)
	Total Areas	143.2	255 (100%)	268 (100%)

This page has been intentionally left blank.

9

Approach to Master Plan Update

9 Approach to Master Plan Update

9.1 Development Strategies

One of the critical issues identified from the review of the Kigali Master Plan 2013 is in the development model and implementation of the proposed zoning plan. Therefore, the primary approach proposed for this Master Plan Update is to introduce alternative zoning approaches to make possible the proposed redevelopment projects including integrated neighbourhoods and affordable housing projects.

The key development strategies to be adopted in the master plan update include the following:

1. Participatory approach in planning and implementation;
2. Land consolidation and readjustment model following the participatory approach for integrated neighbourhoods and infrastructure;
3. Updates on existing land use and review zoning with socio-economic and real estate market analysis;
4. Introduce alternative zoning models such as Inclusionary Zoning, Overlay Zoning, Incentive Zoning etc. - e.g. inclusionary zoning to upgrade informal settlements;
5. Propose incremental development for flexibility of development; and
6. Promote integrated developments for mixed use mixed income quality affordable housing and public open spaces, industrial with worker housing and social infrastructure

9.2 Concept Demonstration

A demonstration site is selected to illustrate the application of Inclusionary Zoning and Overlay Zoning concepts into an existing site suitable for redevelopment.

Objectives

The objectives of this concept demonstration model are :

1. **Creating quality urban environment:** Improve living conditions within informal settlements;
2. **Establishing a framework for formalising the informal economy:** Recognize informal economy within unplanned settlements and provide mixed use with job opportunities for different skill set and income groups;
3. **Ensuring minimum relocation:** Resettle the existing population – owners and tenants within the same location
4. **Relocation of Population within hazardous areas** – steep slope, wetlands etc. resettled within close proximity; and
5. **Unlocking Land Potential:** Initiate redevelopment of prime areas e.g. along BRT corridor located near city centre

Site Selection Criteria

The site for redevelopment is selected using multiple criteria such as high density unplanned settlements on high cost land e.g. near CBD, along BRT corridor (150-300m) that is likely to have market demand for redevelopment. The site is also selected clear of environmentally sensitive areas such as existing forests, wetlands and steep slopes above 30%.

Site Characteristics

The site described as an overcrowded central area is an unplanned settlement, in need of infrastructure development (especially roads) and improved access of basic services. It is predominantly residential with mixed use in the form of commercial and retail along the main roads and connecting lanes. The inside lanes are mostly unpaved and difficult to access. Being close to CBD and major road with proposed BRT the commercial profile of the site areas is very attractive for business development.

The site has a gradual slope and some areas are also under steep slopes (above 30% slope).

Population Characteristics

The population of the selected site showcase mixed characteristics of people living and also working within the same area, some people may only live on the site but work in the CBD. Other may only visit the site for work and live in other locations in the city. Approximately 8% of the current population are residing on the steep slopes of the site.

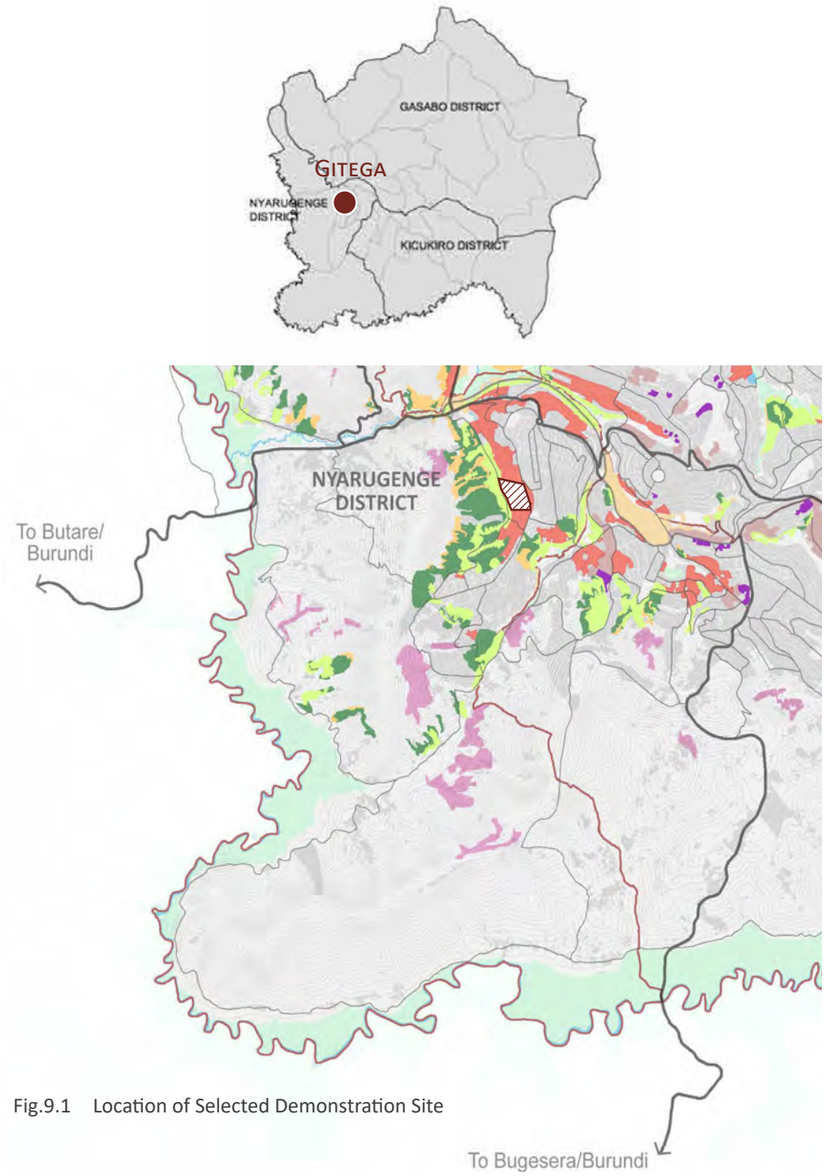
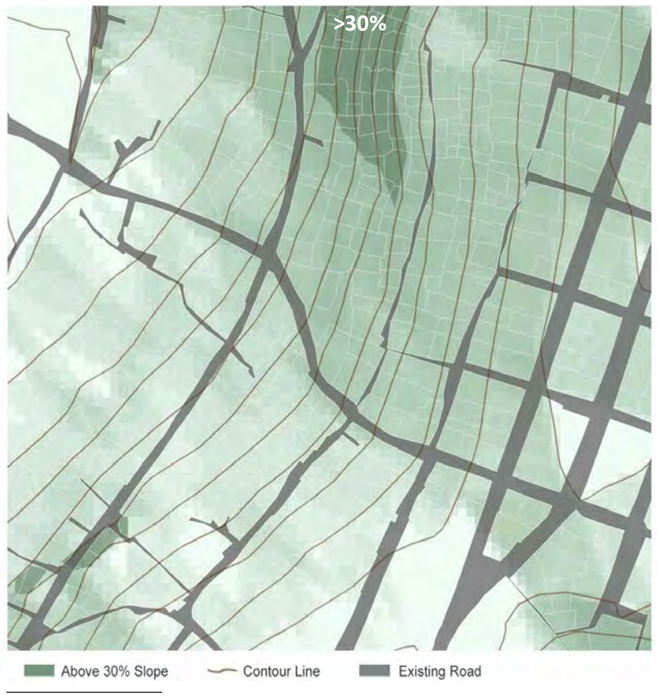


Fig.9.1 Location of Selected Demonstration Site

1 Selected Site

Selected Site: Unplanned settlements
Settlement – near CBD, along BRT corridor, high land value
Category: Overcrowded[1]
Site Area: 25ha
Density: 100-250 ppha[2]
Household Size: 4.02[3]



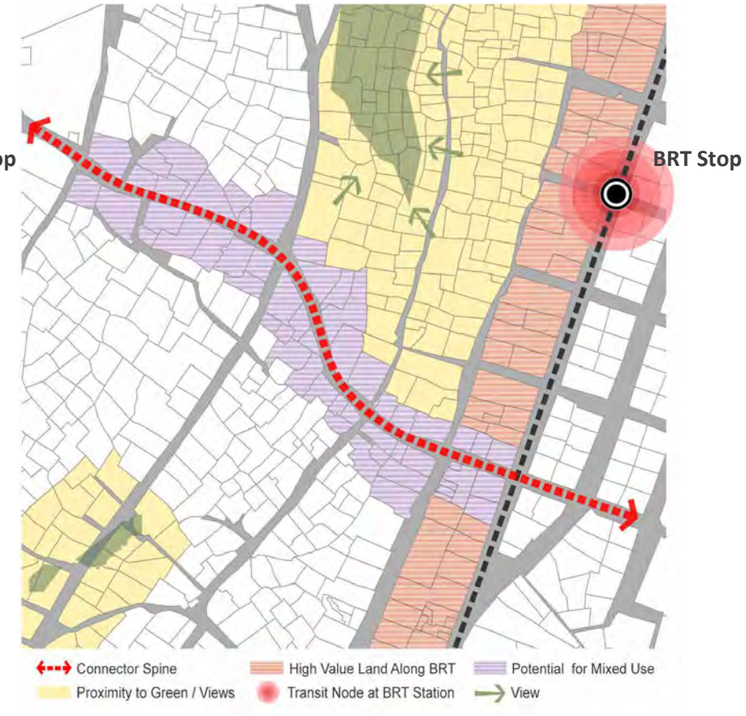
2 Key Challenges

1. **Private land Ownership:** Most of the land is privately owned
2. **Land sub-division:** Being close to the CBD, there is high demand for residential accommodation in the site. Original parcels have been sub-divided to accommodate more population
3. **Protecting steep slopes and eco fragile areas:** 8% of population living within areas above 30% slope

Original Plots (including undevelopable land)

3 Site Potential

1. **Proposed BRT corridor and station**: High land value
2. **Connector spine:** The main social street connecting the inner streets to the main road
3. **Steep slopes for green and open public spaces :** Steep slope area unsuitable for residential development may provide opportunity for developing green and open recreation spaces
4. **Proximity to green and open spaces** provides opportunity for integrated residential development



1 Proposed citywide category of unplanned settlement from 'Upgrading and Preventing Unplanned and Underserviced Settlements in Kigali city, Rwanda, Towards the definition of a citywide strategy' UNHABITAT
2 Proposed citywide category of unplanned settlement from 'Upgrading and Preventing Unplanned and Underserviced Settlements in Kigali city, Rwanda, Towards the definition of a citywide strategy' UNHABITAT
3 IGC Medium Growth Scenario 2018

4 Land Consolidation

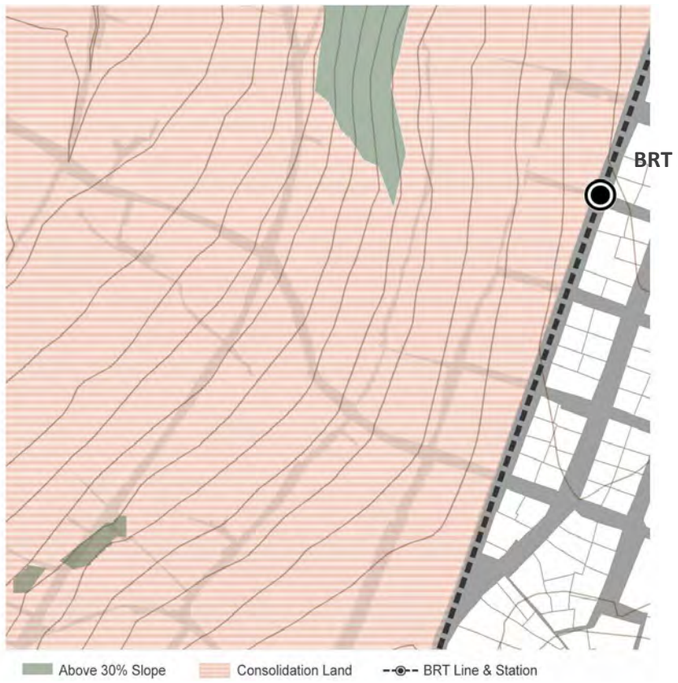
Consolidated land after ecologically sensitive area e.g. slope factor/ protected forest/ wetlands

Undevelopable Land (above 30% slope) : 2ha
Developable Land (Below 30% slope): 23ha

5 Land Readjustment for Infrastructure

Land for development after roads, infrastructure and open spaces
30-40% contribution for roads, infrastructure and open spaces
Wherever feasible, the undevelopable land may contribute to passive and active open space

Roads, Infrastructure, Open Spaces (30%) : 7.5ha
(including steep slope land used for active/passive open spaces)
Land available for other uses: 17.5ha



Desired Land Use for integrated development

Mixed Use - Mixed Income Housing

- Mixed useAffordable Housing 60%
- Multi Family Apartments
- Single Family Housing

Mixed Employment

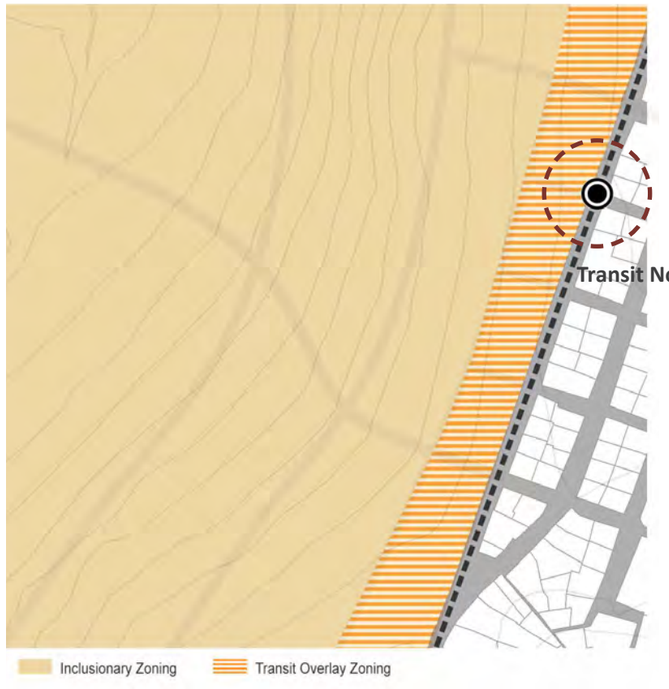
- Micro-light Industrial with Worker Dormitories
- Mixed use Commercial – Offices, Retail

Services & Infrastructure

- Social Infrastructure
- Open Spaces
- Roads and Infrastructure

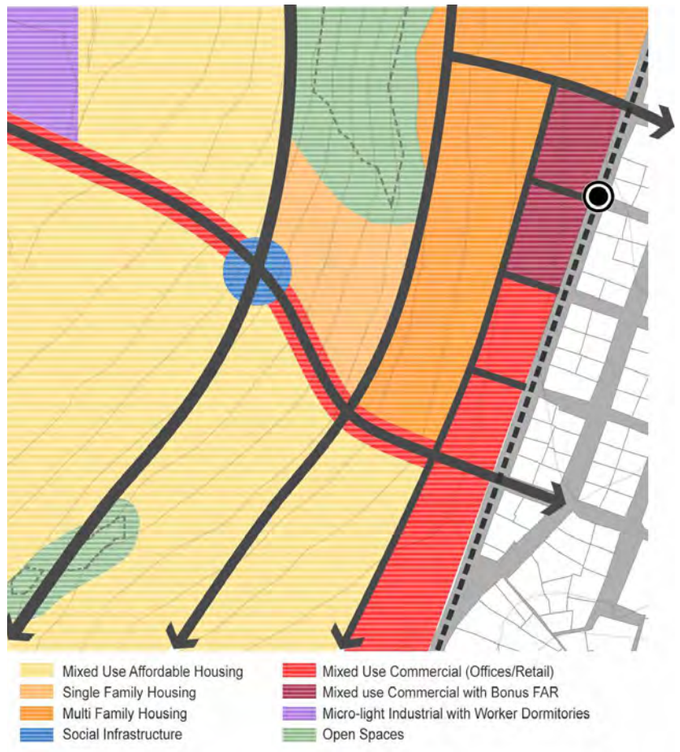
5 Alternative Zoning Approach

Alternative Zoning options:
Inclusionary Zoning for integrated development
Overlay Zoning: Transit Overlay Zoning along BRT (150m buffer) for higher density, mixed use development
Incentive Zoning along BRT Station to form transit node



6 Land Readjustment for Other Land Uses

Adjusted Plots and Land Use Distribution
Adjusted Plots for mixed use, mixed income residential, commercial and micro light industrial with dormitories for single tenants
New Density: 100DU/ha



62% Mixed use Affordable housing and micro-light industrial with Dormitories

08% Real Estate along Transit corridor-Commercial Mixed Use, Multi Family Apartments, Single Family houses (based on market demand and site location)

30% Open Spaces, Roads & Infrastructure

Bonus FAR for Mixed Use commercial along BRT Node for providing quantum for affordable housing/ social infrastructure

7 Win-Win

Inclusionary Zoning on real estate development to provide some quantum of affordable housing and social infrastructure

9.3 The Way Forward

The demonstrated planning approach shall be further investigated and shall guide the next stage of the project to update the Master Plan, consolidating all inputs collected in all previous stages of the project. The review will initially address Land Use and Zoning Plans and Regulations, Infrastructure and Transport Networks.

The process is envisioned as a reiterative review exercise where CoK technical team will be involved and collaborate with Planners and Engineers from SJ and SMEC in highlighting critical issues and discussion.

This page is intentionally left blank.

This Page has been intentionally left blank

Annexures

Annexure I : Social Economic Indicators and Projections for Kigali City

Annexure II : Determinants of Housing Demand in City of Kigali

Annexure III : Commercial Real Estate Study in City if Kigali

Annexure IV : Environmental and Green Cities Legal, Policy and Institutional Framework

Annexure V : Approved Projects

Annexure I: Social Economic Indicators and Projections for Kigali City

I.IV Positioning of Kigali City within Rwanda and the Region

Rwanda's Vision 2050 aspires to take the country beyond high income, to high living standards by the middle of the century. Rwanda's income targets are to attain upper middle-income country status by 2035 and high income status by 2050 with the intention of providing high quality livelihoods and living standards to Rwanda citizens by mid-century. As part of this plan, Rwanda aims at developing modern infrastructure and livelihoods. This will be done through creating modern SMART green cities, towns and rural settlements, with well-designed transport facilities and efficient public and private services.

In recent years, the government of Rwanda has been actively investing in the Meetings, Incentives Conferences and Exhibitions(MICE) sector in order to generate economic value for the country as well as raise its profile as a destination for business. In prioritizing MICE tourism as one of the drivers of economic growth, the city of Kigali has been positioned as an important part of this growth strategy. As part of MICE strategy, Kigali City has had investments in infrastructures, such as the Kigali Convention Centre, improvements of the National airport at Kanombe, investments in the national fleet - which has seen an increase in the number of destinations for Rwanda Air. In this respect, new destinations have been established with strategic trading routes including Dubai, West and Central Africa, Europe, South Africa and others, all with the aim of position Kigali as a regional business hub. In addition, the Government of Rwanda has invested in hotels, and attracted the private sector to support the value chain of the conference tourism. Rwanda has also seen complementary policies like the issuing of visas upon arrival for all nationalities. In addition, Rwanda Development Board has signed a three-year deal with Arsenal football Club in order to promote Rwanda as an attractive tourism destination under the 'Visit Rwanda' campaign. These efforts have begun and continue to pay off. In 2017, Rwanda collected a total of $42 million (about Rwf36.3 billion) from 192 conferences and is poised to hit its target of $74 million (Rwf64 billion) in 2018.

In terms of trade and logistics, the City of Kigali has been positioned as a business transit hub through which goods destined for the Democratic Republic of Congo and Burundi pass, prior to reaching their final destinations. These are mainly goods from regional ports such Mombasa and Dar-es-salam. All these strategies have been buttressed by a strong ICT backbone, where innovative ICT technologies have been streamlined in all sectors of Rwanda to ensure that efficiencies are obtained while doing business. With respect to this, Kigali City has been positioned as an ICT hub and a center of excellence of ICT applications, which is expected to promote activities such as business processes, outsourcing, networking and other which are key to promoting the City of Kigali as a regional business hub. With the plans to decentralize government services and grow the six secondary cities, Kigali City will be a major business center, which will also serve the secondary cities as they develop in the medium and long term.

In addition, Rwanda Development Board has prioritized and implemented several reforms in doing business indicators over the past 10 years, in order to make Kigali City and other parts of Rwanda a very competitive business environment. Three major reforms have been instituted in 2018 to decrease bureaucracy in construction, ensure timely electricity provision for investors, and reduce the amount of time exporters spend at customs. Today, export¬ers are able to obtain certificates of origin online. In addition, exporters are able to apply for the phyto-sanitary certificate from the Ministry of Agriculture and Animal Husbandry online. This has facilitated businesses that export tea, coffee, and other agricultural products.

In summary, the City of Kigali, and Rwanda as a whole, has high potential to develop vibrant services and knowledge based sectors, building on major investments that have been undertaken such as: Rwandair - expanding routes worldwide - a state of the arts conference facility in Kigali Convention Center, hotels and Eco-tourist facilities, country wide fiber optic for internet connection and roll out of 4G network, 89% financial inclusion rate (2016), well maintained and expanding road network in urban and rural areas, developed special economic zones and fast adoption of ICT in service delivery through online services, among others. This means that Kigali city is well positioned to become a major business and service hub in the medium to long terms. Hence, the plans to update the Kigali Master plan, which this report aims at informing, have to incorporate these goals for the City of Kigali.

I.V Population Dynamics and Projections in Kigali City

I.V.I Generalities

Against the national population density of 415 inhabitants per square kilometer in 2012, the respective districts of the city of Kigali, had a population density of 2,124 inhabitants per square kilometer for Nyarugenge, 1,911 inhabitants per square kilometer for Kicukiro and 1,234 inhabitants per square kilometer for Kicukiro, making Kigali city the most densely populated province in the country.

In comparison to national figures, the populations are mainly settled in urban areas within the respective districts with Kicukiro having the highest urban settled population.

In comparison to national figures, the populations are mainly settled in urban areas within the respective districts, with Kicukiro having the highest urban settled population.

In terms of age structure, Kigali city's population is mainly comprised of young people with a median age of 22 years for all districts in the city. Females are generally younger than males and have a median age of 21 years compared to males whose median age is 23 years.

Table I.VIII Population of Districts in City of Kigali

Area	Total	Male	Female	Urban Area	Rural Area
Rwanda	10,515,973	5,064,868	5,451,105	16.5	83.5
City of Kigali	1,132,686	586,123	546,563	75.9	24.1
Nyarugenge	284,561	148,132	136,429	75.2	24.8
Gasabo	529,561	274,546	255,015	69	31
Kicukiro	318,564	163,445	155,119	87.9	12.1

Source: RHP

Table I.IX Population of Districts in City of Kigali

	Mean Age			Mean Age		
Area	Both	Female	Male	Both	Female	Male
Rwanda	22.7	23.5	21.9	19	19	18
Nyarugenge	22.6	22.3	23	22	21	23
Gasabo	22.6	22.3	22.9	22	21	23
Kicukiro	22.5	22.2	22.8	22	21	23

Source: Population census 2012

I.V.II Resident Vs Day Populations

Care should be taken to draw a distinction between the resident population and the day population. Our projections are those of the resident population and we are cognizant of the fact that in rapidly growing cities it may be the case that the majority of people who work in the city reside outside and commute from their homes every day. As an example, Kampala has a resident population of 1.5 million inhabitants, and a day population of about 4 million people. Nairobi a much bigger city than both Kigali and Kampala only has resident population of 3.5 million people today. The resident and day population serve different purposes. As an example, in terms of planning for affordable housing, it is important to plan for the projected resident population while in terms of infrastructure planning it is important to plan for both the resident population and the commuting day population

I.V.III Key Government Policies Underlying Population Growth Rates and Population Projections for the City of Kigali

The following are assumptions underlying our population projections for the City of Kigali

1. **Reproductive Health Policies and programs are contributing to declining fertility rates over time in Rwanda:**

Based on past data, fertility change in Rwanda can be classified into three periods reflecting on three phases of implementation of the national policies and programmes put in place to mitigate the rapid growth of the population. These include a period of steady decline in fertility (1978-1992), a period of increase in fertility (the 1994 genocide aftermath) and a period of rapid decline in fertility (2005 to present).

The period between 1978 and 1992 was marked by a steady decline of the fertility rate, following a proactive governmental policy to reduce fertility and by implementing a vigorous family planning programs using all available means. The 1994 genocide had a catastrophic impact on health systems and households were affected severely by the loss of family members. Fertility declined slightly during this period but then recuperated between 2000 and 2005. Ober the third period, the post-2005 rapid decline in fertility is attributed to increase in access to community-based health services, successful public campaigns promoting responsible parenthood and, more importantly, a steady increase in the level of education of females.

2. **Health Policies and programs are resulting into declining mortality rates in Rwanda over time**

The current socio-health context of Rwanda is characterized by the increase in the availability of health facilities down to the lowest administrative level, almost universal access to health care through mandatory medical insurance for all, and significant improvement in family and environmental hygiene. These factors contributed to the decline in mortality, as clearly illustrated by the increase in life expectancy at birth between 2002 (51.2 years for both sexes) and 2012 (64.5 years). It is assumed that these factors will continue to play a significant role in improving the health and living conditions of people, along with Vision 2050 agenda aimed at transforming Rwanda into a middle-income country.

3. **Growth of secondary cities will reduce net migration into Kigali City in the medium and long term**

There are pro-active steps currently being undertaken by the government to ensure balanced growth and ease the pressure on the city of Kigali. These include the development of secondary cities, and the plans to move government departments such as RAB to Nyagatare and to move some industries to the six secondary cities. Already, different faculties of the University of Rwanda have been moved to the districts outside Kigali, which is likely to reduce the inflow of people coming to Kigali for better services and jobs. This strategy is hence expected to reduce net internal migration to Kigali City in the medium to long term.

4. **Medium to long term trends in internal migration into Kigali city are not dominated by rural to urban migration but my migration to the sectors surrounding the city of Kigali.**

The 2017 World Bank study on migration patterns in Rwanda shows that in contrast to popular belief, rural-to-urban migration is the least among all types of migration in Rwanda. Of all internal population movements between 2010/11 and 2013/14, 20 percent went from rural to urban areas, only slightly higher than the share in 2000-2005. Intra-rural migration remained the dominant form of internal population movements in 2010/11-13/14 at 34 percent. Urban-to-rural migration is the second most common type of migration, accounting for 27 percent of all internal population movements. Urban-to-urban migration increased slightly since the 1990s. Overall, rural areas were the destination for 61 percent of internal migrants since 2011.

Another migration dynamic that is less obvious from the district statistics is the move towards the fringes of the City of Kigali, rather than into the city of Kigali itself. Recent internal migrants make up 13 percent of the population in sectors that border Kigali City Province, compared to 8 percent of the overall population. Sectors that border Kigali City are Runda, Rugarika, and Mugina in Kamonyi District, Ntarama, Mwogo, and Juru in Bugesera District, Myumbu, Gahengeri, Nyakaliro and Fumbwe in Rwamagana District, and Shyorongi, Ngoma, Murambi, Masoro and Ntarabana in Rulindo District.

The Population in the sectors bordering Kigali increased by 40 percent between 2002 and 2012, compared to a 30 percent overall population growth (World Bank 2017).

5. **Topography, current prevailing conditions and housing preferences within the city of Kigali City.**

Based on the 2012 population census, the city of Kigali is a highly densely populated province. Compared to a national population density of 415 inhabitants per square kilometer in 2012, the population densities of districts in Kigali are higher. In 2012, Nyarugenge had 2,124 inhabitants per square kilometer, Kicukiro had 1,911 inhabitants per square kilometer while Gasabo had 1,234 inhabitants per square kilometer. While it is true that densification has a potential in increasing population density per sq. km, the topography of Kigali, which consists of very steep hills and valleys, puts limitations in densifying the current available land within the city. Anecdotal evidence from our housing survey also indicates that there is low appetite for apartment-type housing among locals. This could imply that growth in resident population could take place in areas that are neighboring Kigali City including Masaka, Bugesera and others. This is sprouting of semi-planned residential housing towns, already happening in towns surrounding Kigali city.

I.V.IV Population projections

A number of methods can be used to project population. These include the following;

Exponential growth model: Presented by Thomas R. Malthus (1978), the model assumes population grows at a constantly growing rate. This model over-estimates the population and as a result its application has been very limited to human population growth.

Logistic growth model: As an improvement to the exponential growth model, the logistic growth model takes into account the capacity of the environment to accommodate a given number of people. Whereas this method is better than the first one, it requires estimating the carrying capacity (environment's maximum load) for the area whose forecast is to be computed. Given that this requires additional assumptions, we decided not to use this method.

Non-Linear Regression Exponential Population Growth Model: This model widely applied using most modern software i.e. Minitab and Matlab cftool. However, this requires a number of observations, which are not available and which prevents the model to be applied.

Considering the above limitations and the quality of data available at the geographical sector level, the **cohort component method**, which was used by NISR in generating the population, was adopted for our population projections. This method is based on the three components that drive population change namely; **fertility, mortality and migration.** The population is projected to evolve following the formula:

$$Pop\ (t2) = Pop(t1) + B(t1,t2) - D(t1,t2) + Immig(t1,t2) - Emig(t1,t2)$$

Where Pop (t2) is the projected population in t2, Pop(t1) is the population in t1, Immig(t1,t2) stands for inward migration during the period (t1,t2), while Emig(t1,t2) stands for outward migration (Emigration) during the period (t1,t2), B(t1,t2) is the number of birth over the period (t1,t2) and D(t1,t2) the number of death over the same period.

Here, the average growth rate generated for Rwanda through NISR[1] estimates was adopted and used to project. National growth rates were used to project the population for the respective years. In addition to the above, population projections were computed using past growth rates (growth rates between the last two population censuses). The underlying rationale is to reflect the different dynamics associated with different geographical sectors in the past. Then, we consolidated sector level population projections to get district and Kigali City population projections. We considered three scenarios: the high population growth scenario, the medium population growth scenario and the low population growth scenario. The characteristics of the scenarios are provided below.

High population scenario

The following assumptions underlie the high population scenario:

- The Total Fertility rate (TFR) would decrease from 4.0 children per woman to 3.5 children per woman between 2012 and 2032;
- Life expectancy at birth (LEB) would increase from 64.5 years in 2012 to 70.7 years in 2032, according to the low rise of the UN model of mortality decline (United Nations, 2003).

Medium Population Growth Scenario

Medium population growth assumptions are as follows:

- Total fertility Rate (TFR) would decrease constantly from 4 children per woman in 2012 and reach in 2032, its current level in the capital city, Kigali, and which is about 3.0 children per woman;
- Life expectancy at birth (LEB) would increase steadily from 64.5 years in 2012 to 71.4 years in 2032, according to the moderate rise of the UN model of mortality decline (United Nations, 2003):

Low Population growth scenario

Low population growth assumptions are as follows:

- TFR would decrease from 4.0 children per woman in 2012 to 3.0 children per woman in 2020 based on the revised target of Vision 2020. It is assumed that fertility will continue to decline to reach its current level among women with secondary and university level of educational attainment, which is about 2.5 children per woman. This fertility rate is projected to be reached by 2032.
- Life expectancy at birth (LEB) would increase rapidly from 64.5 years 2012 to 72.6 years in 2032, according to the fast rise of the UN model of mortality decline (United Nations, 2003):

We note that Birth and death rates used are constant across the districts.

Adjustments for internal migration

We draw our population projections based on the Cohort component method used by the National Institute of Statistics of Rwanda (NISR) based on the Rwanda National census data (2012). This method takes into account fertility rates, mortality rates and net migration rates. Given that NISR projections assumed net zero migration, we have adjusted our projections in order to account for net internal and external migration which were positive according to EICV4 World bank analysis on urbanization trends in Rwanda.

Migration rates have been based on EICV4 migration trends which show that for every 1000 inhabitants, the three districts in the city of Kigali have net positive migration rates, and are characterized as follows;

Nyarugenge district, had a net migration of 32 new inhabitants for every 1000 inhabitants, Kicukiro had a net migration of 240 new inhabitants for every 1000 inhabitant, while Gasabo had a net migration of 212 new inhabitant for every 1000 inhabitants.

For this exercise, we assume a conservative net migration growth rates of 2.5% in every 10 years to reflect the fact that growth in the secondary cities will suppress net internal migration to the districts of Kigali city in the medium and long term.

Our migration adjusted estimates show that in the medium population growth scenario, the resident population of Kigali City will reach about 3.6 million by 2050. In the high population growth scenario, the resident population has been projected to reach about 3.8 million people by 2050 while the low growth scenario projects a resident population of 3.2 million people by the same year.

At the time of writing, the Rwanda Land Management and Use Authority (RLMUA) is coordinating the update of the National Land Use and Development Master Plan (NLUDP). According to preliminary material circulated, the NLUDP is establishing that Kigali population should not exceed 2.5 million, based on the theoretical optimal spatial population distribution that the Plan is envisioning. After several interactions

Table I.X Population of Districts in City of Kigali

Year	IPAR-NISR adjusted projections		
Figure I.II	Low growth Scenario	Medium growth Scenario	High growth Scenario
2012(Census year)	1,132,686	1,132,686	1,132,686
2014	1,354,921	1,361,492	1,361,492
2024	1,816,298	1,872,462	1,897,462
2034	2,266,269	2,405,418	2,499,110
2044	2,816,981	3,071,923	3,258,504
2050	3,224,316	3,570,015	3,824,708

1 NISR uses the cohort component method which is based on the components of population change: fertility, mortality and migration (NISR, 2012)

with the competent authorities, it was decided that the Kigali Master Plan Update would be based on the high-case scenario of 3.8 million: the higher -and most pessimistic- scenario would accommodate all the others, ensuring a compact and phased development if the optimistic 2.5 million figure would be exceeded.

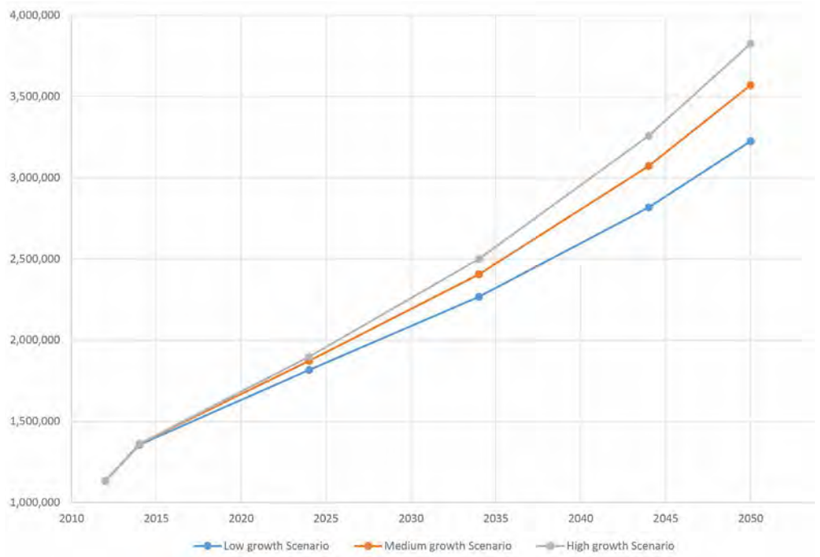


Figure I.III Population Projection for the City of Kigali 2012-2050

Table I.XI Working age Population and Labour Force in City of Kigali

District	Labour force 2010/11 (EICV3)	Labour force 2013/14 (EICV4)	Working age population (16+) 2010/11 (EICV3)	Working age population (16+) 2013/14 (EICV4)
Gasabo	224,517	320,569	280,258	394,609
Kicukiro	147,876	172,926	186,228	221,381
Nyarugenge	130,176	157,855	173,185	206,253
City of Kigali	502,569	651,350	639,671	822,243

Source: Integrated Household Living Conditions 2010/11, 20/1314

I.VI Labour Market

I.VI.I General characteristics

At the time of EICV4 (2013/14)[2], the City of Kigali had a total working age population of 822,243 units and a labour force of 651,350 units, from respectively 639,671 units in the working age population and 502,569 in the labour force in 2010/11. This showed an increase in tandem of about 30% of both indicators over a period of 3 years. With Gasabo experiencing an increase above 40% and the two other districts around 20% (See Table I.IV).

Unemployment levels in the district ranged between 9.8% and 12.9% with Nyarugenge having the highest unemployment rate and Gasabo the lowest. In comparison to national unemployment rates that stood at 3.4% in 2013/14, Kigali districts unemployment rates are significantly higher. The high unemployment rate is exacerbated by (i) high time related underemployment ranging between 16% and 19.2% in the districts and (ii) the inactivity rates ranging between 18.6% for Gasabo, 21.7% Kicukiro and 23.5% in Nyarugenge District.

Table I.XII Labour Market Features in City of Kigali

District	Gasabo		Kicukiro		Nyarugenge	
	2010/11	2013/14	2010/11	2013/14	2010/11	2013/14
Employment to Population ratio	72.8	73.3	69.2	69.2	65.7	66.6
Unemployment rate	9.1	9.8	12.8	11.4	12.6	12.9
Inactivity rate	19.9	18.6	20.6	21.7	24.8	23.5
Time related Underemployment rate	25.8	19.2	15	16.1	11.7	17.4

Source: Integrated Household Living Conditions 2010/11, 2013/14

The type of jobs was dominated by wage non-farm which ranged between 53% and 63% for the individual districts, and independent non- farmers (see Table I.VI).

Table I.XIII Main Activity

District	Wage Farm	Wage Non-farm	Independent farmer	Independent non-farmers	Unpaid non-farmer
Gasabo	3.80%	53.30%	20.90%	20.40%	1.60%
Kicukiro	1.90%	62.80%	9.50%	22.50%	3.40%
Nyarugenge	1.70%	55.20%	10.10%	29.30%	3.60%

Source: Integrated Household Living Conditions 2010/11, 2013/14

2 At the time of data analysis, the EICV5 data was not available. We note that from 2017, EICV will not be the reference for employment indicators, as the employment measures have changed. The most detailed information on employment is now the Labor Force Survey (LFS). However, given its limited time series, it could not be used for the purpose of this exercise. The employment projections for the subsequent MP updates should use the LFS, which will then have a long enough time series. The current model used to project employment until 2050 is independent to the use of EICV5, as it is based on population assumptions and long-term employment sector distribution assumptions, which are both independent to EICV5.

In essence there is currently underutilization of labour in the districts, at 47.6% in Gasabo district, 49.2% in Kicukiro district and 53.8% in Nyarugenge District. The labour force not efficiently contributing to district productivity.

I.VI.II Education and the labour market

The number of completed years of education in the 3 districts has roughly doubled between 2010/11 and 2013/14. In 2010/11, the average number of years completed in school was 2.9 years, 2.7 years and 2.9 years for Nyarugenge, Gasabo and Kicukiro respectively. This is an increase by 90%, 82% and 101% respectively, which can be partly attributed to increased school enrollments arising from free public education in form 9-year basic education.

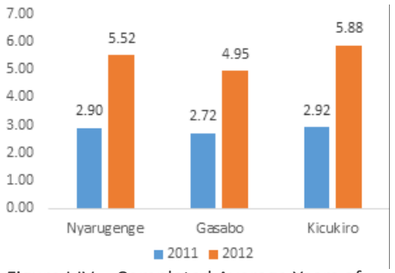


Figure I.IV Completed Average Years of Schooling in City of Kigali Districts. Source: EICV3-4

Despite the substantive increase arising from increased school enrollment in City of Kigali and the country at large, the average number of years completed in school are still low compared to the international standards of middle income countries Rwanda and the city of Kigali are aspiring to become.

Similarly, education attainment of the labour force has improved for all districts and the country at large. The labour force that never attended school reduced from 4 percentage points at national level, and the same trend was experienced at district level, with Gasabo district reducing by 4%, Nyarugenge 3% and Kicukiro 1%.

A similar trend was manifested at primary school attainment level, with a reduction of 3%, 2% and 1% for Gasabo, Nyarugenge and Kicukiro districts respectively. In parallel, we observe an increase in the proportion of the labour force that had either secondary or university education, with an aggregate increase of 7% ,3% and 6% for Gasabo, Kicukiro and Nyarugenge respectively, against a 5% increase at national level. It's important to note that of the total educated labour force with university and secondary education in the country; 50%, 33%, 21% with university, upper secondary and lower secondary respectively are located in the City of Kigali with Gasabo having the highest number of educated labour units, although not the highest percentage (see Table 7 for details).

In comparison to the skill set envelop at national level, the labour force in City of Kigali and the respective districts is highly skilled. Nevertheless, the overall proportions of labour units equipped with upper secondary or more, is low, reaching less than 30%.

I.VI.III Employment Trends (2005-2014)

In order to analyse and compare employment trends in Kigali City between 2005 and 2014, data from EICV2, EICV3 and EICV4 household surveys from NISR is used to disaggregate employment by economic sector and by province. To allow comparisons between the 3 surveys, the ISIC classification on economic activity in each of these surveys has been aggregated into seven major sectors namely; (i) Agriculture, Fishing, Forestry and Agro-processing; (ii) Mining; (iii) Manufacturing; (iv) Services; (v) Construction; (vi) Trade; and (vii) Transport.

Table I.XV Employment Distribution by Sector

City of Kigali Employment Distribution by Sector 2005/6 to 2013/14			
	Share of total employment		
Sector	EICV 2 (2005/6)	EICV 3 (2010/11)	EICV4 (2013/4)
Agriculture, forestry, Fishing & Agro-processing	2.3%	10.3%	24.7%
Mining	0.6%	1.1%	1.3%
Manufacturing	4.0%	1.8%	3.9%
Services	63.7%	62.8%	32.6%
Construction	12.9%	12.2%	10.8%
Trade	8.4%	6.0%	22.7%
Transport	8.1%	5.8%	4.1%
Not adequately defined	0.0%	0.1%	0.0%
Total	100.0%	100.0%	100.0%
Source EICV2, EICV3 & EICV4			

Table I.XIV Education attainment of the labour force (ratio)

	Never attended		Primary completed		Post primary		Lower secondary		Upper secondary		University	
District	2010/11	2013/14	2010/11	2013/14	2010/11	2013/14	2010/11	2013.14	2010/11	2013/14	2010/11	2013/14
Gasabo	0.11	0.07	0.22	0.16	0.06	0.05	0.07	0.11	0.11	0.13	0.09	0.11
Kicukiro	0.06	0.05	0.23	0.22	0.08	0.05	0.09	0.12	0.14	0.15	0.13	0.16
Nyarugenge	0.09	0.06	0.24	0.25	0.03	0.03	0.08	0.13	0.15	0.15	0.10	0.12
Rwanda	0.21	0.17	0.19	0.20	0.03	0.02	0.04	0.06	0.04	0.06	0.02	0.03

Source: Integrated Household Living Conditions 2010/11, 2013/14

According to the EICV survey findings, we noted to types of change in employment. First an increase in the number of people in employment, from 190,736 in 2005/7 to 255,658 in 2010/11 and to 579,969 in 2013/14. In other words, the city experienced an average net employment creation of 6% per year in the first period, which accelerated to 31% over the second period. The services sectors account for the largest share of employment in Kigali city at 32.6% in 2013/2014. In terms of job growth, services have had a relative decrease, it still had a high increase in absolute numbers between 2005 and 2014. The reason behind this shift is that as the economy transforms, labour moves from low productive agricultural activities into non-agricultural activities such as services and trade. Services include activities such as tourism, accommodation and food, hotels and restaurants, information and communication, financial services and insurance, real estate activities, professional, scientific and technical activities, administrative and support service activities, education, human health and social work activities, among others.

The second largest sector in 2013/14 was agriculture, agro-processing, fishing and forestry which amounts for 24.7% of employment in the City of Kigali. Although the absolute numbers of persons engaged in primary agriculture has reduced over time, agricultural is still dominant in the rural sectors of Kigali. In addition, jobs in agro-processing sector will continue to grow given the urgent need for value addition in the agriculture, sector.

The employment share of agriculture, agro-processing, forestry and fishing grew from 0.02% in 2015 to about 25% in 2014. This increase has mainly been mainly attributed to increased agricultural production in the rural sectors of Kigali and the development of agro-processing industries within Kigali City over the 2005 - 2014 period. The booming construction activity within the city of Kigali also increased employment opportunities for people dealing in forestry products such as timber(wood) which are used in both the construction industry and the furnishing of finished buildings.

The third largest sector in terms of employment is trade which accounted for 22.7% of employment in the Kigali city districts in 2013/14, from 6% in 2010/11. In terms growth, the construction sector has had a threefold increase in employment between 2005 and 2013/14, due the on-going construction of both residential and commercial properties. In addition, there have been a significant growth in infrastructure projects such as roads within the last 10 years. As the need for affordable housing is high, we expect employment in the construction to grow in both the long and medium term.

Finally, employment in the transport sector has relatively reduced from 8.1% in 2005/6 to 4.1% in 2013/14. However, the sector has seen an increase in job by 50% over the period. As the resident population increases within the city of Kigali, employment in this sector will increase in the medium and long term. The mining sector is a relatively small sector in terms of employment in the city of Kigali. However, its share of employment has doubled since 2005, to reach 1.3% in 2013/14.

I.VI.IV Employment projections by District (2014-2050)

In the long run, employment highly correlates with population. In this respect, if one makes reasonable long term assumptions about - (i) the population, (ii) the dependency ratio, that is the ratio of the non-working age population on the working age population, (iii) the labour force participation rate, that is the number of people available for work as a ratio of the working age population and (iv) employment rate, that is the number of persons at work as a ratio of the number of persons available for work – then we can project employment.

In this respect, we are making the following assumptions.

First, we use the high case population projections described supra as a basis to project employment. We prefer this scenario as it allows to accommodate the other scenarios. Conversely, choosing another scenario (low or medium) would not accommodate the employment level of the high case scenario.

Second, the dependency ratio is projected to reach 0.53 in 2050.[3] We use a constant percentage growth extrapolation of the dependency ratio to project every successive year from 2013/14 to 2050 and reach 0.53 by 2050.

Third, the labour force participation rate is projected to reach 0.72 in 2050, which is the mean of the OECD labour force participation rate. As Rwanda is planning to become a high income country by 2050, we use that measure as a benchmark. Similarly, we use a constant percentage growth extrapolation of the labour force participation rate to project every successive year from 2013/14 to 2050, and reach 0.72 by 2050.

Forth, we project full employment in 2050, which is commonly defined as an employment rate of 95%. Again, we use a constant percentage growth extrapolation of the employment rate to project every successive year from 2013/14 to 2050, and reach 0.95 by 2050.

We hence apply the following formula to project employment:

$$E_t^d = PP_t^d * \frac{1}{(1 + DR_t)} * LFP_t * ER_t$$

Where:

- E_t^d is the level of employment in district d in year t
- PP_t^d is the projected population in district d in year t
- DR_t is the projected dependency ration in year t, which is assumed constant across districts.
- LFP_t is the projected labour force participation rate in year t, which is assumed constant across districts.
- ER_t is the projected employment rate in year t, which is assumed constant across districts.

Table I.IX provides the projected employment level per district. On average, the net job creation is expected to reach 3.5% yearly growth until 2024, then oscillated between to 2.8% and 2.9% until 2050. The rate of employment growth will oscillate between 2.6% and 3.9%, across decades and district. Gasabo will be the highest job creation district with a projected net creation of 572,952 jobs over the period 2014-2050. Kicukiro and Nyarigenge will respectively amount for 362,489 and 204,232 additional jobs created over the same period.

Table I.XVI Projected Employment per district

	2014	2024	2034	2044	2050
Gasabo	277,098	399,685	537,498	715,094	850,051
Kicukiro	169,390	247,666	334,344	446,348	531,879
Nyarugenge	133,208	172,727	224,821	290,195	337,439
City of Kigali	579,696	820,078	1,096,664	1,451,637	1,719,369

3 NISR. (2017). Unlocking Rwanda's Potential to Reap the Demographic Dividend. Accessed from www.statistics.gov.rw

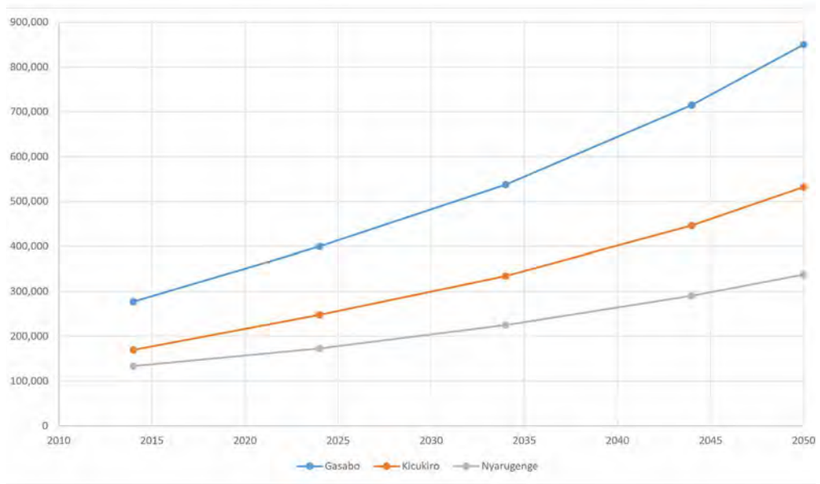


Figure I.V Employment projections per district

I.VI.V Employment projections by Economic Sectors

To project employment trends by economic sector we have first divided the economy into different sectors. Following the ISIC classification on economic activity and the type of data available from EICVs surveys, we have divided activities into seven major sectors namely;

- Agriculture, Fishing, Forestry and Agro-processing
- Mining
- Manufacturing
- Services
- Construction
- Trade
- Transport

For each of these sectors, we have made assumptions based on (i) general trends observed in the economy, such as the decrease in agriculture shares in the economy over the last decade, as well as (ii) key strategic orientation of the Country, from the Vision 2050 and National Strategy for Transformation. The evolution of the sector shares and the underlying assumptions are provided in Table I.X.

Table I.XVII Sector Employment share projections

	2014	2024	2034	2044	2050	Assumptions
Agriculture, Forestry Fishing and Agro-processing	24.7%	20.6%	16.6%	12.6%	10.2%	Employment Share of primary agricultural activities is projected to reduce by 4 percentage point every 10 years. More labour will be released from agriculture to non-farm jobs as Rwanda transforms to a service based middle income economy.
Mining	1.3%	1.3%	1.3%	1.3%	1.3%	The share employment in the mining sector will remain at constant rate of 1.3% which is observed from the 2014 EICV4 survey findings given the low mineral endowments in Rwanda.
Manufacturing	3.9%	4.9%	5.9%	6.9%	7.5%	Due the implementation of domestic recapturing(import substitution) policies such as made in Rwanda, the share of employment in manufacturing is projected to increase by 1% every 10 years.
Services	32.6%	33.6%	34.6%	35.6%	36.2%	As Rwanda transforms to a service based economy Kigali city will be a major regional business hub providing services such MICE tourism, Business processes outsourcing, ICT service. The share of employment in the service sector has been projected to grow by 1 percent very 10 years.
Construction	10.8%	11.8%	12.8%	13.8%	14.4%	An increasing population will generate demand for affordable housing which led to more construction jobs. The share of employment in the construction sector has been projected to increase by 1 % in every 10 years.
Trade	22.7%	23.2%	23.7%	24.2%	24.5%	The share of employment in trade has been projected to increase by 0.5 every 10 years as more workers transition from the agriculture to the business sector in the medium to long term.
Transport	4.1%	4.6%	5.1%	5.6%	5.9%	As the resident and day populations increase in Kigali city, there will be need for increased transport services in the medium to long term. The share of employment in the transport sector is projected to increase by 0.5% every 10 years.

Table I.XI provides the employment projections per sector. On average, 31,650 additional jobs are expected to be created yearly in the city of Kigali, hence reaching 1,719,319 jobs by 2050. The service sector will continue to be the larger sector of employment by 2050 and will account for about 622,412 jobs. It will also contribute to 38.1% of the job created, with a yearly average of 12,045 additional jobs. As the city of Kigali continues to transform into a regional business hub and an important city for Meetings Incentives, Conferences and Exhibitions (MICE), tourism & services such as hotel accommodation, business process, outsourcing, accommodation and food, hotels and restaurants, ICT, financial services and insurance will employ more people in the medium and long term. In addition, as the resident population in Kigali increases, other services that are likely to employ more people include real estate activities, professional and scientific activities, administrative and support service activities, education, human health and social work activities.

Services will be followed by trade which has been projected to employ a total of 421,245 people by 2050. This is almost three times the employment level of about 132,000 trade jobs in 2013/14 and it underlies a yearly average of 8,041 additional jobs to be created in the sector until 2050. As Rwanda transforms from agriculture into a service based middle income economy, the majority of low-skilled people in the agriculture, fishing and forestry sectors of Kigali city are expected to mostly move into the retail and wholesale trade, explaining the increase in the sector employment.

Although employment share in traditional agriculture is expected to reduce over the next 30 years, the overall sector (comprising agro-processing, forestry, fishing, etc.) is expected to see a minor increase in the number of additional jobs, accounting for an average 2.8% of net job creation of the City. It is expected that value addition through agro-processing in the food, fishing, and the forestry sector will generate the majority of these jobs. Although the construction boom saw a sharp increase in employment from about 25000 jobs to 68,000 jobs between 2005/6 and 2013/14, we project a further average annual increase of more than 5,000 jobs in the sector reaching. However, land limitations in the city of Kigali, due to an already high population density in Kigali city, are already pushing more people to construct in fledging towns surrounding Kigali. In addition, we expect more construction to take place in the secondary cities, which have less land limitations compared to Kigali City. Hence, the construction sector, while expected to be vibrant in terms of employment creation, will be creating relatively less jobs than the service and trade sectors.

Manufacturing, mining and industrial production are likely to shift to the secondary cities hence the lower employment projections when compared by other sectors in 2050.

I.VII Economic activity

I.VII.I District production (GDP)

Attempts have been made to generate district GDPs in Rwanda by (i) the World Bank (2014) which used the lights intensity approach to estimate economic activity in individual districts and (ii) ILO (2016) which used the expenditure approach to estimate the individual economic activities.

The nature of Rwanda's economy, in particular the rural setting and informality components that are detached from existence of electricity in a given area limits the scope of the Light Intensity Approach. The expenditure approach attempted to address this problem by using the consumption levels, investment levels and government expenditure when computing the district economic activities. However, it the approach does not take into account district exports and imports, because of unavailability of time series data, and since the purpose of generating these values is to inform projections, single data points do not help much.

It is against the above background that we used the income approach method. The adopted approach sums up all income of labour units that reported to have been employed in the three household surveys of 2005/6, 2010/11 and 2013/14.

The total income includes wage salary income for working household members, household agricultural income, household enterprise profit, in kind payments, housing benefits and other benefits received by the household. The aggregate income is triangulated with the median hours worked by employees of each district and then multiplied by all labour units that reported to have been employed in the district. Once the actual GDPs trends are obtained by districts, growth rates of 6% and 10 % are applied to past GDP figures to obtain the moderate and high growth scenarios respectively.

Table I.XVIII Sector Employment Projections

	2014	2024	2034	2044	2050
Agro-processing, Agriculture, Forestry & Fishing	143,136	168,936	182,046	182,906	175,376
Mining	7,656	10,661	14,257	18,871	22,352
Manufacturing	22,387	40,184	64,703	100,163	128,953
Services	188,780	275,546	379,446	516,783	622,412
Construction	62,463	96,769	140,373	200,326	247,589
Trade	131,769	190,258	259,909	351,296	421,245
Transport	23,779	37,724	55,930	81,292	101,443
Total	579,969	820,078	1,096,664	1,451,637	1,719,369

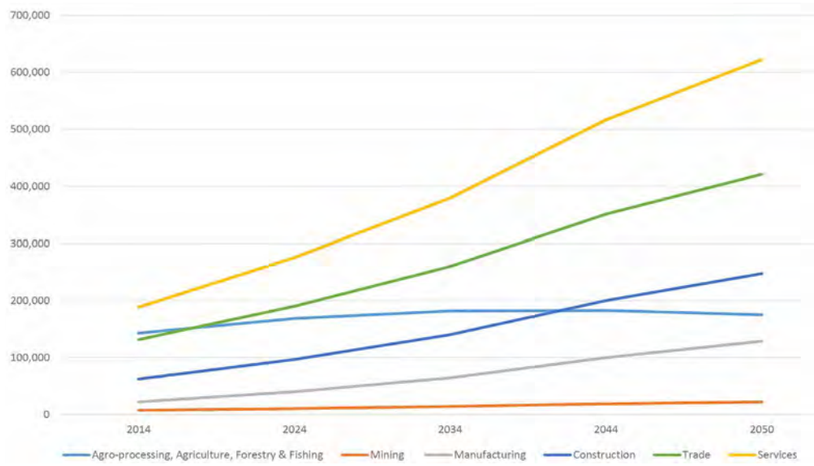


Figure I.VI Employment projections per district

Whereas this approach generates values relatively similar to official GDPs, it falls short by assuming similar incomes across different employment units, this does over estimate labour units productivity.

Despite the above limitations, the approach generates fair signals of activity in the districts. Within City of Kigali, Gasabo district was the biggest producer in 2005 with a share of 42%. Since then, Kicukiro has become the biggest economy within the city, accounting for 44% by 2015 because of the high average yearly nominal growth of 20% in comparison to the two districts, see Table I.XII for details.

In terms of per capita GPD, it ranged between 554,016RwF in Gasabo district and 1,082,942RwF in Kicukiro district.

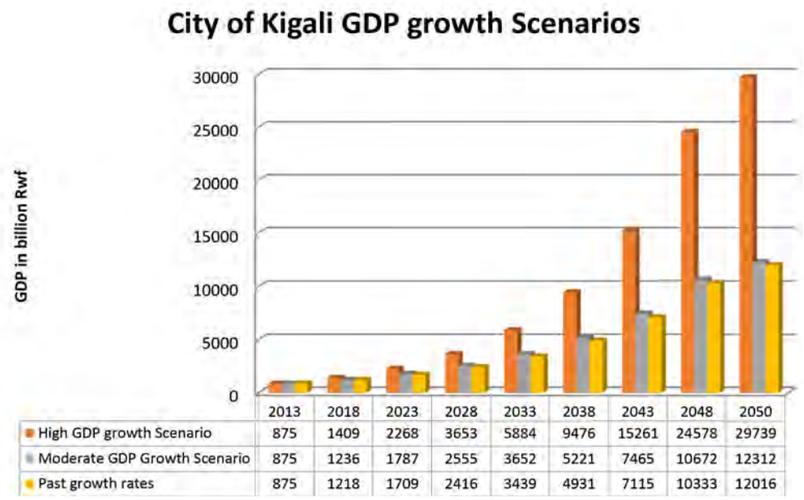
I.VII.II GDP PROJECTIONS PER DISTRICT

The economy of City of Kigali has experienced positive growth in that last decade averaging 6.5%, among the 3 districts, Kicukiro district is the biggest in terms of GDP accounting for 42% of the total GDP, this is followed by Gasabo (35%) and Nyarugenge (23%) respectively.

The three districts and the city at large are projected to continue growing between 6.5% and 10% for the next 3 decades because of the enormous investments taking place especially in the service and manufacturing sectors, these however will have to generate employment for the growing labour force if indeed the above growth rates are to be realized.

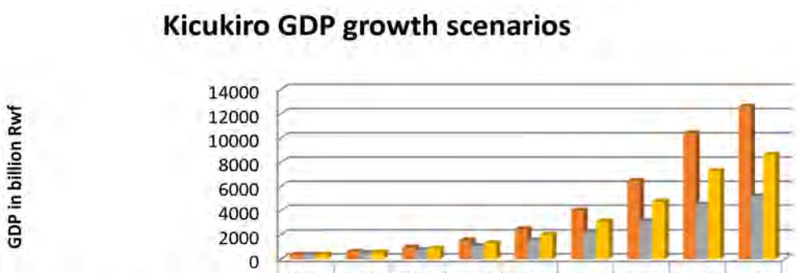
Table I.XIX Sector Employment Projections

District	GDP (billion Rwf) 2005/6	GDP (billion Rwf) 2013/14	Average Annual Growth rates (%) (2005/6-2013/14)
Gasabo	115	306	13.0%
Kicukiro	85	370	20.2%
Nyarugenge	69	198	14.1%



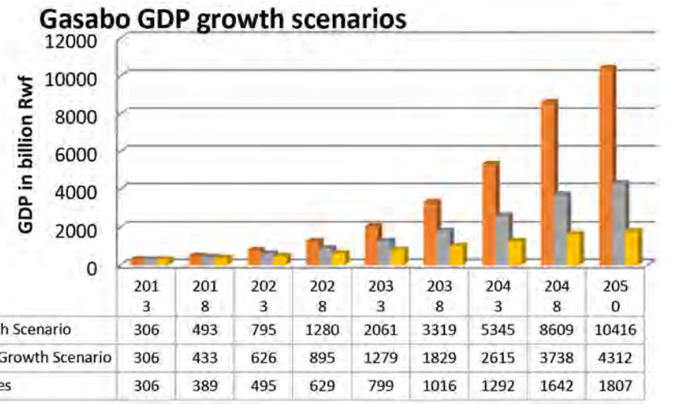
	2013	2018	2023	2028	2033	2038	2043	2048	2050
High GDP growth Scenario	875	1409	2268	3653	5884	9476	15261	24578	29739
Moderate GDP Growth Scenario	875	1236	1787	2555	3652	5221	7465	10672	12312
Past growth rates	875	1218	1709	2416	3439	4931	7115	10333	12016

Figure I.VII City of Kigali GDP Growth Scenario



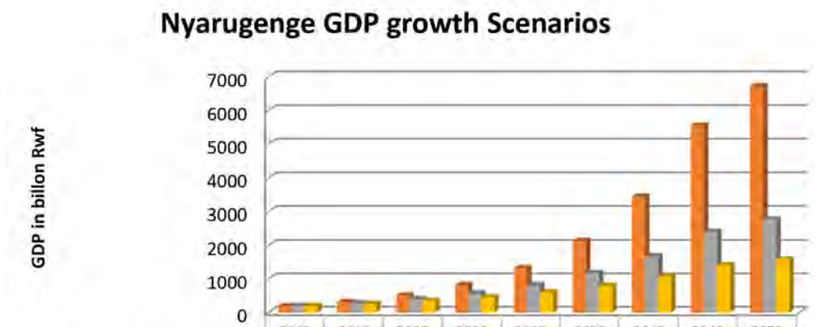
	2013	2018	2023	2028	2033	2038	2043	2048	2050
High GDP growth Scenario	370	596	961	1547	2492	4013	6463	10408	12594
Moderate GDP Growth Scenario	370	523	757	1082	1547	2211	3161	4519	5214
Past growth rates	370	567	867	1327	2030	3107	4754	7274	8623

Figure I.VIII Kicukiro GDP Growth Scenario



	2013	2018	2023	2028	2033	2038	2043	2048	2050
High GDP growth Scenario	306	493	795	1280	2061	3319	5345	8609	10416
Moderate GDP Growth Scenario	306	433	626	895	1279	1829	2615	3738	4312
Past growth rates	306	389	495	629	799	1016	1292	1642	1807

Figure I.IX Gasabo GDP Growth Scenario



	2013	2018	2023	2028	2033	2038	2043	2048	2050
High GDP growth Scenario	198	319	513	827	1331	2144	3453	5561	6729
Moderate GDP Growth Scenario	198	280	404	578	826	1181	1689	2415	2786
Past growth rates	198	262	347	460	610	808	1070	1418	1586

Figure I.X Nyarugenge GDP Growth Scenario

I.VII.III Establishments characteristics by District

The city of Kigali has 32,619 establishments , having increased by 9.5 % between 2011 and 2014. Gasabo district accounts for 37.8 % of the total number of establishments[4], Nyarugenge 37.4% and Kicukiro 24.8%. The number of enterprises (establishments) increased by 26% for Gasabo district, by 10% for Kicukiro district and decreased by 3.5% for Nyarugenge district over the same period.

Construction and services activities dominate the business establishments in all the three districts accounting for 93% in Gasabo, 92% Kicukiro and Nyarugenge 90%. In all districts micro establishments dominate in number, accounting for 95.4%, 95.2% and 96% in Gasabo, Kicukiro and Nyarugenge respectively. In Gasabo district, Large and Medium establishments increased by 176% between 2011 and 2014, whereas micro and small establishments increased by 25% and 64.5% respectively. In Kicukiro district, the total number of establishments increased by 10%, with the major increase occurring among micro and small establishments by 12.5% and 64% respectively. In Nyarugenge district, whereas there was a reduction by 3.5% in the overall number of establishments, large and medium establishments collectively increased by 153%. The reduction in establishments occurred among micro establishments which reduced by 2.5%.

Within the respective districts, the major growth of establishments occurred in Nduba, Gikomero and Bumbogo sectors whereas firm destruction occurred in Kacyiru, Kimihura and Kimironko sectors within Gasabo district. In Kicukiro district, growth mainly occurred in Kagarama, Gahanga, Gatenga sectors whereas firm closure occurred in Kicukiro and Masaka sectors. In Nyarugenge District, growth was mainly in Kanyinya and Kigali sectors, whereas firm closure mainly occurred in Muhima and Rwezamenyo sectors (see Table I.XIII).

4 It is an enterprise or part of an enterprise with constant site, performing one or more economic activity under one administration. Holder of the establishment could be natural or nominal person or governmental body. Accordingly, elements of the establishments are: a. Constant site; b. Practice of economic activity; c. Holder (natural or nominal) (NISR, 2014).

Table I.XX Evolution of number of Establishments per sector in City of Kigali (2011-2014)

Location	2014	Change from 2011	Location	2014	Change from 2011	Location	2014	Change from 2011
Gasabo	12337	0.259	Kicukiro	8091	0.100	Nyarugenge	12191	-0.036
Bumbogo	449	0.927	Gahanga	281	0.301	Gitega	686	-0.003
Gatsata	806	0.088	Gatenga	1023	0.386	Kanyinya	267	0.723
Gikomero	152	1.027	Gikondo	601	0.066	Kigali	485	0.374
Gisozi	1865	0.961	Kagarama	181	0.521	Kimisagara	1942	0.049
Jabana	668	0.572	Kanombe	1150	0.184	Mageregere	374	0.206
Jali	324	0.261	Kicukiro	1162	-0.225	Muhima	2173	-0.319
Kacyiru	754	-0.088	Kigarama	1203	0.298	Nyakabanda	409	0.102
Kimihurura	535	-0.061	Masaka	1046	-0.047	Nyamirambo	753	0.104
Kimironko	2254	-0.010	Niboye	593	0.389	Nyarugenge	3922	0.054
Kinyinya	939	0.465	Nyarugunga	847	0.063	Rwezamenyo	1158	-0.121
Ndera	511	0.030	Didn't specify	4		Didn't specify	22	
Nduba	488	2.012						
Remera	1694	0.230						
Rusororo	641	0.051						
Rutunga	204	0.316						
Didn't specify	53							

As already noted, majority of the establishments are micro and small in nature with 66%, 66% % and 62 % having a capital size of less than 500,000 Rwandan FRWS in Gasabo, Kicukiro and Nyarugenge districts respectively, (see Table I.XIV).

Within the period under review, the number of establishments with capital size of more than 75m decreased in all the three districts; Gasabo, Kicukiro and Nyarugenge by 53.5%, 62% and 26% respectively. Among establishments with capital size between 15m and 75m, unlike Nyarugenge where we observed a modest increase of 0.67%, Kicukiro had a significant increase of 15% while Gasabo had a decline of approximately 14%.

Among establishments with capital size between 500,000 and 15m, albeit there was an increase in both Gasabo and Kicukiro by 18% and 18.5% respectively, Nyarugenge registered a decline of 13.9%. Finally, we observed an increase in all districts among establishments with capital size of less than 500,000, with the highest proportionate increase registered in Gasabo and the lowest in Nyarugenge (See table I.XV).

It is worth noting than despite having a significant capital size above 15m (Rwf), there are establishments profiled as micro and small, which raises questions on their operations, or the quality of data. Should the problem be associated with operations, the authorities will have to investigate the taxations records of these establishments, these mainly located in Nyarugenge and Kicukiro districts (see Annex A).

Against the total employment within the respective districts as was reported by the EICV surveys, a limited proportion of the labour units are employed within establishments, In City of Kigali 24 % of the total workforce or employed labour units are working in establishments (See Table I.XVI).

Approximately 88% of the workforce employed in establishments located in City of Kigali are employed in construction and service sectors, having decreased by 4% in the period under review. This is equally depicted in the 3 districts within City of Kigali with more than 80% of the workforce employed in these sectors. In terms of establishment size contrary to the 2010 scenario, the large and medium establishments employ majority of the labour units, despite a large number of small and micro establishments.

Conclusively the establishment growth over the period 2011-2014 was mainly driven by large and medium establishments, an less by micro ones.

I.VIII Standards of living

I.VIII.I Housing Quality

There are five types of habitat for private households, these include clustered rural settlements (umudugudu)/ old settlements, dispersed/isolated habitats, planned urban housing (cadastre), and spontaneous or squatter habitats (Akajagari) (NISR, 2012). Over the decade 2002-2012, quality of housing improved with more households moving into planned housing within the City of Kigali, which was partly due to a decline in the proportion of households staying in Umudugudu, old settlement and dispersed settings. However, despite the overall improvement in planned housing in the City of Kigali, there was a decline in planned housing in Nyarugenge district.

Generally, over 60% of households in City of Kigali reside in spontaneous housing structures with Nyarugenge, Gasabo and Kicukiro having proportions of 76%, 55% and 66% having increased from 62%, 34% and 45% respectively. The sector distribution of the population residing in spontaneous houses in each district is given is Appendix B.

I.VIII.II Poverty and income inequality

Rwanda uses the nutrition-based poverty lines to quantify the poverty levels at individual, household and national level. The poverty line is 159,375 RWF (2014 January prices), and the extreme poverty line is 105,064 RWF.

Poverty rate in Rwanda has reduced from 44% to 39% in the period 2010/11-2013/14, while extreme poverty had dropped from 24% to 16%. Poverty rates in the City of Kigali are generally low compared to national poverty rates. In 2013/14, it ranged between 9% and 10% for the extremely poor and between 14% and 19% for overall poverty, which includes both extreme and relatively poor (See Table 17). Gasabo district has a higher share and number of poor than the other districts of the City.

Table I.XXI Establishments Distribution by Capital Size

District	Less than 500.000 (Rwf)	500.000 – 15 million (Rwf)	More 15 to 75 million (Rwf)	More than 75 million (Rwf)	Didn't Specify
Nyarugenge	0.62	0.30	0.04	0.03	
Gasabo	0.66	0.28	0.01	0.02	0.03
Kicukiro	0.66	0.27	0.02	0.02	0.03

Source: Establishment Census 2014

Table I.XXII District Growth rate of Establishments (%) by capital size (2011-2014)

District	Less than 500.000 (Rwf)	500.000 – 15 million (Rwf)	More 15 to 75 million (Rwf)	More than 75 million (Rwf)	Didn't Specify
Nyarugenge	0.5	-13.9	0.7	-26.1	61.9
Large	-	50.0	-	180.0	-
Medium	-20.0	28.6	16.7	81.3	1900.0
Micro	4.4	-14.5	0.3	-36.1	56.0
Small	77.8	3.1	1.6	-12.1	1137.5
Gasabo	30.0	18.5	-13.9	-53.5	50.6
Large	-		-50.0	600.0	
Medium	-33.3	140.0	50.0	-4.5	3700.0
Micro	31.1	17.7	-20.1	-70.1	44.6
Small	69.2	42.0	3.7	-30.6	931.8
Kicukiro	7.7	18.0	15.3	-63.0	51.3
Large	-	-50.0	50.0	-37.5	
Medium	-	0.0	300.0	27.8	
Micro	13.9	17.4	2.4	-82.0	44.7
Small	166.7	34.8	42.3	-20.9	1233.3

Source: Establishment Census 2014

Table I.XXIII Establishment employment

District	Total Employment 2010/11	Establishment Employment 2011	Total Employment in 2013/14	Establishment Employment 2014
Gasabo	203,983	27,091	137,427	52701
Kicukiro	128,907	21,713	289,308	57173
Nyarugenge	113,759	31,825	153,234	30478
City of Kigali	446,649	80,629	579,969	140,352

Table I.XXIV Poverty Levels per District

Period	District	Extremely Poor	Poor	Total Poor	Non Poor
2010/11	Nyarugenge	0.022	0.042	0.064	0.936
2013/14		0.068	0.102	0.170	0.830
2010/11	Gasabo	0.095	0.098	0.193	0.807
2013/14		0.090	0.100	0.190	0.810
2010/11	Kicukiro	0.019	0.034	0.053	0.970
2013/14		0.055	0.086	0.141	0.859

Table I.XXV HDI boundaries

Dimension	Indicator	Minimum	Maximum
Health	Life expectancy (years)	20	85
Education	Expected years of Schooling (years)	0	18
	Mean Years of Schooling (years)	0	15
Standard of Living	Gross National Income per capita (USD)	100	75000

Source: Human Development Report (UNDP 2017)

Table I.XXVI Human Development Indicators for City of Kigali Districts

Indicator	Nyarugenge 2012	Nyarugenge 2015	Gasabo 2012	Gasabo 2015	Kicukiro 2012	Kicukiro 2015
Health Index	0.685	0.728	0.685	0.728	0.685	0.728
Expected years of Schooling Index	0.889	0.889	0.889	0.889	0.889	0.889
Mean Years of Schooling (years)	0.193	0.367	0.181	0.330	0.195	0.392
Education Index	0.541	0.628	0.535	0.609	0.542	0.640
Income index 2013	0.357	0.355	0.325	0.306	0.426	0.421
HDI 2013	0.510	0.546	0.492	0.514	0.541	0.581

Albeit Nyarugenge and Kicukiro have low poverty levels, the proportion of people living in poverty increased from 2010/11 to 2013/14 for the two districts reflecting a growing problem of urban poverty. In addition to rural urban migration, the growth in poverty rates are partly explained by high dependency ratio in the three districts, seasonal employment and meagre returns associated with employment opportunities existing in the respective districts. The poverty rates per sector in each district are provided in Annex C.

Inequality in both Nyarugenge and Gasabo reduced over the period 2010/11-2013/14, the Gini coefficient reduced from 0.8776 to 0.4734, from 0.9234 to 0.466 in Nyarugenge and Gasabo respectively, though it increased and significantly remained the same in Kicukiro district having increased from 0.76 to 0.7966 from 2012 to 2015.

In conclusion, despite the positive growth and overall economic expansion in the districts of City of Kigali, poverty slightly increased in the three districts and income inequality remained extremely high in Kicukiro district though significant progress was registered in both Nyarugenge and Gasabo Districts.

I.VIII.III The Human Development Index

The Human Development Index measures progress in development. Owing to the seminal work of Mahbub ul Haq and Amartya sen, this indicator has been computed for all economies since 1990 (Human Development Report 1990), and with improvements in aspects of its measurement to ascertain trends in overall development. The index measures progress in life longevity, education and standard of living which are relevant to human choices.

The dimension indices for the respective indicators are computed using the following index:

$$DI = \frac{AV - MinVal}{MaxVal - MinVal}$$

DI : Dimension Index
AV : - Actual Value
MinVal : - Minimum Value
MaxVal : - Maximum Value

The HDI Index is a geometric combination of the three dimension indices; health, education and income.

$$HDI = (I_{Health}.I_{Education}.I_{Income})^{1/3}$$

The boundaries used to generate the indices are adopted from the UN (Human Development Report, 2016), taking into account that Rwanda's development agenda is targeting to become a middle income nation.

As already noted in the previous sections, the mean years of schooling measured by years of completion, were between 2.72 and 2.92 years among the city of Kigali, with Gasabo having the lowest number of years of school completed in 2010/11. The situation improved by approximately 90%, to between 4.95 years to 5.88 years, in the three districts by 2013/14 probably reflecting the tremendous government investment in 9-year basic education.

Life longevity measured by life expectancy improved from 64.5 years to 67.3 years at the national level. This was used to approximate the health status of all districts in City of Kigali because of unavailability of data at district level. Standard of living was measured using per capita GDP, which was generated using estimated GDP. Whereas overall district productivity increased significantly, per capita GDP decreased because of mainly population growth and macroeconomic adjustments in exchange rates.

Give the trends in health, education and income in each of the districts of the City of Kigali, we observe increase in the HDI index in all districts, and from 0.510 to 0.545 in Nyarugenge district, from 0.492 to 0.5414 in Gasabo district and from 0.541 to 0581 in Kicukiro district (see table I.XIX).

Annex A

Table I.XXVII Establishments by Size and Capital in City of Kigali

Period	2011				2011 total	2014					2014 Total
Capital size	Less than 500,000	500,000 - 15 million	More 15 to 75 million	More than 75 million		Less than 500.000	500.000 - 15 million	More 15 to 75 million	More than 75 million	Didn't Specify	
Nyarugenge	**7487**	**4223**	**447**	**483**	**12640**	**7528**	**3636**	**450**	**357**	**220**	**12191**
Large		2		5	7		3	1	14	6	24
Medium	5	7	6	16	34	4	9	7	29	31	80
Micro	7173	4083	379	355	11990	7492	3493	380	227	99	11691
Small	18	127	61	99	305	32	131	62	87	84	396
#N/A	291	4	1	8	304						
Gasabo	**6304**	**2870**	**209**	**413**	**9796**	**8193**	**3401**	**180**	**192**	**371**	**12337**
Large			4	2	6		1	2	14	12	29
Medium	3	5	2	22	32	2	12	3	21	38	76
Micro	6215	2773	149	274	9411	8147	3263	119	82	167	11778
Small	26	88	54	108	276	44	125	56	75	154	454
#N/A	60	4		7	71						
Kicukiro	**4967**	**1866**	**111**	**413**	**7357**	**5349**	**2201**	**128**	**153**	**260**	**8091**
Large		2	2	8	12		1	3	5	6	15
Medium		5	1	18	24		5	4	23	19	51
Micro	4676	1790	82	294	6842	5325	2102	84	53	141	7705
Small	9	69	26	91	195	24	93	37	72	94	320
#N/A	282			2	284						

Source: Establishment Census 2011, 2014

Annex B

In Nyarugenge District, majority of the population residing in spontaneous houses are located in Kimisagara, Nyamirambo, Muhima and Rwezamenyo whereas the dispersed are located mainly in Mageregere and Kanyinya those residing in Planned houses mainly located in Nyarugenge and Nyamirambo and Muhima.

In Gasabo district, the population residing in planned houses are mainly located in Kimironko, Kacyiru, Remera, Ndera, Kimihurura and Bumbogo. Spontaneous houses are mainly located in Gatsata, Remera, Kacyiru, Gisozi and Kimironko.

Table I.XXVIII Residence by Quality of Housing in Nyarugenge District Geographical Sectors

Nyarugenge	Umudugudu (Old Settlement)	Old Settlement	Dispersed	Planned Urban Housing	Spontaneous (Squatter Habitats)	Other Type	Missing	Total
Gitega	610	760	240	0	27,600	0	250	29,460
Kanyinya	500	150	11,340	0	9,560	0	20	21,570
Kigali	560	290	18,800	80	10,850	50	20	30,650
Kimisagara	290	10	890	220	44,150	10	10	45,580
Mageregere	1,040	30	14,310	160	7,940	470	30	23,980
Muhima	0	150	500	950	24,770	0	70	26,440
Nyakabanda	0	20	250	190	24,140	60	110	24,770
Nyamirambo	650	1,330	4,260	4,050	30,410	70	0	40,770
Nyarugenge	30	1,360	200	1,920	17,160	80	110	20,860
Rwezamenyo	30	290	70	780	15,500	0	0	16,670
Total	3,710	4,390	50,860	8,350	212,080	740	620	280,750

Source: Rwanda Population Census 2012

Table I.XXIX Residence by Quality of Housing in Gasabo District Geographical Sectors

Gasabo	Umudugudu	Old settlement	Dispersed	Planned	Spontaneous	Other type	missing	Total
Bumbogo	800	180	18,540	4,820	10,570	50	10	34,970
Gatsata	610	40	340	1,780	33,270	110	180	36,330
Gikomero	110	0	16,430	80	440	10	0	17,070
Gisozi	10	230	2,710	2,340	37,990	20	160	43,460
Jabana	2,170	100	20,100	1,920	6,910	560	60	31,820
Jali	1,820	90	17,540	270	5,440	90	70	25,320
Kacyiru	90	650	760	4,050	29,850	0	90	35,490
Kimihurura	0	0	160	5,510	15,090	240	230	21,230
Kimironko	3,520	210	1,030	18,980	27,410	250	550	51,950
Kinyinya	1,190	460	5,350	4,660	46,060	230	350	58,300
Ndera	380	520	16,690	7,290	15,630	0	10	40,520
Nduba	1,230	210	16,710	80	6,300	30	10	24,570
Remera	1,020	550	440	6,990	32,800	100	160	42,060
Rusororo	2,230	340	14,610	4,730	13,410	200	130	35,650
Rutunga	950	0	15,400	560	780	20	10	17,720
Total	16,130	3,580	146,810	64,060	281,950	1,910	2,020	516,460

Source: Rwanda Population Census 2012

In Kicukiro District, the population residing in planned houses are mainly located in Nyarugunga, Niboye, Kagarama and Masaka, whereas those in spontaneous houses are mainly located in Gatenga, Kigarama, Kanomber, Masaka and Nyarugunga.

Table I.XXX Residence by Quality of Housing in Kicukiro District Geographical Sectors

Kicukiro	Umudugudu	Old settlement	Dispersed	Planned	Spontaneous	Other type	missing	Total
Gahanga	1,290	120	13,840	1,350	11,370	0	60	28,030
Gatenga	180	1,310	3,860	3,530	38,170	350	1,000	48,400
Gikondo	120	90	270	3,010	12,360	140	230	16,220
Kagarama	730	30	1,160	7,370	5,210	370	20	14,890
Kanombe	1,890	360	4,120	3,850	33,530	370	80	44,200
Kicukiro	10	110	570	2,190	13,570	10	40	16,500
Kigarama	920	740	1,600	3,650	38,050	400	200	45,560
Masaka	5,080	100	9,310	5,330	21,230	110	0	41,160
Niboye	250	480	560	14,830	11,050	160	100	27,430
Nyarugunga	670	30	1,110	10,030	27,180	90	170	39,280
Total	11,140	3,370	36,400	55,140	211,720	2,000	1,900	321,670

Source: Rwanda Population Census 2012

Annex C

The major poverty hotspots in Nyarugenge District are Mageregere, Kanyinua, Nyakabanda and Nyamirambo sectors, whereas in Gasabo District, they are Gikomero, Rutunga, Bumbogo, Jali, Nduba and Ndera and within Kicukiro Distict, the major poverty hotspots are Gahanga, Masaka, Kagarama and Kanombe.

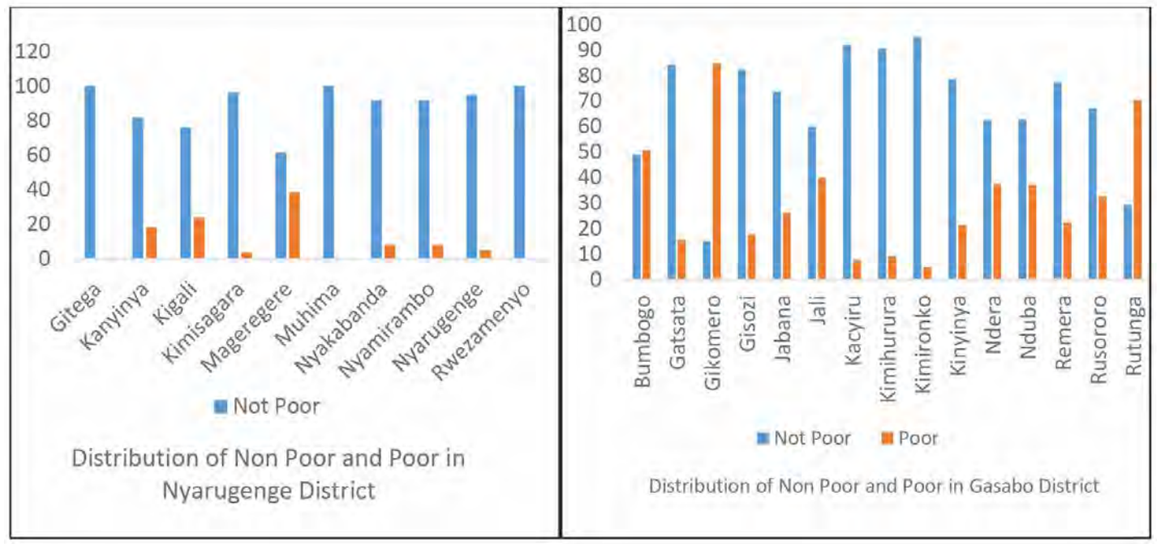
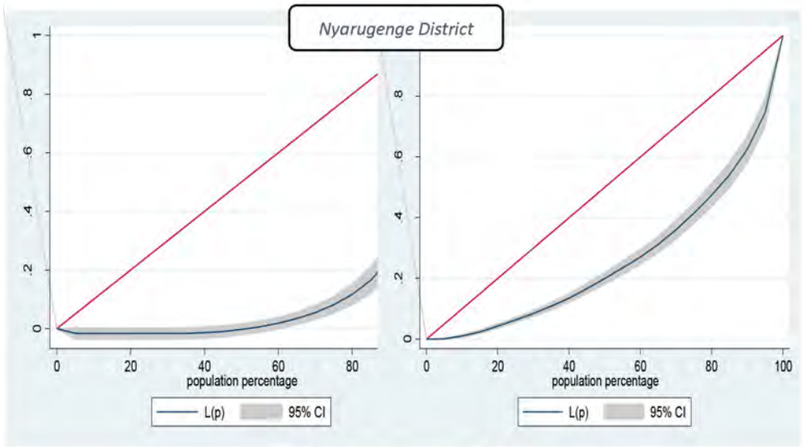
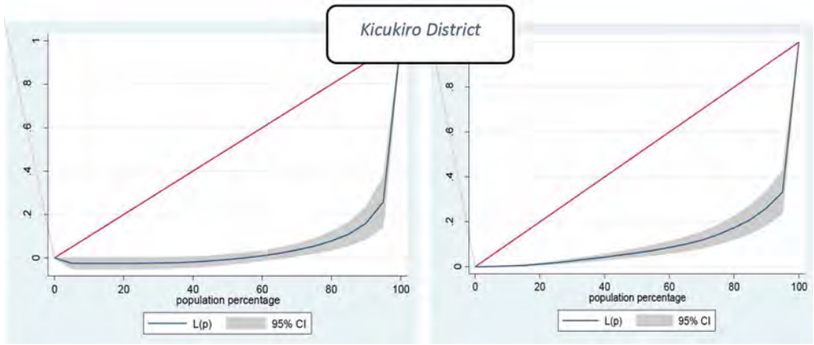
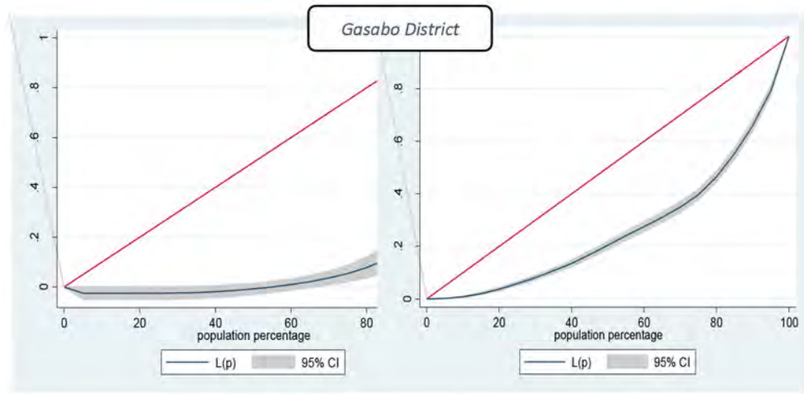


Figure I.XI Poverty rates per sector

Annex D


Nyarugenge District
0
.2
.4
.6
.8
1
0
20
40
60
80
100
population percentage
L(p)
95% CI


Kicukiro District
0
.2
.4
.6
.8
1
0
20
40
60
80
100
population percentage
L(p)
95% CI


Gasabo District
0
.2
.4
.6
.8
1
0
20
40
60
80
100
population percentage
L(p)
95% CI

This Page has been intentionally left blank

Annexure II: Determinants of Housing Demand in City of Kigali

II.I Housing Demand in City of Kigali

In terms of households, Gasabo is the most populated district in City of Kigali accounting for 47% of the total households, this is followed by kicukiro and Nyarugenge accounting for an almost equal distribution of households. Among the household heads, female account for 35%, 27% and 24% in Nyarugenge, Kicukiro and Gasabo respectively, see Table II.I for details.

Table II.I Distribution of household heads by gender, educational attainment disaggregated at district level Kigali City

GENDER	GASABO	NYARU-GENGE	KICU-KIRO
Male	45,685	21,629	24,481
Female	14,055	11,872	9,260
Total	59,740	33,501	33,741

Among the household heads, majority have less than primary education, with 57% in both Gasabo and Nyarugenge and 42% in Kicukiro having either no formal education or completion of primary education as the highest level of education. In terms of secondary education, 24%, 32% and 31% household heads have either attended or completed secondary school education in Gasabo, Nyarugenge and Kicukiro district respectively. University education: 13%, 6% and 21% of the household heads have completed university education in Gasabo, Nyarugenge and Kicukiro respectively, see Table II.II for details.

II.I.I Cost of Construction of houses in Kigali

The median cost of construction of residential houses is 12m Rwandan Francs with variation of approximately 3% in either direction, accounting for 60% of the total value of the property each of housing owners possess.

87% of residents profile their housing structures as whole house, these are averagely one roomed structures (see table 2). 8% reside in what was profiled as “part of house under share” whereas 3.4% reside in bungalows, for details, see Figure II.I.

Table II.II Level of Education

Highest level of education	Gasabo	Nyarugenge	Kicukiro
No formal education	7,684	4,514	2,452
Primary not completed	12,054	6,438	5,737
Primary completed	14,352	8,089	6,038
Secondary Not completed	7,432	6,007	4,614
Secondary completed	6,702	4,701	5,848
Vocational training	3,512	1,674	1,952
University Level	6,116	1,752	5,138
Masters/PHD	1,888	326	
Total	**59,740**	**33,501**	**33,741**

Table II.III Construction Cost and Value of Property in City of Kigali

Variable	Median Cost (Rwf)	Average Cost (Rwf)	Coefficient of Variation (%)
Cost of Construction Value of Property (land and house)	12,000,000 20,000,000	21,000,000 54,200,000	2.77925800

Table II.IV Average Size of Houses in City of Kigali

VARIABLE	MEDIAN SIZE OF RESIDENTS IN KIGALI	MEAN	CV
size of house	1	1.25	0.6106

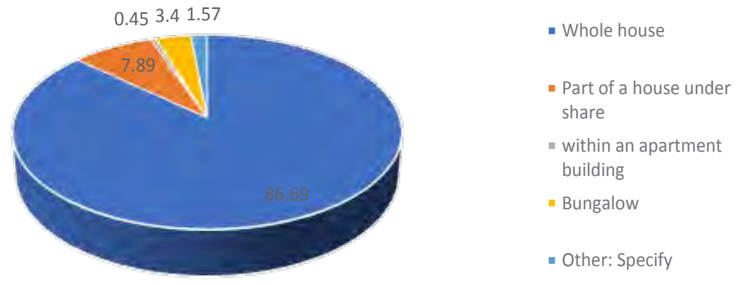


Figure II.I Size of houses in City of Kigali

II.I.II Average size and Quality of houses for Residents in City of Kigali

22% of the residents would wish to expand their current residential places, 20% wish to shift to other sectors but within City of Kigali whereas 4% would wish to get out of Kigali, see table I.IV for details.

The major building material for houses in City of Kigali is soil pressed bricks, sand cement bricks and stones, see figure II.II for details.

Corrugated iron sheets are the main building material used for roofs by residents of City of Kigali, see figure II.III below for details.

Majority of residents in City of Kigali use either cement, tiled floors or earth for construct the floors of their respective houses, see figure II.IV below for details.

II.I.III Land Ownership

In terms of land ownership, 78.75% of the residents in Kigali don't own land, with approximately 86% of those that own land having registered titled land as the document of ownership see figure II.V for details.

Table II.V Location resident plan to occupy in 5 to 10 years

In which location do you plan to build or occupy a house in 5 to 10 years	Percent
Expanding our current city resident places	22.18
In another plot within the same sector	13.82
In another disttict within Kigali City	6.77
Outside Kigali city	4.36
None	52.87
Total	100

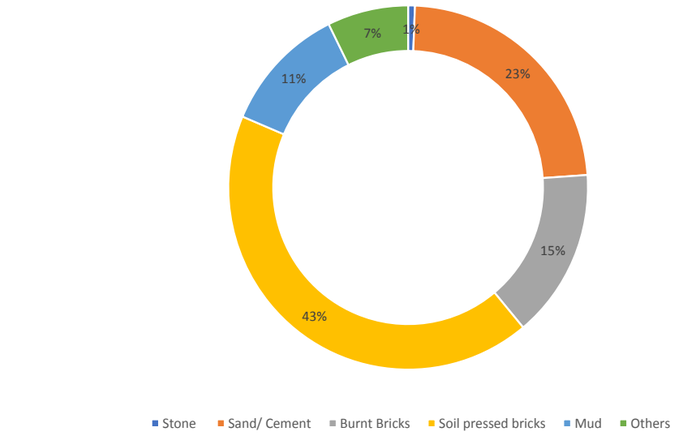


Figure II.II Type of Building Material on External Walls (%)

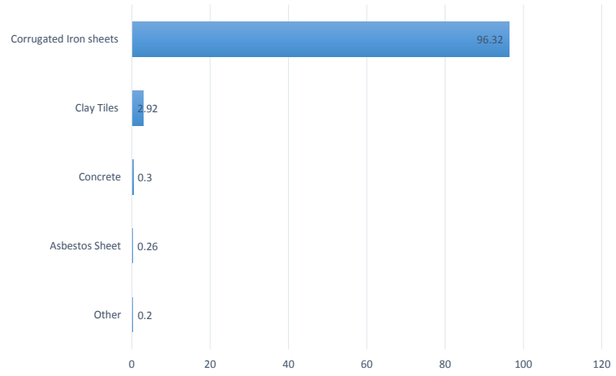


Figure II.III Type of Building Material on Roof (%)

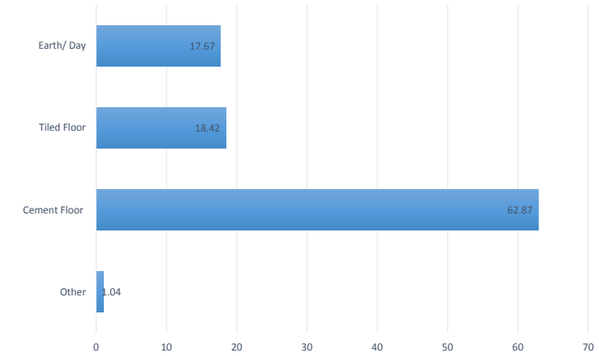


Figure II.IV Type of Building Material on the Floor (%)

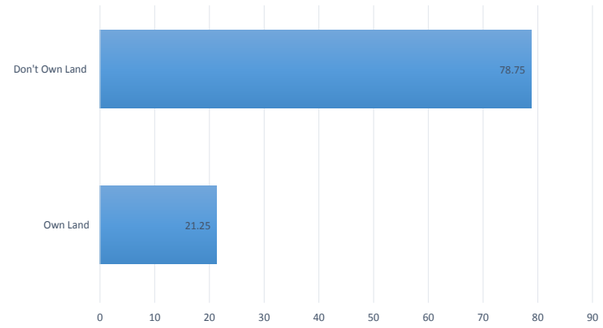


Figure II.V Land Ownership by Household Members in City of Kigali

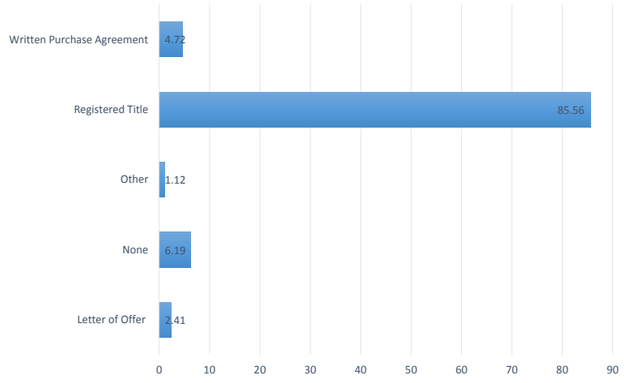


Figure II.VI Type of Land Document (%)

II.I.IV 1.4. Information Demand by Residents in City of Kigali

98% of the residents in the city reported a desire for more information about the overall city and District Master plans. The same proportion requested the district and City authorities to inform them about events, advocated for more sensitization and engagement with citizens at sector levels (see table II.VI for details).

Among those that receive information their main sources are local leaders, community meeting, radios and televisions.

Transport Section analysis

Majority of households' members travel a distance of less than 500metres from their places to residence to places of work, these account for 40%, 37.2% and 32.9% for Gasabo, Nyarugenge and Kicukiro.

Over 60% of the children in the 3 districts have a distance of less than a kilometre to their places of school. Approximately 30% of the students travel between 1km and 5km and less than 3% travel a distance longer than 5 kilometres to their places of school, see figure II.VIII for details.

In terms of modes of transportation, majority of the employed labour units use walking as a means of transport to their places of work, these are followed by private cars whose proportion lies between 5% and 22% for the respective districts, see figure II.IX for details.

Table II.VI Information Demand in City of Kigali

Ranking	Would like to receive information about City and District Master Plan (%)	The City of Kigali and District Master Plan are an important tool to (%)	In the case City of Kigali will organize events to inform above the City (%)	More efforts need to be taken in order to sensitize and engage local citizens (%)
Strongly Agree	39.98	38.89	40.6	38.2
Agree	58.53	56.51	58.05	59.56
Disagree	1.3	4.01	1.22	2.1
Strongly Dis-agree	0.19	0.58	0.13	0.13
Total	100	100	100	100

Table II.VII Main Sources of Information

What are the main sources of information on public events	Percent
Radio	16.98
Television	13.63
Newspaper	0.58
Community meetings	25.77
Fellow citizens around my neighbourhood	4.97
Sensitization from Local leaders	29.99
City of Kigali enforcement officers	0.27
Social media Social media	2.1
Billboards	0.05
Notice board	0.19
Internet	1.12
Other	4.36

Table II.VIII Current mode of transport to your workplace

	Gasabo	Nyarugenge	Kicukiro
Walking	52,753	27,057	24,320
Cycling	1,652	788	784
Motorcycle	3,730	1,321	3,309
Public Transport (Buses and Taxis)	7,064	5,186	3,814
Private Car	8,304	1,888	9,097
Total	73,503	36,240	41,324

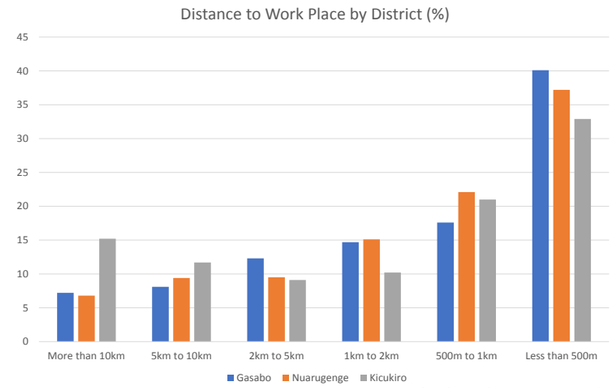


Figure II.VII Distance to work place by District (%)

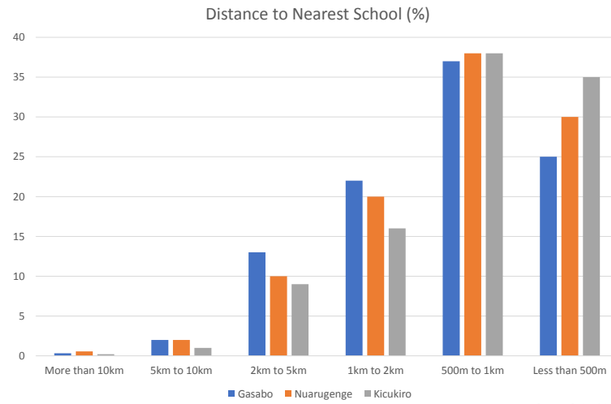


Figure II.VIII Distance to Nearest School (%)

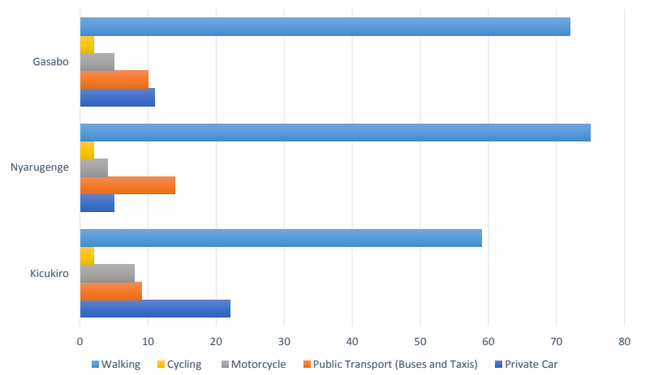


Figure II.IX Current Mode of Transportation to Workplace (%)

Among the households willing to upgrade their modes of transportation more than 60% in all districts favour private cars as a means of preferred transportation, holding other factors constant, this is indicative of the future preference of cars, nevertheless this realistically constrained by household incomes levels and competing expenditure priorities.

97.5% of the households in City of Kigali work in one of the three districts in the city with the rest (2.5%) working in other parts of the country, see table II.X for details.

Distance to nearest school:
In terms of distance to school, between 24% and 33% of the school going children travel a distance of less than 500metres from their places of residence to their schools. Majority though accounting for 37% of all districts travel between 500m and 1km to their respective schools, for details see figure II.XI.

Table II.IX Cross tabulations of planned transport-work –mode within next five years disaggregated at district and sector level

If yes, what mode of transport would like to upgrade/ downgrade to in the	Gasabo	Nyarugenge	Kicukiro
Walking	361	59	226
Cycling	2296	417	577
Motorcycle	3138	1331	2177
Public transport (Buses and taxis)	928	557	395
Private car	10043	6439	6380
Total	**16766**	**8804**	**9755**

Table II.X Median cost of transportation for school going children

District	Mean Cost	Median Cost	Cv	Min	Max
Gasabo	790	500	1.143506	10	6500
Nyarugenge	877	500	1.361943	0	5200
Kicukiro	1285	600	1.138473	0	7000

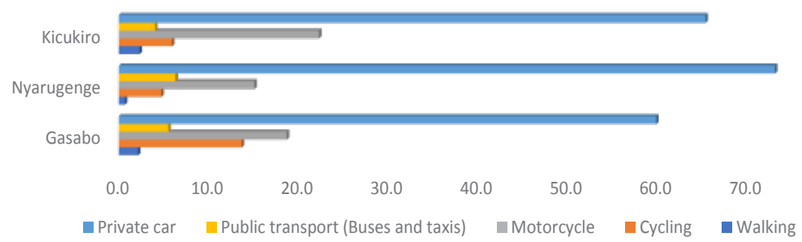


Figure II.X Mode of transportation households would like to upgrade to (%)

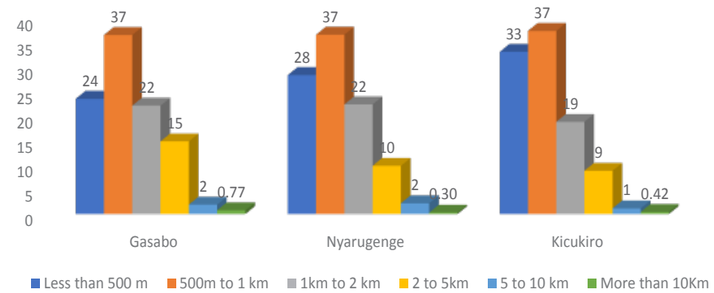


Figure II.XI Distance to Nearest School (%)

Table II.XI Geographical distribution of household head place of work district

Geographical distribution of household head place of work by District	Proportion (%)
Nyarugenge	28.58
Gasabo	46.56
Kicukiro	22.36
Nyanza	0.08
Gisagara	0.09
Huye	0.21
Ruhango	0.15
Muhanga	0.39
Kamonyi	0.26
Karongi	0.08
Rutsiro	0.10
Ngororero	0.09
Rusizi	0.09
Rulindo	0.05
Gakenke	0.09
Musanze	0.10
Burera	0.06
Rwamagana	0.11
Nyagatare	0.08
Gatsibo	0.05
Kayonza	0.05
Kirehe	0.06
Ngoma	0.09
Bugesera	0.23

In terms of distance to facilities, the majority of households in Gasabo, Nyaurugenge and Kicukiro take their children to schools which within between 500metres and a kilometer from their homes. These households account for 0ver 40% of the households in the three districts. This trend is followed by households who prefer to take their children to schools that are within 500metres from the households. This trend is indicative of the fact that parents prefer to take children to nearby schools possibly to reduce transport costs and commuting costs involved in going to schools which are further away from their homes.

In terms of future transport preferences, the majority of the households surveyed prefer to maintain their current modes of transport. In terms of those willin to change, Gasabo district has the highest number of households standing at about 16,700 heads out the 73,000 household heads in the district.

A disaggregation of willingness to change transport modes by employment shows that households in full time employment are proportionately more will to change transport mode and account for over 40% of their counterparts of the same employment status. This is contrast to the self employed and occasional employment modes where the majority i.e. over 70% of households heads are not planning to change transport modes within the next five years. This is possibly due to the unstable nature of the largely informal occasional and self employment which don't guarantee stable incomes when compared to full time employment.

Table II.XII Distance to nearest school

Distance to school	Gasabo	nyarugenge	kicukiro
Less than 500m	14,093	9,530	11,207
500m to 1km	21,894	12,301	12,650
1km to 2km	13,256	7,521	6,367
2km to 5km	8,886	3,308	2,985
5km to 10km	1,148	739	390
More than 10km	462	102	143
Total	**59,740**	**33,501**	**33,741**

Table II.XIII Number of household heads willing to change transport-to-work transport modes in the next 5 years, disaggregated by district level

Do you plan to change your current mode of transport in the next 5 years	Gasabo	nyarugenge	Kicukiro
Yes	16,766	8,804	9,755
No	56,737	27,436	31,569
Total	73,503	36,240	41,324

Table II.XIV Cross tabulations of willingness (or plans) to change transport-to-work transport modes in the next 5 years, disaggregated by employment

District	Do you plan to change your current mode of transport in the next 5 years?	Full-time Employed	Self-employed	occasional employment	Retiree
Gasabo	Yes	3,168	10,183	3,255	160
	No	6,521	37,896	8,903	3,416
	Total	9,689	48,079	12,158	3,576
Nyaru-genge	Yes	-	1,345	6,098	1,360
	No	3,497	18,183	4,061	1,695
	Total	3,497	19,528	10,159	3,055
Kicukiro	Yes	-	2,602	6,136	1,017
	No	5,607	19,823	3,764	2,375
	Total	5,607	22,425	9,900	3,392

Table II.XV Distance to Nearest School

Distance to nearest school	Gasabo	nyarugenge	kicukiro
Less than 500 m	29,075	18,914	24,008
500m to 1 km	42,325	23,642	26,528
1km to 2 km	24,740	12,423	11,253
2 to 5km	15,085	6,430	6,391
5 to 10 km	2,531	1,432	808
More than 10Km	638	204	143

Table II.XVI Cost of Transportation costs to School by sector

SECTOR	MEAN	P50	CV	MIN	MAX
Bumbogo	100	100	-	100	100
Gahanga	625	625	0.849	250	1000
Gatenga	1127	975	0.908	10	3000
Gatsata	427	300	0.893	10	1500
Gikomero	-	-		-	-
Gikondo	662	527	1.118	0	2100
Gisozi	440	375	0.624	200	1000
Gitega	1210	500	1.233	0	4000
Jabana	679	510	0.659	220	1500
Jali	867	1000	0.371	500	1100
Kacyiru	1189	500	1.302	255	3500
Kagarama	1044	650	1.044	277	2600
Kanombe	1813	1100	1.036	310	5000
Kanyinya	300	300	.	300	300
Kicukiro	1055	650	0.929	250	2500
Kigali	376	275	0.982	45	1000
Kigarama	1086	540	1.003	99	2500
Kimihurura	946	500	1.084	260	2700
Kimironko	557	500	0.598	200	1000
Kimisagara	924	500	1.257	15	5200
Kinyinya	699	500	0.692	216	1500
Mageragere	2000	2000	.	2000	2000
Masaka	2800	1000	1.303	400	7000
Ndera	1838	1600	0.801	350	3800

II.II Housing Demand Determinants in City of Kigali

II.II.I Methodology

Given the multiple and standard normal cumulative distribution nature of the dependent variable a Multinomial regression model was used to examine the determinants of demand for housing in City of Kigali.

The multiple outcome dependent variable takes the following form:

$$\Pr(Y_i = 1) = \frac{e^{\beta_1' \cdot \mathbf{X}_i}}{1 + \sum_{k=1}^{K-1} e^{\beta_k' \cdot \mathbf{X}_i}}$$

.....

$$\Pr(Y_i = K-1) = \frac{e^{\beta_{K-1}' \cdot \mathbf{X}_i}}{1 + \sum_{k=1}^{K-1} e^{\beta_k' \cdot \mathbf{X}_i}}$$

$$\Pr(Y_i = K) = \frac{1}{1 + \sum_{k=1}^{K-1} e^{\beta_k' \cdot \mathbf{X}_i}}$$

Each of the outcomes can be considered as a binary model where *y* takes one of two values

$$y = \begin{cases} 1 \; with \; probability \; p \\ 0 \; with \; probability \; 1-p \end{cases}$$

The analysis examined both the probabilities direction and the magnitude of the impact of each explanatory variable on the demand for housing in City of Kigali.

The dependent variable which is demand for housing was proxied by type of residence i.e. Either renting, owning a house or having free accomodation while the explanatory variables include income, Gender, Employment status, Family size, level of education, Possession of residence outside Kigali, Migration intention and Ubudehe profile for the residents.

II.II.II Analysis of findings from the Multinomial regression

Findings from the multinomial regression model are shown below. Given that the base category is households living under free accommodation, our analysis on the housing demand based on both house renting and house ownership are interpreted in comparison with the base category.

Income

Households with higher incomes are more likely to rent their premises than households with lower incomes. This effect is significant at 1% percent level.

Employment status

Relative to households where the head is unemployed, retiree household haed are less like to rent their housing as shown by the negative sign on the coefficient . In addition the coefficient on retiree household head is significant at a 5% level. This result follows from the fact that most retirees have been working for some time and have accumulated enough income to construct or buy homes of their own unlike the unemployed household heads and those in active employment who are still working their way up to home ownership.

Household size

Findings from the multinomial regression show that larger families are less likely to be renting but rather own their homes when compared to smaller families. Indeed the larger families are mostly first generation family homes headed by older household members who have been working for some time and have constructed or bought their own homes in the past. On the contrary, smaller households are mainly owned by younger people who have moved out of their parents homes to start their own families and these are more likely to rent their homes.

Education

Irrespective of the level of education, there's a positive relationship between renting and education. Findings on the marginal effects show in terms magnitude, households whose heads completed primary education have an 8.5% likelihood rent while those that did not complete primary education have an 8.9% likelihood to rent their housing.

Individuals (household heads) that completed secondary school education have a likelihood of 18.7%, those that never completed secondary school education have a likelihood of 14.4%, University graduates have a likelihood to rent of 14% while vocational graduates have a 10% likelihood to rent.

Table II.XVII Multinomial Logistic regression for Housing Demand in the City of Kigali

Multinomial logistic regression	Number of obs	3720	
LR chi2(38)	=	441.72	
Prob > chi2	=	0	
Log likelihood = -2203.02	Pseudo R2	0.0911	
Housing Demand(Renting, ownership, free housing)	Coef. Std. Err.	z	P>z
RENTING (dependent outcome variable)			
Log_Income	0.1725098	2.94	0.003
Gender	0.2823322	1.38	0.166
Full-time employment	-0.3909575	-1.12	0.263
Self-employment	0.2746657	1.17	0.24
Occasional employment	-0.0527438	-0.17	0.863
Retiree	-2.145485	-2.54	0.011
Household size	-0.0944891	-2	0.046
Primary_not completed	0.9040247	2.7	0.007
Primary_completed	0.7800874	2.34	0.019
Secondary not completed	1.055134	2.92	0.004
Secondary_completed	1.530723	3.95	0.000
Vocational	1.115586	1.85	0.064
University	1.69181	3.44	0.001
Masters_phd	14.46183	0.02	0.982
Has other residence out of Kigali city	-0.6050339	-1.25	0.213
Planning to migrate out of Kigali city	-0.2599254	-0.77	0.44
ubudehe_1	-1.669713	-2.11	0.035
Ubudehe_2	-0.1858665	-0.24	0.81
Ubudehe_3	-0.6006578	-0.79	0.427
_constant	1.06895	0.72	0.472
OWNERSHIP(dependent Outcome variable)	Coef. Std. Err.	z	P>z
Log_Income	0.0658599	1.25	0.211
Gender	0.0112296	0.06	0.953
Full-time employment	-0.8115213	-2.42	0.016
Self-employment	0.4033375	1.83	0.068
Occasional employment	-0.2679193	-0.95	0.344
Retiree	0.3737469	0.61	0.545

Household size	0.1586619	3.58	0
Primary_not completed	0.3091961	1.06	0.291
Primary_completed	0.2136628	0.73	0.464
Secondary not completed	0.0790879	0.24	0.807
Secondary_completed	0.269404	0.76	0.446
Vocational	0.4347493	0.77	0.44
University	0.8479792	1.84	0.065
Masters_phd	14.3452	0.02	0.982
Has other residence out of Kigali city	-0.1773002	-0.37	0.711
Planning to migrate out of Kigali city	0.9374411	2.84	0.005
ubudehe_1	-1.63449	-2.14	0.032
Ubudehe_2	-0.3360327	-0.44	0.657
Ubudehe_3	-0.4961734	-0.67	0.503
_constant	0.3645623	0.25	0.799
Free_accomodation	**(base outcome)**		

Desire to Migrate out of Kigali

Individuals willing to migrate out of Kigali are more likely to more likely to rent than those staying not willing to migrate. This means that an individual likely to migrate out of Kigali is less likely to own a house in Kigali by the above magnitude in comparison to a person not intending to migrate out of Kigali.

Ubudehe Categories

Relative to household heads in category 4, household heads in category 1 are less likely to rent. In other words, an individual in category 4 has a higher likelihood of 30% to own a house than an individual in the other ubudehe categories. This means as household's income improve their demand for better housing improves.

Looking at house ownership, households in full-time employment are less likely to own their houses relative to the unemployed, while larger households are more likely to own their homes.

In conclusion, given the major indirect relationship between income and the rest of the explanatory variables, ownership of houses can mainly be increased through improving household income.

Table II.XVIII Marginal Effects of the following explanatory variables on Renting within the City of Kigali

	Expression	**Pr(Q_4_5==Tenant), predict()**		
	dy/dx	Std. Err.	z	P>z
Log_Income	0.0162034	0.0045882	3.53	0.000
Gender	0.0400385	0.0133766	2.99	0.003
Full-time employment	0.0560067	0.0228058	2.46	0.014
Self-employment	-0.0159933	0.0146935	-1.09	0.276
Occasional employment	0.0297398	0.0231837	1.28	0.2
Retiree	-0.368538	0.0878902	-4.19	0.00
Household size	-0.0361414	0.0030526	-11.84	0.00
Primary_not completed	0.0899447	0.0287855	3.12	0.002
Primary_completed	0.0850548	0.0285935	2.97	0.003
Secondary not completed	0.1444347	0.0292551	4.94	0
Secondary_completed	0.1878806	0.029038	6.47	0
Vocational	0.1035454	0.0405105	2.56	0.011
University	0.1306115	0.032442	4.03	0
Masters_phd	0.1228458	4.678731	0.03	0.979
Has other residence out of Kigali city	-0.0643463	0.0235459	-2.73	0.006
Planning to migrate out of Kigali city	-0.1695664	0.021957	-7.72	0
ubudehe_1	-0.0172297	0.0414268	-0.42	0.677
Ubudehe_2	0.0196569	0.0340043	0.58	0.563
Ubudehe_3	-0.0190536	0.0321871	-0.59	0.554
_constant				

II.III Affordability Dynamics in the City of Kigali (In terms of renting)

Among the households that rent, within the lowest income quantile, they allocated 88% of their incomes to rent, whereas those in the highest income quantile, they averagely allocate 20% of their income to rent, see table II.XIX for details.

Among households with property in the city of Kigali, the value of their residential properties (including land and houses) ranges between 10m francs and 400m francs.

In comparison to their income streams, the lowest quantile requires approximately 24 years to purchase the same property, while those in the highest quantile require 16 years to purchase the current properties they own.

II.III.I Forecasting Housing Affordability

With an assumption that the income of the household head is the what is allocated to household rent, the housing affordability dynamics are computed within the scope the household head income. This income is projected to increase from the present 240,000 francs to 292,414 francs for the Lowest income earner in 2050 and from the current 6000,000 francs to 7310,342 by 2050 if the median household head income pattern grows by the same rates as the national growth patterns that are estimated to average approximately 7%, see table XXI for details for the respective income quantiles.

Triangulating the above income with current household rental fees and proportion of income allocated to rent, annual household rent is estimated to increase from 211,200 francs to 257,324 francs for the lowest income earners and from the present annual 1200,000 francs to 1,462,068 francs by 2050 for the highest income earners.

With the above household head income levels, affordability ratios and current market value of land and houses in City of Kigali, the lowest income earners require 5,7414,400 francs to construct a house and acquire land, this is projected to increase to 6,962,370 by 2050 in current (2018) prices. The middle-income earners can afford houses costing between 17m and 38m francs, this is projected to increase to 21m to 47m by 2050. On the other hand, the highest income earners need 96 million Rwanda francs to construct houses which is projected to increase to 116,965,474 by 2050 or its equivalent in current prices.

Table II.XIX Affordability Ratio (Proportion of Renting to Monthly Household Income)

Income Quantile	Median Income	Median Rent	Affordability Ratio
1(25%)	20,000	17,500	0.88
2(50%)	70,000	30,000	0.43
3(75%)	170,000	50,000	0.29
4(100%)	500,000	100,000	0.20

Table II.XX Affordability Ratio (Proportion of Property Value to Annual Household Income)

Quantile	Median Annual Income	Median Property Value Rent	Affordability ratio (Years needed to construct a house)
1(25%)	420,000	10,000,000	23.81
2(50%)	1,200,000	25,000,000	20.83
3(75%)	2,640,000	50,000,000	18.94
4(100%)	25,000,000	400,000,000	16.00

Table II.XXI Median Household Annual Income

Year	Q1 Annual Income	Q2 Annual Income	Q3 Annual Income	Q4 Annual Income
2018	240,000	840,000	2,040,000	6,000,000
2023	247,635	866,724	2,104,900	6,190,883
2028	255,376	893,816	2,170,697	6,384,402
2033	263,359	921,756	2,238,550	6,583,970
2038	271,591	950,569	2,308,524	6,789,776
2043	280,081	980,282	2,380,685	7,002,015
2048	288,836	1,010,924	2,455,102	7,220,889
2050	292,414	1,023,448	2,485,516	7,310,342

Table II.XXII Annual Rent by income Level

Year	Q1 Median Annual Rent	Q2 Median Annual Rent	Q3 Median Annual Rent	Q4 Median Annual Rent
2018	211,200	361,200	600,066	1,200,000
2023	217,919	372,691	619,156	1,238,177
2028	224,731	384,341	638,510	1,276,880
2033	231,756	396,355	658,469	1,316,794
2038	239,000	408,745	679,052	1,357,955
2043	246,471	421,521	700,279	1,400,403
2048	254,175	434,698	722,168	1,444,178
2050	257,324	440,083	731,115	1,462,068

Table II.XXIII Median value of affordable house for tenants (2018 prices)

YEAR	Q1 Median value of affordable house for tenants	Q2 Median value of affordable house for tenants	Q3 Median value of affordable house for tenants	Q4 Median value of affordable house for tenants
2018	5,714,400	17,497,200	38,637,600	96,000,000
2023	5,896,197	18,053,853	39,866,810	99,054,129
2028	6,080,504	18,618,193	41,112,994	102,150,429
2033	6,270,573	19,200,172	42,398,131	105,343,515
2038	6,466,582	19,800,344	43,723,440	108,636,413
2043	6,668,719	20,419,277	45,090,177	112,032,243
2048	6,877,175	21,057,556	46,499,636	115,534,221
2050	6,962,370	21,318,420	47,075,679	116,965,474

Projecting Housing Need (2018-2050)

In order to determine the housing need forecast per district, we use data collected by IPAR during the 208 housing survey. From this data , we calculate the total population by sector and also compute the average household size. By dividing the total population per sector by the mean household size, we then obtain the total number of houses needed.

We have also made projections on how household size is likely to grow in city of Kigali over time based on the 2012 census, EICV3, EICV4 and our own household survey of 2018 as shown table II.XXIV.

Our key assumption here is that Household size reduces by 0.1 every five years as adults move out of their parents homes to form new families/ households.

As part of the household survey, we collected data on the quality of existing houses within the city of Kigali including poor, fair and good houses. We have combined fair and good houses into one category of good houses . We used the census rate of growth of good houses of 2.6 every 10 years to project the growth of good houses every 7 years. This was the rate of growth of god houses between the 2002 and 2012 census years.

In order to project the housing need by district and sector we have subtracted projected houses needed from the projected good houses within the city of Kigali. Details by sector can be obtained from an excel sheet from which we have obtained the district housing need forecasts.

Table II.XXIV Household Survery of 2018

	Actual	Actual (census)	Actual	Actual (IPAR HH survey)	Projected Mean Household size					
Year	2011	2012	2014	2018	2025	2030	2035	2040	2045	2050
Mean Household size	4.7	3.9	4.5	5.2	5.1	5.0	4.9	4.8	4.7	4.6
change		-0.8	0.6	0.72						
Annual change		-0.8	0.3	0.18						
Average change used for projecting HH size	-0.1067									

Table II.XXV Projected Housing Need by District (2018-2050)

District	2018	2024	2031	2038	2045	2050
Nyarugenge Total	30374	42721	58453	76939	104244	125020
Gasabo Total	78,271	110,380	151,970	201,533	275,681	335,111
Kicukiro Total	40,983	60,991	86,994	118,053	164,654	202,208
City of Kigali Total	149,629	214,092	297,416	396,525	544,580	662,340

II.III.II Determining housing affordability based on Housing typologies

Based on the household survey conducted by IPAR within the city of Kigali,, data on monthly household incomes and expenditure is used to disaggregate households into 5 income categories including those earning less than 40,000Rwf (30%), those earning between 41,000 and 100,000(28%), those earning between 100,001 to 250,000Rwf per month(21%), those earning between 250,001 and 500,000Rwf per month (14%) and those earning over 500,000 Rwf per month (9%). For all the above categories, total income and expenditure ranges are computed by multiplying by the number of households in each income/ expenditure category. Average incomes, expenditures, and average rents for each category are computed in order to determine the disposable income that can be used to invest into affordable housing by households in each income class (see table II.XXVI).

In table XX, the different housing typologies including their purchase (construction costs including the cost of land) and rent cost are matched onto the income categories to determine which households can afford the different housing typologies. The key findings indicate that households who earn less than 40,000 Rwf can only afford to purchase rudimentary shelter only if they own the land on which their house will be located. These households can only afford to rent a small space which is below 30sqm when the shelter is rudimentary. Households that earn less than 40,000Rwf can neither afford to rent or purchase better housing typologies including low cost brick SKAT houses, bungalows and apartments.
This implies that social housing will be required as a policy option if these households are to benefit from decent affordable housing.

Households that earn between 40,001 and 100,000 Rwf can afford to purchase and rent rudimentarty shelter but can neither afford to rent or purchase other better housing typologies including apartments, bungalows and low cost brick houses. Again social housing would be a viable housing policy option for this class of households.

Households earning between 100,001 and 250,000Rwf monthly can afford to rent and purchase low cost skat type housing and medium house bungalow. Households earning between 250,001Rwf and 500,000Rwf are the ones that can afford to rent or purchase medium quality banglows and can be targeted by mortgage and low cost affordable housing loans.

Lastly households that earn over 500000Rwf per month are the only ones that can afford to rent or purchase an average quality apartment.

Table II.XXVI HH income and available resources based on declared income, expenditure, rent

Based on Montly declared Income and Expenditure												
Income Ranges				Total per Range				Average per HH				
RWF	USD	HH	HH %	Range Total Income (RWF)	Range Total Expenditure (RWF)	Income / Expenditure ratio	Average HH Income (RFW)	Average HH Total Expenditure	Average Rent	Available HH Cash after Rent	Available HH Cash Before Rent	USD equivalent
0 - 40.000	0 - 45	1117	30%	22,258,912	25,645,756	115%	19,927	22959	14,171	-3,032	11,139	12.3
41.000 - 100.000	46 - 112	1037	28%	75,539,500	68,472,706	91%	74,382	67801	41,848	6,581	48,428	53.3
100.001-250.000	113 - 280	778	21%	137,041,610	97,979,106	71%	207,542	156152	96,379	51,390	147,770	162.5
250001 - 500.000	281 - 560	516	14%	195,371,700	126,095,000	65%	531,893	369740	228,210	162,152	390,362	429.4
Above 500.001	Above 561	327	9%	557,848,000	249,121,801	45%	1,705,957	761840	470,220	944,117	1,414,337	1555.8
Total		**3770**	**100%**	**988,059,722**	**567,314,369**	**57%**						

Table II.XXVII Currently Affordable Typologies

						Shelter (rudimentary)		Semi temporary house (mud or concrete bricks, metal roofing)		Low cost brick row housing (SKAT type) - row housing		Medium quality bungalow		Villa		High Quality G+3 Apartment		High Quality G+7 Apartment	
Income ranges (RWF)	Income ranges (USD)	Household ds %	Household no.	Population	Available monthly repayment	Purchase	Rent	Purchase	Rent	Purchase	Rent	Purchase	Rent	Purchase	Rent	Purchase	Rent	Purchase	Rent
0 - 40.000	0-45	30%	77,348	386,739	$12.25	Only if owning land	Yes, Small DU below 30 sqm.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
41.000-100.000	46-112	28%	71,808	359,040	$53.27	YES	YES	Only if owning land	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
100.001-250.000	113-280	21%	53,873	269,367	$162.55	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO
250.001-500.000	281-560	14%	35,731	178,654	429.40					YES	YES	YES	YES	NO	NO	YES	YES	NO	NO
Above 500	above 561	9%	22,643	113,217	1,555.77							YES	YES	YES	YES	YES	YES	YES	YES
TOTAL	TOTAL	100%	261,057	1,305,286															

Annexes

Distribution of household heads by gender, educational attainment disaggregated at a sector level

DISTRICT 1: GASABO

Highest level of education	Bumbogo	Gatsata	Gikomero	Gisozi	Jabana	Jali	Kacyiru	kimihurura	Kimironko	Kinyinya	Ndera	Nduba	Remera	Rusororo	Rutunga
No formal education	920	220	289	259	791	545	222		416	734	664	953	235	764	672
Primary not completed	1249	440	687	862	304	644	444	333	520	1362	1476	902	862	1083	885
Primary completed	1315	1247	723	1034	1034	792	962	523	520	1153	1181	1053	706	1401	708
Secondary Not completed	329	293	145	517	243	297	1257	381	416	1467	443	201	862	510	71
Secondary completed	197	660	431		243	248	444	333	1353	838	517	50	1098	255	35
Vocational training	131	660	72	259	426	149	74	48	104	524	148	201	392	255	71
University Level	197	587	431		243	50	518	714	1873	210	148		1019	127	
Masters/PHD			172		61	99	370	143	520	210			314		
Total	4339	4107	2950	2930	3346	2823	4290	2474	5722	6498	4577	3359	5488	4395	2442

DISTRICT 2: NYARUGENGE

Highest level of education	Gisozi	Gitega	Kanyinya	Kigali	Kimisagara	Mageragere	Muhima	Nyakabanda	Nyamirambo	Nyarugenge	Rwezamenyo
No formal education	86	284	732	849	169	967	356	279	263	367	162
Primary not completed	86	454	942	653	932	1018	416	391	876	550	121
Primary completed	86	1192	889	587	1440	560	831	502	1051	504	445
Secondary Not completed		568	52	587	2118	153	653	837	613	183	243
Secondary completed		625	262	326	1016	102	653	446	350	596	324
Vocational training		170	157	131	169	51	416	279	88	92	121
University Level	86	170			254		297	112	350	321	162
Masters/PHD							178	56		92	
Total	345	3463	3035	3133	6098	2850	3800	2902	3591	2705	1579

DISTRICT 3: KUCIKIRO

Highest level of education	Gahanga	Gatenga	Gikondo	Kagarama	Kanombe	Kicukiro	Kigarama	Masaka	Niboye	Nyarugunga
No formal education	363	533	126	182	176	73	341	232	107	320
Primary not completed	967	977	168	73	615	365	1108	852	54	559
Primary completed	423	889	461	145	966	182	767	1162	484	559
Secondary Not completed	363	533	503	218	527	182	682	697	430	479
Secondary completed	242	889	293	73	702	401	937	387	645	1278
Vocational training	242	355	209	36	263	73	85	232	215	240
University Level	121	711	377	255	1141	292	256	542	645	799
Masters/PHD		444	126	182	88	109	85	232	376	320
Total	2720	5331	2261	1164	4478	1679	4261	4338	2955	4554

GASABO DISTRICT

Sex	No formal education	Primary not completed	Primary completed	Secondary Not completed	Secondary completed	Vocational training	University Level	Masters/PHD
Male	4,467	8,794	11,124	5,506	5,681	3,121	5,225	1,767
Female	3,218	3,260	3,228	1,926	1,020	392	891	122
Total	7,684	12,054	14,352	7,432	6,702	3,512	6,116	1,888

NYARUGENGE DISTRICT

Sex	No formal education	Primary not completed	Primary completed	Secondary Not completed	Secondary completed	Vocational training	University Level	Masters /PHD
Male	2,004	3,739	5,831	3,837	3,314	1,074	1,609	220
Female	2,510	2,699	2,258	2,171	1,386	599	143	105
Total	4,514	6,438	8,089	6,007	4,701	1,674	1,752	326

KUCIKIRO DISTRICT

Sex	No formal education	Primary not completed	Primary completed	Secondary Not completed	Secondary completed	Vocational training	University Level	Masters /PHD
Male	1,086	4,027	4,186	3,110	4,352	1,373	4,427	1,920
Female	1,366	1,711	1,852	1,504	1,496	579	711	42
Total	2,452	5,737	6,038	4,614	5,848	1,952	5,138	1,962

Distance to work place by Geographical Sector

Distance to workplace	Less than 500 m	500m to 1 km	1km to 2 km	2 to 5km	5 to 10 km	More than 10Km
Bumbogo	1,381	592	657	526	66	329
Gahanga	665	484	423	181	121	181
Gatenga	977	444	533	711	622	622
Gatsata	880	880	220	660	293	147
Gikomero	831	470	253	181		72
Gikondo	712	168	168	84	293	42
Gisozi	1,379	345	345	603	345	259
Gitega	1,135	397	625	57	57	114
Jabana	1,278	548	183	61	365	243
Jali	842	495	396	248	50	248
Kacyiru	1,405	148	370	444	444	222
Kagarama	109	327	109	145	109	109
Kanombe	966	527	88	88	351	790
Kanyinya	889	314	157	262	314	105
Kicukiro	292	292	73	36	146	36
Kigali	914	718	326	261	261	65
Kigarama	1,364	767	256	256	256	170
Kimihurura	571	428	95	381	238	238
Kimironko	728	1,040	416	624	624	208
Kimisagara	932	847	932	508	593	593
Kinyinya	1,677	838	943	629	314	314
Mageragere	916	865	356	153	102	102
Masaka	1,007	1,162	465	232	77	542
Muhima	1,188	831	356	178		
Ndera	1,698	295	664	295	369	443
Nduba	1,604	652	602	50	100	50
Niboye	537	376	54	161	376	376
Nyakabanda	558	279	223	223	167	56
Nyamirambo	701	526	175	263	438	263
Nyarugenge	504	275	275	275	183	92
Nyarugunga	1,118	399	240	240	399	719
Remera	1,490	470	784	627	235	235
Rusororo	1,783	510	510	191	255	318
Rutunga	885	319	248	106		35
Rwezamenyo	648	40	40		40	81

Geographical distribution of household head place of work by District

Nyarugenge	26,331
Gasabo	42,889
Kicukiro	20,594
Nyanza	74
Gisagara	80
Huye	191
Ruhango	135
Muhanga	360
Kamonyi	238
Karongi	78
Rutsiro	88
Ngororero	85
Rusizi	85
Rulindo	50
Gakenke	85
Musanze	90
Burera	54
Rwamagana	101
Nyagatare	74
Gatsibo	46
Kayonza	42
Kirehe	57
Ngoma	80
Bugesera	214
Total	92,119

Distribution of transport mode children use to travel to school at sector level

Sector	Walking	Cycling	Motorcycle	Public transport (Bus)	Private car
Bumbogo	2,433		131		
Gahanga	1,814		60	121	60
Gatenga	2,666		89	178	533
Gatsata	2,567				73
Gikomero	1,554		36		
Gikondo	754		168		42
Gisozi	2,068		172		172
Gitega	1,476		57	227	170
Jabana	2,068		61		122
Jali	1,684		99		248
Kacyiru	1,479		74	148	296
Kagarama	364		36	109	73
Kanombe	1,756	88	88	88	439
Kanyinya	1,779				
Kicukiro	438		73		109
Kigali	1,371				
Kigarama	2,301		85		85
Kimihurura	999		48	95	333
Kimironko	1,561		104	624	416
Kimisagara	2,710		169		85
Kinyinya	3,878		105		105
Mageragere	1,578				
Masaka	2,556	77	155		155
Muhima	1,603		59		59
Ndera	2,879	74	74		295
Nduba	1,805		50		
Niboye	860		54		430
Nyakabanda	1,562		112		
Nyamirambo	1,752		88		88
Nyarugenge	1,330		46	138	138
Nyarugunga	1,598		240		240
Remera	1,803		235		157
Rusororo	3,185		64	127	
Rutunga	1,734				
Rwezamenyo	688		121		40
Total	62,651	239	2,953	1,855	4,963

Descriptive statistics in terms of mean and median transport time-to-school for children disaggregated at sector level

SECTOR	mean	p50	cv	min	Max
Bumbogo	267	300	0.390	150	350
Gahanga	1275	1275	0.804	550	2000
Gatenga	945	235	1.843	200	4500
Gatsata	826	440	0.923	20	2300
Gikomero	4800	4800	.	4800	4800
Gikondo	786	500	1.313	30	2600
Gisozi	547	466	0.519	250	1000
Gitega	433	275	0.721	200	1000
Jabana	745	575	0.739	300	2000
Jali	600	600	0.236	500	700
Kacyiru	563	600	0.407	250	800
Kagarama	425	250	0.747	200	1000
Kanombe	490	400	0.622	200	1000
Kanyinya	.	.	.	.	.
Kicukiro	800	600	0.586	500	1500
Kigali	.	.	.	.	.
Kigarama	383	260	1.120	10	1000
Kimihurura	482	262	0.934	20	1100
Kimironko	1172	275	1.811	200	7000
Kimisagara	1417	950	0.995	300	3000
Kinyinya	222	216	0.115	200	250
Mageragere	.	.	.	.	.
Masaka	673	673	1.320	45	1300
Muhima	310	250	0.448	200	550
Ndera	500	500	.	500	500
Nduba	1500	1500	.	1500	1500
Niboye	1705	1800	0.544	500	2720
Nyakabanda	391	350	0.466	220	700
Nyamirambo	590	350	0.898	200	1500
Nyarugenge	840	900	0.656	30	1500
Nyarugunga	700	450	0.543	360	1200
Remera	617	475	0.946	20	2000
Rusororo	815	1000	0.628	60	1200
Rutunga	.	.	.	.	.
Rwezamenyo	448	450	0.718	40	1000
Total	723	430	1.311	10	7000

Geographical distribution of schools where children study disaggregated at cell

Cell in which the school where your children study is located?	Gasabo	Nyarugenge	Kicukiro
	22,453	15,339	14,700
999	1,559	1,300	778
Agasharu	61		
Agatare		138	
Agateko	149		
Akabahizi		141	
Akamatamu	365		
Akatabaro		169	
Amahoro		178	
Amakawa	61		
Ayabakore	74		
Ayabaraya			465
Bibare	639		301
Biryogo		523	54
Bugaragara		59	
Bugesera			85
Buhiza	50		
Busanza			263
Butare	251		
Bweramvura	183		
Bwerankori	74		765
Bwiza	295		
Cyahafi		119	
Cyarunzinge	74		
Cyaruzinge	507		80
Cyimo	64		620
Cyinyana	36		
Cyivugiza		544	

Cyuga	61		
Gacuriro	48	86	
Gacyamo		57	
Gahanga			484
Gako			77
Gasabo	566		
Gasagara	463		
Gasanze	205		
Gasave			36
Gasharu	210	88	
Gashura	50		
Gasura	351		
Gatare			395
Gatenga		57	889
Gatsata	73		
Gatunga	50		
Gicaca	289		
Gicaca and Munini	36		
Gihogwe	147		
Gikondo		46	85
Giporoso			107
Gishushu	48		
Gisozi	48		
Gitaraga			465
Gitega		59	42
Igishaka	35		
Jurwe	36		
Kabagari	74		
Kabahizi		169	
Kabakene		59	
Kabasengerezi	73	59	
Kabeza		119	660
Kabidandi			60
Kabuga		59	
Kabuga 1	382		
Kabuga 2	127		
Kabuguru 2		125	

Kabunzu		46	
Kabusunzu		361	
Kabuye	548		
Kabuye 1	64		
Kacyatwa	101		
Kacyiru	256		134
Kacyiru 1	74		
Kagarama	66		89
Kagasa			496
Kagina	78		
Kagugu	2,698		
Kagunga			378
Kamashashi	64		967
Kamatamu	435		
Kamuhoza		508	
Kamukina	48		
Kamusare	35		
Kamutwa	565		
Kamutwe	74		
Kankuba		356	
Kanombe			80
Kanserege		57	78
Karama		65	615
Karambo			800
Karubandi		56	
Karugira			682
Karurayi			85
Karuruma	293		
Katabaro		169	
Katare			54
Kavumu		102	
Kibagabaga	1,423		77
Kibara	289		
Kibaza	74		
Kibenga	1,054		
Kicukiro		88	36
Kicyacya	64		

Cell in which the school where your children study is located?	Gasabo	Nyarugenge	Kicukiro
	22,453	15,339	14,700
999	1,559	1,300	778
Agasharu	61		
Agatare		138	
Agateko	149		
Akabahizi		141	
Akamatamu	365		
Akatabaro		169	
Amahoro		178	
Amakawa	61		
Ayabakore	74		
Ayabaraya			465
Bibare	639		301
Biryogo		523	54
Bugaragara		59	
Bugesera			85
Buhiza	50		
Busanza			263
Butare	251		
Bweramvura	183		
Bwerankori	74		765
Bwiza	295		
Cyahafi		119	
Cyarunzinge	74		
Cyaruzinge	507		80
Cyimo	64		620
Cyinyana	36		
Cyivugiza		544	
Cyuga	61		
Gacuriro	48	86	
Gacyamo		57	
Gahanga			484
Gako			77
Gasabo	566		
Gasagara	463		
Gasanze	205		
Gasave			36
Gasharu	210	88	
Gashura	50		
Gasura	351		
Gatare			395
Gatenga		57	889
Gatsata	73		
Gatunga	50		
Gicaca	289		
Gicaca and Munini	36		
Gihogwe	147		
Gikondo		46	85
Giporoso			107
Gishushu	48		
Gisozi	48		
Gitaraga			465
Gitega		59	42
Igishaka	35		
Jurwe	36		
Kabagari	74		
Kabahizi		169	
Kabakene		59	
Kabasengerezi	73	59	
Kabeza		119	660
Kabidandi			60
Kabuga		59	
Kabuga 1	382		
Kabuga 2	127		
Kabuguru 2		125	
Kabunzu		46	
Kabusunzu		361	
Kabuye	548		
Kabuye 1	64		
Kacyatwa	101		
Kacyiru	256		134

Kacyiru 1	74		
Kagarama	66		89
Kagasa			496
Kagina	78		
Kagugu	2,698		
Kagunga			378
Kamashashi	64		967
Kamatamu	435		
Kamuhoza		508	
Kamukina	48		
Kamusare	35		
Kamutwa	565		
Kamutwe	74		
Kankuba		356	
Kanombe			80
Kanserege		57	78
Karama		65	615
Karambo			800
Karubandi		56	
Karugira			682
Karurayi			85
Karuruma	293		
Katabaro		169	
Katare			54
Kavumu		102	
Kibagabaga	1,423		77
Kibara	289		
Kibaza	74		
Kibenga	1,054		
Kicukiro		88	36
Kicyacya	64		
Kidashya	365		
Kigabiro	802		
Kigali		447	
Kigarama		159	301
Kigarama,Bwenkori			54
Kimihurura	1,067		42

Kimironko	66	40	335
Kimisagara	147	1,101	
Kimisange		51	
Kinunga			432
Kinyana	318		
Kinyange		284	
Kinyinya	78		
Kirehe,Nyakarambi	73		
Kiyovu	356	1,107	42
Kora		40	
Ku murenge wa Rutunga	35		
Kuyovu		57	
Masoro	722	103	60
Mataba		763	
Mayange			36
Mbandazi	446		
Mubuzima		59	
Mugare	73		
Mugeyo	64		
Muhanga	50		
Muhima	147	57	
Muhororo	61		
Mukuyu	810		
Mumena	99	236	
Munanira		112	
Munanira 1		279	
Munanira 2		308	
Munini	542		
Murama	734		
Muremure	451		
Musanze			85
Musave	805		
Musezero	794	86	
Muyange			182
Muyumbu	64		
Mvuzo	197		
Mwendo		326	

Ndera	104		
Ngara	526		
Ngiryi	415		
Ngoma	50		182
Niboye	157	85	599
Nkusi	743		
Nkuzuzu	74		
Nombe	36		
Nonko			80
Nunga			605
Nvuzo	263		
Nyabikenke	263		
Nyabisindu	157		
Nyabugogo	563	1,099	
Nyabuliba	50		
Nyacyonga	61		
Nyagahinga	446		
Nyagasozi	131		
Nyagatovu	416		
Nyagisozi	50		
Nyakabanda	78	141	107
Nyakabanda 1		88	
Nyakabanda 2		85	
Nyakabungo	198		
Nyamabuye	343	65	
Nyamirambo			36
Nyamitanga	347		
Nyamugari	880		
Nyamweru		105	
Nyange	74		
Nyanza			770
Nyarufunzo		254	
Nyarugenge	104	138	88
Nyarugunga	74		36
Rubingo	99		
Rubirizi			439
Rubungo	66		
Rudashya	221		
Rugabo			89

Rugando	742		
Rugarama		613	
Rugenge	48	59	
Rugira			89
Rugunga			120
Ruhanga	318		
Ruhango	1,120	272	
Rukatsa			347
Rukatsi			89
Rukiri			90
Rukiri 1	78		77
Rukiri 2	314		
Rukiri I	78		
Runzenze		51	
Rusheshe			930
Rutonde		52	
Rwamagana	64		
Rwamapara			170
Rwamashyongoshyo	64		
Rwampara		183	127
Rweri	318		
Rwezamenyo		546	
Rwezamenyo 1		466	
Rwezamenyo 2		96	
Rwimbogo			320
Rwintare	74		
Sasabirago	36		
Sha	301		
Shango	567		
Shyorongi		52	
Taba		942	
Tabaro		57	
Tetero	86		
Ubumwe	74	238	KET STUDY
kabuga 1	64		
kabuguru 1		56	
Kabusunzu		85	
Karitas		88	
Kibala	36		
kuri EPA		46	
Total	59,740	33,501	33,741

Annexure III: Commercial Real Estate Study in City of Kigali

III.I Executive Summary

- The commercial real estate study was conducted in order to understand current and expected future demand in the city of Kigali's commercial real estate market, understand market confidence and determine the drivers of rent. In addition, the study was done to determine the impact of zoning regulations on market performance, determine challenges faced by players in the market and suggest recommendations to improve market performance. The following are the key findings from study
- Proximity to customers and building quality and design matter; Findings from the descriptive statistics show that the key factors for the choice of buildings to rent was mainly proximity to customers and the prestige that comes with rent premises by businesses. These issues seem to outweigh the rent factor implying that in addition to rents, building design, quality and proximity or access to customers matter.
- Regression findings show that zoning regulations are a significant driver of rents within the city of Kigali. Relative to higher rise buildings, commercial buildings in the lower rise zones seem to attract lower rents. According the qualitative findings this is possibly due to high interest funding sources which are used to raise high rise buildings. These directly translate into high rents.
- The majority of businesses that rent commercial buildings within the city of Kigali are small and medium in nature. These are sometimes not able to afford high rents charged by high class buildings in prime areas within the city of Kigali.
- According to qualitative findings, the building permits approval processes sometimes take too long which affects returns on commercial real estate projects since all these investments are implemented using loans which accrue interest as well. The longer approvals are delayed the higher interest rates accrued on construction loans and mortgages. However, delays in the approval process are also sometimes caused by incompetent architects and engineers who hired by commercial real estate developer who fail to translate master plan regulations into proper architectural and building plans.
- Market confidence in the city of Kigali's commercial real estate is mainly medium to low. The majority of commercial real estate owners expressed little optimism in having viable commercial real estate properties if the rate of development continues as it is. 10% of the developers asked for some government policy intervention to increase commercial viability of their buildings.
- According to the qualitative findings, bank rates imposed on commercial real estate investors are too high resulting into stress and high rents since they fail to figure out on how to recover the money in a short period of time once units remain unoccupied for a long time after completio

Following from the above findings, the following are our key policy recommendations

- There is need for accountability and quick turnaround times during the construction permit process. The city of Kigali should be able to inform architects and constructors on how long they can get work started and how long they can wait for approvals. In addition, there is need to update of information especially on their websites concerning change of building regulations.

- Allow Incremental construction: There is need for flexibility in building regulations from the City authorities in order to allow for incremental construction of commercial buildings in city. This will reduce the pressure to borrow and develop properties at exorbitant interest rates by the owners. Flexibility in building regulations should also allow the use of locally available construction materials. Incremental construction and the use of locally available building materials will help lower rents and increase occupancy rates

- There is a need for flexible financing arrangements such as the pooling of resources by several commercial real estate developers in order to get favorable loan terms which then translate into favorable rental terms for small and medium enterprises

- Owners of commercial buildings should allow flexible rental arrangements such as the sharing of office space or commercial space among several small and medium enterprises. These will allow SMEs to afford prime locations which are close to their clients

- Sound market analysis is urgent for developers: For buildings with low occupancy rates, commercial real estate developers need to study the types of businesses that they are targeting to rent their buildings after completion. They need to do sound market studies so that the commercial real estate buildings meet both quality needs and affordability needs of the businesses they are targeting.

III.II Introduction

Zoning regulations in Kigali City have had a major impact on commercial real estate, notably rents. Rents that commercial property owners charge are often based on cost and frequently unaffordable to target businesses. However, the extent and nature of the challenge of ensuring supply meets demand and that commercial real estate development supports wider densification and spatial planning goals, has not been studied in depth, and baseline information is not readily available on commercial real estate at present.

The objective of the project is to generate a quantitative and qualitative analysis of current and expected market supply, demand and confidence, assess the impact of Master Plan zoning regulations as they have been enforced so far, and propose policy directions that will achieve better market performance.

III.III Methodology

TThe city of Kigali commercial real estate study was aimed at understanding the supply and demand of the commercial real estate market in Kigali city. In addition, the study was aimed at determining whether the Kigali master zoning regulations have an effect on the pricing and the occupancy rates within commercial real estate markets in Kigali City

As part of the exercise, we conducted a survey among 1476 tenants and 456 commercial buildings owners within 9 commercial centers in the city of Kigali. These commercial centers included Nyarugenge (the Central Business District), Nyabugogo, Nyamirambo, Gisozi. Kacyiru, Remera. Kimironko, Nyamirambo. Information elicited from commercial real estate survey included; location specific aspects of commercial buildings; occupancy rates, pricing in terms of rent and rent components, commercial real estate by usage type; construction costs and others; In addition, we conducted surveys among tenants in order to get some understanding of the demand side within Kigali's Commercial real estate market.

Lastly, we held key informant interviews with stakeholders' architects, owners of

buildings and tenants occupying these buildings of which we were informed in detail the procedures taken before and after establishing commercial real estates.

Commercial Real estate supply side data obtained and computed from the City of Kigali Building Permits Information database which spans three years between 2015 and 2018.

III.IV The Supply of Floor Space within the City of Kigali (2015-2018)

According to data from the City of Kigali Building Permit Management Information System(BPMIS) total floor space for all types f construction permits that have been issued in the city of Kigali between 2015 and 2018 is about 40.8 million square meters. Of these, the majority of the new construction is taking place in the mainly residential districts of Gasabo and Kicukiro which account for 19.4 million sq. Meters and 17.5 million sq meters respectively. Nyarugenge which is a commercial district hosting the Central Business District of Kigali city only accounts for 3.86million sq. meters (9%)of the new total floor space that will be realized in the near future. The reason we refer to this as anticipated supply of floor space is that once potential developers apply for building permits some may complete their buildings within the required time while others fail to do so in time.

A further breakdown of the types of building permits that have been issued over the last three years shows that most of the new construction is mainly residential and accounts for 61% (or 24.9 million square meters of anticipated floor space within the city of Kigali. Commercial real estate

City of Kigali Anticipated Floor Space supply by District (2015-2018)

District	Total Floor space	Percent
Gasabo	19,400,000	48%
Kicukiro	17,500,000	43%
Nyarugenge	3,862,285	9%
TOTAL	40,762,285	100%

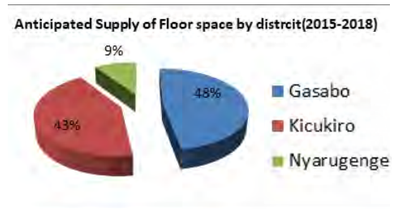


Figure III.I Anticipated supply of floor space by District (2015-2018)
Source: City Of Kigali One stop center BPMIS

floor space comes seconds in terms of anticipated supply of commercial space and account for 20.5% (8.36 million sq. meters) of the anticipated supply of floor space within the city of Kigali. With the re-allocation of the industrial zone to Bugesera, industrial buildings account for 10% of the anticipated floor space and this is likely to reduce further as more industrial move to the designated industrial zones.

III.V Sampled Commercial Buildings / Properties by Location within Kigali City

TThe locations of sampled commercial building/properties with respective to districts are reported here. Gasabo district had the highest number of commercial buildings in our sample with 255 (55.9%), followed by Nyarugenge with 169(37.1%) while Kicukiro had the lowest number of commercial buildings sampled with 32 (7%). (Table III.II and Figure III.III)

Commercial Building/ Property per Commercial Center

In terms of commercial building sampled In terms of commercial building sampled by commercial center, Kimironko had the highest with 98 commercial buildings making up 21.5% of the sample. Nyarugenge (Mumugi) ranked the second with 89 (19.5%) commercial buildings while Kimihurura had low number with 13 commercial building making up 2.9% of the sample.

III.VI Tenants Perceptions on the Quality of Commercial Buildings within the City of Kigali

Regarding the quality of commercial building, table 3 and figure 3 shows that the majority of the tenants (i.e. 52%) regarded their buildings as medium quality of commercial buildings. 10.4 percent of the buildings were regarded high quality buildings located in prim locations while 11% were regarded hig quality buildings located in sub-prim locations within Kigali city.391 tenan making up 26.5% of the sampled tenan regarded the commercial buildings th rented being low quality

City of Kigali Total floor space Building Use 2015-2018

Building use	Total floor space (Sqm)	Percent
Agricultural building	13,137	0.03%
Commercial buildings	8,368,752	20.50%
Educational buildings	751,015	1.84%
Health buildings	328,436	0.80%
Industrial buildings	3,857,076	9.45%
Infrastructure buildings	61,197	0.15%
Mixed use buildings	815,027	2.00%
Modified Buildings	767,921	1.88%
Office buildings	591,195	1.45%
Residential buildings	24,900,035	61.01%
Social and cultural building	304,906	0.75%
Others	56,401	0.14%
Total	**40,815,098**	**100%**

Source: Building Permits MIS, City of Kigali one stop center 2015-2018

Table III.I Sampled Commercial buildings per District

District	No. of Buildings	Percent
Nyarugenge	169	37.1
Gasabo	255	55.9
Kicukiro	32	7.0
Total	**456**	**100.0**

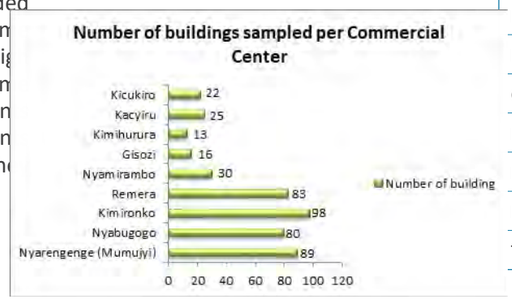


Table III.II Sampled Commercial buildings per Commercial Centre

Commercial Center	Number of building	Percentage
Nyarengenge (Mumujyi)	89	19.5
Nyabugogo	80	17.5
Kimironko	98	21.5
Remera	83	18.2
Nyamirambo	30	6.6
Gisozi	16	3.5
Kimihurura	13	2.9
Kacyiru	25	5.5
Kicukiro	22	4.8
Total	456	100

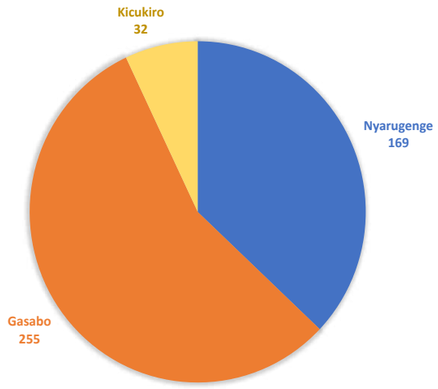


Figure III.II Commercial Buildings per District

Table III.III Quality of Sampled Commercial Buildings

QUALITY OF COMMERCIAL BUILDING	TENANT'S VOTE	PERCENTAGE
High quality building located in a prime location within the city	154	10.4
High quality building located in a sub-prime location within the city	166	11.2
Medium quality building	765	51.8
Low quality building	391	26.5
Total	**1476**	**100**

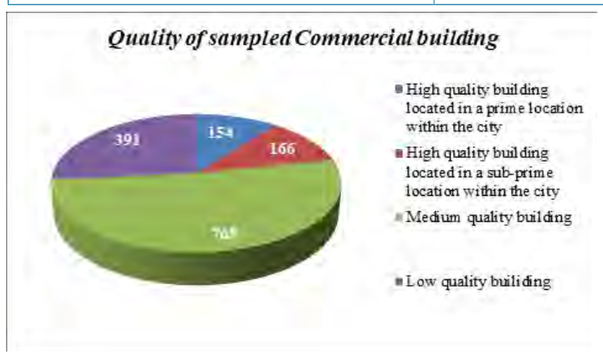


Figure III.III Quality of sampled Commercial building

III.VII Source of Funds for Commercial Building/ Property in Kigali

It can be inferred from Table 4 and figure 4 that private equity is the major source of fund for commercial building/property in Kigali City. Private equity has funded 246 (53.9%) of the commercial buildings which are more than half of sampled buildings. The reason is that private equity charges slightly low interest rates compared to commercial banks or buys shares from those buildings. About 167 (36.6%) commercial buildings in Kigali City were funded by single commercial bank. Members' shares have been able to fund 9 (2%) commercial buildings. Only 8 (1.8%) commercial buildings got fund from more than one bank. Besides, foreign investors and foreign banks funded 3(0.7%) and 1(0.2%) commercial buildings respectively..

III.VIII Occupancy rates by Commercial Node

SSurvey findings show that average occupancy rates within the sample of 456 commercial buildings surveyed within Kigali City is 85%. However, the high occupancy by commercial node is Remera (93.1%) followed by Nyabugogo (89.5%) while Gisozi and Kicukiro have low average occupancy rates of commercial buildings at 77.6% and 75.8% respectively.

Commercial buildings with Occupancy rates below 50%

DData included in Table 6 below indicate

Table III.IV Source of construction funds

QUALITY OF COMMERCIAL BUILDING	NO.	PERCENTAGE
Private equity	246	53.9
Single commercial bank	167	36.6
More than one bank	8	1.8
Member's shares	9	2.0
Foreign bank/ investors	1	0.2
Foreign investors	3	0.7
Other	22	4.8
Total	**456**	**100**

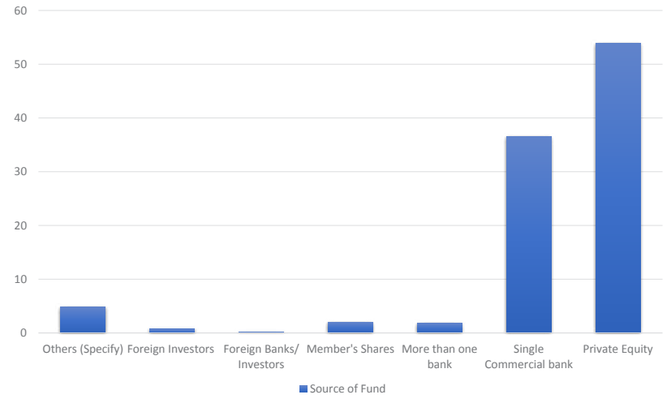


Figure III.IV Source of fund

that Nyarugenge has the highest number of under-occupied commercial buildings with 14 buildings occupied less than 50%. The second under-occupied commercial center is Kimironko with 11 buildings occupied less than 50%. Moreover, the less unoccupied commercial centers are Kimihurura and Nyamirambo with 2 buildings occupied below 50%. Some of the reasons for these differences in occupation rates of commercial buildings are renting cost and population density

Occupancy rates by the year building were opened for business

AAs shown in Figure 7, although there is a bit volatility in the occupancy rates by the year building were opened for business; occupancy rates for buildings that were opened in the last eight years generally show a downward trend. This corresponds to the period when implementation of the 2012 master plan was in force. Prior to the implementation of the master plan, occupancy rates

Table III.V Occupancy Rates

No.	Quality of commercial building	No.	Min.	Mean
1	Nyarugenge CBD	89	0.00	82.1
2	Nyabugogo	79	0.00	89.5
3	Kimironko	97	0.00	86.3
4	Remera	83	36.36	93.1
5	Nyamirambo	30	25.00	86.4
6	Gisozi	16	0.00	77.6
7	Kimihurura	13	0.00	84.6
8	Kacyiru	25	14.29	89.3
9	Kicukiro	22	0.00	75.8
	City of Kigali average Occupancy Rate	**454**		**85**

Table III.VI Occupancy Building with Occupancy rates below 50%

Quality of commercial building	No.	Percent
Nyarugenge CBD	14	38
Nyabugogo	9	20
Kimironko	11	21
Remera	4	42
Nyamirambo	2	31
Gisozi	4	31
Kimihurura	2	0
Kacyiru	3	33
Kicukiro	5	20

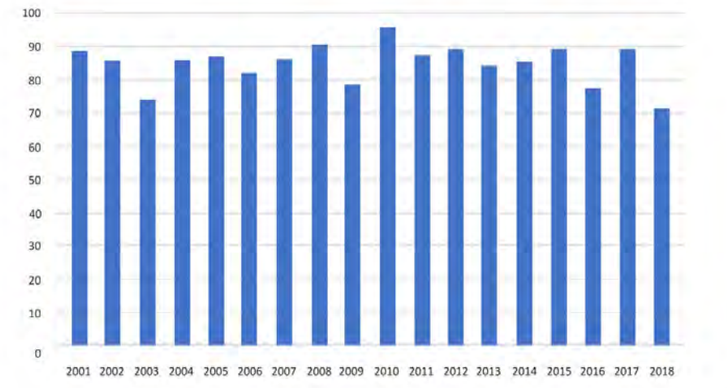


Figure III.V An occupancy rate by year building was opened for business

steadily increased between 2004 and 2010. It could be the case that master plan zoning regulations may be correlated with occupancy rates for buildings opened after 2012 but this will be investigated further using regression analysis. Qualitative information from commercial real estate developers indicates that zoning regulations sometimes push prime land owners into borrowing money at high interest rates in order to construct buildings of required high standards within the city. High interest rates charged by commercial banks for recently constructed commercial buildings push commercial estates owners into raising rents in order to pay back bank loans. In addition, most of the businesses in Kigali are small and medium type which cannot afford prime buildings rents. As a result, people have adopted shared office system which
has been emerged in the past few years; this is seen on the figure below, as occupancy rates reduction is high in the last year and the beginning of 2019.
.

III.IX Occupancy rate by Market segment

The data presented in Table 9 indicate that most of the commercial buildings are located in the sub-urban area. The reason is that there were places to build new houses in those areas while in central business city district, most of the time to build a new house requires to pull down the existing houses and plots are very expensive where available. Another reason is that many people are living in the suburban areas, thus, building commercial estates in the same area helps them to get cheaper rent compared to that of central business city as many of them do small businesses. In addition, getting commercial building in those areas ease daily transportation cost for business owners, especially, those staying in the same place.
Table 10 reveals that Kimironko has many commercial buildings 94 are located in the suburban area. The reason is that there were places to build new houses in those areas while in central business city district, most of the time to build a new house requires to shut down the existing houses and plots are very expensive where available. Other reason is that many people are living in the suburban areas, thus, building commercial estates in the same area helps them to get cheaper rent compared to that of central business city as many of them do small businesses. In addition, getting commercial building in those areas ease daily transportation cost for business owners, especially, those staying in the same place.

Table III.VII Reasons for renting buildings

Reasons	No. of Tenants	Percent
Prestige that comes with this location	269	18.2
Cheaper price of floor area	214	14.5
Proximity to clients of my business	683	46.3
Proximity to complimentary services to my business	184	12.5
Availability of reliable Internet Access in this building	7	0.5
Attractive quality of the building	24	1.6
Others (Specify)	95	6.4
Total	**1476**	**100**

III.X Reasons for Renting Buildings

Table III.VIII summarizes the reasons fTable 7 summarizes the reasons for renting commercial buildings in the selected commercial centers. Our findings show that the proximity to clients and location prestige are the key reasons for renting commercial buildings with 46.3% and 18.2% respectively. The availability of reliable internet ranked last with 0.5%. Surprisingly, renting costs and attractive quality of the buildings were ranked lower than prestige associated with the building and proximity to clients by the business persons who are renting commercial buildings.

III.XI Tenants by Commercial Nodes

Table III.VIII Tenants Per commercial nodes

No.	Commercial node/center	Number of Tenants	Percentage
1	Nyarungenge (Mumujyi)	316	21.4
2	Nyabugogo	250	16.9
3	Kimironko	220	14.9
4	Remera	192	13.0
5	Nyamirambo	185	12.5
6	Gisozi	69	4.7
7	Kimihurura	21	1.4
8	Kacyiru	51	3.5
9	Kicukiro	172	11.7
	Total	**1476**	**100**

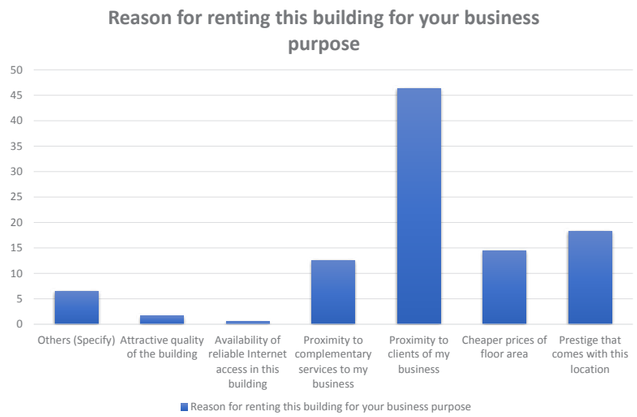
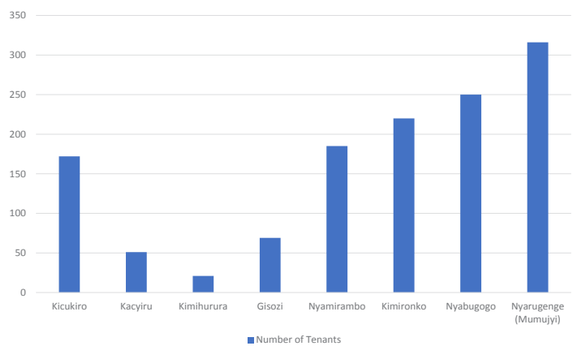


Figure III.VI Occupancy rate by Commercial Nodes



It can be inferred from Table 8 and Figure 6 that Nyarugenge (Mumugi) has many tenants than other commercial nodes/ centers with 316 (21.4%) tenants of total sampled tenants in this survey. Despite Nyarugenge (Mu mujyi) has many buildings occupied below 50%, it ranks first in terms of many tenants because it has many commercial buildings with high heights in terms of number of floors. Nyabugogo ranked second with 250 (16.9%) tenants, Kimironko ranked third with 220 (14.9%) tenants and Remera ranked fifth with 192 (13%) tenants. Kimihurura and Kacyiru are the two commercial nodes/centers having low number of tenants with 21(1.4) and 51(3.5) tenants respectively.

Table III.IX Occupancy rate by Metropolitan Statistical Area

Commercial Building/ Property location (MSA)		N	Min.	Max.	Mean	Std. Deviation
Central Business District	Occupancy rate	80	0	100	82	21
City Suburb	Occupancy rate	314	0	100	88	24
Down town	Occupancy rate	60	0	100	86	30

*MSA: Metropolitan Statistical Area

Table III.X Commercial Real Estate Rents per unit by Commercial Node

Monthly Rent per unit by Commercial Center (RWF)					
Commercial node/ Center	N	Min.	Max.	Mean	Median Rents
Nyarugenge (Mumujyi)	88	8,644	6,000,000	490,022	311,500
Nyabugogo	77	30,000	1,800,000	264,744	250,000
Kimironko	94	-	2,000,000	212,714	100,000
Remera	82	1,500	8,200,000	693,249	341,667
Nyamirambo	28	45,000	1,200,000	233,750	150,000
Gisozi	16	35,000	500,000	188,125	175,000
Kimihurura	10	-	2,000,000	921,050	946,500
Kacyiru	24	60,000	9,000,000	808,182	300,000
Kicukiro	22	50,000	3,613,400	658,609	268,000

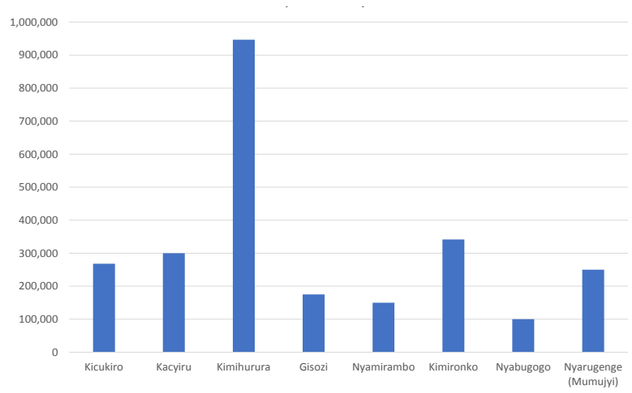


Figure III.VIII Median Rents in Rwf per Unit by Commercial Center

Given that average rents are affected by the maximum and minimum rents in a given center, we consider median rents as a more reliable statistic for commercial rental space

- The city surburbs of Kimironko, Nyamirambo , and Gisozi have the lowest median rents for commercial space per unit per month at 100,000Rwf, 150,000Rwf , 175,000Rwf and 250,000Rwf respectively.
- Medium rent commercial centers include Nyabugogo, Kicukiro, and Kacyiru with median rents of Rwf 250,000, 268,000,and 300,000 respectively
- High rent centers include Kimihurura, Remera and Nyarugenge with median rent per unit per month of 946,500Rwf, 341,667 and 311,500 respectively

Rent Components within the city of Kigali

A broad analysis of included as part of the rent per unit for commercial building is shown in Table 11 below. The results report that most of the commercial building owners charge rent for only the floor space with 76.3% while in a few cases rent includes floor space, electricity, and water (11.8%). Furthermore, rent which covers floor space, electricity, water, and furnishing is at 4.6% in the 9 selected commercial centers in the city of Kigali.

Table III.XI Included as part of the rent per unit on this commercial building

Included as part of the rent	No. of building	Percent
Rent for floor space only	348	76.3
Rent for floor space plus electricity and water	54	11.8
Rent for floor space, electricity, water and furnishing	21	4.6
Rent for floor space, electricity, water, furnishing plus municipal fees(such as security and cleaning services)	22	4.8
Other (specify)	11	2.4
Total	**456**	**100**

Median rent cost per square meter by Commercial node in Kigali City

When compared to other commercial centers, Nyarugenge CBD, Gisozi and Nyabugogo have the highest median rents per square meter at 15,000Rwf, 11,750Rwf and 85,000Rwf respectively. The higher median cost per square meter in these commercial centers is due the high cost of buying plots in these areas given that these are prime commercial centers. In addition building regulations and standards within these prime areas are stricter, implying that that high plot purchase and construction costs are manifested within rent per sq meter. Medium-end commercial centres in terms rent cost per square meter include the city surburbs of Remera, Nyamirambo and Kacyiru whose median range between 4000 to 4200Rwf per square meter.
Kimironko, Kicukiro and Kimihurura are the low rent commercial nodes whose rents per square meter are within the range of 2000-3000Rwf. The lower rents in some of these city suburbs are due to the fact that land purchase costs in these areas are relatively lower given that these are mainly residential areas. In addition, some residential houses in some of the city suburbs have been converted into commercial units which are rented out at cheaper prices when compared to other commercial buildings in places such as the Central Business District in Nyarugenge. Although, government policy has been to discourage businesses renting premises within residential houses, the practice still continues as business that move to the city center fail to sustainably afford to pay the high rents in the city centers.

Average vacancy period before a new tenant moves in by Commercial Center

Table 13 suggests that it takes up to 5 months before new tenant moves in for commercial buildings located at Kicukiro. Kacyiru ranked second with 4 months average vacancy period before new tenant moves in. At Kimihurura, it takes only about two months average vacancy period before a new tenant moves in which is the minimum period found for the selected Commercial Centers.

Table III.XII Median rent cost per square meter by Commercial node

No.	Commercial center	N	Median Rent(Rwf/ sqm)
1	Nyarengenge (Mumujyi)	89	15,000
2	Nyabugogo	80	8500
3	Kimironko	98	2,042
4	Remera	83	4,083
5	Nyamirambo	30	4,083
6	Gisozi	16	11,750
7	Kimihurura	13	2,778
8	Kacyiru	25	4,166
9	Kicukiro	22	2876
	Total	**456**	**100**

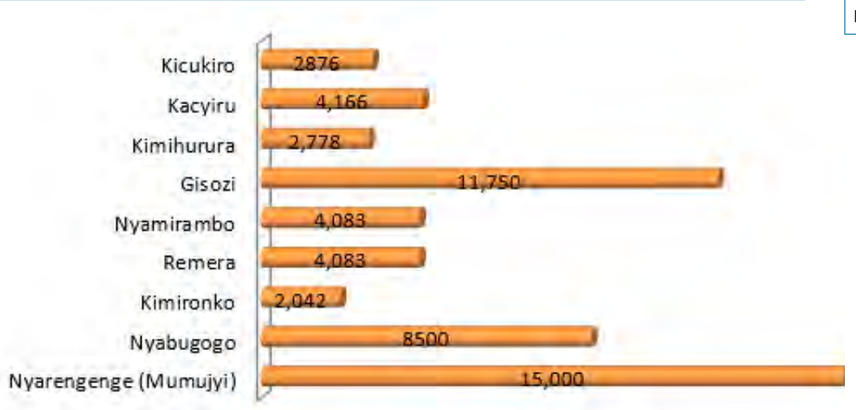


Figure III.IX Median rental cost per Sqm by commercial node

Table III.XIII Average vacancy period before a new tenant moves in (months) by Commercial Center

Commercial Center	N	Min. Months	Max. Months	Mean Months
Nyarugenge (Mumujyi)	89	0	35	2.84
Nyabugogo	80	1	12	2.15
Kimironko	98	0	20	2.84
Remera	83	0	15	2.11
Nyamirambo	30	0	14	2.93
Gisozi	16	0	12	2.94
Kimihurura	13	0	4	1.69
Kacyiru	25	0	12	4.00
Kicukiro	22	0	36	4.91

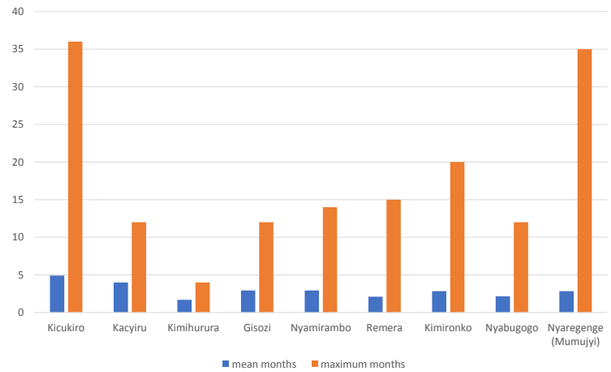


Figure III.X Average vacancy period by commercial center in months

Commercial Buildings Usage by Business Activity

AAs shown in figure 10 below, retail/ wholesale businesses are the major activities occupying property in the city of Kigali with 47%. Other main activities using large part of property in the city of Kigali include offices and Hotels/restaurants with 17% and 13% respectively. Among the other activities, multifamily residential uses 1% of the total property. Given that Industries and warehouse have special economic zones within the city, they were not part of our sample. .

Commercial Building Usage by Business Activity

No.	Main Property Usage	Frequency	%
1	Offices	88	19.3
2	Retail/whole-sale	213	46.71
3	Industrial use	2	0.44
4	Multifamily residential use	5	1.1
5	Hotels/Res-taurants	57	12.5
6	Health facili-ties	12	2.63
7	Storage facili-ties	2	0.44
8	Multipurpose building	45	9.87
9	Other	32	7.02
	Total	**456**	**100**

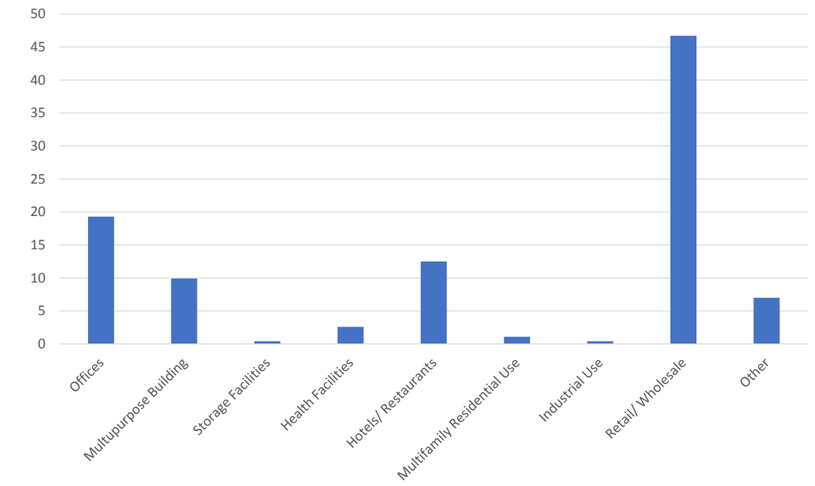


Figure III.XI City of Kigali Property Usage by Activity

Types of retail or wholesale businesses renting commercial buildings

Table III.XV contains information about types of business renting commercial buildings in the selected commercial nodes. The results reveal that most of the commercial buildings occupied by shops business (85.5%). Supermarkets occupy 5.1% of the commercial buildings in the selected commercial centers. Besides, it is found that few commercial buildings occupied by Pharmacies business (0.9%).

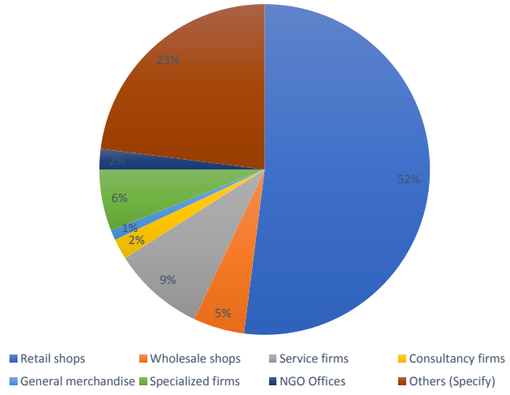


Figure III.XII Main type of business firms renting space on sampled commercial buildings

Table III.XIV If the property rented by for retail or wholesale businesses specify types of business

Types of Businesses	No. of Retail/ Wholesale	Percent
Shops	183	85.5
Supermarkets	11	5.1
Pharmacies	2	0.9
All the above	5	2.3
Others (Specify)	13	6.1
Total	**214**	**100**

Figure III.XIII Types of business firms renting space on sampled commercial buildings per District

Types of Businesses	Nyarugenge CBD	Nuabugogo	Kimironko	Remera	Nyamirambo	Gisozi	Kimihurura	Kacyiru	Kicukiro
Retail Shops	43	66	59	37	57	63	30	52	55
Wholesale Shops	13	1	3	1	20	-	-	-	5
Service Firms	11	14	4	13	3	6	70	4	14
Consultancy Firms	1	3	5	1	-	-	-	-	5
General Merchandise	1	-	2	1	-	-	-	-	-
Specialized Firms	3	8	7	7	3	-	-	4	5
NGO Offices	-	-	1	7	-	-	-	8	-
Others (Specify)	27	9	18	31	17	31	-	32	18
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

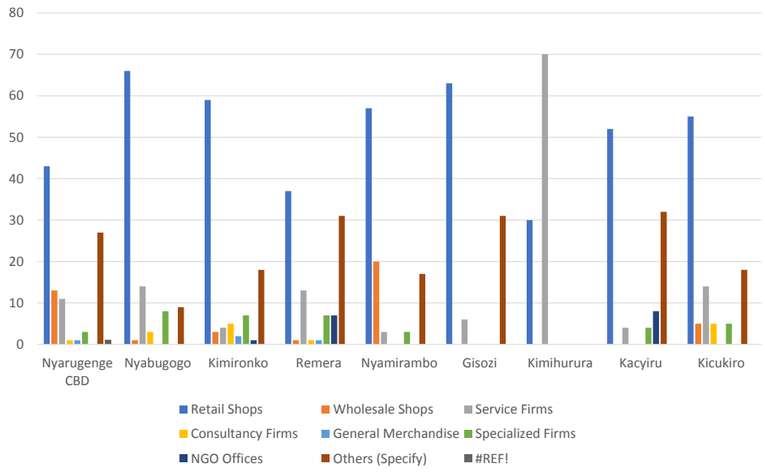


Figure III.XIV Real Estate Market Segmentation (%) by Commercial Center

Tenants preferences on floor loctions for businesses within Kigali City

Table III.XVI ddisplays location on the floors of the building for the main service or product businesses. The findings indicate that most of the main service or product businesses are located on the first floor of the building (58.6%). Proximity to clients seems to be the major attraction towards renting the first floors of buildings. Given that most of the businesses mainly target clients who are moving on the streets being located on the first floor makes businesses more accessible and visible to clients across the street when compared to businesses located in upper floors of commercial buildings.
On the other floors of the building, businesses activities are few, for example, only 5.3 % of activities are located on the second floor of the building while it is 1.1% for the third floor and 0.4% for the fourth floor. Overall, these findings show that occupancy rate is too low from the third floor up to the last one.
In addition, rent prices increased with the increase in numbers of the units occupied by the tenant. Those that occupied more rooms paid more money. It further also depended on the floor the tenant occupied on those particular buildings with more than one floor. For example, the tenants on the upper floors paid relatively less money compared to their counterparts on the ground floors.
.

Drivers of occupancy rates and rents of commercial buildings in Kigali City

The main objective of this part the project is to examine the key determinants of occupancy rates and rents of commercial buildings in Kigali City. For this purpose, we adopted the multiple linear regressions model to determine the link among the variables of interests. Multiple linear regression models and appropriate diagnostic statistics tests are discussed in methodological section

Table III.XV Location on the floors of the building for the main service or product businesses

Location of the Floors	No. of Services per floor	Percent
1st Floor	267	58.6
2nd Floor	24	5.3
3rd Floor	5	1.1
4th Floor	2	0.4
Others (Specify)	158	34.6
Total	**456**	**100**

Methodology

This part of the project explains the methods used to achieve the aims of the study. It discusses the multiple linear regression models which are used to investigate the main drivers of occupancy rates and rents for commercial buildings in Kigali City. It also discusses some diagnostic statistics tests, for example, collinearity test which is used to examine if independents variables are not inter-correlated

Multiple linear regressions model

The multiple linear regressions model is The multiple linear regressions model is mainly employed to explore the link among variables of interests. These variables are one dependent (Y) variable and two or more independent variables (X1, X2, X3…Xn). It helps to estimate and quantify the effect of independents variables on dependent variable (Wooldridge, 2002) . In this respect, we adopted the multiple linear regressions model to determine the main drivers of occupancy rates buildings in Kigali City. Occupancy rate model is given below:

where:

$$OR = \beta_0 + \beta_1 YB + \beta_2 PS + \beta_3 ZB + \beta_4 LB + \beta_5 I + \beta_6 AV + \beta_7 SF + \beta_8 LnMR + \beta_9 TB + \varepsilon \ldots\ldots(1)$$

OR: Occupancy rates.
YB: Year in which commercial building was opened
PS: Parking space
ZB: Zoning of commercial building in the terms of 2013 City of Kigali Master plan.
LB: Location of the commercial building
IR: Included in the rent (electricity, water…)
AV: Average vacancy before new tenant moves in
SF: Source of funds used to construct commercial building
MR: Monthly rent
TB: Types of business renting the building
β0 is the intercept while β1, β2, β3, β4, β5, β6, β7, β8, and β9, are the coefficients of elasticities to be calculated while ε is the error term.
After creating dummies from categorical variable such as the zoning of commercial building in the terms of Kigali city 2013 master plan and location of the commercial buildings, our occupancy rates model can be specified as:

$$OR = \beta_0 + \beta_1 YB + \beta_2 PS + \beta_3 IR + \beta_4 AV + \beta_5 TB + \beta_6 FS + \beta_6 FS + \beta_7 LnMR + \beta_8 C + \beta_9 I + \beta_{10} S + \beta_{11} EA + \beta_{12} R1 + + \beta_{13} R2 + \beta_{14} R3 + \beta_{15} CBD + \beta_{16} DT + , {}_5 DT + \beta_{17} CSU + \beta_{18} + \varepsilon \ldots\ldots\ldots(2)$$

where

OR: Occupancy Rate
YB: Year in which commercial building was opened
PS: Parking space
IR: Included in the rent (electricity, where
OR: Occupancy Rate
YB: Year in which commercial building was opened
PS: Parking space
IR: Included in the rent (electricity, water…)
AV: Average vacancy before new tenant moves in
FS: Source of funds used to construct commercial building
TB: Types of business renting the building
MR: Monthly rent
C: Commercial
I: Industry
S: Social
EA: Economic Administration
R1: Single Family Residential District
R2: Low Rise Residential District
R3: Medium Rise Residential District (R3)

Gujarati, D. N. 2004, "Basic Econometrics", Fourth Edition, McGraw–Hill, New York.
Wolldridge, Jeffrey M. 2002. Introductory econometrics: A modern approach, 2 editions. Michigan: South-Western.

CBD: Central Business District
DT: Down Town
CSU: City Sub Urban
β0 is the intercept while β1, β2, β3, β4, β5, β6, β7, β8, β9, β10, β11, β12 , β13, β14, β15, β16, β17 and β18 are the coefficients of elasticities to be determined while ε is the error term.

RESULTS AND DISCUSSIONS

This section provides empirical results and discusses the drivers of occupancy rates and rents of commercial buildings in Kigali City. It also discusses diagnostic statistics tests results used in this exercises.

UNDERSTANDING THE DRIVERS OF OCCUPANCY RATES ON COMMERCIAL BUILDINGS IN KIGALI CITY

To assess the drivers of occupancy rates in Kigali City, we consider the occupancy ratio which is simply the ratio of rented space to total available space on a commercial building, as our dependent variable.

Independent variables that affect occupancy rates include related to the location of the commercial building in terms of the commercial center in which it is located, the Metropolitan Statistical Area(MSA) in which the building is located i.e., whether the building is located in the Central Business District(CBD), City Suburb or down town and the Zoning in which the building is located as designated by the 2012 City of Kigali City Master plan. We hypothesize that buildings located in the central business district where zoning regulations are tougher more likely to have lower occupancy rates than buildings in the city suburbs whose building requirements and subsequent rents are lower.

Secondly, we consider independent variables such as factors related to the quality of the building in terms of number of parking spaces, the number of storeys the commercial building and other amenities within the building. We hypothesize that better-quality buildings with better amenities such as ample parking spaces are more likely to have higher occupancy rates since these will tend to attract more tenants.

We also consider the costs associated with renting the building as other independent variables. In order to avoid possible endogeneity between occupancy rates and rents, we use the variable called bills included as part of the rent as a proxy or for the rent paid. The billed included variable is ordinal variable which runs from 1 to 5, meaning that the more components included as part of the rent, the higher the number. Buildings with higher costs associated (such as water, electricity, municipal fees, furnishings etc) with their rents are more likely to have lower occupancy rates and vice versa. Lastly, we consider sources of funds and the costs incurred in the construction of the buildings since these may affect Occupancy rates.

N.B: Given the most of the independent variables are categorical in nature, we generate dummy variables for each of the categorical variables and add the dummy variables into linear the regression model. This implies that our findings on the dummies are relative to the base categories for each of the independent variables which are left out of the model. Regression results are shown in Table 16

Table III.XVI Occupancy rates estimates results: Dependents variable occupancy rates

VARIABLES	COEFFICIENTS	P-VALUES
Number of storeys	-0.006	0.012*
Bills included in rent	-0.061	0*
Zoning_R1	0.145	0.001**
Zoning_R2	-0.025	0.576
Zoning_R3	-0.128	0*
City_surburb	0.004	0.895
Down_town	-0.097	0.093
Nyabugogo	0.141	0.003**
Remera	0.110	0*
Number of parking spaces	0.000	0.328
funds from Private equity	0.127	0.01*
Funds from single commercialbanks	0.102	0.044*
Funds from Multiple banks	0.150	0.113
funds from shares	0.151	0.122
_cons	0.838	0
R-squared	0.182	
Adjusted R-squared	0.156	
Number of observations	454 buildings	
Number of observations	454 buildings	

DISCUSSION OF THE FINDINGS ON THE DRIVERS OF OCCUPANCY RATES AMONG COMMERCIAL BUILDINGS WITHIN THE CITY OF KIGALI

In terms of the quality of the commercial buildings, we find that buildings higher numbers of storey are more likely to have lower occupancy rates while commercial buildings with ample parking spaces have higher occupancy rates. The finding on height or number of storeys on the commercial building are statistically significant at 10% significance level, while the finding on parking spaces though positive is not statistically significant A one percentage point increase in the number of storeys on a commercial building in our sample results into a 0.6 percentage point decrease in the occupancy rate of the building. This finding is significant at 0.01 significance level.

Indeed, observations during our field work showed that the upper floors of some tall commercial buildings were least occupied by business tenants while the ground floors were fully occupied on most of the commercial buildings. From our focus group discussions with tenants, the underlying reasons for this phenomenon include tenants' preferences for the ground floors which are closer to customers who move on the streets. In addition, the high building costs incurred while constructing tall buildings subsequently results into unaffordable rents for some of the small and medium enterprises within the city of Kigali. In some of the tall commercial buildings we visited, there is a growing trend of specialization in terms of goods or services offered on the different floors. However, building owners need to do more sensitization to consumers about available goods and services at the different floors through media advertising.

We also find that the more bills are embedded within the rent package, the lower the occupancy rates of commercial buildings within our sample. Commercial buildings whose rent includes more components such as floor space, water, electricity, furnishings etc significantly have lower occupancy rates than building with fewer components such as floor space only. This is possibly due to the fact that commercial tenants seem to prefer paying for the floor space, a fixed cost to the landlord while privately paying the variable costs which they can manage individually. This implies that to increase occupancy rates in their buildings, commercial real estate developers and owners are better off charging the fixed cost of floor space and leaving the variable costs of utilities such as water, electricity and municipal fees to the clients.

Our findings show that zoning regulations matter; relative to commercial buildings located in industrial zones, commercial

buildings located in the R1 zone which has less stringent and less demanding regulations in terms of number of floors have significantly high occupancy rates. On the contrary, commercial buildings located in the R3 zones which have more demands in terms of number of floors have significantly lower occupancy rates. This implies that stringent demands in terms of number floors and other building regulations feed into the construction costs and subsequent rents which then lower occupancy rates. This calls for flexibility in the zoning regulations to allow for incremental construction in some R3 zones where applicable.

In terms of location, relative to buildings located in the Nyarugenge Central business, commercial buildings located in the city suburbs of Nyabugogo and Remera have significantly higher occupancy rates. This is further reinforced by findings on lower median rents for commercial buildings in the city suburbs which make them make more attractive to business tenants.

In terms of the sources funds used in the construction, buildings which are constructed using developers own funds(equity) have significantly higher occupancy rates when compared to buildings constructed using bank loans. This alludes to the high costs of obtaining and repaying mortgage finances (in terms of interest rates and repayment periods) which put upward pressure on rents and subsequently, occupancy rates.

Regression Diagnostics

The above results indicate that coefficient of determination (R2) is 0.3076. This implies that about percent of the variation in commercial real estate rents are explained by the selected variables in this model while remaining changes are explained by other factors as laid out in qualitative section on page 40 of this report .

Understanding the drivers of commercial real estate rents in Kigali City

This part of exercise investigates the key determinants of commercial real estate rents in Kigali City. This will help policymakers to know how Kigali City 2013 master plan has affected supply side.

We also employed the multiple linear regressions model to investigate the key determinants of rent for commercial buildings in Kigali City. Rent model is written as follows:

Variables	Coefficients	P-values
Log_rent(Dependent variable)		
Nyarugenge_CBD	-1.03	0.038*
Nyabugogo	-1.21	0.005**
Kimironko	-1.52	0*
Remera	-0.63	0.116
Nyamirambo	-1.12	0.011*
Gisozi	-1.15	0.014*
Kacyiru	-0.49	0.252
Kicukiro	-0.62	0.167
Zoning_R1	-0.16	0.453
Zoning_R2	-0.33	0.124
Zoning_R3	-0.68	0*
City_surburb	-0.47	0.155
Down_town	-0.02	0.954
Private_equity_funds	-0.34	0.082
Single_commercial bank_funds	-0.49	0.014*
More_than one commercial bank_ funds	-1.06	0.013*
Number of storeys	0.10	0.005**
offices_use	0.26	0.089
retail_wholesale_use	-0.32	0.019*
hotels_restaurants_use	-0.17	0.326
loan_partially recovered	0.34	0.004**
Loan_not_recovered	-0.23	0.211
_cons	14.00047	0
R-squared	=	0.3076
Number of observations		437

where
R: Rent (proxied by the log of rent per unit)
YB: Year in which commercial building was opened
PS: Parking space
ZB: Zoning of commercial building in the terms of 2013 City of Kigali Master plan.
LB: Location of the commercial building
AV: Average vacancy before new tenant moves in
SF: Source of funds used to construct commercial building
MR: Monthly rent
TB: Types of business renting the building
HB: Height of building in terms of number of floors
PUT: Property Usage Type
RY: Renovated Year
MC: Maintenance Cost
CB: Cost of buildings
β0 is the intercept while β1, β2, β3, β4, β5, β6, β7, β8, β9, β10, β11, β12 and β13 are the coefficients of elasticities to calculated while ε is the error term.

$$LnR = \beta_0 + \beta_1 YB + \beta_2 LB + \beta_3 ZB + \beta_3 IR + , \\ + \beta_{11} RY + \beta_{12} LnMC + \beta_{13} LnCB + \varepsilon .....(3) \\ + \beta_6 AV + \beta_7 PS + \beta_8 HB + \beta_9 PUT + \beta_{10} FS \\ )$$

Results are summarized in Table 18 below:

Discussion of the findings on Rent drivers within Commercial buildings in the Sample

Relative to the upscale commercial center of Kimihura, rents per unit of commercial space are significantly lower in the city suburbs of Nyabugogo, Kimironko , Nyamirambo and Gisozi. In addition, the average rents per unit are significantly lower on commercial buildings within the Central Buisness District of Nyarengenge relative to Kimihurura. These findings are significant at 0.01% level.

We also find that zoning regulations matter for the pricing of commercial building units within building sampled in the city of Kigali. Commercial buildings located in areas designated as zone R3 are have significantly lower rents relative to buildings in areas designated as commercial zones. Again, this could possibly be due the tougher building regulations wr.t to the number of required floors to be completed in commercial zones relative to the R3 zones. This finding further supports the case for flexibility during the implementation of zoning regulations within the city of Kigali to allow for practices such as incremental construction, where possible.

Our findings also show that the source of financing matters during the pricing of commercial real estate within the city of Kigali. Relative to commercial buildings constructed using funds foreign sources, buildings constructed using loans obtained from local banks have significantly lower rents. In addition, the negative coefficients on the rents of commercial buildings constructed using own equity are lower and more statistically significant when compared with the coefficients on borrowed funds from single and multiple commercial banks. This implies that the pressure on commercial rents is higher when funds are borrowed to construct commercial buildings.

Considering loan financing, we also unpack the status of loan repayment commercial real estate rents within the city of Kigali. Relative to commercial buildings whose loan repayments have been completely recovered, buildings whose construction loans have been partially recovered have significantly higher rents per unit.

Lastly, the use to which commercial buildings are put matters for the pricing of commercial real estate units within the city of Kigali. Relative to other uses, buildings rented out for wholesale and retail shops have significantly lower rents

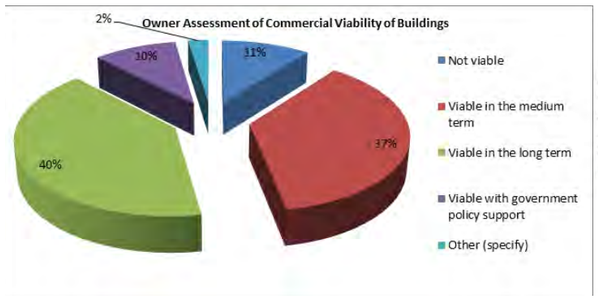


Figure III.XV Owner Assessment of Commercial Viability of Buildings

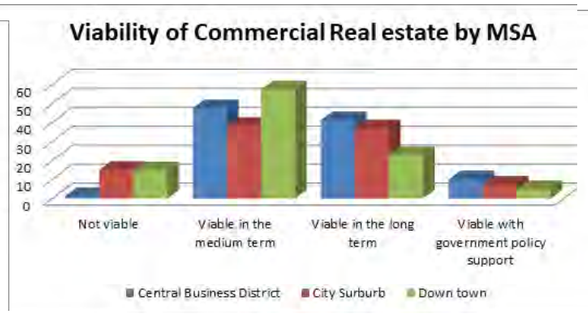


Figure III.XVI Owner Assessment of confidence in commercial real estate sector

Regression Diagnostics

The above results indicate that coefficient of determination (R2) is 0.3076. This implies that about percent of the variation in commercial real estate rents are explained by the selected variables in this model while remaining changes are explained by other factors as laid out in qualitative section on page 40 of this report .

Owner Assessment of Commercial Viability and Confidence in Commercial Real Estate industry

The majority of owners think that building will be commercially viable in the medium (37%) and long term (40%) . 10% need government policy support to improve viability. Confidence in commercial real estate market is mainly medium (36%) to low (25%) among building owners.

breakdown in owner perceptions on the viability of commercial real estate by Metropolitan Statistical area(MSA) shows a higher percentage of building owners in the Central business district and down town area indicating that their buildings will be commercially viable in the medium term when compared to owners of buildings in the city suburbs. In addition, less than 3% of the building owners in the central business district think that their buildings will not be commercially viable compared to about 10% of the owners in both the city suburbs and the down town area who think that their buildings will not be commercially viable. This shows more optimism among building owners in the CBD despite the CBD being the area being most affected by low occupancy rates

In terms Confidence in the future of the commercial real estate market the majority i.e. 36% of the building owners within the city of Kigali have medium confidence while 24% of the owners have high confidence in the commercial real estate market. A significant percentage of building owners i.e. 20% express low confidence in the future of the commercial real estate market within the city of Kigali. In terms of market confidence the picture is basically mixed but so bad.

.

Research findings from qualitatative Key Informant interviews and focus groups discussions conducted within the Commercial Real Estate Industry in Kigali City

Tenants

T1.0 Tenants' motivation for the selection of the building.

Majority of the tenants said that amongst other factors, the main reason as to why they selected the places they located their various businesses was the proximity of the business or place to anticipated or targeted customers. However, others said that, they selected the buildings on which they operate their businesses because of the prestige that comes with the location of the building, and the cheaper or price depression of the floors on the buildings especially the flat buildings.

1.2. Tenants preferences of the business location on the building.

Majority of the tenants said that if they had any other option for preference of the floors on the buildings to put their businesses they said that, the ground and the first floors on storeyed buildings would be their preferences since these come greater proximity to clients on lower floor and complementary services to their various businesses. Tenants operating big businesses like supermarkets, micro-finance institutions, coffee shops and restaurants said that they would still choose the ground floors because they would offer required increased space for such businesses.

1.3. Challenges faced by tenants renting Commercial Buildings in Kigali City

Majority of the respondents said that, the major challenge they face in the course of transacting their businesses, is the ever-increasing taxes and unregulated and uncoordinated taxing policies by the taxing authorities in the city that heighten their operation costs.

The second challenge was the additional costs incurred by the tenants like electricity bills, security and cleaning fees. For example, some tenants with big businesses hire their own security guards and they still have to pay to the authorities the fees for security, which is a double expense.

There is yet another challenge of increased competition from people doing the same or similar businesses like their counterparts on the same or from the neighboring buildings.

However, some tenants don't see this as challenge as the said that increased number of people doing the same business prompts the improvement in service delivery and customer care.

1.4. The quality of commercial building. On average, the commercial buildings that we visited in the sector of kimironko are of low quality as told by the respondents. That is to say that most of them were old buildings while others were initially built for residential but later modified for commercial use. The city's master plan of 2013 decrees to renovate all houses along the city roads and be turned for commercial purposes.

However, a few new commercial buildings put up in Kimironko are said to be of medium quality, they are strong but lack some facilities that are required to be put on modern commercial buildings like elevators and other optional ladders for the people with the disabilities to access the upper offices on the same buildings. In general, the most commercial developers didn't put into consideration the people with different disabilities and how such people would be given the right to access services on such buildings.

Landlords of commercial buildings in the city

MMost of the buildings we visited were of medium standards, where some of them were very old having been built in the early or late 1990s. The modern buildings were also built way back before 2013 before the government decided that commercial developments within the city be guided by the master plan. However, few of the buildings that were built post 2013 are of high quality and standard as required by the city authorities.

The building were grouped in 3 categories namely; small buildings, multi-complex commercial buildings and specialized commercial buildings. The small buildings were mainly ground floors and had between 2-6 commercial units which they rent out to tenants. On the high end were the big commercial buildings with more than 3 floors going up and having a capacity of more than 15 commercial units being rented. The last category of these commercial buildings were Hotels and Apartments which had a capacity of over and more than 20 commercial units being rented out to regular clients.

Most of the landlord respondents said that, the rent charges they collect from their tenants is mainly for floor space only. However, a few of these commercial buildings like Hotels and Apartments add supplementary services like electricity, water and furnishing inclusively as part of rent to their customers.

The pricing of rent by the commercial buildings depends on the quality of the buildings and the location. It also most times depend on the location of the commercial building floors in case of multi-complex commercial buildings. For example, for rooms on the same commercial storeyed building, the ground rooms are rented at an average of 300,000frw while as the floors goes up on the building the prices reduce to 150,000frw. On the other hand, old and substandard buildings there prices are low like on average 150,000frw and the prices continue to depreciate for the buildings off the tarmac and main roads as said by the landlords. However, the prices for Hotels and Apartments are high if amounted in months, on average in the Hotels a small room is charged at 50$ and a triple room goes to as much as 150$ per night.

Also the parking lots and space was relative to the sizes of the commercial buildings. To the very worst the small and old commercial buildings lacked the parking space required by the city authorities as they were very close and adjacent to main roads. The medium houses can on average accommodate 10 cars at once, however Hotels and Apartments have more and bigger parking space to the capacity of accommodating over 50 cars at once.

The majority of commercial buildings are mainly occupied by retail/wholesale shops as the main businesses renting them, also offices, restaurants and pharmacies follow in the sequences as other main businesses that are almost on every building in the city. However, there are some specialized businesses like supermarkets, hotels, health clinics and consultancy firms that own or rent the whole buildings for their services.

These businesses on the various buildings are mainly owned local people with a few exceptions of international consultancy firms and multi-national telecommunication and like MTN. also some Hotels and Apartments are owned by local investors, however a few of them are co-owned by both foreign and local investors while some others are owned by mainly foreign by foreign investors.

It was also found out that, most commercial houses we visited were bought from their original landlords and therefore it was hard to tell as the value cost of their plots but rather few opened up to the amount they bought their buildings which were on average more than 50M frw. However, the old buildings their values were hard to estimate as the landlords said that they have been upgrading their buildings over times since the 1990s. On the other hand, some mega commercial buildings were worth in billions of Rwandan Francs especially for the Hotels and Apartments who built up their own premises.

Furthermore, the respondents said that they used their own money in building such commercial buildings. However, the landlords for mega commercial buildings said that they indeed accessed loans from banks to supplement on their investments. On whether they covered the repayment of the loans, most of them said that they're still financing the loans and the few who completely recovered the loans, said that they requested for more loans to invest in other commercial businesses.

Challenges faced by the different landlords and commercial real estate Investors.

Anomalies in city policies which affect the investment climate in Rwanda. This at times prompts investors to withdraw their money or not invest in the country. Sometimes the city authority levy taxes on investors based on personal interests or differences with particular investors. This makes the investors to make loses but also indirectly the city authorities/ country from the potential developers

More still what the city's master plan regulations and policies require for city development does not at most times favour the peoples' financial potentials, for example when there are random expansions of roads and any other form of reconstructions and renovation of public facilities that require quickest displacement of the landlords' houses pose a great challenge and affect commercial developers.

Rwandans lack innovations in their bid to operate commercial building businesses. Commercial developers just imitate others in establishing similar businesses without considering their domain of expertise. They often don't do a clear assessment of the market before investment and in the end, make losses so first and close their businesses prematurely.

Commercial Real Estate Developers and Consultants

Commercial real estate developers and consultant firms covers a wide range of consultancies and are broadly categorised into two categories of commercial developers, that is to say

- The construction implementers
- The land mangers/leasers

And they are engaged in various activities as listed below:

- Architectural designs
- Structural design
- Mechanical designs
- Supervision of construction sites
- Electrical designs and
- Bills of quantities and impact assessment surveys.

Architectural procedure starts straight way from the time a company has been contracted for a service, it starts by designing architectural paper work, and continue to help the client submit the designs to authorities and therefore process all the construction permits, to construction site supervision hence offering general construction procedure consultancy.

The permit usually takes like 21 days to be processed but also depending on the sizes of the project and the area issuing authority from where the building is being constructed. The city of Kigali takes lesser days as compared to district authorities, they said. Within the city of Kigali the construction permits for commercial building are processed from the one stop centre/ city of Kigali while the permits for residential construction are accessed from the respective hosting district offices. The district authorities usually takes between 2-3 months to respond to the submitted files. It's however said that it depends on the district response performance and flexibility. Forex maple the district of Gasabo takes more to review and respond to the submitted construction permits requests.

On financial viability and occupancy rates on commercial buildings, they said that some buildings have clients while others don't have, so to better understand the reasons why, they suggested for a specialised research for specific reasons.

Challenges faced by commercial developers in commercial development business in the city of Kigali

The commercial developers and proprietors said to be facing different but coordinating problems that in the end pose various challenges to the development and management of commercial real estate buildings in the city of Kigali as discussed below.

Also, the Abrupt and agent road expansions interruptions by the city authorities to the urban land owners. In bide to expand and construct big roads, some people's plots are encroached and eaten up and that they unlikely to be compensated. In the move by the government to expropriate the land from the owners often prompts the delay or even refusal of issuing out construction permits to those whose plots are adjacent to roads and of priority interest to city authorities.

The process for the submission of papers requesting construction permits is long and expensive. They often require the commercial developer to hire the Architectural Engineers and contractors, design all the construction project and of which at times can be rejected, making the whole exercise expensive and tiresome. There should be stages for approval, e.g. to approve progressively or step by step before the submission of the whole project paper.

The city authorities are not very strict on the parking space requirements from commercial developer. They are very lenient with the developers in relation the city regulated parking space requirement in the Master plan. In reality, most buildings don't have enough parking space. E.g. one parking space per 2 houses for apartments.

Also, the high and fluctuating land prices. The land prices are not always standard and fixed which prompts the land owners to heighten the prices through what they called "price predictions". Here the land owner may over rate the value of his/her land to the developer in predictions that the place where the land is located will have gained value in the future. But when there is a precedent change in the government's development priority of that particular land area against what was earlier predicted, in that case the developers lose their money because they can't develop the land as forethought.

Furthermore, the high land taxes introduced by the /government on undeveloped land is hampering the commercial real estate market development. Some people have land in areas which are not on government's agent development priority. In such areas the development of infrastructures like water pipes, roads and communication lines/cables are not well spread, they are only concentrated in the city centres. More still other public social facilities like schools, markets, and Taxi Parks are too not well scattered around all places for neighborhood easiness to commercial real estate developers. Henceforth making the commercial real estate market not so viable for expansion to such areas as the developers predict less returns on their investments.

The Banking system is not favouring the Commercial real estate developers through the current mortgage way of buying house system. The interest rates on loans are high and therefore less returns on the loans for investment hence making the commercial rea estate business unproductive to developers. For example, an individual commercial developer cannot access mega loans for like over 20 billion Frw. Banks are not risking to give out such huge sums of money, they well know that taxes and interests are high and the rate of return on investment will be low.

Also, the geographical zoning regulations are not conducive/ applicable to all zoned areas hence becoming a developmental bottleneck. For example, in areas like Masaka, Ndela, Budashya. Such places have high density, and yet the city regulations require commercial developers to construct big residential houses which are not comparable to land sizes. In a way of economizing the land, the government should be promoting commercial developers to construct flat houses in such areas.

III.XII Recommendations

Recommendations for the Regulatory side

- There is need for accountability and quick turnaround times during the construction permit process. The city of Kigali should be able to inform architects and constructors on how long they can get work started and how long they can wait for approvals. In addition, there is need to update of information especially on their websites concerning change of regulations and zoning.
- Incremental construction: Commercial real estate investors should be allowed to build according to their financial capacities through incremental construction. The master plan should be according to the demand and supply of Rwanda which will be affordable to tenants who will easily afford to rent these buildings.

Supply side Recommendations

- For buildings with low occupancy rates, commercial real estate developers need to study the types of businesses that they are targeting to rent their buildings after completion. They need to do sound market studies so that the commercial real estate buildings meet both quality needs and affordability needs of the businesses they are targeting.
- Flexibility in pricing commercial real estate spaces so that rent is

affordable to businesses

- In terms of tenancy arrangements to increase affordability of commercial spaces, there is need to encourage flexible work office arrangement such office sharing by landlords. The pooling of rent by different businesses or organizations will enable SMEs and smaller organization to afford rents in high quality buildings located in prime places
- In terms of reducing construction costs, commercial real estate owners need to look out for and use affordable building materials and building technologies. These will help lower construction costs and consequently the rents that can be afforded by the majority of medium and large enterprises within the city of Kigali
- Building designs should be suited to feel and demands of the potential businesses rather than copying construction designs from other countries which may not suit Rwandan businesses

Recommendations suggested by Tenants of Commercial Buildings

- The majority of the tenants highlighted high rent costs as a major challenge they face in the course of running their businesses and therefore recommended for reduction on the taxes levied on the houses they rent. This would prompt the landlords to subsequently reduce on the rent charges.
- Tenants also recommended that the city of Kigali should be doing tax zoning/coding. This would help it to set favourable tax base and taxing policies dependable on business people's financial potential. For example, the city has to survey and establish the tax potentials of the business owners depending on the location of their businesses in town areas. They said that those in urban towns who have higher numbers of customers should be taxed slightly higher than those in the suburbs as they usually have less turner over of potential customers.
- Mores still they requested the city authorities to improve and tighten the regulations requiring buildings to have enough parking space. They said that on some buildings they get less customers because they lack where to park their cars to access their services. This was always on the old buildings with less space that encroaches the roads. This makes it hard for customers to bargain the space with the pedestrians hence posing a challenge to business owners.

Recommendations Suggested by Commercial Real estate Developers and Owners

- They city of Kigali should fasten on the issuing process of the permits for construction or renovations to commercial developers. This would improve on the quality of most buildings in the city. The government authorities should also improve on the construction inspection process. They should inspect and evaluate the construction process progressively "they should not wait for the whole building to be finished and then ask for durability standards" some developers said.
- Reduce on the high taxes levied on traders. The authorities should help traders by reducing and regulate the many taxes levied on their businesses so that they could be able to get enough returns to pay rent and meet their family basic needs for survival. Business people find it hard to even raise rent for on the commercial houses and most of them are kicked out of business just in few months' dues to high taxes and low rates of customers. "At times, the tenants default us and even others go with their rent arrears as they leave the buildings" some landlords complained.
- The Kigali city authorities should give some tax incentives or holidays to local commercial developers. They should be making projections of about to ten years when designing and setting taxing and renting policies which destabilize the investors. Let the authority give a grace period before taxing a new commercial building. This would enable investors to make profits and bring up more buildings. They further said that the authorities can introduce a taxing policy based on percentages. For example, they should tax only 50% of returns in profits and leave the remaining 50% to the developers for financing and maintaining the commercial buildings.
- The government should not concentrate commercial and public facilities in specific areas like the city centre. In every zoned area for residential and commercial development, the government should be recommending developers to establish services like health clinics that would save residents from necessarily making long distances in search for those services
- The government should consider its expropriation, resettlement and compensation policies. People with plots and old houses which they cannot develop, in places deemed for commercial development and are on government's development priority interests, should be well explained to them on how they can be expropriated and compensated for their land in case of commercial development. If people are to be given rooms as a compensation for their land, it should be better too for them at least an additional commercial room on the building to rent out and collect money for survival.
- The government should consider peoples' financial potentials before levying taxes on them. The government should survey to identify how much business people can afford to pay in taxes and how much money the commercial developers have to develop their lands before prioritizing certain commercial building developments in certain areas.
- The city of Kigali should put more emphasis in research through Private-Public Partnership (PPP). The commercial developers do extensive market surveys for their projects, so they would share their information finding with the government to act as a bench mark for the government decision making on policies and regulations.
- Also the government should revise ways through which it can subsids on the commercial real estate developers. The government should provide incentives like subsidizing on buying or giving out land to mega commercial developers to attract more investments hence convincing the developers to lower the prices for the customers and boosting the market. More still the government can give incentives to developers like giving out land cheaply to subsidise on the commercial construction costs because high construction costs influences high rents charges as the developers wish to return on their investments.
- • Most importantly the government should sensitize the masses about the use and importance of real estate development in the city. Informing the public about why certain projects are done. This would save the targeted buyers from the ignorance of need for commercial development.

Specific Recommendations Suggested from Hotels and Hospitality services

- RDB- should promote tourism by maintaining stable taxes on hotels so that they keep stable prices, the continuous increase in taxes causes the hotel price charges to fluctuate hence at times scaring away potential customers.
- Rwanda should maximise the EAC friendships in promoting tourism

to include the sharing of surplus animals in the game parks from amongst other member countries. For example, in other countries' game parks when they want to reduce or maintain a given number of a particular animal breed say lions, they kill some off, it would be a good idea therefore if countries can exchange or share the excess numbers with the member country that has few animals of that particular breed/type.

- The city authorities and the country at large should think of the changing or improving on the tourist attractions we market, for time they have been marketing the Genocide memorial cites, but with time they will be attracting less tourists, so the government should consider creating animal centres in the city suburbs like snake zoos among others to attract more tourists to the city because there no such things in Kigali city centre.
- Also, RDB should be considering on how to engage the tourist travel agencies because they are fundamental in promoting tourism in the country. The government ought to engage them and they share with them the information they receive from the tourists from their websites, this would help the tourism sector to improve on their services. Research is needed on these institutions to identify the information shared and the room for improvements.
- Government should reduce or even exempt taxes on the sports facilities that are imported into the country in a way of promoting sporting services in the country and enabling most recreation centres to charge low prices on sports activities.

III.XIII Conclusion

The main objectives of the project were tThe main objectives of the project were to understand the supply and demand of the commercial real estate market in Kigali city and to determine the impacts of Kigali master plan in terms of regulations and zoning on commercial real estate activities. To achieve these targets, we conducted a survey 1476 tenants and 456 commercial buildings owners within 9 commercial centers in the city of Kigali. We also used descriptive statistics, frequency tables, figures, and multiple linear regressions for data analysis.

In this project, we found that private equity and commercial banks are the major source of funds for commercial building within Kigali City. Wholesaler/ Retailer is the major activities renting commercial buildings in Kigali City. Occupancy rates are very low in Central Business City with 14 buildings occupied below 50%. Businesses rent units which are closer to their clients and therefore prefer the first floors of commercial buildings.

Our findings show that zoning regulations matter; relative to commercial buildings located in industrial zones, commercial buildings located in the R1 zone with less demanding regulations in terms of number of floors have significantly high occupancy rates. On the contrary, commercial buildings located in the R3 zones which have more demands in terms of number of floors have significantly lower occupancy rates. This implies that zoning regulations in terms of number floors and other building regulations feed into the construction costs and subsequent rents which then lower occupancy rates. This calls for flexibility in the zoning regulations to allow for incremental construction in some R3 zones where applicable.

Considering loan financing, we also unpack the status of loan repayment commercial real estate rents within the city of Kigali. Relative to commercial buildings whose loan repayments have been completely recovered, buildings whose construction loans have been partially recovered have significantly higher rents per unit. This implies that flexibility in mortgage financing in terms the recovery of loans used in construction is needed in order to avoid upward pressure on commercial real estate rents which subsequently results into low occupancy rates and low returns on investment from commercial real estate within the city of Kigali.

Annexure IV: Environmental and Green Cities Legal, Policy, and Institutional Framework[1] [2]

1 Srinivasan Sunderasan. 2015. Review of Environment and Natural Resources Sector Policies. Final Report. Prepared by Verdurous Solutions Private Limited for Ministry of Natural Resources, Government of Rwanda. January 2015.
2 Rwanda Ministry of Environment. 2018 DRAFT. National Environment and Climate Change Policy. Draft Report.

Green growth is facilitated by having in place a clear and well-structured legal, policy and institutional framework for environmental and natural resource management. The Government of Rwanda has issued laws and policies and designated institutions to regulate and guide the nation towards sustainable development and resource use while protecting providing for environmental safeguards and enhancement.

IV.I Legal Framework

Table IV.I Laws and Regulations establishing the legal framework for environmental and natural resource management in Rwanda

TOPIC	LAWS AND REGULATIONS [1] [2]
ENVIRONMENTAL MANAGEMENT AND PROTECTION	Constitution of the Republic of Rwanda (2003) and its amendments: Article 22 on "Right to a clean environment": Everyone has the right to live in a clean and healthy environment. Article 53 on "Protection of the environment": Everyone has a duty to protect, safeguard and promote the environment. It also indicates that The State ensures the protection of the environment. The Constitution stipulates that a law determines modalities for protecting, conserving and promoting the environment. Organic Law N° 04/2005 of 08/04/2005: determining the modalities of protecting, conserving and promoting the environment. It aims to conserve the environment, people and their habitats. It provides fundamental principles related to protection of environment, with the intention of promoting natural resources, and to discourage any hazardous and destructive activity that may degrade the environment. In addition, the Law provides ways of promoting the social welfare of the population considering equal distribution of the existing wealth; considering the durability of the resources with an emphasis especially on equal rights of present and future generations; and a guarantee to all Rwandans of sustainable development that does not harm the environment and the citizens' social welfare. Furthermore, the Law provides for the setting up of strategies for protecting and reducing negative effects on the environment and for restoring the degraded environment. [3] Law Determining the Organization, Functioning and Mission Of the National Fund for Environment (FONERWA) (2012): This Law provides for mobilization and management of (i) resources used in activities aiming at protecting environment and natural resources and (ii) funds to be used in the fight against the climate changes and its impacts. The Law also sets out to support public institutions, associations and individuals to carry put activities to protect the environment, conduct research and manage climate change.
ENVIRONMENTAL IMPACT ASSESSMENT	**Ministerial order n°003/2008 of 15/08/2008** Ministerial Order relating to the requirements and procedure for Environmental Impact Assessment. Ministerial Order N°004 establishing the list of works, activities and projects that have to undertake an environment impact assessment Ministerial Order on the **establishment of the National Man and Biosphere Committee.** The Law and guidelines on **Occupational Safety and Health**

1 Srinivasan Sunderasan. 2015. Review of Environment and Natural Resources Sector Policies. Final Report. Prepared by Verdurous Solutions Private Limited for Ministry of Natural Resources, Government of Malawi. January 2015.
2 Rwanda Ministry of Environment. 2018 DRAFT. National Environment and Climate Change Policy. Draft Report.
3 UNESCO-SIDA 2017. Country Profile – Rwanda, October 11, 2017. Accessed 04 March 2019. http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/FEI_Country_profile_Rwanda.pdf

INSTITUTION ESTABLISHMENT	Law n° 39/2001 of 13 September 2001 establishing the Rwanda Utilities. Regulatory Agency (RURA) Law determining the organisation, functioning and responsibilities of National Forests Authority (2006): . - Law No 10/2010 of 20 April 2010 authorising the ratification of the grant Agreement Nº TF94928-RW signed in Kigali, Rwanda, on 8 February 2010, between the Republic of Rwanda and the International Bank for Reconstruction and Development (IBRD) acting as an Implementing Agency of the Global Environment Facility (GEF) relating to the grant. - Law no 40/2010 of 25/11/2010 establishing the Rwanda Housing Authority (RHA) and determining its responsibilities, organisation and functioning. - [Repealed in 2017] Law No. 53/2010 of 25 January 2011, Gazette No. 10 of 7 March 2011: Law establishing Rwanda Natural Resources Authority (RNRA) and determining its mission, organisation and functioning . Law N°63/2013 of 27 August 2013: Law determining the mission, organization and functioning of Rwanda Environment Management Authority (REMA) (Repealing Law n°16/2006 of 3 April 2006 and other prior legal provisions inconsistent with this law) Prime Minister's instructions No 004/03 of 13/11/2015 determining the conditions and procedures for obtaining government support for affordable housing projects. Nº05/2017 of 03/02/2017 Law establishing Rwanda Land Management and Use Authority and determining its mission, organisation and functioning (and: N°04/2017 of 03/02/2017 Law repealing Law no 53/2010 of 25/01/2011 establishing Rwanda Natural Resources Authority (RNRA) and determining its mission, organisation and functioning. Law Nº06/2017 of 03/02/2017 Law establishing Rwanda Water and Forestry Authority and determining its mission, organisation and functioning Law Nº07/2017 of 03/02/2017 Law establishing Rwanda Mines, Petroleum and Gas Board and determining its mission, organisation and functioning
BIODIVERSITY	Law N° 70/2013 of 02/09/2013. Governing Biodiversity in Rwanda: determining the modalities for biodiversity management and conservation. Ministerial Order No 008/MINIRENA/2015 of 18/06/2015 establishing a list of protected trees Ministerial Order No. 007/2008 of 15/08/2008 establishing the list of protected animal and plant species.
FOREST	Law Nº47bis/2013 of 28/06/2013 determining the management and utilization of forests in Rwanda Law Nº06/2017 of 03/02/2017 Law establishing Rwanda Water and Forestry Authority and determining its mission, organisation and functioning
MINING	Ministerial Order N° 001/16.01 of 03/01/2012 on explosives used in mining, quarrying and infrastructure activities Law N° 13/2014 of 20/05/2014 on mining and quarry operations Law Nº07/2017 of 03/02/2017 Law establishing Rwanda Mines, Petroleum and Gas Board and determining its mission, organisation and functioning
WATER	Law N°62/2008 o10/09/2008 (Water Law) Putting In Place The Use, Conservation, Protection and Management Of Water Resources Regulations : puts in place regulations for the use, conservation, protection and management of water resources. The Water Law provides a clear framework for the principles of integrated water resources management, including the prevention of pollution, and the principles of 'user pays' and 'polluter pays', as well as the principle of users' associations for the administrative management of water. [4] - The Law on natural water resources and discharges/effluents Law N° 58/2008 of 10 September 2008: deals with agriculture, fishing, wetlands and protected areas. Ministerial Order N° 007/16.01 of 15/07/2010 determining the length of land on shores of lakes and rivers transferred to public property. This law sets the boundary for development and settlement activities next to water bodies for environmental protection. The land within a distance of fifty (50) meters from the lakeshore is public property. The land within a distance of ten (10) and five (5) meters from the shore of big rivers and small rivers respectively is public property and is statutorily regarded as a protected area. The only activities aimed at protecting the water bodies are permitted in these protected areas. Law No 50/2011 of 5 December 2011 authorising the ratification of the financing agreement nº 4973-RW signed in Kigali, Rwanda, on 2 September 2011, between the Republic of Rwanda and the International Development Association (IDA) relating to the credit of nine million three hundred thousand Special Drawing Rights (SDR 9 300 000) for the Lake. Law nº 97/2013 of 30/01/2014 repealing the Law nº 43/2010 of 07/12/2010 establishing Rwanda Energy, Water and Sanitation Authority (EWSA) and determining its responsibilities, organization and functioning are transferred to the following companies: 1° Rwanda Energy Group ; 2° Water and Sanitation Corporation (WASAC). Prime Minister's Order Nº 87/03 of 16/08/2014 determining modalities of transfer of responsibilities and property of Energy, Water and Sanitation Authority (EWSA)

4 Water Policy. Accessed March 1, 2019. http://www.water.rw/waterpolicy/

HAZARDS including POLLUTION and WASTE MANAGEMENT	Organic Law N° 04/2005 of 08/04/2005: determining the modalities of protecting, conserving and promoting the environment. Includes sanctions for solid and wastewater disposal violations. Ministerial Order N° 26/03 of 23/10/2008 determining the list of chemicals and other prohibited pollutants. Law Relating To the Prohibition of Manufacturing, Importation, Use and Sale of Polythene Bags in Rwanda (2008): Prohibits manufacturing, use, import, and sale of polythene bags in Rwanda. - Ministerial Order N°005/2008 of 15/08/2008 establishing modalities of inspecting companies or activities that pollute the Environment Ministerial Order N°003/16.01 of 15/07/2010 preventing activities that pollute the atmosphere Ministerial Order N°006/16.01 of 15/07/2010 establishing special regulations relating to burying toxic wastes; Prime Minister's Instructions N°005/03OF27/12/2013, Official Gazette No. 3 of 20 January 2014: preventing air pollution caused by vehicular emissions and machines using petroleum products in Rwanda Prime Minister Instructions Nº001/03 of 11/07/2014 relating to the fire prevention in Rwanda. The Prime Minister's instructions No 002/03 of 05/05/2015 determining procedures for eradication of asbestos materials. Law N° 18/2016 of 18/05/2016, Official Gazette n° 23 of 06/06/2016: Law governing the preservation of air quality and prevention of air pollution in Rwanda.
LAND and HABITATION	Organic Law No. 08/2005 of 14 July 2005, Gazette Year 44 No. 18 of 15 September 2005: Law determining the use and management of land in Rwanda; - Law N°20/2011 of 21/06/2011 Governing Human Habitation in Rwanda The law governs land occupation and construction on land reserved for human habitation. It defines the human settlements and criteria of an area reserved for human settlement. - Law N°10/2012 of 02/05/2012 Governing Urban Planning and Building in Rwanda. The law establishes the basis applicable to urban planning and building in Rwanda.
	Law No.43/2013 of 16/6/2013 Governing Land in Rwanda: Determines modalities of allocating, acquisition, transfer, use and management of land in Rwanda (Article 1). The law calls for establishment of air quality standards (Article 4); Compliance with minimum air quality standards (Article 5); Prohibition of emission of chemicals, materials, gas or hazardous substances (Article 6); emission limits (Article 7), specific tolerance limit of pollutants from industries (Article 8); inspection of air pollutants from transport means (Article 9); avoid producing air pollution from construction works (Article 10) storage of objects (Article 11) waste incineration (Article 12), or other sources (Article 13); requirements for obtaining an air pollutant emission permit (Article 14); obligation to comply with air quality (Article 15); monitoring of air quality compliance (Article 16), and the Powers of City of Kigali and the District to notify and require polluters to take measures to remedy air pollutants (Article 21). Law N° 32/2015 of 11/06/2015 Relating to Expropriation in the Public Interest. The Expropriation Law provides for public dissemination on the importance of the project to be established and the need for expropriation. Ministerial Order N° 04/Cab.M/015 of 18/05/2015 determining urban planning and building regulations, annexed with the Urban Planning Code and Rwanda Building Code o Urban Building Code: Annex 2 of the Ministerial Order N° 04/Cab.M/015 of 18/05/2015 Determining Urban Planning and Building Regulations. It is a performance-based code, integrating any technology and material for use in construction when fulfilling minimum performance requirements. o Urban Planning Code: Annex 1 of the Ministerial Order N° 04/Cab.M/015 of 18/05/2015 Determining Urban Planning and Building Regulations. It lays out the principles for the sustainable development and management of land used for human settlement. Presidential Order N°46/01 of 30/06/2015 determining procedures for formulation, approval, revision and publication of the master plan for land use management and urban planning. - Prime Minister's Order N° 104/03 of 06/05/2015 determining procedures for formulation, approval, publication and revision of the local land development plan - Prime Minister's Order N° 114/03 of 19/06/2015 determining conditions for authorization to carry out real estate development operations - Ministerial Order determining procedures for formulation, approval, publication and revision of the Specific Land development plan (Adopted but not yet gazetted) - Ministerial Order N°06/Cab.M/015 of 08/06/2015 determining the instructions of categorization of buildings, conditions and procedure for application for and issuance of building permits - Ministerial Order N° 05/Cab.M/015 of 21/05/2015 determining the contents of urban planning documents and procedures for investigation, initiation, organization and issuance of authorization to carry out urban planning operations Nº05/2017 of 03/02/2017 Law establishing Rwanda Land Management and Use Authority and determining its mission, organisation and functioning (and: N°04/2017 of 03/02/2017 Law repealing Law no 53/2010 of 25/01/2011 establishing Rwanda Natural Resources Authority (RNRA) and determining its mission, organization and functioning.
INFRASTRUCTURE	Law N°55/2011 of 14/12/2011 governing roads in Rwanda Law N° 26/2012 of 29/06/2012 Governing the Professions of Architecture and Engineering and Establishing the Institute of Architects and the Institute of Engineers in Rwanda Law N°52/2018 OF 13/08/2018 modifying Law nº21/2011 of 23/06/2011 governing electricity in Rwanda

IV.II Policy Framework

Table IV.II Policies and strategies forming the policy framework for environmental and natural resource management in Rwanda

SECTIONS	LAWS AND REGULATIONS[1] [2]
NATIONAL DEVELOPEMENT	Vision 2020 Economic Development and Poverty Reduction Strategy (2013-2018) Vision 2050 National Strategy for Transformation (NST1) / Seven Years Government Program (2017-2024) Various Sectoral and District Medium Term Strategies (2017-2024) Local Physical Plans Detailed Plans
ENVIRONMENTAL MANAGEMENT AND PROTECTION	National Roadmap for Green Secondary City Development (2015) Environment Policy (2005) National Green Growth and Climate Resilience Strategy (GGCRS) (2011) National Environment and Climate Change Policy (2018 DRAFT) Rwanda Environmental Education for Sustainable Development Strategy
CLIMATE CHANGE	National Green Growth and Climate Resilience Strategy (GGCRS) (2011) National Environment and Climate Change Policy (2018 DRAFT)
BIODIVERSITY	Biodiversity Policy (2011) National Biodiversity Strategy And Action Plan (2003) Rwanda Wildlife Policy Fifth National Report to the Convention on Biological Diversity
AGRICULTURE	National Agriculture Policy (2017) National Food and Nutrition Policy (2013) Rwanda Irrigation Master Plan 2010 Strategic Plan for Agriculture Transformation 4 (PSTA 4) – 2018-2024 Agriculture Mechanization Strategies for Rwanda
FOREST	Forestry Policy (2011) Forest Sector Strategic Plan
MINING	Mining Policy (2010) Petroleum Sector Strategy (2012)
WETLAND	Wetland Management Strategy
WATER	National Policy For Water Resources Management (2011) National Water Resources Master Plan (2015) National Water Supply Policy 2016 National Water Supply Policy Implementation Strategy 2016 National Policy & Strategy For Water Supply And Sanitation Services (2010)
HAZARDS including POLLUTION and WASTE MANAGEMENT	National Policy & Strategy For Water Supply And Sanitation Services (2010) National Sanitation Supply Policy 2016 National Sanitation Policy Implementation Strategy 2016 National E-Waste Management Policy National Disaster Management Policy (2009, Revised 2012)
LAND and HABITATION	Land Policy (2004) National Land Use And Development Master Plan (2011) Strategic Plan For The Transformation Of Agriculture – Phase Iii (2013) National Human Settlement Policy National Housing Policy (2015) National Urbanization Policy (2015)
INFRASTRUCTURE	National Poverty Reduction Strategy Tourism Policy Energy Policy (2014, Draft) Public Transport Policy (2012) Industrial Policy (2011) Health Sector Strategic Plan

1 Srinivasan Sunderasan. 2015. Review of Environment and Natural Resources Sector Policies. Final Report. Prepared by Verdurous Solutions Private Limited for Ministry of Natural Resources, Government of Malawi. January 2015.
2 Rwanda Ministry of Environment. 2018 DRAFT. National Environment and Climate Change Policy. Draft Report.

Table IV.III International policies, agreements and commitments which help shape Rwanda's environmental and natural resource policy and regulatory framework.

INTERNATIONAL POLICY/ STRATEGY	DESCRIPTION[1] [2]
Sustainable Development Goals (SDGs) (2015)	Seventeen (17) Sustainable Development Goals (SDGs) with targets and indicators for achievement. The SDGs address a range of economic, social and environmental issues
African Union Agenda 2063 and its First 10-Year Implementation Plan 2014-2023 adopted in September 2015	Dedicated to the building of an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the international arena (especially Aspiration 1, goals 1, 3 and 7).
East African Community (EAC) Vision 2050	Adopted in February 2016, focuses on initiatives for environment protection by prioritizing development enablers which are integral to long-term transformation, value addition and acceleration of sustained growth (directly link with pillar 4 and indirectly links with pillars 1, 2, 3 and 5).

1 Rwanda Ministry of Environment. 2018 DRAFT. National Environment and Climate Change Policy. Draft Report. Accessed 04 March 2019.
2 http://www.environment.gov.rw/fileadmin/Environment_Subsector/Laws__Policies_and_Programmes/Useful_documents/Final_Draft_Environment_and_Climate_Change_Policy.pdf

Multilateral Environmental Agreements (MEAs) ratified by Rwanda	Chemical-related MEAs: Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; • Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; • Stockholm Convention on Persistent Organic Pollutants, • Cartagena Protocol on Biosafety. Environment-related MEAs: • Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); • Convention on Wetlands of International Importance (Ramsar Convention); • Convention on Biological Diversity (CBD); • Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the CBD; • Convention on the Conservation of Migratory Species of Wild Animals (CMS Convention). Climate change-related MEAs: • United Nations Framework Convention on Climate Change (UNFCCC): • Kyoto Protocol • UN Convention to Combat Desertification and Land Degradation (UNCCD) • Montreal Protocol on Substances that Deplete the Ozone Layer • Kigali Amendment on Montreal Protocol in October 2016: phase down of the production and consumption of hydro fluorocarbons (HFCs) • The COP 21 Paris Agreement on Climate Change and other agreements: setting overarching global goals to limit temperature increase to well below 2 degrees Celsius and pursue efforts to limit increase to 1.5 degrees Celsius above preindustrial levels, and peak emissions.

IV.III Institutional Framework

The institutional framework for environmental and natural resource management in Rwanda includes those institutions designated as per the laws and policies as being responsible for regulation and/or promotion of the development of sectors relevant to the environment and natural resources. In Rwanda there are a number of ministries and agencies whose mandates cover different aspects of the environment such as environment, natural resources, land, forestry, climate change, agriculture, and livestock.

The Ministry of Environment (formerly Ministry of Natural Resources[1] (MINIRENA)) is responsible for overseeing and developing policies, strategies, and programmes related to the environment, climate change, natural resource management. The Ministry of Environment (MOE) has under its authority several agencies include Rwanda Environment Management Authority (REMA), Rwanda Meteorology Agency (RMA), and Rwanda Green Fund (FONERWA).

Rwanda Environment Management Authority (REMA) is an agency under the MOE which is responsible for coordinating the implementation of the national environmental policy to ensure appropriate management and rational use of environmental

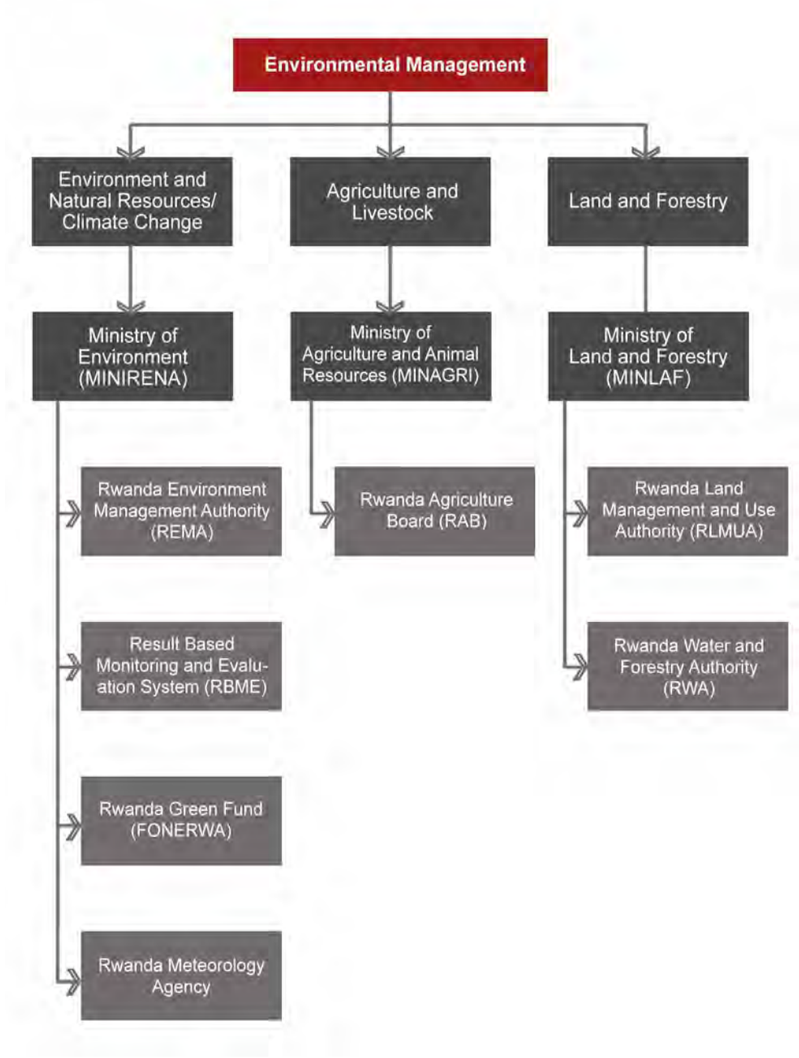


Figure IV.I National Institutional Framework for Environmental and Natural Resource Management in Rwanda

1 REMA. 2015. Rwanda: State of the Environment and Outlook Report 2015. Rwanda Environment Management Authority (REMA). P.O. Box 7436 Kigali, Rwanda.

resources, while the nation pursues sustainable production for improving the well-being of the people of Rwanda. Rwanda Meteorology Agency (RMA) is responsible for establishing meteorological stations, collecting meteorological data and analyzing and communicating weather and climate information and alerts to the government and public. Rwanda Green Fund (FONERWA) is an environmental and climate change fund established to provide financial and technical support to public and private projects addressing Rwanda's environmental, climate change and green growth needs.

The Ministry of Lands and Forestry (MINILAF) is responsible for ensuring sustainable protection, conservation and development of lands and forests in Rwanda. The Rwanda Water and Forest Authority (RWFA), an agency under MINILAF, is responsible for implementation of laws, policies, strategies, and government decisions related to forest management and natural resources management. Another agency under MINLAF is Rwanda Land Management and Use Authority (RLMUA), which is responsible for ensuring sustainable protection, conservation and development of lands and forestry. RLMUA is responsible for putting in place and operationalizing an efficient system of land administration, use and land management that secures land ownership in the country.

The Ministry of Agriculture (MINAGRI) is responsible for implementation of Rwanda's agriculture policy. MINAGRI integrates agricultural sectors including cultivation and livestock. The Rwanda Agriculture Board (RAB), an institution under MINAGRI, is responsible for developing agriculture and animal husbandry through sector reforms, research, agricultural extension and capacity building of farmers towards promoting adoption of modern practices and technologies for crop and animal production. RAB was formed from the merging of Rwanda Animal Resources Development Authority (RARDA), Rwanda Agricultural Development Authority (RADA), and Rwanda Agriculture Resource Institute (RARI).

At the district, municipal, or city level, the District Environment Protection Officer (reporting to the Director of the Public Health and Environment Unit) is responsible for implementation of environmental protection, conservation and promotion as regular by Rwanda's environmental laws including the Organic Law No. 04/2005 of 08/04/2005.

Table IV.IV Institutional framework for environmental and natural resource management in Rwanda and Kigali

SECTOR	INSTITUTION	SUB-INSTITUTION	ROLE
Environment and Natural Resources	Ministry of Environment (MOE). Formerly the Ministry of Natural Resources (MINIRENA)		responsible for developing land utilization policies; Developing environmental policies and procedures (e.g. environmental impact assessments), and protection of natural resources (including water, land, flora, and fauna).
Environment and Natural Resources	Ministry of Environment (MOE).	Rwanda Environment Management Authority (REMA)	responsibility to coordinate the implementation of the national environmental policy, with the aim of ensuring appropriate management and rational use of environmental resources on the basis of sustainable production.
Environment and Natural Resources	Ministry of Environment (MOE).	Results Based Monitoring and Evaluation System (RBME)	
Environment and Natural Resources	Ministry of Environment (MOE).	Rwanda Green Fund (FONERWA)	
Environment and Natural Resources	Ministry of Environment (MOE).	Rwanda Meteorology Agency	
	Rwanda Mines, Petroleum and Gas Board		To implement national policies, laws and strategies related to mines, petroleum and gas; To advise the Government on issues related to mines, petroleum and gas; To monitor and coordinate the implementation of strategies related to mines, petroleum and gas; To provide advice on the establishment of standards and regulations in mining, petroleum and gas; To supervise and monitor public or private entities conducting mining, trade and value addition of minerals operations; To conduct research, vary out exploration, and assist with valuing mining and quarry concessions.
Environment and Natural Resources	District / City Council >> Mayor >> Executive Secretary >> DC Social Development	Director of the Public Health and Environment Unit >> District Environment Protection Officer	responsibility to ensure the implementation of Organic Law N° 04/2005 of 08/04/2005 determining the modalities of protection, conservation and promotion of the environment and other environmental laws in Rwanda.
Agriculture and Livestock	Ministry of Agriculture (MINAGRI)		to deliver on the implementation of the National Agriculture Policy involving agriculture livestock issues.
Agriculture and Livestock	Ministry of Agriculture (MINAGRI)	Rwanda Agriculture Board (RAB)	tasked to develop agriculture and animal husbandry through their reform, and using modern methods in crop and animal production, research, agricultural extension, education and training of farmers in new technologies.
Lands and Forestry	Ministry of Lands and Forestry (MINILAF)		ensures sustainable protection, conservation and development of lands and forestry.

Lands and Forestry	Ministry of Lands and Forestry (MINILAF)	Rwanda Land Management and Use Authority (RLMUA)	RLMUA Mission: To implement national policies, laws, strategies, regulations and Government resolutions related to the management and use of land; to provide advice to the Government, monitor and coordinate the implementation of strategies related to the management and use of land; to promote activities relating to investment and value addition in the activities related to the use and exploitation of land resources in Rwanda; to supervise all land-related matters and represent the State for supervision and monitoring of land management and use; to prepare, disseminate and publish various maps and master plans relating to land management using the most appropriate scales; to set up principles and guidelines related to use of land; to resolve conflicts relating to land use and management which were not resolved at the District or City of Kigali levels;
Lands and Forestry	Ministry of Lands and Forestry (MINILAF)	Rwanda Water and Forest Authority (RWFA)	Mission: To implement policies, laws, strategies and Government decisions related to the management of forests and natural water resources. To advise Government, monitor and coordinate the implementation of strategies related to the management of forests and natural water resources. To assist public and private institutions in charge of management of forests and natural water resources in a bid to fight erosion; To prepare programmes of reforestation, forest promotion and appropriate management and support districts in the management of forests and natural water resources;
Infrastructure	Ministry of Infrastructure (MININFRA)		responsibility to orient and supervise the functioning and management of public institutions and agencies for transportation and infrastructure management in Rwanda.
Housing	Ministry of Infrastructure (MININFRA)	Rwanda Housing Authority (RHA)	responsible to implement the national housing and construction policy through coordination, conception, development, monitoring and evaluation. Also enforce environmental laws compliance in the context of urban housing and construction.
Roads	Ministry of Infrastructure (MININFRA)	Rwanda Transport Development Agency (RTDA)	responsible for the implementation of transport planning and policies.
Roads	Ministry of Infrastructure (MININFRA)	Roads Maintenance Fund (RMF)	
Air Transport	Ministry of Infrastructure (MININFRA)	Rwanda Civil Aviation Authority (RCAA)	
Air Transport	Ministry of Infrastructure (MININFRA)	Rwanda Airports Company (RAC)	
Air Transport	Ministry of Infrastructure (MININFRA)	Aviation Travel and Logistics (ATL)	
Water and Sanitation	Ministry of Infrastructure (MININFRA)	Water and Sanitation Corporation (WASAC)	
Energy	Ministry of Infrastructure (MININFRA)	Rwanda Energy Group (Energy Development Company & Energy Utility Company Ltd)	Energy and power management and implementation falls under responsibility of the Rwanda Energy Group.
Energy, Water and Sanitation		Energy, Water and Sanitation Authority (EWSA)	EWSA (Energy, Water and Sanitation Authority) is a national company that distributes power and water in Rwanda. Implementation and maintenance of water supply, sewerage and power supply infrastructure fall under the responsibility of EWSA.
Development Investment	Rwanda Development Board (RDB)		
Local Governance	District Local Governments		
	Ministry of Local Government		
Urban Planning and Construction	District / City Council >> Mayor >> Executive Secretary >> City Engineer		City Urban Planning and Construction One Stop Center (OSC)
Risk and Disaster Management	Ministry of Disaster Management and Refugees (MIDMAR)	Director of Risk Reduction and Preparedness Unit	
Finance and Economics	Ministry of Finance and Economic Planning	Minister of State in MINECOFIN in charge of Economic Planning	Coordinates national budgeting, planning and financing.
Trade and Industry	Ministry of Trade and Industry		
Recreation	Ministry of Sports and Culture		
Health	Ministry of Health		
Intersectoral Projects	Multiple ministries	Single Project Implementation Units (SPIU)	Establishment of Single Project Implementation Units (SPIU) across various ministries, which allows for the grouping of all the different project implementation units within a ministry under one single umbrella. This helps to better coordinate work, retain staff expertise and reduce duplication of work.

This Page has been intentionally left blank

Annexure III : Approved Projects

S.I.No	PlotNo_UPI	Project Name	Type
1	1/02/01/01/1518	Bumbogo Proposed Apartment	BPMIS
2	1/02/01/01/1728	CONSTRUCTION OF A TELECOM TOWER AT ZINDIRO	BPMIS
3	2039	CONSTRUCTION OF GATSATA HEALTH POST	BPMIS
4	1/02/02/02/1096	CONSRUCTION OF A TELECOM TOWER AT NYAMUGALI SITE	BPMIS
5	1/02/02/02/850	Imena Estate Villas	BPMIS
6	1/02/04/01/1129	CONSTRUCTION OF A TELECOM TOWER AT GISOZI 7 SITE	BPMIS
7	1/02/04/01/1588	PROPOSED APARTMENT HOUSE	BPMIS
8	1/02/04/01/1574	GISOZI COMERCIAL COMPLEX	BPMIS
9	1/02/04/01/861	RESIDENTIAL APARTMENT	BPMIS
10	1/02/04/01/449	CONSTRUCTION OF RESIDENTIAL APARTMENT	BPMIS
11	1/02/04/01/1741	PROPOSED CONSTRUCTION OF FRUITS HOPE ACCADEMY EXTESION	BPMIS
12	1/02/04/01/1725	CONSTRUCTION OF A TELCOM TOWER AT GISOZI 6 SITE	BPMIS
13	1/02/04/01/2782	CONSTRUCTION OF S TELCOM TOWER AT JABANA SITE	BPMIS
14	1/02/04/01/2144	MODERN RESIDENTIAL APARTMENTS	BPMIS
15	1519	CONSTRUCTION D'UNE MAISON BIFAMMILIALLE	BPMIS
16	1521	PROPOSED RESIDENTIAL APARTMENT PROJECT	BPMIS
17	1/02/04/01/711	PROPOSED CONSTRUCTION OF FRUITS HOPE ACCADEMY EXTESION	BPMIS
18	1/02/04/01/3514	APARTMENT BUILDINGS	BPMIS
19	1/02/04/01/709	PROPOSED CONSTRUCTION OF FRUITS HOPE ACCADEMY EXTESION	BPMIS
20	1/02/04/01/396	MIXTE USE PROJECT	BPMIS
21	1/02/04/01/3309	PROPOSED APARTMENT HOUSE	BPMIS
22	1/02/04/01/4052	PROPOSED RESIDENTIAL HOUSE	BPMIS
23	1/02/04/01/4086	CONSTRUCTION RESIDENTIAL HOUSE	BPMIS
24	1/02/04/01/4302	RESEDENCE APPART	BPMIS
25	1/02/04/02/90	PROPOSED APPARTMENT BUILDING	BPMIS
26	1/02/04/02/1147	PROPOSED APARTMENTS AT GISOZI	BPMIS
27	1/02/04/02/1080	PROPOSED APARTEMENT	BPMIS
28	1/02/04/02/37	NAMBIAR APPARTEMENT	BPMIS
29	1/02/04/02/3367	Proposed construction of three stories apartment building	BPMIS
30	1/02/04/02/3390	PROPOSED TWIN RESIDENTIAL HOUSE	BPMIS
31	1/02/05/01/212	PROPOSED COFFEE BUSINESS CENTER	BPMIS
32	1/02/05/01/216	CONSTRUCTION OF WAREHOUSE	BPMIS
33	1/02/05/01/2447	PROPOSED MULTIPURPOSE HALL	BPMIS
34	1/02/07/01/1467	PROPOSED KACYIRU APARTMENT	BPMIS
35	1/02/07/01/1530	CONSTRUCTION DES APPARTEMENTS	BPMIS
36	1/02/07/01/201	LAUNDRY AND CATERING	BPMIS
37	1/02/07/01/508	PROPOSED SINGLE FAMILY VILLA AT KACYIRU	BPMIS
38	1/02/07/01/229	KUBAHO PLAZA REFURBISHMENT AND CONSTRUCTION OF A MODERN SERV	BPMIS
39	1/02/07/02/512	PROPOSED SEVENTH DAY ADVENTIST CHURCH AT KACYIRU	BPMIS
40	1/02/07/02/856	6 DU RESIDENTIAL APARTMENT	BPMIS
41	01/02/07/02/1533	RESIDENTIAL HOUSE	BPMIS
42	1/02/07/03/249	PROPOSED COMMERCIAL BUILDING AT KACYIRU	BPMIS
43	1/02/07/03/927	Proposed Residential Apartment	BPMIS
44	1/02/08/02/602.	PROPOSED MOTEL HOUSE	BPMIS
45	1/02/08/02/294	PROPOSED MIXED USE COMMERCIAL BUILDING	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
46	1/02/08/03/672	PALM APARTMENTS	BPMIS
47	581	HOTEL APARTMENT	BPMIS
48	1/02/09/01/1687	PROPOSED RESIDENTIAL TWIN HOUSE WITHONE STORY AT BIBARE-KIMIROI	BPMIS
49	2314	RESIDENTIAL APARTEMENTS	BPMIS
50	1/02/09/01/1512	PROPOSED FOUR UNITS APARTMENT	BPMIS
51	1/02/09/01/972	EAST APARTMENT HOMES	BPMIS
52	1/02/09/01/531	construction of apartment	BPMIS
53	1/02/09/01/1672	PROPOSED RESIDENTIAL DEVELOPMENT	BPMIS
54	1/02/09/01/675	PROPOSED CONSTRUCTION OF COMMERCIAL BUILDING IN BIBARE CELL	BPMIS
55	1/02/09/01/797	PROPOSED RESIDENTIL SIX UNITIES APARTMENT	BPMIS
56	1/02/09/01/2340	PROPOSED PARTMENTS	BPMIS
57	1/02/09/02/790	PROPOSED 4 IN 1 APARTMENTS	BPMIS
58	1/02/09/02/3407	Mukasa House	BPMIS
59	311	CONSTRUCTION D'UNE MAISON JUMELLE	BPMIS
60	1/02/09/02/3663	PROPOSED APARTMENTS	BPMIS
61	1/02/09/02/3475	Twin residential houses	BPMIS
62	1/02/09/02/3952	Gulf hotel to hostel conversion	BPMIS
63	1380	PROPOSED EXTENSION	BPMIS
64	1/02/09/02/1133	KAMUGISHA APARTMENTS	BPMIS
65	1/02/09/02/702	KIBAGABA RESIDENTIAL APARTMENT	BPMIS
66	792	CONSTRUCTION OF MODERN APPARTMENT	BPMIS
67	3509	CHAPELLE	BPMIS
68	1/02/09/02/2362	PROPOSED MIXED USE BUILDING	BPMIS
69	1/02/09/02/464	residential	BPMIS
70	1/02/09/02/607	RESIDENTIAL APPARTEMENTS	BPMIS
71	3918	KIBAGABAGA APARTMENT	BPMIS
72	1/02/09/02/3064	RESIDENTIAL THREE UNITY APARTMENT	BPMIS
73	1/02/09/02/3959	PROPOSED EXTENSION OF RESIDENTIAL BUILDING	BPMIS
74	1/02/09/02/783	Residential Building	BPMIS
75	1/02/0/902/2265	COMMERCIAL BUILDING KIBAGABAGA 2265	BPMIS
76	1/02/09/02/3582	CONSTRUCTION OM MODERN APPARTMENT	BPMIS
77	1/02/09/02/2880	RWANDA CORRECTIONAL SERVICES	BPMIS
78	1/02/09/02/5865	Apartment	BPMIS
79	1/02/10/01/1842	CONSTRUCTION DES APPARTEMENTS	BPMIS
80	1/02/10/01/1758	RESIDENTIAL HOUSE	BPMIS
81	1/02/10/01/1541	8 Units Appartment building for Mr Ismael KHANABADI	BPMIS
82	1/02/10/01/275	Vista Apartments	BPMIS
83	1101	PROPOSED COMMERCIAL BUILDING	BPMIS
84	1/02/10/01/2441	residential apartment	BPMIS
85	1987	ETUDES ARCHITECTURALES D'UNE MAISON JUMELLEE A GACURIRO	BPMIS
86	1/02/10/01/1982	residential house 2in1	BPMIS
87	1/02/10/01/2109	JOHN + LENA	BPMIS
88	1/02/10/01/1529	Residential Building	BPMIS
89	1/02/10/01/2041	Appartments for residential	BPMIS
90	1/02/10/02/2017	URUKUMBUZI AFFORDABLE HOUSING	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
91	1/02/10/02/2033	URUKUMBUZI AFFORDABLE HOUSING	BPMIS
92	1/02/10/02/2014	URUKUMBUZI AFFORDABLE HOUSING	BPMIS
93	1/02/10/03/2042	Construction of a bloc of toilet at ADEPR Batsinda	BPMIS
94	1/02/10/03/2610	PROPOSED RESIDENTIAL HOUSE AT KINYINYA	BPMIS
95	1/02/10/03/795	PROPOSED KINGDOM VILLAGE ESTATE	BPMIS
96	4456	CONSTRUCTION DES MAISONS D'HABITATION	BPMIS
97	1/02/10/03/2025	PROPOSED KINGDOM VILLAGE ESTATE	BPMIS
98	1/02/10/03/796	PROPOSED KINGDOM VILLAGE ESTATE	BPMIS
99	1/02/10/04/1827	Proposed Construction of Real Estate	BPMIS
100	1/02/10/04/2302	PROPOSED APARTMENTS	BPMIS
101	01/02/10/04/2293	Apartment house	BPMIS
102	523	PROPOSED FUELING STATION	BPMIS
103	1/02/10/04/2273	motel building	BPMIS
104	1/02/10/04/2519	PROPOSED 2 STORY RESIDENTIAL HOUSE	BPMIS
105	1/02/11/02/151	Residentialbuildings	BPMIS
106	1/02/11/02/2313	PROPOSED RESIDENTIAL APPARTMENT	BPMIS
107	1/02/11/02/2903	PROPOSED RESIDENTIAL APARTMENT BUILDING	BPMIS
108	1/02/11/02/2315	PROPOSED APARTENTS AT NDERA	BPMIS
109	1/02/11/03/2282	proposed residential house	BPMIS
110	1/02/11/03/1009	CONSTRUCTION OF FIVE SINGLE UNITS RESIDENTIAL HOUSES	BPMIS
111	1/02/11/03/1942	proposed apartment	BPMIS
112	1/02/11/03/3743	PROPOSED RESIDENTIAL APPARTMENT	BPMIS
113	1/02/11/03/1947	PROPOSED APAERMENT	BPMIS
114	1/02/11/03/4360	CONSTRUCTION OF NEW APARTMENT NDERA	BPMIS
115	1/02/11/04/267	EXTENSION OF KIGALI GREAT HEIGHT SCHOOL	BPMIS
116	1/02/11/04/551	RESIDENTIAL BUILDING	BPMIS
117	1/02/11/04/965	PROPOSED PARKINGS AND STORAGE	BPMIS
118	1/02/11/04/1986	RESIDENCE APPARTMENT	BPMIS
119	1/02/11/06/545	Commercial Building Rudashya	BPMIS
120	1/02/11/06/2343	PROPOSED APARTMENTS	BPMIS
121	1/02/13/01/1253	PROPOSED CAPITAL APARTMENTS	BPMIS
122	1/02/13/01/1165	PROPOSED COMMERCIAL BUILDING	BPMIS
123	1/02/13/01/446	Residential project	BPMIS
124	442	CONSTRUCTION OF 2 THREE LEVEL APARTMENTS	BPMIS
125	1/02/13/01/1166	PROPOSED COMMERCIAL BUILDING	BPMIS
126	1/02/13/01/1080	CONSTRUCTION OF RESIDENTIAL APARTMENTS	BPMIS
127	1/02/13/01/413	PROPOSED APARTMENT BUILDING	BPMIS
128	1/02/13/01/1111	Twin Residential House	BPMIS
129	1/02/13/02/1403	E apartments	BPMIS
130	1/02/13/02/644	NYARUTARAMA APEX APARTEMENTS	BPMIS
131	1/02/13/02/2277	PROPOSED RESIDENTIAL APARTMENT BUILDINGS	BPMIS
132	1443	PROPOSED RESIDENCE APARTMENTS	BPMIS
133	1/02/13/02/1440	PROPOSED RESIDENCE APARTMENTS	BPMIS
134	1/02/13/02/247	PROPOSED RESIDENTIAL APARTMENT BUILDINGS	BPMIS
135	1/02/13/02/643	NYARUTARAMA APEX APARTEMENTS	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
136	1/02/13/02/158	BIH POLYCLINIC	BPMIS
137	1/02/13/02/263	office block	BPMIS
138	1/02/13/02/339	PROPOSED APARTMENT AT NYARUTARAMA	BPMIS
139	1594	KOZA ESTATES NYARUTARAMA Plot 1594	BPMIS
140	1/02/13/02/324	PROPOSED RESIDENTIAL APARTMENTS	BPMIS
141	1/02/13/03/819	Proposed Construction of Kigali bilingual seventh day Adventist church	BPMIS
142	1/02/13/03/423	KISIMENTI PLAZZA	BPMIS
143	1/02/13/03/988	Construction de 2 rampes	BPMIS
144	1/02/13/03/110	mixed use building at Remera	BPMIS
145	1/02/13/03/417	PROPOSED CHANGE OF USE FROM RESIDENTIAL TO COMMERCIAL	BPMIS
146	1/02/13/04/529	CONSTRUCTION OF APPARTMENT HOUSE	BPMIS
147	1/02/13/04/711	PROPOSED COMMERCIAL BUILDING	BPMIS
148	1/02/13/04/571	Mixed Single family residential apartments	BPMIS
149	1/02/13/04/259	PROPOSED EXTENSION OF SCHOOL	BPMIS
150	1/02/13/04/766	Commercial mixed use building	BPMIS
151	1/02/13/04/224	PARA-ACHEMENT D'UN IMMEUBLE COMMERCIAL MULTI-FONCIONNEL	BPMIS
152	1/02/13/04/303	PROPOSED COMMERCIAL	BPMIS
153	1/02/14/03/882	Proposed of construction for a residential apartment	BPMIS
154	1/02/14/04/548	PROPOSED LIQUEFIED PETROLEUM GAS FILLING PLANT	BPMIS
155	1/02/14/04/540	PETROL DEPOT IN KABUGA II	BPMIS
156	1/02/14/04/944	PETROL DEPOT IN KABUGA II	BPMIS
157	1/02/14/04/1003	PETROL DEPOT IN KABUGA II	BPMIS
158	1/02/14/07/3117	APARTMENTS	BPMIS
159	1/02/14/07/3257	PROPOSED APARTMENT	BPMIS
160	1/02/14/07/3308	resindential building	BPMIS
161	1/02/14/07/3266	APARTMENT	BPMIS
162	1/02/14/07/3241	PROPOSED RESIDENTIAL TWIN HOUSE	BPMIS
163	1/02/14/07/3113	Residential apartments	BPMIS
164	1/02/14/07/1875	NURSERY SCHOOL	BPMIS
165	1/02/14/07/3248	Assumpta Apartment	BPMIS
166	1/02/14/07/3194	TRANQUILI1Y APARTMENT	BPMIS
167	1/02/14/07/3292	residential house	BPMIS
168	1/02/14/07/3180	Residential apartment	BPMIS
169	1/02/14/07/3152	PROPOSED RESIDENTIAL APARTMENTS	BPMIS
170	1/02/14/07/3019	PROPOSED FOOD CENTER	BPMIS
171	1/02/14/07/4670	CONSTRUCTION OF 4DU RESIDENTIAL APARTMENTS	BPMIS
172	1/02/14/07/4672	Construction of apartment building	BPMIS
173	1/02/14/07/4757	PROPOSED APARTEMENT	BPMIS
174	1/02/14/07/4753	Didi Residential Apartment	BPMIS
175	1/02/14/07/4808	RESIDENTIAL HOUSE	BPMIS
176	1/02/14/07/4834	Four unity residential building	BPMIS
177	1/02/14/07/4829	PROPOSED RESIDENCE HOUSE	BPMIS
178	1/02/14/07/4820	Semi Attached House	BPMIS
179	1/02/14/08/753	CONSTRUCTION OF PETROL STATION AND SERVICES	BPMIS
180	1/02/14/08/104	CONSTRUCTION OF A TELECOM TOWER AT RUGENDE	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
181	1/03/01/01/2150	twin residential	BPMIS
182	1/03/01/03/1707	PROPOSED RESIDENTIAL APARTMENT	BPMIS
183	1/03/01/03/792	GAHANGA ESTATE	BPMIS
184	1/03/01/05/1208	GAHANGA CONCERTE,PAVERS & BRICK PRODUCTION FACILITIES	BPMIS
185	1/03/01/05/1246	PERTO STATION PROJECT	BPMIS
186	1/03/01/05/788	PROPOSED RESIDENTIAL APARTMENTS	BPMIS
187	1/03/02/01/312	CONSTRUCTION OF A TELECOM TOWER AT GATENGA 2 SITE	BPMIS
188	652	PETROL SERVICES STATION	BPMIS
189	1/03/02/03/1299	RESIDENTIAL HOUSE	BPMIS
190	1/03/02/03/286	CONSTRUCTION D'APARTEMENTS DETROIS UNITES EN DEUX IMMEUBLES	BPMIS
191	1/03/02/03/1915	Emsdi reform movement church and school construction	BPMIS
192	1/03/02/03/406	PROPOSED HINDU MANDAL	BPMIS
193	1/03/02/03/632	RESIDENTIALHOUSE	BPMIS
194	344	PROP0SED RESIDENTIAL APARTMENT HOUSE	BPMIS
195	1/03/02/03/3085	PROPOSED THREE UNITS APARTMENT	BPMIS
196	1/03/02/03/1010	extension of La bonne addresse	BPMIS
197	1/03/02/03/2387	proposed construction of single family residential house	BPMIS
198	1/03/02/03/355	RESIDENTIAL HOUSE	BPMIS
199	1/03/02/03/2812	PROPOSED MKU SCHOOL OF JOURNALISM AND HOSTELS	BPMIS
200	1/03/02/03/2819	PROPOSED MKU SCHOOL OF JOURNALISM AND HOSTELS	BPMIS
201	1/03/02/03/2549	CONSTRUCTION OF A TOWER AT KARAMBO SITE	BPMIS
202	1/03/02/03/2816	PROPOSED MKU SCHOOL OF JOURNALISM AND HOSTELS	BPMIS
203	1/03/02/03/1725	constrction of twin G+1 Residential building	BPMIS
204	934	Construction of 2 units residential house	BPMIS
205	1/03/02/03/630	RESIDENTIALHOUSE	BPMIS
206	1/03/02/03/3508	CONSTRUCTION PROJECT OF 2 UNIT PROPOSED RESIDENTIAL HOUSE	BPMIS
207	2881	Construction of Apartment building	BPMIS
208	1/03/02/03/2813	PROPOSED MKU SCHOOL OF JOURNALISM AND HOSTELS	BPMIS
209	1/03/02/03/2811	PROPOSED MKU SCHOOL OF JOURNALISM AND HOSTELS	BPMIS
210	1/03/02/03/629	RESIDENTIALHOUSE	BPMIS
211	1/03/02/03/3536	CONSTRUCTION OF AN APARTMENT	BPMIS
212	1/03/02/03/3594	PROPOSED RESIDENTIAL APARTMENTS	BPMIS
213	1/03/02/04/443	MOTEL AT NYARURAMA	BPMIS
214	1/03/03/01/421	CONSTRUCTION OF A TOWER AT MAGERWA KANSEREGE SITE	BPMIS
215	1/03/03/01/1068	CONSTRUCTION OF A TOWER AT RUJUGIRO ESTATE SITE	BPMIS
216	1/03/03/01/56	RESIDENTIAL HOUSE	BPMIS
217	1/03/03/01/898	GIKONDO RESIDENTIAL HOUSES	BPMIS
218	1/03/03/01/483	church	BPMIS
219	324	PROPOSED APARTMENTS IN KAGARAMA, KANSEREGE	BPMIS
220	654	construction project of 3 proposed residential house	BPMIS
221	1/03/03/02/246	LIGHT INDUSTRY (WAREHOUSE)	BPMIS
222	185	APARTMENT HOUSE PROJECT	BPMIS
223	1/03/03/02/245	LIGHT INDUSTRY (WAREHOUSE)	BPMIS
224	1/03/03/02/663	proposed 4 story extension for construction laboratory	BPMIS
225	1/03/03/03/213	GUEST HOUSE	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
226	1/03/04/01/30	Construction of five units apartment at Kagarama	BPMIS
227	1/03/04/01/75	PROPOSED APARTMENT HOUSE	BPMIS
228	1/03/04/01/749	PROPOSED RESIDENTIAL BUILDING	BPMIS
229	1/03/04/01/667	RESIDENTIAL HOUSE	BPMIS
230	1/03/04/01/420	Proposal of Four residential units	BPMIS
231	1/03/04/01/87	PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT	BPMIS
232	1/03/04/01/163	PROPOSED RESIDENTIAL BUILDING	BPMIS
233	1/03/04/01/1011	Proposed Residential Apartment	BPMIS
234	1/03/04/01/1068	PROPOSED TWEEN RESIDENTIAL HOUSE	BPMIS
235	1078	PROPOSED 3UNITS RESIDENTIAL HOUSE IN MUYANGE	BPMIS
236	1/03/04/02/421	CONSTRUCTION OF RESIDENTIAL HOUSE FOR 2 UNITS	BPMIS
237	1/03/04/02/1083	PROPOSED RESIDENTIAL HOUSE	BPMIS
238	1/03/04/02/1226	PROPOSED RESIDENTIAL APARTMENT	BPMIS
239	1/03/04/02/1400	PROPOSED APARTMENTS BUILDING	BPMIS
240	1552	Proposed Apartment G+1	BPMIS
241	1/03/04/03/1555	Twin house	BPMIS
242	869	PROPOSED RESIDENTIAL APARTMENT	BPMIS
243	1/03/04/03/1130	Commerialc	BPMIS
244	1/03/04/03/1509	PROJET DE CONSTRUCTION D'UNE MAISON D'HABITATION POUR 2 FAMILLE	BPMIS
245	1387	SOUTH VIEW APARTMENTS	BPMIS
246	1/03/04/03/1535	RESIDENTIAL HOUSE	BPMIS
247	1/03/04/03/616	PROPOSED APARTMENT	BPMIS
248	1/03/04/03/1567	RESIDENTIAL HOUSES	BPMIS
249	1828	PROPOSED RESIDENTIAL APARTMENT BUILDING	BPMIS
250	1/03/04/03/1549	nsengimana remy	BPMIS
251	1/03/04/03/1261	RESIDENCE	BPMIS
252	1/03/04/03/274	PROPOSED APARTMENT	BPMIS
253	1/03/04/03/1692	CONSTRUCTION OF RESIDENTIAL APARTMENT	BPMIS
254	1/03/04/03/1132	Mixed use building	BPMIS
255	1/03/04/03/1520	Twin house	BPMIS
256	1563	PROPOSED APARTMENT	BPMIS
257	1/03/04/03/1445	PROPOSED KIGALI DE LA SALLE SCHOOL	BPMIS
258	1/03/04/03/1723	Construction of residential house	BPMIS
259	1728	PROPOSED 2-UNITS RESIDENTIAL HOUSE	BPMIS
260	1/03/04/03/1730	PROPOSED RESIDENTAIL APARTEMENT	BPMIS
261	1/03/04/03/1794	Construction of apartment	BPMIS
262	1/03/04/03/1800	residential	BPMIS
263	1/03/04/03/1803	RESIDENTIAL HOUSE	BPMIS
264	1/03/04/03/1839	PROPOSED RESIDENTAIL APARTEMENTS	BPMIS
265	1/03/05/01/134	PROPOSED ESTATE HOUES	BPMIS
266	1/03/05/02/632	CONSTRUCTION OF RESIDANTIAL HOUSES	BPMIS
267	1/03/05/02/648	PROPOSED APARTMENT	BPMIS
268	1/03/05/02/1987	RESIDENTIAL HOUSE 1987 KABEZA	BPMIS
269	1/03/05/03/2661	CONSTRUCTION PROJECT OF RESIDENTIAL APARTMENT	BPMIS
270	1/03/05/04/3048	RESIDENTIAL HOUSE	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
271	1/03/05/04/1107	PROPOSED APPARTMENT	BPMIS
272	1/03/05/04/1729	G+2 RESENTIAL HOUSE	BPMIS
273	1/03/05/04/603	Establishment of Centre of Excellence in Farm Mechanisation, Rwanda	BPMIS
274	1/03/05/04/3058	CONSTRUCTION OF AN APARTEMENT BUILDING	BPMIS
275	1/03/05/04/2041	APARTMENT HOUSE	BPMIS
276	1/03/05/04/1392	proposed apartment and rehabilitation of existing house	BPMIS
277	1/03/05/04/3205	PROPOSED APARTMENT BUILDING	BPMIS
278	1/03/06/01/7	PROPOSED COMMERCIAL COMPLEX	BPMIS
279	1/03/06/01/8	car wash	BPMIS
280	1/03/06/04/734	PROPOSED CONSTRUCTION OF APARTMENT	BPMIS
281	1/03/07/01/2397	Project of construction of a residential house of Mr. MUSEMINALI Vincent	BPMIS
282	1/03/07/0/1208	CONSTRUCTION OF A TOWER AT KIMISANGE SITE	BPMIS
283	1/03/07/02/13	PROPOSED KIGARAMA COMMERCIAL AND OTHERS	BPMIS
284	1/03/07/02/1052	CONSTRUCTION OF A TELECOMTOWER AT KARUGIRA SITE	BPMIS
285	1/03/07/02/570	RESIDENTIAL HOUSE	BPMIS
286	1/03/07/02/613	GROUPE SCOLAIRE CONSULAIRE CONGOLAIS DE KIGALI EXTENSION	BPMIS
287	1/03/07/03/628	KARICONDO APOPHIE	BPMIS
288	1/03/07/03/273	CONSTRUCTION OF RESIDENTIAL BUILDING	BPMIS
289	1/03/07/03/1131	CONSTRUCTION OF RESIDENTIAL APARTMENT	BPMIS
290	1/03/07/03/242	PROPOSED RESIDENTIAL APARTMENTS	BPMIS
291	1/03/07/04/67	RESIDENTIAL HOUSE	BPMIS
292	1/03/07/04/2147	PROPOSED RESIDENTIAL DEVELOPMENT	BPMIS
293	1/03/07/04/2148	RESIDENTIAL	BPMIS
294	1/03/07/05/349	APPARTEMENT HOUSE	BPMIS
295	1/03/08/03/3008	PROPOSED APARTEMENT AT MASAKA	BPMIS
296	1/03/08/03/1533	Elexis of commercial building	BPMIS
297	3437	MUKAMUSONI Sylvia	BPMIS
298	1/03/08/04/950	Construction of apartments	BPMIS
299	1/03/08/04/1650	proposed apartment at masaka	BPMIS
300	1/03/08/06/789	CONSTRUCTION OF TELECOM TOWER AT MASAKA RUSHESHE	BPMIS
301	940	Residential appartment	BPMIS
302	1/03/09/01/404	CONSTRUCTION OF 4DU RESIDENTIAL APARTMENT	BPMIS
303	1/03/09/01/526	residence extension	BPMIS
304	145	kicukiro apartments	BPMIS
305	1/03/09/01/70	PROPOSED RESIDENTIAL APARTMENTS	BPMIS
306	1/03/09/01/697	CONSTRUCTION PROJECT OF 12 UNITS TO BE APARTMENTS	BPMIS
307	503	RESIDENTIAL APARTMENT	BPMIS
308	1/03/09/02/159	CONSTRUCTIONOF A RESIDENTIAL APARTMENT	BPMIS
309	1374	RESIDENTIAL HOUSE	BPMIS
310	2390	KANOMBE APPARTMENTS	BPMIS
311	1829	Appartment Building	BPMIS
312	1/03/10/01/116	construction of educational building	BPMIS
313	1/03/10/01/1210	Construction of apartment (4 IN 1)	BPMIS
314	1/03/10/01/2388	construction of proposed 4 units	BPMIS
315	1/03/10/01/3014	CONSTRUCTION OF 3STORY RESIDENTIAL APARTMENT WITH 9UNITES	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
316	10310012000	Sparks Academy Construction Project	BPMIS
317	1/03/10/01/3179	RESIDENTIAL HOUSE	BPMIS
318	1/03/10/01/2519	RESIDENCIAL HOUSE OF 4APARTMENTS	BPMIS
319	1/03/10/01/2389	PROPOSED APARTMENTS AT KICUKIRO	BPMIS
320	1/03/10/01/993	IMBONEZA SACCO NYARUGUNGA	BPMIS
321	1/03/10/01/2848	PROPOSED APARTMENT	BPMIS
322	1/03/10/012453	CHANGING (3) FAMILY APARTMENTS WITH (2) FLOORS INTO A GUEST HOUS	BPMIS
323	1/03/10/01/3020	CONSTRUCTION OF A TELECOM TOWER AT NYARUGUNGA	BPMIS
324	1/03/10/01/3027	PROPOSED RESIDENTIAL APARTMENT	BPMIS
325	1/03/10/02/1539	Kanombe Apartment	BPMIS
326	1/03/10/03/349	kia - plaza	BPMIS
327	1/03/10/03/477	Construction of a mixed use Building	BPMIS
328	833	Nyaruganga Estate	BPMIS
329	1/01/01/01/487	Construction of apartment building	BPMIS
330	1/01/01/01/489	CONSTRUCTION OF A TOWER AT NYAKABANDA 4	BPMIS
331	1/01/01/01/468	Petrol station	BPMIS
332	1/01/01/05/92	CONSTRUCTION OF A TELECOM TOWER AT KABUSUNZU 2	BPMIS
333	1/01/02/01/1033	KANYINYA RESORT	BPMIS
334	1/01/02/01/2680	CONSTRUCTION OF A TOWER AT YANZE SITE	BPMIS
335	1/01/02/01/1026	KANYINYA RESORT	BPMIS
336	1/01/02/01/1032	KANYINYA RESORT	BPMIS
337	1/01/02/01/1038	KANYINYA RESORT	BPMIS
338	1/01/02/01/1031	KANYINYA RESORT	BPMIS
339	1/01/02/01/1029	KANYINYA RESORT	BPMIS
340	1/01/02/01/1030	KANYINYA RESORT	BPMIS
341	1/01/02/01/1034	KANYINYA RESORT	BPMIS
342	1/01/02/01/1037	KANYINYA RESORT	BPMIS
343	1/01/02/02/1070	New packaging line building	BPMIS
344	1/01/03/03/322	PROPOSED RESIDENTIAL APARTEMENT	BPMIS
345	1/01/03/03/302	Construction of twin Residential House	BPMIS
346	1/01/03/03/3939	CONSTRCTION OF A TELECOM TOWER GITICYINYONI	BPMIS
347	1/01/03/03/4004	RESIDENTIAL HOUSE	BPMIS
348	1/01/03/03/4124	RESIDENTIAL BUILDING	BPMIS
349	1/01/04/01/276	PROPOSED RESIDENTIAL BUILDING	BPMIS
350	1/01/04/01/51	Construction d' une sallepolyvalente pour les enfants	BPMIS
351	1/01/04/01/52	Construction d' une sallepolyvalente pour les enfants	BPMIS
352	405	Model house at Mpazi by SKAT	BPMIS
353	183	Model house at Mpazi by SKAT	BPMIS
354	400	Model house at Mpazi by SKAT	BPMIS
355	415	Model house at Mpazi by SKAT	BPMIS
356	2313	construction of commercial complex	BPMIS
357	1/01/05/03/1508	MATABA MIXED FARMING PROJECT	BPMIS
358	1/01/07/02/199	CONSTRUCTION OF A TOWER AT MUHOZA SITE	BPMIS
359	1//01/08/01/477	APPARTEMENT	BPMIS
360	1/01/08/01/1348	RESIDENTIAL HOUSE	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
361	1607	Nyarugenge District Hospital	BPMIS
362	1606	Nyarugenge District Hospital	BPMIS
363	1/01/08/02/682	CONSTRUCTION OF RESIDENTIAL HOUSE	BPMIS
364	325	ACACIA Appartment	BPMIS
365	1/01/08/03/810	HALL	BPMIS
366	1/01/08/03/1119	PROPOSED 2 RESIDENTIAL TWIN HOUSES	BPMIS
367	1/01/08/03/920	PROJET DE CONSTRUCTION D'UNE MAISON D'HABITATION POUR 2 FAMILLE	BPMIS
368	1/01/08/03/1752	residential construction project	BPMIS
369	1/01/08/04/2343	residential	BPMIS
370	1/01/08/04/1856	CONSTRUCTION OF APARTMENT	BPMIS
371	1/01/08/04/1843	PROJET DE CONSTRUCTON D'UNE MAISON D'HABITATION POUR 2 FAMILLES	BPMIS
372	1/01/08/04/2539	PROPOSED RESIDENTIAL BUILDING	BPMIS
373	1/01/09/03/1160	NOBELIA	BPMIS
374	1/01/09/03/1065	NOBELIA	BPMIS
375	1/01/09/03/1112	Nyarugenge Sector Office	BPMIS
376	1/01/09/03/781	15kV NETWORK STRENGTHENING PROJECT	BPMIS
377	1/01/09/03/1069	amarembo city center	BPMIS
378	1/01/09/03/1070	NOBELIA	BPMIS
379	1264	High End Housing , Kiyovu	BPMIS
380	1/01/09/03/1131	NSIT OFFICE BUILDING	BPMIS
381	1/01/09/03/1196	PROPOSED COMMERCIAL BUILDING	BPMIS
382	1/01/09/03/862	CONSTRUCTION OF A G +1 HOUSE	BPMIS
383	1/01/09/03/1059	amarembo city center	BPMIS
384	1/01/09/03/1296	PROPOSED APART HOTEL	BPMIS
385	1/01/09/03/706	YUSSA OFFICE BLOCK	BPMIS
386	1/01/09/03/1063	amarembo city center	BPMIS
387	1/01/09/03/1198	HONEST PLAZA HOUSE PHASE 2	BPMIS
388	1/01/09/03/871	PROPOSED RESIDENTIAL PROJECT	BPMIS
389	1/01/10/02/398	Construction of additional residential unit	BPMIS
390	1/01/10/03/285	COMMERCIAL BUILDING	BPMIS
391	1/01/10/04/304	CONSTRUCTION OF COMMERCIAL & APARTMENT BUILDING	BPMIS
392	1/03/08/02/2747	RESIDENTIAL APARTMENT	BPMIS
393	2288	METALEN WAREHOUSE	BPMIS
394	1/03/04/01/1035	Proposed Residential Appatment	BPMIS
395	1/03/05/02/280	PROPOSED MIXED USE GARDENPROJECT IN KABEZA	BPMIS
396	1/02/14/07/4870	PROPOSED CONSTRUCTION OF A RESIDENTIAL APARTMENT	BPMIS
397	1/03/10/03/1914	PROPOSED SINGLE FARMILY RESIDENTIAL PROJECT AT RWIMBOGO	BPMIS
398	1/03/05/04/3930	PROPOSED APARTMENT	BPMIS
399	1/03/04/03/1966	Construction of Apartment	BPMIS
400	1/02/11/04/2408	MUMENYI ESTATE	BPMIS
401	1/02/11/04/2409	MUMENYI ESTATE	BPMIS
402	1/03/10/01/3629	APARTMENT BUILDING	BPMIS
403	1/03/08/02/923	PROPOSED RESIDENTIAL APARTMENTS	BPMIS
404	1/03/08/02/922	PROPOSED RESIDENTIAL APARTMENTS	BPMIS
405	1/03/08/02/924	Appartments for residential	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
406	1/03/02/03/1802	EDUCATIONAL PROJECT	BPMIS
407	1/02/04/02/64	NAMBIAR APPARTEMENT	BPMIS
408	1/02/04/02/36	NAMBIAR APPARTEMENT	BPMIS
409	1/01/09/03/1324	amarembo city center	BPMIS
410	1/01/09/03/1058	amarembo city center	BPMIS
411	1/03/05/01/3727	BUSANZA GOLDEN HOMES	BPMIS
412	1/03/05/01/3729	BUSANZA GOLDEN HOMES II	BPMIS
413	1/03/05/01/3734	BUSANZA GOLDEN HOMES II	BPMIS
414	1/03/05/01/3728	BUSANZA GOLDEN HOMES II	BPMIS
415	1/03/05/01/3735	BUSANZA GOLDEN HOMES II	BPMIS
416	1/03/05/01/3736	BUSANZA GOLDEN HOMES II	BPMIS
417	1/03/05/01/3737	BUSANZA GOLDEN HOMES II	BPMIS
418	1/03/05/03/3779	RESIDENTIAL APARTMENT	BPMIS
419	1/02/11/03/4849	residential building apartment	BPMIS
420	1/03/10/01/1350	MIXED USED APARTMENT	BPMIS
421	1/03/04/03/1978	PROPOSED ECHO CHURCH	BPMIS
422	1/02/10/04/3074	APARTMENT	BPMIS
423	1/02/09/02/7051	PROPOSED APARTMENT HOUSE	BPMIS
424	1/03/08/02/3067	IWACU SHOP	BPMIS
425	1/01/03/03/4434	RESIDENTIAL HOUSE	BPMIS
426	1/03/05/01/3835	CONSTRUCTION OF A TELECOM TOWER AT BUSANZA SITE	BPMIS
427	1/01/09/03/466	NOBELIA	BPMIS
428	3152	PROPOSED FUELING STATION	BPMIS
429	1/03/08/02/3189	PROPOSED FOUR-UNITS APARTMENT	BPMIS
430	3508	The Ark residence	BPMIS
431	1/02/11/02/3515	PROPOSED RESIDENTIAL APARTMENT	BPMIS
432	1/02/10/03/7916	Service Apartments Construction	BPMIS
433	1/02/09/02/7149	CONSTRUCTION D'UNE RESIDENTIELLE	BPMIS
434	1/02/09/02/7150	CONSTRUCTION D'UNE VILLA RESIDENTIELLE	BPMIS
435	7153	Construction of a single residential villa in R2 with a plot of 270sqm	BPMIS
436	1/02/09/02/7155	Construction d'une Villa Residentielle	BPMIS
437	1/02/09/02/7156	NTAKIYIMANA THEONESTE	BPMIS
438	7157	residential building	BPMIS
439	1/02/09/02/7158	CONSTRUCTION WORKS OF3UNITS APPARTMENT BUILDING	BPMIS
440	7159	RESIDENTIAL BUILDING	BPMIS
441	1/02/09/02/7160	CONSTRUCTION WORKS OF3UNITS APPARTMENT BUILDING	BPMIS
442	1/02/09/02/7161	CONSTRUCTION D'UNE VILLA RESIDENTIELLE	BPMIS
443	1/02/09/02/7162	CONSTRUCTION OF G+1 RESIDENTIAL BUILDING	BPMIS
444	1/02/09/02/7163	CONSTRUCTION D'UNE VILLA RESIDENTIELLE	BPMIS
445	3848	PROPOSED RESIDENTIAL APARTMENT	BPMIS
446	3851	PROPOSED RESIDENTIAL APARTMENT	BPMIS
447	1/03/10/01/3861	PROPOSED RESIDENTIAL APARTMENT	BPMIS
448	1/03/04/02/1363	Proposed Ultra_modern Residential Apartment	BPMIS
449	1/03/05/04/4048	RESIDENTIAL HOUSE FOR FOUR FAMILIES	BPMIS
450	1/01/09/03/1044	Mixed use development	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
451	1/03/02/03/3822	construction Residential House	BPMIS
452	1/02/07/02/1827	CONSTRUCTION OF PARKING EXHIBITS	BPMIS
453	1/03/08/04/3093	NURSERY SCHOOL	BPMIS
454	1/03/03/01/200	University of Tourism, Technology and Business Studies (PHASE 1)	BPMIS
455	1/02/14/04/1332	PETROL DEPOT IN KABUGA II	BPMIS
456	1/02/10/02/3539	PROPOSED RESIDENCE HOUSE TWO UNITS	BPMIS
457	1097	MIXED USE PROJECT	BPMIS
458	1/03/04/02/1729	RESIDENTIAL HOUSES	BPMIS
459	1/03/04/02/1734	PROPOSED 4 UNIT DWELLING HOUSE	BPMIS
460	1/02/13/02/3015	COMMERCIAL/RESIDENTIAL APPARTIMENT	BPMIS
461	1/03/10/01/4038	CONSTRUCTION OF 4 UNITS APARTMENT HOUSE	BPMIS
462	1/02/10/02/3552	PROPOSED RESIDENCE HOUSE(TWO UNITS)	BPMIS
463	1/03/05/01/4125	Proposed Residential Apartment	BPMIS
464	1/03/05/01/4130	RUTERANA APARTMENTS	BPMIS
465	3048	RUGARAMA APARTMENT	BPMIS
466	1/01/09/03/1211	Construction d'un immmeuble à 4 NIveaux (G+3)	BPMIS
467	1/03/01/05/2829	Commercial	BPMIS
468	1/03/09/01/1536	Proposed apartment building	BPMIS
469	1/03/09/01/1537	Proposed Apartment building	BPMIS
470	1/01/06/07/250	APARTEMENT	BPMIS
471	1/03/10/01/4085	RESIDENTIAL HOUSE	BPMIS
472	1/02/04/02/3943	RESIDENCE	BPMIS
473	1/01/09/03/1055	PROPOSED TNC- TOWN CENTRE BUILDING	BPMIS
474	1/01/09/03/1054	PROPOSED TNC- TOWN CENTRE BUILDING	BPMIS
475	1/02/10/01/3142	PROPOSED OF RESIDENTIAL HOUSE	BPMIS
476	1/02/14/07/5482	PROPOSED APARTMENT HOUSE	BPMIS
477	1/03/03/01/1326	CONSTRUCTION OF A RESIDENTIAL HOUSE	BPMIS
478	1/03/03/01/1319	PROPOSED LM RESIDENTIAL HOUSE	BPMIS
479	10303011346	RESIDENT	BPMIS
480	1/02/09/01/3529	PROPOSED RESIDENTIAL HOUSE	BPMIS
481	1/02/09/02/7346	CONSTRUCTION OF RESIDENTIAL HOUSE	BPMIS
482	1/01/10/04/94	PROPOSED ROAD CONSTRUCTIONWORKSHOP	BPMIS
483	1/02/10/02/3576	URUKUMBUZI AFFORDABLE HOUSING	BPMIS
484	1/02/09/01/3372	RESIDENTIAL HOUSE	BPMIS
485	1/02/10/01/3158	construction of petrol station vision city	BPMIS
486	1/03/05/04/4519	PROPOSED APARTMENT	BPMIS
487	1/03/05/01/4240	ATTACHED RESIDENTIAL HOUSE	BPMIS
488	1/03/10/01/4231	APARTMENT BUILDINGS	BPMIS
489	1/03/10/01/4232	APARTMENT BUILDINGS	BPMIS
490	1/03/04/02/1827	RESIDENTIAL BUILDING	BPMIS
491	1/02/10/04/3445	Proposed Residential House	BPMIS
492	1/02/10/04/1462	RESIDENTIAL APARTMENT	BPMIS
493	1/01/03/03/4605	proposed three unit apartments	BPMIS
494	1/03/01/02/4029	light house chapel church	BPMIS
495	1/03/05/01/4350	CONSTRUCTION OF RESIDENTIAL APARTMENT	BPMIS

S.I.No	PlotNo_UPI	Project Name	Type
496	1/02/10/03/8545	EXTENSION OF LANDMARK SUITES WITH RECREATION FACILITIES	BPMIS
497	1/02/04/01/5493	2BLOCS APARTMENT AT GISOZI	BPMIS
498	1/02/14/075806	PROPOSED RPF HEAD QUARTERS BUILDINGS	BPMIS
499	1/03/10/02/1604	PROPOSED 7TH DAY ADVENTIST CHURCH IN KUCUKIRO DISTRICT, NYARUGU	BPMIS
500	1/03/04/01/1286	PROPOSED TWO UNITS APARTMENT	BPMIS
501	1/02/1/1/02/4095	JULIUS PROJECT	BPMIS
502	1/02/09/02/7456	BUILDING CONSTRUCTION	BPMIS
503	1/02/09/02/7458	RESIDENTIAL HOUSE	BPMIS
504	1/02/10/02/3916	KINYINYA ATTACHED-RESIDENTIAL HOUSE	BPMIS
505	1/02/10/02/3917	RESIDENTIAL HOUSES	BPMIS
506	1/02/11/02/3488	Four units storey building	BPMIS
507	1/01/02/02/5162	Proposed warehouse	BPMIS
508	1/02/10/01/3243	Abies Hotel	BPMIS
509	1/02/10/01/3244	Abies Hotel	BPMIS
510	1/03/10/01/2236	PROPOSED APARTMENT	BPMIS
511	1/03/05/03/4618	BUSANZA HOUSING ESTATE	BPMIS
512	1/02/09/02/7481	RESIDENTIAL BUILDING	BPMIS
513	1/03/10/02/2599	VIVANTE VOCATIONAL CENTER	BPMIS
514	311	IGICUMBI ESTATE	BPMIS
515	1/02/11/03/5146	RESIDENTIAL HOUSE	BPMIS
516	1/03/05/04/3931	RESIDENTIAL APARTEMENT	BPMIS
517	1/02/09/02/7501	Stored residential house	BPMIS
518	1/03/09/01/1042	PROPOSED APARTMENT	BPMIS
519	1/02/04/01/5596	PROPOSED RESIDENCE APARTMENTS	BPMIS
520	1/03/10/01/4380	Proposed extension of Legacy Clinic	BPMIS
521	1/02/14/07/6012	proposed twins house	BPMIS
522	1/03/10/01/691	Apartment Building	BPMIS
523	1/03/04/01/1294	Proposed JUVA Apartments	BPMIS
524	1/02/09/02/7535	SYMMETRIC RESIDENTIALS APARTMENTS	BPMIS
525	1/03/04/02/1989	Apartment Building	BPMIS
526	1/03/04/01/1296	CONSTRUCTION OF RESIDENTIAL BUILDING	BPMIS
527	1/02/13/04/944	PROPOSED HOTEL IN RUKIRI II	BPMIS
528	1/03/10/01/1792	Proposed commercial building	BPMIS
529	1/02/10/04/3885	Villa C&A	BPMIS
530	1/03/08/03/3007	MUGAMBWA JEAN DE DIEU	BPMIS
531	1/01/04/03/2668	MIXED USE DEVELOPMENT	BPMIS
532	1/02/14/07/6211	PROPOSED SEVEN UNITS APARTMENT HOUSE	BPMIS
533	1/02/10/04/3931	APARTMENT	BPMIS
534	1/02/04/02/3311	PROPOSED TWIN RESIDENTIAL HOUSE	BPMIS
535	1/03/04/03/41	RENEWAL CONSTRUCTION PERMIT OF CONSTRUCTION OF APARTEMENTS	BPMIS
536	101010413	PROPOSED KIGARAMA COMMERCIAL BLOCK	CPMIS
537	10102025102	CONSTRUCTION AND OPERATION OF A WAREHOUSE, A CANTEEN FOR WORKERS AND A PARKING YARD IN NZOVE CELL, KANYINYA SECTOR, NYARUGENGE DISTRICT, CITY OF KIGALI	CPMIS
538	10102025131	PROPOSED WAREHOUSE	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
539	10103034348	PROPOSED RESIDENTIAL BUILDING	CPMIS
540	10103034422	PROPOSED RESIDENTIAL DEVELOPMENT	CPMIS
541	10104021560	DBTCR APARTMENT AT KIMISAGARA	CPMIS
542	1010507182	PROPOSED PARKING	CPMIS
543	10106011	PROPOSED COMMERCIAL BUILDING AT SONATUBE ROUNDABOUT	CPMIS
544	1010601250	MUHIMA SDA CHURCH	CPMIS
545	1010601528	CONSTRUCTION OF APPARTEMENTS HOUSE	CPMIS
546	1010601562	GASABWE Alphonse	CPMIS
547	1010601638	construction d'un immeuble a usage des bureaux et commercial	CPMIS
548	1010602159	PROPOSED OFFICE BUILDING IN MUHIMA	CPMIS
549	1010602170	PROPOSED RENOVATION	CPMIS
550	101060232	PROPOSED 6 FLOORS COMMERCIAL BUILDING IN NYARUGENGE	CPMIS
551	101060252	PREMIER BUILDERS	CPMIS
552	101060266	Renovation Commercial building	CPMIS
553	101060314	PROPOSED MIXED USE BUILDING	CPMIS
554	10106032	PROPOSED APARTMENT & GARAGE FOR RFTC Cooperative	CPMIS
555	1010603200	PETROL STATION	CPMIS
556	1010603201	CONSTRUCTION OF PETROL STATION LOCATED AT KABEZA, KICUKIRO	CPMIS
557	10106033	PROPOSED RCS PROJECT	CPMIS
558	1010603311	STORAGE BUILDING	CPMIS
559	1010603345	PROPOSED APARTEMENT BUILDING	CPMIS
560	1010603396	KWIGIRA ESTATE PROJECT	CPMIS
561	101060348	CONSTRUCTION OF A MODERN CHURCH AND COMMERCIAL BUILDING	CPMIS
562	1010605509	CONSTRUCTION OF RURA HEADQUARTERS (TWIN TOWERS) AT RUGENGE, K	CPMIS
563	1010605620	Proposed G+2 Commercial Building	CPMIS
564	1010606151	Commercial	CPMIS
565	1010606197	commercial & apartements	CPMIS
566	1010607111	BAMBOO PLAZZA	CPMIS
567	1010607128	Onomo Hotel Kigali	CPMIS
568	101060747	UNIVERSITY OF KIGALI	CPMIS
569	101060798	BMC PROPERTY	CPMIS
570	10108011020	PROPOSED APARTMENT HOUSE	CPMIS
571	10108011269	residential house	CPMIS
572	10108011296	residential house	CPMIS
573	10108011608	Nyarugenge District Hospital	CPMIS
574	1010801202	RESIDENTIEL	CPMIS
575	1010801446	CONSTRUCTION OF AN APARTMENT	CPMIS
576	1010801497	CONSTRUCTION OF TWIN RESIDENTIAL BUILDING	CPMIS
577	1010801527	EXTENSION OF A RESIDENTIAL HOUSE	CPMIS
578	1010801718	CONSTRUCTION OF A TOWER AT KIVUGIZA SITE	CPMIS
579	1010801747	PROPOSED MULTIFAMILY RESIDENTIAL BUILDINGS OF 3 DWELLING UNITS	CPMIS
580	10108021	CONSTRUCTION D'UN IMMEUBLE COMMERCIAL	CPMIS
581	1010802123	JENDE APARTMENT	CPMIS
582	1010802141	PROPOSED CONSTRUCTION OF CENTRE D'ACCEUIL	CPMIS
583	10108021457	CONSTRUCTION D'UNE EGLISE PAROISSIALE A BIREMBO /ADEPER KINYINYA	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
584	1010802205	HOLY HOUSE	CPMIS
585	101080228	PROPOSED GARAGE RENOVATION	CPMIS
586	1010802303	RESIDENTIAL HOUSE	CPMIS
587	1010802435	extension of education building	CPMIS
588	1010802455	Good Future School (DAYCARE & NURSERY)	CPMIS
589	10108025	Proposed extension of temporary bar	CPMIS
590	10108028	CARWASH	CPMIS
591	101080288	appartement	CPMIS
592	101080299	CONSTRUCTION OF COMMERCIAL HOUSE C1	CPMIS
593	10108031015	PROPOSED COMMERCIAL BUILDING WITH 2 STOREY	CPMIS
594	1010803115	CONSTRUCTION OF A TOWER AT MUMENEA SITE	CPMIS
595	10108031188	Proposed apartment	CPMIS
596	10108031490	residential house	CPMIS
597	1010803157	Construction works of commercial courts building	CPMIS
598	10108031749	Proposed residential house at Mumena	CPMIS
599	10108031938	Proposed STOREY RESIDENTIAL HOUSE AT NYAMIRAMBO	CPMIS
600	10108031942	CONSTRUCTION DES 5 APPARTEMENTS	CPMIS
601	1010803398	PROPOSED MODIFICATIONS OF EGLISE EPR	CPMIS
602	1010803628	apartment house	CPMIS
603	1010803672	residential house	CPMIS
604	1010803915	PROPOSED LODGE HOUSE	CPMIS
605	1010803981	PROPOSED EXTENSION FOR G+1 TO G+2 RESIDENTAIL HOUSE	CPMIS
606	10108041	RUGARAMA PARK ESTATE	CPMIS
607	10108041259	REHABILITATION RESIDENTIAL	CPMIS
608	10108041276	ATTACHED HOUSE	CPMIS
609	10108041277	ATTACHED RESIDENTIAL HOUSE	CPMIS
610	10108041751	2DU RESIDENTIAL APARTMENTS	CPMIS
611	10108041876	PROPOSED CONSTRUCTION OF RESIDENTIAL UNIT HOUSE	CPMIS
612	10108041933	Proposed Petrol Station	CPMIS
613	10108041948	Two stories apartment construction	CPMIS
614	10108042048	DOCUMENT DE DEMANDE DE REGULARISATION D'UNE MAISON D'HABITAT	CPMIS
615	10108042112	PROPOSED CONSTRUCTION OF RESIDENTIAL UNIT HOUSE	CPMIS
616	10108042144	RESIDENTIAL	CPMIS
617	10108042449	CONSTRUCTION OF RESIDENTIAL APARTEMENT	CPMIS
618	10108042613	PROPOSED RESIDENTIAL HOUSE	CPMIS
619	10108042795	APPARTMENT BUILDING	CPMIS
620	10108043033	Proposed construction of twin residential	CPMIS
621	1010804541	Single Residentiel house	CPMIS
622	1010901231	Proposed ICT Innovation Center	CPMIS
623	1010902102	Proposed Multi Purpose Hall at St. Etienne Cathedral grounds	CPMIS
624	1010902156	PROPOSED EXTENSION OF GRACE APARTMENT	CPMIS
625	1010902301	ALFAT'H MOSQUE	CPMIS
626	1010902380	PROPOSED CONSTRUCTION OF MIXED USED COMMERCIAL COMPLEX	CPMIS
627	1010902415	SHOPS AND APARTMENTS CONSTRUCTION	CPMIS
628	1010902422	PROPOSED RENOVATION OF EXISTING HOUSE TO MIXED USE HOUSE	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
629	10109031005	BUD	CPMIS
630	10109031007	CHAMPIONS INVESTMENT CORPORATION Ltd (CHIC)	CPMIS
631	10109031012	Commercial Building	CPMIS
632	10109031013	TROPICAL PLAZZA	CPMIS
633	10109031018	PROPOSED ADDITIONAL WASTE WATER TREATMENT PLANT	CPMIS
634	10109031049	COMMERCIAL BUILIDNG	CPMIS
635	10109031053	PRELIMINARY COMMERCIAL DESIGN	CPMIS
636	10109031056	PROPOSED CONSTRUCTION OF A COMMERCIAL BUILDING AND RENOVATIO	CPMIS
637	10109031085	TRAFIPRO PROJECT	CPMIS
638	10109031106	Modification of Commercial House	CPMIS
639	10109031113	FALSE	CPMIS
640	10109031132	Zigama CSS Nyarugenge Commercial Development	CPMIS
641	10109031135	Koza Residence Luxury Apartments	CPMIS
642	10109031177	COMMERCIAL	CPMIS
643	10109031191	ATHENEE BUILDING	CPMIS
644	10109031193	honest plaza house	CPMIS
645	10109031195	commercial building	CPMIS
646	10109031197	HONEST PLAZA HOUSE	CPMIS
647	10109031209	PROPOSED MODIFICATION OF COMMERCIAL BUILDINGS	CPMIS
648	10109031212	MATTEUS DOWNTOWN HERITAGE	CPMIS
649	10109031213	MC PARKING	CPMIS
650	10109031217	Faculty of Architecture and Environmental Design F.A.E.D	CPMIS
651	10109031240	PROPOSED EIGHT STORIED OFFICE PARK	CPMIS
652	10109031262	NOBELIA (October 2016 amendment to Building Permit)	CPMIS
653	10109031263	KIYOVU VILLAS	CPMIS
654	10109031290	petrol station in Nyarugenge District	CPMIS
655	10109031318	rehabilitation with intent of operating a pharmaceutical whole sale business	CPMIS
656	1010903134	ENLARGEMENT OF KANIMBA HOSPITAL	CPMIS
657	10109031370	CONSTRUCTION OF MIC COMMERCIAL COMPLEX	CPMIS
658	101090318	PROPOSED COMMERCIAL BUILDING	CPMIS
659	1010903413	PROPOSED APART-HOTEL IN LIYOVU	CPMIS
660	1010903415	APART HOTEL KIYOVU	CPMIS
661	1010903424	BETA SUITES	CPMIS
662	1010903450	CONSTRUCTION OF TEMPORARY SHED	CPMIS
663	1010903491	PROPOSED CANOPY LA GARDIENNE	CPMIS
664	1010903504	COMMERCIAL BUILDING	CPMIS
665	1010903573	TRANSFORMATION OF RESIDENTIAL HOUSE INTO APARTMENTS	CPMIS
666	1010903599	KBC	CPMIS
667	1010903611	PROPOSED 12 UNITS DWELLING APARTMENT	CPMIS
668	1010903616	PROPOSED A RESTO-BAR BUILDING	CPMIS
669	1010903668	BELLA VISTA APARTMENTS	CPMIS
670	1010903670	Luxury Boutique Hotel	CPMIS
671	1010903701	CONSTRUCTION D'UN IMMEUBLE A APPARTEMENTS	CPMIS
672	1010903716	Residential house	CPMIS
673	1010903768	MINECOFIN	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
674	1010903769	FACADE CHANGE OF THE PROPOSED BPR HEADQUARTERS	CPMIS
675	1010903780	Extention of City Hall	CPMIS
676	1010903783	PROPOSED ACCESS ROUTE TO ECOBANK MAIN PARKING SPACE	CPMIS
677	1010903795	RKF COMPLEX	CPMIS
678	1010903861	Empire Shine Service Apartments	CPMIS
679	1010903884	CONSTRUCTION D'UNE MAISON COMMERCIALE A 4 NIVEAUX	CPMIS
680	1010903924	PROPOSED APARTMENT	CPMIS
681	1010903929	OFFICE BLOCK	CPMIS
682	1010903954	COMMERCIAL AND OFFICE BUILDING	CPMIS
683	1010903957	RAMADA A HOTEL AND SUITES	CPMIS
684	1010903986	Proposed extension of the hotel isimbi	CPMIS
685	1010904190	construction of apartement	CPMIS
686	1010904203	construction of temporary carwash	CPMIS
687	101090427	Rwampara Cell Office Model Block	CPMIS
688	1010904349	APARTMENT	CPMIS
689	10201011414	PROPOSED RECREATIONAL-TRAINING CENTER	CPMIS
690	10201064968	CONSTRUCTION OF AN APARTMENT	CPMIS
691	10204011572	PROPOSED REHABILITATION OF COMMERCIAL BUILDING AT GISOZI- GASAB	CPMIS
692	10204014840	UMURYANGO PLAZZA	CPMIS
693	10204014886	Residential Appartment	CPMIS
694	10204015059	Residential House for Mr Munyakazi	CPMIS
695	10204015279	PROPOSED MODIFICATIONS TO A FOUR STOREY COMMERCIAL BUILDING	CPMIS
696	10204015393	G+1 Commercial building	CPMIS
697	1020402105	HANGAR DE POULE INZU Y'INKOKO	CPMIS
698	10204023856	ZION TEMPLE CHURCH	CPMIS
699	10204023895	CONSTRUCTION OF ELLIOTT APPARTEMENT	CPMIS
700	10204023896	Proposed construction of residential unit	CPMIS
701	10204023918	DETACHED RESIDENTIAL HOUSES	CPMIS
702	10204023982	ALQUDUWAT MOSQUE REHABILITATION	CPMIS
703	102040260	Construction of a residential house	CPMIS
704	10205013117	PROPOSED LUBRICATING OIL BLENDING PLANT	CPMIS
705	10205031255	PROPOSED EXTENSION OF HOTEL BUILDING IN KIMIHURURA	CPMIS
706	10205033280	PROPOSED CONSTRUCTION OF HIGH WAY ACADEMY NURSERY SCHOOL	CPMIS
707	10205034583	erp office	CPMIS
708	10205034722	proposed construction of a single storey residential house	CPMIS
709	10205035135	SINGLE FAMILY RESIDENTIAL HOUSE	CPMIS
710	1020503691	CONSTRUCTION OF PROPOSED MIXED FARMING	CPMIS
711	1020503871	KABUYE SUGAR WORKS EXTENSION	CPMIS
712	1020503928	PROPOSED SEVENTH-DAY ADVENTIST CHURCH	CPMIS
713	10206011612	PROJET DE CONSTRUCTION DES MAISON POUR ELEVAGE DES POULES,PERD	CPMIS
714	1020601200	PROPOSED INKURUNZIZA CHURCH	CPMIS
715	1020601332	CONSTRUCTION OF HALL	CPMIS
716	1020605160	CONSTRUCTION OF TELCOM TOWER AT JALI SITE	CPMIS
717	10206052486	CONSTRUCTION OF A FAMER HOUSE	CPMIS
718	10207011844	CONSTRUCTION AND RENOVATION OF ACCOMODATION HOUSE AND KITCH	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
719	1020701185	PROPOSED RESIDENTIAL HOUSE AT KACYIRU	CPMIS
720	1020701191	REHABILITATION(HALL-EXISTING BUILDING-LANDSCAPE)	CPMIS
721	1020701192	REHABILITATION OF RSSB HALL	CPMIS
722	1020701225	EXTENSION OF CONSTRUCTION PERMIT	CPMIS
723	1020701481	PROPOSED MODOFICATIONS TO APPROVAL DRAWINGS OF THE PROPOSED	CPMIS
724	1020701492	proposed master plan project	CPMIS
725	1020701810	apartment hous	CPMIS
726	1020701811	CONTRUCTION OF APARTMENTS FOR ADRA RWANDA	CPMIS
727	1020701831	KACYIRU APARTMENTS	CPMIS
728	102070184	EGYPT EMBASSY OFFICE BUILDING AND RESIDENTIAL HOUSE	CPMIS
729	102070185	TEMPORART WOODEEN PAGODA	CPMIS
730	1020701867	PROPOSED APARTMENT BUILDING	CPMIS
731	1020701989	PROPOSED RESTORATION CHURCH KACYIRU	CPMIS
732	10207021157	PROPOSED APARTMENTS ON PLOT NO. 1157 KG 684 ST. KACYIRU	CPMIS
733	10207021414	NGIRABABYEYI Gerase	CPMIS
734	10207021439	CONSTRUCTION OF A TWO FLOORS RESIDENTIAL BUILDING	CPMIS
735	10207021713	apartment	CPMIS
736	1020702568	PROPOSED EXTENSION OF LA COLOMBIERE SCHOOL	CPMIS
737	102070267	RENOVATION OF EXISTING SHOP	CPMIS
738	1020702818	PROPOSED COMMERCIAL BUILDING	CPMIS
739	1020702841	CONSTRUCTION OF CATECUMENAT HALL	CPMIS
740	102070288	COMPLETION OF EXISTING BUILDING AND CONVERSION INTO OFFICE COMF	CPMIS
741	10207031036	EXTENSION OF LEGEND HOTEL	CPMIS
742	10207031093	PROPOSED TWESE HAMWE TRAINING CENTRE	CPMIS
743	10207031625	MIXED USE	CPMIS
744	10207031736	COMMERCIAL BUILDING AT KACYIRU	CPMIS
745	10207031751	Rehabilitation works for Rwanda Red Cross buildings	CPMIS
746	102070322	Rwanda national archive building	CPMIS
747	1020703289	CONSTRUCTION D'UN HOTEL	CPMIS
748	1020703366	INTERHOUSE LTD.	CPMIS
749	1020703516	RWANDA NATIONAL ARCHIVE DESIGN	CPMIS
750	1020703918	CONSTRUCTION OF A TOWER AT RWANDA NATIONAL POLICE 1 SITE	CPMIS
751	10208011046	MIXED USE COMMERCIAL BUILDING	CPMIS
752	10208011067	BAMBOO PLAZA	CPMIS
753	10208011071	construction of toilet for kamukina adventist church	CPMIS
754	1020801593	Coffee shop & Resto-Bar	CPMIS
755	1020801788	TEMPORARY STUDIO	CPMIS
756	1020801792	office buiding	CPMIS
757	1020801793	PROJECT OF CONSTRUCTION OF A G+9 COMMERCIAL BUILDING OF MR. BIS.	CPMIS
758	1020801904	PROJECT OF CONSTRUCTION OF A TEMPORARY RESTAURANT TO REPLACE T	CPMIS
759	1020801905	RENOVATION AND IMPROVE AESTHETICALLY THE FACADES OF A BUILDING	CPMIS
760	10208021042	INDATSIKIRA SACCO BANKING HALL	CPMIS
761	10208021077	Extension offices for NIDA (National ID Authority	CPMIS
762	10208021078	Park Restaurants	CPMIS
763	10208021095	M.O Apartment	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
764	10208021175	FALSE	CPMIS
765	10208021190	APLICATION FOR RENOVATION	CPMIS
766	10208021271	construction des appartements a kimihurura	CPMIS
767	10208021422	proposed construction of hotel at kimihurura	CPMIS
768	1020802226	PROPOSED COMMECIAL BUILDING	CPMIS
769	1020802230	PROPOSED EXTENSION OF IFAK SCHOOL	CPMIS
770	1020802245	SCHEBA APARTMENTS	CPMIS
771	1020802476	SCARADA MOTEL APARTMENT	CPMIS
772	1020802587	PROPOSED MULTIFAMILY RESIDENTIAL DEVELOPMENT	CPMIS
773	1020802777	MR & MRS BIPIN PATEL (ANIK) VILLA	CPMIS
774	1020802998	Socio-Educative Center at Kimihurura	CPMIS
775	10208033	PROPOSED APARTMENT BUILDING	CPMIS
776	1020803364	FALSE	CPMIS
777	1020803391	CONSTRUCTION OF A TOWER AT RUGANDO SITE	CPMIS
778	1020803395	PROPOSED LEMIGO HOTEL EXTENSION	CPMIS
779	1020803500	PROPOSED EXTENSION AND CONVERSION TO COMPLEMENTARY FACILITY/N	CPMIS
780	102080353	RUGANDO APARTMENTS	CPMIS
781	1020803579	KIMIHURURA RESIDENTIAL APARTMENTS	CPMIS
782	1020803602	BOUTIQUE HOTEL	CPMIS
783	1020803622	Proposed Ethiopian Traditional and cultural Bungalow	CPMIS
784	1020803629	PROPOSED ORCHID COURTS APARTMENT; REQUEST FOR EXTENSION OF PEI	CPMIS
785	1020803636	APARTMENT	CPMIS
786	1020803642	Kigali convention center- Extension Building	CPMIS
787	1020803650	CONSTRUCTION PROJECT OF A SERVICED HOTEL	CPMIS
788	1020803701	PROPOSED MULTI FUNCTIONAL BUILDING, RE. FOR MODIFICATION APPROV	CPMIS
789	10209011005	CONSTRUCTION OF RESIDENTIAL BUILDING APARTMENT WITH ONE FLOOR	CPMIS
790	10209011078	CONSTRUCTION PROJECT OF RESIDENTIAL BUILDING	CPMIS
791	10209011117	FINALIZATION OF CONSTRUCTION WORKS FOR THE RESIDENTIAL HOUSE	CPMIS
792	10209011431	COMPLIMENTARY HOUSE	CPMIS
793	10209011486	RENOVERATION PERMET	CPMIS
794	10209011526	RESIDENTIAL HOUSE	CPMIS
795	10209011527	PROPOSED RESIDENTIAL APARTMENTS (3 D.Us)	CPMIS
796	10209011534	RESIDENCIAL BUILDING	CPMIS
797	10209011550	APARTMENT BUILDING	CPMIS
798	10209011580	REHABILITATION OF AN ADVENTIST CHURCH	CPMIS
799	1020901200	RENEWAL OF CONSTRUCTION PERMIT AND REVISION	CPMIS
800	1020901202	CONSTRUCTION PROJECT OF RESIDENTIAL APARTMENT	CPMIS
801	10209012135	PROPOSED 4 UNITS AFFORDABLE APARTMENT	CPMIS
802	10209012262	Proposed temporary commercial shops	CPMIS
803	10209012334	Construction of apartments house	CPMIS
804	10209012339	APPARTMENT BUILDING	CPMIS
805	10209012481	CONSTRUCTION OF A TOWER AT BIBARE III SITE	CPMIS
806	10209012512	PROPOSED APARTMENTS AT BIBARE.	CPMIS
807	10209012531	PROPOSED RESIDENTIAL HOUSE	CPMIS
808	10209012596	EXTENSION OF MALAIKA PRESCHOOL.	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
809	10209012650	Construction of ITUZE APARTEMENT	CPMIS
810	10209012699	PROPOSED MODIFICATION TO A RESIDENTIAL HOUSE	CPMIS
811	10209012765	PROPOSED ENTERTAINMENT CENTRE ON PLOT No: 2765 BIBARE, KIMIRONK	CPMIS
812	1020901311	APPLICATION FOR FACADE IMPROVEMENT PERMIT(MODIFICATION)	CPMIS
813	10209013161	PROPOSED BUILDING RENOVATION AT KIMIRONKO	CPMIS
814	10209013290	CONSTRUCTION OF APPARTMENT	CPMIS
815	10209013292	CONSTRUCTION OF RESIDETIAL BUILDING	CPMIS
816	10209013300	PROPOSED GLODI APARTMENTS	CPMIS
817	10209013320	Projet de Construction de la Chapelle a Kimironko	CPMIS
818	10209013505	Construction of ABC Guest house Motel	CPMIS
819	10209013541	PROPOSED APARTMENT HOUSE	CPMIS
820	1020901494	PROPOSED ULTRA-MODERN APARTMENTS	CPMIS
821	1020901505	cntruction of commercial building	CPMIS
822	1020901510	TEMPORALLY WAREHOUSE	CPMIS
823	1020901608	Contruction of Appartement	CPMIS
824	1020901646	CONSTRUCTION OF HIGH STANDING RESTAURANT	CPMIS
825	1020901663	Mixed use	CPMIS
826	102090171	TIME EXTENSION OF CONSTRUCTION PERMIT	CPMIS
827	1020901950	PROPOSED SCHOOL	CPMIS
828	1020901999	proposed residential house	CPMIS
829	10209021008	CONSTRUCTION OF A MIXUSER BUILDING	CPMIS
830	10209021092	CONSTRUCTION PERMIT RENIEWABLE	CPMIS
831	1020902111	PROPOSED APARTMENTS	CPMIS
832	10209021196	Residentiel	CPMIS
833	10209021214	PROPOSED CHURCH BUILDING	CPMIS
834	10209021223	PROPOSED RENOVATION OF SUPER MARKET	CPMIS
835	10209021275	3dwelling units residential project	CPMIS
836	10209021502	CONSTRUCTION DU BUREAU POUR PASTEUR POUR EGLISE ADVENTISTE DU	CPMIS
837	10209021906	CONSTRUCTION STUDY OF APPARTIMENT	CPMIS
838	10209021916	Apartiment house	CPMIS
839	10209022029	APARTMENT	CPMIS
840	10209022183	RESIDENTIAL HOUSES	CPMIS
841	10209022410	KIMIRONKO ICT CENTER	CPMIS
842	10209022564	Single Residential House	CPMIS
843	10209022794	RESIDENTIAL HOUSE	CPMIS
844	10209022829	Rugema Emmanuel Resto-Bar	CPMIS
845	10209022965	PERMIT TIME EXTENSION	CPMIS
846	10209023061	CONSTRUCTION OF A RESIDENTIAL APARTMENT	CPMIS
847	10209023273	REHABILITATION OF LUXRY HOTEL RWANDA LTD	CPMIS
848	10209023274	PROPOSED TOP SEC APARTMENTS	CPMIS
849	10209023303	CONSTRUCTION OF TELCOM TOWER ATKIMIRONKO 4 SITE	CPMIS
850	10209023375	two apartment house	CPMIS
851	10209023447	TWINHOUSE RESIDENCE APPARTMENTS	CPMIS
852	10209023460	PROPOSED CONSTRUCTION OF ONE STOREY RESIDENTIAL BUILDING	CPMIS
853	10209023479	PRE-CONSULTATION OF THE PROPOSED MASTER PLAN	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
854	10209023487	st Ignace	CPMIS
855	10209023579	FALSE	CPMIS
856	10209023885	RESIDENTIEL APARTMENT OF 5 UNITS	CPMIS
857	10209023887	residantial	CPMIS
858	10209023892	PROPOSED MULTIPURPOSE COMPLEX BUILDING	CPMIS
859	10209023953	CONSTRUCTION OF TELCOM TOWER AT CAIMAN SITE	CPMIS
860	10209023982	PROPOSED MULTIPURPOSE COMPLEX BUILDING	CPMIS
861	1020902473	CONSTRUCTION OF TELCOM TOWER AT KIBAGABAGA III SITE	CPMIS
862	1020902502	EXTENSION PROJECT OF PILI-PILI HOTEL	CPMIS
863	1020902509	APARTMENTS AT KIBAGABAGA	CPMIS
864	10209025859	rugambwa plazza	CPMIS
865	10209025912	PROPOSED PEAR APARTMENTS	CPMIS
866	10209025917	Residrntial house counstruction	CPMIS
867	10209025946	Ntagwabira Aloys	CPMIS
868	1020902605	PROPOSED RESIDENTIAL APARTMENT IN KIBAGABAGA	CPMIS
869	10209026121	PROPOSED CONSTRUCTION OF 2 DWELLING UNITS	CPMIS
870	10209026295	PROPOSED RESIDENTIAL BUILDING	CPMIS
871	102090265	PROPOSED MEDICAL OFFICES BUILDING AT KIBAGABAGA	CPMIS
872	10209026938	GARDEN AND RECREATION CONSTRUCTION PROJECT	CPMIS
873	10209027026	MIXED USE BUILDING AT KIBAGABAGA	CPMIS
874	10209027031	PROPOSED SCHOOL	CPMIS
875	10209027032	St IGNACE	CPMIS
876	1020902704	Kibagabaga apartments	CPMIS
877	10209027049	KIMIRONKO Sector Offices	CPMIS
878	10209027112	apartment builiding	CPMIS
879	10209027141	CENTO APPARTMENTS	CPMIS
880	10209027143	CONSTRUCTION D'UNE MAISON RESIDENTIELLE	CPMIS
881	10209027302	CENTO RESIDENCE	CPMIS
882	1020902789	RESIDENTIAL	CPMIS
883	102090284	DETTACHED RESIDENTIAL HOUSES	CPMIS
884	102090331	HOSPITALITY MANAGEMENT INSTITUTE	CPMIS
885	102090363	Proposed temporary houses	CPMIS
886	102090376	PROPOSED EXTENSION AND REHABILITATION OF WORKSHOP	CPMIS
887	1020903773	PROPOSED RENOVATION OF A WAREHOUSE AT KIMIRONKO.	CPMIS
888	10210011259	RESIDANTAIL HOUSE	CPMIS
889	10210011466	Maison d'habitation a 3 niveaux	CPMIS
890	10210011481	GACURIRO APARTMENTS	CPMIS
891	10210011503	KANIR MIXED USE	CPMIS
892	10210011505	PROPOSED PETROL STATION IN GACURIRO	CPMIS
893	10210011532	FALSE	CPMIS
894	10210011602	APPLICATION PROJECT FOR CONSTRUCTION PERMIT EXTENSION PERIOD	CPMIS
895	10210011603	PROPOSED SCHOOL AT GACULIRO	CPMIS
896	10210011834	PROPOSED 'PLEASANT RIDGE' RESIDENTIAL DEVELOPMENT AT NO. 11, KG 4	CPMIS
897	10210011856	GACURIRO APARTMENT BUILDING	CPMIS
898	10210011883	Renewal Permit Request	CPMIS

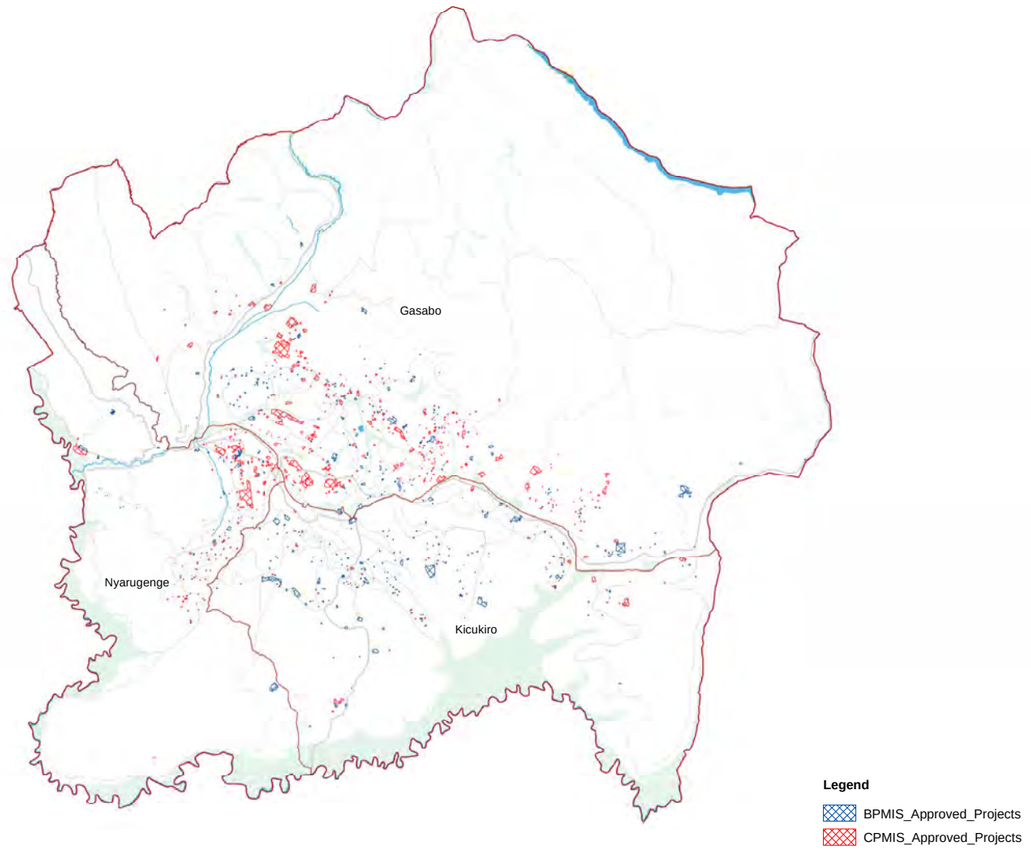
S.I.No	PlotNo_UPI	Project Name	Type
899	10210011936	PROPOSED APARTMENTS	CPMIS
900	10210011938	Extension of constrution permit	CPMIS
901	10210011976	SINGLE FAMILY RESIDENTIAL HOUSE	CPMIS
902	10210011989	RESIDENTIAL HOUSE	CPMIS
903	10210012046	CONSTRUCTION OF TELCOM TOWER AT GACULIRO 4 SITE	CPMIS
904	10210012101	update of the construction permit for Construction of 6 Residentiel Houses	CPMIS
905	10210012106	COMPLETION OF A RESIDENTIAL HOUSE	CPMIS
906	10210012117	CONSTRUCTION D'UNE MAISON MULTIFOCTIONNELLE	CPMIS
907	10210012298	Construction des appartements	CPMIS
908	1021001233	Construction pour extension de l'Ecole horizon	CPMIS
909	10210012444	RESIDENTIAL APPARTMRNT	CPMIS
910	10210012458	CONSTRUCTION OF A RESIDENTIAL HOUSE	CPMIS
911	10210012484	John Kamili & Yvonne Keeza Apartment	CPMIS
912	10210012787	PROPOSED MODIFICATIONS TO RESIDENTIAL HOUSE UNDER CONSTRUCTIO	CPMIS
913	1021001280	CONSTRUCTION DES APPARTEMENTS	CPMIS
914	1021001283	Break Away Apartments	CPMIS
915	1021001286	PROPOSED GARR APARTMENTS AT KINYINYA	CPMIS
916	10210012865	SERVICED APARTMENT PROJECT	CPMIS
917	1021001485	CONSTRUCTION OF APPARTEMENTS HOUSE	CPMIS
918	1021001534	BARAKA VILLAS	CPMIS
919	1021001565	RESIDENTIAL HOUSE	CPMIS
920	1021001732	PROPOSED COMMERCIAL BUILDING AT KAGUGU, KIGALI CITY	CPMIS
921	1021001834	CONSTRUCTION D UNE SALLE POLYVALENTE ,UN CHAPEL ET RECONSTRUCT	CPMIS
922	1021001843	International Institute at Kagugu	CPMIS
923	10210031789	PROPOSED CONSTRUCTION WORKS FOR IZUBA CITY APARTEMENT PHASE I	CPMIS
924	1021003192	APARTEMENT	CPMIS
925	10210031991	KDF BEBF NURSARY SCHOOL	CPMIS
926	10210032129	APPLICATION FOR CONSTRUCTION OF APARTMENT	CPMIS
927	10210032360	Batsinda II affordable Housing project	CPMIS
928	10210032401	commercial building construction project ·	CPMIS
929	10210032653	PROPOSED CHAPEL FOR EPR	CPMIS
930	10210032858	Apartment Project	CPMIS
931	10210032902	CONSTRUCTION OF TELCOM TOWER AT KAGUGU SOS SITE	CPMIS
932	10210033482	Construction of one level single family house	CPMIS
933	10210033566	CONSTRUCTION OF MULTIPURPOSE HALL	CPMIS
934	10210033797	CONSTRUCTION OF A TOWER AT GISOZI 5 SITE	CPMIS
935	10210034679	APARTMENT	CPMIS
936	10210034725	PROPOSED LOW RISE APARTMENT AND RESIDENTIAL HOUSE	CPMIS
937	10210034778	SCHOOL EXTENSION	CPMIS
938	10210034781	CONSTRUCTION DE L'EGLISE PAROISSIALE DE KAGUGU	CPMIS
939	10210035121	PROPOSED ALARM-RWANDA MULTIPURPOSE TWO STORED BUILDING	CPMIS
940	10210035191	PROPOSED APARTMENTS AT KAGUGU	CPMIS
941	10210035539	PROPOSED COMMERCIAL BUILDING	CPMIS
942	10210035657	PROPOSED OFFICES HOUSE FOR TEMPORARY USE	CPMIS
943	10210036018	ITUZE HOMES	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
944	10210036147	proposed construction of H apartments	CPMIS
945	10210036227	PROPOSED RESIDENTIAL APARTMENT	CPMIS
946	10210036586	KIM AESIM	CPMIS
947	10210036981	PROPOSED CHANGES TO UBUMWE COMMERCIAL BUILDING	CPMIS
948	10210037047	RESIDENTIALS	CPMIS
949	10210037632	CONSTRUCTION D'IMMEUBLE D'HABITATION A 4 CHAMBRES.	CPMIS
950	10210037664	EXTENSION FOR BATSINDA PRIMARY SCHOOL	CPMIS
951	10210037677	apartment houses	CPMIS
952	10210037753	PROPOSED RESIDENTIAL BUILDING	CPMIS
953	10210037958	PROPOSED RESIDENTAL HOUSE	CPMIS
954	10210037979	CONSTRUCTION OF A RESIDENTIAL HOUSE	CPMIS
955	10210042279	PROPOSED KINYINYA APARTMENTS	CPMIS
956	1021004243	PROPOSED RESIDENTIAL TWIN HOUSE AT KINYINYA	CPMIS
957	10210042498	CONTRUCTION 5 RESINTIAL HOUSES	CPMIS
958	10210042515	Residential house	CPMIS
959	10210042580	URUKUMBUZI ESTATE	CPMIS
960	10210042635	CONSTRUCTION PROJECT OF RESIDENTIAL BUILDING	CPMIS
961	10210042655	PROPOSED RESIDENTIAL DEVELOPMENT	CPMIS
962	10210042660	RESIDENTIAL HOUSE	CPMIS
963	10210043075	apartment	CPMIS
964	10210043127	RESIDENTIAL BUILDING	CPMIS
965	1021004637	JN COURTS APARTMENTS	CPMIS
966	1021004832	construction of church,Eglise pentecote des assemblee de Dieu	CPMIS
967	10211022368	RAFIKI HOUSE	CPMIS
968	10211022373	CONSTRUCTION OF A RESIDANTIAL HOUSE	CPMIS
969	10211022394	PROPOSED RESIDENTIAL UNITS	CPMIS
970	10211022879	PROPOSED 4 RESIDENTIAL UNITS	CPMIS
971	10211022949	RESIDENTIAL HOUSE	CPMIS
972	10211022973	NDERA SACCO OFFICE	CPMIS
973	1021102334	Appartment	CPMIS
974	1021102352	PROPOSED CONSTRUCTION OF A RESIDENTIAL HOUSE	CPMIS
975	10211023875	residential house	CPMIS
976	1021102419	APARTMENT	CPMIS
977	102110249	POULLAILER	CPMIS
978	1021102819	4 UNITS BUILDING FOR Mr NDORI	CPMIS
979	1021102857	MEDICAL LABORATORY	CPMIS
980	10211031005	PROPOSED SITE HOUSES FOR TEMPORARY USE	CPMIS
981	10211031121	apartment building	CPMIS
982	10211031252	SEVENTH DAY ADVENTIST CHURCH	CPMIS
983	10211033723	CONSTRUCTION OF RESIDENTIAL HOUSE	CPMIS
984	10211033736	Construction of residential house	CPMIS
985	10211033739	RESIDENTIAL HOUSE	CPMIS
986	1021103387	CONSTRUCTION OF RESIDENTIAL BUILDING	CPMIS
987	10211034352	residential house	CPMIS
988	10211034356	PROPOSED RESIDENTIAL APARTMENT	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
989	10211034357	PROPOSED RESIDENTIAL APARTMENT	CPMIS
990	1021103436	CONSTRUCTION OF APARTMENT OF TWO STOREY WITH PENTHOUSE	CPMIS
991	10211034389	PROPOSED RESIDENTIAL HOUSE	CPMIS
992	102110345	PRIMARY SCHOOL PROJECT	CPMIS
993	102110347	CONSTRUCTION OF TRAINING CENTER (TVET) + REGIONAL RESIDENTIAL BUI	CPMIS
994	1021103473	EPR NDERA KINDERGATEN	CPMIS
995	10211034810	CONSTRUCTION OF RESIDENTIAL APARTMENT	CPMIS
996	10211034834	PROPOSED APARTEMENT HOUSE LOCATED AT KIBENGA,NDERA, GASABO D	CPMIS
997	10211034954	RESIDENTIAL HOUSES AT NDERA	CPMIS
998	10211034989	PROPOSED APARTMENTS	CPMIS
999	10211034999	RESIDENTIAL HOUSE	CPMIS
1000	1021103648	APARTMENT	CPMIS
1001	10211041153	Industry&ware house	CPMIS
1002	10211041175	RESIDENTIAL HOUSES	CPMIS
1003	10211041486	Gorilla Estate	CPMIS
1004	10211041989	PROPOSED RESIDENTIAL HOUSE AT MASORO	CPMIS
1005	10211041994	CONSTRUCTION OF A RESIDENTIAL APPARTEMENT	CPMIS
1006	10211042033	APARTMENT HOUSE	CPMIS
1007	10211042049	PROPOSED RESIDENTIAL APARTMENT BUILDING	CPMIS
1008	10211042283	MASORO RESIDENCE	CPMIS
1009	10211042406	multipurpose hall	CPMIS
1010	10211042547	Construction of a warehouse for Tolirwa Ltd	CPMIS
1011	10211042598	PROPOSED RESIDENTIAL BUILDING	CPMIS
1012	10211042599	PROPOSED RESIDENTIAL BUILDING	CPMIS
1013	10211042600	PROPOSED RESIDENTIAL BUILDING	CPMIS
1014	10211042601	PROPOSED RESIDENTIAL BUILDING	CPMIS
1015	10211042602	PPROPOSED RESIDENTIAL BUILDING	CPMIS
1016	10211042603	PROPOSED MIXED USE BUILDING	CPMIS
1017	10211042604	PROPOSED RESIDENTIAL BUILDING	CPMIS
1018	1021104363	PROPOSED EXISTING CHURCH REFURBISHMENT	CPMIS
1019	1021104455	PRE-CONSULTATION OF THE PROPOSED CHURCH	CPMIS
1020	1021104456	proposed warehouse in gasabo district	CPMIS
1021	102110453	PROPOSED STRIVE FOUNDATION ECD	CPMIS
1022	1021104550	4Units residential builldings	CPMIS
1023	1021104623	Multi Storey Mixed use Complex	CPMIS
1024	10211047	MASORO APARTMENTS	CPMIS
1025	1021104785	CONSTRUCTION OF A TELECOM TOWER AT AKAKAZA SITE	CPMIS
1026	10211061029	Shed for livestock	CPMIS
1027	10211062329	APARTMENT BUILDING	CPMIS
1028	10211062449	PROPOSED CONSTRUCTION OF RESIDENTIAL UNIT APARTMENT	CPMIS
1029	10211062450	PROPOSED CONSTRUCTION OF RESIDENTIAL UNIT APARTMENTS	CPMIS
1030	10211062784	APARTMENT BUILIDING	CPMIS
1031	10211062863	PROPOSED RUSORORO CHURCH	CPMIS
1032	1021106861	CONSTRUCTION OF KIGALI INFANT'S SCHOOL	CPMIS
1033	10212022441	CONSTRUCTION OF TELCOM TOWER AT GASANZE SITE	CPMIS
1034	10212023471	IGISUBIZO COOPERATIVE MOTORS OF GASABO	CPMIS
1035	1021202550	PROPOSED MOTEL	CPMIS
1036	1021202768	CONSTRUCTION OF NEW JERUSALEM CHURCH, GASANZE PARISH	CPMIS
1037	10213012436	PROPOSED CHURCH	CPMIS
1038	10213012438	CONSTRUCTION OF A RESIDANTIAL HOUSE	CPMIS
1039	10213022959	PROPOSED MULTIPURPOSE HALL	CPMIS
1040	10213023012	NYARUTARAMA PLAZA	CPMIS
1041	10213023040	PROPOSED NEW CONFERENCE HALL	CPMIS
1042	10213023053	KAFAM PLAZA	CPMIS
1043	10214073088	RESIDENTIAL HOUSE	CPMIS
1044	10214074871	D'ARC APPART	CPMIS
1045	10214074872	D'ARC APPART	CPMIS
1046	10214075262	appartment and residantail house	CPMIS
1047	10214075263	TWO APARTMENT HOUSE	CPMIS
1048	10214075353	PROPOSED RESIDENTIAL APARTMENT	CPMIS
1049	1021407950	DAR CARE AND RECREATIONAL CENTRE	CPMIS
1050	10301023431	PROPOSED CONSTRUCTION OF RESIDENTIAL UNIT APARTMENTS	CPMIS
1051	10301052026	MAIZE FLOUR FACTORY AND WARE HOUSE	CPMIS
1052	10301052027	PROPOSED	CPMIS
1053	10301052174	Relocation of warehouse in Gahanga Light Industrial District	CPMIS
1054	10301052253	PROPOSED WAREHOUSE	CPMIS
1055	10301052840	PROPOSED MANUFACTURE OF AVOCADO OIL	CPMIS
1056	10301052884	PROPOSED WAREHOUSE AND FACTORY IN GAHANGA	CPMIS
1057	10302033801	PROPOSED RESIDENTIAL HOUSE	CPMIS
1058	10302033808	PROPOSED RESIDENTIAL BUILDING	CPMIS
1059	10302033824	PROPOSED A SINGLE FAMILY RESIDENTIAL HOUSE	CPMIS
1060	1030203685	PROPOSED MEMORIAL CHURCH	CPMIS
1061	10303011269	luxury sidential villas	CPMIS
1062	10303011329	CONSTRUCTION OF A MODERN HOUSE	CPMIS
1063	103030259	PROPOSED CONSTRUCTION OF A NURSERY SCHOOL IN KANSEREGE/ GIKONI	CPMIS
1064	1030302795	PROPOSED RESIDENTIAL HOUSE	CPMIS
1065	1030303152	RENOVATION OF A PETROL STATION	CPMIS
1066	10304021494	RESIDENTIAL HOUSE	CPMIS
1067	10304021495	RESIDENTIAL HOUSE	CPMIS
1068	10304021623	PROPOSED RESIDENTIAL TWIN HOUSE	CPMIS
1069	10304021691	APPARTEMENT	CPMIS
1070	10304021722	APPARTEMENT	CPMIS
1071	10304021723	APPARTEMENT	CPMIS
1072	10304021727	PROPOSED G+1 RESIDENTIAL APARTMENT	CPMIS
1073	10304021733	2in1 Residential Building for Mr MUSANGWA Desire	CPMIS
1074	10304021810	CONSTRUCTION OF A CADASTRAL TWIN RESIDENTIAL BUILDING	CPMIS
1075	10304031962	PROPOSED COMMERCIAL AND RESIDENTIAL BUILDING	CPMIS
1076	10304031986	single family house	CPMIS
1077	10304031990	Residential Apartment Project	CPMIS
1078	10304032019	APARTMENT PROJECT	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
1079	10304032025	APARTMENTS	CPMIS
1080	10304032065	CONSTRUCTION OF A TELCOM TOWER KAGARAMA 4 SITE	CPMIS
1081	103040337	RESIDENTIAL APARTMENT	CPMIS
1082	10305011895	PROPOSED RESIDENTIAL TWIN HOUSE	CPMIS
1083	10305013604	apartement dwelling units	CPMIS
1084	10305013721	BUSANZA APARTMENT	CPMIS
1085	10305013731	BUSANZA APARTMENT	CPMIS
1086	10305013857	PROPOSED APARTMENT	CPMIS
1087	10305014203	GATSINZI EMMANUEL	CPMIS
1088	10305033898	NKUSI'S APPARTEMENT	CPMIS
1089	10305034007	PROPOSED RESIDENTIAL APPARTMENT	CPMIS
1090	10305044007	APARTMENT	CPMIS
1091	10305044025	RESIDENTIAL HOUSE	CPMIS
1092	10305044026	PROPOSED MODIFICATION	CPMIS
1093	10305044089	PROPOSED RESIDENTIAL HOUSE	CPMIS
1094	10305044102	RESIDENTIAL HOUSE	CPMIS
1095	10305044111	Building Appartmen	CPMIS
1096	10305044507	APPARTEMENT	CPMIS
1097	10305044508	APPARTEMENT	CPMIS
1098	10305044564	PROPOSED APPARTMENT	CPMIS
1099	10307013084	CONSTRUCTION OF RESIDENTIAL APARTEMENT	CPMIS
1100	10308022617	Proposed Heaven's Family Guest house	CPMIS
1101	10308022745	CONSTRUCTION OF AN APARTMENT	CPMIS
1102	10308023028	RESIDENTAIL HOUSE	CPMIS
1103	10308023266	MASAKA AFFORDABLE HOUSING	CPMIS
1104	1030802838	ICYEREKEZO MASAKA SACCO	CPMIS
1105	10308033056	CBCR Christian Centre	CPMIS
1106	103080432	CONSTRUCTION OF MULTI-PURPOSE BUILDING AND GREEN PARK	CPMIS
1107	10309011535	construction of apartements	CPMIS
1108	10309021065	PROPOSED 5 UNITS DWELLING RESIDENTIAL	CPMIS
1109	10309021541	REHABILITATION OF COMMERCIAL BUILDING	CPMIS
1110	10310011552	4 in 1 residential house for Mr Mutware	CPMIS
1111	10310013436	RESIDENTIAL	CPMIS
1112	10310013691	residential building	CPMIS
1113	10310013769	APARTMENT HOUSE	CPMIS
1114	10310013781	PROPOSED CONSTRUCTION OF RESIDENTIAL UNITS APARTMENT	CPMIS
1115	10310013805	PROPOSED RESIDENTIAL HOUSE	CPMIS
1116	10310013808	CONSTRUCTION OF RESIDENTIAL HOUSE	CPMIS
1117	10310013840	PROPOSED RESIDENTIAL APARTMENT	CPMIS
1118	10310013841	PROPOSED RESIDENTIAL APARTMENT	CPMIS
1119	10310013849	Construction of a residential appartement	CPMIS
1120	10310013850	Proposed residential	CPMIS
1121	10310013853	Proposed residential apartment	CPMIS
1122	10310013854	Proposed residential apartment	CPMIS
1123	10310013936	PROPOSED RESIDENTIAL APARTMENT	CPMIS

S.I.No	PlotNo_UPI	Project Name	Type
1124	10310013975	CONSTRUCTION PROJECT	CPMIS
1125	10310014106	PROPOSED RESIDENTIAL HOUSE	CPMIS
1126	1031002158	CONSTRUCTION OF TELCOM TOWER AT NYARUGUNGA SITE	CPMIS
1127	10310022211	PROPOSED PARKING AT KICUKIRO- NYARUGUNGA FOR PETROLUDA LTD	CPMIS
1128	10310031944	THE EXTENSION OF POST HARVEST HANDLING AND STORAGE FACILITIES	CPMIS



SURBANA JURONG

SMEC

Member of the Surbana Jurong Group

Institute of Policy Analysis and Research - Rwanda