NLUDMP-2050

RWANDA NATIONAL LAND USE AND DEVELOPMENT MASTER PLAN

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Sub-national level actors' awareness creation and outreach

Ensuring tomorrow's sustainability today!

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Acknowledgements

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Acronyms and abbreviations

CSOs: Civil Society Organizations

GCF: Green Climate Fund

GDP: Gross Domestic Product

GGGI: Global Green Growth Institute

GoR: Government of Rwanda

Ha: Hectare

MINECOFIN: Ministry of Finance and Economic Planning

MININFRA: Ministry of Infrastructure

MoE: Ministry of Environment

NLUDMP: National Land Use and Development Master Plan

NST 1:   National Strategy for Transformation (2018–2024)

RLMUA: Rwanda Land Management and Use Authority

Foreword

Rwanda's path to sustainable growth faces challenges related to population growth, which is leading to overexploitation of its lands. To respond to challenges related to land use, population growth, and development, the GoR has embarked on a long-term planning process to establish a guiding framework for proper land use. In 2011, the GoR adopted the first National Land Use and Development Master Plan (NLUDMP) which intended to guide land use in line with the national development agenda from 2011 to 2020. A revised Plan was adopted in 2021, to drive land use activities in the next 30 years.

The partnership between GGGI and the GoR is aimed at ensuring that the country's growth and development consider sustainability and green growth as core principles. Considering the great extent to which optimal and efficient land resources use is key to achieving green growth in Rwanda, GGGI worked with its partners to disseminate and create awareness on the National Land Use and Development Master Plan (NLUDMP 2050) to ensure that land uses, national and local Plans as well as any land development are aligned with the Plan. The dissemination, in 19 Districts out of Rwanda's 30 Districts, was also an opportunity to conduct physical verification for boundaries of areas earmarked for urban, rurban and rural areas – with a view to cross-check the feasibility and suitability of the areas in line with current policies, local contexts, community needs, and field realities.

GGGI believes that engagement and awareness creation are critical for proper implementation of policies, strategies and plans. It is no doubt to us that the dissemination of the NLUDMP 2050 is a major step forward in ensuring its implementation, monitoring and evaluation to ensure better land use to support Rwanda's path to inclusive, sustainable development.

Okechukwu Daniel Ogbonnaya
GGGI Rwanda Country Representative

Executive summary

Rwanda is a small landlocked country with a surface of only 26,338 km^2 and a population of approximately 12.9 million people. This population is expected to more than double by 2050, bringing the density to about 1000 people per m^2 – further increasing the pressure on land resources. Therefore, optimum use of land and adoption of green growth principles remain a burning priority for Rwanda to cope with future population trends and be able to ensure efficient land use to meet the population needs in the areas of settlements, food security, natural resources, and environmental management.

To respond to challenges related to land use, population growth, and development, the GoR has embarked on a long-term planning process to establish a guiding framework for proper land use. In 2011, the GoR adopted the first National Land Use and Development Master Plan (NLUDMP) which intended to guide land use in line with the national development agenda from 2011 to 2020.

In 2018, an assessment of the 2011 land-use Master Plan was undertaken by the Ministry of Environment (MoE), through Rwanda Land Management and Use Authority (RLMUA), jointly with key stakeholders. The assessment concluded that the 2011 NLUDMP was not aligned with the country's Vision 2050, the National Strategy for Transformation (NST1), the revised Land Law, the Secondary City development strategy, the Green Growth, and Climate Resilience Strategies as well as other key national policies, strategies and plans. Therefore, the process to revise the land use Master Plan was engaged, and the revised National Land Use and Development Plan were adopted (NLUDMP-2050) by Rwanda's Cabinet Meeting on 29th July 2020 and legally established by the Presidential Order N° 058/01 of 04/23/2021.

The adopted NLUDMP provides guidelines for effective and efficient land use at a nationalwide level to lead the country's development up to 2050. The NLUDMP (2050) identified major land consumers in the areas of Agriculture, Livestock, Wetlands, Natural Forests, Forest Plantations, Settlements, and Infrastructure.

The NLUDMP is driven by its motto, "*Ensuring tomorrow's sustainability today!*" and is built on nine aspirations reflected in the acrostic word "COPERATE" detailed as (**1**) Consolidated development; (**2**) Orderly planning; (**3**) Openness for innovation; (**4**) Preservation of nature; (**5**) Economic yields; (**6**) Rational urbanization; (**7**) Ambient services, education, and healthcare; (**8**) Transportation for all; and (**9**) Employment all over.

Considering that the highest population growth rate was observed in the City of Kigali, the NLUDMP-2050 proposed alternative solutions including establishing Satellites and Secondary Cities as centers of growth to curb rural migration to Kigali. Three Satellite Cities namely, Rwamagana, Bugesera, and Muhanga are expected to accommodate between 800,000 and 1 million, which were identified. In the same perspective, eight (8) Secondary or Peripheral Cities with a projected population capacity of between 300,000 – 650,000 people were identified and are expected to serve as cross-border and trade hubs due to their strategic locations linking Rwanda to neighboring countries. The Secondary Cities' policy is to be implemented in two phases including the first phase covering five Cities (Musanze, Rubavu, Rusizi, Nyagatare, and Huye) and three in the second phase (Karongi, Kayonza and Kirehe).

To ensure effective implementation, the NLUDMP-2050 provides for awareness at all levels including mainly decentralized entities and other stakeholders. The awareness is expected to serve as a strategic channel for different government entities as well as other stakeholders to understand the land-use Master Plan and to mainstream it in their respective plans.

To this end, RLMUA in collaboration with the GGGI and Rwanda Environment Management Authority (REMA), through the Green Climate Fund (GCF) Readiness Support to Capacitate Rwanda's Subnational Level Actors in Green Growth and Climate Resilience project conducted dissemination of the NLUDMP-2050 to raise awareness of all stakeholders at District level.

The dissemination was carried out in 19 districts: Ruhango, Nyamagabe, Muhanga, Kamonyi, Burera, Gakenke, Musanze, Rulindo, Nyabihu, Rusizi, Nyamasheke, Karongi, Ngororero, Rutsiro, Bugesera, Gatsibo, Ngoma, Kirehe, and Nyagatare.

During the dissemination campaign, the NLUDMP-2050 was presented and explained to leaders and technical staff as well as stakeholders at the District level for them to understand key provisions and provide them with basic knowledge, understanding, and skills for the proper implementation of the Master Plan. The dissemination was attended by members of the District Executive Committee, Councilors, Staff of District's One Stop Centers, Executive Secretaries of Sectors and Cells, Sector Land Managers, and other relevant stakeholders including select members of the Private Sector Federation and representatives of Civil Society Organizations (CSOs).

In addition to presentation and training on NLUDMP, the dissemination campaigns provided an opportunity for field exercise to be able to physically verify settlements' boundaries both in urban and rural areas. As a result of field verification, settlements' boundaries in all Districts were updated to match the realities on the ground.

The dissemination campaign was a success as it provided the required knowledge for local leaders to align the NLUDMP with District development strategies and plans. It is indeed worthy to underline that continued awareness and capacity building are still needed to reach out to all concerned stakeholders at all levels and citizens to ensure effective implementation of the NLUDMP-2050. Targeting: There is also a need to develop and distribute user manuals and summarized versions of the NLUDMP (preferably in Kinyarwanda) to facilitate better awareness of implementation at local levels.

Volcanoes National Park, Rwanda
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via Wikimedia Commons

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GENERAL INTRODUCTION

Nyungwe park, Nyungwe, Rwanda
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1.1 Introduction

In January 2011, the GoR adopted the first version of the NLUDMP to determine the actual land use and prepare for the efficient use of land resources and facilitate development in the country from 2011 to 2020. Following the implementation of this Plan, The Ministry of Environment (MoE), through Rwanda Land Management and Use Authority (RLMUA), jointly with key stakeholders, conducted an assessment and evaluation of the 2011 NLUDMP implementation of different land-use plans at the District level. The assessment concluded that the 2011 NLUDMP was not aligned to the country's Vision 2050[1], the National Strategy for Transformation (NST1)[2], the revised Land Law, the Secondary City development strategy, the Green Growth, and Climate Resilience Strategies as well as other key national policies, strategies and plans.

The outcome of this assessment was the basis for the revision of the 2011 NLUDMP which started in December 2018 and concluded in June 2020 resulting in the NLUDMP-2050. Throughout the development of the NLUDMP-2050, all sectors, which are land users, were analyzed in parallel, feeding, and influencing each other, to produce for each of them plans that meet with their projected land consumption demands for the Horizon 2050 (with a mid-term projection of 2035).

In the Horizon 2050, land is expected to be in great shortage and a contentious issue in a country where the population is projected to almost double from 10.5 million in 2012 to over 22 million in 2050[3] and an estimated population density of almost 1000 people per km^2. This population growth coupled with high demands for land for housing, agriculture and other economic activities, if left unchecked, and without a proper land use plan might lead users in permanent competitions over land and, likely, causing conflicts. Therefore, a determined solution for the allocation of land, in the long term, can be achieved through economic and spatial considerations. Hence, the main target of NLUDMP-2050 was to find the best land-use balance sheet based on spatial and economic analysis.

The NLUDMP-2050 includes 13 prime land consumers: Prime Agriculture Lands, Secondary Agriculture Lands, Conditional Agriculture in Wetlands, Grassland for Livestock, Natural Forests and Forest Plantations, Wooded Savannah and Shrub Lands, Urban Settlements, Rurban Settlements, Rural Settlements, Industry, Roads, and Airfields. The category of Settlements contains secondary land users: Housing, Commerce and Trade, Public Services, Financial and Business Services, Open Spaces, Parks and Sports, Tourism, Urban Farming, Urban Forest, Industrial Parks, Infrastructure Utilities, Streets, etc., and other Urban Environmental Constraints. The proposed balance sheet achieves a zero balance and reasonable equilibrium between natural resources, arable lands, built-up areas, and roads.

The motto for the NLUDMP-2050 is "*Ensuring tomorrow's sustainability today!*", and its ideals are encapsulated in the word "COOPERATE" which is defined as: (**1**) Consolidated development; (**2**) Orderly planning; (**3**) Openness for innovation; (**4**) Preservation of nature; (**5**) Economic yields; (**6**) Rational urbanization; (**7**) Ambient services, education, and healthcare; (**8**) Transportation for all; and (**9**) Employment all over. These nine ideals define the key principles upon which the elaboration of the NLUDMP-2050 was built from.

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1   Vision 2050 is a long-term strategy with overarching objectives of promoting Economic Growth and Prosperity and High Quality of Life for Rwandans. Under this Strategy, Rwanda aspires to become an upper-middle income country by 2035 and a high-income country by 2050.

2   Adopted in 2018, this is a short-term Strategy (2018–2024) designed to accelerate the country's growth through improving skills and positioning Rwandans as a competitive workforce in a global environment and positioning the private sector as the engine of development.

3   Rwanda Vision 2050.

1.2 Background

Rwanda is a small, landlocked country of only 26,338 km^2 – including water areas, andapopulationofover 12.9 million[4] people; the majority of which are farmers. With a current annual growth rate of up to 2.4%, Rwanda's population may reach 25.8 million in 2050 and a gross density of nearly 1000 people per km^2. The best case scenario in this booming population growth scenario would be to limit the growth rate to no more than 2%, thanks to an aggressive family planning campaign, making it possible to limit the population in 2050 to an estimated 22.1million, better "fitting" the impending land shortages in Rwanda. This means that Rwanda's socio-economic transformation and sustainable development relies and shall continue to rely on the optimal use of land resources. This calls for a robust land use planning and management at national, sectorial, and local government levels.

Since 2018 December, the GoR was engaged in revisingand updating the NLUDMP to support the country to meetits long-term Vision 2050. The new National Land Use and Development Master Plan 2050 for Rwanda (NLUDMP-2050) was adopted by Rwanda's **Cabinet Meeting on 29th July 2020** and legally established by the **Presidential Order N° 058/01 of 23/04/2021**[5].

The NLUDMP is a well-designed countrywide Plan that envisages the effective use of land for the country's economic development with the 2050 target, and proposes land uses and management practices to cater for the growing populations, urbanization, settlements and housing, manufacturing, industry and mining, agriculture, environment and natural resources (land, forest, water, mines), tourism and conservation as well as transport and logistics infrastructures such as roads, railways, electricity, water, schools, health facilities, public administration, religious, and so on.

The NLUDMP-2050 has analyzed and defined the sectorial land uses to produce optimal land consumption demands for Horizon 2050 and establish policy orientations to guide each Sector.

These include:

1. **Urbanization** with established urban settlement hierarchy of (a) City of Kigali, (b) three Satellite Cities – Muhanga, Bugesera, and Rwamagana, (c) Eight Secondary Cities[6] – Nyagatare, Musanze, Rubavu, Rusizi, Huye, Karongi, Kirehe, and Kayonza, (d)16 District towns, (e) 73 rurban settlements (emerging urban centers). The Satellite Cities play the role of restraining rural migration to Kigali as population outlets because they have the potential to grow faster than Secondary Cities. Fighting urban sprawl by agglomeration and consolidation of settlements will be a very crucial task going forward towards the 2050 targets.

2. **Housing development** promoting informal settlement upgrading and application of densification principles for the existing Cities and centers prior to the use or development of new developable lands.

3. **Rural settlements** with restructured organized settlements (*imidugudu*) policy/ system for organized clusters and promoting four-in-one and eight-in-one model housing units to progressively reduce the size of rural residential plot sizes from 600 m^2 to 300 m^2.

4. **Agriculture** suitability mapping has been conducted countrywide, available agriculture lands were also identified and mappedat the national scale. Land consolidation will continue to be promoted to gradually eliminate scattered homesteads. The transformation of the rural settlement system will be key to unlock the development of commercial agriculture.

5. **Manufacturing, industrial development, and mining** with determined spatial distribution and optimal sizes of industrial parks 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.

4 NISR Population projections 2021: https://www.statistics.gov.rw/publication/size-resident-population

5 https://rlma.rw/fileadmin/user_upload/National_Land_Use_DevMaster_Plan_2020-2050.pdf

6 The Secondary Cities will be developed under two phases. See subsection 2.2 for more details.

7. **Tourism and conservation** are not ignored and the NLUDMP-2050 recommends the application of intensification principles of using small land at the maximum benefit given the limited available land.

8. **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 slopes above 55% including cash crops like tea plantations, protection of water bodies and wetlands, conditional use of unprotected wetlands, and commercial agriculture, etc.

After the adoption of the NLUDMP-2050 by the Cabinet and its establishment by the Presidential Order, its implementation immediately started. This implementation requires rigorous measures and capacities of different institutions, stakeholders, and technical staff involved for its efficient and effective implementation. The sub-national level actors' awareness creation and outreach, which was undertaken by the GGGI (Rwanda) in collaboration with responsible national institution, responds to this urgent need to build the capacities of local institutions, actors and stakeholders for a proper implementation of the actions embedded in NLUDMP-2050.

1.3 Rationale for the outreach

One of the first steps for a successful implementation of policies and plans is the creation of public awareness, their dissemination to local implementers, and capacity development for users. For NLUDMP-2050 implementation, compliance and monitoring, the Plan recommends that the MoE, which is in charge of the land, and the RLMUA provide technical guidance, coordinate, organize and participate actively in all awareness programs on NLUDMP-2050 and other land use planning processes. On the other hand, the Plan urges the City of Kigali and Districts to understand the NLUDMP-2050 and their respective profiles so that they are duly implemented under the prescribed schedule.

Second, the urban boundaries and rural settlement sites proposed by the NLUDMP-2050 needs to be cross-checked to provide the final boundaries considering the Districts' needs, local constraints and local contexts after physical terrain and spatial observations. Finally, local land use and the development of Master Plans must also be developed and implemented, and the existing Cities' Master Plans like those of the City of Kigali and Secondary Cities[7] are at different levels of development, with some fully developed and aligned with NLUDMP-2050 while others are not in line with the projections and proposals of the Master Plan. Some plans are also outdated and need to be thoroughly revised. The local detailed Master Plans as well as physical plans will ensure the control and enforcement of the compliance with the NLUDMP-2050 for all land users.

However, since all Master Plans cannot be reviewed at the same time, urgent cases were identified in close collaboration with responsible institutions. In this regard, RLMUA in collaboration with the GGGI and Rwanda Environment Management Authority (REMA), through the implementation of the GCF Readiness Support to Capacitate Rwanda's Subnational Level Actors in Green Growth and Climate Resilience project[8] have conducted the awareness creation and dissemination campaigns of the NLUDMP-2050 in 19 Districts of Rwanda. The profile for the 19 target Districts are described in details under chapter 2 (section 2.9) of this report.

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7   See subsection 2.2. for details.

8   More details about the project can be found here: https://gggi.org/project/rw20-readiness-support-to-capacitate-rwandas-subnational-level-actors-in-green-growth-and-climate-resilience and at https://www.greenclimate.fund/sites/default/files/document/rwanda-nap-gggi.pdf

1.4 Objectives

The main objective of the awareness and dissemination campaigns was to introduce to responsible leaders at the District and local level the key provisions of the NLUDMP-2050 and provide them with basic knowledge, understanding and skills for the proper implementation of the Master Plan. It was also an opportunity to equip the leaders with the skills and strengthen their capacity to implement, execute and enforce the NLUDMP-2050 provisions within their respective entities.

Specifically, this exercise had the following objectives:

1. To strengthen the capacities of Districts' staff and leaders and equip them with the skills on managing and implementing the NLUDMP-2050 as well as its monitoring, evaluation, implementation strategies and compliance.

2. To ensure that the local land actors gain the knowledge of understanding the implementation procedures of the NLUDMP-2050, Districts' local land use plan tools in line with the national targets of NST1, Vision 2050 and District Development Strategies (DDS) and how these are harmonized in the same path of development.

3. To sustain the NLUDMP-2050 land use proposals by updating and cross checking urban and rural settlement sites boundaries

1.5 Approach

This assignment enhanced the understanding, knowledge, and capacities of District staff and decision makers, and other relevant stakeholders involved in land use planning and management. The assignment covered all components of the new revised NLUDMP-2050 and targeted members of the District Executive Committee, Councilors, Staff of Districts' One Stop Centers, Executive Secretaries of Sectors and Cells, Sector Land Managers, and other relevant stakeholders including select members of the Private Sector Federation and representatives of Civil Society Organizations (CSOs).

The district land use profile and projections were presented and discussed with the stakeholders and the implication of plan implementation during each outreach and dissemination visit. Each outreach started with a detailed presentation of the District (land) profile and planned land use followed by a field visit to the settlement sites and boundaries and concluded by a presentation of field verification findings like physical boundaries verification, new number of settlement sites, and recommended immediate, short- and long-terms actions or interventions.

1.6 Constraints

The NLUDMP-2050 outreach and dissemination activity in Districts relied on the availability of the participants and support provided by the District leaders and technical staff. The constraints and challenges faced included limited time and availability of senior managers, limited time dedicated for the physical verification and confirmation of boundaries due to different developmental aspirations and needs of land users and local leaders. Other sectorial local activities that require the involvement of District leaders and staff also coincided with this exercise in some Districts and resulted in less focus on the dissemination activity.

2

SUMMARY OF NLUDMP-2050 PROVISIONS AND PLANS

Kigali, Rwanda
© Unsplash

The land area of Rwanda, including water bodies, is 26,338 km². Currently, agricultural land takes the vast proportion of most of Rwanda's land, occupying almost 12,000 km² (though it is estimated that only 8,400 km² are currently very suitable for agriculture). The second broad current land cover category are forests: combined, they occupy about 724,695 ha of the total country land (30.4%)[9] of which 387,425 ha (53.5%) are plantations, 130,850 ha (18.1%) are natural mountain rainforests, 161,843 ha are wooded savannah (22.3%) and 43,963 ha are shrub lands (6.1%). Bamboo stands occupy only 613 ha. All built-up areas, including roads, cover 2,888 km² or 11% of the country's surface, 1,500 km² of which are rural settlements. Two-thirds of the rural settlements are small disjointed parcels of poorly used agricultural lands. These lands may potentially be added to the stock of consolidated agricultural lands, once the rural system is transformed. A total of 2,068 km² of Rwanda's surface are wetlands, including buffer zones, and 1,637 km² are covered by water bodies with their buffer zones.

The proposed balance sheet achieves zero balance and reasonable equilibrium between natural resources, arable lands, built-up areas and roads

NLUDMP-2050 projects that in 2050, Rwanda's land will be dominated by agriculture and livestock (taking up 12,433km² equivalent to 47.2% of the total country's surface), followed by forests and conservation areas occupying 7,725km² (29.3%), built-up areas and infrastructure (including all settlements, railways, roads, buildings, etc.) totaling 3,980km² (15.1%), and water bodies, their buffer zones and protected wetlands totaling 2,200 km² (8.5%).

The NLUDMP-2050 provides an in-depth analysis of the long-term needs for each land-use and the current cover, and calculates how much area should be allocated to meet the mid-term 2035 and long-term 2050 targets. The Master Plan suggests preserving entirely 1,389 km² of natural forests and all existing 3,873 km² of forest plantations and to plant forests on the identified 1,554 km² of bare high slopes as a protective measure against erosion and landslides. In parallel, the Plan advocates for the preservation of 497 km² of wooded savannah and 7km² of shrub lands. All the water bodies and their buffer zones and the protected wetlands and their buffer zones will be fully protected. Unprotected wetlands will be conditionally open for agriculture, which may add 1,100 km² to the agricultural land stock.

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9   Ministry of Environment, 2019, Rwanda Forest Cover Mapping.

Rwanda
© Unsplash

2.1 Agricultural land and food security by 2050

Agricultural land in Rwanda plays a dual role in creating income and foreign currency through the export of agricultural products – mainly coffee and tea, and in producing food for the local population. Given the size of the country, a central question to be asked is whether it is possible to feed the growing population 30 years from now, given the limited arable land. It is the central question that the NLUDMP-2050 addresses, and an affirmative answer is dependent on choices that will be made by decision makers from now on to (**1**) protect existing agricultural land against scattered housing development, (**2**) improve agricultural productivity, and (**3**) promote climate resilient and commercially sustainable agricultural practices. Another response is (**4**) to preserve the totality of the suitable arable land and consolidate the lands for commercial agriculture while land unsuitable for agriculture must be prioritized for built-up areas in urban, rurban and rural settlements. There is thus a need to protect this land by laws and cater for it in local Master Plans. With 12,433 km^2 dedicated for agriculture by 2050, Rwanda could be food secure if the yield is **improved 15 times** more than the existing 2019 return. This requires significant investments into **commercial, sustainable and climate-resilient agriculture**.

FIGURE 1
Land use categories

A = Predominant prime agricultural lands
B = Includes prime agricultural land but the half size and variably scattered
C = Blend of open spaces including grassland and forests
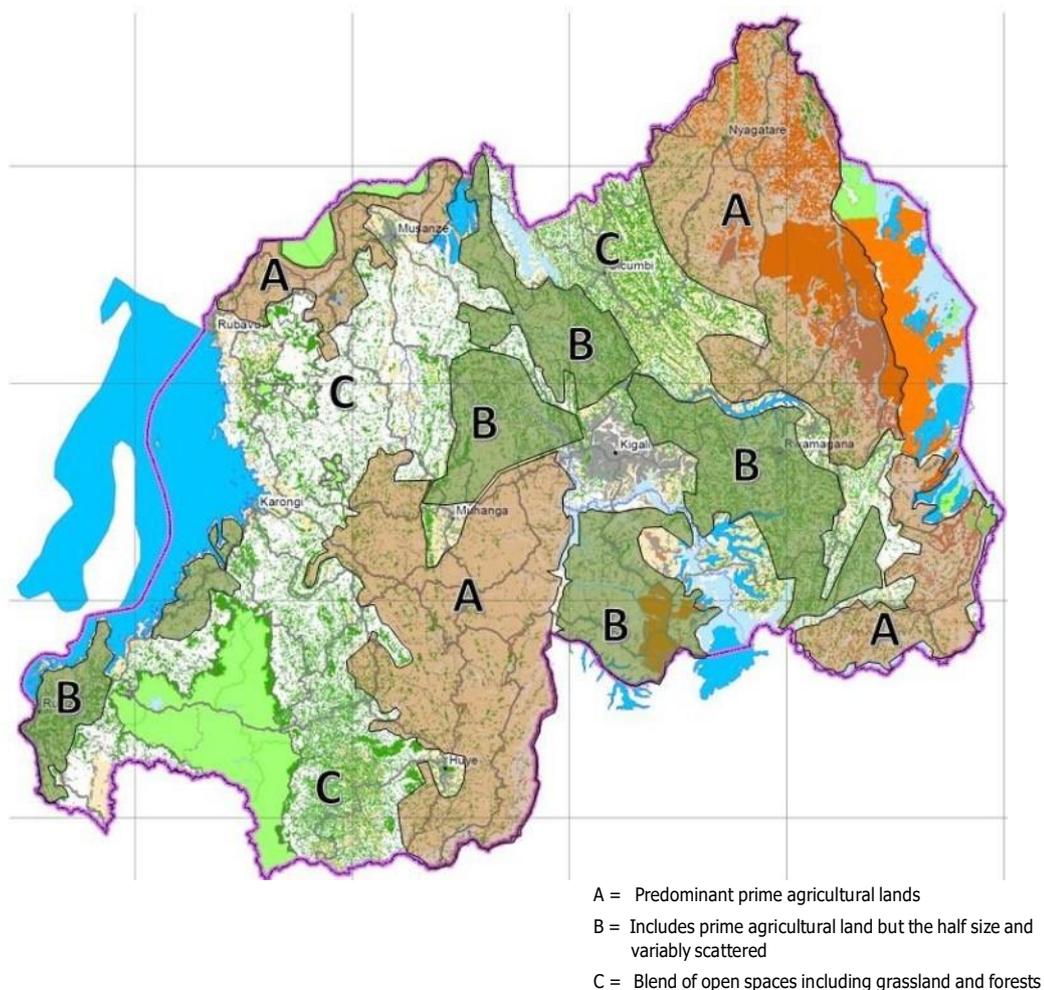
Source: NLUDMP 2050.

2.2 New urban and rural settlement hierarchy and structure

In the Horizon 2050, the NLUDMP plans that the population size of Kigali should be limited to 3.8 million people. For this to become a reality, a new layer of three Satellite Cities – Muhanga, Bugesera and Rwamagana – are to be established to strategically restrain migration toward Kigali and to support decentralization. The population of each of the Satellites Cities are projected to reach between 800,000 and 1 million people, respectively. **Rwamagana** will serve as an agricultural hub, **Bugesera** as a logistics and airport city, and **Muhanga** as a trade and mining processing hub. The Satellite Cities have potentials to grow faster and they need special attention in terms of building quality, sustainable Cities and better livelihoods. When combined with the City of Kigali, they will **become a "golden triangle," agglomerating up to 6.4 million people in 2050**.

In addition, **eight (8) Secondary or Peripheral Cities**[10] of between 300,000 to 650,000 (or even more) people each, will play the role of cross-border and trade hubs. They are located on an external belt near the borders, have the potential to grow faster as outer growth poles, and are expected to make use of their location as international border towns and to optimize commerce beyond their specific advantages and specialization. A belt of arterial roads will connect the Peripheral/Secondary Cities. The development of Secondary Cities will be conducted in two phases according to available capacities – five Cities: Musanze, Rubavu, Rusizi, Nyagatare, and Huye during the first phase and three Cities: Karongi, Kayonza and Kirehe during the second phase.

FIGURE 2
Urbanization-2050 – recommended structure according to NLUDMP-2050
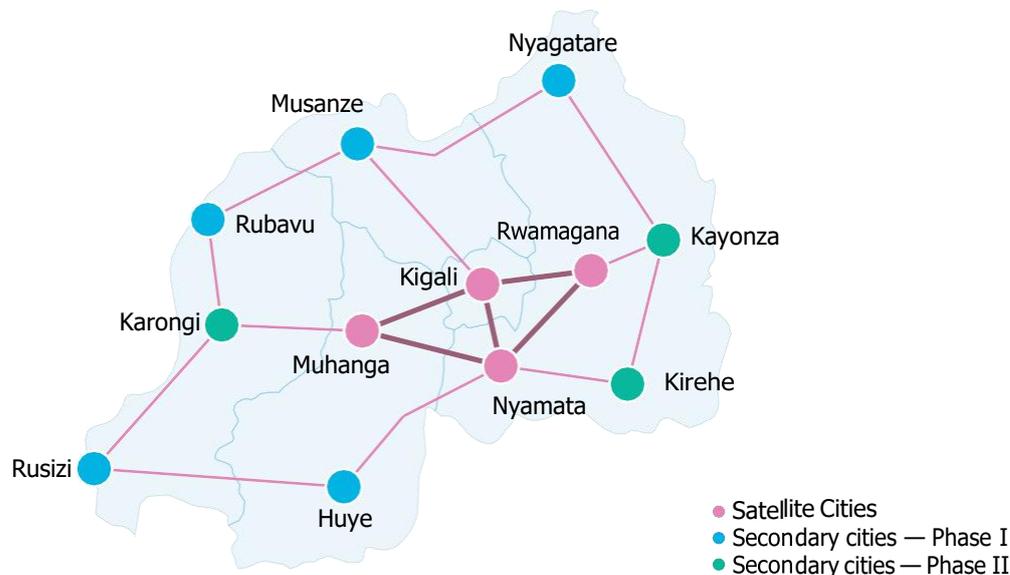
Rurban settlements are proposed as linking nodes of rural and urban areas. NLUDMP proposes 73 rurban settlements and recommends the minimization of rurban populations in small and emerging weak towns, and rather recommends directing in situ urbanization towards big Cities with several hundred thousand inhabitants. As the Rurban Phenomenon cannot be eliminated immediately, the Master Plan suggests a maximum of 1.8 million people living in rurban areas by 2050.

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10   Nyagatare, Musanze, Rubavu, Rusizi, Huye, Karongi, Kirehe, and Kayonza.

The distribution of the urban population is based on the recommended urbanization hierarchy and specific constraints and potentials of each City. The land needs for Cities, based on desired gross densities and local constraints, are 897 km² by 2035 and 1,447 km² by 2050.

NLUDMP-2050 – recommended urbanization hierarchy options in 2050

1 Capital city	**Kigali** 3-3.8M			Center = 6.5M
3 Satellite cities	**Rwamagana** 650k - 1M	**Bugesera** 650k - 1M	**Muhanga** 650k - 1M	
8 Secondary cities - Phase I / Secondary cities - Phase II	**Musanze** 250-650K / **Huye** 250-650K	**Rubavo** 250-650K / **Karongi** 250-650K	**Rusizi** 250-650K / **Kayonza** 250-650K	**Nyagatare** 250-650K / **Kirehe** 250-650K
16 District tows	**Nyanza** 100-250K / **Nyaruguru** 100-250K / **Rulindo** 100-250K / **Nyabihu** 100-250K	**Ruhango** 100-250K / **Gisagara** 100-250K / **Gakenke** 100-250K / **Ngororero** 100-250K	**Kamonyi** 100-250K / **Ngoma** 100-250K / **Burera** 100-250K / **Rutsiro** 100-250K	**Nyamagabe** 100-250K / **Gatsibo** 100-250K / **Gicumbi** 100-250K / **Nyamasheke** 100-250K
73 Rurban/ emerging centres	**Rurban Centres** 20-100K			Periphery = 9.0M

2.3 Manufacturing, industrial development, and mining

The industrial sector in Rwanda is still nascent, though over the past decade the GoR has been pushing for more investment in the manufacturing sector; leading to an average growth of 9.4% per annum since 2009. Industries occupy only about 10 km². The sector is primarily focused on the production and processing of wood, tobacco, cement, textiles, agricultural products, small-scale beverages, soap, furniture, shoes, plastic goods, tea, and coffee. Others include chemicals, construction, printing, paper, engineering, and methane gas. Rwanda's economy, thus, is heavily dependent on the primary sector, with industry strongly tied to the processing of primary products.

Rwanda's Vision 2050 projects that by 2050 up to 13 million people will be formally employed, within the manufacturing sector employing up to 5.4 million people – a tenfold growth from half a million employed in 2018. This will be mostly driven by Rwanda's industrial competitiveness should it go as expected.

On the other hand, mining will play a critical role as a driver of economic development in the next decades. The mining industry is expected to continue to grow due to the growing world demand for minerals and metals, which is projected to more than double. According to the MoE, the mining sector aims to contribute up to 4% of Rwanda's GDP by 2050, mostly through minerals value addition activities and gas sector developments from Liquefied Petroleum Gas (LPG) taken from Lake Kivu. Towards this target, the mining sub-sector aims to earn USD 800 million by 2020 and USD 1.5 billion annually by 2024[11].

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11 Ministry of Environment, 2017, Strategic Plan for the Environment and Natural Resources Sector 2018–2024: https://chm.cbd.int/api/v2013/documents/4DCB4025-33B5-6C59-D28F-C7E7DCEA006D/attachments/213175/Environment%20and%20Natural%20Resources%20Sector%20Strategy%202018-2024.pdf

2.4 Transportation

An efficient land, maritime and air transport system is critical for development as it helps ease and speed up the movement of people and goods, alike – thus facilitating further accelerated economic growth. NLUDMP calls for the development and expansion of transport infrastructures, mainly expressways, railways, and roads – at an estimated length of 37,185 km and 821 km^2 of land. To ease and speed movements between places, NLUDMP plans for the development of a modern and efficient public transport system with a media commute time of no more than 45 minutes in 2035 and 25 minutes maximum in 2050. Then it is expected that 80% of the population will be using public transport in their routine movements.

NLUDMP recommends eight ports to improve water transportation – something which is also expected to bring in double benefits: Facilitating transport while also promoting and increasing tourism activities. For air transport, the Master Plan recommends the development of two international airports (Kigali and Bugesera), one regional airport in the south-western city of Rusizi and five internal airfields.

2.5 Tourism

Tourism remains a major foreign currency earner for Rwanda and is expected to continue growing over the coming years, retaining its vital position in Rwanda's long-term socio-economic transformation. In planning the future of tourism, it is estimated that the total tourism direct and indirect contributions to the GDP will reach 20% of overall country's GDP of USD 274,472 billion. It is projected that to achieve this target, tourism must grow at around a 4% rate per annum from the current 1.2% rate per annum.

2.6 Environment and natural resources

Rwanda is known for taking the lead and putting in place strong measures, strategies, policies, and regulations that protect its natural resources and the environment. The NLUDMP aligns environment protection and sustainable resources use with green growth, green urbanization, sustainable agriculture, ecotourism, environmental and social safeguards, resource efficiency and cleaner production, circular economy, and a zero waste economy. It proposes a rational use of natural resources in order to optimize future land use management. The NLUDMP proposes that in the Horizon 2050, 37.7% of the country – or 9,925 km² – be allocated to conservation in the form of protected parks, protected wetlands, water bodies, and forests. Conservation areas will be second in size to the land allocated to agriculture. To mitigate and balance the expected needs for development and conservation needs, this calls for demarcation and protection of identified protected sites and environmentally sensitive areas, putting in place measures and implementing green Cities and infrastructures and ensuring sustainable land management and resource efficiency.

2.7 Implementation requirements

2.7.1 Institutional roles and responsibilities

NLUDMP-2050 proposes a very clear path for implementation of the priorities and plans it details; and provides a path to ensure it is properly implemented and complied with over the course of the next decades to come.

According to the Master Plan, the Ministry of Finance and Planning (MINECOFIN) leads all activities and provides policy and strategic orientation as well as the budget needed to implement the Plan. The MoE, under which the land docket falls, and the RLMUA – the government agency responsible of land management – are responsible of the implementation of the NLUDMP-2050 providing technical guidance and support on the development of all the Sectorial and the Districts' land use Master Plan. They are also responsible of monitoring and enforcing the implementation of the Master Plan – including a proposal to give them the power to provide non-objections on all land use planned activities.

Local government authorities, including Districts and the City of Kigali, are responsible of planning land use in their Districts, in line with the NLUDMP, inspecting land use and restricting informal constructions (other non-compliant uses) as well as to efficiently operationalize the implementation and inspection of the Master Plan in the entire District territory.

Other ministries, agencies and entities are encouraged to respect the Master Plan, support its implementation, and review their laws and policies so that they are aligned with the NLUDMP.

2.8 Field verification of pre-defined settlement boundaries

The field verification missions took place in all the 19 target Districts and was carried out to check whether the proposed boundaries for urban, rurban and rural areas are aligned to the NLUDMP and other land use and development strategies, and respond to the needs and contexts of the specific Districts. They combined on-site physical observations, local knowledge of Sector land managers and high-resolution satellite images to deduce general conclusions and recommendations on whether maintaining, updating or changing the Plans to respond to the current and projected future situation in Districts, should take place.

Rwanda
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3

DISTRICTS PROFILES

3.1 Kayonza

Kayonza District sits at the junction of two major entry points into Rwanda's capital, Kigali, from Uganda and Tanzania and is a transit area for goods imported into Rwanda. Its close proximity to Kigali makes trade a very viable sector. The District also is home to major parts of the Akagera National Park, the last remaining refuge for savannah-adapted species in Rwanda. This renders the District a hub for tourism, logistics, trade, and mining activities. The District covers an area of 1,935 km^2 with a population of over 344,000 people. This population is projected to more than double to reach 799,500 people in 2050. By then, it is expected that 70% of its population will be living in Cities, urban centers and rurban areas across the District while the remaining shall be living in rural settings.

According to the NLUDMP, the urban and rurban population of Kayonza shall live on an area covering approximately 50.6 Km^2 in 2050. Some of the emerging Cities, urban and rurban centers that shall be home to Kayonza's urban population are Mukarange, Kabarondo, Rwinkwavu, and Karubamba; areas that are expected to play a major role in the projected urbanization targets in the District in the Horizon 2050. On the other hand, Kayonza is projected to have at least 105 settlements in rural settings that will be supporting urban and rurban areas to cater for its ever-growing population.

The balance sheet for the land use in Kayonza, however, shall continue to be dominated by agriculture and livestock farming, occupying over 51% of the District's lands. Areas reserved for conservation and tourism shall also dominate the land mass, with the Akagera National Park occupying 24% of the District's total area (46,184.54 ha), and forests taking up 5% of the District's areas (including natural forests and new areas that are set to be re/afforested). Settlements, infrastructures and industries will take up 11,089.38 ha (5.78%). The remainder will be distributed between wetlands (4.88%), as well as lakes and their buffer zones (8.63%).

The dissemination of the NLUDMP-2050 in Kayonza was organized by the District and the RLMUA in collaboration with the GGGI from 11 to 14 May, 2021 and included both discussions, trainings and field visits. The exercise brought together District staff, members of the District Executive Committee, the District Council and other stakeholders and actors who play a role in the land use sector. After the discussions, participants undertook a field verification for proposed boundaries for urban, rurban and rural areas; concluding with proposals to reduce the urban areas from 2,248.8 ha to 1,709.6 ha and a decrease of 1,877.8 ha on areas planned for rurban settlements. These changes were proposed in order to avoid including areas allocated for mining into rurban and urban areas and other areas that were found not to be suitable for human settlements. On the other hand, 2,416.4 ha were proposed to be added to rural areas as their potential for urbanization was found to be extremely limited.

1,935 km²
Area

344,000
Population

2050 PROJECTION

799,500
Population

70%
Urban Population

LAND USE

51% Agriculture & Farming

6% Infrastructures & Industries

24% Tourism

5% Forest

5% Wetlands

9% Lakes

Street scene in Kayonza
© Vivien Henry de Frahan, CC BY-SA 4.0, via Wikimedia Commons

3.2 Burera

Located in the north of Rwanda on the northern border with Uganda, Burera District covers a surface area of 644 Km^2. The population of Burera is estimated at 407,264 people and is projected to grow further to reach 500,000 people in 2050. By then, it is expected that 70% of the District population shall be living in urban and rurban areas while the remaining 30% shall live in rural settings.

The NLUDMP projects that by 2050, the urban areas of Burera District shall extend to at least 29 km^2 to be able to accommodate the growing urban population and respond to the needs of that population. The rurban centers of Kivuye, Gahunga-Kinoni, Kirambo, and Cyanika shall also be prioritized in the District's development, hosting a projected population of about 74,000 people on a combined area of 16.8 ha.

644 km²
Area

407,264
Population

2050 PROJECTION

500,000
Population

70%
Urban Population

The dissemination of the NLUDMP-2050 in Burera District took place from May 11 to May 14, 2021 to discuss proposed land uses boundaries (urban, rurban and rural settlements sites) and propose readjustment with District Plans, where necessary. The dissemination also included field visits for the verification of proposed site boundaries. Following the visits, the technical teams recommended the reduction of areas proposed for urban settlements from 29 km^2 to only 10 km^2 and an increase of areas allocated for rurban settings from 16.8 km^2 to 38 km^2 to respond to the needs and context of the District's population.

3.3 Gatsibo

Gatsibo, in the east of Rwanda, is a District that is highly suitable for commercial agriculture, agro-processing and tourism. Gatsibo District has a population of 523,954 people, projected to grow to 750,000 people in 2050. The District's total area is 1,585.3 km^2.

Gatsibo has suitable land for agriculture and the landscape is favorable for mechanized farming. It also has access to the Akagera National Park and a new proposed northern gate entrance into Akagera shall go through Gatsibo creating more tourism business opportunities for its population. Mining is another sector with great potential to transform the economy of the District, through generating more income and jobs for the local population. It is expected that in 2050, at least 70% of the District's population will be living in urban or rurban areas, within the emerging urban centers of Kiramuruzi, Murambi, Ngarama, Kabarore, Rwimbogo, and Muhura.

1,585.3 km²
Area

523,954
Population

2050 PROJECTION

750,000
Population

70%
Urban Population

The dissemination of the NLUDMP-2050 in Gatsibo District was held between 17 and 21 May, 2021 and targeted District staff, members of the District Executive Committee, the District Council and other stakeholders and actors who intervene in land use and management activities. It also included field visits to assess areas demarcated for urban and rurban settlements and their proposed boundaries based on the needs, context and realities of the District and NLUDMP's (2020–2050) guidelines and targets.

After verification, it was recommended that areas earmarked for urban and rurban settlements be reduced from 8,524.26 ha to only 2,958.9 ha, while the remaining areas shall be mostly dedicated to agriculture, conservation, forests, wetlands, infrastructures, and rural settlements.

Rwanda Mountain at Gatsibo
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via Wikimedia Commons

3.4 Nyabihu

Nyabihu is a District which is appropriate for agriculture and mining and these are projected to be the core economic activities that will continue to drive the District's growth towards the 2050 target. Nyabihu has access to the Volcanoes National Park (which is home to the rare and majestic mountain gorillas), thus, creating tourism opportunities. Nyabihu, in the north-west of the country, covers an area of 531.5 km^2 with a population estimated to be 356,635 people, as of 2018. This population is set to reach 600,000 people by 2050 according to the NLUDMP.

531.5 km²
Area

356.635
Population

2050 PROJECTION

600,000
Population

3.5 Rusizi

Rusizi District, in the south-west of the country, borders with the Democratic Republic of Congo (DRC) to the west and Burundi to the south. This strategic location makes Rusizi a strategic area for development. The District covers an area of 940.95 km^2, with a total population of 483,615 people and a population density of 418 people per km^2. The main town of Rusizi District is Kamembe and is one of the eight Secondary Cities, alongside Nyagatare, Musanze, Rubavu, Huye, Karongi, Kirehe, and Kayonza. The District boasts of many touristic attractions such as Lake Kivu, the Nyungwe National Park, the Rusizi River, the Bugarama Hotsprings, and several tea plantations.

The population of Rusizi District is projected to grow to 732,500 people in 2050 according to the NULDMP and will be distributed in different settlements as follows:

ASPECTS	POPULATION	LAND SURFACE
Urban population	400,000	65 Km^2
Rurban	123,285	21 Km^2
Rural population	200,000	38 Km^2

In the Horizon 2050, the economy in Rusizi is projected to be built dominantly on cross-border trade, agri-business and tourism. A total of 45.5% of the District's land will be dedicated to agriculture, 16.2% to forests, 22.1% to settlements, while the remainder will be occupied by water bodies, wetlands and transport infrastructures.

The dissemination workshops for the NLUDMP took place from 17 to 21 May, 2021 in Rusizi with the main objective of creating awareness and a deep understanding of the Master Plan among members of the District Executive Committee, District Council and staff – who are responsible for its implementation.

During the dissemination workshops, participants were taken through the different proposed land uses as per the NLUDMP-2050, and the linkage between the local Master and Physical Plan Projects and what needs to be done to ensure its smooth implementation over the years. The training enhanced the participants' capacity and skills in accessing the NLUDMP as well as its correct use as a reference for any land use planning and/or change of the land use.

940.95 km²
Area

483.615
Population

2050 PROJECTION

732,000
Population
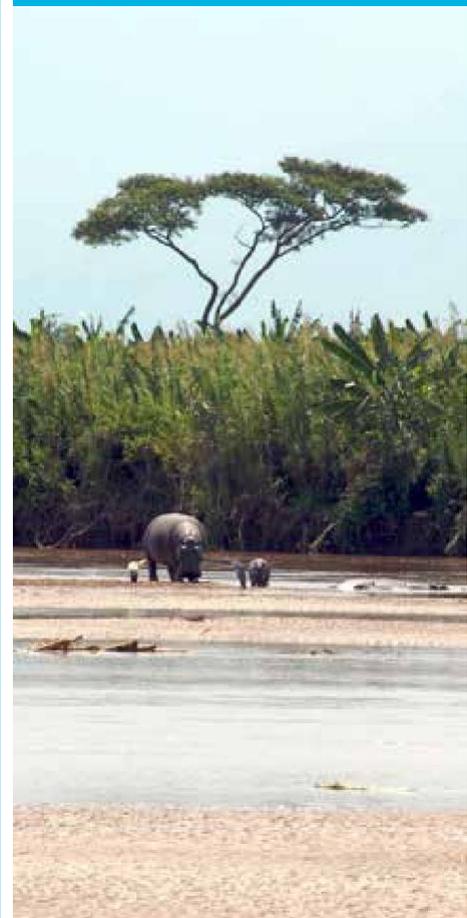
Rusizi National Park
© Dave Proffer, CC BY-SA 2.0, via Wikimedia Commons

Field verifications in urban and rurban boundaries were conducted through observations of the physical aspect in the area of interest and reviewing of existing Master Plans, existing needs regarding urban development, and proposed urban and rurban boundaries.

During the field visit in Rusizi District, some changes were proposed on existing urban and rurban boundaries as a way of ensuring that the Plans are aligned with the current needs and planned expansion of urban and settlement sites. After discussions, participants recommended a reduction of the site reserved for urban areas and that rurban sites remain the Bugarama-Muganza and the Mushaka sites, while Giheke and Gashonga sites should be categorized as rural areas mostly due to their topographic characteristics and the projected dominant land uses: agriculture. Participants also recommended that Bweyeye should be considered to be a designated rurban area, but only after conducting a specific feasibility study for this area to determine its suitability and potentials as a rurban area.

3.6 Kamonyi

Kamonyi, one of the eight Districts of the Southern Province, has a total surface of 655.5 km^2 and a population of 340,501 people. The District is located directly on the southern outskirts of Kigali, Rwanda's capital, and is a transit to the Satellite Town of Muhanga, located far in the south. The Di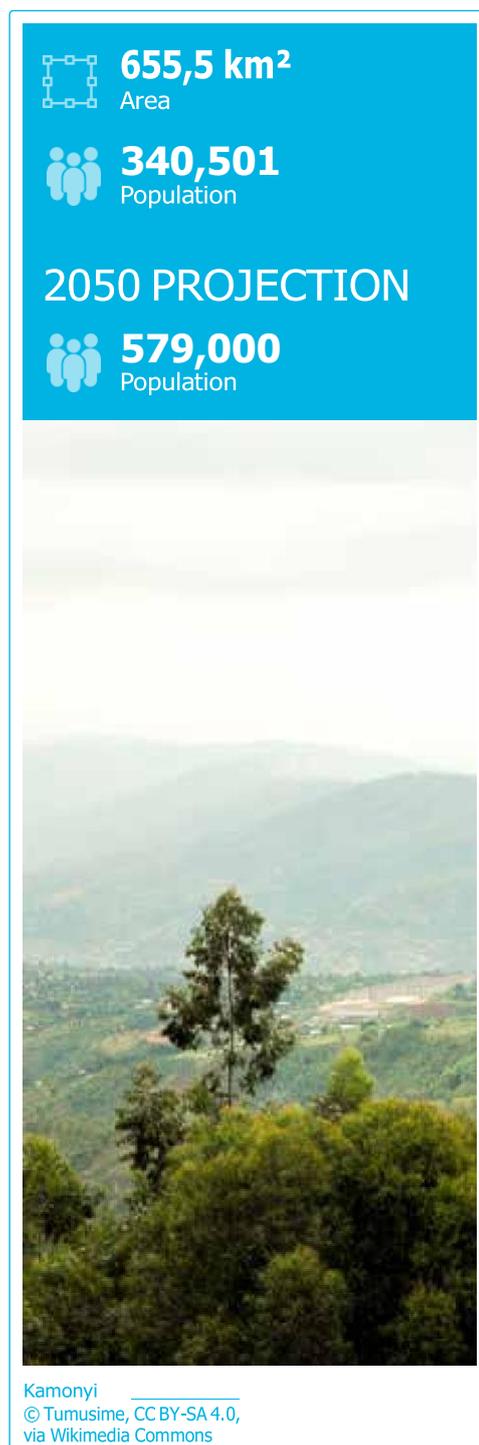strict's strategic location is a major factor for its urbanization and settlement growth. Over the past few years, the District has been marked by a proliferation of settlements mainly prompted by its land and housing standards affordability compared to the city of Kigali.

According to the NULDMP, the population of Kamonyi District is projected to reach 579,500 people by 2050 and will be distributed as follows:

ASPECTS	POPULATION	LAND SURFACE
Urban population	300,000	43 km^2
Rurban	73,971	12.6 km^2
Rural population	300,000	57.7 km^2

Over the Horizon 2050, the NLUDMP projects that agriculture lands will continue to occupy the main parts of the District's land, taking over 67.4% of its lands (43,667.46 ha), followed by forested areas (12.95%), settlements (9.8%), wetlands and their buffer zones (9.8%) and areas dedicated for conservation and tourism activities. However Kamonyi's economic rise is expected to be driven by mining activities, as the District is rich in minerals. Due to its closeness to Kigali, construction and infrastructure services are also expected to grow as it will be expected to offer low housing facilities for low income earners working in Kigali or Muhanga, further to the south.

From 31 May, 2021 to 11 June, 2021, a team of the RLMUA and the GGGI staff conducted fieldwork in Kamonyi District to disseminate NULDMP. The dissemination activities aimed to familiarize the District staff with the NLUDMP and to conduct verification and checking on the allocation of the District's land uses in the next decades. It was also an opportunity to discuss the proposed land uses and allocations, so as to propose changes that guarantee that defined boundaries for urban, rurban and rural settlement sites are in line with the National Land Use Master Plan.

655,5 km²
Area

340,501
Population

2050 PROJECTION

579,000
Population

Kamonyi
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Participants were equipped with skills and abilities to effectively implement the NLUDMP as a comprehensive and reference document for any land use planning and/or land use change. Furthermore, urban areas boundaries (District Town and rurbans) were revised and validated for implementation.

A field work was conducted across the District to collect data that reflected the current situation on the ground and meets the recommendations of the NLUDMP-2050. The boundary verification methodology involved observation of the sites to identify required adjustments and brainstorming for decision-making purposes. ArcGIS Collector and SW maps were also used which helped in mapping out features, boundaries, as well as the specific spots to be considered when revising the boundaries.

The awareness creation and fieldwork in the entire Kamonyi District lasted for two weeks from 1 June to 11 June, 2021, with the first week being dedicated to the marking and reshaping of the District Town and three rurban areas and establishing their new boundaries. The second week focused on all rural settlement sites in all Sectors. At the end of the verification exercise, some of the sites were removed, others decreased or extended. This task has been undertaken, to comply with the NLUDMP-2050 recommendation based on the reality on the ground.

After the field exercise, the settlements boundaries were adjusted as follows:

AREA	SIZE BEFORE REVISION	SIZE AFTER REVISION	CHANGE
Urban area	7000 ha	4,346 ha	Decrease of 2,654 ha
Rurban	1,059 ha	899 ha	Decrease of 160 ha
Rural area	5, 769 ha	6,759 Ha	Increase of 1000 Ha

3.7 Bugesera

Bugesera District is located directly at the eastern exit of Kigali, Rwanda's capital, and this proximity to the City of Kigali constitutes a major factor for its rapid urbanization. Bugesera's Town, Nyamata, is one of the three Satellites Cities established to decongest Kigali, alongside the Towns of Muhanga in the South and Rwamagana, also in the East.

Bugesera District has 15 sectors with a population of 479,624 and a density of 282/km^2. The District population is projected to increase to 1,206,500 people by 2050. This population increase will undoubtedly affect land use and put the land use under pressure. This will require careful and strategic adjustments of settlements' structure over the years to come.

Nyamata, another Satellite Town is expected to cover a surface of 61 km^2 in 2030 and 100 km^2 in 2050, with a projected population of 550,000 people in 2035 and set to reach 1 million people by 2050, according to the NLUDMP.

ASPECTS	2035	2050
Nyamata Satellite City Population	550,000	1,000,000
Nyamata Satellite City Area Land demand	61 Km^2	100 Km^2

The projected population and land demand by 2050 is 49,314 people covering 850 ha for rurban areas and 180,000 people covering 3,400 ha for rural settlements in 2050, respectively.

282 km²
Area

479,624
Population

2050 PROJECTION

1,206,500
Population

Lac Cyohoha Bugesera district
© Umurerwajanne, CC BY-SA 4.0, via Wikimedia Commons

The anticipated growth of urbanization, rural settlements and population increase in Bugesera District goes hand in hand with the need for basic services such health and education for this ever-growing population. The demand of basic facilities is therefore projected as follows:

According to the NLUDMP model, a city of 1 million inhabitants like Nyamata Satellite City, needs a vicinity of 60,000 ha of agricultural lands to provide food security for its inhabitants. Compared to 56,971 ha currently available in Bugesera District, meaning there is already a deficit of 3,209 ha – which may also increase as the population increases. Additionally, the population in rurban and rural settlements is projected to grow bigger and as such, available agriculture land in Bugesera District will not only fail to feed Nyamata City dwellers, but also the remaining Bugesera District inhabitants, in general.

To cope with these demanding challenges related to urbanization, settlement and food security, the NLUDMP proposed solutions by developing a housing Master Plan for Nyamata Satellite City, rurban and rural settlements areas, land use Master Plan and population densification, taking place as the projected population increases. Most land was therefore allocated for agriculture activities – which the NLUDMP recommends, and should adopt sustainable, green and technology-driven practices to increase productivity and to meet the growing demands of the population.

From 7th to 18th, 2021, in Bugesera District, a series of activities were carried out for the dissemination of the NLUDMP. They included on-site trainings and field works for site delineation and mapping as well as quality assessment of elaborated physical Master Plans. The approaches used involved meeting with Districts' authorities and staff, field assessment and observation and analysis of findings and reports.

Following the discussions and field visits, the boundaries for urban, rurban and rural settlements were revised as the following:

SITES	COVERAGE	TOTAL SPACE AREA (in km²)	
		BEFORE REVISION	AFTER REVISION
Nyamata Node	Nyamata, Mayange, Ntarama	34	43
Airport belt node	Ririma, Juru, Mayange, and Mwogo	91	69
Ruraban area	Ruhuha, Nyarugenge, Mareba, Ngeruka, and Rweru	26	22
Rural settlements sites	Gashora, Juru, Kamabuye, Mareba, Mayange, Masenyi, Musenyi, and Mwogo, Ngeruka, Ntarama, Nyamata, Nyarugenge, Ruhuha, Rweru, and Shyara	134	78

Participants also recommended the consultation of the Aviation Authority during the decision-making process, strengthen inspection mechanisms in residential areas for compliance with the Master Plan as well as increasing awareness and sensitization among the wider public and leaders to ensure that everyone understands what is going to happen and is well equipped to respect and comply with the Plans.

3.8 Muhanga

Muhanga sits some 50 km in the south of Rwanda's capital, Kigali, and has a population of slightly over 318,000 people distributed across 12 Sectors. The District covers an area of 647.7 km². As one of the three Satellites Cities supporting Kigali, Muhanga's population is expected to triple to reach one million people by 2050, according to projections of the NLUDMP. The driving factor for Muhanga's economy is expected to be primarily located in the mining industry as the District is rich in minerals. However, trade and finance shall be equally essential to support the District's growth. Due to its consideration as a Satellite City, infrastructure services and construction will be on the rise to respond to the rising population and growing demand for services.

By 2050, it is expected that 7,722 ha of Muhanga's land will be occupied by urban settlements while rural communities will occupy 3,904 ha. The remaining land will be used for agriculture (which will be the dominant use at 54% of the total District area), forest, wetlands, water bodies, industries and infrastructure to support the District's urbanization process, economic transformation and high standards of life for its population.

The balance sheet for Muhanga's land use in 2050 is summarized as the following:

LAND USE	AREA COVERED IN HA	PERCENTAGE
Residential zones	7,515 ha	11.6%
Commercial zones	318 ha	0.9%
Industrial zones	234 ha	0.6%
Transportation	1,814 ha	3%
Agriculture zones	34,879 ha	54%
Forest zones	16,065 ha	24%
Wetlands	3,321 ha	5%
Public facilities	493 ha	0.7%
Water bodies	11 ha	0.2%

647.7 km²
Area

318,000
Population

2050 PROJECTION

1.000.000
Population

7,722 ha
Urban settlements

3,904 ha
Rural communities

LAND USE

54%
Agriculture & Farming

Muhanga (Gitarama)
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3.9 Ruhango

Ruhango District is one of the eight Districts of the Southern Province and covers an area of 628.8 km². Its population is estimated to be 357,028 people with a density of 568/km². The strategic location of Ruhango District in between the Cities of Muhanga and Huye is foreseen as a triggering factor for rapid urbanization and population growth. The economy of Ruhango District mainly depends on agriculture and animal husbandry, and will continue to be driven by them in the future.

The population of Ruhango District is projected to reach 649,500 people by 2050 and will be distributed in different settlements, according to the NLUDMP, as follows:

ASPECTS	POPULATION	LAND SURFACE
Urban population	250,000	33.5 km²
Rurban	73,971	21.3 km²
Rural population	320,000	60.5 km²

The projected use of land in the Horizon 2050 is mostly dominated by agricultural land at 64.8% of the total land area (translating to roughly 40,237.04 ha). The remainder will be occupied by forests that are projected to occupy 7704.04 ha, settlements in urban, rurban and rural areas covering 9219.7 ha and wetlands and their buffer zones covering 4861.8 ha.

The NLUDMP dissemination in Ruhango took place in August 2021 and targeted members of the District Executive Committee, District Councilors, District One Stop Center (OSC) Staff, Sector Land Managers and other concerned District stakeholders. They focused on the NLUDMP-2050, and included the verification of the main urban boundaries of Ruhango District Town as well as a revision and adjustment of areas earmarked for rurban and rural settlements, alike.

628,8 km²
Area

357,028
Population

2050 PROJECTION

649,500
Population

7704.04 ha
Urban settlements

9219.7 ha
Urban settlements

40,237.04 ha
Agriculture & Farming

4861.8 ha
Wetlands

Ruhango
© GATETE Pacifique,
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Participants in the dissemination exercise were introduced to the purpose of the NLUDMP, the profile of the District with descriptions and comparisons of the current and projected land uses in the District. The dissemination workshops were followed by field verification missions to ensure that what is reflected in the Master Plan aligns with the field realities. Following the visits, participants proposed adjustments to the Plan, particularly on the existing urban/rurban boundaries. As an example, some parts of Ruhango's Sector were found to be located in high-risk zones (particularly areas prone to or susceptible of facing natural disasters that may lead to loss of life to people and wildlife and property), thus, were removed from the District Town's boundaries and from proposed settlement sites. In the rurban area of Gitwe-Buhanda some parts of it were removed since they are dominated by agriculture and forests that are not suitable for new settlements. In addition, some rurban areas were extended to include some parts that had been allocated for the rural settlement, with rural settlements sites reduced from 148 to 141.

Overall, the following changes were made in the boundaries of urban, rurban and rural settlements areas.

AREA	EXISTING SIZE	REVISED SIZE	CHANGE
Urban area	33.5 km²	33.4 km²	Decrease of 0.1 km²
Rurban area	21.2 km²	22.2 km²	Increase of 1 km²
Rural settlement area	55.8 km²	57.5 km²	Increase of 2.14 km²

3.10 Nyagatare

Nyagarare is a border District of approximately 530,907 people and has a total surface area of 1,919 Km^2. Located far north-eastwards on the border with Uganda, this designated Secondary City is projected to become one of the fastest growing towns in the coming decades – becoming a hub for cross-border trade between Rwanda and Uganda. The economic growth of Nyagatare is expected to be driven by growing commercial agriculture, livestock, cross-border trade, agro-processing, and tourism.

It is projected that by 2050, the population of Nyagatare shall reach one million people, with over 65% of them living in urban areas and 40% in rural settlements.

In 2050, land use is projected to be dominated by agriculture taking up 1,310.6 km^2 (68%), forests and conservation areas (parks, natural and plantation forests) covering 278 km^2 (14.5%), settlements (rural, rurban and urban) covering 250 km^2 (13%) and wetlands and their buffer zones (protected and unprotected) covering 78.4 km^2 (4%).

1,919 km²
Area

530,907
Population

2050 PROJECTION

1.000,000
Population

65%
Urban settlements

40%
Rural communities

3.11 Ngororero

Ngororero District is located in the Western Province at a high topography spanning between 1,460 m and 2,883 m. The District covers an area of 679 km^2 with a population of 333,723 people and covering a density of 493/km^2.

According to the National Land Use and Development Master Plan, the population increase in different sites in Ngororero District is projected to reach 336,000 by 2050.

In 2050, Ngororero will be dominated by agriculture, forestry, mining and tourism. Ngororero District's activities by 2050 will be dominated by forestry, agriculture, mining, and tourism

From 23 August to 27 August, 2021, the dissemination of the NLUDMP took place in Ngororero District, consisting of trainings, discussions and field visits for verification of planned boundaries for urban, rurban and rural sites. The discussions were followed by a desk review of available spatial data together with the field observations combined with local knowledge of local authorities, some changes have been made on urban, rurban and rural Settlement site boundaries that had been proposed by the NLUDMP-2050 in Ngororero District.

The land use balance sheet for Ngororero District shows that the District lands shall continue to be dominated by agriculture which is expected to occupy over 69.2% (46,822.92 ha), forests and conservation zones covering 11,946.01 ha (17.66%), settlements and infrastructures covering 76,439.11 ha (30%), and wetlands covering 1207.84 ha (1.78%).

679 km²
Area

333,723
Population

2050 PROJECTION

69,2%
Agriculture

30%
Settlements & Infrastructures

1.78%
Wetlands

17.6%
Forest

Farming community - Ngororero District, Rwanda
© Vivian Atakos (CCAFS),
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3.12 Ngoma

Covering an area of 867.74 km², the eastern Ngoma District has a population of 338,562 people with a population density of 393 people per km². While agriculture remains the dominant economic activity in Ngoma District, the District also has the potential to be a transit for regional trade between Rwanda, Tanzania, and Burundi.

According to the National Land Use Development Master Plan, the population of Ngoma District is predicted to reach 473,000 people and will be living in different settlements, in urban, rurban and rural areas. As planned and expected, the urban and rurban settlements will dominate the residential areas of Ngoma.

Population projections in the Horizon 2050 in Ngoma District are the following:

ASPECTS	POPULATION	LAND SURFACE
Urban population	200,000	43 km²
Rurban	49,314	8.4 km²
Rural population	220,000	67 km²

The land cover will be mostly dominated by agriculture, which is projected to take up to 57% of the District's entire surface, followed by lakes and water bodies at 15.9%, settlements at 12.9%, wetlands at 9.8%, and forests taking up 4.9%.
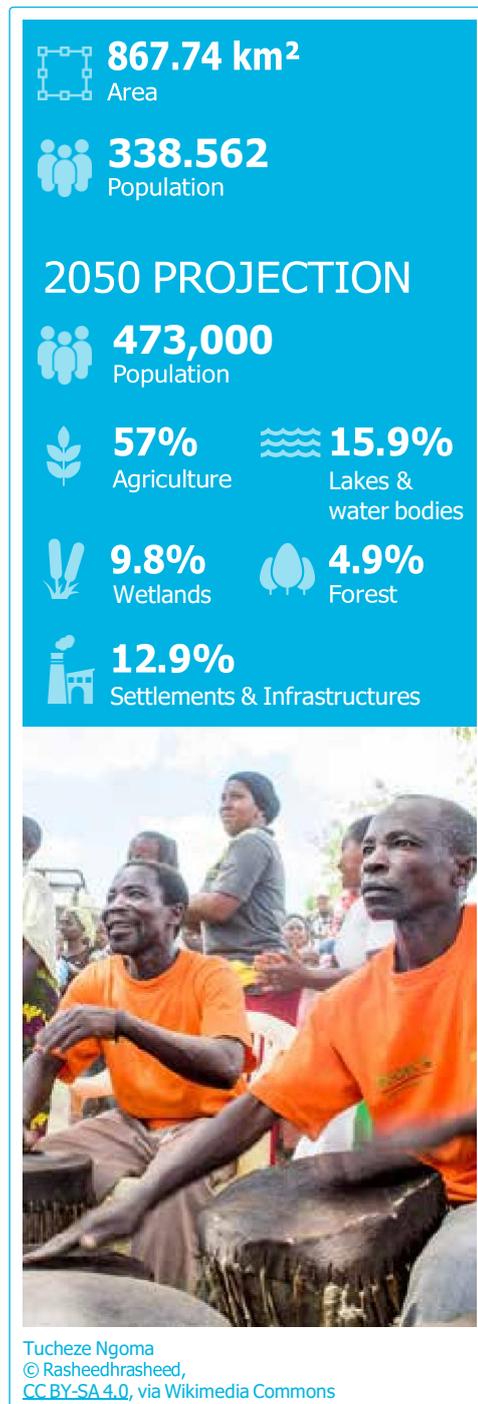
The dissemination and training on NLUDMP in Ngoma District were conducted from 30 August to 4 September, 2021, with the aim of raising awareness on the planned land uses in the Horizon 2050 within the District. This is expected to lead to a proper implementation and monitoring of the execution of the Master Plan by all responsible individuals. It was also an opportunity to carry out boundary verification processes for areas allocated for settlements, in rural, rurban and urban settings. Participants included members of the District Executive Committee, District Council, and technical staff, and they were taken through an in-depth introduction to the NLUDMP, the land use management at the District level, as well as the linkage between the NLUDMP and local Master and Physical Plans. Participants also developed capacity and skills on access and use of the NLUDMP for implementation and monitoring.

A field mission for verification of boundaries in the urban, rurban, and rural settlement was also conducted based on observations of the physical aspects and led to proposed changes on the existing proposed urban, rurban, and rural settlement boundaries after the assessment with the District team.

The proposed changes were as follows:

AREA	SURFACE BEFORE VERIFICATION	SURFACE AFTER VERIFICATION	PROPOSED CHANGES
Urban area	4,389.5 ha	2,894 ha	Decrease of 1495.5 ha
Rurban area	1,585 ha	1,464.1 ha	Decrease of 120.9 ha
Rural settlement area	6,705 ha	7,077.7 ha	Increase of 372.7 ha

Following the proposed changes, projected areas dedicated for rurban and urban areas decreased by about 1,616.5 ha mainly because some areas were found to be not suitable for urban settlements while others were found to be mostly appropriate for agriculture.

867.74 km²
Area

338.562
Population

2050 PROJECTION

473,000
Population

57%
Agriculture

15.9%
Lakes & water bodies

9.8%
Wetlands

4.9%
Forest

12.9%
Settlements & Infrastructures

Tucheze Ngoma
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3.13 Kirehe

Kirehe District is located far in the Eastern Province, on the border with Tanzania and covers an area of 1,118.5 km² with a population 411,845 people (as of 2018) and with a density of 1,237 people per km². It is expected to become one of the most rapidly-growing urban areas due to its location near the border with Tanzania, a transit point for transportation of goods from across the region.

The National Land Use Development Master Plan proposes for Kirehe District a Secondary City and two rurbans – Nasho and Rusumo, and a rural settlement setting of 141 sites outside the urban areas boundaries. According to the NLUDMP, by 2050 the population of the District is expected to reach 525,000 people, with over half of them living in the urban area.

It is projected that in the coming decades, Kirehe will rely mainly on cross-border trade and commercial agriculture to achieve the desired levels of growth and transformation. The main Rusumo border is expected to get busier once the planned railway route from Tanzania to Kigali (through Ngoma and Kirehe) is completed; trade and logistics shall grow at a double-quick rate thanks to this strategic transport investment. In addition, with the proposed improvement in irrigation, agriculture yields are expected to increase, and as a further result, the agro-processing sector shall get much attention and investments – further driving economic growth throughout the District.
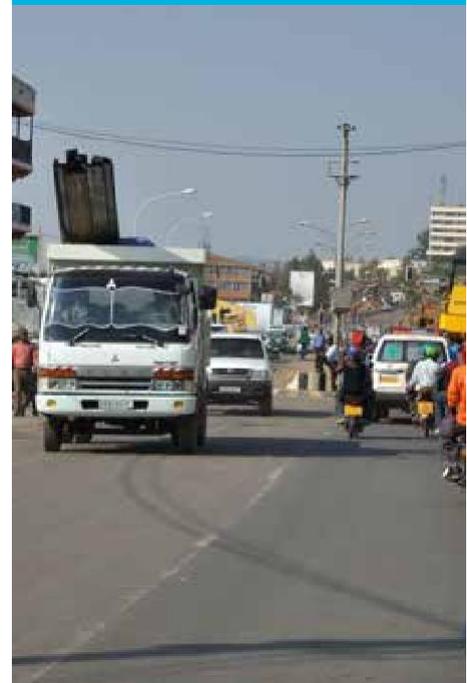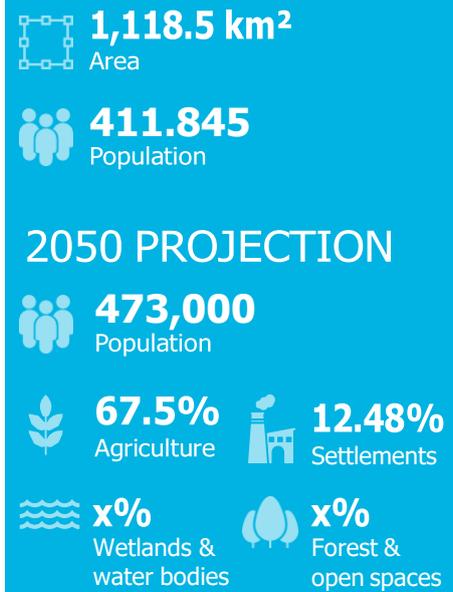
Land will be mostly used for agriculture, which shall occupy up to 80,816 ha (67.5%), settlements covering 14,950 ha (12.48%), while the remainder will be distributed between forests and open spaces (6,261 ha), and wetlands and water bodies (16,016 ha).

The dissemination of the NLUDMP in Kirehe took place from 30 August to 3 September, 2021; a team of the RLMUA supported by the GGGI conducted fieldwork in Kirehe District to verify and update the boundaries of the District City, rurbans and rural settlements sites across the entire District in accordance with the National Land Use and Development Master Plan (NLUDMP 2020–2050). It was also an opportunity to create awareness on the NLUDMP Plans for the District and empower local land actors with the skills they need for its proper implementation.

1,118.5 km²
Area

411.845
Population

2050 PROJECTION

473,000
Population

67.5%
Agriculture

12.48%
Settlements

x%
Wetlands & water bodies

x%
Forest & open spaces

Kirehe
Hansueli Krapf,
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Participants in the dissemination workshops included members of District Executive Committee and technical staff, Sector Executive Secretaries, District staff and technical teams, Sector Land Managers, Sector Agronomists, and Security Organs Representatives. Participants were trained on the NLUDMP's key guidelines and different proposed land uses in Kirehe District.

The joint RLMUA -District team conducted the field visit to different sites to verify proposed boundaries of the proposed District City, rurbans and rural settlements sites by using satellites images and based on the reality on the ground and the NLUDMP 2020–2050 guidelines.

After field verification, the team agreed that the urban setting should be made up by the District Secondary City and two rurban centers – Nasho and Rusumo , which are proposed to accommodate up to 49,000 people per 8.4 Km² by 2050. In rural areas, the NLUDMP proposes 58 Km² of land coverage and 141 sites for rural settlement sites in Kirehe District to accommodate a total population target of about 310,000 inhabitants.

3.14 Karongi

Karongi sits strategically on the western Congo-Nile trail and is located along the coastlines of Lake Kivu and parts of Nyungwe natural forests – all great tourist attractions. This gives Karongi the potential of quick and speedy growth, owing to projected growth in tourism activities in the area. The District, in the Western Province, is projected to reach 750,000 people by 2050 up from 401,488 people, and its economy will rely heavily on tourism and related touristic activities.

Karongi's Secondary City will play a critical role in the exponential growth of urban areas in the District, supported by the planned rurban areas. Other factors expected to support the growth of Karongi include cross-border trade with the neighboring DRC as well as the Kivu-belt expressway, which, apart from easing the movements of people and goods, is also expected to facilitate tourism along the many attractions of Karongi District and adjacent areas.

In the coming decades, settlement areas will cover an area of 149 km^2 (or 17.5% of the total area, including road infrastructures), with the urban area taking up 32.5 km^2, rurban covering 20.6 km^2, while rural settlements will dominate at 96.5 km^2. Agriculture is expected to cover 41% of the District's land, while the remaining will be occupied by forests (20.6%), wetlands and water bodies (approx. 21%).

401,488
Population

2050 PROJECTION

750,000
Population

32.5 km^2
Urban area

20.6 km^2
Rurban area

Hills of Karongi
© Ericnkurunziza,
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The dissemination workshops in Karongi and boundary verification missions took place from October 4 to October 8, 2021 and included training, capacity development, and boundary verification for sites allocated for settlements. The verification mission provided recommendations based on observations made and analysis of the needs of the population and existing data, proposing to extend the urban area from 3,194 ha to 3,251 ha, as the following:

SETTLEMENT TYPE	ORIGINAL SIZE (ha)	PROPOSED CHANGE SIZE (ha)
Urban Boundary	3,194 ha	3,251 ha
Rurban boundaries	2,015 ha	2,060 ha
Rural settlement sites	9,800 ha	9,841 ha

3.15 Gakenke

Located in the northern, mountainous part of Rwanda, Gakenke District covers an area of 704.06 km^2 and has a population of 382,932 people. This population is projected to grow to about 537,000 in 2050. In 2050, the District's economy will primarily rely on cross-border trade between Uganda and Rwanda. Mining and manufacturing will be also be very important activities for the growth and economic transformation of the District.

According to the NLUDMP, in 2050, Gakenke Town is expected to be extended on a surface area of 21 km^2 with a population of 150,000

704.06 km²
Area

382.932
Population

2050 PROJECTION

537,000
Population

people. Its emerging rurban residential centers, notably Ruli and Rushashi, will cover 8.4 km^2 with 49,314 inhabitants, while the projection for rural settlements is set to 77 sites inhabited by 170,000 people on a surface area of 32 km^2.

According to the NLUDMP, the distribution of settlements in Gakenke in 2050 and the needs for land will be as follows:

AREAS	POPULATION	LAND SURFACE
Gakenke Town	150,000	21 km²
Rurban areas	49,314	8.4 km²
Rural settlements	170,000	32 km²

Agriculture is expected to cover the larger part of the District, with 57% of the total district area (40,137 ha), while the remainder will be occupied by forests (16,396 ha), settlements (11,362 ha), and wetlands (2,897 ha).

Dissemination of the NLUDMP in Gakenke District was carried out from 4 October to 8 October, 2021. The activity consisted of presenting the Master Plan to the District' authorities, staff and stakeholders as well as validation of boundaries of Gakenke Town, two rurban centers, and 19 rural settlements sites. During the dissemination work, boundaries were revised for some sites in the urban, rurban and rural areas.

3.16 Nyamasheke

Nyamasheke District is one of the seven Districts of the Western Province. It covers an area of 1.174 km² with 471,388 people (meaning 386 people/km²). Nyamasheke District has a great potential of tourism opportunities around the Nyungwe National Park and Lake Kivu. The District is also open to cross-border trading due to its proximity with the DRC.

The NLUDMP projected that by 2050, Nyamasheke District will be inhabited by a total population of 483,000 people which shall be settled as follows:

ASPECTS	POPULATION	LAND DEMAND
Urban area	250,000	25 km²
Rurban area	49,314	8.4 km²
Rural settlement	180,000	38 km²
District's total population	500,000	-

Trade and tourism are projected to remain the main economic activity for the District Town. The neighboring Nyungwe Forest National Park and Lake Kivu will create more business opportunities leading to the growth of this center, while the mining sector exhibits great potential, also.

The land use allocation in Nyamasheke District for different activities is predicted by the NULDMP as follows:

Agriculture
35,869 ha; 30.69%

Forest, open spaces, tourism, and conservation zone:
41,494 ha; 35.51%

Urbanization, settlement and infrastructure:
15,050 ha; 12.88%

Wetlands and water bodies:
2.77%

Water bodies:
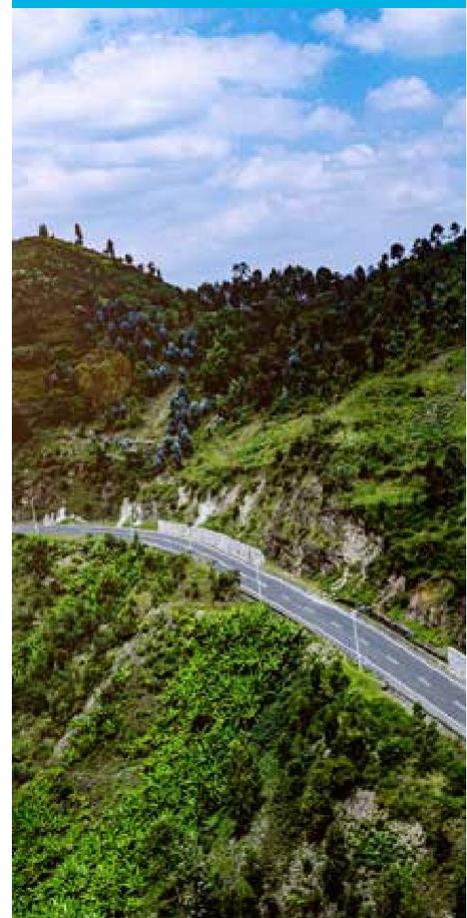18.2%

1.174 km²
Area

471.388
Population

2050 PROJECTION

482,000

Kivu belt Road
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The dissemination of the NULDMP in Nyamasheke District took place from 21 June to 25 June, 2021 and was focused on training members of the District Executive Committee, District Councilors, District OSC Staff, Sector Land Management and other concerned District stakeholders on the NLUDMP-2050; and verifying and cross checking the boundaries of Nyamasheke District Town, rurban and rural settlements sites through technical field visits.

During these field visits in Nyamasheke District, some changes and adjustments were proposed on existing urban and rurban boundaries: generally, field urban boundary verification started by visiting Sectors covered by Nyamasheke Town namely; Kagano, Kanjongo and Bushekeri. After the field assessments, some sites were removed from the urban boundaries due to a number of factors such as inappropriate geographic locations and other geological situations. Similarly, changes were made for rurban areas whereby some locations were found unsuitable for settlements, and thus removed. The number of sites for rural settlements were also reduced.

The adjustment made in boundaries and urban and rurban are summarized in the following table.

AREA	EXISTING SIZE (KM²)	PROPOSED SIZE (KM²)	CHANGES
Urban Boundary	25.2 km²	23.59 km²	Decrease 1.61 km²
Rurban boundary	16.6 km²	17.28 km²	Increase 0. 60 km²
Rural settlements boundaries	93.8 km²	78.7 km²	Decrease 15.1 km²

Overall, the number of sites for rural settlements were reduced from 166 to 86 sites, Moreover, two new sites has been added while 80 sites were removed.

Participants recommended the continued capacity development of staff responsible of land to ensure that they are well equipped to oversee the implementation of the NLUDMP, develop a manual at every Sector to facilitate awareness of land use within the local community, and develop modalities for issuing permission for harvesting of forests.

3.17 Nyamagabe

Nyamagabe District is located in the Southern Province and covers an area 1,090 km² with a population of 413,204 people. The District is located a few kilometers on the road from the academic and research town of Huye, making it a prime area of urbanization in this part of the country. The District also boasts of a rich potential for tourism, mainly because it is partly home to parts of the Nyungwe National Park.

According to the NLUDMP, by 2050 the population growth, urbanization, and land demand for settlements in Nyamagabe District is projected as the following:

AREAS	POPULATION	LAND DEMAND
Urban area	250,000	36 km²
Rurban area	49,314	8.4 km²
Rural settlement	180,000	34 km²

The NLUDMP predicts the land use balance sheet of Nyamagabe to be distributed between agriculture that is projected to occupy 43,659.34 ha (39.96%), forests and green spaces (including land for tourism and conservation) that will take 51,367.47 ha (47.01%), settlements areas covering 11,011 ha (10.08 %) and wetlands and water bodies occupying up to 3,221.01 ha (2.95%). It also recognizes that trade and tourism shall become the main economic activities for the District Town.

1,090 km²
Area

413,204
Population

Working in the hills of Rwanda
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The dissemination and training on the NLUDMP-2050 was conducted in Nyamagabe District in August 2021. The exercise consisted of training members of the District Executive Committee, District Councilors, and other concerned District stakeholders as well as verifying and cross-checking the main urban boundaries of Nyamagabe District Town, rurban boundaries, and rural settlement sites.

Participants included members of the District Executive Committee, Sector Land Managers, One-stop center staff, Sector Executive Secretaries, representatives of the Private Sector and Religious Leaders, among others. The participants were taken through the rationale of the National Land Use Development Master Plan and profile for Nyamagabe District, describing the current land uses and comparing them to the proposed recommendations of the NLUDMP as well as the balance sheet for land use in the District. After interactive discussions, participants undertook a field boundary verification for planned urban, rurban and rural sites. The visit assessed the current uses, plans and future land use needs and proposed recommendations for efficient use of land in the coming decades, and to ensure that the uses respond to the needs and requirement for proper land use. They concluded with adjustments on the land uses, in line with the country's land use vision and plans. In result, participants recommended that the two planned sites for urban settlements merged into one and that areas with steep slopes be excluded from planned residential sites. To avoid the urban sprawl, fewer rural settlements closer to the urban area were added to the Nyamagabe Town boundary, than was initially planned.

After field verification, boundaries were revisited as follows:

AREA	EXISTING SIZE (km²)	PROPOSED SIZE (km²)	CHANGES
Urban Boundary	23.3 km²	25.9 km²	Increase of 2.6 km²
Rurban boundary	17.7 km²	13.1 km²	Decrease of 4.6 km²
Rural settlements boundaries	60.8 km²	45.6 km²	Decrease of 15.2 km²

3.18 Rutsiro

Located in the high-mountainous Congo-Nile region (which is also rich in natural forests) and in some parts on the lower shores of Lake Kivu, Rutsiro District is poised to quickly develop in the coming decades. An entry point to the new Gishwati-Mukura National Park and UNESCO Biosphere Reserve as well as to Lake Kivu, the District has many opportunities to expand its tourism and touristic activities – putting it on the path to high and accelerated growth.

The District's population is estimated to be 392,831 and the NLUDMP projects that this population will grow to reach 550,000 people in 2050, with over 150,000 of them living in urban areas. The emerging rurban centers of Kivumu, Kayove, and Boneza will also play a critical role in the urbanization of Rutsiro, and are expected to be home to over 73,900 people.

A Kivu belt Road in Rutsiro District
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The growing size of the population is expected to put too much pressure on land resources as people compete for land and housing. The urban area will span an area of 12 km², with a population density expected to reach 7,000 people/km². Rurban areas shall cover up to 12.5 km². The rural population, is projected to reach over 180,000 by 2050, and they will live in 92 settlements spanning 40 km² across the whole District. The land sheet balance for Rutsiro District will be predominantly dominated by agriculture and forests – cementing the status of the District as a tourism hub:

LAND ALLOCATION ON MAIN LAND (LAKE KIVU EXCLUSIVE)	AREA IN ha	%
Agriculture and livestock	31,443.31 ha	47.5%
Forest	11,911.86 ha	18.9%
Urbanization, settlement, and infrastructure	5,571.07 ha	8.4%
Wetland and their buffer zones; Kivu lake buffer zone	2,571.66 ha	3.88%
National parks and open spaces and other eco-tourism zones	14,300.51 ha	21%

3.19 Rulindo

One of the five Districts that make up Rwanda's Northern Province, Rulindo District is a mountainous district characterized by steep slopes and prone to landslides. Communities in this District on the northern border of the capital city, Kigali, live mostly on top of the hills, due to its topography. The District covers an area of 567 km² and has a total population of 348,094 people. The proximity of Rulindo District to the City of Kigali constitutes a major potential for rapid settlement in the future; and there are already observed movement of people (though still at a limited scale) coming from Kigali to settle in this adjacent District.

567 km²
Area

348,094
Population

2050 PROJECTION

200,000
Population

The NLUDMP projects that the population of Rulindo will grow to reach 575,000 people by 2050, with about 200,000 of them living is urban settlements.

The economic transformation in Rulindo will be driven by forestry, commercial agriculture, agro-processing, and mining.

It is projected that by 2050, agriculture shall occupy 51.4% of the lands in Rulindo (30,785 ha), while forestry will take up 13,835 ha or 23%. Other areas will be occupied by settlements covering 10,330 ha (17.2%) and wetlands, water bodies and their buffer zones at 4,839.5 ha (8%).

4

CONCLUSION AND RECOMMENDATIONS

Kigali skyline
© Unsplash

The NLUDMP dissemination workshops and field verification exercises were successful activities which led to a deep understanding of the Master Plan as well as what is needed for its implementation. It was an opportunity for leaders to exchange on what needs to be done to ensure that in the coming decades land – a scarce and highly contentious resource in the highly populated country of Rwanda – is well utilized to serve and meet the needs of the population in the next 30 years. Without a clear plan and a good understanding of the Master Plan, land would be badly utilized, become much scarcer, highly degraded, and could potentially lead to conflicts. The NLUDMP-2050, if properly implemented, has the potential to ensure a better utilization of land resources to meet the needs and demands of the growing population in the next 30 years. Creating a better understanding about the planned scenarios and provisions of the Master Plan is a critical stage in ensuring its proper execution, compliance and monitoring.

The following are recommended, following the conclusion of the dissemination activity:

1. Continue efforts to raise awareness and create deep understanding of the provisions of NLUDMP-2050 among all stakeholders, particularly local leaders, in order to ensure a good knowledge of the Master Plan and better implementation and monitoring of compliance.

2. The MoE should continue to work with other ministries and public institutions to ensure that any new plans take into consideration and is aligned with the NLUDMP-2050.

3. Raise awareness and educate the population on the need to comply with the NLUDMP-2050.

4. Continue to work with field technicians, local leaders and local communities to ensure that boundaries for urban, rurban and rural settlements are aligned to local realities, contexts and needs.

5. Continued capacity development of staff responsible of land to ensure that they are well equipped to oversee the implementation of the NLUDMP.

6. Develop and distribute user manuals and summarized documents for each District (preferably in Kinyarwanda) to facilitate better awareness of land use within the local community and local stakeholders.

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FIELD MISSION REPORTS

1. Presentations and Reports of Field Missions for the Dissemination of NLUDMP-2050 in 19 Districts.

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