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ITEKA RYA MINISITIRI N° 002/24/10/TC RYO KU WA 22/08/2024 RISHYIRAHU IGISHUSHANYO MBONERA CY'IMIKORESHEREZE N'IMITUNGANYIRIZE BY'UBUTAKA CY'AKARERE KA GISAGARA Minisitiri w'Imari n'Igenamigambi; Ashingiye ku Itegeko Nshinga rya Repubulika y'u Rwanda; Ashingiye ku Itegeko n° 27/2021 ryo ku wa 10/06/2021 rigenga ubutaka, cyane cyane mu ngingo yaryo ya 59; Inama y'Abaminisitiri yateranye ku wa 11/09/2023 imaze kubisuzuma no kubyemeza; ATEGETSE: <u>Ingingo ya mbere: Ishyirwaho</u> Hashyizweho igishushanyo mbonera cy'imikoreshereze n'imitunganyirize by'ubutaka cy'Akarere ka Gisagara.	MINISTERIAL ORDER N° 002/24/10/TC OF 22/08/2024 ESTABLISHING LAND USE AND DEVELOPMENT MASTER PLAN OF GISAGARA DISTRICT The Minister of Finance and Economic Planning; Pursuant to the Constitution of the Republic of Rwanda; Pursuant to Law n° 27/2021 of 10/06/2021 governing land, especially in Article 59; After consideration and approval by the Cabinet, in its meeting of 11/09/2023; ORDERS: <u>Article One: Establishment</u> The land use and development master plan of Gisagara District is established.	ARRÊTÉ MINISTÉRIEL N° 002/24/10/TC DU 22/08/2024 ÉTABLISSANT LE SCHEMA DIRECTEUR D'UTILISATION ET D'AMÉNAGEMENT DES TERRES DU DISTRICT DE GISAGARA Le Ministre des Finances et de la Planification Économique ; Vu la Constitution de la République du Rwanda ; Vu la Loi n° 27/2021 du 10/06/2021 portant régime foncier, spécialement en son article 59 ; Après examen et adoption par le Conseil des Ministres, en sa séance du 11/09/2023 ; ARRÊTE : <u>Article premier : Établissement</u> Il est établi le schéma directeur d'utilisation et d'aménagement des terres du District de Gisagara.
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<u>Ingingo ya 2: Ibigize igishushanyo mbonera</u> Igishushanyo mbonera cy'imikoreshereze n'imitunganyirize by'ubutaka cy'Akarere ka Gisagara, kigizwe n'ibi bikurikira: (a) raporo rusange y'igishushanyo mbonera cy'imikoreshereze n'imitunganyirize y'ubutaka cy'Akarere; (b) amakuru ndangahantu y'igishushanyo mbonera; (c) amabwiriza agenga ishyirwa mu bikorwa ryacyo.	<u>Article 2: Composition</u> The District land use and development master plan of Gisagara District is composed of the following: (a) the main report of the District land use and development master plan; (b) zoning plan; (c) zoning regulations.	<u>Article 2 : Composition</u> Le schéma directeur d'utilisation et d'aménagement des terres du District de Gisagara est composé de ce qui suit : (a) le rapport général du schéma directeur d'utilisation et d'aménagement des terres du District ; (b) le plan de zonage ; (c) le règlement de zonage.
<u>Ingingo ya 3: Itangazwa</u> (1) Raporo rusange y'igishushanyo mbonera cy'imikoreshereze n'imitunganyirize y'ubutaka cy'Akarere ka Gisagara iri ku mugereka w'iri teka. (2) Amakuru ndangahantu y'igishushanyo mbonera cy'akarere ka Gisagara n'amabwiriza agenga ishyirwa mu bikorwa ryacyo bitangazwa ku rubuga rw'ikoranabuhanga rwagenwe n'urwego rufite imicungire	<u>Article 3: Publication</u> (1) The main report of the land use and development master plan of Gisagara District is annexed to this Order. (2) The zoning plan and zoning regulations of the land use and development master plan of Gisagara District are published on the website designated by the organ in charge of land use management.	<u>Article 3 : Publication</u> (1) Le rapport général du schéma directeur d'utilisation et d'aménagement des terres du District de Gisagara est annexé au présent arrêté. (2) Le plan de zonage et le règlement de zonage du schéma directeur d'utilisation et d'aménagement des terres du District de Gisagara sont publiés sur le site web désigné par l'organe ayant l'utilisation et la gestion des terres dans ses attributions.

n'imikoreshereze by'ubutaka mu nshingano. <u>Ingingo ya 4: Igihe igishushanyo mbonera kimara</u> Igishushanyo mbonera cy'imikoreshereze n'imitunganyirize by'ubutaka cy'Akarere ka Gisagara gikurikizwa kugeza mu 2050. <u>Ingingo ya 5: Ivugururwa</u> (1) Igishushanyo mbonera cy'imikoreshereze n'imitunganyirize by'ubutaka cy'Akarere ka Gisagara gishobora kuvugururwa cyose nyuma y'imyaka icumi cyangwa ikindi gihe bibaye ngombwa uhereye ku muni gishyiriweho. (2) Ivugururwa ry'igishushanyo mbonera cy'imikoreshereze n'imitunganyirize by'ubutaka cy'Akarere ka Gisagara rishobora kandi gukorwa rireba agace gato igihe bibaye ngombwa bitabangamiye iterambere ry'utundi duce kandi hakurikijwe amategeko abigenga. <u>Ingingo ya 6: Ingingo y'ururimi</u> Iri teka ryateguwe mu rurimi	<u>Article 4: Period of validity</u> The land use and development master plan of Gisagara District is implemented until 2050. <u>Article 5: Revision</u> (1) The land use and development master plan of Gisagara District may be comprehensively reviewed after ten years or whenever considered necessary from the date of its establishment. (2) The revision of land use and development master plan of Gisagara District may also be done on a specific area, when considered necessary, without compromising the development of other areas in accordance with relevant laws. <u>Article 6: Language provision</u> This Order was drafted in Ikinyarwanda.	<u>Article 4 : Période de validité</u> Le schéma directeur d'utilisation et d'aménagement des terres du District de Gisagara est mis en œuvre jusqu'en 2050. <u>Article 5 : Révision</u> (1) Le schéma directeur d'utilisation et d'aménagement des terres du District de Gisagara peut être entièrement révisé après dix ans ou chaque fois que cela est jugé nécessaire à partir du jour de son établissement. (2) La révision du schéma directeur d'utilisation et d'aménagement des terres du District de Gisagara peut également être effectuée sur une zone spécifique, en cas de besoin, sans compromettre le développement des autres zones conformément à la législation en la matière. <u>Article 6 : Disposition linguistique</u> Le présent arrêté a été rédigé en Ikinyarwanda.
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rw'Ikinyarwanda. <u>Ingingo ya 7: Gutangira gukurikizwa</u> Iri teka ritangira gukurikizwa ku muni ritangarijweho mu Igazeti ya Leta ya Repubulika y'u Rwanda. Agaciro karyo gahera ku wa 11/09/2023.	<u>Article 7: Entry into force</u> This Order comes into force on the date of its publication in the Official Gazette of the Republic of Rwanda. It takes effect as of 11/09/2023.	<u>Article 7 : Entrée en vigueur</u> Le présent arrêté entre en vigueur le jour de sa publication au Journal Officiel de la République du Rwanda. Il prend ses effets à partir du 11/09/2023.
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Kigali, 22/08/2024

(sé)

MURANGWA Yusuf

Minisitiri w’Imari n’Igenamigambi
Minister of Finance and Economic Planning
Ministre des Finances et de la Planification Économique

Bibonywe kandi bishyizweho Ikirango cya Repubulika:

Seen and sealed with the Seal of the Republic:

Vu et scellé du Sceau de la République :

(sé)

Dr UGIRASHEBUJA Emmanuel

Minisitiri w’Ubutabera akaba n’Intumwa Nkuru ya Leta
Minister of Justice and Attorney General
Ministre de la Justice et Garde des Sceaux

UMUGEREKA W'ITEKA RYA MINISITIRI N° 002/24/10/TC RYO KU WA 22/08/2024 RISHYIRAHO IGISHUSHANYO MBONERA CY'IMIKORESHEREZE N'IMITUNGANYIRIZE BY'UBUTAKA CY'AKARERE KA GISAGARA	ANNEX TO MINISTERIAL ORDER N° 002/24/10/TC OF 22/08/2024 ESTABLISHING LAND USE AND DEVELOPMENT MASTER PLAN OF GISAGARA DISTRICT	ANNEXE À L'ARRÊTÉ MINISTÉRIEL N° 002/24/10/TC DU 22/08/2024 ÉTABLISSANT LE SCHÉMA DIRECTEUR D'UTILISATION ET D'AMÉNAGEMENT DES TERRES DU DISTRICT DE GISAGARA
IGISHUSHANYO MBONERA CY'IMIKORESHEREZE N'IMITUNGANYIRIZE BY'UBUTAKA CY'AKARERE KA GISAGARA	THE LAND USE AND DEVELOPMENT MASTER PLAN OF GISAGARA DISTRICT	LE SCHÉMA DIRECTEUR D'UTILISATION ET D'AMÉNAGEMENT DES TERRES DU DISTRICT DE GISAGARA



GISAGARA

District Land Use Plan 2023-2050



2023

Report Title	Gisagara DLUP 2023-2050 2023 - 2050
Project title	Gisagara DLUP 2023-2050 Report
Owner	Gisagara District
District Council Approval	11 th June, 2021
Cabinet Approval	11 th September, 2023

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LIST OF ACRONYMS

CoK:	City of Kigali
CMO:	City Management Office
CDDU:	City Development and Delivery Unit
CUR:	Catholic University of Rwanda
DDS:	District Development Strategy
DLUP:	District Land Use Plan
DHS:	Demographic and Health Survey
EDCL:	Energy Development Corporation Limited
EUCL:	Energy Utility Corporation Limited
ESSP:	Energy Sector Strategic Plan
EARP:	Energy Access Roll-out Program
EICV:	Integrated Household Living Conditions Survey
EIA:	Environmental Impact Assessment
GDP:	Gross Domestic Product
GIS:	Geographical Information System
GPS:	Global Positioning System
GGCRS:	National Green Growth and Climate Resilient Strategy
GGGI:	Global Green Growth Institute
HQ:	Head Quarters
ICT:	Information and Communication Technology
LUDP:	Local Urban Development Plan
LODA:	Local Administrative Entities Development Agency
LUCA:	Land Use Category
MoE:	Ministry of Environment
MICE:	Meetings Incentives, Conferences, and Exhibitions
MINICT:	Ministry of ICT and Innovation
MINICOM:	Ministry of Trade and Industry
MINALOC:	Ministry of Local Government

MINAGRI: Ministry of Agriculture and Animal Resources
MICOM: Ministry of Infrastructure
MSME: Medium Small and Micro Enterprise
NIRDA: National Industrial Research and Development Agency
NISR: National Institute of Statistics of Rwanda
NST: National Strategic Transformation
NLUDMP: National Land Use and Development Master Plan
NGOs: Non-Governmental Organizations
OSC: One Stop Center
RDB: Rwanda Development Board
RCAA: Rwanda Civil Aviation Authority
RMF: Road Maintenance Fund
NLA: National Land Authority
REG: Rwanda Energy Group
REMA: Rwanda Environment Management Authority
RTDA: Rwanda Transport Development Agency
RURA: Rwanda Regulatory Authority
RWFA: Rwanda Water Forest and Authority
SWOT: Strengths Weaknesses Opportunities and Threats
SUPU: Strategic Urban Planning Unit
SIA: Strategic Environmental Assessment
TAG: Technical Advisory Group
TVETs: Technical Vocational Education and Training
WSS: Water Supply and Sanitation
WTTC: World Travel & Tourism Council
WASAC: Water and Sanitation Corporation Ltd
USD: United States Dollar

EXECUTIVE SUMMARY

Gisagara DLUP is a new concept for District development planning aligned with NLUDMP 2020-2050 and harmonized with the DDS and other national directives. Integrated District development planning is one of the key tools for local government to manage its new developmental role through sustainable and rational land use.

Gisagara DLUP, however, will not only inform the district management, they are also supposed to guide the activities of any agency from other spheres of government, corporate service providers, NGOs, the private sector and civil society within the Gisagara District area. The role of the DLUP is to give decision makers quick and simple information in a spatial (map enabled) context. It will thereby contribute to the fulfillment of overall national objectives, e.g. Vision 2050, food security, poverty alleviation, gender balance, conflict resolution and environmental protection. Furthermore, it will enhance the impact of the NLUDMP 2020-2050 by introducing a spatial dimension of the district development planning using GIS as a tool.

This report details the land allocation of Gisagara District in different sectors such as urbanization and rural settlement, agriculture, forests, environment, infrastructure, socio-economic infrastructure, industry and employment with their spatial distribution. The main outcome by 2050, is the spatial distribution of Gisagara population in urban and rural settlements whereby it is planned to have Ndora as the main District town followed by four other rural centres Kibirizi, Save, Gikonko and Mamba respectively, all together will host around 52.7% of Gisagara total population by 2050. The remaining population 47% will be hosted in 138 rural settlement sites across the district.

It has analyzed and defined the sectorial land uses to produce optimal land consumption demands for 2050 horizon and establish policy orientations to guide each sector in Gisagara District.

These include:

- 1) Urbanization with established urban settlement hierarchy of (a) Ndora as the main District town, (b) rural settlement (emerging centres) Kibirizi, Save, Gikonko and Mamba. The rural centres play the role of increasing the urban population at District level as population outlets because they have the potential to grow faster than other trade centres in this District. Fighting urban sprawl by agglomeration and consolidation of settlements will be a very crucial task going forward.
- 2) Housing development promoting informal settlement upgrading and application of densification principles for the existing cities and centres prior to the use or development of new developable lands.

- 3) Rural settlements with restructured imidugudu policy/system for organized clusters and promoting 4 in 1 and 8 in 1 to progressively reduce the size of rural residences from 600 m² to 300 m².
- 4) Agriculture suitability mapping has been conducted countrywide as well as at District level, available agriculture lands were also identified and mapped at the local scale. Land consolidation will continue to be promoted to gradually eliminate scattered homestead. The transformation of the rural settlement system will be key to unlocking the development of commercial agriculture and ensuring food security in Gisagara District.
- 5) Manufacturing, industrial development, and mining with determined spatial distribution and optimal sizes of small industrial parks in urban and rural centres and encouraged vertical construction of industrial buildings to optimize the land. Small-scale mining exploitation will progressively transform into a regional mineral processing hub.
- 6) Transportation with the existing road network analyzed, and a new road hierarchy proposed to achieve the desired vision 2050. The consolidation of settlements and public facilities will reduce the cost and length of roads needed.
- 7) Public services and utilities will improve when people move from where they are today to agglomerations where utilities are centralized. Provision of utilities to sprawled hamlets must be eliminated. Utilities will be supplied to consolidated settlements.
- 8) Tourism and conservation are not ignored, Gisagara DLUP 2023-2050 recommends the application of densification principles of using small land at the maximum benefit given the limited and scattered available land.
- 9) Environment and natural resources with proposed rational use of natural resources to optimize future land use management including preservation of natural forests, planting trees on bare slope above 55% including cash crops like coffee plantations, protection of water bodies and swamplands, conditional use of unprotected swamplands commercial agriculture, etc

1. INTRODUCTION

1.1 Background of the DLUP

Aligned with the Government of Rwanda's Vision 2050, there exists an ambitious objective to propel urbanization forward while concurrently augmenting the average annual growth rates of the gross domestic product (GDP) and the GDP per capita. The realization of this vision promises Rwandan citizens a heightened quality of life, characterized by robust social protection measures, enhanced healthcare services, effective disaster risk reduction strategies, and bolstered food security initiatives. Integral to this vision is the strategic development of urban infrastructure, harmonized with efforts aimed at biodiversity conservation, thereby mitigating citizens' vulnerability to the adverse impacts of climate change.

Aligned with Rwanda's aspirations to elevate the economy to an upper middle-income status by 2035, targeting a GDP per Capita of \$4,035, and ultimately transitioning to a high-income economy by 2050, characterized by a GDP per Capita of \$12,476, fostering food security, and nurturing a knowledge-based economy, underscores the imperative for optimal land utilization.

Rwanda encompasses a land area of approximately 26,338 km², inclusive of water bodies. The population stood at around 13.2 million as of 2022, experiencing a growth rate of nearly 2.3 percent annually. Urbanization is on the rise at a rate of 7.5 percent, while agricultural production constitutes over 36.7 percent of export earnings.

Over the past twenty-five years, the demand for land in Rwanda has intensified, primarily due to the repatriation of Rwandan refugees from various nations. Addressing the settlement needs of this population received significant emphasis, leading to the subdivision of land and economic rehabilitation efforts. This dynamic is compounded by Rwanda's inherently rugged terrain and rapid population expansion. Urbanization stands out as a pivotal catalyst for economic advancement, and in line with Vision 2050, the Rwandan government is committed to accelerating urban development while bolstering average annual GDP growth and per capita GDP.

Recognizing the need for improvement, Rwandan government-initiated revisions to the NLUDMP 2020-2050 2010-2020 in 2018. An evaluation conducted in 2016-2017 underscored various challenges, prompting the call for a comprehensive review. In July 2020, the Cabinet endorsed the newly revised NLUDMP 2020-2050 2020-2050. This updated plan aims to address identified issues, establish precise implementation guidelines, and formulate a fresh spatial blueprint for the nation. Notably, Kigali and the network of secondary and satellite cities pose significant geographical

challenges, spanning urban and rural landscapes, and varying in scale.

As per the guidelines outlined in the NLUDMP 2020-2050, every Sector possessing spatial dimensions and land allocation requirements for sectoral activities must revise its master plan and strategies in accordance with the NLUDMP 2020-2050 guidelines.

The NLUDMP 2020-2050 introduces the concept of a DLUP Cluster, proposing its implementation as an innovative strategy. This approach entails the simultaneous development of a set of plans at both district and city levels, ensuring alignment and adherence to regulations. The DLUP Cluster incorporates urban and rural zoning schemes, consolidating urban land use zoning (including cities and urban centers) with rural zoning, encompassing Imidugudu complexes, agricultural zones, forests, district infrastructures, and natural resource considerations.

The DLUP cluster is expected to adhere to green principles and integrate climate-resilient strategies, aiming to establish the district as a model for sustainable land use practices. Development of any master plan within the district should be approached as a cohesive package, integrating both Local Urban and Rural area plans at the district level. The culmination of this process will yield a unified One District Detailed Zoning Map, complete with zoning regulations. This comprehensive map will serve as a valuable tool for cadastral purposes, construction permitting systems, and further local detailed physical planning endeavors. By enforcing these regulations and implementing smart permitting services, this integrated planning approach is poised to mitigate settlement sprawl and promote consolidation within the district.

It is therefore from this perspective that the elaboration and review of Gisagara DLUP commenced in April 2021 and were slated for completion by July 2021. The review of Gisagara DLUP is in alignment with the NLUDMP 2020-2050 2020–2050.

1.2 Scope and Objectives

1.1.1 Scope

The scope of this project entails the revision of Gisagara DLUP cluster to encompass the whole district, integrating both urban and rural components into a unified plan.

1.1.2 Objectives

The main objective is to provide the district with a tool that will lead the land use management, efficient and optimal use to support the implementation of the district strategic objective which is *“to support agriculture transformation, granite production and eco-tourism development by green and sustainable*

urbanization through improved infrastructure development that positively impacts job creation and the life of District residents.”

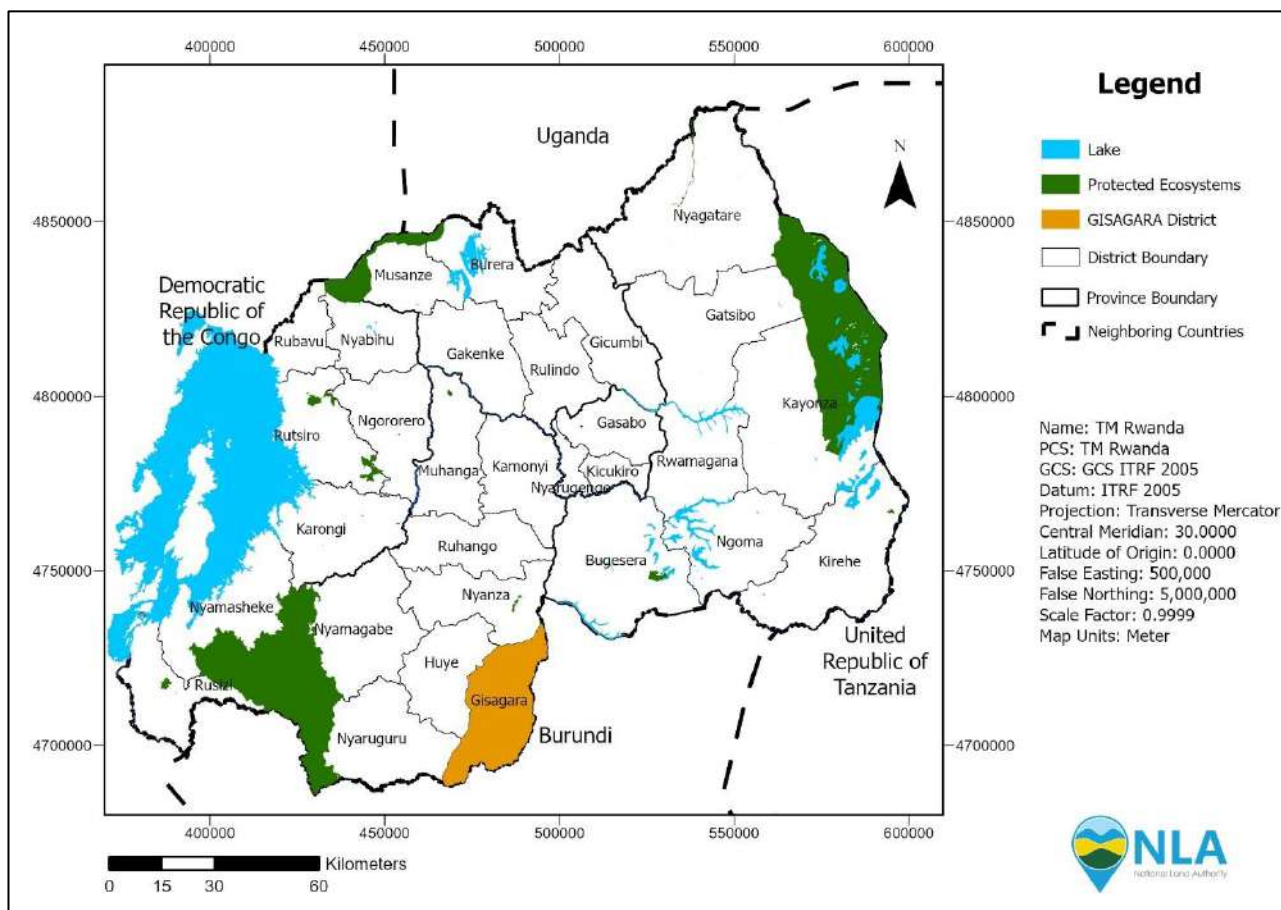
The specific objectives for Gisagara DLUP Cluster are as follows:

1. To provide different scales and cost range of commercial and light industrial solutions, following current and expected market dynamics;
2. To allow and facilitate vertical and horizontal incremental development allowing phased construction of commercial, mixed-use and residential buildings following the investment capacity of investors and developers but in respect of clear guidelines;
3. To integrate micro-enterprise zones in housing areas, mixed use with social infrastructure and green open spaces;
4. To ensure reduction of zones dedicated to single family housing, promotion of densification with incentives to modify building typologies and densities;
5. To promote upgrading and/or redevelopment in high land value areas where land pooling approach will be effective due to cross financing mechanism;
6. To preserve more parts of agricultural land by encouraging land consolidation, also in rural areas;
7. To preserve desirable open space, historic related resources, water resources, swamplands, forests, and other environmentally important lands;
8. To facilitate adequate provisions for community utilities and facilities such as transportation, water, sewerage, schools, parks, and other public requirements.

1.3 District description

1.3.1 Geographical location

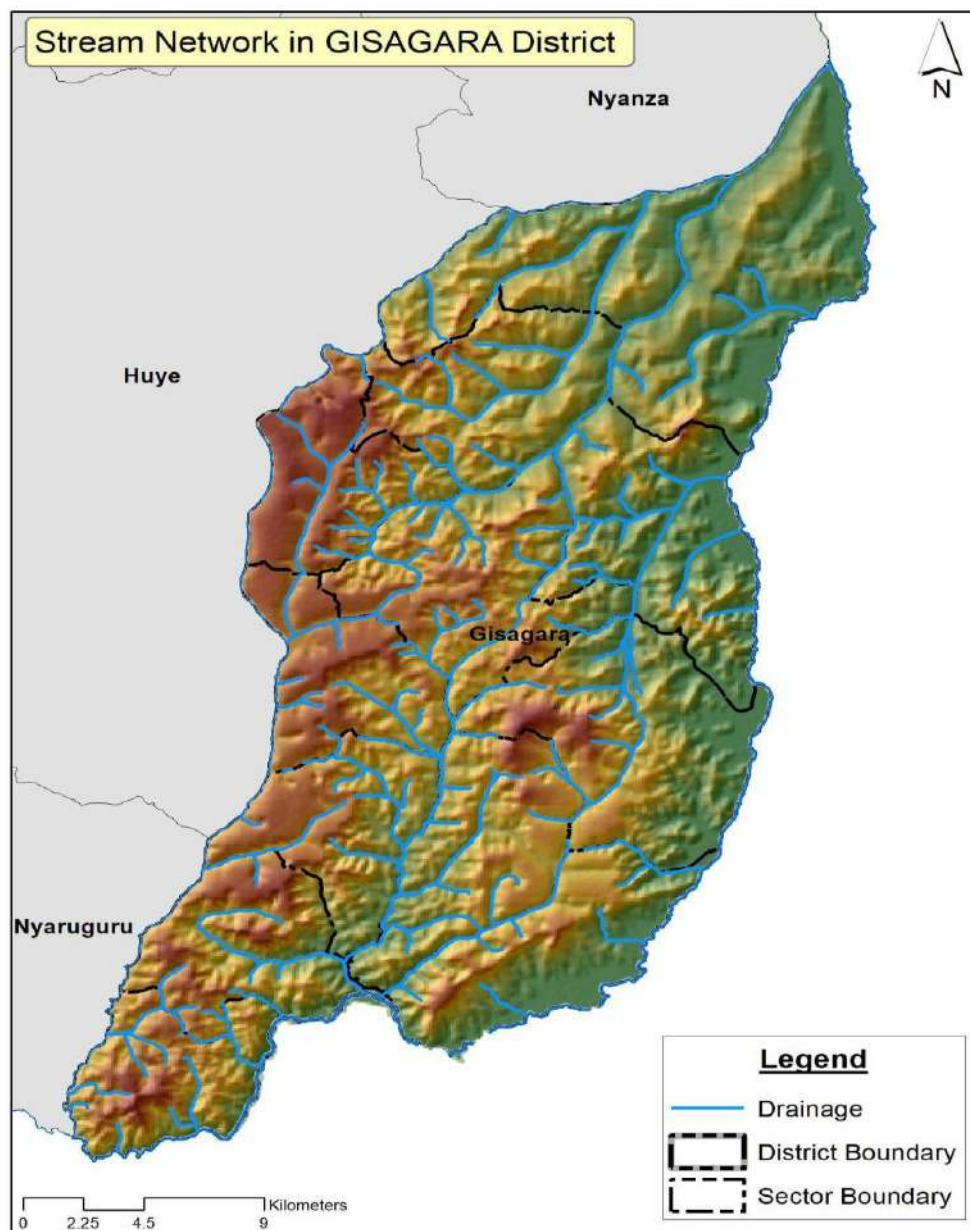
Gisagara District is located in the Southern Province and covers an area of 678.9 Sq Km. It is subdivided into 13 Sectors namely, Gikonko, Gishubi, Kansi, Kibilizi, Kigembe, Mamba, Muganza, Mugombwa, Mukindo, Musha, Ndora, Nyanza and Save; into 59 Cells and 524 Villages. It borders in the South and East with the Republic of Burundi, in the North with Nyanza District, and in the West with Huye and Nyaruguru Districts. Its headquarters is in Ndora Sector.



Map 1: Geographical location of Gisagara District

1.3.2 Hydrography

The district hydrography is made up of two rivers: Akanyaru river which surrounds Gisagara on 80km to border Rwanda and Republic of Burundi and Migina that borders the district with Nyaruguru and Huye Districts on the west side. In the district, springs give streams that flow down to these rivers. Gisagara has other smaller rivers such as Kabogobogo, Kidaturwa, Nyiramageni, Buzana, etc. Those rivers contribute to irrigation in rice plantation, maize, and exploitation of sand.



Map 2-Hydrography of Gisagara District

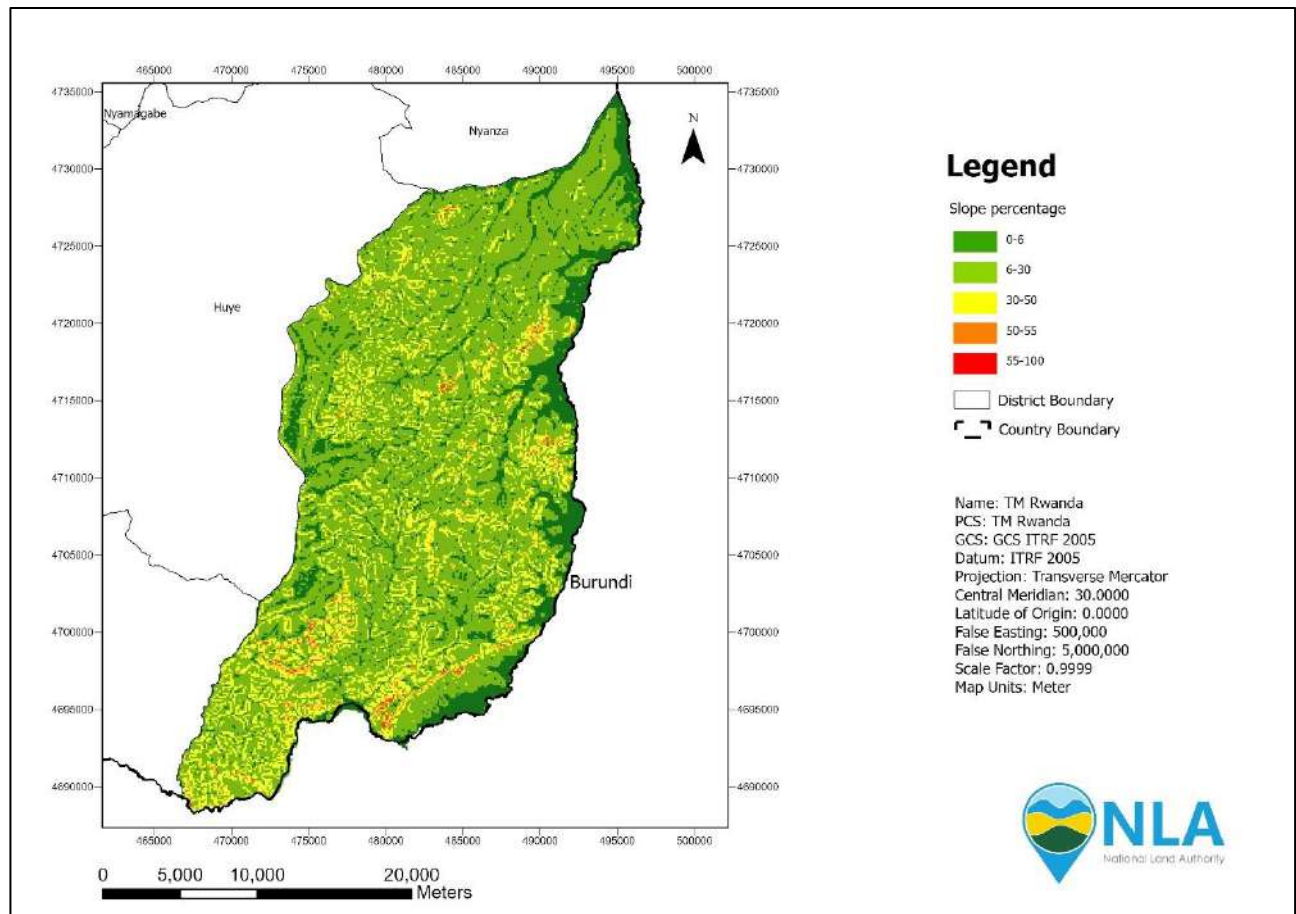
1.3.3 Soil and erosion

Gisagara District is characterized by an abundance of humus bearing soils, granite-based soils, and ferralsols. The district has other geological materials such as stones, gravel, sand, and clay which are exploited for use in construction. In Gisagara District, 66% of land is reported as protected against soil erosion as per EICV 5. The percentage of irrigated land (5.9%) in Gisagara District is lesser than the national level (6.2%), hence the district must improve its efforts to reach the national target of 100% of land protected against soil erosion.

1.3.4 Topography

Gisagara altitude average ranges from 1,346 to 1,805 meters above the sea level, and a relatively moderate slope varying from 0 to 45% whereby 85% of the area has the slope ranging between 0 and

30% while the proposed main urban center of Ndora is located on undulating hills with a few lowlands as the rest of the district. This relief is physically favorable to the implementation of different infrastructures aiming at local urban development such as road networks, hotels, drainage systems, etc.



Map 3-Topography of Gisagara District

1.3.5 Climate and rainfall

Regarding the district temperate climate, it has a succession of irregular seasons which vary from rainy to dry seasons: Season A starts in September and ends in December and is characterized by high many rainfalls especially in December. It is linked to agricultural season A which is very important with abundant production. Season B that starts in January and ends in June. It is also linked with agricultural season B and combines both a small dry season (which normally starts from January to mid-March) and a long rainy season starting from mid-March to end of June. It also has abundant rains in April. Season C which is a dry season starting with July and ends with September. Average annual temperatures generally oscillate around 200 °C with amplitudes changing between 150 °C and 200 °C and annual rainfalls of about 1200 mm.

1.3.6 SWOT ANALYSIS

SECTOR/ POTENTIALITIES	OPPORTUNITIES/STRENGTHS	WEAKNESSES/THREATS
Agriculture	▪ Availability of arable land for rice, banana, cassava, coffee, vegetables and fruits. ▪ Available of suitable agricultural policy and programs (SSIT, Land use consolidation, TWIGIRE MUHINZI). ▪ Climate with three agricultural seasons favorable for planting three times in a year.	▪ Low level of productivity resulting from limited input use. ▪ Insufficiency of value addition to the production by lack of processing skills and utilities. ▪ Prevalence of subsistence farming systems on scattered small plots of lands. ▪ Insufficiency of value addition to the production by lack of processing skills and utilities. ▪ Soil erosion from manmade activities and disasters. ▪ Climate changes that affect crops.
Urbanization and Rural Settlement	▪ Availability of Gisagara DLUP 2023-2050. ▪ 57% of Gisagara District households live in planned settlements. ▪ Existing legal framework (housing and urbanization policy, regulations on planned settlement and urban development)	▪ Lack of detailed implementation plans of Gisagara urban master plan. ▪ Insufficient budget for implementing developed master plans. ▪ Poor organizational structure and insufficient staff in charge of urbanization and rural settlement. ▪ Weak capacity of private sector in development of housing sector. ▪ Insufficient budget for infrastructure financing.

Energy	▪ Main on-grid Electricity Supply lines available. ▪ Institutions in distribution of on grid and off electricity	▪ Instability of Electricity (cuts) which can be a source of loss for private operators. ▪ Scattered settlements leading to low levels of households connected on grid electricity. ▪ High cost of electricity infrastructures
Transport	▪ Favorable landscapes ▪ Adequate labor and local road materials available. ▪ Availability of agencies with clear mandates and responsibilities in road development and maintenance. ▪ Availability of transport policies and regulations.	▪ Lack of financial capacity for paved roads. ▪ Roads in bad conditions.
Water and Sanitation	▪ Availability of source with enough water regardless of the seasons. ▪ Scattered population and difficulties for water supply connectivity.	▪ Sources that are located in areas which do not facilitate the application of gravity system in water supply.

ICT	▪ Availability of internet network infrastructure at Cell level. ▪ Availability of companies supplying internet and phone networks. ▪ Optic fiber reaches District headquarters. ▪ 4G network covering 1/3 of District.	▪ Low level of households access to ICT durable goods: radio: 46.5%, TV sets: 1.4%, mobile phone 32.4%; computer: 0.3% 505 villages have not any access to computer service access points. ▪ Disturbances in the network especially on the side of borders with Burundi.
Environment and Natural Resources	▪ Availability of eligible land for forestation. ▪ Presence of a strong political will on environmental conservation. ▪ Availability of agencies with clear mandates and responsibilities in the sector.	▪ Poor coordination of all concerned District departments. ▪ Lack of expertise and low skill levels environmental staff. ▪ Lack of participation of Civil Society in the implementation of environmental management programs. ▪ Dependency of firewood as source of cooking energy. ▪ Climate change issue. ▪ Poor management of human settlements and deterioration of the environment by economic activities.
Health	▪ Healthcare facilities at District and Sector level. ▪ CHW at village level cares on some illness cases and performs health mobilization as needed. ▪ Regular campaigns for vaccination, screening for malnutrition.	▪ Insufficiency of healthcare facilities at cell level. ▪ Low level of hygiene in community and in public places linked to human security issues.

Education	▪ Accessibility of schools in Cells. ▪ Sufficient female and male qualified teachers. ▪ Availability of stakeholders (NGOs, Churches, MINISTRIES) that contribute to the education sector.	▪ Insufficiency of TVET infrastructures: 5/15 schools. Low level (11.7%) of enrolment in TVET: 1398 over 12,000: 570 female and 828 male students. ▪ No teachers for ECDs. ▪ Low level of access to ICT infrastructures: 17/84 have access to computer labs. ▪ Low enrollment in ECD due to lack of infrastructures and operationalization costs. ▪ Insufficiency of school materials and equipment. ▪ Lack of parent's awareness on the importance of education. ▪ Disasters. ▪ High level of poverty in the population (53%).
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Table 1: Gisagara District SWOT analysis

2 REGULATORY AND POLICY FRAMEWORK

2.1 Policies

- National Land Policy, June 2019, MoE

The revised Land policy of June 2019 focuses on the efficient utilization and management of land to support the national transformation goals without compromising the benefits of future generations. To achieve this objective, the policy outlines actions organized into three core pillars: land use planning, surveying, and mapping; land use management; and land administration. These pillars encompass eight thematic areas:

- (a) Land use planning, surveying, and mapping;
 - (b) Integration of land utilization across various Sectors;
 - (c) Effective land use management;
 - (d) Facilitation of private sector investment in land;
 - (e) Land registration procedures;
 - (f) Administration of land lease fees, real property taxes, and land markets;
 - (g) Ensuring land rights security and managing land disputes;
 - (h) Institutional framework and coordination mechanisms within the land sub-sector.
- National Urbanization Policy, December 2015, MININFRA;
 - National Human Settlement Policy in Rwanda, May 2009, MININFRA;
 - National Housing Policy, March 2015, RHA.

2.2 Laws and Regulations

- **Presidential Order n° 038/01 of 20/05/2022 establishing NLUDMP 2020-2050**

The Presidential Order n° 038/01 dated 20/05/2022, which establishes the NLUDMP 2020-2050, delineates a planning horizon spanning the next three decades. The Order outlines the revision process, ensuring alignment with other plans, and assigns responsible institutions for implementation, emphasizing the pivotal role of all sectors. With the NLUDMP 2020-2050 gazetted, the focus now shifts to effectively implementing it through DLUPs and other tools, ensuring strict adherence to alignment principles between NLUDMP 2020-2050 and DLUPs.

- **Law n° 27/2021 dated 10/06/2021 governing land in Rwanda**

Law n° 27/2021 dated 10/06/2021 governing land in Rwanda, which regulates land affairs, contains detailed provisions concerning land use management and development, as well as the institutional framework and procedures governing the initiation, development, adoption,

and establishment of land use and development plans at the district level. This legislation specifically governs land occupancy and construction activities on areas designated for human habitation. Moreover, it encompasses the planning of plots and site development to facilitate the realization of national, City of Kigali, and district land use master plans.

Gisagara DLUP was revised taking into consideration other laws related to land management and utilization such as:

- Law n°10/2012 of 02/05/2012 governing urban planning and building in Rwanda. Urban planning should strive for the gradual and adaptable advancement of urban centers within the context of economic and social development policies, incorporating rural planning and environmental preservation objectives;
- Law n°20/2011 of 21/06/2011 governing human habitation in Rwanda. This law governs land occupation and construction on lands reserved for human habitation;
- Ministerial Order n° 04/Cab.M/015 of 18/05/2015 determining urban planning and building in Rwanda;
- Ministerial Order N° 005/MoE/22 of 15/02/2022 determining modalities of change of land use.
- Land use plans zoning regulations edition 1, November 2022.
- Ministerial Instructions relating to the implementation of the National Grouped Settlement Program in Rural Areas (27 May 2009);
- Ministerial Instructions n°.001 of 23/04/2018 determining the management and use of the lands allocated for agriculture and livestock.

2.3 Guidelines

Numerous land use planning guidelines established in previous years remain pertinent and continue to inform current practices. While we can mention a few examples, it's important to note that the list includes:

- Urban Planning and Building Codes (June 2019, MININFRA);
- Land Use Planning Guidelines (December 2017, NLA);
- Land Readjustment Guidelines (October 2021, NLA);

3 METHODOLOGY

3.1 Consultation

The preparation of Gisagara DLUP was developed through a collaborative effort between the district administration and the assistance provided by NLA. Staff members from both parties cooperated closely throughout the entire process, facilitating the seamless exchange of necessary data between NLA and Gisagara District.

The elaboration of Gisagara DLUP was done in the framework of alignment with the NLUDMP 2020-2050, hence the preparation of the plan was made to harmonize not only with NLUDMP 2020-2050 but also DDS, NST1 and Vision 2050 etc. Since the work was being done jointly between the two teams of NLA and Gisagara District, the first activity was NLA presenting the approved NLUDMP 2020-2050 by the cabinet to District Authorities, this provided awareness for District leaders, staff and stakeholders. This activity was also a kick-off for Gisagara DLUP elaboration.

Similar to other planning activities, the process commenced with situational and deskwork analyses, involving the active participation of staff members from both parties. Together, they identified available data, determined methodologies, scheduled consultative meetings, and planned investigations. This included various steps such as data collection through land surveys and physical analyses, ensuring compliance with boundaries for urban, rural, and rural settlement sites. Additionally, efforts were made towards disseminating information to enhance public awareness, as well as developing draft reports and undertaking other necessary tasks. Throughout each phase, the team collaborated closely, ensuring cohesive progress.

Subsequently, validation meetings were arranged for the District Council and focal persons from partner institutions to review both interim and final reports. During these meetings, the District Council, executive committee, and stakeholders offered feedback and acknowledged the progress made, leading to the final approval of Gisagara DLUP 2023-2050.

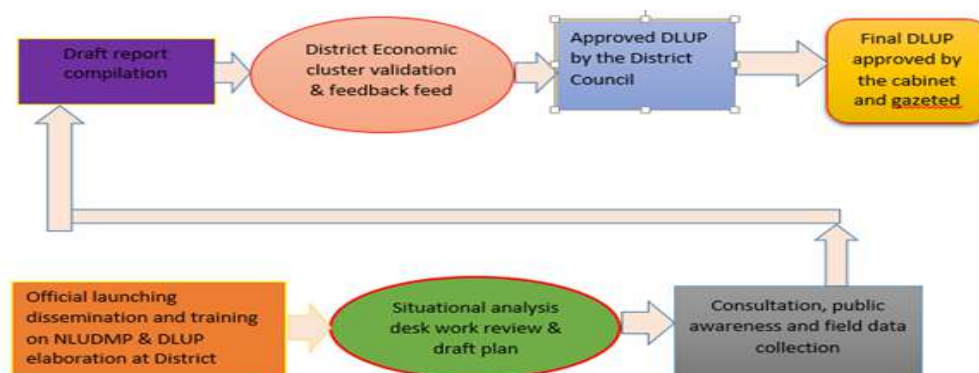


Figure 1-Planning steps used during elaboration and review of Gisagara DLUP 2023-2050

3.1.1 Consultation at Sector and District level

A variety of consultative meeting were held at district level that brought together different district stakeholders including representatives of sectors, cells, villages, church leaders, civil society organizations, security organs, private sector operators as well as NLA as the coordinating institution of this assignment and district organization with the aim of ensuring that participatory approach especially in terms of discussion and agreement on the priority areas and the implementation strategy.



Figure 2: District Council validation meeting of Gisagara DLUP

3.1.2 Consultation with National Stakeholders

In May 2019, the Cabinet approved the “Detailed Guidelines for the Coordination Mechanism of the Elaboration and Validation Process of Land Use Plans,” concurrently with the endorsement of the Technical Advisory Group (TAG) responsible for ensuring the quality assurance and validation of any Land Use Master Plan. Subsequently, NLA organized a five-day retreat from December 5th to 10th, 2021, held in Musanze District, Northern Province.

The primary objective of the retreat was to conduct a comprehensive review of all five DLUPs reports, inclusive of spatial data, with a particular focus on Gisagara area. Attended by technical staff representatives from TAG, nominated by various institutions responsible for the implementation of land use master plans, the retreat saw participation from Gisagara District, represented by the Director

of One Stop Center.

During the retreat, participants examined the process of DLUP elaboration, as well as the targets for 2035, both in textual and spatial formats. They provided direct inputs, comments, and recommendations aimed at enhancing the collaborative efforts between NLA and the districts.

The retreat identified areas within the DLUPs that warranted improvement and subsequently furnished inputs based on the priority sectors represented by the participating institutions. NLA ensured that all comments and inputs were meticulously integrated into the finalized reports, reflecting a concerted effort towards enhancing the quality and efficacy of land use planning initiatives.

3.2 Data collection

3.2.1 Field survey and spatial data collection

The key field visits conducted by the teams include, Gisagara town and rural areas the following sites, Ndora, Save, Kibirizi, Mamba, Gikonko as urban areas, regarding rural settlements, all sectors were visited. Geographic Positioning System (GPS) coordinates were taken especially to identify clearly the boundary consistencies and zoning compliance. After field work the team of Gisagara District composed of staff from One Stop Center with different backgrounds of expertise met with the NLA team at Kigali/NLA Head Office for report development.



Figure 3: Field survey for data collection.

3.2.2 Non-spatial data collection

The non-spatial data gathered and utilized in the development of the Gisagara DLUP encompassed a variety of demographic statistics capturing both current and projected trends. This included the allocation of economic data pertinent to Gisagara, such as income generation patterns, economic activities vital for sustaining livelihoods within the community, as well as trade dynamics encompassing the movement of goods and services.

3.3 Data analysis

The NLA team, alongside counterparts from Gisagara District, convened at the NLA head office in Kigali to conduct a comprehensive analysis and interpretation of the field-collected data. Spatial data collected underwent a careful analysis and interpretation utilizing Geographic Information System (GIS) tools, complemented by the utilization of Orthorectified satellite images.

The task of data interpretation was seamlessly integrated with the development and compilation of the report, ensuring that insights gleaned from the data were effectively translated into actionable recommendations.

3.4 Report compilation.

The joint team comprising members from the NLA and Gisagara District collaborated closely under the supervision of experts from SDA- Lantmäteriet and senior management of NLA. To uphold the envisioned quality standards of the report, several sessions were conducted, culminating in a retreat involving key stakeholders and institutions in land use planning and development.

After passing through the economic commission of the District Council, the report was finally approved by the District Council. Comments and inputs provided were considered by the technical team working on the report. The TAG also held a 5-day retreat to validate the report. Comments and guidelines were provided which helped in report improvement.

4 GISAGARA LAND USE AND DEVELOPMENT PLANNING

4.1 Visioning and Economic Specialization

4.1.1 Visioning

The Vision of Gisagara DLUP is based on NLUDMP 2020-2050 recommendations that aims at transforming Rwanda into a middle- and higher-income economy in which Rwandans are healthier, educated and generally more prosperous. Vision 2050 establishes the development framework for 2020-2050, with a mid-term review envisaged in 2035 and regular reviews planned every 5 years. The vision intensifies the country's ambitions and continues the drive towards self-reliance and competitiveness.

To implement and achieve vision 2050 at District level, Gisagara DLUP is aligned with NLUDMP 2020-2050 development framework to which its planning horizon is 2050. Further implementation will be through NST1 targets as covered in the DDS and the potentialities of the district will be developed as the potential driver opportunities for the district Development as follows:

- a) Improving service delivery
- b) Agro-processing development
- c) Agricultural modernization
- d) Strong and vibrant Public and Private Partnership
- e) Sustainable urbanization and rural settlement
- f) Access to good quality health care
- g) Enabling hard and soft infrastructures (Roads, energy, water, etc);
- h) Exploit the local natural resource without compromising the environment.
- i) Sport and Eco-tourism development

4.1.2 Economic Specialization

Gisagara District's economy is driven by agriculture where 84.6% of the active population is in agriculture (24.5% being farm wage workers and 60.1% being independent farmers). Only 15.4% are non-farm wage workers with 10.7% with non-farm wages. 3.9% independent non farmers and 0.8% with unpaid non-farm wages (NSIR, ECIV5). Agro-processing industrial zones in Kibirizi center (Agro-processing centers) is one of the key potential areas to stimulate development. The district will further still continue to establish agro-processing industries productivity especially for maize, rice, banana, pineapples and avocados through their extension, increase availability of agricultural raw materials and motivate them to fulfill requirements of products quality standards for local and regional markets as well as promoting production of "made in Rwanda " in Textile industry to satisfy clothing

needs through supporting craft persons in clothing, establishment of clothing units and promotion of sericulture for raw materials.

To minimize the high dependency of the population on agriculture, the district is planning to put in place the descent off-farming activities that will be achieved through increasing opportunities for job creation: industries focusing on value chains development such agro-processing, hand crafts, professional skills, and financial and technical support to MSMEs. That creation must take into consideration that 54.6% of the population are female.

As far as services are concerned, Gisagara District has only 2,693 establishments, which represents the lowest percentage of establishments in the Country (1.4%), grouped 2478 enterprises where 93 are formal and 2,385 are informal enterprises (respectively representing 0.7% and 1.4% of the Country formal enterprises). 88.8% of these enterprises are classified as micro, 9.5% (252) are small, 1.5% (41) are medium and 0.2% (4) large. They employ 9,019 workers (representing 1.5% of the total establishments workers in Country) where 5,234 (58%) are male and 3,785 (42%) are female (NSIR, ECIV5). The majority of the Private Sector in the district is not developed. Only small business operators in trading, bars and restaurants are main taxpayers in the district and tourism activities are at a very low level; only one guest house is operational in the district. There is no established modern market or trade center where people can trade their crops hence a limiting factor.

Tourism is one key area to accelerate economic development of Gisagara District, promoting hand craft productions and cultural tourism on ways linking touristic sites: District HQ-Kibilizi Hospital-Kansi-Rwabisemanyi –Utwicarabami twa Nyaruteja-Gisunzu-Akanyaru watershed, District HQ-Mugombwa refugee’s camp- Makwaza-Akanyaru watershed-District HQ-Musha- Muyaga mount-Hakan Power Plant and Save-Rwanza-Gisagara banana processing plant- District HQ and Save Parish-Gikonko health center & Gikonko rice plant-Muyaga mount –Hakan Peat Power Plant.

Promote tourism linked on attraction of at least 27 visits for innovation realized in implementing projects/programs especially in environment protection, sports and culture, social protection, and ICT such as graduation model, volleyball sport promotion, greening households and public places with fruit trees and ornamental trees, eradication of malnutrition and ICT penetration in community.

4.2 Population, Urbanization, Settlement and Housing (PUSH)

4.2.1 Population

4.2.1.1 Existing population in Gisagara District

According to the NISR, the population of Gisagara District increased **322,506** from in 2012 to **397,051** in 2022. The population is predominantly rural, where **98.4 %** of the total population live in rural areas in 2012 as compared to 96.6% in 2022. Additionally, the female population is slightly higher than the male population, with females representing **53.3%** of the total population in 2012, compared to **52.4%** in 2022 and people aged (0-17 years) represented **49.1%** of the total population in 2012 as compared to **47.2 %** of the total population in 2022 and this reflecting a decrease in fertility rate over ten-years period. Private households were estimated at **77,259** as compared to **101,145** in 2022. The population density in Gisagara District increased from **475** inhabitants per square kilometer in 2012 to **584** inhabitants per square kilometer in 2022. This indicates that the district has become more densely populated over the ten-year period.

Sector Name	Type of Sector: Urban; Rural	2012 Census			Households per	2022 Census			Households per
		Counts			Sector year 2022	Counts			Sector year 2022
		Male	Female	Total		Number	Male	Female	
Gikonko	Rural	10,863	12,235	23,098	5,580	13,776	14,996	28,772	7,201
Gishubi	Rural	11,763	13,141	24,904	5,942	15,366	16,494	31,860	7,805
Kansi	Rural	8,410	10,013	18,423	4,461	10,465	11,845	22,310	5,883
Kibirizi	Rural& Urban	11,851	14,269	26,120	6,510	14,806	16,639	31,445	8,623
Kigembe	Rural	9,400	10,864	20,264	4,801	10,611	11,877	22,488	5,842
Mamba	Rural& Urban	16,396	18,496	34,892	8,166	21,896	23,387	45,283	11,224
Muganza	Rural &Urban	13,868	15,913	29,781	6,829	17,358	19,172	36,530	9,182

Mugombwa	Rural	10,526	12,186	22,712	5,396	17,116	19,353	36,469	8,693
Mukindo	Rural	12,605	14,224	26,829	6,338	15,621	16,772	32,393	8,055
Musha	Rural	11,413	12,892	24,305	5,974	13,856	14,906	28,762	7,411
Ndora	Rural	11,087	12,726	23,813	5,867	14,121	16,050	30,171	7,872
Nyanza	Rural	8,995	9,934	18,929	4,397	9,281	10,346	19,627	5,058
Save	Rural	13,278	15,158	37,029	6,998	14,692	16,249	30,941	8,296
Total		150,455	172,051	322,506	77,259	188,965	208,086	397,051	101,145

Table 2: Ruhango District population for the years 2012 and 2020

4.2.1.2 Projected population entire District (2035-2050)

According to the NLUDMP 2020-2050 projection, the total population of Gisagara District is estimated to reach 508,327 inhabitants by 2035 and 676,000 inhabitants by the year 2050. Of this, 195,800 inhabitants are expected to live in urban areas by 2035 and 356,000 inhabitants are expected to live in urban areas.

The above projection is based on the assumption that the population projection for cities, will be distributed based on recommended hierarchy and economic potentials of each city, for rurban, the document specifies the rurban population and the number of rurban settlements within each District, and the geographical distribution of the rural population is based on the assumption that it will distribute proportionally to the future agricultural lands in LUCA (Land Use Categories). In the LUCA A, population will grow by 41% due to the availability of prime lands. LUCA B remains static, and the massive change in LUCA C, where the population decreases more a million, to 17.6% of its current population. This result indicates two main movements: first, a very profound movement of farmers from C to A searching for new agriculture opportunities. Secondary, C also appears as the primary source of urbanization, either in situ or by migrating to cities in A and B. From the above explanations, Gisagara is a rural District categorized in LUCA A

Sector Name	Type of Sector: Urban; Rural	Pop 2022	HHs 2022	Pop 2035	HHs 2035	Pop 2050	HHs 2050
Gikonko	Rural & urban	28,772	7,201	33,190	8,298	44,818	11,205
Gishubi	Rural	31,860	7,805	25,961	6,490	26,582	6,645
Kansi	Rural	22,310	5,883	18,179	4,545	18,614	4,654
Kibirizi	Rural & urban	31,445	8,623	115,787	28,947	190,170	47,543
Kigembe	Rural	22,488	5,842	18,324	4,581	18,763	4,691
Mamba	Rural & urban	45,283	11,224	51,842	12,961	64,951	16,238
Muganza	Rural	36,530	9,182	29,767	7,442	30,478	7,620
Mugombwa	Rural	36,469	8,693	29,717	7,429	30,427	7,607
Mukindo	Rural	32,393	8,055	26,395	6,599	27,027	6,757
Musha	Rural	28,762	7,411	23,437	5,859	23,997	5,999
Ndora	Rural & urban	30,171	7,872	89,027	22,257	144,633	36,158
Nyanza	Rural	19,627	5,058	15,993	3,998	16,376	4,094
Save	Rural & urban	30,941	8,296	30,707	7,677	39,164	9,791
Total		397,051	101,145	508,327	127,082	676,000	169,000

Table 3: Gisagara District population growth according to NLUDMP 2020-2050 Guidelines

In summarizing the presented table depicting the projected population of Gisagara District according to the NLUDMP 2020-2050 guidelines, it is noteworthy to observe that the subsequent figure illustrates the anticipated population distribution based on residence. Notably, the rural population constituted 98.4 % of the overall population in 2012, followed by a rise 96.6 % in 2022. Further projections indicate a gradual decrease to 61.5 % by the year 2035, ultimately reaching 47.3% by 2050.

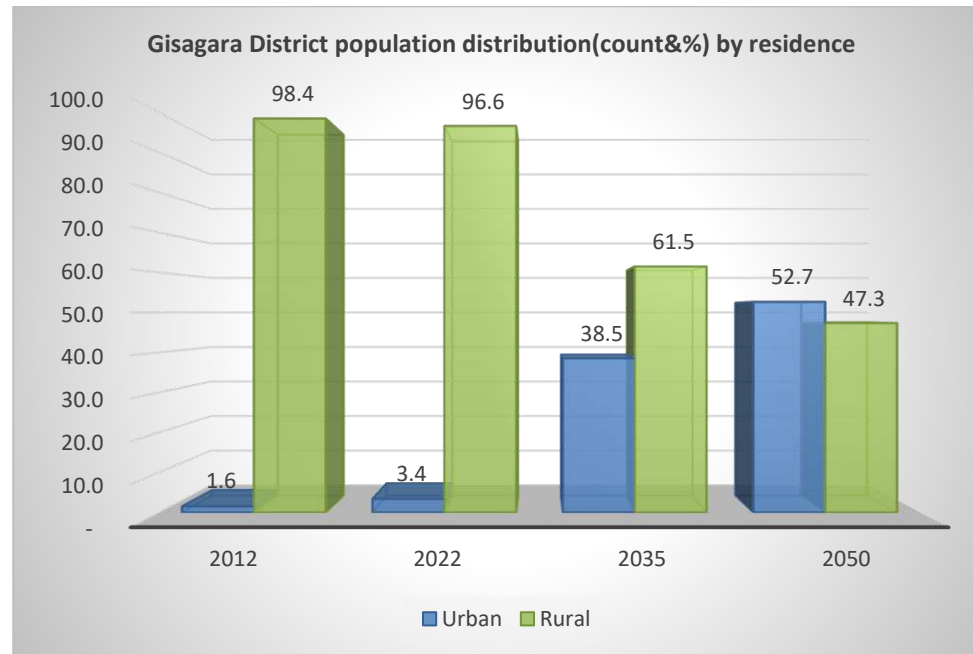


Figure 4: change of rural population to urban in Gisagara District by 2035 and 2050

4.2.2 Urbanization and settlement

According to RPHC4 & 5, the Rwandan population grew from 10.5 million in 2012 to 13.2 Million in 2022 and a high population growth rate of 2.3%, making it one of Africa's fastest-growing populations and this has severe implications in terms of demand on its natural resources including, land, water, forest, housing, health, education, jobs etc.

Rwanda's urbanization rate remains significantly low despite its level of increasing at a high rate. Between 2012 and 2022, Rwanda's urban population grew almost twice as fast as the rural population, even though fertility levels within urban areas have generally been declining. High natural population growth in towns due to improved health and internal migration (mainly rural to urban) are by far the most significant causes of urban expansion, as people tend to migrate hoping to improve their livelihoods. While most of the Rwanda's population still lives and works in rural areas, the process of urbanization is rapid as Kigali and several major Rwandan secondary cities are expanding rapidly and contributing to the country's socio-economic growth.

Between 2012 and 2022, Rwanda's urban population increased from 1.7 million to 3.7 million-by almost 2 million people or 113 percent-at an average rate of 6.7. In 2022, the level of urbanization was about 27.9%, and the annual growth rate of urbanization was only 7.5 %. Achieving this target is very challenging. Urbanization is a process of change by migration. The migration of people who move from rural to urban areas is currently the only urbanization modality in Rwanda. Migration reinforces urban centers but, at the same time, deteriorates and weakens rural settlements by lack of investments and employment opportunities.

4.2.2.1 Gisagara District Town

The review for Gisagara DLUP 2023-2050 has been drafted combining national best practices with a bottom-up approach; it means that decision-making and process implementation originates from lower levels and proceeds upwards, based on extensive socio-economic data collection and analysis and continued interaction with local stakeholders and communities who are the beneficiaries of the master plan.

According to the projections and directions of the NLUDMP 2020-2050, the big number of the population will be living in urban areas, this is based on global indicators where the trend of urbanization rate is significantly increasing, making the huge shift from rural to urban areas as indicated in figures below.

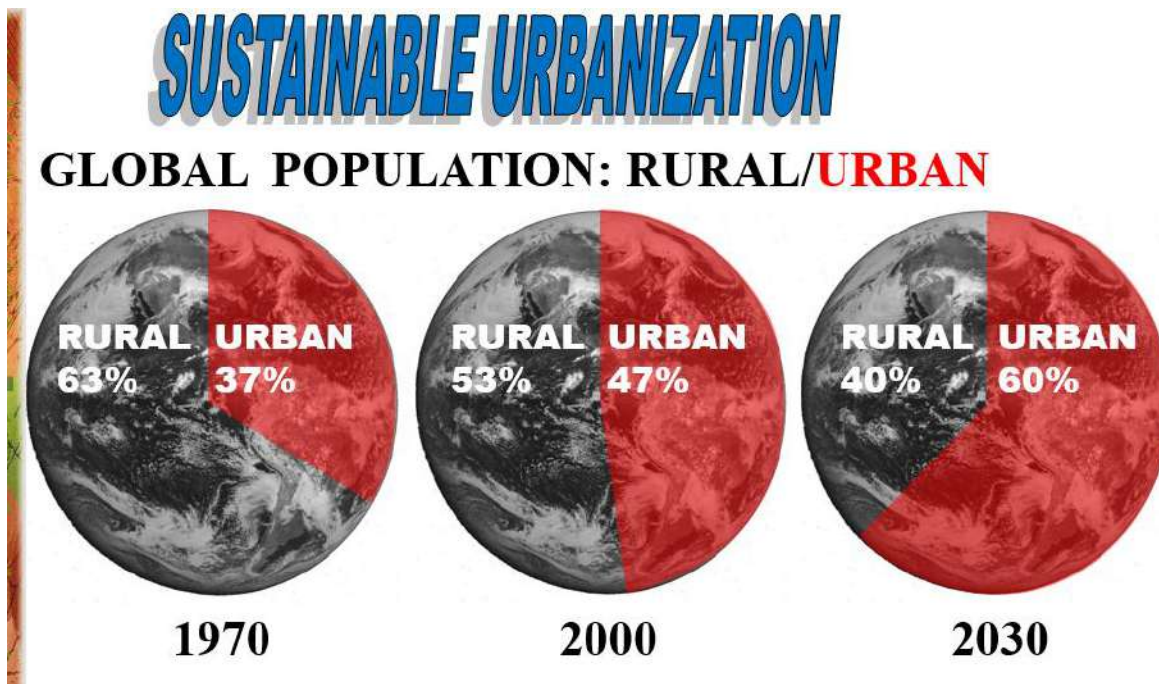
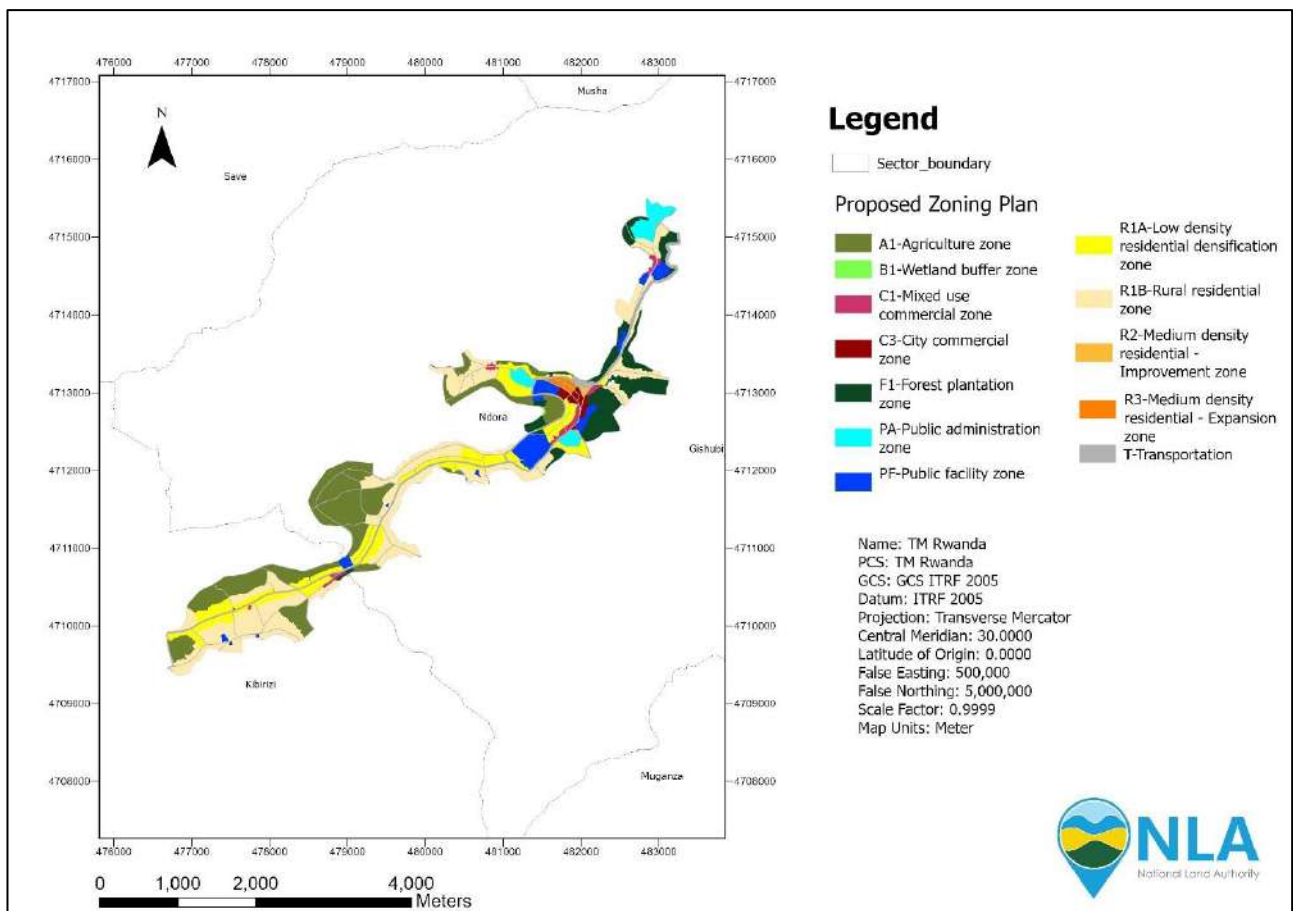


Figure 5-Global increase trend of population from rural to urban areas

Gisagara District Town population will significantly increase due to booming of economic activities, infrastructures and improved services provided by the government in collaboration with the private sector. The district town of Gisagara will have an urban population ranging between 178,441 – 356,000 in the period of 2035-2050.



Map 4-Map of proposed zoning of Gisagara District Town

The above map indicates the whole District urban area with different proposed land use categories. The proposed zoning for residential areas is composed of; R1A, R1B, R2, and R3 in which the component of densification was highly considered in planning of residential zones. Agriculture lands dominates the large part of zoning not only in the main District town but also the whole District. All other land use categories have been allocated to their respective uses according to the land use balance sheet.

a) Urban demographic characteristics of Gisagara District Town

In 2012, Gisagara District population in urban areas was 1.6% with an annual population growth rate of 2.1%, this urban population was estimated at 3.4% in 2022. With an objective to contribute to the national target where its annual urban growth rate is expected to be 35% in 2035 from the current 27.9%. The district committed to realize an average growth of 5%.

b) Urban Planning perspectives for the district (2035, 2050)

According to NLUDMP 2020-2050, the urban population will be 250,000 in Gisagara District town, 106,000 will be distributed in 4 rural centers and remaining 320,000 will be distributed in consolidated 145 rural settlement sites by following this structure:

1. Gisagara District town
2. 4 Rurbarans
3. 145 rural settlements

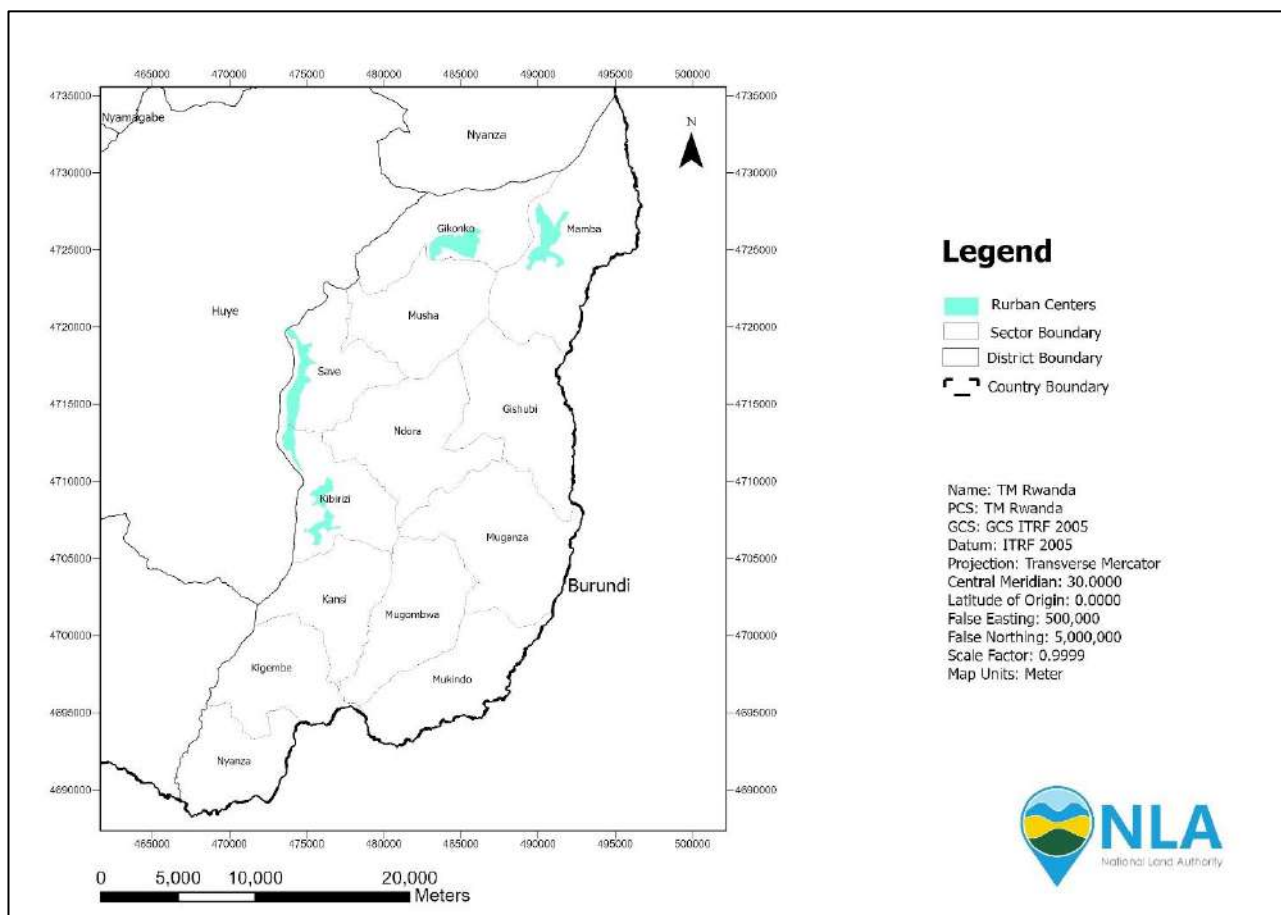
4.2.2.2 Rural centers**a) Existing land use**

Rural centers are developing hubs for connecting rural and urban areas. They will play a critical role in connecting urban and rural areas, which will help Rwanda achieve its urbanization goals. The spatial distribution of existing rural settlements or growing centers, especially in a small country, is an overwhelming phenomenon. They are Kibirizi, Mamba, Save, and Gikonko in the Gisagara District. The following District Council guidance factors were taken into consideration when selecting rural settlements: emerging existing potential trading centers, high pressure of rapidly increasing residential settlements as a result of Huye city economic impacts, peat development, existing and developing infrastructures such as roads, water, electricity, healthcare facilities, employment opportunities, and education facilities.

S/N	URBAN AREAS	SECTORS	COVERED AREA in Km ²
1	Gisagara District town	Ndora, Kibirizi	6.3
2	Save Rurban	Save, Kibirizi	5.72
3	Kibirizi Rurban	Kibirizi	2.95
4	Mamba Rurban	Mamba	4.36
5	Gikonko Rurban	Gikonko	3.98

Table 4: Urban categories in Gisagara District and land size coverage

Gisagara District is composed of 4 rurbans as mentioned above consisting of Kibirizi, Mamba, Save, and Gikonko, these rurban will play a key role in accelerating urbanization while connecting District main town and rural settlements areas as indicated in the map below. The development of rurban centers will not only increase job opportunities especially to youth, minimizing rural urban migration but also availing markets for agricultural food production from rural areas especially for the people living in rural settlement sites in remote areas.



Map 5-Map indicating Gisagara rurban areas and their location

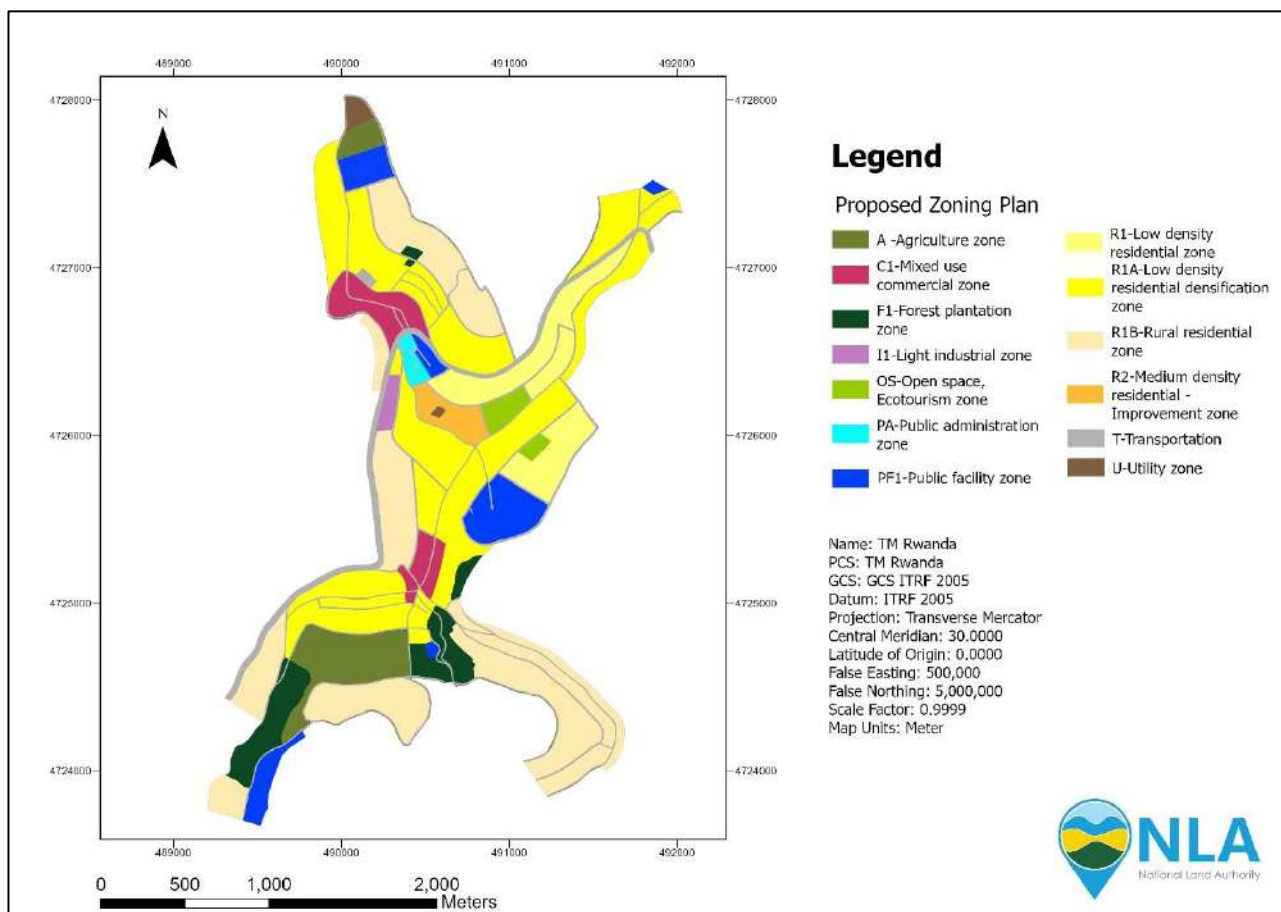
The above map indicates four rurban areas with their boundaries in Gisagara District, including Kibirizi, Save, Gikonko and Mamba

b) Projected population in rurban (2035, 2050)

Rurban settlements are new layer types of urban settings on hierarchy of urbanization in Rwanda that will play a key role in contributing to achieving of the country's urbanization rate desired by 2035-2050. The Total rurban population in Gisagara District will be 106,000 by 2050 while covering 16.9 Sq Km of land.

c) Planning perspectives and phasing plans for rurban (2035-2050)

Rurban Centers will play a big role in accelerating the growth of urbanization rate in Gisagara District as well as being intermediary growing towns between District main town and rural settlement sites. Rurbans land use plans and zoning have been prepared and being supported by zoning guidelines. The following are zoning elaborated land use plans for proposed 4 rurban of Gisagara District, each with detailed zoning.

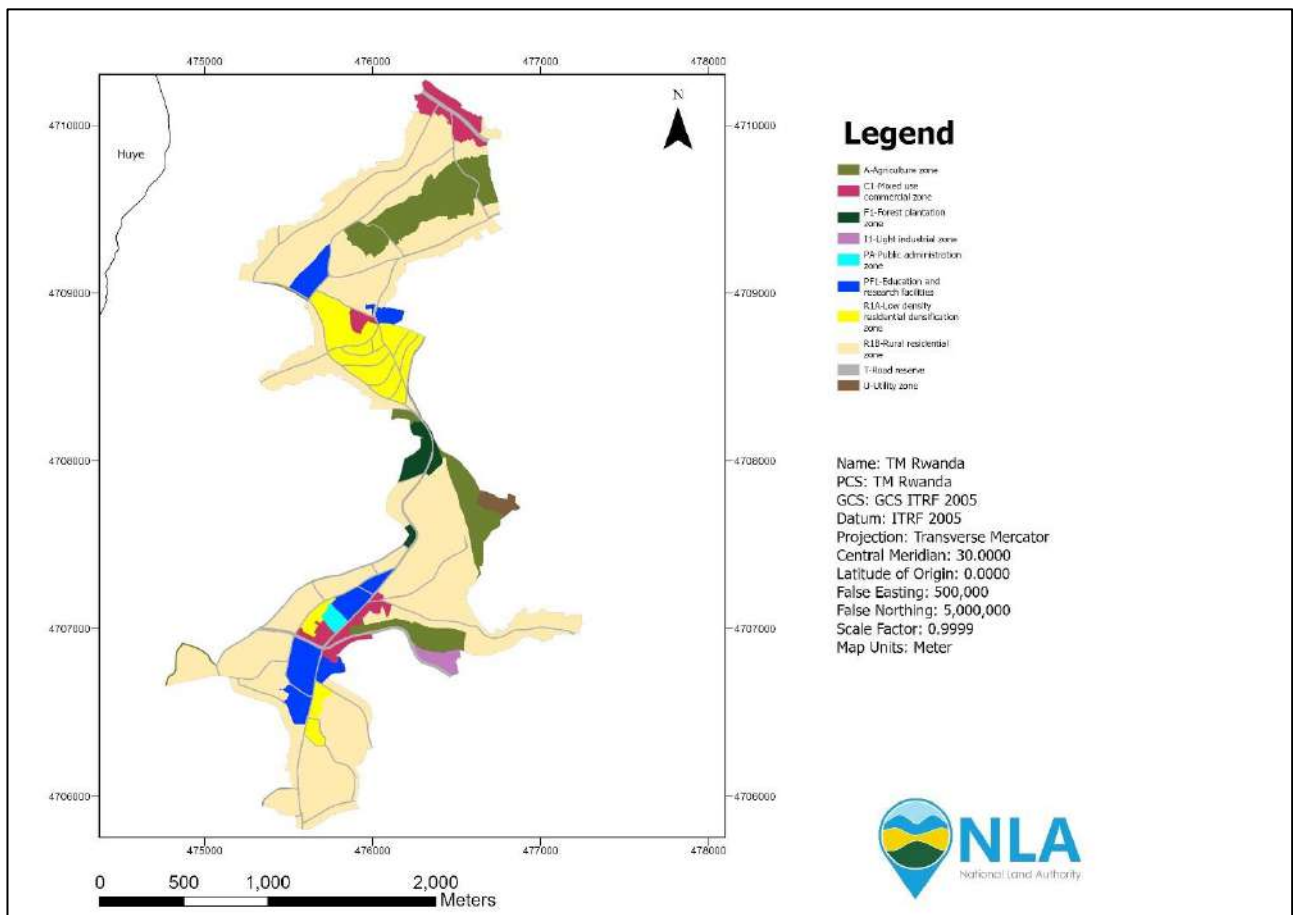


Map 6-Proposed land use plan for Mamba urban centre

Mamba urban is one of the Gisagara District potential trading center with economic potentialities to become one of the district's commercial hub. Due existing socio-economic infrastructures and agricultural processing plants makes Mamba being economically booming area these include; Gakoma Hospital, a rice processing plant, a maize flour factory, peat to power project—which seeks to generate power from peat in (Akanyaru) marshland, and schools.

The 28 kilometre road, with 7 metres wide at the border of Gisagara and Huye Districts, connects the sectors of Save, Gikonko and Mamba, leading to Rwanda-Burundi border at Akanyaru River, makes Mamba to be in geographical strategic area favorable and convenient for business and trade development with neighboring sectors, Huye District and Burundi.

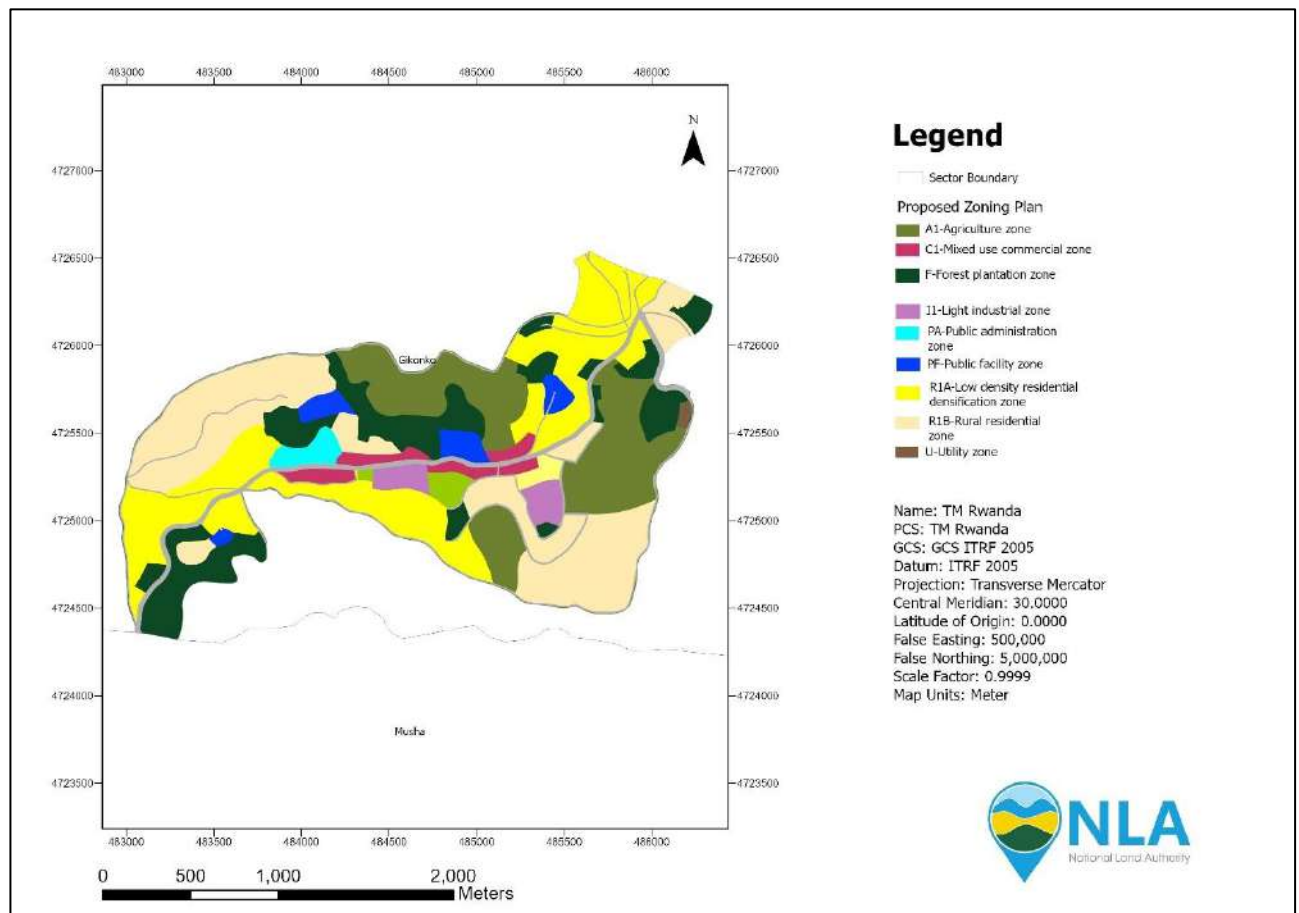
The map above indicates proposed different land uses for Mamba Urban, which mainly composed residential, commercial, services and utilities, education and research compared to agriculture and forest land uses.



Map 7-Proposed land use plan for Kibirizi Rurban Centre

Kibirizi rurban is one Gisagara developing rurban centers that will significantly contribute to the district development urbanization rate. Currently there a variety of activities going on basing on potentialities of agriculture. Majority of businesses and trades are backed by agricultural production due to fertile soils.

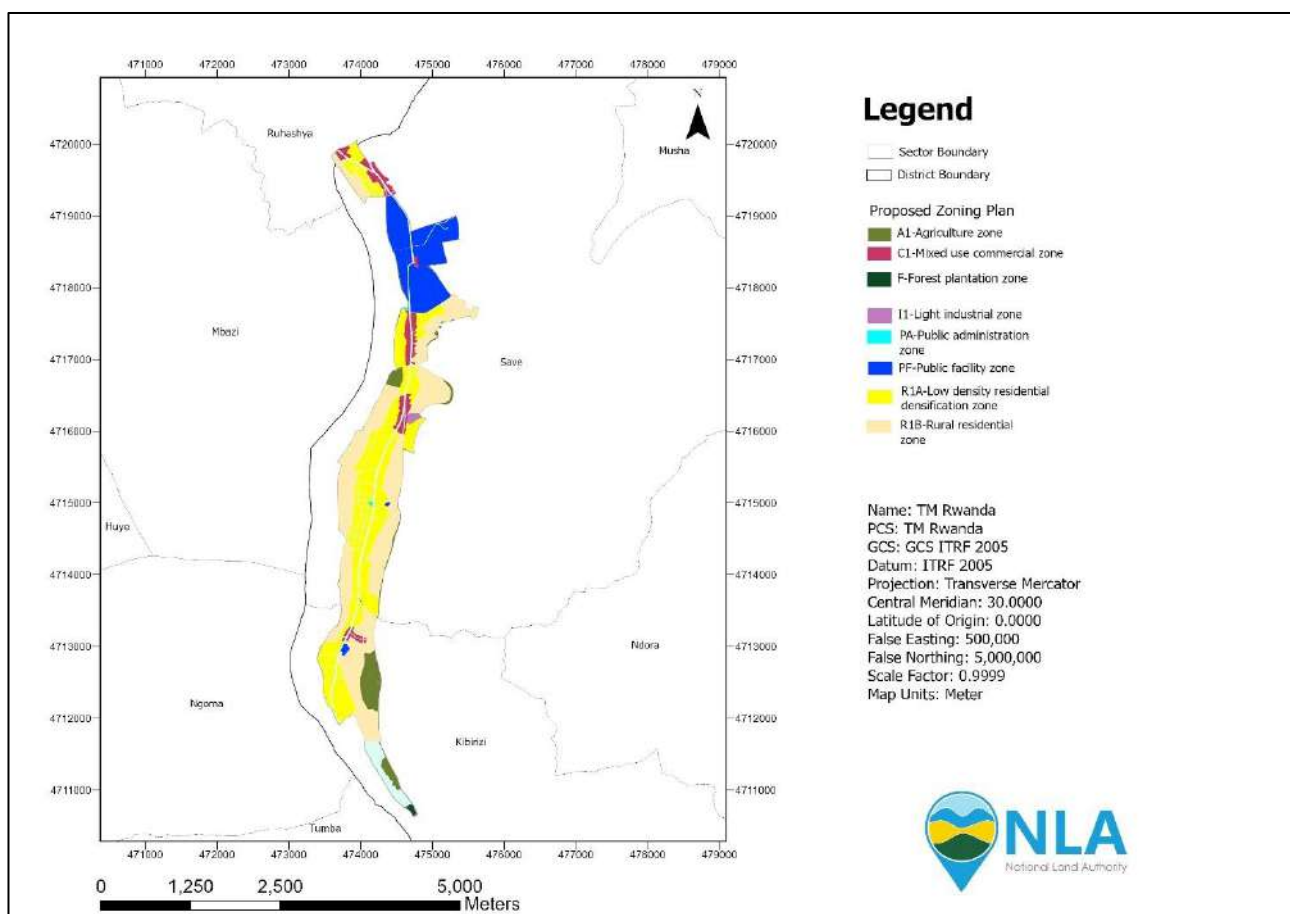
The zoning plan for proposed land uses for Kibirizi has been developed in order to enhance efficient land use planning and optimal use of land to which each land use zone has been proposed to be respected during implementation as indicated in the above map.



Map 8-Proposed land use plan for Gikonko Rurban Centre

Gikonko is a developing rural center in Gisagara District and has been proposed due to some potentialities for further development. Tourism and agriculture will greatly contribute to the development of the rural. There is currently UNESCO world heritage site nearby. Due to its geographical location, it is convenient to visit some of the following locations: Nyanza, Huye, Kirundo in Burundi, Nyamagabe and Muhanga Districts.

Gikonko rural is mainly composed of various proposed land uses which are mainly composed of residential zones in yellow color and light brown, like any other rural the settlements are made of R1, R1A, R1B. R1 has proposed to represent low density residential zone with the component of densification of dwelling, R1A represents low density residential densification zone and R1B standards for the rural residential zone as part of the rural. Mixed commercial zones (CI) will play a big role in development of Gikonko rural to complement agriculture in terms of economies of scale and will be supported by light industries that will promote off farming activities. Agriculture and forest zones also have been proposed to which they will contribute to the development of the rural. The rest of various land uses have been proposed and their guidelines have been detailed in the zoning regulations.



Map 9-Proposed land use plan for Save Rural Centre

Save rural is one of developing trading centers in Gisagara District. The rural is supported by being geographically located and connected to main road connecting Huye, Nyanza via Burundi. This favors

trade among the people of Save. Agro-processing industries backed by agricultural food products produced within Save Sector supports and will continue to favor the development of the rural. The new proposed land uses were based on the best potentialities of the area. Several land uses have been proposed and indicated in the map above.

4.2.2.3 Rural settlements

The rural settlements system suffers traditionally from continuous isolation of homesteads which prevents improvement in agricultural yield and inefficient supply of services and infrastructure. An audit survey that has been prepared in 2019 by RHA and NLA shows how deep the problem is. 210,000 houses out of 570,000 have been found out of settlement plans in a sample of some Districts. In 2017-18 the districts reported to the Audit team that the population accommodated in rural settlement sites is 93% while the spatial analysis with current land use plans (urban and rural villages' sites) figures that among 82% of the Rwandan population living in rural area, 69.2% in 2019 were accommodated in 13,661 rural settlements.

Because a variety of Imidugudu and scattered single-family homesteads in rural areas do not favor economies of scale, Rwanda's rural settlement structure must be transformed in order to improve efficient land use planning, to provide and protect as much agriculture land as possible, and to promote densification of dwelling in rural settlements. The majority of agricultural arable lands and other lands are declining as a result of the 13,661 rural habitation sites distributed across 11,000 km². There are 9,545,149 people living in rural areas, with 2,348,456 families where as in Gisagara District 383,538 live in rural areas (RPHC, 2022). As a result, the average size of rural settlement sites in Rwanda is 80.5 ha, with an average population of 777 people, or around 172 households. Therefore, the following actions are proposed by the NLUDMP 2020-2050 to address the issue of excessive rural settlement sites.

a) Planning perspective of rural settlement sites in Gisagara District

By 2050, the total population of rural settlements in Gisagara District will be 320,000, with all rural communities being required to settle in authorized rural settlement sites. Construction of any individual house outside of a rural settlement site is strictly prohibited and will continue to be considered a violation of land use under Article 76 of the Land Law, which states that non-compliance with the land use and development master plan will be sanctioned with harsh measures and fines. A total of 134 rural settlement sites with a total area of 65 Sq.Km are planned.

Location of District rural population by LUCA

According to the NLUDMP 2020-2050, the rural population of Gisagara District would reach 320,000 by 2050. The district is highlighted by suitable prime agriculture land in category A that, if consolidated, is suitable for commercial usage. However, because of the dispersed rural settlements and fragmented land usage, land consolidation and construction restrictions outside of rural settlement sites are recommended.

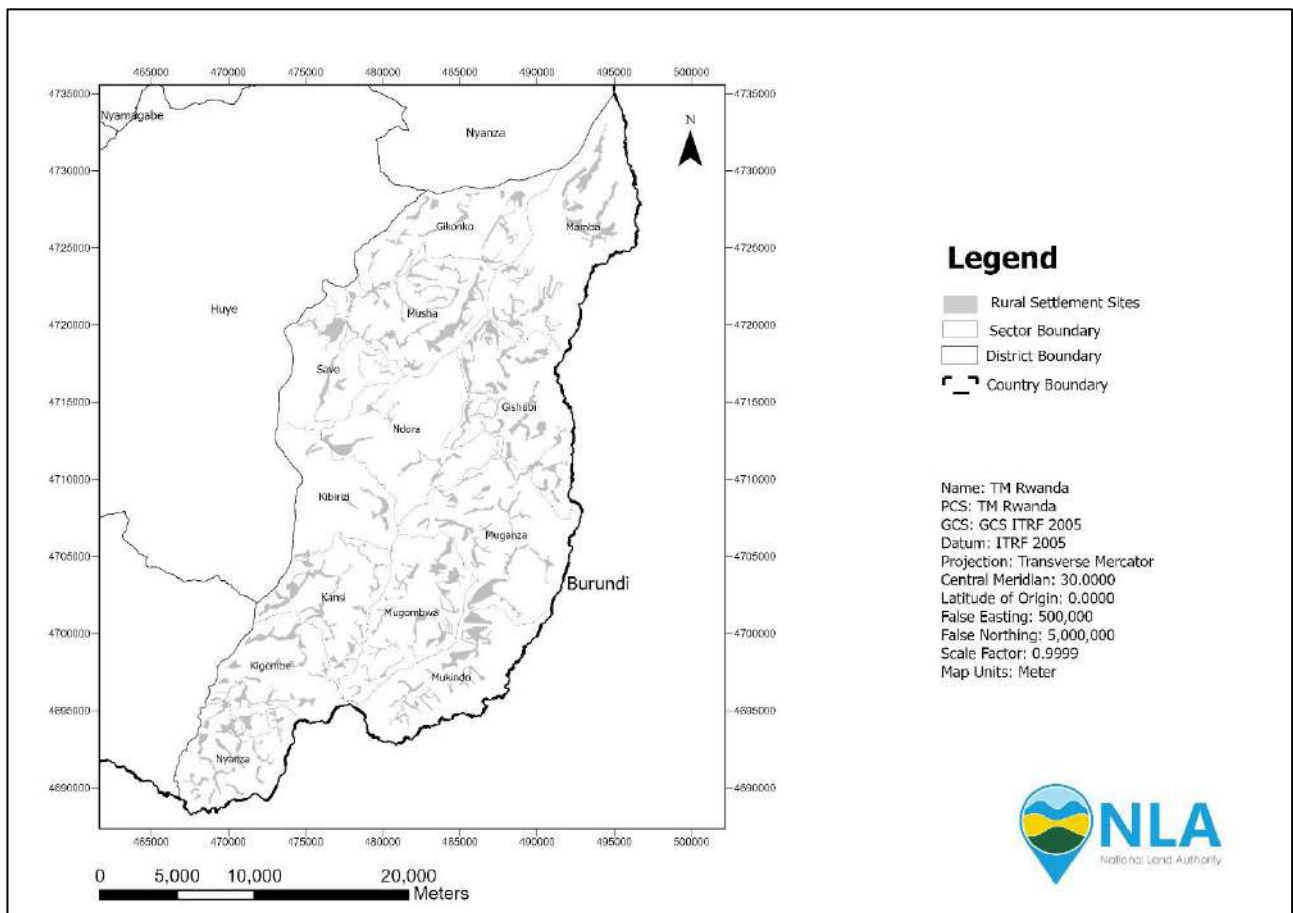
The gross land size per household is 0.46 Ha, Including the house and farm, however NLUDMP 2020-2050 proposes that this land distribution among farmers should change by 2050 where Land allocation for Agriculture is limited to 1,243,300 Ha. The subdivision of this area among 6,6M rural inhabitants or 1.650M households shows an increase from the current size to 65%. From 0.46 ha to 0.76 Ha per household. However, the geographical distribution of the rural population will change significantly. The assumption is that it will distribute proportionally to the future agricultural lands in the LUCA's: LUCA A population will grow by 41% due to the availability of prime lands. LUCA B remains static, and the massive change is in LUCA C, where the population decreases by more than a million, to 17.6% of its current population.

District rural settlement sites consolidation

In terms of advancing urbanization and grouping rural settlement concepts, the Gisagara rural settlement development will be in line with Vision 2050 and the National Land Use and Development Master Plan 2050. Consultation sessions and collaborative field visits were held from the district level to the cell level in each sector during the development of Gisagara DLUP in order to identify priorities for grouped rural settlements to be included in Gisagara DLUP. In order to choose possible rural settlement sites in accordance with the National Land Use and Development Master Plan, the following indicators have been provided throughout all sectors.

The National Land Use and Development Master Plan 2050 proposed 145 sites covering 60 SqKm for rural settlement sites. After joining only 134 sites covering 65 Sq Km emerged in collaboration with Gisagara District staff, NLA staff agreed to restructure and maintain and reshape for further development while complying in line with NLUDMP 2020-2050.

The map below shows the number of proposed rural settlement sites in Gisagara District that will be used for rural settlement purposes alone, with any settlement outside of these locations severely forbidden.



Map 10-Map indicating spatial distribution of rural settlement sites in Gisagara District

Item	Number	Covered area (Sqkm)	Change (%)	Observation
Rural settlement sites provided by NLUDMP 2020-2050	145	60	• Number: - 8% • Area: +8%	The Area and Number of rural and rurban settlements provided in the DLUP complies with NLUDMP 2020-2050 directives.
Final Rural settlement sites after revision of the DLUP.	134	65		
Rurban Centers provided by NLUDMP 2020-2050	4	16.9	• Number: +0% • Area: +1%	
Rurban Centers after revision of the DLUP.	4	17.01		

Table 5: Rural and rurban settlements compliance with NUDMP 2020-2050

4.2.3 Housing

4.2.3.1 Existing situation of housing and orientation of NLUDMP 2020-2050

An assessment of the current and future Housing stock was conducted: The country has today about

2.8M housing units and needs 5.5 M (150,000 dwelling units to be constructed annually) to cater for 22.1M by 2050. Start by replacing and upgrading existing informal settlements and densifying existing cities and centers before using the new land.

The target in the housing sector is a steady annual increase of building on one hand and access to housing mortgages on the other hand. A second target is to develop new local construction materials and housing typologies. The achievement of these targets will be the backbone for the roll-out of affordable and decent housing countrywide.

The NLUDMP 2020-2050 proposes that given the future demographic trends and the high housing needs that requires a large housing stock and space, it is strongly recommended to develop in vertical housing infrastructure in urban and rural areas in the form of multi-family apartments and socio-economic infrastructure (industries, schools, healthcare facilities, public administration, religious buildings, etc.). The incremental development of the building is encouraged. At each stage of construction, the building must be considered strictly as a finished product.

The NLUDMP 2020-2050 recommends considering mixed-use housing urban development in which a real estate in a city or suburb can blend different functions such as residential, commercial, cultural, institutional, etc. into one block. These functions should be well integrated physically and functionally. Flexibility regarding type of housing shall be recognized (for example single units, semi-detached, low houses and apartment blocks). Mixed-income approach is also strongly proposed by NLUDMP 2020-2050 whereby low, medium and high-income earners should be well integrated physically and functionally. Flexibility regarding type of housing shall be recognized (for example single units, semi-detached, low houses and apartment blocks).

Urban Housing Types 2050							
	Level	Max Capacity per building	Diagram	Lot Ha	DU/Ha NET	Efficiency	DU/Ha Gross
A+	1	1-2		0.05	40	60%	24
A	2	2-4		0.05	80	50%	40
B	3-4	5-12		0.1	120	40%	48
C	5-9	36		0.2	180	35%	63
D	10-22	90		0.3	300	30%	90

Table 6: General housing typologies according to NLUDMP 2020-2050

4.2.3.2 Planned perspectives of Housing in Gisagara District (2035, 2050)

Portion of existing low-density housing that will be converted into higher - density housing. Housing

will occupy a total of 69 km² in the district (services will require a total of 35-41 km² depending on how service level areas are calculated). A total of 97,329 dwelling units are required for the existing and future population. The population will be distributed in different zones in order to achieve proposed density as follows:

A+ units	7,219	13,125
A	7,219	13,125
B	5,156	9,375
C	1,031	1,875
D	0	0
Total number of DU	20,625	37,500

Table 7: Proposed housing units in Gisagara District

4.2.3.3 Proposed housing in rural settlements 2023-2050

The 35% of all houses in Gisagara District will be A+, whereas A+ is the most common type of detached or semi-detached houses (apartments), one level high, on a lot of 500 m² for two households totalizing **24 apartments per hectare** as indicated below.

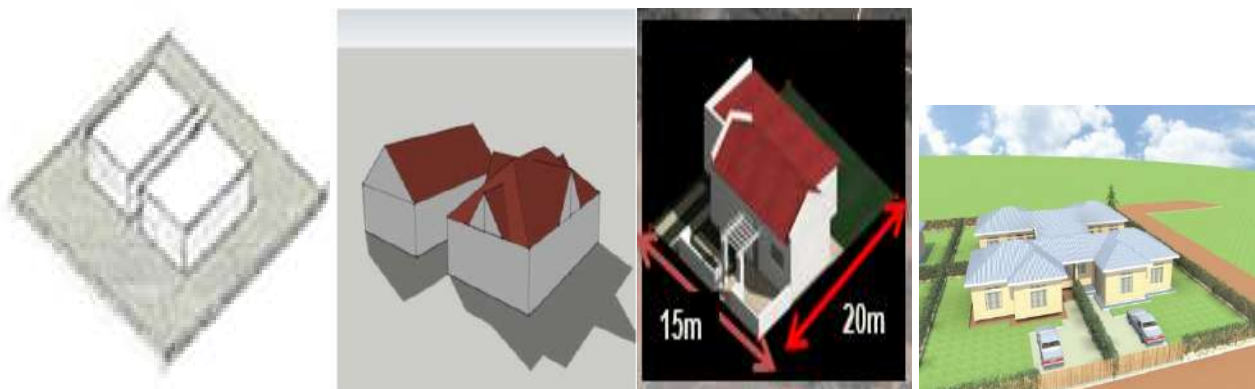


Figure 6-Proposed housing units in category A+

Housing categories consisting of detached or semi-detached houses as indicated in the above design will be the most common housing especially in rural settlements and rurbans and such housing should promote the densification component of dwelling. 50% of housing will be in A+ category in rural settlements and 50% of housing categories will be in A.

Housing construction in rural settlements guidelines:

- No newer house will be allowed outside the planned settlement area

- The plot size should be revised and joint-houses should be encouraged in rural settlements
- Housing cooperatives should be encouraged for commercial and apartment buildings
- Buildings should be designed in a more sustainable, ecological and energy-saving way, not forgetting tradition, climate and environment using local and environmentally friendly materials
- Rain water harvesting should be introduced at household level and water should be conserved and recycled
- Market incentive systems should be introduced in order to promote private contracting firms/developers (PSF) and a more efficient industry.

4.2.3.4 Proposed Urban Design in rurbands and District Town of Gisagara District

About 35% of all houses will be **A**, whereas **A** category is based on the same lot of 500 m² but consolidates four apartments in 2 stories and a density of **40 apartments per Hectare**. Both **A** and **A+** can be fitted to suit various topographies of Gisagara District which is highly dominated by plateau and hilly settings.



Figure 7-Proposed housing units in category A

Categories **A+** and **A** are recommended in rurband settlements whereas 52% of all houses will be in **A+**, 45% of all houses will be **A**, 2% of all houses will be in **B** and 1% of all houses will be in **C**.

Gisagara District Town will have all 25% houses in **B**, this category **B** represents a typical multifamily house of up to 12 apartments in 3-4 floors on a lot of 1000 m² with a density of **48 apartments per Hectare**. As the town of Gisagara District will continue to grow and expand, **B** and **C** categorization of housing will be constructed to settle a big number of the population in apartments while efficiently utilizing the scarce land.



Figure 8-Proposed housing units in category B

Category C includes 5% of planned housing to be constructed in the district, this category represents a typical multifamily high rise building up to 9 floors on a lot of 2000 m² with a density of **63 apartments per Hectare**. Such housing in category C as indicated in the block below are proposed mainly in Gisagara town will not only be purposely for multifamily high rising buildings, but also commercial, hotel, office, and other purposes. Mixed use and mixed incomes are highly recommended in such houses.

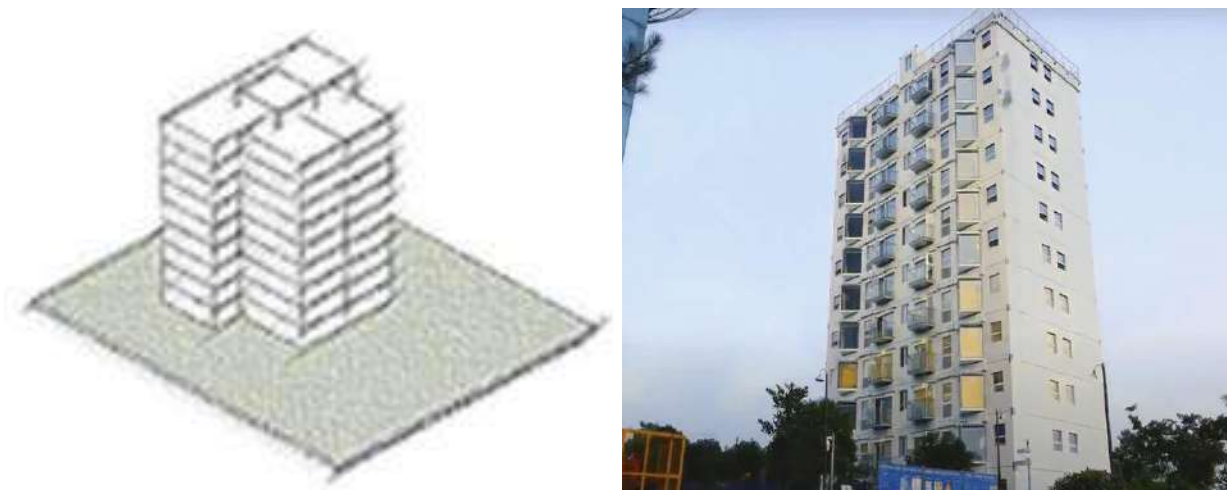


Figure 9-Proposed housing units in category C

Category B and C are mainly recommended in the rural and District main Urban area in order to ensure achieving densification of dwelling emphasizing multi-family high rise story apartments, commercial and office buildings.

Gisagara District has a project of building a new District office with an inviting and ‘transparent’ architectural design and a multi-purpose community hall near the current District Office. A pedestrian friendly shopping area with a marketplace should be centrally located in Ndora Centre.



4.3 Transportation

Rwanda has a very dense road network coverage, which explains the scattered nature of its human habitat, and this is very expensive to the government in terms of service provision. The existing road network of 37,896 km (44,669Km including paths) has been analyzed, and a new road hierarchy is proposed to achieve the desired vision 2050 as demonstrated by the map below.

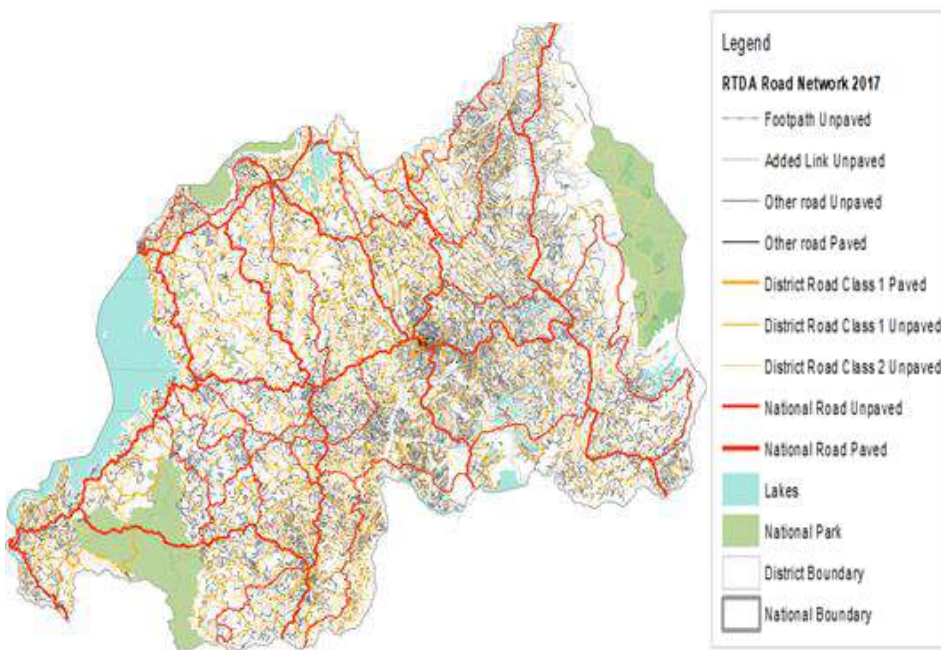


Figure 10-Map indicating the country dense road network coverage.

The spatial expression of this network density is a road grid of 1.28 km, and an average distance from any given point to a highway is 0.64 km. The road density demonstrates that Rwanda has good road network coverage. If the network were all-season roads, Rwanda would have uninterrupted accessibility and mobility.

4.3.1 Existing situation of transportation system in Gisagara District

Gisagara District has a dense road network coverage, which explains the scattered nature of its human habitants, and this is very expensive to the district in terms of service provision. The existing road network for Gisagara District is 1,281.9 km including paths.

The road network is subdivided into four categories, namely:

1. National Roads: 66.85 km
2. District Road Class 1: 105.5 km
3. District Road class 2: 380.5 km
4. Other roads: 729 km

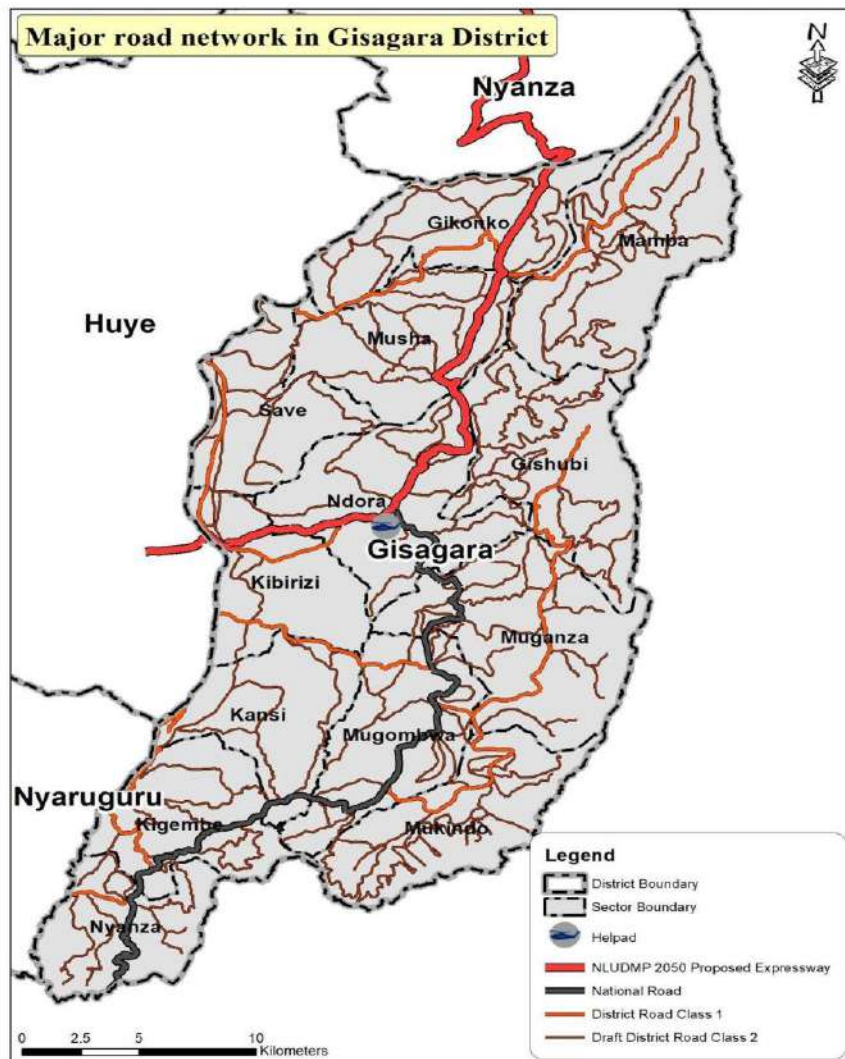


Figure 11-Existing categories of road network in Gisagara District

Description of land transportation network in Gisagara District

Based on the review of existing roads the following deficiencies and gaps were identified:

- Insufficient and irregular carriageway widths;
- Existing gravel road with poor riding quality;
- Existing pavement (mostly earthen) condition is poor to fair and is structurally inadequate;
- Poor horizontal geometry at many locations;
- Poor vertical geometry at many locations;
- Insufficient and improper cross slope;
- Traffic congestion and insufficient turning radius at intersection locations;
- Absence of cross drainage structures causing discontinuity of the road and causing inconvenience to pedestrians. It is also accident prone zones;

- Absence of proper cross drainage arrangements to facilitate storm water drainage along cross road;
- Absence of proper cross drainage arrangements for continuation of roadside drains;
- Encroachment of road formation (mainly the portion just by the side of carriageway) by local people for household purposes almost at all built-up areas;
- Absence of proper roadside drains;
- Absence of proper road signs, pavement markings, safety features and street lighting on the main road from Huye City;

Transportation improvement: Regular public transport with electrical powered vehicles shall be provided for the inhabitants as provided in new transportation policy. A bus terminal for regional public transportation is zoned for at a conflict free location close to the market and District office to facilitate the accessibility of public facilities.

Required land for Parking

Off-street parking is provided to ensure minimum disturbance to local residents and for road safety. In local neighborhoods with small communities, parking for vehicles off the site may lead to cost savings and save on-site space.

The Rwanda National Land Use Planning Guidelines of 2017 stipulates that parking areas should encompass places at 25 SqM per housing unit.

For new residential development, provide land for open space and recreation purposes and/or circulation space by ensuring that land is surrendered during subdivision to provide the open space. Provide adequate public parking and related support facilities (such as rest rooms, showers and security arrangements among others) will be considered during the elaboration of detailed physical plans both in rural and urban settlements.

4.3.2 Planning perspectives, transportation network for Gisagara District

The development of road network infrastructures will highly contribute to the development of Gisagara District. The interconnection of roads between urban, rural and rural settlement sites not only easing the movement of goods and services but also promoting trade and easy access on agricultural production and market.

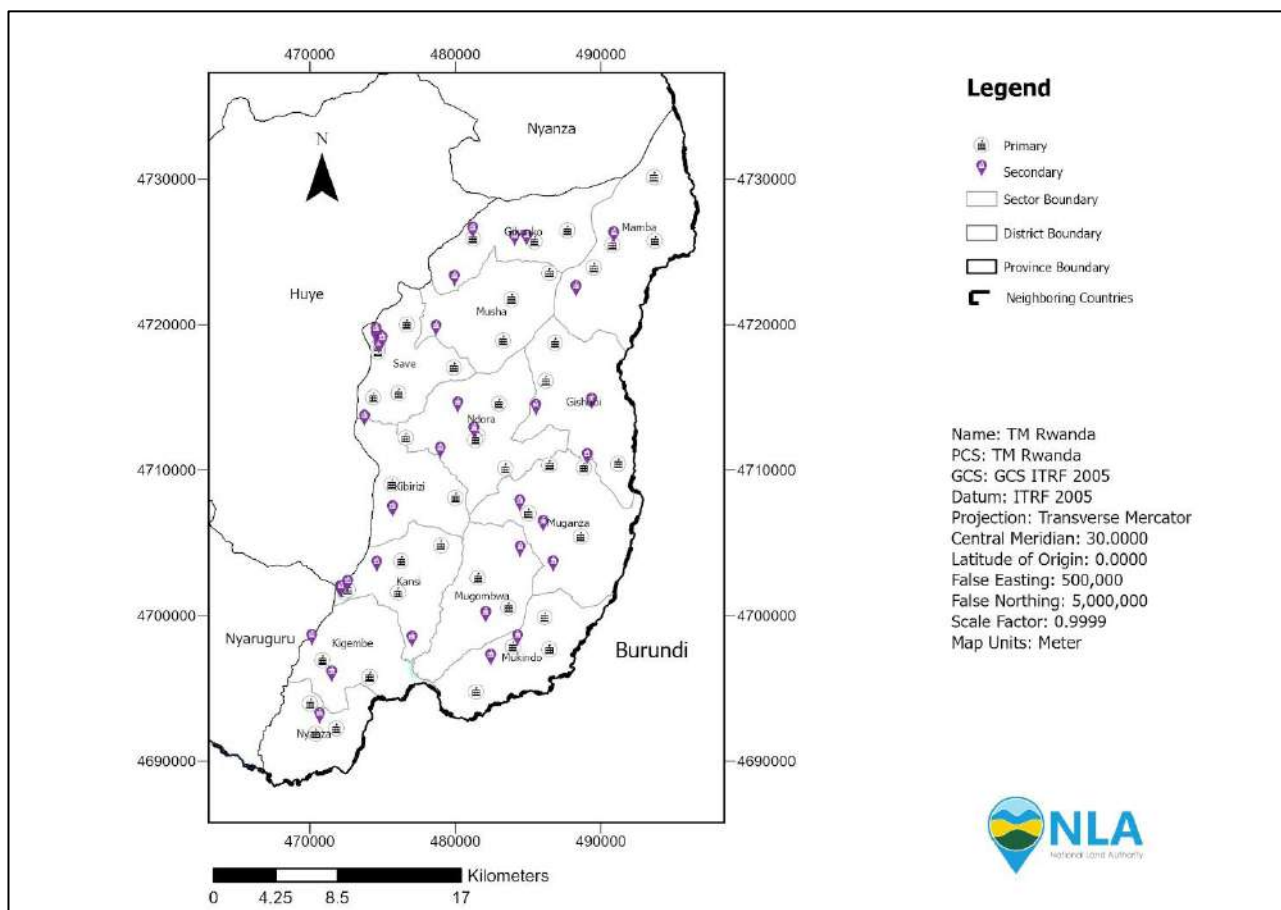
4.4 Public facilities services

4.4.1 Existing situation of educational services/facilities

An effective school facility is responsive to the changing programs of educational delivery, and at a minimum should provide a physical environment that is comfortable, safe, secure, accessible, well illuminated, well ventilated, and aesthetically pleasing. The school facility consists of not only the physical structure and the variety of building systems, such as mechanical, plumbing, electrical and power, telecommunications, security, and fire suppression systems. The facility also includes furnishings, materials and supplies, equipment, and information technology, as well as various aspects of the building grounds, namely, athletic fields, playgrounds, areas for outdoor learning, and vehicular access and parking.

Currently, tangible progress has been made to address education qualification levels in the district. In collaboration with the private sector and development partners mainly the World Bank, the district has constructed 598 classrooms and 60 new schools.

TVETS colleges in 2017. Additionally, there is one higher learning institution in Gisagara District; Catholic University of Rwanda (CUR) However, education provision still faces serious challenges across the district, including overcrowded classrooms and poor infrastructure in some schools. For example 31.25% of the schools lack electricity, which hampers the use of ICT for teaching and learning.



Map 11-Map indicating existing educational facilities in Gisagara District

Gisagara District education sector is organized from Nursery Schools, Primary Schools, Secondary Schools, Higher Education Institutions, Professional and Vocational Schools.

Gisagara/Year	2017	2018	2019	2020	2021
Pre-Nursery centers	5	8	8	889	889
Pre-Nursery caregivers	414	363	363	2218	2118
Early childhood education					
Nursery schools	41	45	45	73	73
Nursery classrooms	56	65	65	134	134
Nursery pupils	3358	3755	40312	61316	61316
Nursery staff	73	74	95	112	112
Primary education					
Primary schools	64	64	71	95	95
Primary classrooms	918	943	1011	1478	1478

Primary pupils' enrolment	83637	81731	82314	86403	86404
Primary staff	1226	1270	1420	2170	2170
Secondary education					
Secondary schools	39	43	51	64	64
Secondary classrooms	454	492	492	522	522
Secondary students' enrolment	14958	17146	17146	18414	18414
Secondary staff	761	821	821	883	883
Technical and vocational education and training					
Tvet schools		7	7	8	8
Tvet classrooms		57	57	89	89
TVET staff		105	105	218	218
Tertiary education					
Number of Campuses		1	1	1	1
Number of students		948	948	948	948
Adult literacy education					
Adult literacy centres	86	77	77	111	111
Adult literacy learners	6139	3296	3296	3237	3237
Adult literacy instructors	118	99	99	130	130

Table 8: Existing schools in Gisagara District

Category	Number
University	1
Secondary schools	50
TVET	8
Primary schools	95

Table 9: Categorization of schools in Gisagara District

The 2050 perceptions ensure access to good quality of education in the initial years of life through increased investments in early childhood development to achieve universal pre-primary enrolment rates by 2050. Access to quality primary education will be confirmed too. All classes will reach middle-

income standards for pupil/classroom and pupil/teacher ratios by 2035. Teachers will be empowered and equipped to deliver an education that provides all Rwandans with the capabilities to improve their skills and productivity continually (NLUDMP 2020-2050).

According to NLUDMP 2020-2050, the following standards and parameters have been established for nursery and primary schools:

Nursery and Primary Education by 2050:

Average class size: 35 pupils/class

Average school size: 840 pupils

Required size for a nursery school: 0.5Ha

Required size for a primary school: 1Ha

The following standards and parameters have been established for Secondary, Vocational and technical Education by 2050, which will support the reform of quality and quantity.

Enrolment rate will be 90%

Average class size: 35 pupils/class

Average school size: 840 pupils

Required size for a secondary school: 1.5Ha

Required size for vocational and technical school: 2Ha

The percentage of children of school age in Gisagara District will be used as a standard at the district level. Thus, 8% are in pre-primary, 16% in primary and 16% in secondary school in addition with existing number of classrooms include 275 in Nursery, 1653 in primary and 840 Secondary level. These percentages will be applied to the total population year by year, and considering the standard of 840 children per school (NLUDMP 2020-2050), the calculation of schools needed to accommodate all school-age children to implement the Education for all policy.

Determination of number of schools needed

The number of schools is determined by the following formula

$$N_s = \frac{P_1 * S(6-11)}{Q_s} \quad \text{Where,}$$

N_s : Number of Schools are needed

$S(6-11)$: Percentage of the population who aged 6-11 years group/depends age group

Q_s = Standard number of students for a level school (ECD, Nursery, Primary, Secondary, Tertiary)

P_1 : Present total Population

Determination of number of Nursery schools needed

Description	2022	2025	2030	2035	2040	2045	2050
Total Population	397,051	420,340	462,231	508,296	558,953	614,657	676,000
Percentage of Babies in Nursery	8%	8%	8%	8%	8%	8%	8%
Nursery (3-5)	31260	33627	36978	40664	44716	49173	54080
Children / School[NLUDMP 2020-2050]	840	840	840	840	840	840	840
Planned school	38	40	44	48	53	59	64
Planned Classrooms	893	961	1057	1162	1278	1405	1545
Required Classrooms	618	686	782	887	1003	1130	1270
Required Schools	26	29	33	37	42	47	53

Source: NLUDMP 2020-2050 Adapted by NLA staff, 2023

In view of population growth increases in Gisagara District will need a new schools which will be necessary to help every child to attend Nursery school and determination clear number of children who will join primary school.

Determination of number of Primary schools needed.

Description	2022	2025	2030	2035	2040	2045	2050
Total Population	397,051	420,340	462,231	508,296	558,953	614,657	676,000
Percentage of Children in Primary	16%	16%	16%	16%	16%	16%	16%
Primary (6-11)	62,520	67,254	73,957	81,327	89,432	98,345	108,160
Children / School[NLUDMP 2020-2050]	840	840	840	840	840	840	840
Planned school	76	80	88	97	106	117	129
Planned Classrooms	1786	1922	2113	2324	2555	2810	3090
Required Classrooms	133	269	460	671	902	1157	1437
Required Schools	6	11	19	28	38	48	60

Source: NLUDMP 2020-2050 Adapted by NLA staff, 2023

This table designates the inadequate of schools in primary level from 2022 to 2050 in order to satisfy the standards of 35 children per classroom and 840 children per school, i.e. 24 classrooms per school (NLUDMP 2020-2050).

Determination of number of Secondary schools needed

Description	2022	2025	2030	2035	2040	2045	2050
Total Population	397,051	420,340	462,231	508,296	558,953	614,657	676,000
Percentage of Children in Secondary	16%	16%	16%	16%	16%	16%	16%

Secondary(12-17)	62,520	67,254	73,957	81,327	89,432	98,345	108,160
Children / School[NLUDMP 2020-2050]	840	840	840	840	840	840	840
Planned school	76	80	88	97	106	117	129
Planned Classrooms	1786	1922	2113	2324	2555	2810	3090
Required Classrooms	946	1082	1273	1484	1715	1970	2250
Required Schools	39	45	53	62	71	82	94
TVETs Schools(60%)	24	27	32	37	43	49	56
General Education(40%)	15	18	21	25	28	33	38

Source: NLUDMP 2020-2050 Adapted by NLA staff,2023

Based on the projected information and schools meet for the NLUDMP 2020-2050 standards, means that 35 children per class and 840 children per school, there is need to build more schools to reduce the overcrowding of pupils in classroom. some programs may need to be introduced into the secondary education curricula to accommodate land use planning. In particular, given that 60% of children will have to attend technical and vocational education, it is imperative to take this into account in planning, in order to provide employment opportunities for young people.

4.4.2 Existing situation of healthcare services /Facilities

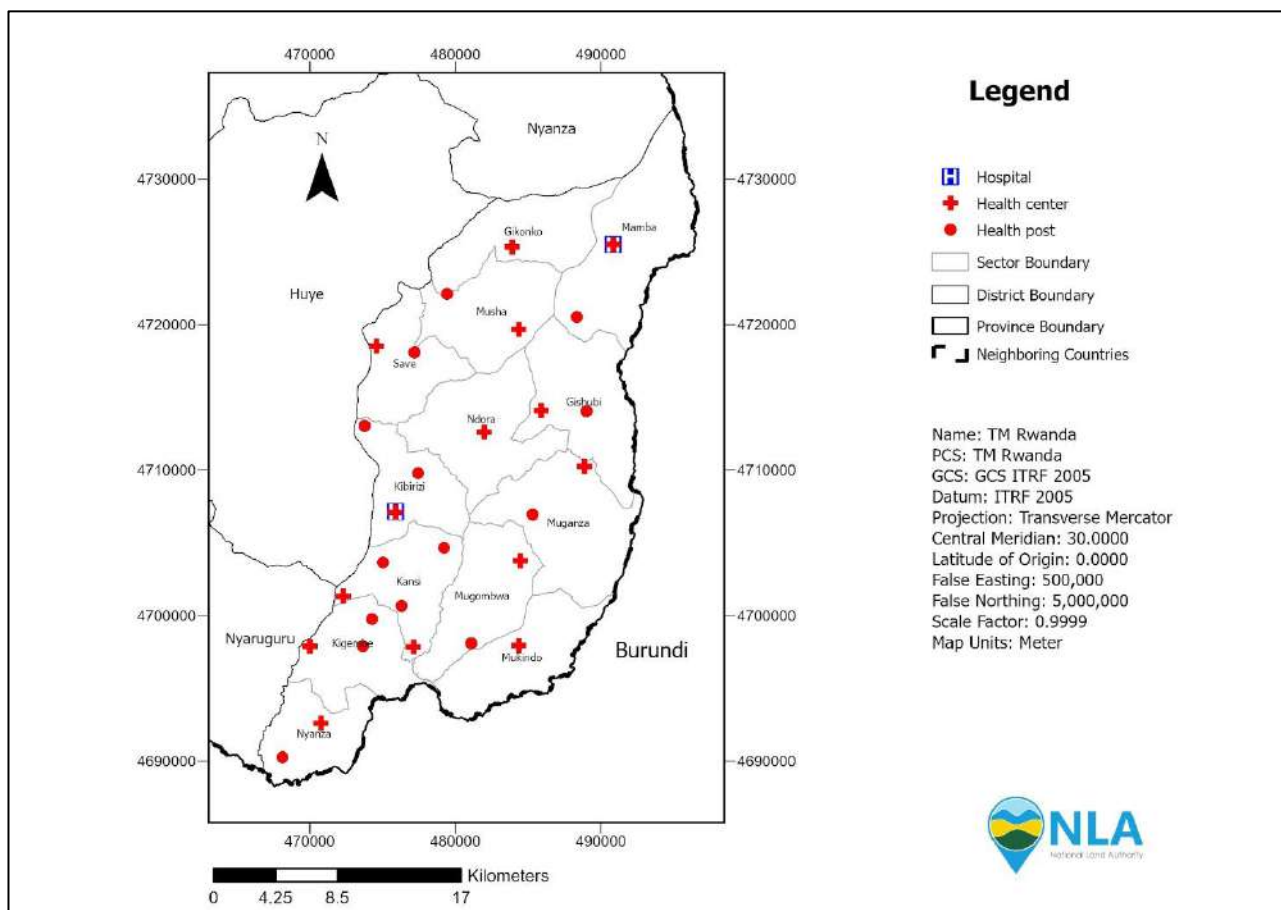
Health is considered as a key essential component of overall social and economic development. The quality of life in human settlements depends on the state of health care which in turn is linked with availability of safe water, waste disposal, transportation, housing, sanitation, and food.

4.4.3 Planning perspectives and Land requirements healthcare services development in 2050

According to National Land uses and Development Master Plan, the following health standards structures have been proposed:

- Community health will be organized in clustered rural settlements sites.
- Health posts (0,06ha each): 3000 for future proposed imidugudu (496 in 2019)
- Health centers (0.2Ha each): 2 / sector =832 (499 in 2019)
- District hospitals (2Ha each): 2 / District = 60 (36 in 2019)
- Provincial Hospital (3Ha each): 2/per province=8 (4 in 2019)
- Referral hospitals (4Ha): 10

In implementing the Gisagara DLUP, it is mandatory to establish any new health facility within urban and rural settlement boundaries, and vertical construction of buildings should be mandatory. All healthcare facilities will be built in areas where they have been designated for, especially in areas proposed for settlements, rurbands and District main town with the pool of other supporting infrastructures.



Map 12-Map showing existing situation for healthcare services in Gisagara District

Healthcare facilities			
	Category	Numbers	Status 2021
1	Hospitals	2	Good state of repair
2	Health Centers	15	Good state of repair
3	Health Posts	47	Good state of repair

Table 10: Existing healthcare facilities in Gisagara District

4.5 Public utilities

Energy stands at the core of Rwanda's economic aspirations and development strategies. It serves as a cornerstone supporting various sectors, including housing and urbanization, manufacturing, agro-processing, mining, tourism, and information technology. Consequently, a well-functioning and efficient energy sector play a pivotal role in realizing the nation's overarching objectives.

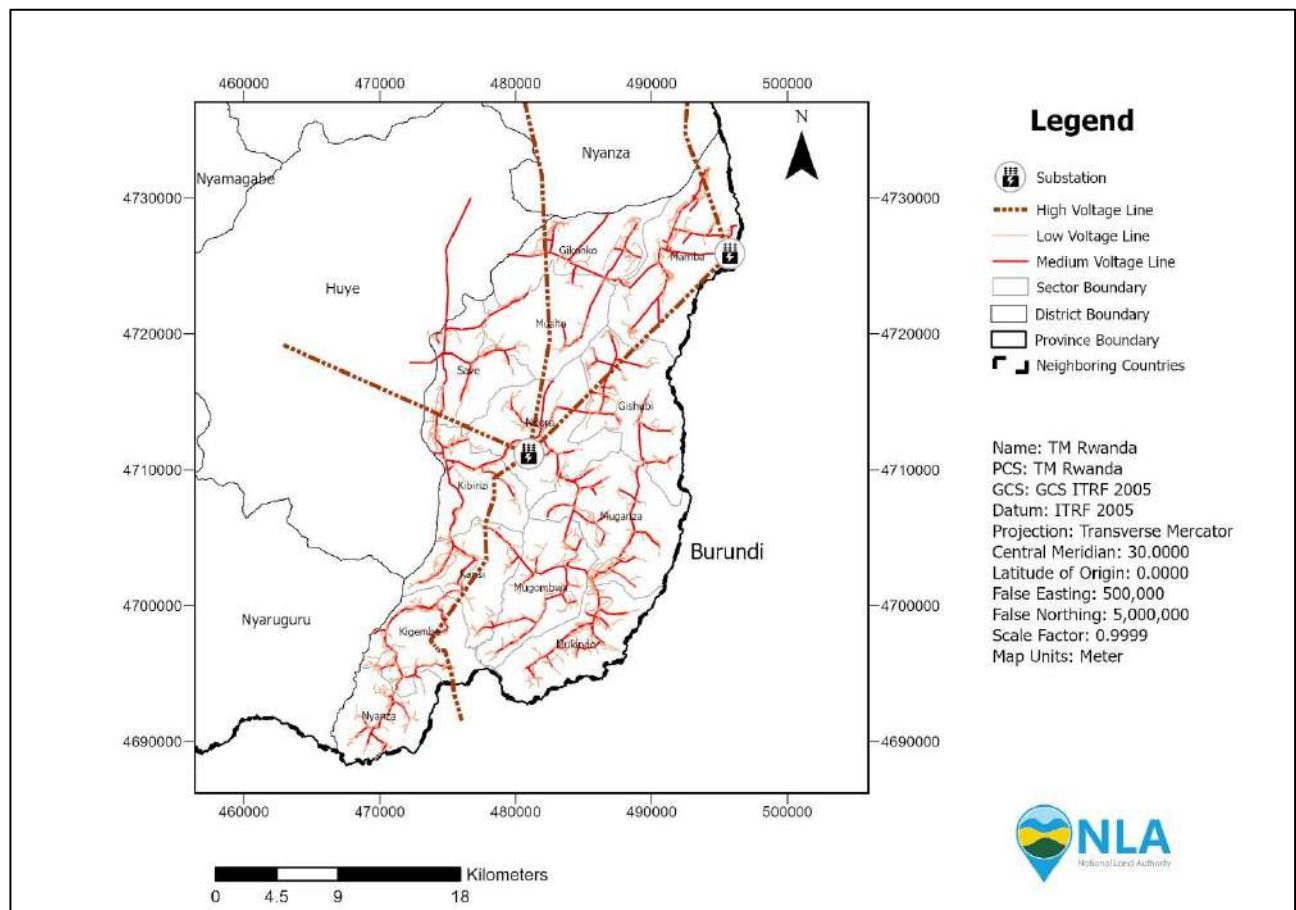
Rwanda's energy sector comprises three primary sub-sectors: power, hydrocarbon, and new and renewable energy sources. Notably, renewable energy sources such as biomass, solar, peat, wind, geothermal, and hydropower are integral components. Among these, biomass stands out as the most prevalent, exerting significant influence over both the demand and supply aspects of the Rwandan

economy.

4.5.1 Power supply

- **Existing situation of electricity connectivity and other sources of energy**

According to population and housing census 2022, in Gisagara District 54.5% of households that have access to electricity. 66.7% in urban areas and 50.5% in rural areas. Only 37% of private households rely on electricity from REG as their primary source of energy for lighting, contrasting with 47% nationally. This underscores the prevalent dependence on firewood for cooking among the majority of Gisagara residents, standing at 83.6%, in comparison to 76.1% nationwide. Additionally, charcoal is utilized by a minimal fraction of Gisagara's population (7.1%) as a cooking fuel source, significantly lower than the 17.3% observed at the national level.



Map 13: Gisagara transmission and distribution network

- **Planning perspectives**

Energy plays a pivotal role in driving economic growth by catalyzing the expansion of small and medium-sized enterprises (SMEs) and mitigating the operational costs associated with conducting business.

In Gisagara District, approximately 50.9% of households currently lack access to electricity, whether

through the grid or off-grid systems. This significant portion of the population faces barriers to development and growth, as electricity serves as a fundamental catalyst for modern technology adoption and socio-economic advancement.

According to Vision 2050, achieving a sustainable energy supply and demand requires universal access to electricity for all households by 2035, whether through grid connectivity or off-grid solutions. This ambitious goal underscores the importance of bridging the electricity gap to foster inclusive development and improve the quality of life for residents in Gisagara District.

The projection of electricity accessibility is presented in the table below:

	HHs 2022	HHs 2035	HHs 2050
Households	101,145	127,082	169,000
Urban Households	3,442	48,950	89,000
Rural Households	97,703	78,132	80,000
Access to electricity (%)	54.5	100	100

Table 11: Electricity demand projection

To achieve this transformation (*bridging the electricity gap*), Gisagara District must enhance energy production and diversify its sources by investing in alternative energy solutions. It is crucial to reduce dependence on biomass by maximizing the use of gas and other viable alternatives. By 2035, the focus will be on increasing electrification rates and expanding energy generation capacity across all sectors, including rural areas. Furthermore, there will be a dedicated effort to ensure equitable distribution of energy access across all socioeconomic groups.

4.5.2 Water supply

- *Existing situation*

The provision of potable water in Gisagara District primarily relies on WASAC, a state-owned public utility responsible for water production, transmission, and distribution in Rwanda.

According to the 2022 population and housing census, 88.4% of private households in Gisagara District have access to improved drinking water. This access varies between urban (96.7%) and rural (87.8%) areas. The predominant sources of drinking water for most households include public taps outside the compound (42.3%) and protected springs/wells (38%). Only a small fraction (5.3%) has piped water within their compounds, contrasting with the national average of 11.5%.

Data from the EICV 5 (2017) reveals that 17.5% of households in Gisagara spend between 30-59 minutes reaching their primary water source. However, the World Health Organization (WHO, 2022) recommends that water sources ideally be within 1,000 meters or approximately a 10-minute walk from homes or communities. This proximity is crucial for reducing collection time and distance, particularly for vulnerable populations such as women, children, and the elderly.

- *Planning perspective*

As per Water Supply Masterplan of 2021, the ongoing economic development within Gisagara District is anticipated to enhance the living standards of households. Consequently, there will be a rise in unit water demand, projected to reach 70 liters per capita per day (l/c/d) in urban areas and 30 l/c/d in rural areas by the year 2050. This forecast underscores the necessity for significant improvements within the district.

According to the water statistics report of 2022 by RURA, water consumption in Gisagara District stood at 810 cubic meters per day (m³/day) in 2022. By 2050, this figure is expected to surge to 21,275m³/day, with an intermediate projection of 19,389m³/day by 2035. These estimates are crucial as they signify a crucial milestone: achieving a 100% water supply coverage for all residents of Gisagara District

The distribution of water consumption between urban and rural areas is presented in the table below:

	Population 2022	Population 2035	Population 2050
District Population	397,051	508,327	676,000
Urban Population	13,513	195,800	356,000
Rural Population	383,538	312,527	320,000
Urban Water demand 70l/p/d	51	6,044	10,989
Rural Water demand 30l/p/d	759	13,345	10,286
Total (m ³ /day)	810	19,389	21,275

Table 12: Water consumption between urban and rural areas

Lack of access to clean water has been cited as the main complaint against most of rural settlement sites established in the past in Gisagara District. Priority must therefore be given to water supply in the villages and other existing rural centres. Water supply networks established in the framework of scattered settlement system this time must be readapted to the planned settlements.

4.6 Agriculture

Agriculture plays a significant role in Rwanda's national economy and planning. One of the pillars of Rwanda's VISION 2050 is that agriculture in Rwanda will be market-led and high-tech, driven by professional farmers with large farms on irrigable lands. The task for NLUDMP 2020-2050 is to provide the spatial infrastructure needed to realize this goal.

Agriculture in Rwanda plays a dual role, in generating income and foreign currency through export of agricultural products (mainly coffee and tea) and in generating food for the local population.

Given the size of the country and population, a main question to be asked is whether it is possible to feed the local population (today and in 30 years from now) given the limited arable land. The food needs of the growing population of Rwanda were analyzed based on three scenarios regarding agricultural yields' development, to calculate the size of the agricultural land needed for protection within the NLUDMP 2020-2050. In a business-as-usual situation, given the current crops' yields – the farmland in Rwanda will not be sufficient to feed 22.1 million people in 2050; because this situation requires large agricultural land surface almost 4 times the current size; which is not possible.

In a realistic scenario where, within 20 years, 80% of farmers are commercial and the consumption of livestock products rises to 10% of the diet – the farmland in Rwanda is still not sufficient to provide food for a population of 22.1 million people, but for less than half of them. Even if the yields in Rwanda improve to the best practice, the existing farmlands cannot provide food for 22.1 million people due to the topography, the climate and competition over land.

The recommendation is therefore to protect the current agricultural land of 10,949 Km² (41.6%) meaning that for the period of 3 decades to achieve vision 2050, only 12,433 Km² (47.2%) of agriculture land to be reserved to satisfy future generations and to be protected and efficiently utilized and enlarge it as much as possible, given the demand for other land uses and possibly up to 15,000 km² to have room for sustainable food security.

The farmers should be no more than 30% of the projected population with less than 10% of agriculture contribution to the GDP and this does not mean reducing the size and value of farmlands, but rather increasing the economic growth of other sectors like Industry and services. The average Land per farmer ratio should be around 1.5 hectares in a consolidated form.

In the Southern Districts, Land Use Category A (the LUCA A) areas proposed in NLUDMP 2020-2050, agriculture should be developed further, so that cultivated land grows in size, and yields improve dramatically. In 2050, the agricultural land / farm (household) ratio should be around 0.75 hectares per

farm (household). About 8.4% of the workforce will be employed in commercial agriculture. It was recommended to eliminate gradually - consolidate/agglomerate in few settlement sites to decongest agriculture zones and thus allow the use of technology in agriculture.

Based on all these recommendations, in 2050 Rwanda will fulfill its vision of a nation that enjoys food security, nutritional health and sustainable agricultural growth from a productive, green and market-led agricultural sector.

4.6.1 Existing situation of agriculture in Gisagara District

The Gisagara District household's economy is driven by agriculture. 84.6% of the active population is in agriculture (24.5% being farm wage workers and 60.1% being independent farmers). Only 15.4% are non-farm wage workers with 10.7% with non-farm wages, 3.9% independent non farmers and 0.8% with unpaid non-farm wages (NSIR, ECIV5). District has a good type of soil for growing different crops such as maize, rice, cassava, beans, coffee, banana and different fruits like avocado, macadamia, and pineapples. This is important for increasing agriculture production for food security and availing raw materials to agro-processing industries and hence sustainably to increase jobs in all sectors. The following are some main indicators in agriculture development:

Indicator	District Status	National Status
Percentage of land under consolidation in (in ha: 2017/18)	37,200 (11.1%)	15.9%
Percentage of land protected against soil erosion	66%	68.5%
Percentage of land under irrigation	5.9% (EICV 5)	6%

Table 13: Indicators of agriculture development in Gisagara District

Within the national program of Land consolidation in the district, the total Land under consolidation has reached 11.1% and only 5.9 percent is under irrigation. However, 66% of the vulnerable land has been protected against soil erosion.

a) Status of Agricultural production in Gisagara District

Based on NST1 objectives regarding the economic transformation pillar, it was planned to increase the agriculture and livestock quality, productivity and production. This principle is decentralized up to all local administrative entities which are generally coordinated by the district for easy and quick implementation.

All combined climatic, physical, and chemical conditions as stipulated in previous sections, in Gisagara District allow to grow different crops which are presented in the following table:

No	Sector	Marshland Name	Area(ha)	Crops cultivated
1	Gikonko, Ntyazo (Nyanza)	Cyili	320	Rice, Vegetables
2	Mamba, Gikonko	Nyiramageni	180	Rice, Vegetables
3	Musha, Ndora	Ngiryi	145	Rice, Vegetables
4	Gikonko, Musha	Mwura - Gatara	110	Rice, vegetables
5	Gishubi, Muganza	Mirayi	150	Rice
6	Ndora, Kibilizi	Kibugazi	108	Maize, Beans
7	Gikonko	Nyakagezi	84	Rice
8	Nyanza, Kigembe	Rumira-Urukingo	85	Rice, Maize
9	Kigembe	Nyakanyeri	75	Rice, Maize
10	Kansi -Kigembe	Akaboti	76	Rice, Maize
11	Mugombwa, Mukindo	Agatare	59	Rice, Maize
12	Mugombwa-Kansi	Kabogobogo	35	Rice, Vegetables
13	Kigembe	Kigaga	50	Rice
14	Save, Musha	Nyabuyogera	109	Maize, Beans
15	Mugombwa, Muganza	Misizi	55	Maize, Beans
16	Kibilizi, Kansi, Kigembe	Migina	200	Maize, Rice
17	Musha-Save	Ruvungirana	27	Maize, beans, soybeans, Vegetables
TOTAL			1868	

Table 14: Marshlands suitable used for rice and vegetables growing in different sectors

Most of these crops (maize, rice, cassava, beans, coffee, and banana) are grown on the hillside. Within the district boundary, on the top, rice is leading as the source of wages to the community. Generally, rice plantations are cultivated in the marshlands of Ginkoko and Mamba sectors.

a) Cash crops.

Gisagara District is an important producer of coffee, one of Districts in the country which produce the coffee.

c) Agricultural land suitability description for Gisagara District

Before talking about Gisagara District agricultural land, it is important to think about a rough description of the agricultural land suitability at country level. Generally, most of the best suitable agricultural land is in the eastern and south-eastern part of Rwanda, where land is relatively flat, and precipitation does not exceed 1,200 mm annually. Agriculture suitability analysis has been conducted countrywide for guiding Districts in Agriculture development. For the national scale, the suitability studies combine 8 crops which are: Maize, Beans, Potato, Soya bean, Cassava, Banana, Coffee, and Tea. The following suitability categories have been established:

- ❖ **S1:** Best suitable
- ❖ **S2:** Suitable
- ❖ **S3:** Low suitable
- ❖ **N1:** Poor suitability
- ❖ **N2:** Not suitable

	Total ha	Maize	Beans	Potato	Tea	Coffee	Banana	Vegetab	Rice
Mountains and major scarps (M)	S1	71.494	71.494	71.494	91.418	99.550		90.823	19.329
	S2				167.971	159.839			
	S3	335.873	335.873	176.034	76.484	76.484		176.034	
Hills and minor scarps (H)	S1				277.700	288.309	218.892	64.185	64.185
	S2	282.318		196.425	165.857	299.973	403.336	282.318	
	S3	596.986		596.986	146.287	94.597		596.986	
Footslope ridges landscape (F)	S1					20.174	20.174	2.789	2.789
	S2	20.174		20.174		10.694	10.694	20.174	
	S3	10.694	30.868	10.694	30.868			10.694	
Dissected plateau landscape (P)	S1		242	242	41.003	41.003	4.668	4.668	4.668
	S2		4.426	4.426		11.246	11.246		
	S3	56.917	52.249	52.249	15.672		41.003	52.249	
Penplain dissected (PD)	S1		564.111	564.111			666.463	666.463	102.352
	S2	666.463	102.352	102.352					
	S3								
Valley Imbo landscape (V)	S1	2.905	2.905	2.905			6.614	6.614	3.709
	S2	3.709	3.709	3.709		2.905			
	S3								

Table 15: Table indicating different parameters and crops suitability at country level.

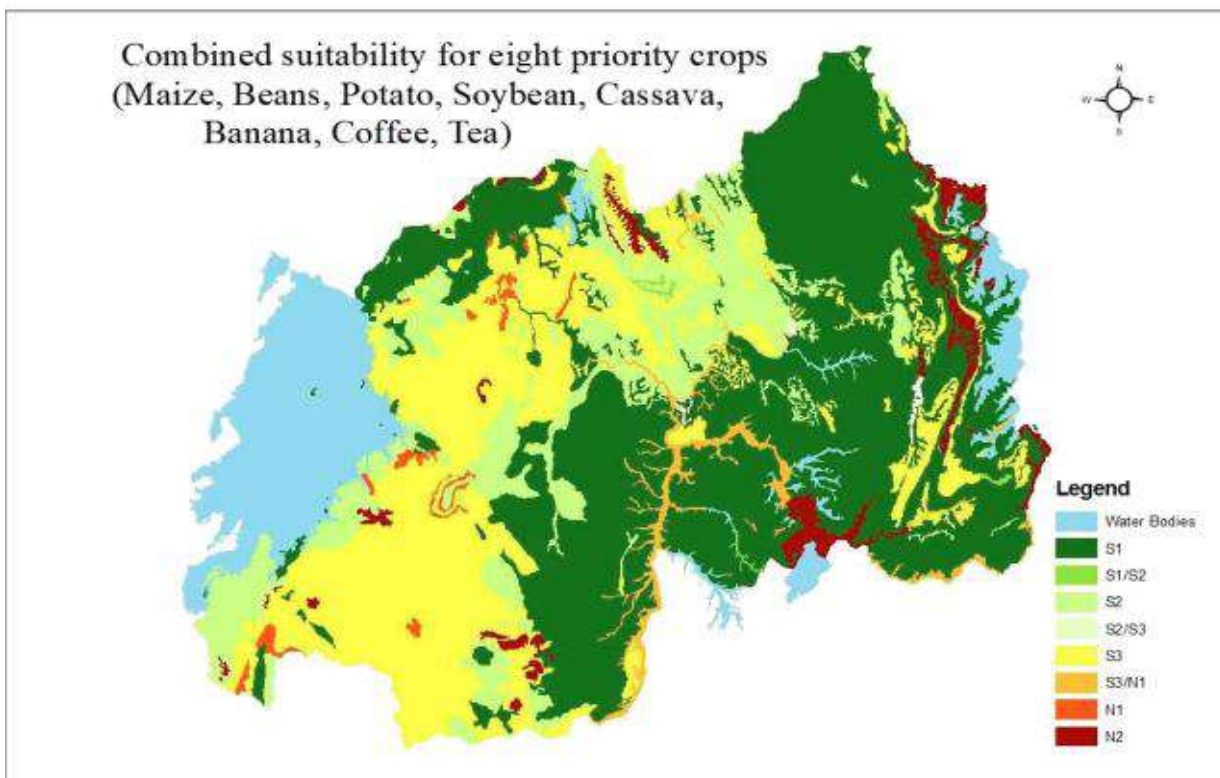


Figure 12-Map indicating different parameters and crops suitability at country level

Gisagara District belongs to the land use category (LUCA) A considered as prime agricultural lands. Although farmers are used to cultivating a variety of crops, the region is most suitable for maize and rice as major cereals grown in Gisagara (12,245T in 2017/2018 with expectation to increase the production up to 23,243T by 2024). Other most suitable among food crops are cassava, beans and bananas. Coffee remains predominant as industrial crops. Apart from this categorization of suitable food and cash crops, Gisagara District is also a domain of different fruits like avocado, macadamia and pineapples.

The map below provides a combined suitability for eight crops which are maize, beans, potato, Soybean, cassava, banana, coffee, and tea. This means that the map shows areas according to the predominance of eight crops in the area. Only S1 (best suitable) and S3 (low suitable) agricultural lands dominate in Gisagara District, with 31,759.7 Ha dominated only by S1.

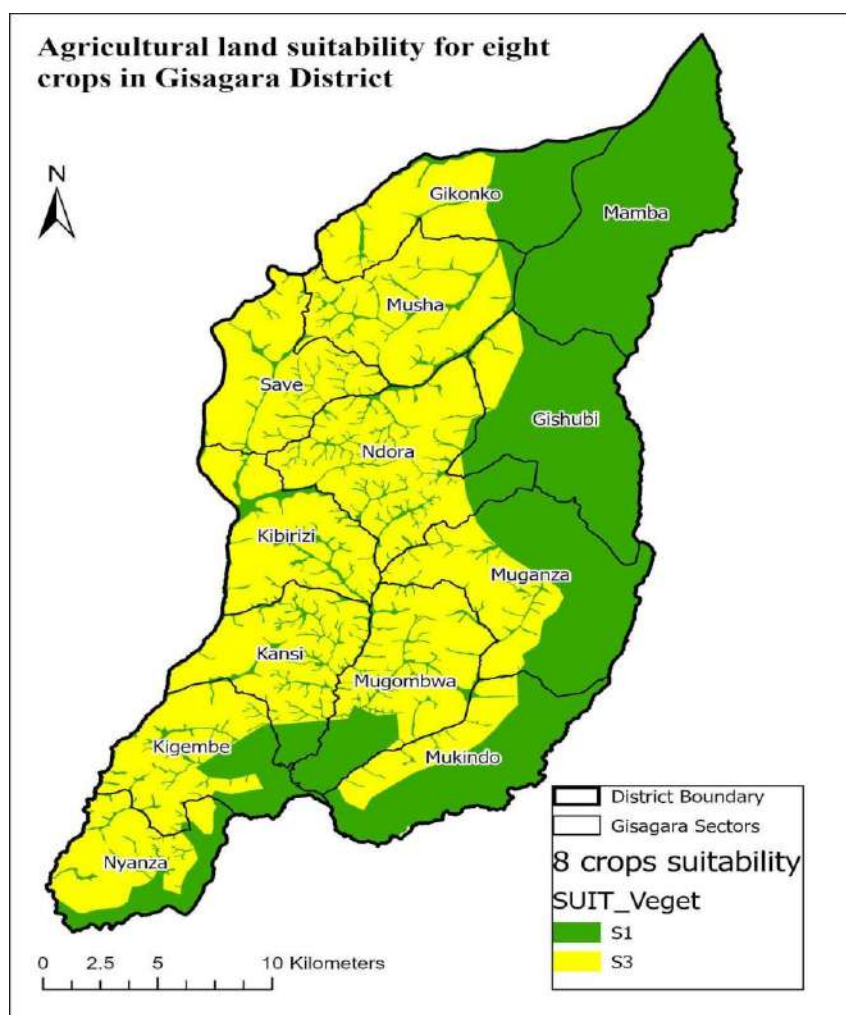


Figure 13-Map indicating 8 suitable crops in Gisagara District

The important part of Gisagara District is low altitude plains covering 4,250 Ha all dominated by S1. Valley Bottom occupies 6,813 Ha, most suitable for eight mentioned crops (S1). The summit (terraced slopes) are the predominant landscape of Gisagara District covering 56,325.7 Ha whose lands are partly most suitable (20,696.66 Ha) and more than its half (35,629.08Ha) are low suitable (S3). The following table illustrates the suitability based on landscape.

Land Unit	8 crops suitability	Area (Ha)
Flood plains	S1	4250.08
Summit/Terraced Slopes	S1	20,696.66
Summit/Terraced Slopes	S3	35,629.08
Valley Bottom	S1	6812.96
TOTAL		67,388.78

Table 16: Eight crop suitability vs different land units

d) Challenges encountered in agriculture sector development.

Agriculture development is in generally hampered by:

1) Land fragmentation due to:

- ❖ Scattered settlements in agricultural landscapes: Majority of population occupies dispersed houses inside arable lands, per influence of culture, financial capacity, ignorance vs master plan and/or lack of sufficient information and adequate enforcement on its implementation.
- ❖ Rapid Urban growth implying the extension of urban areas which monopolizes areas formerly reserved for agriculture

2) Changing climatic conditions: weather and climate parameters are the driving forces for successful agricultural practices; therefore, nowadays they are no longer the basis for agricultural production due to their mobility and consequently it results in the drought, reduction of rain.

3) Topographic constraints limiting the advanced technology use: limited mechanization

4) Low rate in use of chemicals and pesticides to increase productivity.

4.6.2 Livestock in Gisagara District

Livestock in Gisagara District is not professional, and production is not well monitored. Interventions will focus on increasing its productivity, professionalization, and capacity to ensure increased animal production for food security and market demand for consumption and transformation.

4.6.3 Ecotourism livestock in Gisagara District

Ecotourism enables full and effective participation in environmental protection as well as viable income-generating opportunities for local communities. It is in that line that the district has a plan to implement livestock-based tourism as essential for the environment and biological diversity, to contribute to the sustainable use of diversity through tourism. For the case of Gisagara District, the initiative comes from the idea of keeping the rare cow race known in Rwanda culture as **“INYAMBO cows”** District plans to grow that race on selected sites distributed in different Sectors as presented in the table below:

ECOTOURISME LIVESTOCK BASED SITE				
No	SECTOR	SITE	CELL	AREA (ha)
1	Muganza	BUSERUKA - NYAMAGANA	Rwamiko	450
2	Muganza	BUTARE BWA REMERA	Remera	20
3	Muganza	NYIRABURIBA	Cyumba	10
4	Kansi	Nyange	Munini	2
5	Mukindo	MPUNGWE	Runyinya	4
6	Gishubi	Kivugiza	Gabiro	3
7	Gishubi	Muyinza	Nyeranza	10
8	Gishubi	Nkunamo	Nyakibungo	3
9	Gishubi	Mutobo	Nyabitare	8
10	Mamba	Shyembe	Muyaga	12
11	Mamba	Ruhuha	Gakoma	18
Total / Gisagara				540

Table 17: Ecotourism livestock in Gisagara District

“**INYAMBO**” as the cultural race of cows will attract a lot of tourists in Gisagara District to see not only cows but also hearing from keepers the historical background of that race and its particular beauty. Gisagara District should invest strongly in this special project which should characterize its uniqueness in the tourism sector.

NLUDMP 2020-2050 has recommended the proportion of livestock taking into consideration the agricultural land. Thus, 18% of the land reserved for agriculture in Gisagara will be used for livestock.

4.6.4 Planning perspectives of agriculture and livestock farming

Results from the population census showed that the population of Gisagara District is estimated to be 397,051 inhabitants (NISR, 2022). The NLUDMP 2020-2050 has projected the total population of Gisagara District to 676,000 inhabitants. The slight decrease/increase of agricultural land by 2050 can be justified by the promotion of other land use categories (settlements, industries etc...) in Gisagara District.

In order to ensure food security by 2050, one of the strategies is to group farmers into settlements out of agricultural lands and prioritize agriculture development projects and techniques such as drainage, irrigation, erosion control mechanisms, especially radical terraces development, the use of fertilizers, land use consolidation, crop regionalization, agricultural mechanization, farmers cooperatives formation, agricultural research and extension services. Further identification and delineation of suitable agricultural land, initiative and opportunity to enlarge will be an important pillar of agricultural development.

This land should be protected as carefully as possible from construction, and prioritized for agricultural development projects such as drainage, irrigation, terrace building, consolidation and farmers cooperatives formation, agricultural research and extension services.

To meet the food security of the growing population (676,000 inhabitants) by 2050, one of the strategies is to address the mentioned production constraints. This will need to relocate farmers from agricultural lands and group them in urban settlements and protect them against other encroachments. Moreover, farmers will be professionalized, and commercialized value chains developed. Land use consolidation will be strengthened, production and productivity increased especially for bananas, maize, beans, rice, cassava, soybeans and vegetables. Gisagara District has envisaged to become an agro-processing hub and this will enable it to enhance the job creation and proceed to poverty reduction. It plans to remain an important referential source of crop production.

To achieve this, the district has assigned itself (District, 2018) to perform the small-scale irrigation, hillside, and irrigation as well as marshland irrigation infrastructures by 2024. Soil erosion control infrastructure such as both radical and progressive terraces will be developed, valorized, and maintained and these good practices should continue within 30 years. Gisagara District through District development strategies 2018-2024 planned improvement of livestock regarding animal resources production and productivity by increasing cow's artificial insemination, preventing, and controlling the disease by increasing vaccination and animal production management. Improvement of quality of animal production through milk collection construction, mini slaughters construction, viable animal markets upgrading. The district wishes to become pigs processed products source for national and regional markets.

This will allow availing more lands for agriculture and enhance farmers' adoption of modern inputs (such as improved seeds) and new fertilizer technologies focused on the efficient and utilization of fertilizer rates to meet crop nutrition needs and thus increased crop productivity. Beside, people operating in agriculture will be empowered by linking them to agriculture finance and risk sharing facilities.

4.7 Environment and natural resources

Rwanda is a natural resources-based economy, and therefore environment and climate change issues are a key priority and cross-cutting area that needs to be enhanced as stated in various medium and long-term national planning and strategic documents. Based on this, the key to planning and implementing the NLUDMP 2020-2050 is to ensure harmonization of land allocation for each sector while at the same time ensuring that there are targeted efforts to the conservation of natural resources

and promotion of their sustainable use.

Therefore, increased public awareness of environmental protection and climate change resilience can be achieved by strengthening environmental committees, raising public awareness, and completing EIAs for all eligible projects. Therefore, the environmental committees (District and Sector) and clubs will be created or enforced and trained on environment protection and sustainability; and Strengthen interventions for environment protection and climate changes resilience.

Moreover, the inventory for identifying the biodiversity and valuable ecosystem in the district is required for assuring their protection and management since ecosystems are made up of both biotic and abiotic elements that are essential for the ecosystem's health and economic development.

4.7.1 Forestry

Forests have a significant role to play in Rwanda's national development. They provide 86% of the primary energy source mainly as domestic cooking energy. They hold the base for the country's tourism opportunities, which in 2013 generated USD 294 million and are targeted to increase to over USD 600 million by 2020 (Forest Investment Program for Rwanda, 2017). In addition, forests protect watersheds and downstream swamplands, supporting agriculture and generate products of the country's export revenues. Further, forests are a vital component of the life-support system and ecological benefits.

Under the forest resources, the vision of Rwanda is to achieve and sustain forest cover at 30%. The most recent data on forestry in Rwanda based on the 2019 forest cover informed that the Rwanda forest cover is about 7,246 km² which is equivalent to 30.4% of the dry land. Specifically, 53.5% of the forest cover are plantations, 23.3% is wooded savannah in the East, 18.1% are natural mountain rainforests, and 6.1% are shrubs. In addition, Bamboo stands occupy only 613 hectares and its plantations have mainly grown in the buffer zones of rivers (Rwanda Forest Cover, 2019).

In terms of the forest density and tree cover, about 318,434 hectares are very dense forests (44%), 234,004 hectares are moderately dense (32%), 146,222 hectares are sparse (20%) and only 26,035 hectares are much degraded (4%). Southern and Western Provinces contain 50% of total forests of which 174,199 hectares are in Western Province and 177,537 hectares are in Southern Province. Eastern province takes up to 38% of the total forest land (274,630 hectares). Northern Province contains only 85,688 hectares and Kigali city remains only with 12,641 hectares (Rwanda Forest Cover, 2019).

4.7.1.1 Existing situation

The total area covered by the forest at national scale is about 330,576 Ha; of which, 215,739 Ha are natural forest while 114,837 Ha are forest plantation. It means that only 34.9% of the total national forest cover represents forest plantations (Ministry of Forestry and Mines, 2010).

Based on Forest data as produced by former Rwanda Water Forest and Authority (RWFA) in 2019, the forest cover in Rwanda totalized in 2019, **724,695 hectares** representing **30.4%** of national land cover. The forest cover is composed of different categories such as forest plantation, natural forest, shrubs and wooded savanna. For Gisagara DLUP 2023-2050, the forest plantation was kept as a unique forest category to consider in Gisagara District due to NLUDMP 2020-2050 recommendation regarding the conversion of shrubs and wooded savanna into agricultural land. From this general information, only Gisagara District present the following situation:

FC	Forest Cover Density	GISAGARA
Bamboo	High (>70%)	
	Medium (40 - 70%)	
	Low (10 - 40%)	
	Very low (0 - 10%)	
Total bamboo		
Forest plantation	High (>70%)	254
	Medium (40 - 70%)	2,307
	Low (10 - 40%)	5,464
	Very low (0 - 10%)	189
Forest plantation		8,214
Natural forest	High (>70%)	
	Medium (40 - 70%)	
	Low (10 - 40%)	6
	Very low (0 - 10%)	1

Total natural forest		7
Shrub	High (>70%)	
	Medium (40 - 70%)	8
	Low (10 - 40%)	687
	Very low (0 - 10%)	103
Total shrub		798
Savannah	Medium (40 - 70%)	
	Low (10 - 40%)	1
	Very low (0 - 10%)	1
Wooded savannah		1
Grand Total FC (ha)		9,021
Total district land (ha)		67,920
Percentage FC (%)		13%

Table 18: Summary statistics of forest cover type and density in Gisagara District

Sector Name	Total Sector land (Ha)	Forest Cover Type				Total FC (Ha)	% Forest cover
		Forest plantation (Ha)	Natural forest (Ha)	Shrub (Ha)	wooded savannah (Ha)		
GIKONKO	4,929	439	1.25	19		459	9
GISHUBI	6,143	365	5.80	26		396	6
KANSI	4,241	755		54		808	19
KIBILIZI	3,983	605		0		605	15
KIGEMBE	4,482	865		12		877	20
MAMBA	8,011	387		3		391	5
MUGANZA	7,039	566		395		962	14
MUGOMBWA	4,985	701		44	0.64	746	15
MUKINDO	5,044	567		57		624	12
MUSHA	4,977	623		11		634	13
NDORA	6,103	908		145		1,053	17
NYANZA	3,876	671		23		695	18
SAVE	4,108	761		7	0.85	769	19
Grand Total	67,920	8,214	7.05	798	1.48	9,021	13

Table 19: Forest cover categories in Gisagara District (2019)

According to the table above, the most important forest area in Gisagara District is occupied by the

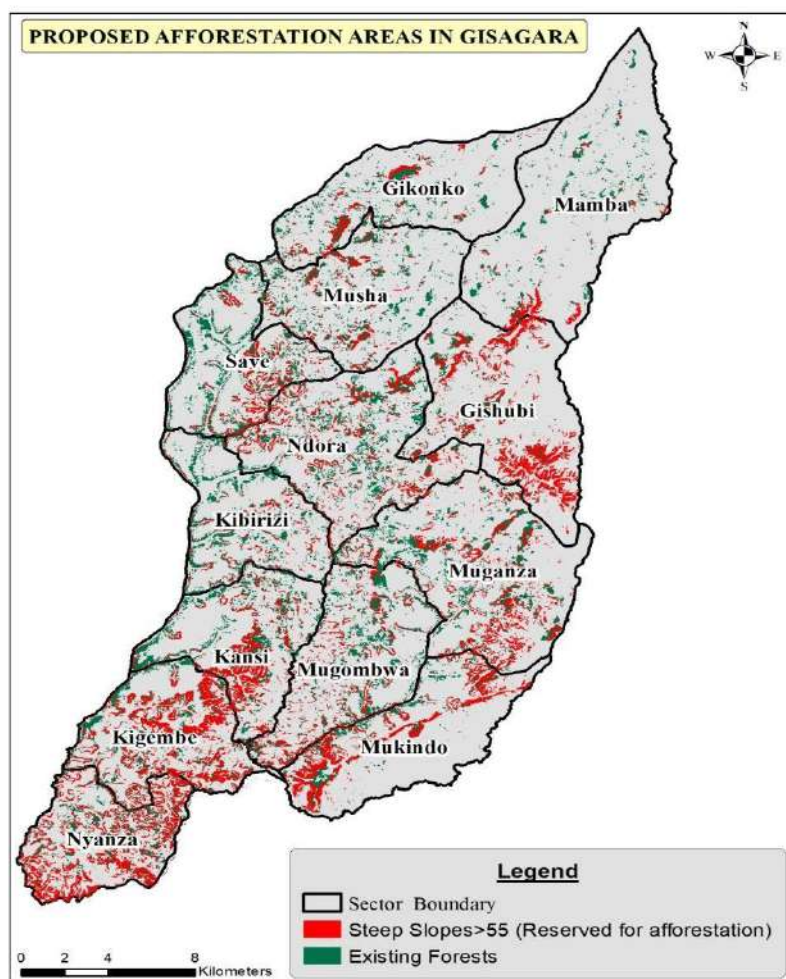
forest plantation while bamboo trees are absent and wooded savannah almost absent. The forest cover in Gisagara District occupies 13% of the total District land area. The table provided above, shows that around 799.48 Ha of identified forest cover in 2019 has been proposed by NLUDMP 2020-2050 to be converted into agricultural land to enlarge that area.

Another area where the high slope, more than 55% has been identified on approximately 833.92 Ha (775 Ha after cleaning) of land is not suitable for settlement (housing and infrastructure development) and even agriculture may not be suitable unless it is practiced with conditions regarding cultivating in contour lines direction, creating radical terraces introducing agroforestry species etc. Currently that area with high slope is not covered by the forest and consequently it could be sensitive to notable soil erosion. It is in this regard that Gisagara DLUP would recommend the afforestation on the area of high slope without forest cover.

4.7.1.2 Planning perspectives

Based on the Forest Policy 2010, the national program for Rwanda forest cover was intended to increase the forest zones to 30% of the total area coverage of the Country Rwanda by 2020. The forest cover report 2019 revealed that at the national scale, from ten years ago (up to 2019), the forest cover has increased with an increase rate of 2.1% and showed that the target for forest cover area was achieved given the total area reported as covered by the forest in Rwanda in 2019 (724,695 hectares; 30.4%).

The forest report 2019 recommended serious intervention and more attention in Eastern, Southern and Western Provinces in forest management with an interest in reforestation especially in Eastern Province where the act of deforestation has been notably identified. In Southern Province, Gisagara was not mentioned among Districts which need more attention in forest monitoring because it is not among those with large forest plantation as Nyaruguru, Nyamagabe Districts etc.



Map 14-Proposed afforestation areas in Gisagara District

In the above map, the areas represented by red colors are steep parts of the district above 55% of slope. Therefore, to increase the forest cover all such areas will be afforested in addition to existing forest cover.

Therefore, it is crucial to know that within 30 years, forest cover will not be increased considerably, only 775 Ha located on high slopes, more than 55% are proposed to further afforestation as the NLUDMP 2020-2050 recommended. The general recommendation focuses on reforestation where it will be a must. Agroforestry will also be intensified, and a few natural forests located in Gisagara District should be protected and maintained as well as all existing forest areas.

4.7.2 Swamplands

There are 935 swamps at national level under the Order n° 006/03 of 30/01/2017, drawing up a list of swamplands, their characteristics and boundaries, and determining modalities of their use, development, and management. They have a total of a recorded 276,477 ha where 74% of total swamplands are under conditional exploitation, 6% are under full exploitation, and 20% of the full swamplands are fully protected.

4.7.2.1 Existing situation

Along Akanyaru and Mugina rivers, there are swamplands that are not protected but being exploited under conditions and thus vital for agriculture productivity. The swampland has different biodiversity, particularly in terms of birdlife; at least 54 bird species have been recorded in the swamp region with swampland habitat, however, swamplands are increasingly being used for agricultural purposes.



Map 15-Existing swampland distribution in Gisagara District

Within the district, there are distributed swamplands of 92.34 Km² that are opened to the conditional use for instance for an integrated farming system on crop production that has an impact on socio-economic development of farmers in Gisagara District.

4.7.2.2 Planning perspectives

Zoning enforcement and ensure limited and acquisition for swampland for other functions. Gisagara's swamplands are designated/zoned for agriculture and others for conservation, where the 159.64 km²

of the existing swamplands their uses are recommended as follows:

- Protection in the totality of 88.13 Km² of the swamplands marked to be preserved.
- Opening up for conditional use 71.52 km² of the unprotected swamplands for agriculture (following the laid down guidelines).
- Opening up and leaving some swamplands parts of the swamplands to be used conditionally for other uses, e.g., Recreation, research, tourism, etc.
- Conservation of all the buffers zones for swamplands totaling 11.15 Km² or have their use guided by the above uses.
- Use and retention of urban swamplands as collection points and filters for storm water from the urban areas, based on the fact that swamplands are part of the “green infrastructure” of healthy catchments and provide a multitude of ecosystem services especially in urban areas
- Systematic restoration of degraded swamplands in the country.
- Recovery or creation of urban swamplands goes together with the protection of river banks, and is essential for the integrity of the water and swamplands resources.
- For the swamplands which are identified for conditional use, their proposed use(s) should be guided by undertaking Environmental Impact Assessment (EIA) to ensure their sustainable utilization.
- Development of ecotourism parks in the swamplands along with development areas for conservation, educational and recreational purposes. The enhancement and development of tourism and recreational activities on swamplands will enhance their conservation elements.

4.7.3 Water bodies

Countrywide, water bodies occupy 6.2 % of the total area of the country that accounts for about 1537 km². Most of the lakes and rivers are fed by marshes, which in turn are fed by shallow groundwater and seasonal floods. 101 lakes cover 149,487 ha, and 861 rivers totaling to 6462 km in length in Rwanda. The central pressures on water resources result from the use of utilizing the natural resources to meet basic household needs as well as social-economic development, e.g., undertaking agriculture.

4.7.3.1 Existing situation

Gisagara District is constituted by 2 main rivers, Migina and Akanyaru that make the border between Rwanda and Burundi countries before joining the Nyabarongo River to become Akagera which is the important source of water for the Nile River. Moreover, those rivers maintain biodiversity and the locals also enjoy fishing in the river and swamps.

Water supply systems are utilized to carry water from a source to consumers. These consumers include domestic users, industry and agriculture.

Water supply systems include several sub-systems:

- ✓ Water source
- ✓ Pumping station
- ✓ Storage facilities
- ✓ Conveyance
- ✓ Connection from supplier to user

Sources include rivers, streams, lakes, rainfall stored behind dams or in reservoirs and underground water that can be pumped from aquifers. Based on rainfall records, most of Rwanda can be irrigated from rivers and lakes for a major part of the year. It may be necessary to add storage by building dams across stream beds or reservoirs off stream, i.e. to the sides of streams and rivers. Such reservoirs are usually built by constructing embankments around the reservoir site and by using soil from the site itself as material for the embankments.

4.7.3.2 Planning perspectives

In the implementation of NLUDMP 2020-2050, the following are recommended.

- Ensuring that all the water bodies and their buffer zones and the protected swamplands and their buffer zones are fully protected. Particularly prohibition of settlements in 50m from lakeshores, currently there is no protected Swamplands 10m for rivers and 20m buffer for swampland boundaries. Buffer zones are used for forestry, tourism and conservation efforts.
- Ensuring policies relating to water resources extraction and protection with a focus on enhancing saving and water conservation are aligned with NLUDMP 2020-2050.
- Putting in place a prudent water resource management plan driven by projected increases in water consumption/demand and climate change at all levels of administration and catchment areas.
- Develop hydrological and hydraulic at District and catchment levels, supported by hydrological and hydraulic models, improved rainfall monitoring, river flow and groundwater monitoring and a better understanding of agro-meteorology and water quality testing.
- Enhance and improve the knowledge and operations of water users within Districts, catchments area, irrigated and mining sites etc as instructed in the NLUDMP 2020-2050.

The growing population as well as the rapid urbanization need to be coupled with adequate and

sustainable water supply. Water supply affects broad areas of human life. The provision of adequate water supply and sanitation (WSS) services plays a crucial role in preventive health care and is more generally a prerequisite and indicator for socio-economic development. Access to drinking water is also a basic amenity, ranked among the highest priority public services by Rwanda's population. As stipulated in NST1 "Access to water will be scaled up to all from 85 % (Estimates 2017) to 100% by 2024 through investments in: Construction, extension, rehabilitation of water supply systems across the Country.

4.7.4 Mining

Mining and quarrying are classified under the industrial sector in Rwanda. The share of mining and quarrying to GDP was 0,6% in 2006 and 1% in 2008. To the secondary sector, mining and quarrying contributed 4,6% in 2006 and 6,3% in 2008 and in 2021 10.1%. This is evident that, the share of mining and quarrying in the secondary sector, but also in the economy at large has been on the significant increase.

4.7.4.1 Existing situation

For the mining sector to meet its goals within the NST1 and Vision 2050, several measures including building domestic mineral extraction and processing capacity, developing a service hub for mineral processing for the sub region and enhancing locally produced construction materials need to be undertaken. This will have the potential to promote private sector participation in exploration, mining and processing, and promote value addition of quarry products to reduce the importing of construction materials. Quarries for construction materials (sand, stones and clays) are predominant in Gisagara District. There are plenty of opportunities in this sector which will create jobs for the young generation and other active population of the district.

4.7.4.2 Planning perspectives

To ensure sustainable mining the following needs to be ensured and undertaken going forward:

- Undertaking a land-use analysis (cost-benefit analysis) for current land use versus the proposed mining activities and use the analysis results to understand the best land use;
- Undertaking of a complete risks analysis to the natural and human environment before the licensing of the mining activities;
- Developing and Implement land-use master plan concerning the proposed mining activities;
- Undertake and Enforce environmental and social assessment and monitoring (EIA, SIA, EMP);
- Enforce the programs for orderly decommissioning, rehabilitation, restoration, and utilization of

mining sites after an operation, develop a mine drainage and leaching of contaminants plan associated with mining metals to avoid impacts on rivers, streams and water quality

4.7.5 Green urbanization

To implement the National Green Growth and Climate Resilient Strategy (GGCRS), green principles should be key priorities integrated in planning of different land use categories. The two program principles under urbanization planning to be focused on during planning and implementation include; Integrated approach to sustainable land use planning and management that recommends employing an integrated approach to planning and sustainable land use management and low carbon urban system that focus on promoting of green efficiency in master plan design, building designs etc. should ensure minimizing of carbon emission.

4.7.5.1 Existing situation

With urbanization and human settlement development, the ecosystem health and its services are affected while it is the source of medicine, energy, environmental life etc, measures are required to preserve and protect the biodiversity and natural environment.

The existing infrastructure for the storm water management system was installed for a smaller population but as the urban centers increase the infrastructure is stretched beyond capacity. This is exacerbated by the construction of new settlements without effective storm water systems. The runoff impact of unmanaged storm water on people and the environment is manifold. Missing or badly maintained infrastructure causes erosion of usable land, increases flooding, and endangers private and public infrastructure.

Therefore, flooding and landslides are an annual problem. Typical impacts include damage to roads and transport infrastructure, severe erosion of cropping land and river channels and severe siltation in swamplands. The steep terrain and moderate rainfall in some Sectors of Gisagara District means erosion, landslides and floods are particularly common in this area. The higher population density which is a common phenomenon in the country is a contributing risk factor. Pressure for agricultural land means large areas of land that should be stabilized for erosion are intensively cultivated.

Climate change impacts are projected to become more frequent, unpredictable and extreme - threatening infrastructure, reducing water and hydro-electricity supplies and affecting agricultural production. Heavy reliance on rain-fed agriculture means the increased variability of these events and even slight changes to temperature and familiar weather patterns poses a particularly difficult challenge to people specifically in Gisagara District. Flooding is the main challenge affecting agriculture

activities in Gisagara District where most of the swamplands are occupied by rice plantations. Heavy rains affect the yield and are a source of fatalities.

Moreover, land clearance has also increased runoff to waterways – increasing the frequency and peak volume of floods and changing the shape of waterways. Higher-up in the catchments, rivers are becoming more channelized – increasing the rate at which valleys drain. Further down in the catchment, silt is reducing the depth of rivers – increasing the frequency of flooding. Because swamplands are highly effective at moderating flood risk, the increased cultivation of swampland areas (rice, maize and vegetables) is also contributing to flooding.

4.7.5.2 Planning perspectives

Various actions must be implemented to guarantee that the NLUDMP 2020-2050 is environmentally sustainable in its execution. It requests that numerous policies and legal frameworks be reviewed and updated in parallel with the NLUDMP 2020-2050. Therefore, for a green urbanization the following are recommended:

- All Population, Urbanization, Settlements, and Housing (Push) programs of the district must comply with the projection of NLUDMP 2020-2050.
- Ensuring that all urban development processes incorporate climate risk and low-emission strategies on all the proposed activities;
- Promote climate-resilient human settlements and prevent informal settlements as well upgrading the existing ones.
- All the proposed investment in the proposed urban areas should have integrated, resilient, reliable and sustainable infrastructure which will enable the district to adapt to climate change and function efficiently at the local level
- All green infrastructure projects should be designed to complement gray infrastructure systems performing a combination of volume management, water quality improvement, and flood control;
- For all the urban developments, there should be identification and strengthening of the value of greenbelts and green spaces.
- All urban development plans and programs must support urban agriculture areas and programs to enhance food security in urban areas.
- Have the operators in the Industrial parks that go for cleaner and greener production and support the Zero waste economy and circular economy in their production activities.
- Ensure that Industrial parks are well supported in green planning, green technology, and production practices.

- Ensure that Strategic environmental assessment (SEA) is undertaken for all land-use master plan to ensure their sustainability.

With the assistance of GGGI and REMA and other stakeholders, the district aspires to integrate the district's development plans to green growth and climate resilience measures to direct the district's growth in a green and climate-resilient manner, resulting in low-carbon urban development, disaster-resilient District, and increased green investment.

Approaches to protect the biodiversity within land use-plan implementation for supporting green growth are: Identify and buffer the essential ecosystem around the district; Plan and connect green belt and green paths around Roads and Industries and Build ecological corridor to connect the valuable ecosystem around the district. Moreover, the district for growing economically within line of green strategies require actions such as:

- ➔ Invest in green urban infrastructures and jobs such as Green building, Clean energy, Integrated water resources management etc.
- ➔ Provide technical training for green industries and support green entrepreneurship.
- ➔ Develop an ecological industrial park and assure compliance with green jobs safeguard.

Moreover, flooding and landslide risks are seen as natural phenomena that are exacerbated by changes in land use and increasing population density in Gisagara. Where possible detailed physical plans should take a catchment approach to flood and landslide mitigation – Applying programs to reduce runoff and slow water drainage from upstream areas to address downstream impacts. Different land use practices such as vegetation clearance, forestation, terracing, urban development and different forms of agricultural production need to be understood by District and local authorities as important variables determining landslide risk. Likewise, soil conservation, radical & progressive terraces and sustainable agriculture are important aspects of flood mitigation used in Gisagara District. Channelization, siltation and swampland removal all contribute to flood risk and are symptoms of poor land management practices in Gisagara District. Land use change such as vegetation clearance is strongly linked with flooding and landslides – periodic mapping and other forms of land use change detection should be an important input to all District flood management plans. To reduce flooding in their District, local-level authorities should also be encouraged by national agencies to develop plans that integrate with Districts higher up in the catchment.

Furthermore, rainwater has to be collected in urban areas from the roof, paved and unpaved areas of a house especially at schools, church, healthcare facilities, and office complexes in order to restore the necessary amount for re-use other to be engaged in the aquifer research area as well as mitigating

impact of storm water.

4.7.6 Waste management

The amount of solid waste is increasing rapidly as a result of rapid growth and migration from rural to urban regions. The fast urban population increase has a significant socioeconomic and environmental influence on solid waste management techniques.

The Rwandan goal is to provide 100% of the population with access to an improved type of sanitation system. Improved sanitation systems are considered to include flush toilets, EcoSan toilets and pit latrines with solid slabs. In order to meet this goal, the following general levels of service are proposed: Rural (R1B) / low-density areas – On site treatment: Pit latrines with septic tanks and solid slabs, EcoSan toilets (waterless composting units); Industrial areas – On site treatment: Industries to treat their own effluent on site, with industry-specific technologies; Urban / high-density areas – Off site treatment: Flush toilets with connection to a waterborne sewer network to be treated at a wastewater treatment plant.

4.7.6.1 Existing situation

In the district, waste management is not quite enough for assuring sustainable management of the waste in the district for the future, since a major percentage of the population lacks access to a formal waste collection system and only one dump site there, with delicate access due to the lack of a clear operating waste collection and transportation systems. Even though the commercial area has a simple and basic garbage collecting system, a strong and efficient waste management plan is required for the whole District. Sewage system and wastewater network are not clearly defined, moreover the EICV 5, described that the percentage of Households with access to improved sanitation are 59.8%.

4.7.7 Solid waste

NLUDMP 2020-2050 recommends the following actions that Gisagara DLUP should comply with:

- Have a robust solid waste management system for all development that is based on reuse hierarchy but be focusing on zero waste generation.
- Support for the circular economy programs in all the planned activities of NLUDMP 2020-2050 so that there is a minimum generation of waste (total zero waste).
- Where they are waste treatment facilities ensure that they could be used for enhanced production of energy, fertilizer, or other production activities.
- Identification of Strategic targets and indicators for monitoring.

Therefore the waste collection system is needed in the Commercial centers and the improvement of the composting system within the whole District is required to recycle the biodegradable wastes which are generally produced in the district for the valorization of the discarded materials, reduce resources consumption and prevent numerous environmental and health issues caused by consumption and disposal patterns, this must be addressed to help shape the livable and sustainable cities of tomorrow. Hence the following key steps for assuring a strong waste management plan have to be considerate.

- The current and future waste situation analysis, basing on the district's demographic; settlement types; and socioeconomic status as well as availability of waste management infrastructures in the district;
- Analyze the quality and types of waste generated by the various sources;
- Definition and establishment of services; infrastructures and implementation measures;
- Identification of Strategic targets and indicators for monitoring.

4.7.8 Liquid waste

The following actions are proposed during the implementation of NLUDMP 2020-2050 to ensure that there are adequate sanitation and water control systems, and recycling programs:

- Enhanced development of liquid waste management systems in cities, towns, urban, and rural settlement areas. Currently there are no centralized wastewater management systems and may be challenging to set up construction of semi-centralized sewerage systems in all planned and grouped settlements;
- Ensuring and having in place elaborated programs for the protection of waterways and systems where they exist;
- Promote sustainable agriculture to reduce environmental impacts;
- Moreover, the measures below will be explored for implementation in Gisagara DLUP 2023-2050;
- Grey water harvesting;
- Replacement of pit latrines with EcoSan toilets to save water, prevent contamination of groundwater;
- Sources and reuse waste as fertilizer. EcoSan toilets use a natural biological process to break down human waste into a dehydrated odorless compost-like material;
- Decentralized technologies which are more sustainable in the context of rapid low density urbanization such as septic tanks, biogas digesters, compost toilets, VIP's;

- Comprehensive strategies for sustainable sanitation systems, from collection to reuse (i.e.: converting sludge into energy sources, or fertilizer etc.).

4.7.9 Pollution control

The environmental threat posed by industry and pollution is fairly limited in Gisagara District but will grow rapidly as soon as the industry sector grows. The main problems are the pollution of swamplands and water bodies from manufacturing and processing facilities (rice processing plants) and the use of pesticides and fertilizers. While most of these are small-scale, a lack of data and monitoring coupled with poor regulation of polluting activities means even a small number of sites have the potential to cause serious (if localized) threats. The impact from polluting activities will rise as population and economic development increase. The designation of the industrial park around Ndora (District Town) is an important first step to containing and monitoring polluting activities.

Regulation of industrial activities and pollution is minimal. The main mechanisms for addressing polluting activities are sections of Law n°.48/2018 of 13/08/2018 on Environment aimed at protecting areas against pollution and degradation. Requirements for some activities to undergo an Environmental Impact Assessments (EIA) also exist and the process is applied in Gisagara District. However, these laws are not supported with the necessary standards or institutional capacity to be applied effectively. For example, there are currently no minimum water quality standards specifying requirements for the storage, treatment, discharge and disposal of polluting and toxic materials - including urban waste.

4.7.9.1 Existing situation related with pollution control in the district

The following list outlines the main pollution risks in Gisagara District:

- ✓ The Kibirizi industrial park: This site can be identified as a source of pollution affecting swamplands and rivers around Rwasave. Its position in a swampland area is particularly problematic since the area is subject to periodic flooding, currently, there is a wine processing plant operational and other industrial plants are under construction.
- ✓ Coffee processing: Coffee washing is a water intensive process so these activities are positioned close to water bodies. The washing process generates significant quantities of polluting organic waste (5kg waste/1kg coffee). This reduces oxygen levels in the water bodies affecting animals and plants; There are more than 10 coffee washing stations in Gisagara District operating seasonally but the quantity of produced waste and pollution generated are not yet known.
- ✓ Agriculture industries: The shift to more intensive cultivation increases the risk of pollution from overuse of fertilizers and pesticides. Rice, coffee and banana production are the most problematic

in Gisagara District. Location can exacerbate problems; for example, production of crops adjacent to water bodies and swamplands (such as rice and banana) increases the risk of pollutants affecting freshwater ecosystems.

- ✓ Mining and quarrying: Gisagara District has few mines but also no specific legislation addressing risks and pollution from mines. Pollution has been linked to the exploitation of coltan mining and other minerals available. Quarrying for building materials is the most common source of mining related pollution – affecting nearby water bodies and source of erosion in Gisagara District.
- ✓ Petrol Stations: These pose a widespread problem across Rwanda due to their risk of leakage to groundwater and the prolonged cost of remediating these sites. Petrol stations are still very few in Gisagara District therefore no data exists regarding the status of petrol stations pollution risks.
- ✓ Peat Power Plant: There is a power plant in the Mamba sector that generates 40MWatt. The peat extraction activities in Akanyaru swampland are done at industrial level using heavy machinery and considerable manpower that can also be a source of water pollution and environmental disturbance.

4.7.9.2 Planning perspective for pollution control, guidelines and enforcement

Addressing pollution in Rwanda requires a review and upgrade of existing national environmental laws. Legislation is urgently needed to define minimum water and air quality standards and acceptable levels of pollution emissions from industrial activities. REMA and the district authorities urgently require the legal and professional capacity to monitor and enforce pollution laws and environmental quality standards. District authorities also need to develop their own pollution control guidelines mainly in the agriculture sector where the use of chemicals is rapidly increasing.

Development of pollution standards should be developed by the national government, but management, monitoring and compliance is best conducted at a district level.

In addition to a review of legislation, priority needs to be given to developing and maintaining a national pollution inventory. This would record the location, type and degree of pollution, giving government agencies and the public a quick reference to activities in their area.

4.8 Tourism and conservation

4.8.1 Existing situation

Tourism remains the top country's foreign exchange earner for more than a decade now and is a major drive for Rwanda's economic growth, development, and poverty alleviation. The Government of Rwanda has set tourism sector specific development strategies aimed at ensuring that it benefits local

people and contributes to the national economy. This is clearly highlighted in the National Tourism Policy and the Master Plan for Sustainable Tourism Development. Given the above, tourism contribution to Rwanda's economy has been increasing at a high rate due to the stability of the country and has been growing at an average rate of over 10% per year. The indirect contribution of tourism to Rwanda's GDP rose by 6.8% from 6.2%, RWF 933.5 billion (US\$ 1,129.9 million) in 2018. The industry is projected to increase significantly to 12.5% of Rwanda's GDP in 2028 (WTTC, 2018). In total, the tourism industry's contribution to employment indirectly grew by 3.9% (346,500 jobs) compared to 333,500 jobs in 2017. It is expected to rise significantly at 3.1% per annum, generating 469,000 jobs by 2028 (WTTC, 2018).

Tourism being recognized as an essential economic sector with huge potential to boost domestic economic growth and development, contribute to poverty, job creation, export growth and prosperity through revenues generated from tourism industry, the Government of Rwanda has defined new and ambitious goals for the further development of the country and implementation of different strategies such as the National Strategy for Transformation whereby Rwanda has to double tourism revenues and reach 800 Million USD by 2024.

In order to achieve the above objective, there is need for proactive tourism product diversification including but not limited to key niche products with great potential for Rwanda namely adventure, birding, community-based tourism, MICE tourism coupled with required soft skills in terms of guiding and storytelling to cater for travelers' expectations. In the same line, an aggressive marketing approach is required to ensure we drive travel traffic to Rwanda while ensuring travelers enjoy their experience.

Based on the 2050 Rwanda's Vision, the new tourism segments that will shape the future of the tourism industry shall include MICE, medical, education, water-based, adventure, and religious tourism. The projected 2050 contribution of each tourism segment is shown in table below.

4.8.1.1 Tourism Development and main tourism attractions in Gisagara District

According to the Heritage Corridor Tourism Sub Master Plan, Gisagara District will build on its abundance of natural beauty attracting tourists seeking untouched natural beauty and bird watching" as Gisagara District is known for hosting natural heritage attractions like the Ityazo rya Ruganzu as well as the famous Mount Makwaza. They are historically related to King Ruganzu II Ndoli (1510 - 1543). The famous Save Saint Spirit Catholic Parish, the first Catholic Church of Rwanda, constructed in 1900 is another historic attraction known to be the first Catholic Church constructed in Rwanda. The Isha peninsula of Gisagara offers scenic views of Burundi. The Akanyaru River and swampland are ideal bird watching destinations to be developed. In terms of sport, the famous rock called Igitare

cya Nyirabakobwa, a big and large rock almost 2 meters high would be ideal for sport's climbing in addition to the modern gymnasia which should be expanded and diversified for the district to position itself as a sport tourism destination.

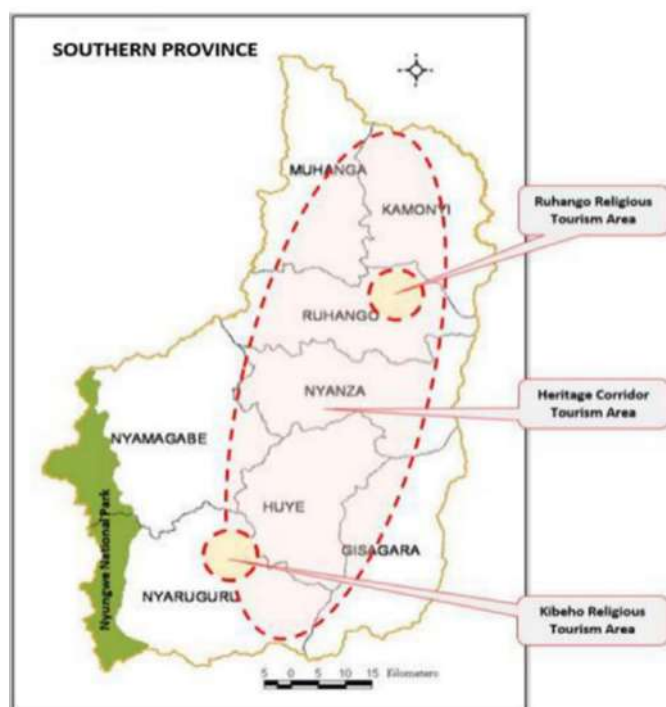


Figure 14-Map demonstrating southern province potential tourism destination

Gisagara District is one of the districts in the Southern Province that have had an archeological and historical area since 800 before Jesus Christ, especially in Cattle. The historical belongings in Rwandans that should return in the region and the country are traditional games and competitions, Manufacturing of traditional material and livestock based on castles since it has been found that Gisagara District is among the origin of cows in Rwanda at Date 800 before Jesus Christ.

Touristic sites in District have been identified as potentiality to boost District economy through offering jobs, increase demand for food consumption from agriculture production and generation of opportunities for business, especially for handcrafts and trade on ways linking developed touristic sites with local towns and District headquarters.

The following are main activities with highest potential to generate tourism revenues and requires further development in Gisagara District.

History and Heritage Attraction	Existing Conditions/Assessment	Potential for Improvement	Photo
Ityazo rya Ruganzu & Makwaza Hill	Natural / Heritage Attraction Historically the site is related to King Ruganzu II Ndoli (1510 -1543) A hut build before the 1994 genocide to keep alive the site can be seen on the top of the hill. (if nothing is done to preserve it will soon disappear)	❖ Build a 3 star Eco-lodge. Improve signage, local guides and story tellers to be trained.	
Save Saint Spirit Catholic Parish	The first Catholic Church of Rwanda, constructed in 1900 Historic attraction In good condition the church is historically known to be the first Catholic Church constructed in Rwanda	❖ Needs information and directional signage ❖ Local guides to be trained ❖ Needs tourism facilities.	
Akanyaru River Wetland	Natural attraction Important but unprotected birding destination; The Wetland are under threat from human activities.	❖ High potential for birding activities ❖ Needs information and directional signage ❖ Local guides to be trained ❖ Needs tourism facilities	
Rwabisemanyi Lakes	Natural Attraction, two beautiful lakes already offering fishing activities	❖ High potential for fishing activities ❖ Needs information and directional signage ❖ Local guides to be trained ❖ Needs tourism facilities	

Table 20: Highest potential areas to generate revenues to be developed in Gisagara District

4.8.1.2 Required intervention in order to develop the area to generate more touristic revenues

- Develop hospitality facilities at Makwaza Mountain, at Rwabisemanyi, at Muyaga Mount and at Save Parish infrastructures.
- Increase access to viable economic infrastructures to the touristic sites: navigable roads, electricity, and sufficient access to clean water.
- Promote hand craft productions and cultural tourism on ways linking District headquarters, Huye Town with the four touristic sites.
- To do innovation and Service delivery for attracting tourists.

4.8.2 Planning perspective, tourism segment by 2050

The employment potential of the tourism sector goes beyond this by generating many temporary jobs for skilled and semi-skilled workers; during construction of hotels; hotel workforce at the hotel-management and support staff; suppliers to the hotels and small businesses, special events (cultural) need extra staff.

Rwanda's goal in the tourism sector is development of "high-end eco-tourism." This will depend critically on the quality of service the country offers. At the moment, the hospitality industry has a total gap of 70%. The shortage of skills in the hospitality sector is serious in the private sector where the gap among the professionals is 55% for technicians 12% and for artisans 53%. Given the severity of

shortage of skills, especially at the professional and supervisory levels, it is not surprising that the quality of service is such a major issue in Rwanda. But this also affects the competitiveness of the sector in the region and may hinder future growth.

4.8.3 Employment in tourism sector

4.8.3.1 Existing accommodation units and direct employment

Currently, Gisagara District has only one main hotel located in the town. This limits the tourists who may need to stay in the district rather they rush to the nearby Huye District where there are many hotel services, hence the district is losing revenues that might be generated from the tourists spending nights in the district. Despite that, the district is planning to promote tourism industry that will catalyze the development of other infrastructures including hotels and other hospitality services in the district. The following some projects that will change the image of the district including;

Developing and implementing 5 projects to develop touristic sites of Makwaza Mount, Rwabisemanyi Fishing Ponds, Muyaga Mount and Save first catholic mission.

Supporting activities of culture tourism through organizing 6 cyclism and 5 folklore culture competitions.

Increasing social inclusive sports and culture facilities and productivity: 13 combined volleyball and basketball playing grounds, 5 accessible playing grounds for sit ball, sitting volley and goalball and incubation football playing ground at every cell.

Further still, Gisagara District has the objective to increase commercial and touristic off farm jobs and agro-processing hubs by establishment of expo places at Makwaza green park, Kansi, Rwabisemanyi, Nyaruteja cultural centre, Mugombwa and Kibilizi centres.

4.8.3.2 Land allocation for tourism areas by 2050

Gisagara District has several tourist sites in the areas of Nyanza, Kigembe, Save, Ndora and Mukindo that need to be developed and generate incomes and provide enough jobs for young people and develop tourism. The implementation of planned projects such as Makwaza Green Park, Rwabisemanyi fishing, Save First Mission historical training center, Utwicarabami twa Nyaruteja cultural center will help to delineate the allocated land for tourism activities in the future.

4.9 ECONOMIC DEVELOPMENT

4.9.1 National context on economic development

One of the key pillars of Rwanda's economic development strategy is the promotion of private sector-led growth. This has involved a range of measures to create an enabling environment for businesses to flourish, such as streamlining business registration procedures, improving access to finance, and promoting investment in priority sectors. Additionally, Rwanda has sought to leverage its strategic location within East Africa to position itself as a regional hub for trade and investment.

The country has made significant progress in recent years, with improvements in key sectors such as agriculture and manufacturing. However, challenges remain, particularly in areas such as infrastructure development and access to finance.

Furthermore, the projected demographic changes will have significant implications for policy development, particularly in areas such as education, healthcare, and employment. The growth in the working-age population presents an opportunity for the country to expand its workforce and drive economic growth, but this will require targeted investments in skills development and job creation.

4.9.2 Employment situation

a) Current situation

According to EICV5, the working age population in Gisagara District was approximately 194,000 with a workforce to population ratio of 88.6 %. In terms of job status, the breakdown is as follows: 24.5 % were engaged in wage farming activities, 10.7 % in non-wage farming activities, 60.1 % were independent farmers, 3.9 % were independent non-farmers and 0.8 % were unpaid farmers. Furthermore, when considering the distribution of these individuals across broad economic sectors, 76 % were employed in agriculture sector, 7.2 % in industry and 16.8 % in services.

Recognizing the significance of employment creation in addressing the country's rapid population growth, poverty reduction, and overall economic growth, the government has made it a priority. In the Gisagara District Development strategy for 2018-2024, it is outlined that the aim to create 36,979 off farm jobs by 2024, with a particular emphasis on empowering women.

To better illustrate the current status of employment creation for the population over 16 years in Gisagara District, a visual representation is provided below:

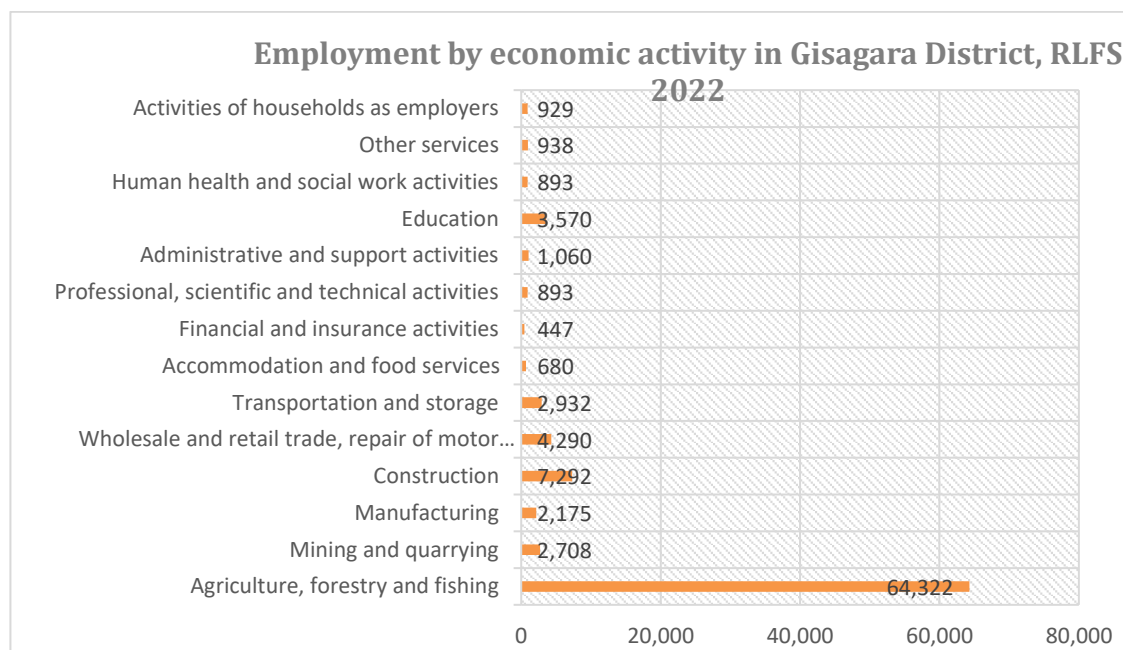


Figure 15: Employment by branch of economic activity in Gisagara District, RLFS 2022

Based on the data presented in the figure above, it is evident that the employment landscape in Gisagara District is characterized by significant sectoral distribution. The key findings reveal:

Agriculture dominates, encompassing a substantial 69.1 % of total employment in the district. The construction sector accounted for 7.8 %, playing a crucial role in both infrastructure development and job creation, thereby fostering economic growth. Wholesale and retail trade, repair of motor vehicles made up 4.6 % of total employment, while education contributed 3.8 %. The remaining 14.66 % of Gisagara's total employment was distributed across other sectors, as illustrated in the figure above.

b) Planned perspective.

Using the base of the labor Force Survey (RLFS 2022), and a methodology that cascades the assumptions from the NLUDMP 2020-2050 to the district level, and considering economic specialization of Gisagara District and grouped the employment into five main categories as follows:

- ❖ Agriculture, Forestry and Fishing
- ❖ Mining and Quarrying
- ❖ Construction
- ❖ Manufacturing and

❖ Services

This systematic approach ensures alignment with NLUDMP 2020-2050 guidelines and facilitating accurate and consistent estimation, as depicted in the graph below.

Sector of activity	Number of Employment to be created
Formal Employment 2050	399,719
Agriculture, forestry and fishing	36,661
Mining and quarrying	25,622
Manufacturing	48,455
Construction	66,337
Services	222,643

Table 21: Employment projection in Gisagara District by 2050

By the year 2050, as urbanization expands and job opportunities increase, the service sector is anticipated to play a significant role in employment generation, making up 55.7% of the total employment to be generated, particularly in commercial activities. Simultaneously, the construction sector is set to play a crucial role in employment growth by facilitating the development of modern infrastructure, representing around 16.6% of the total employment landscape is expected to contribute 34.3 % of employment creation. In contrast, the manufacturing sector is expected to contribute 34.3 % of employment creation. Despite the availability of arable land and abundant forests, agriculture, forest, and fishing are projected to make up only 9.2 % of total employment. Finally, the mining sector is estimated to contribute 6.4%.

4.9.3 Trade and industry

The major activities of trade in Gisagara District are still based on raw food production, agro-processed food products, milk processing, cash crop production including coffee, macadamia etc. compose one of the priorities for the district, which is to increase exports of value-added goods, promoting industrialization and to attain a structural shift in the export base to high-value goods and services.

4.9.4 Commercial Trade

Gisagara District geographical location is strategically favorable in terms of trade, the district is easily able to export its produced products to neighboring Districts such as Huye, Nyanza and Nyaruguru. The district also has opportunities to export goods to Burundi as most Gisagara District Sectors including Mamba, Gishubi, Kigembe, Muganza and Mukindo are bordering Burundi.

a) Existing situation

Achievements made in secondary and tertiary sectors, which are directly linked to businesses and industrializations, were only 18.25% (56,760/311,104); 81.75% (254,344 were in the primary sector). This is linked to low levels of agro-processing production for local and regional markets: their limited number as well as their incapacity to operate at their full capacity due to owners' financial capacity and lack of sufficient raw materials to ensure production all the time. Beside these limitations to the private sector, there is also a problem of road infrastructures that are in bad conditions. To increase sustainable quantity and standards of "made in Gisagara" products, interventions focus on capacity building of existing industry, ensuring respect to standards and reducing production costs.

Doing business in Gisagara District is constrained to a road network that is not in good condition. Only 14% of the population are satisfied with road network conditions against 86% who are not satisfied. This increases cost of doing business in feeding markets such as processing units, business centers, Huye city and other establishments with high consumption in food and services such as schools, markets and selling points with agriculture production and vis a vis the cost of accessing to products from those areas. There is a need to link productive areas in District with other local and regional corners through upgrading road networks.

b) Planning perspectives

Improving and constructing cross border posts between Rwanda and Burundi entry and exit points between two countries will increase the level of business.

Infrastructure development, where construction of Akanyaru bas-Kansi-Huye tarmac road to strengthen regional integration of Gisagara District with bordering countries and Huye City will highly increase business development and trade.

Districts will have expanded areas marked as an industrial park with land being designated for this. By 2050, Kigali Special Economic Zone Phase III and new industrial parks in Bugesera, Huye, Musanze, Rwamagana, Muhanga, Nyagatare, Nyabihu/Rubavu, and Rusizi Districts will be developed and fully operationalized as State-of-the-art industrial parks and it's from the perspective that land planned for industrial park development have been allocated to the above mentioned Districts, other Districts will only have room for light industries and agro-processing industries based on agricultural production. Employment will increase as the result of the industrial sector that will have passed in the series of revolutions. The number of employees working in manufacturing industries will be 2,4M and 700K in mining. Construction industry will employ 1.7 Million workers. 40% (560K) of the workers will be engaged in Industry parks. 60% will be spread in the urbanized areas in a small scale manufacturing.

The consumption of land in the parks is according to density standards of 64 employees per Ha, and the allocated properties for industrial parks will be 8,777 Ha.

4.9.5 Industry and Manufacturing development in Gisagara District

Since Gisagara District is not among the prioritized for heavy industrial park development, the district will continue to have light industries and agro-processing industries. Agro-processing industries will play a key role towards the development of the district in transforming agricultural products for both internal and outside markets - Agro-processing industrial zones in Kibirizi center (Agro-processing centers) will serve as the hub area for the district in agro-processing process. Establish new processing units of key crops and livestock production in the district, especially one for pigs, one for maize and one for avocados in collaboration with the private sector.

Light industries will also play a big role in terms of employing many people as these types of industries do not need huge areas of land for establishment as indicated in the map below.

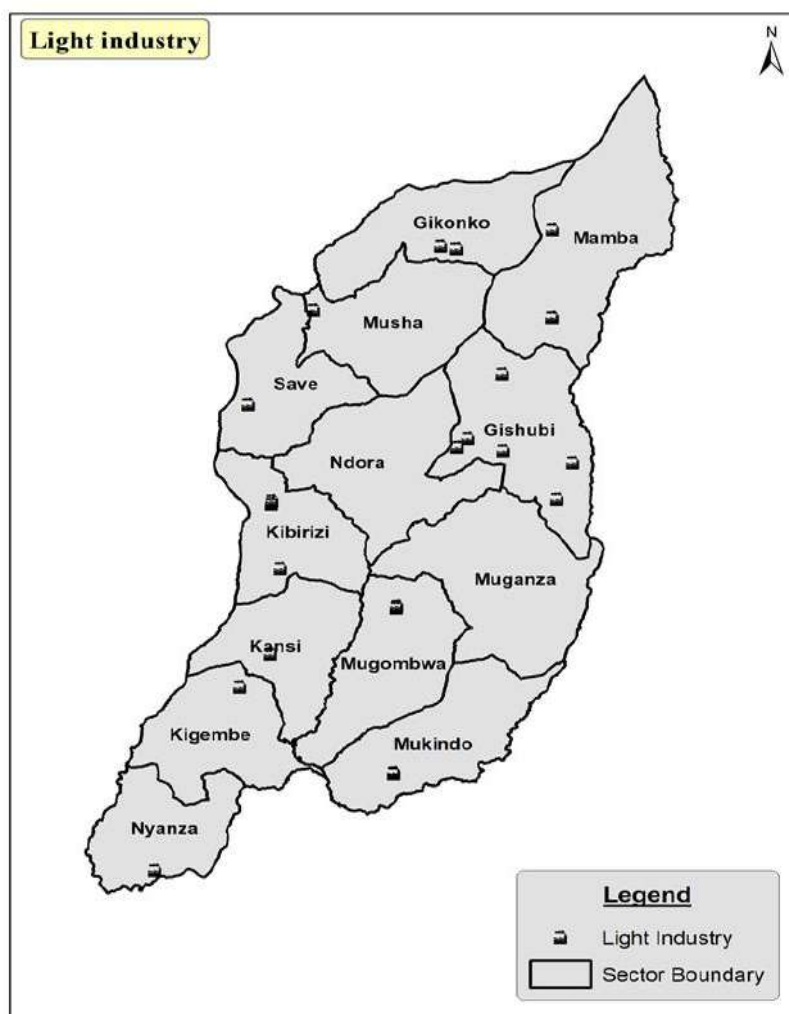


Figure 16-Planned Light Industry in Gisagara District

4.10 District land use balance sheet

4.10.1 Existing Land Use Balance Sheet

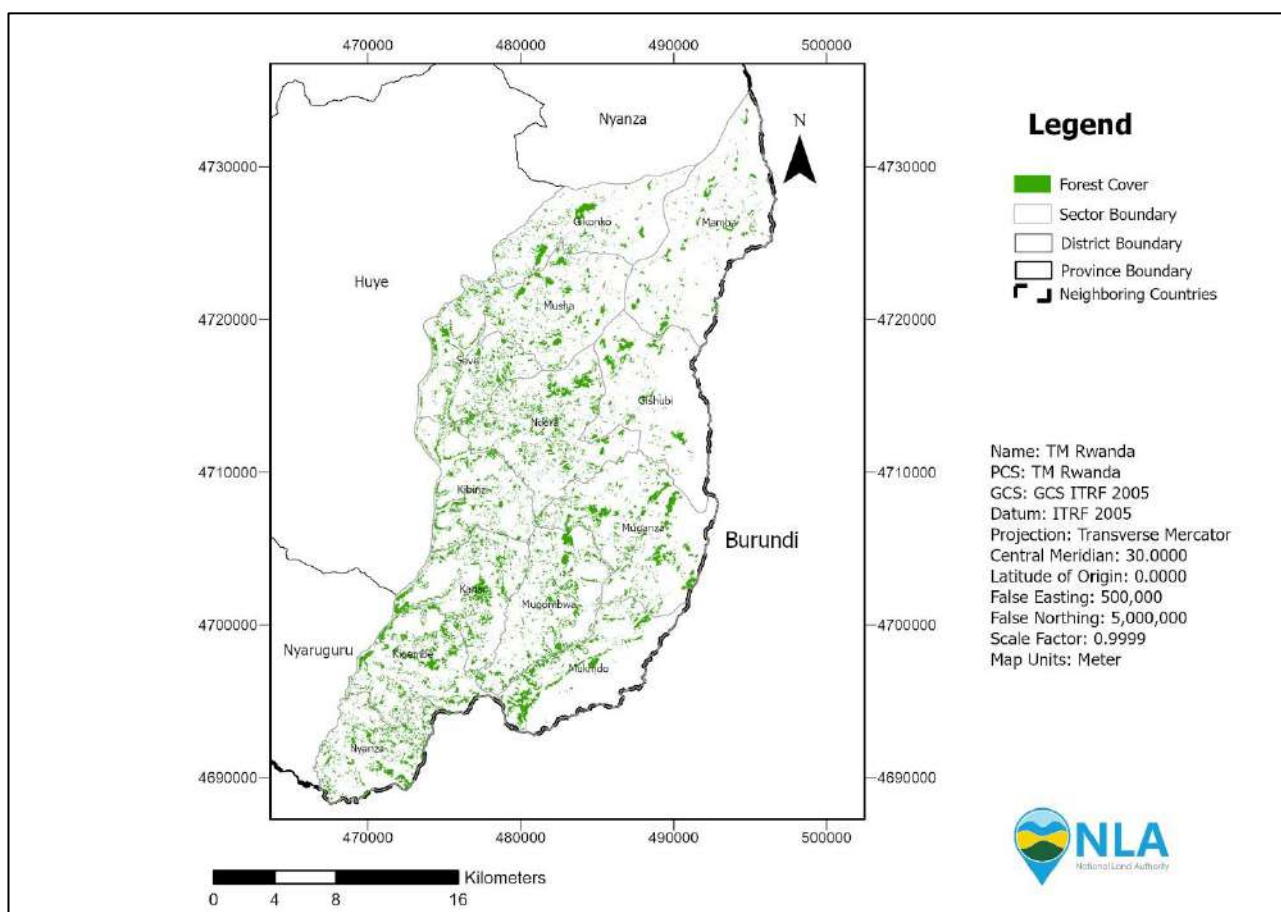
○ Forest Cover

The Ministry of Environment (MoE) through Rwanda Forest Agency (RFA) has produced a forest cover report in 2019 which provides for Gisagara District a total forest area of 9,021 Ha including forest plantation; most important area, predominant with 91% of total forest use/cover; natural forest occupying only 0.07%; shrubs and wooded savannah totalizing alone 8.8%. The total area covered by the forest in Gisagara District was about 13%.

Sector Name	Total Sector land (Ha)	Forest Cover Type				Total FC (Ha)	% Forest cover
		Forest plantation (Ha)	Natural forest (Ha)	Shrub (Ha)	wooded savannah (Ha)		
GIKONKO	4,929	439	1.25	19		459	9
GISHUBI	6,143	365	5.80	26		396	6
KANSI	4,241	755		54		808	19
KIBILIZI	3,983	605		0		605	15
KIGEMBE	4,482	865		12		877	20
MAMBA	8,011	387		3		391	5
MUGANZA	7,039	566		395		962	14
MUGOMBWA	4,985	701		44	0.64	746	15
MUKINDO	5,044	567		57		624	12
MUSHA	4,977	623		11		634	13
NDORA	6,103	908		145		1,053	17
NYANZA	3,876	671		23		695	18
SAVE	4,108	761		7	0.85	769	19
Grand Total	67,920	8,214	7.05	798	1.48	9,021	13

Table 22: The forest cover types per sector in Gisagara District

The map below shows how the forest was categorized in four classes with bamboo stand. Forest plantation dominates the western part of Gisagara District while shrubs occupy a small area mainly in Muganza Sector, in the east and a very small proportion in Ndora Sector. Gishubi Sector keeps a very small natural forest.



Map 16-Gisagara District forest cover map 2019

The exercise of mapping and spatial analysis conducted during Gisagara DLUP elaboration brought small changes on the proportion of existing forest zone in Gisagara District, given that the mapping was done following NLUDMP 2020-2050 recommendations regarding the conversion of shrub lands and wooded savannah into agricultural lands. In addition, scattered settlement, data harmonization process has obviously led to clean data and remove some areas found not suitable for forest. Consequently, forest cover has reduced from 13% to 11.3%.

Gisagara as a rural District, is characterized by a predominance agricultural land both on hillside (46,157.79 ha) and in unprotected swamplands (9015.48 ha). The total agricultural land in in Gisagara District is currently about 55,173.27 Ha.

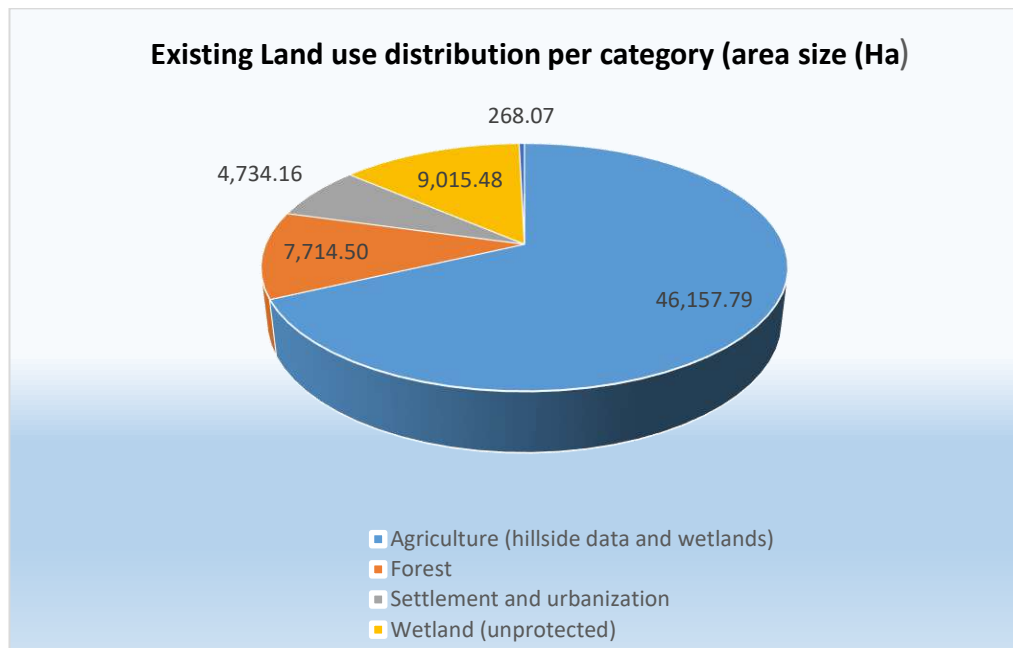
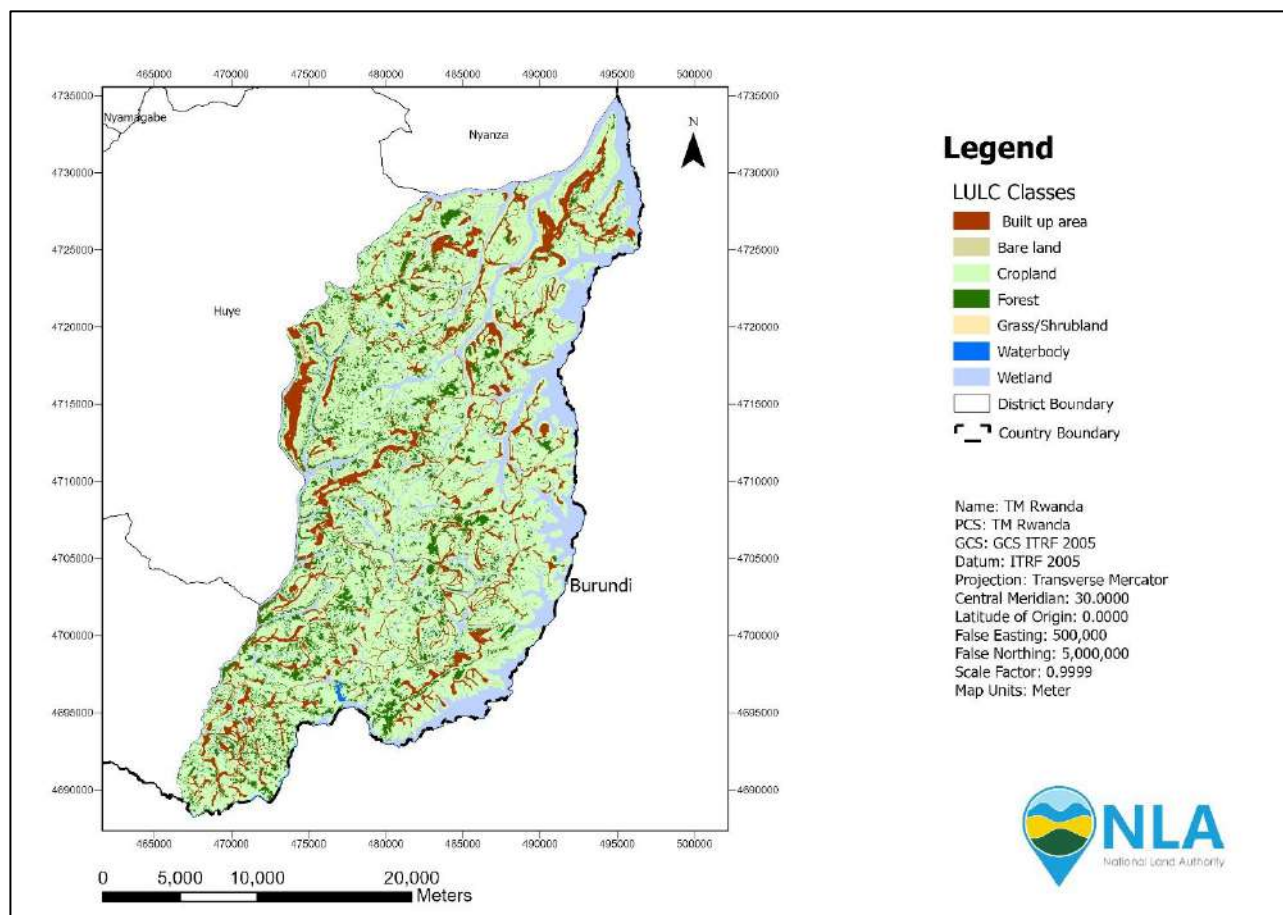


Figure 17-Land Use distribution in Gisagara District

The settlement comprises urbanized areas including sprawling urban zones and village settlements where scattered houses are generally distributed alternating with farms and forest on the whole District territory. Water body is almost absent in Gisagara District to the extent, it only covers 0.3%. The existing swamplands are all non-protected and used in agriculture, especially in growing rice and this has increased the total area reserved for agriculture.

Land use category	Area size (Ha)	Percentage (%)
Agriculture	46,157.79	67.9
Forest	7,714.5	11.3
Settlement and urbanization	4,734.16	6.9
Swampland (unprotected)	9,015.48	13.2
Water body	268.07	0.3
Total	67,890	100

Table 23: Balance sheet for Existing land use in Gisagara District



Map 17-Existing land use map for Gisagara District

4.10.2 Planned land use balance sheet

The above map indicates existing and different land uses for Gisagara District, the zoning plan is comprised of different land uses that will efficiently be implemented without overlapping each other. The zoning guidelines have been developed that will guide the users and implementers to be respected during implementation.

The table mentioned below, illustrates main land use categories and how they have changed over time in Gisagara District.

Land use category	Existing area size (Ha)	Percentage (%)	Planned Land Use 2050 (Ha)	Total Planned Land Use 2050 (Ha)	Percentage (%)	Observation (increase/decrease)
Agriculture	46,157.79	67.9	40,251	40,251	59.57	Decrease of 5,906.79ha
Forest (F1)	7,714.5	11.3	7,640	8,632	12.7	Increase of 917.5 ha
Afforestation	-	-	742			

Land use category	Existing area size (Ha)	Percentage (%)	Planned Land Use 2050 (Ha)	Total Planned Land Use 2050 (Ha)	Percentage (%)	Observation (increase/decrease)
Settlement and urbanization	4,734.16	6.9	8582.6	8,582.6	12.6	<i>Increase of 3,848.4</i>
Swampland (unprotected)	9,015.48	13.2	8,991.6	10,760.9	15.8	<i>Increase of 1,745.4</i>
Swampland Buffer zone	-	-	1,769.3			
Water body	268.07	0.3	154.4	161.6	0.2	<i>Decrease of 102.47</i>
Water body buffer	-	-	7.2			
Total	67,890	100		7,421	100	

Table 24: Balance sheet for planned land use vs existing land use in Gisagara District

A slight analysis is brought to the table provided above:

Two zoning areas which are agriculture and water body zones are expected to reduce in the future land use. The reason for agricultural land reduction (decrease of 5,906.79ha) may be justified by the fact that:

Some old agricultural zones have been qualified suitable for forestry and they are proposed to be planned for afforestation. Thus, an area of approximately 742 Ha will be converted into forest cover. The NLUDMP 2020-2050 has recommended new settlement boundaries larger (8,582.6 Ha) than existing built-up areas (4,734.16 Ha) which were scattered mostly inside agriculture lands. They also reduced hillside agricultural land area.

Therefore, the use of all unprotected swamplands as well as their buffers was also reserved for agriculture practices, and this will increase considerably the size of lands to be used for agriculture and livestock by 2050.

Another area of decrease identified was water body. Gisagara is normally crossed by few rivers but it does not have any lake. The balance sheet mentioned above stipulates a reduction of water body zone from 268.07 Ha to 161.6 Ha by 2050; the reason of this reduction remains unknown but thought as a climate change effect.

The forest areas are currently found at 7,714.5 Ha; after cleaning and harmonizing with other land uses based on NLUDMP 2020-2050 recommendations, the forest zone reduced a little bit to 7,640 Ha. However, 742 Ha to be afforested will increase the forest area by 2050 which will increase to 8,632 Ha or 12.7%

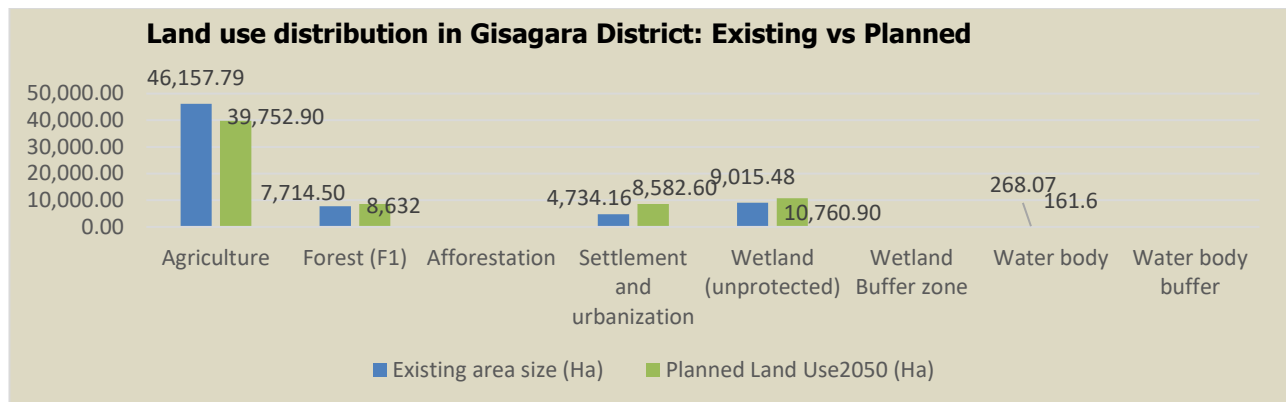


Figure 18-Existing vs the planned land use for 2050

As it is seen in the previous paragraphs, the proportion of forest as reported by RFA (13%) decreased slightly to remain 12.7%; almost the same cover. This is not surprising because it was learnt that the national policy recommended national forest cover at 30% in 2020 and the forest mapping report showed that the target was achieved (30.4%) which means that Gisagara forest cover is part of the national coverage and only some recommended areas such as high slopes more than 55% can be afforested as well as deforested areas which must be reforested.

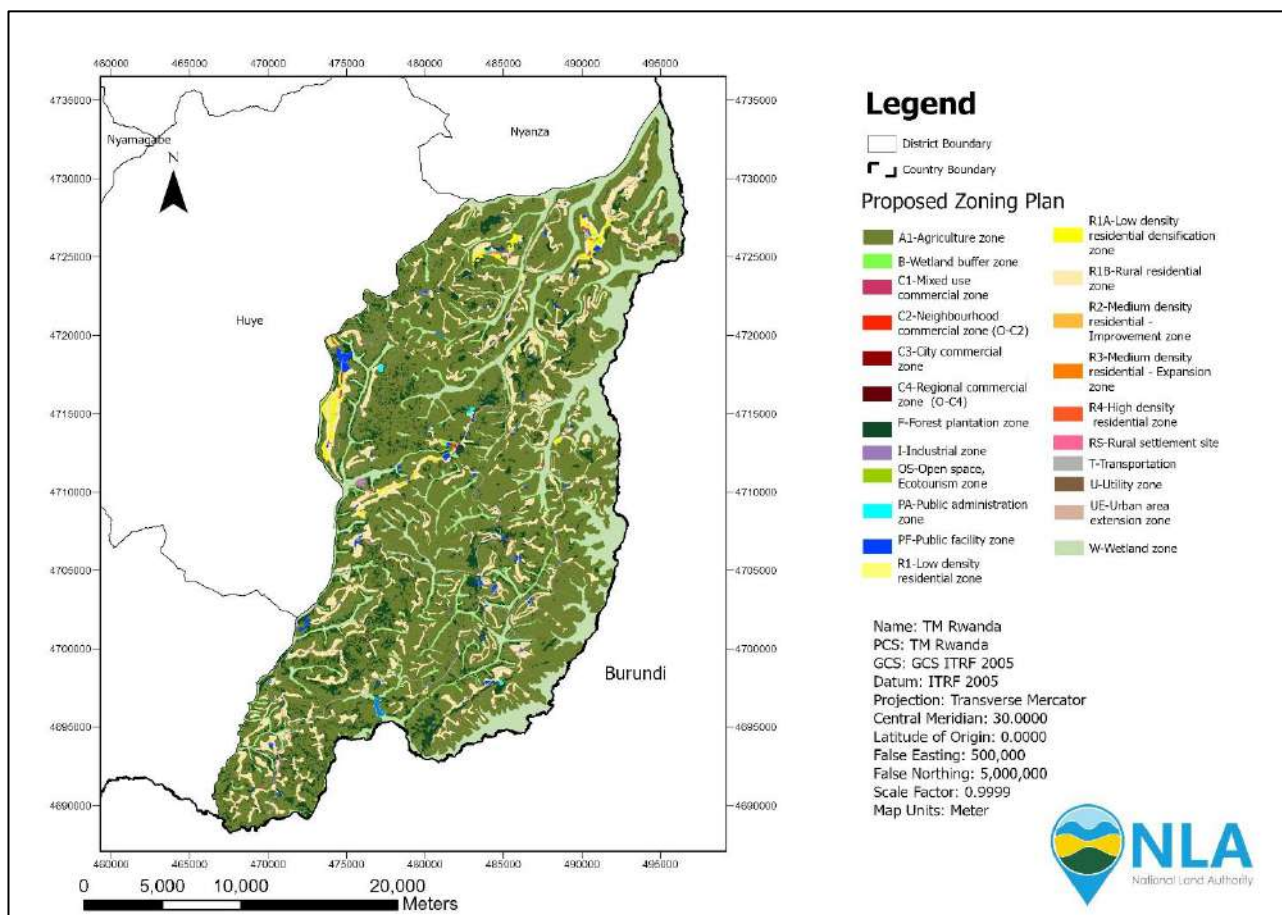


Figure 19-Map of Planned Land Use in Gisagara District

The above map above indicates proposed land uses for Gisagara District, the zoning plan is comprised of different land uses that will efficiently be implemented without overlapping each other. The zoning guidelines have been developed that will guide the users and implementers to be respected during implementation.

5 IMPLEMENTATION FRAMEWORK

5.1 The new structure of planning and implementation

In order to facilitate the development of Gisagara DLUP, implementation strategies were proposed to guide and realize the vision of Gisagara. Several key master plan implementation strategies were discussed, in consideration of the specific implementation issues faced by Gisagara at present and the possible challenges that the master plan could encounter. An integrated implementation framework is proposed that covers four key pillars:

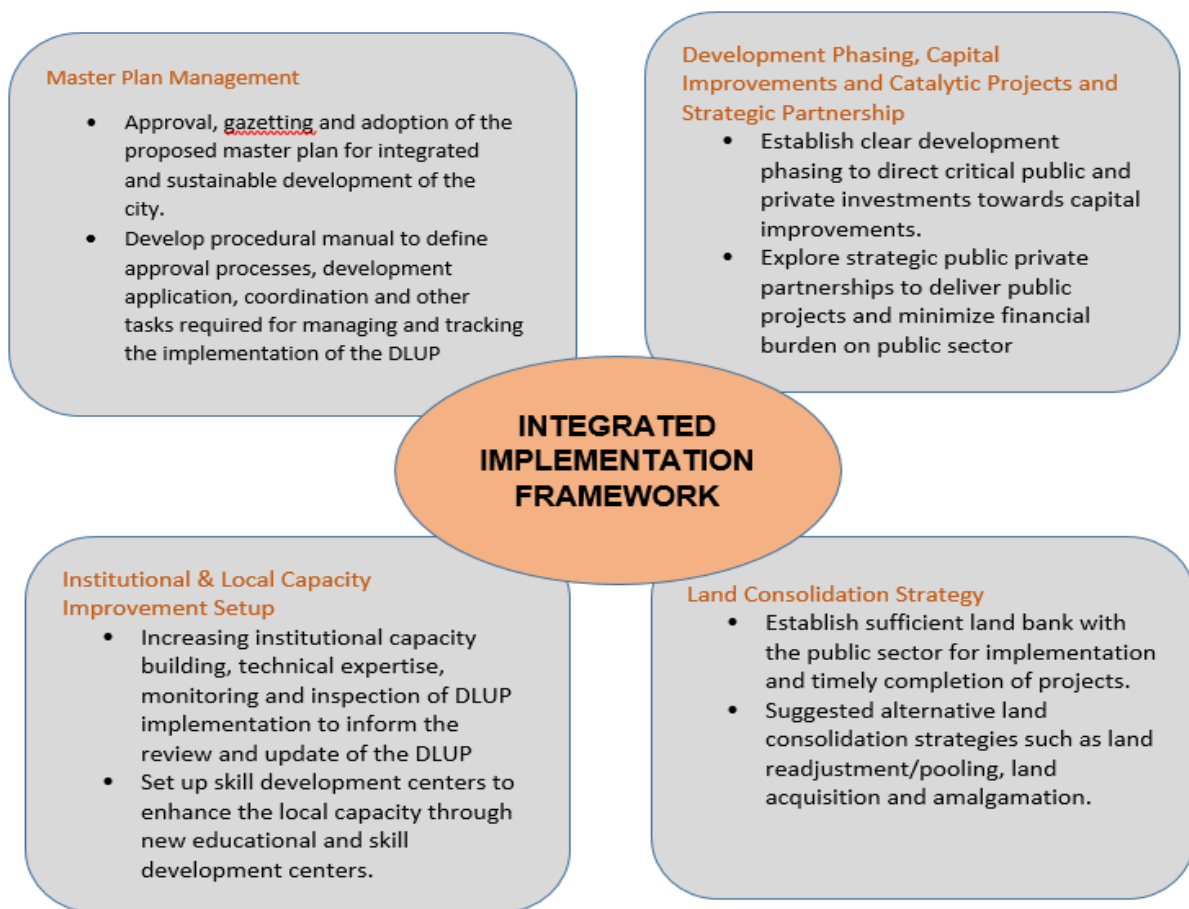


Figure 20-Integrated implementation framework for Gisagara DLUP

5.2 Existing laws and enforcement

The design and implementation of land use plans in Rwanda align with the provisions of the National Constitution of 2003 as amended in 2015 especially in its articles 6, 11, 34, 35 and 48, as well as other national development policies such as the vision 2050, NLUDMP 2020-2050, National Strategy for Transformation NST1-2018/2024, the decentralization policy of 2002 as revised in 2013 and the urbanization policy (2015) to cite but a few.

The following legal instruments shall guide all activities aimed at initiating and implementing land use plans;

- Law N° 27/2021 of 10/06/2021 governing land;
- The Law N°10/2012 of 02/05/2012 Governing Urban Planning and Building in Rwanda;
- The Ministerial Order N° 05/Cab/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;
- The Ministerial Order N° 03/CAB.M/019 of 15/04/2019 determining urban planning and building regulations;
- The Ministerial Order N° 006/MoE/22 of 12/05/2022 on land registration.
- Prime minister's order no 022/03 of 12/08/2022 governing registrars of land titles;
- NLUDMP 2020-2050;
- Participatory Land Readjustment Guidelines first edition of 13th October 2021
- The Kigali Master Plan 2050;
- DLUPs;

The current legal structure does not provide sufficient tools for implementation. The deficiencies are:

- The Rwandan legal system for planning is incremental, with some existing coordination gaps that can hardly support the land-use master planning and integrated planning.
- Under the current law system, each District Council is empowered to develop its land-use plan engineered by its economic development and poverty reduction strategy, but without any compliance control of the national Land Use and Development Master Plan.
- The law on land use planning, passed in 2012 remains silent on national co- ordination.
- Substantive rules govern each component of the spatial planning separately: the law governing modalities for protection, conservation, and promotion of environment, the law governing human habitation in Rwanda, urban planning law and its orders, special economic zone law, condominium law, many other conflicting relevant laws and ministerial orders in different sectors, and national policies and directives that may affect the implementation of the National Land Use and Development Master Plan.
- There is no top-down legal hierarchy in the land-use master-planning process and regular review of the same. There is still standalone planning, based on sector goals and plans, not an

integrated perspective.

- The Government has identified the structural inadequacies that have led to un-coordinated land use planning and management. A new land law reform was developed to prevent the current highly decentralized Government structures of land use development.
- Strengthening the legal and institutional framework is necessary to support the effective implementation of NLUDMP 2020-2050 and DLUP as well. The new land law and its proper orders would be able to be a sole legal tool to govern the land use planning in Rwanda. All other conflicting laws and policies should be repealed. The institutional reform should strengthen the institution in charge of land use management to be able to do oversight for land use planning and management.
- The Government has identified the structural inadequacies that have led to un-coordinated land use planning. The new Land Law reform which holds the view to change legal procedures and prevent the current highly decentralized Government structures of land use master-plan.
- The draft land law that is currently undergoing legislative process enshrines provisions for land use planning and management. It creates a legally supported and structurally implementable land use master-planning, allowing an overarching plan to guarantee optimal usage of the Rwandan land resources. The draft should be expedited, and the law promulgated to give legal credence to the land use master-planning and its on-going review/overhaul.
- The draft land law provides for penal sanctions, which are aligned to penal code provisions.
- There is a need for a review of all other relevant laws and regulations, including those that vest powers into institutions and organs to plan and manage land use. Such acts should be harmonized with the land law and other rules that are relevant for a nationally coordinated planning and management of land use across all sectors.
- NLUDMP 2020-2050 has evaluated the draft law and suggested some amendments and comments reach a proper alignment with the national plan.

From the above deficiencies the following conclusions may be drawn:

- ✓ Legal requirements and responsibilities for maintaining and revising NLUDMP 2020-2050 should be defined legally in the law and all other policies and regulatory frameworks should be harmonized with this national plan.
- ✓ The approval procedure and responsibilities in the current legal instruments are not aligned with the specific recommendations in this report. A harmonization of laws is needed.
- ✓ The law does not speak of the option that the central government can initiate District or local

plans by itself or orders local governments to prepare them.

- ✓ The proposed principle of District Plans Clusters should be anchored in the law.
- ✓ Consolidation principles in land use planning are directed in the law towards agriculture only. It should be applied to the context of Urban and Rural settlement planning as well.

5.3 Legal and institutional framework

The institution in charge of land use management and National Spatial Planning (NLA) under the Ministry in charge of Environment (MoE) in a strong linkage and collaboration with a Ministry in charge of Finance and Economic Planning (MINECOFIN); both should be responsible and coordinate and approval the planning compliance of land use. The NLUDMP 2020-2050 implementation is the role of other relevant technical sectors and local governments (Districts). An institution in charge of land management and National Spatial Planning (NLA) will be responsible for the monitoring of the compliance and implementation of NLUDMP 2020-2050 through other lower-level land use plans. The real-time tracking using systems and ortho-imageries is recommended.

The land law provides for an organ in charge of land inspection to ensure that land allocated is put to the intended usage within the prescribed tenure. All other ministries should mostly follow and respect instructions from MINECOFIN and MoE regarding land use management.

Continuous planning from the national to lower levels is required to actualize development programs and budgets to implement the NLUDMP 2020-2050.

5.3.1 Distribution of responsibilities among concerned institutions

- Strengthening the legal and institutional framework is necessary to support the effective implementation of NLUDMP 2020-2050. The new land law and its implementation orders would be able to be a sole legal tool to govern the land administration and use in Rwanda. All other conflicting laws and policies should be repealed. The institutional reform should strengthen the institution in charge of land management to be able to do oversight for land use planning and management.
- NLUDMP 2020-2050 proposal is to upgrade and strengthen technically and financially the institution in charge of land management (currently NLA) and Districts/CoK. MoE/NLA will become the high-level authority responsible for tracking and compliance controlling of all land-use planning and its spatial implications in urbanization and settlements, Infrastructure, Energy,

Minerals, Oil and Gas, Transport, Education, Health, Agriculture, Industry, Trade, Tourism, and Housing. These operations in NLA will be established through Governmental regulations.

- MININFRA is the national level Ministry responsible for policy development and supervision of the urban planning, housing, meteorology, and major infrastructure areas including transport, energy, water and sanitation. In addition to Rwanda Housing Authority (RHA); Road Maintenance Fund (RMF), Rwanda Civil Aviation Authority (RCAA), Rwanda Energy Group (REG), Water and Sanitation Corporation Ltd (WASAC), Rwanda Transport Development Agency (RTDA) and Rwanda Maintenance Fund (RMF) are the agencies and companies under MININFRA responsible for major physical infrastructure.
- Many other agencies such as National Land Authority (NLA) under Ministry of Environment (MoE), Rwanda Development Board (RDB), Rwanda Utilities Regulatory Authority (RURA) under Ministry of ICT and Innovation (MINICT), Rwanda Energy Group Limited (REG), Rwanda Transport Development Agency (RTDA), Water and Sanitation Corporation (WASAC), Road Maintenance Fund(RMF) under Ministry of Infrastructure (MININFRA), Local Administrative Entities Development Agency (LODA) under Ministry of Local Government (MINALOC), Rwanda Cooperative Agency (RCA), National Industrial Research and Development Agency (NIRDA) under Ministry of Trade and Industry (MINICOM), etc., are involved in related urban sector developments.
- Additionally, the district works closely with the Ministry of Finance and Economic Planning (MINECOFIN) to secure central funding for implementation of public projects.
- Local Administrative Entities Development Agency (LODA) within MINALOC is also responsible for financing the development activities of the districts, and is acting as the intermediary between local government and donors, as well as providing support in strengthening the capacity of local governments.
- The implementation of major infrastructure in Gisagara District is done by the following institution and private sector/various stakeholders as follow:

5.3.2 Transport infrastructure

- Rwanda Transport Development Agency (RTDA) under MININFRA is responsible to plan and implement national and District roads, railway, cable car, water transport and develop public

transport service.

- Republic of Rwanda Road Maintenance Fund (RMF) is established to receive, manage and disburse funds for the maintenance of Class 1 national, District and Kigali roads.
- The Ministry of Justice through the Rwanda National Police has the responsibilities of enforcing traffic laws and regulations.
- Additionally, Rwanda Regulatory Authority (RURA) regulates and licenses certain public utilities including transport.

5.3.3 Power supply & ICT

- The Rwanda Energy Group Limited (REG) maintains and operates the energy infrastructure in Rwanda through its two subsidiaries, the Energy Utility Corporation Limited (EUCL) and the Energy Development Corporation Limited (EDCL). EUCL is the trading arm that serves Rwanda's electricity customers, while EDCL focuses on developing new energy generation and transmission projects.
- ICT services are provided and managed by numerous private companies in Rwanda.

5.3.4 Water supply

- Water and Sanitation Corporation (WASAC) is responsible for potable water supply and management in the urban and some rural areas of Gisagara District. There are also a number of private operators in this sector that are supplying to the local population.
- Operations and maintenance of rural water supply systems and schemes located in different parts of the district are carried out by cooperatives and private companies coordinated and organized by the district. There is a great need to better manage water supply in the Gisagara District, to protect the water resources and to reach long-term sustainable development with 100% water access for the local population. The existing network and treatment plants should be restored to full functionality and all households with access to the networks should be connected.
- Farmers should be educated to use drip irrigation systems and such equipment should be locally manufactured. Modern irrigation systems and improved management of irrigation projects

should be introduced. There should be a focus on increasing production per unit of used water. Economic incentives could be used to enforce desired changes in irrigation and cultivation methods.

5.3.5 Minor infrastructure development

- The Ministry of Local Government (MINALOC) is responsible for the planning, development, and maintenance of transport infrastructure and services within local authorities.
- In the existing set-up, District Infrastructure One Stop Centre has appointed personnel for road development and maintenance, and most of the utilities infrastructure, except waste management.
- Implementation of minor transport infrastructure development such as planning of road construction, supervision and road maintenance are done by Gisagara District. Local roads are planned and implemented by the district depending on the available budget, which usually is very limited.
- Planning, supervision, inspection and maintenance of other minor utilities infrastructure such as water and sanitation works, and street electrification and public lighting are also handled by the Gisagara District.
- In addition to the above agencies, local community companies provide support in small hydropower projects. Considering the multiple authorities and stakeholders involved in central, local and community level, there remains a challenge in coordinating development amongst all stakeholders.

5.3.6 Strategic developments

At present, strategic projects are planned, promoted and developed by relevant sector Authorities and Ministries.

While most of the strategic projects are currently being taken up through government initiatives, there is a need to attract private investments and partnerships to reduce the burden on limited government resources (Public Private Partnership). Another hurdle in implementing strategic projects are assurance of infrastructure provision and the right skilled human resources and labor force required to support the new economic activities.

5.3.7 Affordable housing

With regards to Affordable Housing, RHA is responsible for providing affordable housing. Affordable housing initiatives which are critical in the Gisagara urban area are not available at this point. IDP villages are planned together by the district and RHA mostly in peripheral rural areas, and the approval of individual development is decentralized to the Cell offices.

5.3.8 Public facilities & open spaces

Public facilities including TVET, markets, cultural center, and development of public spaces, health centers, schools, and sports up gradation projects are planned under the district Development Plan for implementation over the seven year planning cycle. The implementation of some of these facilities such as educational institutes and the health centers are implemented by the respective Ministries following their standards and the approved guidelines by One Stop Center. Some of the parallel issues faced for implementation of these projects include limited public land, and funding.

5.3.9 Development control, development application and approval

Development control and development application approval is managed by the district's Infrastructure One-Stop Centre (OSC), which is responsible to handle all construction permits in the district through its online permit system. The OSC is positioned under the district Council and acts as the coordinating agency for urban development in Gisagara District.

Under the current policy framework, and due to the lack of dedicated planners, zoning plan and regulations, the development control and approval process rely on the planning team under RHA for larger commercial, and mid-rise developments. Building permits for smaller residential buildings (200 sqm) are issued by OSC based on the checklist developed in line with Kigali zoning parameters.

Larger developments in the present scenario are required to clear the non-objection from RHA.

For any change of land use especially from agriculture to other uses District is required to seek non-objection from NLA. This process is put in place to minimize loss of agricultural land; the process is highlighted to remain unchanged at this point, due to the national intention to protect agricultural land.

There is an ongoing proposal by the Ministry of Local Government to change the organization structure of Districts with secondary cities. Under this proposal, the City Management Office (CMO)

will be the key entity to manage the development in urban boundaries. The CMO will be led by the City Manager and will have a Strategic Urban Planning Unit (SUPU) and City Development and Delivery Unit (CDDU). Under this structure, CMO is understood to be working with District One Stop Center.

However, the details on whether the development applications will be reviewed for District and City by existing One Stop Center or be built into the CMO is not yet elaborated.

With the existing/proposed institutional framework, there are some overlapping roles between certain agencies, which creates inefficiencies in resource utilization, and needs to be improved in the future.

5.4 Phasing Plan 2020-2035

According to NLUDMP 20-2050 implementation strategies, to avoid settlement sprawl and to promote urbanization consolidation, District land uses plans will be elaborated in 2 phases, 2020-2035 for phase 1 and 2035-2050 for phase 2

Phasing of Development is part of all land-use plans provisions and elaborated based on the local context. The leading spatial principle in phasing is Tiling, which simply prevents random and remote locations of development. A new development site must always have a common boundary with a previous one, as shown in the figure below;

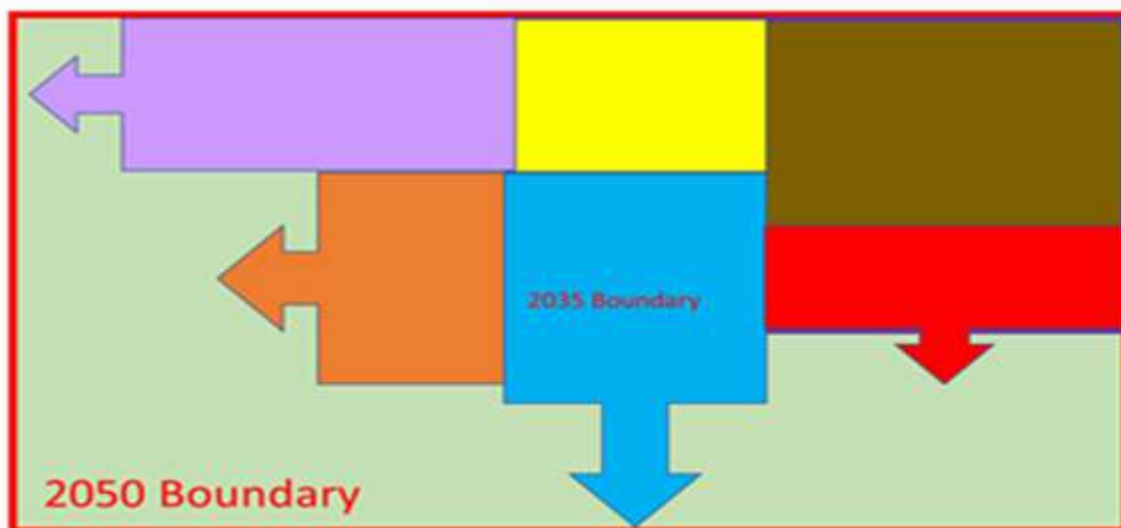


Figure 21-Phasing implementation strategies

Every settlement land use master plan must demonstrate where implementation will focus every 5 years, after which evaluation will be conducted before opening the next phase. The evaluation report of each phase would be presented to institutions in charge of land management and urban planning

(NLA) and relevant stakeholders to be a learning and decision-making tool before moving forward to implement other sites of the next phase of development.

The construction permits will be issued only in phase1, to avoid urban sprawl and to promote densification until phase 2 will have basic infrastructure enabling construction projects to be developed thereon. Big projects/Investments are however prohibited to provide construction permits in Phase II, for big projects like schools, healthcare facilities, real estates, apartments, hotels, complex markets, etc, can be assessed by Gisagara District One Stop Center for permission in phase II, if investor can develop basic infrastructures himself. Phase II: The construction permits will be allowed in this phase after development of detailed physical plans and distribution of basic infrastructures like electricity, water, drainage network etc.

5.5 Zoning regulations

5.5.1 Objective of the zoning plan and regulations

The objective of the *Zoning Regulations* is to provide a clear mechanism for the implementation of CoK and Districts land use plans and to direct public and private sector development to follow a clear set of development objectives, definitions, regulations, and guidelines that reflect the vision and concept proposed in the Master Plans. The objectives, definitions and regulations ensure that development is carried out to achieve a logical, attractive, and liveable development pattern in the Cities, safeguard privacy and amenities, and provide opportunities for growth, with enough flexibility to respond to changing business needs and development trends.

The regulations place an emphasis on encouraging mixed-use mixed-income development for integrated, well connected, inclusive, and equitable development that are sustainable and are designed to achieve a quality living environment.

5.5.2 Zoning plan and zoning regulation

Zoning regulates the types of uses, the development intensity, the required density, the setting, and height of buildings on any plot. As such, it serves as an effective planning tool to guide development in a logical and orderly fashion. The Zoning Plan is meant to provide landowners, developers, and stakeholders with a clear picture of what can and cannot be developed on any parcel of land.

The Zoning Plan is made up of a Zoning Map and a set of Zoning Regulations. The Zoning Map identifies specific zones within the planning area based on the predominant land use, and the desired

intensity, building height and density for that area.

The Zoning Regulations stipulate the permitted, conditional, and prohibited uses, location of a building on any plot, the overall maximum intensity, as well as the building height. Specific regulations related to overall building form, landscaping, development strategy and signage are also stipulated in the Zoning Regulations. Zoning Regulations stipulate allowable development for a zone, but flexibility in development is ensured by allowing incentives such as additional GFA, promoting inclusionary zoning, incremental / phased development.

The Zoning Regulations tabulate the uses into three categories: Permitted, Conditional and Prohibited uses.

Permitted Use: Uses that comply with the intended use for the zoning code and can be permitted outright. However, the development shall comply, when relevant, with other context specific additional regulatory restrictions such as Urban Design Guidelines, Overlays, Heritage, and Conservation guidelines.

Conditional Use: Conditional uses are usually activities that may create significant traffic, noise, or other impacts on the surrounding neighborhood. Such identified uses can be permitted “conditionally” within a zone following the assessment of CoK and Districts’ One Stop Centre’s approval. OSC may require the development to conform to a set of conditions and standards as per the regulations which must be met always. Each zone can allow different but compatible developments that are complementary in terms of use and scale. For example, a small-scale commercial development could be allowed in residential areas to provide convenience for residents to meet their daily shopping needs. Similarly, Civic facilities like schools, day care centres, religious facilities could be allowed in a residential zone, provided the facility meets the parking, noise standards etc. Such conditional uses could be permitted after careful consideration and evaluation by the One Stop Centre of CoK and Districts and may be subject to certain conditions as deemed necessary by the review committee, to ensure that the overall planning intention for any specific is not compromised.

Prohibited Use: These are uses that are deemed prohibited and include activities that have been found to be incompatible with the zone. For example, Heavy Industrial Uses are prohibited within the residential zones.

Overlay Zones: Within these Zoning Regulations, overlay zones provide more discretion and

flexibility by allowing the City to protect certain areas as well as encourage or discourage certain types of development. Overlay Zones are mapped zones superimposed over the established zoning and can be used to impose supplement restrictions, permit, or disallow various forms of density as well as provide bonuses and incentives to achieve the desired planning intent for that area. The parcels within the overlay zone will be thus subject to the regulations of the underlying zoning as well as the overlay zoning requirements. An overlay zone can cover more than one zone and even portions of several underlying zoning. The Steep Slope Overlay Zone, Urban Design Overlay, Heritage and Conservation Overlay are examples of Overlay Zones.

5.6 Land readjustment (detailed physical plans)

It is of utmost importance to prioritize the development of the detailed physical plans, land readjustments and site servicing to ensure that the implementation is properly guided.

These physical plans are prerequisite plans for construction permits. The specialty of these plans is in establishing new lots for construction and development.

Land readjustment coupled with detailed physical plan of existing plots are recommended during implementation of Gisagara DLUP 2023-2050 to assure rational development. Where the plots are of different quality or value, area or value adjustments are made. The underlying principle is that every owner must be compensated for their land with the land of equivalent value. The readjustment of the land transforms the irregularly shaped plots into regular and standard shape land with access to infrastructures such as roads, electricity, water, schools, hospitals and other services, which contributes to the value of the land in any specific area. Statutory phasing in each land-use plan will be compulsory. The leading idea in phasing is Tiling, which prevents random or remote locations of development. Each new phase must attach the previous stage geometrically.

The communities who are the landowners must be willing to participate in all phases from beginning to the end including elaboration of detailed physical plans, data collection and all mapping and site demarcations exercises until the assignment is completed and approved, being provided by in-depth advice of planners and appraisal experts. A land readjustment map and appraisal documents must be approved together with the concerned detailed local plan as The details local plans to approve should be clarified here: for example, to show if detailed plans are the one existing, already elaborated by the district before or those elaborated by the team having worked on DLUP one unit. Alternatively, simplified voluntary land exchange processes shall be introduced. A readjustment is an essential tool for land consolidation and orderly development.

Gisagara District communities should have ownership in all phases and must contribute as well as ensuring compliance during development. Any conflicts and disputes that may occur in the process should be resolved between landowners, the site committee established, local Village Chiefs and Cell Leaders. There must be established guidelines for local physical plan development procedures and implementation, roles and responsibilities for local communities, the site committee, local authorities and the consultants or experts developing the neighborhood planning site. Therefore, community approach is part of Gisagara DLUP 2023-2050 for its successful implementation.

5.7 Capital improvement projects & catalytic projects

5.7.1 Transport infrastructure

Road infrastructure is the most important means of transportation in Gisagara District and a significant contributor to socio-economic development. The district has a very dense classified road transport network consisting of National and District roads and a dense unclassified feeder road network. The average road network density for the entire country is estimated to be about 3km/sqKm. The high rainfall regime, topography and rolling terrain in Gisagara cause erosion on the roads to be very severe, increasing maintenance frequencies, which subsequently increase road maintenance costs. The importance of road maintenance is well known and understood, and the district authorities have placed high emphasis on the development and maintenance of roads in the district as a vehicle for socio-economic development. The district together with RTDA are planning the construction of the road Nyamiyaga-Ntyazo-Nyaruteja-Akanyaru Bas (KABAS) that will serve as the eastern corridor of the district connecting the central part of the Country and the neighboring Country (Burundi). In urban area, there is a plan of construction of deviation road for main road DR 104 (Gisagara-Huye-Nyakibanda-Nyagisozi) toward the town centre at GS St Phillippe Neli up to District Office in order to avoid the destruction of the current CDB and market.

5.7.2 Power supply infrastructure

A reliable supply of energy is a basic prerequisite for economic development and improvement of living standards for all. Energy is a requirement for cooking and lighting homes, but also as electricity for running machinery and equipment, for powering healthcare facilities and schools. No country has had sustained development without a corresponding increase in energy demand per capita.

The Energy Sector Strategic Plan (ESSP) for 2018/19-2023/24 laid down sufficient electricity supply is vital to economic growth and expanding household electricity access. The diversification of power sources will continue, with further peat-to-power and methane gas-to-power capacity planned, and

the potential for solar, wind and geothermal to be further explored, alongside additional hydropower projects. This will reduce the use of expensive and polluting diesel generation and will enable the Government to lower the long-term cost of service and work towards a cost-reflective consumer tariff.

Access to electricity has increased significantly in recent years, to 34.5% as at June 2017, and by the end of the NST-1 period will be at 100% for households. Expansion of the grid will continue through the Energy Access Roll-out Program (EARP), with 52% of households connected to the grid. It is expected that 48% of all households will have their electricity needs met by off-grid solutions by 2024.

Rwanda plans to reach 100% electrification target by 2024. The rate of access to electricity in Rwanda has increased to 60.9%, including 45% of households connected to the grid and 15.9% using off-grid solutions, mainly solar home systems.

Currently, Rwanda generates 221MW and it targets 512MW by 2024 but the country has a diverse mix of renewable sources. Hydro-power is the main contributor at 49%, followed by thermal (26%) and methane (14%) peat 7% and 4% solar energy- which is currently a new growing source of energy.

Rwanda peat study indicates that Rwandan peat bogs contain up to 155 million tonnes of dry peat covering a combined area of 50 000 hectares. About 77% of peat reserves are near Akanyaru and Nyabarongo rivers and the Rwabusoro Plains.

YUMN Ltd. is developing an 80 MW peat fired power plant in South Akanyaru prospect in Gisagara District, Mamba Sector and the project is developed as Public Private Partnership (PPP). There is also an ongoing project of construction of electrical substation at Kibirizi that will serve in power distribution to increase the accessibility in Southern Province.



Figure 22: Peat Power plant in Gisagara District

5.7.3 ICT infrastructure

Information and Communication Technology (ICT) refers to all the technology used to handle telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems, and network-based control and monitoring functions. The ICT enables users to access, store, transmit and manipulate information.

The Rwanda market for Information and Communication Technologies is characterized by a high evolution and demand for services across the socio-economic spread of the country. Enhancement in the use of ICT requires a proper regulatory framework to create an environment that promotes public confidence and ensure stability, transparency, competition, investment, innovation, and growth in the ICT sector.

The contribution of ICT to the GDP is 3%. This share doesn't include all enabler activities of which

their calculations are somehow complicated but contributing to the development of the country. On the other hand is the cross cutting sector, which means that tracking its implementation involves various sectors since. The key sectors that use ICT in Rwanda are mainly five priority sectors namely Telecommunications, Finance, Governance, Education, Health, and Agriculture. A particular emphasis was put on tracking the current adoption and use of key ICT systems, services and solutions in the above-mentioned sectors respectively.

ICT continues to boost the growth in the Finance Sector and contributes to improving the digital inclusion in Rwanda. This is seen through the improved use of ICT for financial services delivery, the unceasingly increased number of mobile payment subscription and electronic transactions, electronic billing machines deployment, online tax payments etc. The benefits include effective and efficient processes, cashless payments, and more business opportunities.

5.7.4 Water supply infrastructure

Water is an abundant resource in Rwanda with a lot of potential for development. The water resources mainly constitute lakes, rivers, marshlands and ground water with the main source of water being rainfall. In comparison the lakes cover more area than rivers for the surface water resources. A survey of the status of water supply services and facilities, conducted by the Ministry of infrastructure in 2018 shows an increase in water supply services and infrastructure, notably the involvement of the private sector in the management of rural water supply infrastructure. Gisagara District has many water sources but the accessibility target of 100% by 2024 is not yet met. There are several projects of water supply networks construction that will facilitate the district to achieve this target by 2035.

5.8 Compliance and Monitoring

- Ensuring compliance across different planning levels is imperative. Currently, compliance is lacking, leading to numerous errors in various plans, policies, and projects. There is a noticeable absence of integration between economic and spatial planning.
- The objective of this section is to establish administrative and planning mechanisms wherein planning instructions seamlessly transfer from one level to another, akin to a relay race. Three fundamental principles characterize the team of runners: a shared objective, strict adherence to regulations, and continuous feedback collection to strategize their moves. This metaphor should serve as a guiding principle for the planning system: CCP – Continuous Compliant Planning. Embracing this principle will guarantee the smooth progression of the

planning chain. To achieve enhanced compliance within the planning system, the following measures and procedures are necessary:

- Obtaining non-objection from the Rwanda Land Authority responsible for Land Use Management, facilitated by robust coordination from MINECOFIN, will play a pivotal role in resolving coordination and compliance issues. This will necessitate technical and financial reinforcement of both institutions (Rwanda Land Authority/MoE and MINECOFIN) to function as high-level authorities responsible for monitoring and ensuring compliance with all land-use plans and projects, considering their spatial implications on urbanization, settlements, infrastructure, energy, minerals, oil and gas, transport, education, health, agriculture, industry, trade, tourism, and housing.
- Establishing the dominance of the National Land Use and Development Master Plan (NLUDMP) ensures that projects and activities of all ministries and authorities align with this overarching plan. Validation of this alignment will be jointly overseen by the Ministry of Finance and Economic Planning and the Ministry responsible for Land, through its designated institution for land use management. The national development planning and budgeting process led by MINECOFIN should guarantee that sector priorities and investments are in line with the NLUDMP.
- Strengthening the legal and institutional framework is essential to support the effective implementation of the NLUDMP. The enactment of a new land law and its accompanying regulations should serve as the primary legal instruments governing land use planning in Rwanda. Any conflicting laws and policies should be repealed. Institutional reforms should bolster the institution responsible for land use management to effectively oversee land use planning and management.
- Establishing and enforcing settlement boundaries is essential. It is recommended that new boundaries gain legal status only to meet developing needs for a specified period, such as 15 years (2020-2035). Designating land for future use may negatively impact rational development due to speculative forces.
- Each settlement master plan must outline implementation phases for the midterm (2035) without exceeding this boundary. Development phases should be adjacent to each other to create an efficient land use pattern. The long-term boundary for 2050 should be safeguarded for the next 15 years, allowing transitional land uses like agriculture or forestry/agroforestry plantation.
- Settlement master plans should indicate where implementation will focus every five years, followed by evaluation and approval before progressing to the next phase. Evaluation

reports should be endorsed by a committee comprising institutions responsible for land management and urban planning (NLA & RHA) and relevant stakeholders.

- NLUDMP recommends a 4km buffer zone around urban boundaries to restrict new settlement setups, limiting urban sprawl. Consolidated farms should be established in these zones.
- Land readjustment of existing plots is recommended to ensure rational development. Adjustment should be made where plots differ in quality or value, ensuring equitable compensation for landowners or utilizing unconventional community approaches for readjustment.
- Consolidation principles in land use planning should be applied across all levels and sectors.
- The freezing and consolidation approach over the period 2020-2050 is recommended to stabilize existing establishments and enforce consolidation in proposed urban and rural settlement sites. All public and private investments should be directed towards these boundaries.
- Consolidation of agricultural land use should be supported, accompanied by the progressive transformation of rural settlement systems.
- Utilities, public facilities, and services should be consolidated within proposed settlement sites, with a community mobilization and facilitation program established to guide the process.
- Intensification principles should be adopted, maximizing small land parcels' benefits, particularly in the tourism sector.
- Spontaneous individual construction should be discouraged, while professional real estate developers, housing cooperatives, and housing investment should be encouraged.
- Legal requirements and responsibilities for maintaining and revising NLUDMP must be legally defined.
- Regular updating of spatial data and base maps through large-scale mapping is crucial for master plan development and land use monitoring.
- A National Geoportal should be developed to host all district land use master plans for public access.
- Real-time monitoring technology, such as integrated geo-information frameworks and Earth Observation tools, should be utilized for effective monitoring.
- Building Permitting Management Information System (BPMIS) should be upgraded to support urban and rural construction permitting nationwide.

- A robust community outreach program should be organized continuously to promote proper land use practices and mobilize all levels of the Rwandan community.
- Annual Land Use and planning forums should be held for stakeholders to discuss land use issues collectively.
- NLUDMP maintenance should include monitoring feedback from lower-level planning procedures and periodic comprehensive evaluations and updates every ten years.
- Non-compliance actions should include withholding budget approval for projects not aligned with NLUDMP and taking legal and administrative steps against authorities conflicting with NLUDMP. No construction permits should be issued until NLUDMP compliance is ensured.

References

1. Rwanda's Vision 2050
2. National Land Use and Development Master Plan 2020-2050
3. National Strategy for Transformation - NST1
5. EICV 5.
6. Rwanda Revised Irrigation Master Plan
7. Gisagara District Development Strategy (DDS) 2018-2024.
9. Rwanda National Land Use Planning guidelines 2017.
10. Rwanda National Base Map 2020.
11. Rwanda Conceptual tourism Master Plan.
13. Rwanda forest cover, GIS Dataset.
14. Industrial sectoral master plan.
15. Law n°48/2018 of 13/08/2018 on environment.
16. Rwanda green building minimum compliance system, Official Gazette No. Special of 16/04/2019
17. Law n°. 27/2021 of 10/06/2021 governing land in Rwanda.
18. Law n° 55/2011 of 14/12/2011 governing roads in Rwanda as amended.

Bibonywe kugira ngo bishyirwe ku mugereka w'Iteka rya Minisitiri n° 002/24/10/TC ryo ku wa 22/08/2024 rishyiraho igishushanyo mbonera cy'imikoreshereze n'imitunganyirize by'ubutaka cy'Akarere ka Gisagara	Seen to be annexed to Ministerial Order n° 002/24/10/TC of 22/08/2024 establishing land use and development master plan of Gisagara District	Vu pour être annexé à l'Arrêté Ministériel n° 002/24/10/TC du 22/08/2024 établissant le schéma directeur d'utilisation et d'aménagement des terres du District de Gisagara
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Kigali, 22/08/2024

(sé)

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