High – Level Environmental and Social Impact Assessment Report

Green City Kigali Project, Rwanda

30 November 2021

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The business of sustainability

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High – Level Environmental and Social Impact Assessment Report

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Document Guide:

The Green City Kigali (GCK) Project will include comprehensive measures to ensure that adequate environmental and social (E&S) conditions will be established. To support Project implementation, a series of technical documents have been prepared ("Safeguard Documentation"), these being:

- Strategic Environmental and Social Impact Assessment (SESA);
- High-Level ESIA (the High-Level ESIA); – **This Document**
- Environmental and Social Management Framework (ESMF);
- Stakeholder Engagement Framework (SEF); and
- Resettlement Policy Framework (RPF).

The High-Level ESIA provides a baseline reference to E&S aspects, risks and impacts appropriate to the stage of the Project at the time of development of this document. Furthermore, this High-Level ESIA will guide the E&S management process of future sub-projects and their sub-components.

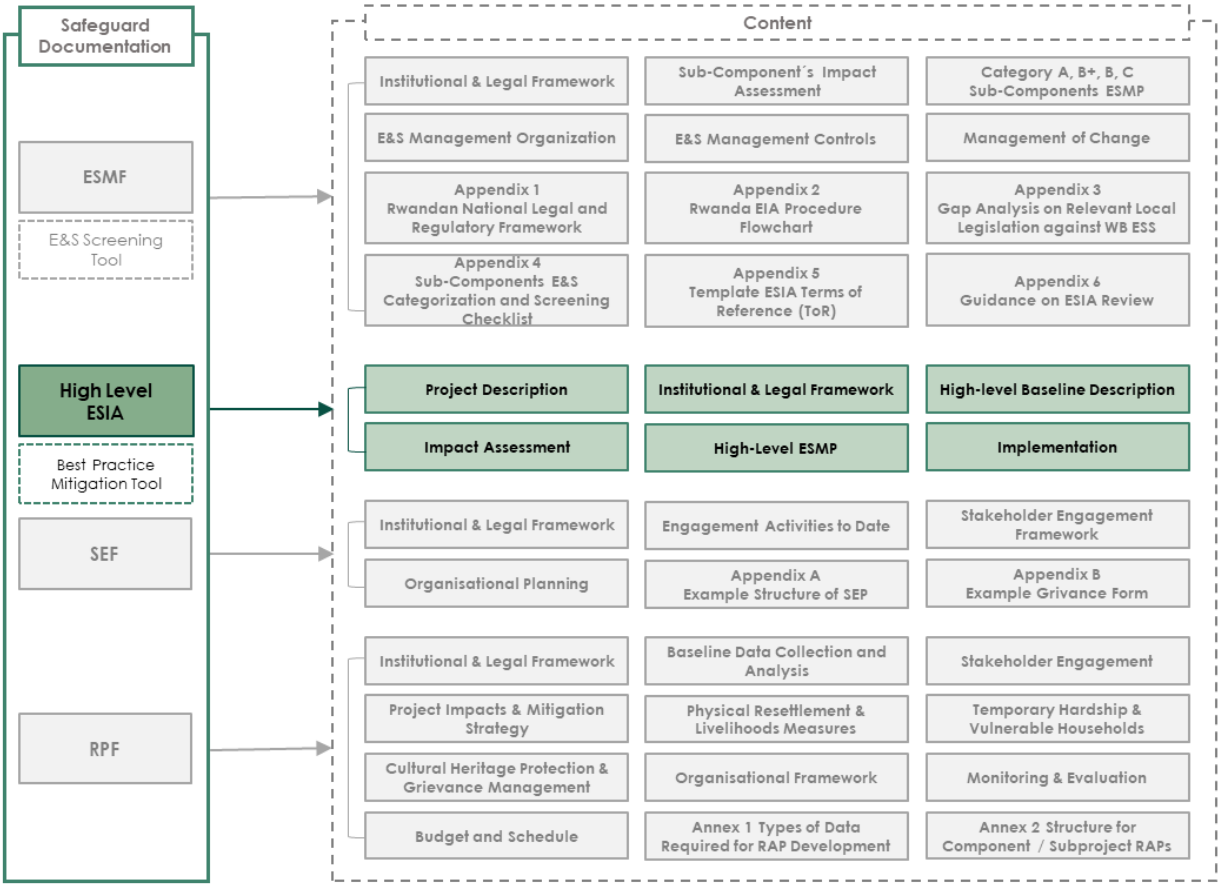


Table of Contents

List of Tables

List of Figures

Acronyms and Abbreviations

Name	Description
AoI	Area of Influence
BMZ	German Ministry for Economic Development and Cooperation
CoK	City of Kigali
E&S	Environmental and Social
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
ERM	Environmental Resources Management GmbH
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Safeguard (of the World Bank)
FFS	Final Feasibility Study
FONERWA	Rwanda Green Fund
GCF	Green Climate Fund
GCK	Green City Kigali
GCKC	Green City Kigali Company
HS	Health and Safety
HSE	Health, Safety and Environment
IFC	International Finance Corporation
ILO	International Labor Organization
KfW	Kreditanstalt für Wiederaufbau, German Development Bank
KICS	Kigali International Community School
LACF	Land Acquisition Compensation Framework
LACP	Land Acquisition Compensation Plan
LRP	Livelihood Restoration Plan
MEIS	Monitoring and Evaluation Information System
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government
MININFRA	Ministry of Infrastructure
MINIRENA	Ministry of Natural Resources
MoC	Management of Change

Name	Description
MoE	Ministry of Environment
PCD	Public Consultation and Disclosure
PEA	Project Executive Agency
pESIA	Preliminary Environmental and Social Impact Assessment
PIE	Project Implementation Entity
RAP	Resettlement Action Plan
RDB	Rwanda Development Board
REG	Rwanda Energy Group
REMA	Rwanda Environment Management Authority
RHA	Rwanda Housing Authority
RLMUA	Land Administration and Use Authority
RPF	Resettlement Policy Framework
RPHC 2012	Rwandan Population and Housing Census (2012)
RSB	Rwanda Standards Board
RSSB	Rwanda Social Security Board
RUDP	Rwanda Urban Development Project
RWFA	Rwanda Water and Forestry Authority
SEF	Stakeholder Engagement Framework
SEP	Stakeholder Engagement Plan
SPV	Special Purpose Vehicle
Sweco	International Consulting for GCK Project (Swedish Consultants)
ToR	Terms of Reference
UADC	Urban and Architectural Design Consultant
WASAC	Water and Sanitation Corporation
WB	World Bank
WWTP	Wastewater treatment plant

1. INTRODUCTION

This document presents the High-Level Environmental and Social Impact Assessment (hereinafter referred to as "High-Level ESIA") for the Green City Kigali Project in Rwanda (hereafter referred to as "GCK" or "the Project"). The purpose of this High-Level ESIA is to identify the likely significant environmental and social (E&S[1]) impacts of the Project and serve as a basis for the future E&S assessments of the Project sub-components.

Definition of this High-level ESIA:
A process of identifying and assessing potential environmental and social impacts and broader impact areas of the Project (umbrella level), evaluating and identifying relevant general mitigation and management measures, and indicating focus areas for specific sub-component E&S assessments. This High-Level ESIA constitutes a framework and baseline E&S guide for all sub-components that will be developed in the Project Area.

1.1 Project Overview

The GCK Project[2] is a major urban development Project in Rwanda. The goal of the Project is to create a model community in Kigali, which demonstrates and sets standards for sustainable urban development that can be replicated in other parts of the country and the wider region, by combining climate change resilience with affordable housing solutions.

The Project is located on Kinyinya Hill (see **Figure 1-1** below) in the northeast of the central business district of Kigali, in the district of Gasabo and comprises an area of around 600 hectares (the "Project Area").

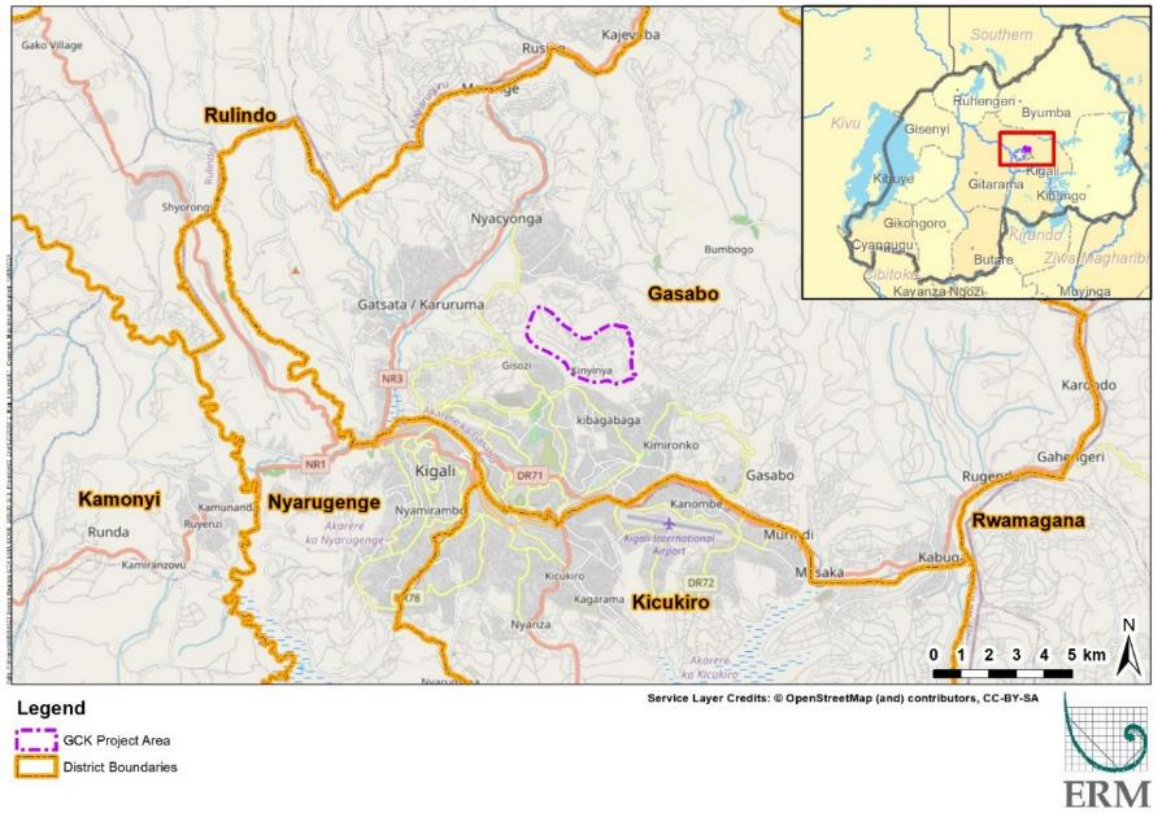


Figure 1-1 Project Location Kinyinya Hill, Kigali, Rwanda

1 Throughout this document, the E&S abbreviation covers environmental, health and safety, social and cultural heritage aspects.

2 Green City Kigali Project website, available at: Green City Kigali: Rwanda's pilot towards green urbanisation

The model community will link four key pillars of sustainable development:

i. affordable and socially equitable development,

ii. climate change adaptation and mitigation,

iii. resource efficiency, and

iv. culturally sensitive urban development.

This integrated strategy will create an attractive and progressive standard, considering these are major pressing issues in the region as well as globally. Such integrated, green urban development offers opportunities in which Rwanda and the region can grow and minimise the negative effects of rapid urbanisation and challenges of informal settlements. Through the creation of affordable housing, low-income society groups can benefit from the effect of urban development. A compactly planned city enables inhabitants to get around by walking and cycling. In doing so, this not only improves air quality and is climate-friendly, but also spurs economic development. Endeavours to integrate electric mobility into the country's electrification process pave the way toward low-emission urban mobility.

The Project will comprise a new enhanced urban area including green housing for low to middle-income inhabitants, commercial spaces, light industrial areas, schools, health facilities, recreational areas, sports facilities, and green areas. The following six key components will be implemented:

- An arterial high street, a loop road linking neighbourhoods with the wider city;
- Sloping streets for pedestrians;
- A series of neighbourhoods each with its own social and commercial centre;
- A hilltop landscape for recreation, sports and social gatherings;
- Shared primary schools which form links between landscape and built communities; and
- Integration with existing housing and infrastructure developments.

In addition, comprehensive infrastructure and basic services will be provided, including information and communications technology (ICT), solid waste management, sustainable transport including more affordable and smart public transport systems, energy, and water and sewage management.

The Project will be implemented by the progressive development of these above key components - and their numerous “sub-components” - as separate smaller projects within the overall GCK Project.

Figure 1-2 below illustrates the concept of the Project sub-components within the Project Area as a whole.

Figure 1-2 Example Illustration of Project Area and the various sub-components within

1.2 Background

The Government of Rwanda has committed itself to shift towards green urbanisation[3] focusing on nation-wide environmentally sustainable, climate resilient and green, economic growth. A number of national strategies, policies and guidelines were developed by the government to set priorities and directions on urban development to tackle challenges related to climate change, population growth and rapid urbanisation. These strategic documents outline the national growth directions in urbanization, green growth and climate resiliency, housing and planning regulations that guide the land use planning of the cities. This was also the basis for the updated City of Kigali Masterplan 2050 (2020)[4]. The City of Kigali Masterplan 2050 provides an Urban Sustainability Framework and guiding principles for the planning processes to ensure the long-term sustainability of Kigali City.

The Green City Kigali (GCK) Project transposes the City of Kigali Masterplan 2050 goals and addresses the above-indicated issues and challenges. It aims at providing an urban development model for increased resilience against the consequences of climate change and a basis for sustainable urban development of Rwanda through the development of a model community at Kinyinya Hill. This objective will be achieved by integrating various solutions such as pilot developments that allow users to enjoy the social and economic benefits of urbanization while minimizing ecological footprint, as described below.

The planned neighbourhood will be the first Green City in Africa. A place of sustainable, affordable, green and inclusive urban living. A place full of life.[5]

The Rwanda Green Fund (FONERWA) has secured funding from the German Development Cooperation through KfW Development Bank and the Green Climate Fund's Project Preparatory Facility, to prepare a feasibility study and to conduct an international design competition and tender process to select an Urban and Architectural Design Consultant (UADC). The UADC will undertake urban planning, infrastructure and architectural design services associated with the GCK Project. In addition, funding was provided to support establishment of a special purpose vehicle (SPV) named the Green City Kigali Company (GCKC) that will serve as the central entity for the implementation of a 16 ha pilot project (refer to **Chapter 2** for more information).

3 National Strategy for Transformation (NST1) 2017 – 2024, available at:
https://www.nirda.gov.rw/uploads/tx_dce/National_Strategy_For_Trsansformation_-NST1-min.pdf

4 Analysis and Vision. Kigali Master Plan 2050, 2020 Edition, available at: 1_Kigali Master Plan_Analysis & VisionLowRes.pdf (bpmis.gov.rw)

5 Green City Kigali Project website, available at: https://greencitykigali.org/

The Project is divided into four phases (see **Figure 1-3** below). Sweco, an international engineering and architecture firm in infrastructure, water, buildings and urban development, has been contracted by FONERWA to support the implementation of the Project during Phase A - feasibility assessment, Phase B - the design competition and Phase C – detail design and master planning. Phases B and C include an international design competition (Phase B) to formulate a site masterplan for the 600 ha planning area and detailed designs and tender documents (Phase C) for the first construction phase of a 16 ha pilot site. During the development of this High-Level ESIA and the associated Safeguard Documentation, the Project was in Phase B[6].

Figure 1-3 Overview of Project Phases

In 2019, Sweco prepared the Mid-term Feasibility Report for the Project[7]. In parallel, Sweco also prepared a Preliminary Environmental and Social Impact Assessment ("pESIA")[8] to document potential E&S issues related to the Project and how those would be conceptually managed. A draft Final Feasibility Study (FFS) was published in November 2020, which included:

6 https://greencitykigali.org/about/timeline/

7 Mid-term Feasibility Report – Part II, Consulting Services for the 'Green City Kigali' Project, Part II – Full Sector Reports, Sweco, June 2019

8 Preliminary Environmental and Social Impact Assessment, Green City Kigali, Sweco, June 2019

- Full Sector Reports undertaken during the feasibility process (Phase A)[9];
- Urban Design Project Handbook that outlines the urban development context of the GCK and which informed the design competition process;
- Terms of Reference (ToRs) for the tender of consulting services for Urban, Infrastructure and Architectural Design Works relating to the Project;
- Illustrative Masterplan 600 ha, concept for the 16 ha pilot site, and design report for the Project;
- E&S Safeguards Documentation; and
- Relevant Project Documentation.

The international design competition for the Project was carried out in the spring of 2020. This High-Level ESIA also includes elements from the winning proposal from the international design competition for the Project. The contract with the winning Urban and Architectural Design Consultant (UADC) had not been finalized at the time of writing this High-Level ESIA and thus the architect is not listed by name. Any reference made to this Masterplan for the Project Area is referred to as "GCK SPA Masterplan" (not to be confused with the above described city-wide Kigali Master Plan 2050).

Sweco, on behalf of FONERWA, contracted the E&S consultancy firm Environmental Resources Management GmbH (ERM) to develop the following E&S Safeguards documentation based on the GCK SPA Masterplan[10]:

- Environmental and Social Management Framework (ESMF);
- High-Level Environmental and Social Impact Assessment (High-Level ESIA); and
- Stakeholder Engagement Framework (SEF).
- The Project Resettlement Policy Framework (RPF) was commissioned by Sweco and prepared and submitted in January 2021 by SRA Consulting Ltd.

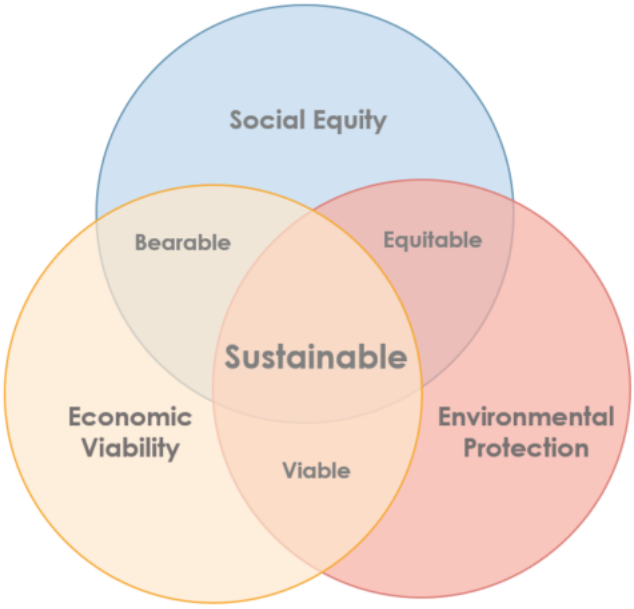
1.3 Project Sustainability Principles

The Green City Kigali (GCK) Project is aligned with the goals of the City of Kigali Masterplan 2050 by providing a model community at Kinyinya Hill for sustainable urban development and resilience against the consequences of climate change. These objectives will be achieved by integrating the Project's key pillars of sustainable development (**Figure 1-4**):

i. Sustainable urban development for social inclusion and reducing poverty;
ii. Sustainable and inclusive urban prosperity and opportunities for all; and
iii. Environmentally sustainable and resilient urban development.

9 The full sector reports include: housing and building; construction industry and building materials; mechanical engineering integration/building technology; water and sewerage; energy and ICT; transport and mobility; solid waste management; urban economy; finance and legislation; job creation and local economic development; cross-cutting issues (E&S); gender analysis; and climate change.

10 The coloured boxes around each E&S Safeguard document correspond with the cover page included as well as the guidance provided in the Navigation Manual. These boxes can be used as buttons, linking the respective reports.



Source: ERM, 2021

Figure 1-4 Project's Key Pillars of Sustainable Development

These sustainability principles were mainstreamed in the GCK Project based on a top-down approach, from national level, down to overall Kigali City and then further down to the Green City Kigali Project. In doing so, consideration has been given to the urban development realities of the country and their impacts on Kigali (given the urbanisation trends) as well as to the more local context and realities.

National Level

At national level secondary cities (Huye, Muhanga, Nyagatare, Rubavu, Musanze and Rusizi) were selected to serve as urban growth poles to ensure a more balanced urban growth by encouraging the emergence of such secondary, economic poles of growth as an alternative to over-concentration in Kigali. It is envisaged that the master plans of the secondary cities in Rwanda are revised by using the City of Kigali Masterplan 2050 (and within that the GCK Project model) as guidance.

The key aim of this urbanisation planning at national level is to achieve economic growth while addressing associated potential negative impacts through embedding the above-indicated sustainable development principles (social equity, environmental protection and economic viability) based on following key characteristics[11]:

- Urbanisation Foundations: good governance, urban planning, and environmental and social Safeguard policies;
- Urbanisation Pillars: building sector, energy, urban mobility, production and distribution of water, sanitation, and waste management; and
- Urbanisation Pull-Factors: economic development, job creation and quality of life.

Kigali City Level

The above-indicated characteristics were transposed into the Kigali Urban Sustainability Framework (USF), providing the city development guiding principles by building on the same three (social equity, environmental protection and economic viability) pillars. These were embedded into the City of Kigali

[11] National Roadmap for Green Secondary City Development, GGGI, MININFRA, Rwanda 2015.

Masterplan 2050 through the definition of a set of goals covering eight themes of development and associated key planning strategies as follows:

- Kigali Integration in the National and Regional Context
- Incremental Development
- Facilitating affordable Housing
- Detailed Phasing aligned to City Development Strategy
- Mixed Use Approach
- Green Growth
- Sustainable and Resilient Infrastructure
- Inclusivity and Equity

Project Level

At Project level, the national and City of Kigali Masterplan 2050 goals and founding development principles were taken forward by embedding them into the masterplan for the GCK Project ("GCK SPA Masterplan"). With regard to the implementation of the sustainable development principles at Project level, the GCK SPA Masterplan (the Masterplan prepared by the Urban and Architectural Design Consultant)aims at addressing the challenges of housing affordability and supply, vulnerability to climate change and increasing urban population, with consideration of the need to improve quality of life, health and wellbeing.

The approach in the GCK SPA Masterplan includes harnessing nature (ecosystem services) to provide an affordable and low footprint ecological infrastructure. These are enhanced through interventions targeting specific synergies such as using constructed wetlands, which enhance biodiversity and landscape amenity whilst also being a practical, low impact and low-cost solution to water filtration and management.

In line with the Project goal of sustainable development and its high visibility, the Project commits to implement all of the sub-components in line with applicable national and international standards, safeguarding physical, biological and social environment at all times. The guiding requirements for management of Project E&S risks and impacts are outlined in the Safeguard Documentation package, reflecting good international practice. The Project commits to applying the following mitigation hierarchy as good international practice: avoid/reduce at source; abate on site; abate at receptor; repair or remedy; and compensate.

The Project commitment to implement relevant E&S safeguards measures and achieve the sustainability principles is under the responsibility of the existing regulatory enforcement agencies, notably CoK and REMA through RDB. The developers of the various sub-components are in charge of preparing, implementing and enforcing their own E&S studies and management plans for their sub-component and for compliance to all regulations.

1.4 Scope and Objective of the High-Level ESIA

This High-Level ESIA is to be read in conjunction with the Project-wide Safeguard Documentation package and provides an overview of expected key E&S impacts and overall guidance on their further assessment and management throughout Project implementation.

Important:
The objective of this High-Level ESIA is to document E&S risks and potential impacts, and appropriate mitigation for these, likely to result from the Project as whole based on the GCK SPA Masterplan in line with the Applicable Standards.

The principles, standards and requirements set in this High-Level ESIA and the Project-wide Safeguard Documentation package are applicable to all future Project sub-components.

Why this High-Level ESIA?

The Project is currently (i.e. mid 2021) still in the conceptual planning and design stage, as reflected in the GCK SPA Masterplan. One specific sub-component will act as a pilot project and will therefore be implemented first (see **Chapter 2**). The actual construction of the Project will occur as a series of developments (i.e. the above-mentioned sub-components of roads, housing areas, wastewater plants, etc.) extending for approximately the next 10 - 20 years.

The details of the sub-components are not currently known, but each of these will be implemented as stand-alone projects subject to their own financing, design approvals (within the general framework of the GCK SPA Masterplan), regulatory permits for construction, environmental approvals, etc. All sub-components will of course need to adhere to the applicable Rwandan E&S requirements as a minimum, and if the sub-component project involves financing from international sources then the respective international standards of the lender(s) will apply as well.

The extent of E&S assessment – and whether or not a full ESIA is required – will depend on the applicable Rwandan legislation and usually this is related to the size of the sub-component project and the inherent E&S risks.

International lenders perform a screening of each project (sub-component) for potential E&S impacts and assigned a category reflecting the associated E&S risks from High Risk to Low Risk. This initial E&S screening and categorization will define the path as well as the type and scope of E&S impact assessment a specific sub-component will undergo.

As per the Good International Practice and in line with the E&S Categorization adopted for the Project, each of the sub-components will be classified into one of the following four risk classes/categories: High Risk (or Category “A”), Substantial Risk (or Category “B+”), Moderate Risk (or Category “B”) and Low Risk (or Category “C”), according to the significance of their potentially adverse E&S impacts and risks[12].

The sub-component E&S Categorization defines the extent and level of detail that will be required at the next steps to diligently take into account E&S impacts and risks as follows:

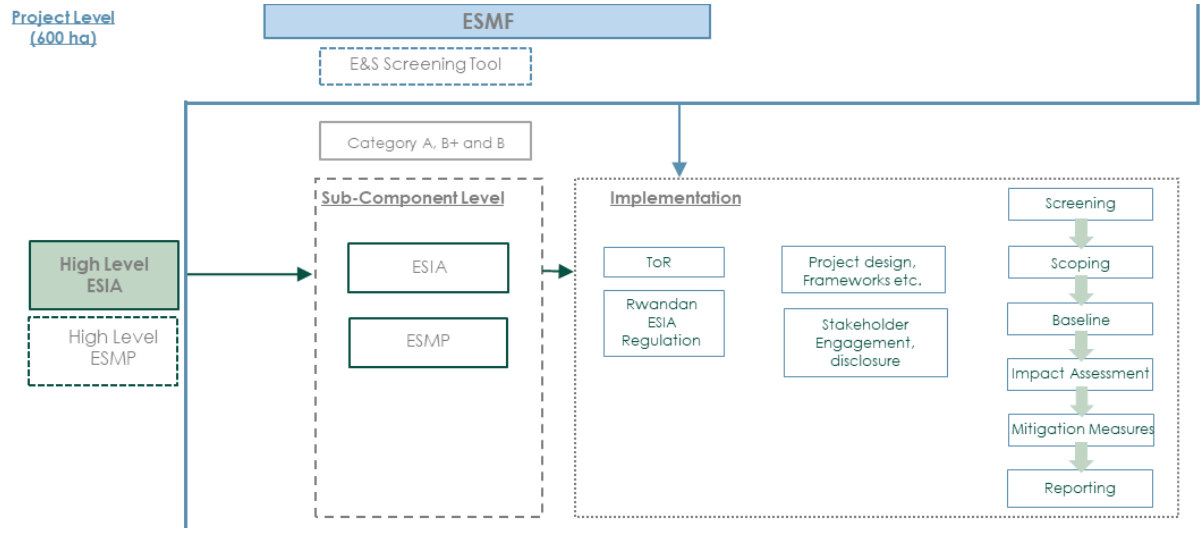
- Sub-components categorized High Risk/A, Substantial Risk/B+ or Moderate Risk/B require an independent Environmental and Social Impact Assessment (ESIA) study, including an Environmental and Social Management Plan (ESMP)
- Sub-components categorized Low Risk/Category C, will be subject to simplified E&S Assessment process as required under the national law and will require the development of a Low-risk ESMP.

Further details with respect to the sub-components categorization and implications for further assessment and studies required are provided in the E&S Management Framework (ESMF)

This High-Level ESIA (which includes a High-Level ESMP in **Chapter 7**) serves as a framework for the subsequent ESIAs and ESMPs for the sub-components. The developers of the sub-components are encouraged to utilise all of the relevant information in this document as a starting point and orientation in the process of developing the subcomponents’ ESIAs and ESMPs. For example, the baseline data of **Chapter 5** can be used as regional background and recommendations are given for further project-specific assessment and **Chapter 6** gives general information on likely E&S impacts; a wide range of corresponding mitigation measures is then presented in the High-Level ESMP in **Chapter 7**.

[12] Adopted categorization aligned with World Bank Environmental and Social Framework and KfW Development Bank Sustainability Guideline. Sub-Components funded by other international lenders may be subject to slightly different E&S categorization. However, the E&S appraisal process provided herein could be applied in the case of these Sub-Components as well.

This high-level information will thus provide guidance for each sub-component ESIA and allow consistency across the various ESIAs being prepared for the Project sub-components under development. The provision of a common framework for use by the sub-components is similar to the purpose of the E&S Management Framework (ESMF), one of the other Safeguard Documents. The application of the High-Level ESIA/ESMP and the ESMF with respect to the sub-components is shown in the **Figure 1-5** below.



Source: ERM, 2020

Figure 1-5 Application of High-Level ESIA

This High-Level ESIA includes a number of assumptions, given that the Project is still in the planning phase. These assumptions are based on phased developments of a similar scale and type, to enable the assessment of likely E&S risks and impacts.

The Project development will include, but will not be limited to, the following activities:

- Land acquisition;
- Land clearing;
- Soil removal and earth works;
- Civil works;
- Construction activities including material sourcing; and
- Greening, etc.

The recommendations arising from this High-Level ESIA are intended to be carried through to the detailed designs of each sub-component. Each sub-component will be screened for its E&S risks and impacts as the detailed designed process is carried out. Further E&S assessments will be undertaken for the sub-components as appropriate, building on the findings of this High-Level ESIA.

The High-Level ESIA is based on baseline information obtained by Sweco in preparation of the preliminary ESIA (pESIA) completed in 2019 and the Final Feasibility Study (FFS) in 2020. The Project description relies on information provided via the GCK SPA Masterplan.

How is this High-Level ESIA different from a normal ESIA?

A normal ESIA is based on a project design/description that is completed, or at least nearly completed to the extent that the impacts stemming from the project development on the existing baseline conditions can be reasonably predicted, and appropriate specific mitigation measures and monitoring procedures can be drafted. In the case of the GCK Project, the overall design is still in progress and in fact the Project will be implemented not in one large construction program, but via the numerous

separate sub-components over a period of many years. As such, this Project is essentially a compilation of the many smaller projects, each of which will be subject to separate financing, permitting, construction etc., yet all within the wider context of the GCK SPA Masterplan and the above-mentioned key principles of urban sustainability.

Given this arrangement, a single overall ESIA would not be feasible at this stage. Instead, this High-Level ESIA will serve as a common framework for the subsequent ESIAs for the sub-components.

Important:
The High-Level ESIA addresses common E&S impacts and is intended to be used as a basis for any future assessment undertaken for sub-components or activities within the Project Area.

1.5 Structure of this High-Level ESIA

The High-Level ESIA is structured to address the following specific objectives:

- Provide an overall Project description based on the FFS and the GCK SPA Masterplan (**Chapter 2**).
- Provide an overview of applicable E&S institutional framework (i.e. applicable Project Requirements, Regulations and Standards) (**Chapter 3**).
- Provide an overview of relevant E&S impact assessment methodology (**Chapter 4**).
- Provide a high-level baseline covering the physical, biological, socio-economic and cultural environment within the defined Area of Influence (AoI) of the Project and identify the key baseline topics to be considered in the subsequent E&S assessments for Project sub-components (**Chapter 5**).
- Provide a baseline reference to E&S aspects, risks and impacts appropriate to the stage of the Project at this time, indicate potential focus areas in terms of E&S risks and general management requirements, setting a baseline for subsequent Project and sub-component specific ESIAs (**Chapter 6**).
- Provide High-Level Environmental and Social Management Plan (ESMP) outlining general recommendations for managing identified High-Level E&S risks and impacts (**Chapter 7**).
- Provide strategic recommendations on how to support adherence to the guiding principles, to avoid negative E&S impacts and to plan and implement the different Project components and infrastructure in an environmentally and socially responsible manner (**Chapter 8**).

1.6 Impact Assessment Summary

This High-Level ESIA identifies a number of potential impacts associated with the overall Project based on the assumed activities and possible sub-components of the Project outlined in the GCK SPA Masterplan to be implemented on the 600 ha Project Area. Significant impacts on the following receptors were identified:

- Air Quality;
- Area Sealing/Covering and Associated Soil Handling
- Flora and Fauna;
- Water/Groundwater;
- Waste Management;
- Noise and Vibration;
- Landscape and Visual;

- Community and workers H&S;
- Land use, acquisition and potential displacement (economic and physical)
- Ecosystem Services.

Furthermore, cumulative impacts from sub-components being implemented at the same time and other developments in the urban area of Kigali are expected. Therefore, the detailed design and development of sub-components should rely on separate, sub-component specific ESIAs, based on the overall findings in this High-Level ESIA.

As a result, general mitigation measures for the identified potential impacts from the Project as whole are proposed in the High-Level ESMP in **Chapter 7**. Sub-components should consider the High-Level ESMP and the ESMF as guidance documents; as appropriate, a specific ESMP will need to be developed during the design of each sub-component based on the further evaluation of E&S risks of the sub-component and site-specific mitigation and enhancement measures.

2. PROJECT DESCRIPTION

2.1 Overview

The following Project description is based on the GCK SPA Masterplan for the 600 ha Project Area, and corresponding design boards submitted to the international design competition.

The Project will comprise a new enhanced urban area including green housing for low to middle-income inhabitants, commercial spaces, light industrial areas, schools, health facilities, recreational areas, sports facilities, and green areas. According to the GCK SPA Masterplan, the following six key components will be implemented (described in detail in **Chapter 2.5**):

- An arterial high street, linking neighbourhoods with the wider city;
- Sloping streets for pedestrians;
- A series of neighbourhoods each with its own social and commercial centre;
- A hilltop landscape for recreation, sports and social gatherings;
- Shared primary schools which form links between landscape and built communities; and
- Integration with existing housing and infrastructure developments.

In addition, comprehensive infrastructure and basic services will be provided, including information and communications technology (ICT), solid waste management, sustainable transport including more affordable and smart public transport systems, energy, and water and sewage management (described further in **Chapter 2.6**). The Project will be implemented via a number of sub-components. Each sub-component will be managed by a Developer. One of these sub-components is the 16 ha pilot site, in the east of the Project Area. The 16 ha pilot site will included close to 1,700 affordable flats for 7,000 to 8,000 people across 16 ha and alternating residential units with commercial units. More flats are envisioned to be added in future. Construction work for the 16 ha pilot site is scheduled to start in 2022.

Important:
Each sub-component will be designed in detail at a later stage and will, when categorized accordingly, be subject to specific ESIAs and permits/approvals as defined in the Rwandan EIA legislation and the Project's ESMF.

2.2 Project Phases and Key Entities Involved

The development of the Project is divided into the following four phases (refer to **Figure 1-3**, with status as of October 2020):

- **Phase A: Feasibility Assessment** – Analysis of the current situation in Kinyinya Hill and design of sustainable and green solutions framework (*completed – see Final Feasibility Study*).
- **Phase B: Design Competition –** Development of the Masterplan – *(completed - see GCK SPA Masterplan).*
- **Phase C: Detailed Design –** Design of all Project sub-components – *due to commence in early 2022*
- **Phase D: Construction -** scheduled for 2023 onwards.

The High-Level ESIA, along with the ESMF and SEF are conducted based on the GCK SPA Masterplan in succession to Phase B. They are intended to inform E&S management for the life of the Project.

Throughout the different Project Phases, different entities have/will be involved in the Project. Key involvement in the Project is described below.

- **FONERWA:** is the Rwandan green fund with a purpose to be the engine of green growth in Rwanda. Its vision is to respond to Rwanda's current and future financing needs for environment, climate change, green growth to accelerate goals of national sustainable economic development. The fund invests in the best public and private projects that have the potential for transformative change and that align with Rwanda's commitment to building a strong green economy. It also provides expert technical assistance to ensure the success of its investments. Financial support of the GCK Project from government and development partners will be managed by FONERWA. Through Phase A, B and C, FONERWA is considered the Project Executive Agency (PEA). For the purpose of single/multiple sub-components implementation, a Special Purpose Vehicle (SPV) called Green City Kigali Company (GCKC) has been established for the development and management of the 16 ha pilot site (see **Chapter 2.1**) and represents the PIE for this sub-component. Future sub-components may be developed and managed by other SPVs or developers. Further, FONERWA will act as Executing Entity (EE) to the Ministry of Environment (AE) for the upgrade of an informal settlement within the planning area and financed largely by the Green Climate Fund (GCF)
- **KFW**: a German state-owned investment and development bank. For the Project it is acting as an International Finance Institution (IFI) by providing financing for the Project through the German Ministry for Economic Development and Cooperation (BMZ) and the Green Climate Fund (GCF). It has financed activities throughout all current Project Phases, including the 16 ha pilot site (see **Chapter 2.1**) throughout Phase D.
- **SWECO:** is an international engineering and architecture firm in infrastructure, water, buildings and urban development, contracted by FONERWA to support the implementation of the Project during Phase A - feasibility assessment, Phase B - the design competition and Phase C – detail design and masterplanning.
- **Urban and Architectural Design Consultant (UADC):** Provides detail design consulting services in form of a Masterplan for the 600 ha (GCK SPA Masterplan) as well as a detailed masterplan for the 16 ha pilot site.
- **Green City Kigali Company** *(Special Purpose Vehicle)*: Green City Kigali Company (GCKC) has been established for the development and management of the 16 ha pilot site.
- **Rwanda Development Board** (RDB): RDB shall authorise the Project to proceed by issuing an EIA certificate and periodically monitor the project activities to ensure mitigation measures are implemented and that it has no adverse impacts on the environment.

The Project sub-components will be implemented by sub-component Developers. The sub-component Developers will:

- Function as the owners of the individual/multiple sub-components.
- Will be in charge of sub-component ESIA, ESMP, and related documentation, aligned to the present ESMF (depending on Project categorizations).
- Will employ the appointed EPC[13] and monitor its E&S performance.

13 Engineering, procurement, and construction (EPC) contracts are the most common form of contract used to undertake construction works by the private sector on large-scale infrastructure projects. Under an EPC contract a contractor is obliged to deliver a complete facility to a developer. The EPC contractor coordinates all design, procurement and construction work and ensures that the whole project is completed as required and in time.

Local Rwandan authorities, FONERWA and KfW (the latter in the case of funded sub-components by KfW; it is foreseen that other lender institutions besides KfW may also participate) are to have a supervisory/monitoring role.

Important:
The Project sub-components, including the pilot and upgrade projects, will be implemented by sub-component Developers. The sub-component Developers will function as the owners of the individual/multiple sub-components. They will also be in charge of sub-component ESIA, ESMP, and related documentation, aligned to the Project ESMF; and employ the appointed EPC and monitor its E&S performance.

2.3 Project Location

The Project is located on Kinyinya Hill in the northeast of the central business district of Gasabo, Kigali, an area of rapid urbanisation. **Figure 1-1**Error! Reference source not found. gives an overview of the location of the Project Area.

Kinyinya Hill is administratively distributed over six villages (Agatare, Ngaruyinka, Rusenyi, Gasaharu, Taba and Binunga) which are part of the two cells Gasharu and Murama in Kinyinya sector. The total number of residents living in Kinyinya Hill is estimated[14] to be around 37,200 people.

The Project Area is naturally defined by the topography of the hill and its surrounding wetlands. There exists a mixture of high mountains with average altitude of 1,504 m, sloping basins and valleys. Wetlands and floodable zones surround the hill. Over time, the Kinyinya Hill has expanded beyond hilltops and steep hillsides to gentler slopes and the marshy valley floor. The lower half of the Project Area is owned by the Rwanda Social Security Board (RSSB) and currently used informally as agriculture land within an urban area. For the south-eastern part and the north-western part of the Project Area, the land use is different with mixed formal and informal settlements (**Figure 2-1**) [15].

Source: Urban Design Handbook, 2019

14 According to calculations in the Final Feasibility Study.

15 Urban Design Handbook (2019), available at: https://greencitykigali.org/wp-content/uploads/Urban-Design-Handbook.pdf

Figure 2-1 Kinyinya Hill settlements, farmland and wetlands

From a landscape and visual perspective, Kinyinya Hill is a mixed-used area. While some parts are covered by settlements, other parts are vegetated or covered by public and social infrastructures. Public infrastructure includes roads, side drains, water supply network and public lighting. Many people living in Kinyinya Hill grow crops according to available agricultural land.

Overall, planted trees dominate the land cover. Eucalyptus is the main large tree species that is visible in the western part of the Project Area. The wetlands in the southern part of the Project Area is considered a sensitive system. It acts as a filter of waste from the different catchment areas and regulates flow and flooding in the area.

In terms of land use, data from Rwandan statistical reports (RPHC 2012[16]) for the whole Kinyinya sector suggest that around 90% of current use of the area can be described as peri-urban with fragmented urban and rural features. There are residential areas, paved and unpaved roads, public utilities such as electricity as well as water, wastewater and waste management infrastructure, agricultural and village community areas with social housing, including a large government owned parcel. The majority of the settlements are concentrated in the surroundings of the hill with considerable distance from the main tarmac road that connects different areas of the hill and surrounding sectors.

Source: ERM, 2020

Figure 2-2 Large trees in the western part of the Project Area

The following different sub-components are being developed within the 600 ha Project Area:

- the Pilot Site, a 16 ha residential and commercial area that will included close to 1,700 affordable flats for 7,000 to 8,000 people;
- the Upgrade site, urban upgrade of existing 18 ha community (Ngaruyinka);
- the Cactus Green Park, a 13 ha housing project developed by Horizon Ltd;
- an affordable housing neighbourhood development on a parcel of 22 ha (first development phase) within the 130 ha site owned by the RSSB and financed by IFC;
- Kigali International Community School (KICS) project; and
- other individual estate development projects.

Please note that the Deutsche Welle site is a significant green area within Kigali and will not be developed under this Project. However, it should be noted that the Deutsche Welle site has been allocated for a different high-end residential development (Emerald Park).

All sub-components are developed independent from each other. What they have in common is that they are private initiatives, developed in compliance with the City of Kigali Masterplan 2050 (see

16 National Institute of Statistics of Rwanda (2012) Fourth Population and Housing Census: Provisional results, Rwanda. Available at: https://microdata.statistics.gov.rw/index.php/catalog/65

Chapter 3.2). **Figure 2-3** shows the locations of sub-components currently under development and gives an overview of the total Project Area.

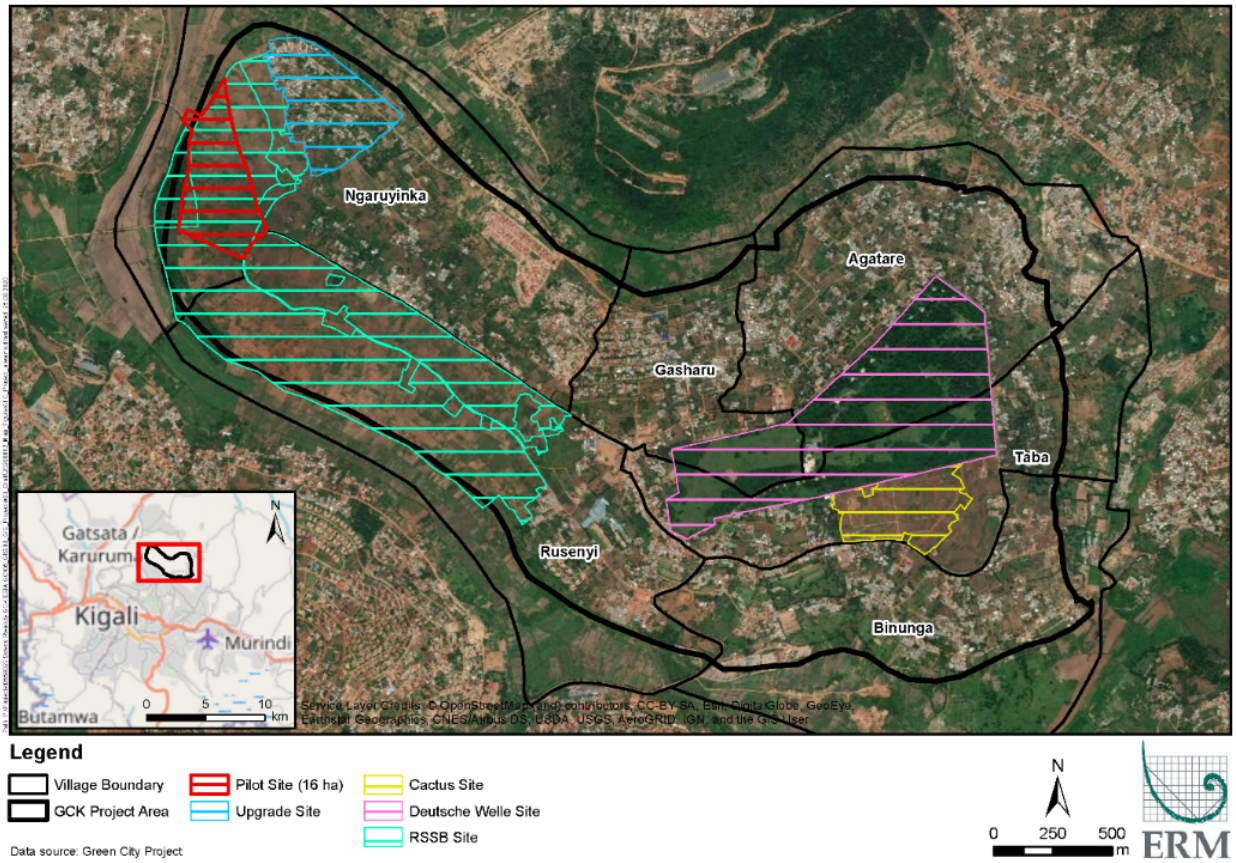


Figure 2-3 Overview of 600 ha Project Area and Sub-component Sites

2.4 Project Development Area

According to the GCK SPA Masterplan, approximately 227 ha of the overall 600 ha Project Area are either not entirely suitable for development, or a development has already been planned and carried out as part of other projects. The areas within the Project Area, which for different reasons will not be developed in the course of the current GCK SPA Masterplan, are listed in **Table 2-1** and shown in **Figure 2-4**.

Such areas include, for example, the buffer area around the existing wetlands around Kinyinya Hill, already existing settlements and infrastructure, planned and permitted projects e.g. the Cactus Project, as well as areas that are physically unsuitable for construction (e.g. steep slopes).

Since the wetlands surrounding the Project Area are recognized as a sensitive system and an important natural habitat, the GCK SPA Masterplan[17] includes a buffer zone of 20 meters of land to ensure adequate protection around wetlands. This 'wetlands buffer' zone will contain a belt of protective tree planting to enhance watershed protection and soil stability. The buffer zones also have an ecological and hydrological function. They will provide rainwater filtration and attenuation for the runoff from both landscape and urban areas and, if possible, water can be used for irrigation.

17 UADC, Masterplan, Design Report, p.14

Table 2-1 Areas within Project Area not be used for development within the GCK SPA Masterplan

Classification	Detail	Area
Wetlands set-back (20m zone)	Around existing wetlands	17.89 ha
Slope constraints	minimal	None steeper than 20% or 1/5
Planned and committed projects	Cactus Project	13.87 ha
	Dubai Site West	5.58 ha
	Central Site	9.11 ha
	Deutsche Welle Site	66.46 ha
	Formal Development Under Construction	31.62 ha
Already existing formal settlements and social infrastructure	Garden Estate	6.02 ha
	Residential Formal Large Houses	6.10 ha
	Residential Formal Medium Houses	35.75 ha
	Education	8.32 ha
	Industry	2.05 ha
	Health	0.81 ha
	Commercial	21.74 ha
Polluted areas		None defined/ classified
TOTAL		**~227.26 ha**

This leaves in total about 373 ha for the development of the Project.

The different projects to be developed in the Kinyinya Hill besides the Project, including Cactus project, Deutsche Welle Site, Kigali International Community School (KICS) project, individual Estate Development, are all independent from each other. What they have in common is that they are private initiatives and projects are to be developed in compliance with the City of Kigali Masterplan[18].

Figure 2-5 shows the zonal GCK SPA Masterplan, which outlays the planned zones for different purpose of use. The Project Area is divided into use for education (primary schools), healthcare, commercial use, parks and recreation, public open spaces, community facilities, utilities, and residential zones. The figure also shows where the already permitted Cactus project (environmentally certified by Rwanda Development Board (RDB), construction permit issued by City of Kigali, One Stop Centre) is located and which areas are already under construction. The white area of 70 ha in the middle of the eastern half is the Deutsche Welle Site.

18 https://masterplan2020.kigalicity.gov.rw/portal/apps/webappviewer/index.html?id=218a2e3088064fc6b13198b4304f3d35/

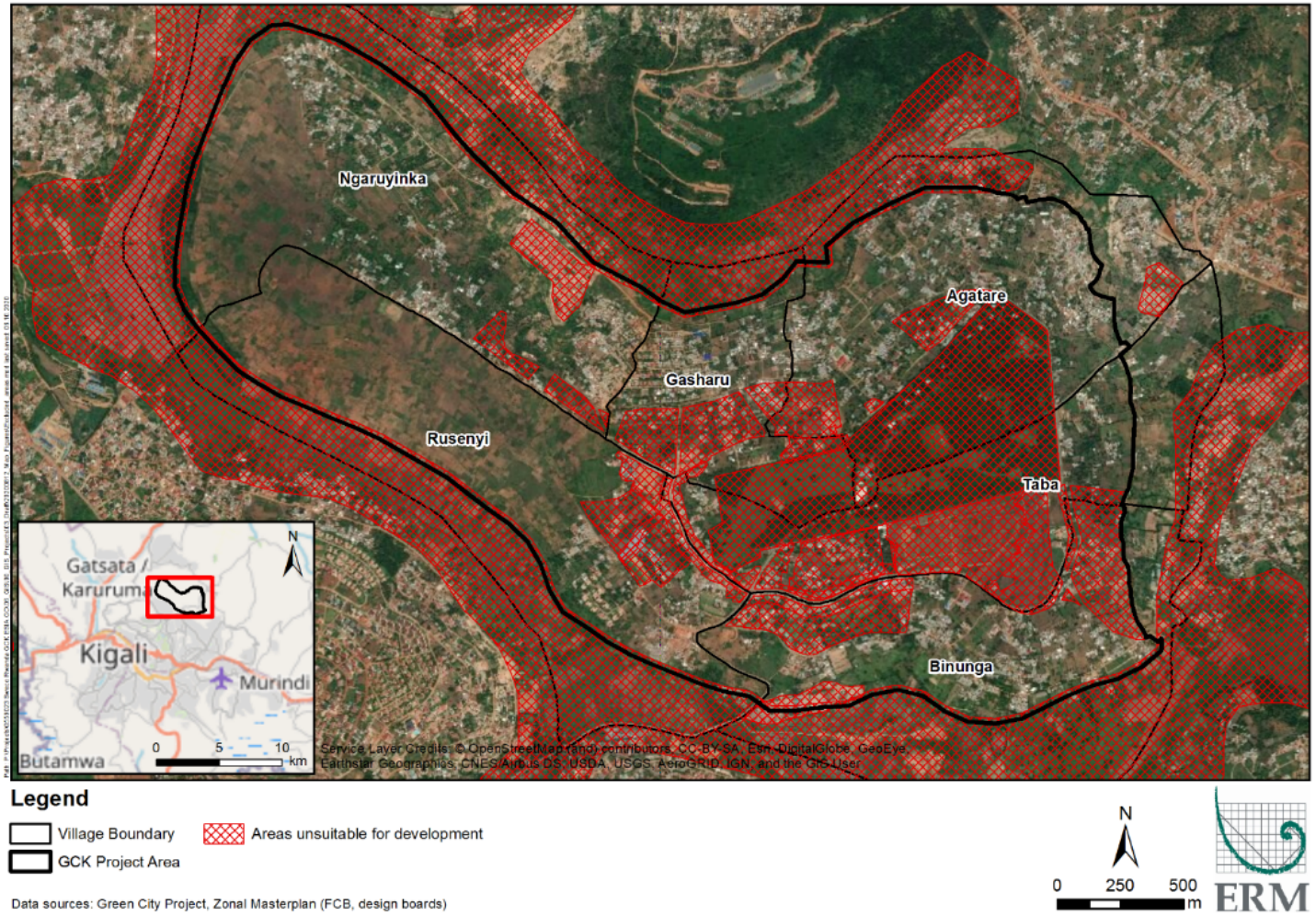


Figure 2-4 Areas Unsuitable for Development[19]

19 This map has been prepared taking into consideration information from the survey carried out by Sweco, as well as from the GCK SPA Masterplan. In cases of inconsistent data or non-overlapping development or zonal blocks between the various data sets, the lowest figures were applied.

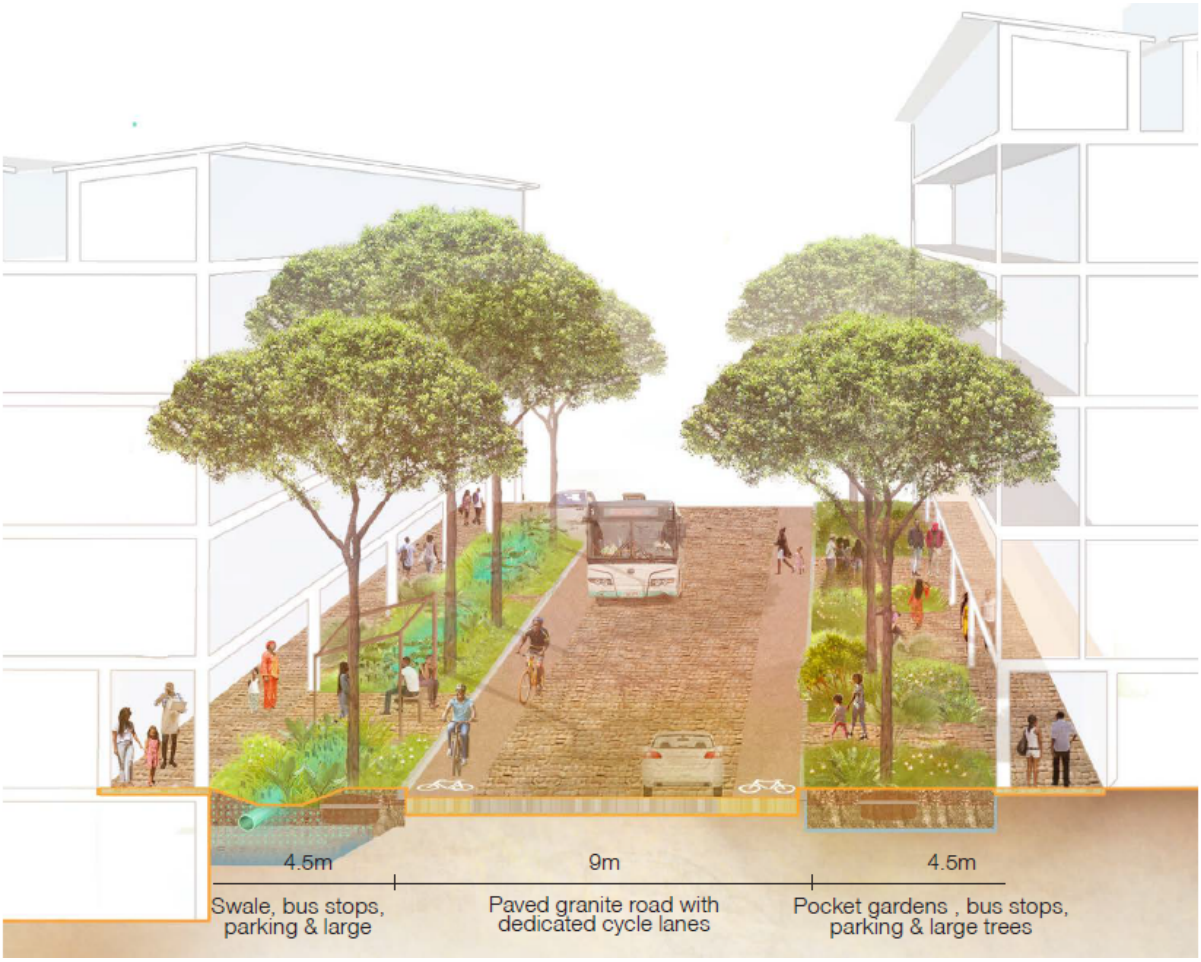
Figure 2-5 Zonal GCK SPA Masterplan

2.5 Project Components

The GCK SPA Masterplan defines the following components to be designed and constructed as part of the Project.

Arterial high street and sloping colonnaded streets

The arterial high street is planned to run around the hill about one third of the way down the slope so that it passes through the centre of each new neighbourhood community. It will be a granite-cobbled street large enough to take buses in each direction adapting to existing topography and residential areas. The following **Figure 2-6** shows the dimension of the planned arterial high street. It is planned to be 18 m wide with enough space for car lanes, cycle lanes, bus stops, parking and pocket gardens.



Source: GCK SPA Masterplan, 2020

Figure 2-6 Main arterial road (18 m wide)

The secondary roads up and down the edge of the hillside are sloping streets for pedestrians, lined with colonnades forming a barrier to shops, houses and workspaces. The streets' asymmetrical arrangement allows for sequence of planted gardens, which step with the slope, creating seating edges beneath large shade trees.

Neighbourhoods

At the heart of each neighbourhood an '*Urubuga'*, a central forum is planned that contains covered and open market spaces, commercial buildings, a health centre and community buildings forming a

colonnaded square. Generally, six roads come together here as well as pedestrian routes up and down the hill, so that every home is within 400 meters of an integrated neighbourhood centre.

A variety of livelihood opportunities is planned within a short walk, such as agriculture (peri-urban farming and greenways), markets, and light industrial activities.

The Project proposes to apply various housing and unit types for residential and commercial buildings. The buildings will vary from two to five story structures focusing on affordability, privacy, environmental design considerations and inclusion of traditional Rwandan culture characteristics. The units will range from 30-150 m². Through the various building types, the Project will provide social housing, affordable housing, single-family and multi-family residential housing as well as mixed use of commercial and residential housing.

Figure 2-7 shows the general approach of the planned units, including renewable energy solutions and climate adaptation considerations.

Source: GCK SPA Masterplan, 2020[20]

Figure 2-7 Holistic Approach to Energy and Construction - The Apartments

Hilltop landscape for recreation, sports and social gatherings

The top of the hill can be seen as an extension to the Deutsche Welle forest. The forest profile will create an image for Kinyinya Hill, which in its clearings will house religious buildings, secondary schools and sports pitches connecting the communities all round.

A series of landscaped swathes join the forested plateau with the wetlands landscape below. These will take the form of both recreational and agricultural terraces, which also provide filtration and attenuation for storm water channels following the line of the sloping streets. These allow for traditional agriculture as well as being significant in terms of rainwater attenuation and their existence also means that each new home is no more than 400 meters from open agricultural landscape.

20 UADC, design boards, p. 10

Shared primary schools

At the intersection of the landscape swathes and the primary circular road, there will be primary schools and large community halls shared by the neighbourhoods each side and opening out onto the rural landscape above and below. The school classrooms form shaded courtyards, which open out onto the educational pollinator gardens, landforms and views down to the valley.

Integration with existing developments

The GCK SPA Masterplan points out the need that new homes and communities are integrated with the existing setup carefully and sensitively upgrading and adding to the existing settlements, providing equivalent new infrastructure and a range of equivalent community healthcare and educational facilities and the same attention to the integration of buildings with the natural environment.

2.6 Infrastructure

The Project will provide sustainable and practical infrastructure solutions to the existing and future residents, as well as visitors of Kinyinya Hill. This includes the following elements.

Information and communications technology (ICT)

The Project will provide universal fast internet access via wireless broadband. In addition, options to access television and radio via antenna and internet will be made available. The Project will aim to maximise access to up-to date ICT solutions in the design of the buildings.

Solid Waste

The Project is considering incorporating a waste management and treatment facility for organic waste within the Project Area. This could be in the form of a biogas facility, which would provide a source of renewable energy. The Final Feasibility Study recommends the introduction of waste separation points per 60 households to separate household waste in organic, recyclable and residual. In addition, the installation of upcycling rooms to encourage reuse of waste materials is recommended (pESIA, Sweco, p. 23). Local collection and recycling stations are planned.

Sustainable Transport

The Project will establish a high quality transportation and mobility system in the Project Area. This will entail pedestrian areas, cycle lanes, bus lanes and roads. The design of the street network will allow linkage to neighbouring areas, reducing private car travel and focusing on safety. The Final Feasibility Study recommends to prioritise provision of sustainable and more affordable transport options and innovate to keep car ownership and need for parking at low levels. In addition, the design of the Project Area shall locate a local or neighbourhood centre within 500 m walking distance of every home to further reduce the need to travel. To design the streets as part of a water management and overall climate control strategy, the pESIA recommended to create a permeable walking and cycling network throughout. In addition, the transport system should incorporate smart public transport systems and electronic charging stations.

Energy

The Project will provide energy via efficient and sustainable solutions. The pESIA recommends incorporating a passive building design and low energy fittings to minimise domestic and commercial energy demand. Lighting and water heating may be powered by onsite renewables such as photovoltaic and solar energy. Further, the pESIA recommends providing installations to use LPG for cooking with a vision to transition to induction electricity stoves powered by onsite renewables (pESIA, Sweco, p. 22).

Water and Wastewater

Water and wastewater management in the Project Area includes water supply and sewage. Overall, the Project aims to substitute individual services with collective services to achieve an efficient infrastructure. Decentralized measures are included in the GCK SPA Masterplan with end user fees consideration. The Project will ensure safe and accessible water through boreholes, storage and rainwater storage strategies to supplement existing centrally supplied sources (the water utility WASAC will supply the future components with water via existing pipeline). Low-flow devices are planned to reduce wastage.

Water Management

The water sensitive urban design includes adequate erosion control, rainwater management and recycling of water to be suitable for household, agricultural and commercial use.

The GCK SPA Masterplan recommends a 'Flow Approach', which will be used for surface water collection, cleansing, conveyance, attenuation and storage.

Water Supply

The Project will include tap water supply in all new buildings. Water will be supplied in the Project Area by WASAC's existing mainline.

In addition, rainwater harvesting systems will be installed in every new building. Cisterns and redistribution systems can be shared by a building complex of up to ten buildings. A rainwater harvesting system consists of:

- The building's roof or similar surfaces to capture the rainfall;
  - Gutters all around the catchment area;
  - A water tank, which can be installed underground;
  - Pipelines to conduct the collected rainwater from the catchment area to the cistern and to the consumption points; and
  - First flush devices to divert the first flush.

The pESIA provides a number of recommendations to enhance the sustainability of water use such as installing green roofs for collecting rainwater to avoid pesticides from landscaping activities to get in touch with the rainwater. In addition, to enhance the reduction in water demand, it is considered to install grey water systems in the new buildings. A dual distribution system could separate grey and black water, whereas the grey water can then be reused in the building to for example flush toilets with, in industry nearby or to water green areas. In addition, an awareness-raising program is recommended to enhance water conservation.

Drinking water

Drinking water supply will be provided by semi-central potable water stations in reusable plastic bottles. The stations will use adequately treated rainwater and groundwater. Treatment of drinking water can be done with UV disinfection, or at least solar water disinfection (SODIS). The Project is considering the necessity of a water treatment plant. The pESIA recommends establishing semi-central water treatment stations before distribution covering the demand of about 7,500 inhabitants.

Wastewater and sewage

With regard to managing wastewater in the Project Area, pre-treatment for wastewater from industries with different contaminants will be made obligatory, before entering the public wastewater treatment plant (WWTP). In this way, the degree of contamination of the wastewater arriving the treatment plant will be lower, hence enhancing the capacity of the WWTP. Further, it is recommended in the pESIA to install a biogas reactor for sludge generated by the WWTP and to construct wetlands areas as a

tertiary treatment of the wastewater, before being discharged in a controlled way into the natural wetlands in the area.

2.7 Associated Facilities

General Overview

The ESIA process per international practice must take into account not only the relevant components belonging to a project itself, but also the so-called Associated Facilities. These are typically defined as facilities or activities that are not funded as part of the project, but are: directly and significantly related to the project, necessary for the viability of the project and would not have been developed if the project did not exist. The E&S standards that apply to the project itself should also apply to the Associated Facilities, to the extent that the project developer has any influence over these facilities.

Typical examples of Associated Facilities are extensions of power lines built by a local utility to service a new factory, an access road built by a town to connect to a new railway terminal or a new stone quarry opened up to provide building material for a motorway. Existing facilities or commercial enterprises that supply materials or services for a project (and to other customers) are not considered as Associated Facilities, as these are not solely dependent on the project.

- It is expected that projects or activities necessary to achieve the objectives of the Project or the realization and development of the future components or project infrastructure could constitute Associated Facilities as per the definition above.

Associated Facilities of the Project

Specific associated facilities of the Project have not been identified yet. Given that the Project itself is comprised of a very comprehensive range of sub-components, including all sorts of infrastructure, it is unlikely that there will be many “additional projects” required within the 600 ha Project area that would be considered as associated facilities.

Therefore, associated facilities will more likely include new developments outside of the Project area, such as regional access roads,, larger-scale transmission lines/substations, , or any new quarry sites and borrow pits developed solely for the purpose of the Project.

The Applicable Standards as defined in **Chapter 3** will also be applicable for the associated facilities of the Project..

The assessment of relevant associated facilities as related to the Project is further described in **Chapter 6.5**.

Associated Facilities on Sub-component Level

On a sub-component level, certain sub-components of the Project might technically be considered as associated facilities to each other, where they are being separately financed and developed independently (e.g. a water project sub-component to supply water to a new school sub-component). However, in the case of this Project all sub-components are being developed under the overall Project umbrella in the frame of the GCK SPA Masterplan as well as per the E&S Safeguard Documents – including this High-Level ESIA. As such, there will be a high standard of E&S protection across all Project sub-components, and ERM recommends that the ESIAs for the various Project sub-components need not elaborate in detail on the other sub-components as associated facilities. Nevertheless, on a case-by-case basis it may be warranted to consider the activities of adjacent sub-components from the perspective of cumulative impacts, e.g. if two or more sub-components are being constructed at same time, causing increased noise, dust, vibration etc. to local residents (refer to **Section 4.4.5**).

2.8 Alternative Analysis

2.8.1 General

An Alternative Analysis is part of an ESIA to determine if a project is needed and also if the project is optimally designed and planned from environmental and social perspectives (ideally, the ESIA starts before the project design is finalized so that ESIA results can further inform the design process). The alternative analysis usually includes the 'do-nothing' or 'no-project' option and a systematic comparison of feasible alternatives to the project in terms of potential social and environmental impact.

In this chapter the No-Project Alternative and Design Alternatives for the overall Project are evaluated. The outcome is largely valid for all sub-components. The overall planning for the sub-components will be included within the finalised GCK SPA Masterplan, and thus an assessment of the "no project" alternative – or other major design alternatives - will not really be relevant the ESIAs for the sub-components. Nevertheless, some further analysis of detailed design alternatives may be useful, e.g. in case some newer technologies exist for energy savings or water re-use that were not yet foreseen in the GCK SPA Masterplan.

Recommendation for future sub-component ESIA:

The major design factors of the proposed sub-components will already be included and finalised in the GCK SPA Masterplan. However, it may be appropriate as part of the ESIA of the sub-component to evaluate some of the more detailed design alternatives for a sub-component, especially to confirm that the designs reflect latest technology and sustainability principles.

2.8.2 No-Project Alternative

The no-project alternative discussed below presents a general high-level alternative scenario for the overall Project.

The no-project alternative means "do nothing", i.e. maintain the current status quo without developing the Project. Adopting this option would mean that (i) negative impacts associated with the construction would be avoided, but also that (ii) all the positive benefits that would result from the Project would not be achieved, such as an increased number of affordable housing units, climate-resilient urban development, construction of environmentally sound housing, further development of local public transport, employment opportunities, water autonomy, etc.,

Rwanda is one of the most densely populated countries in Africa. The increase in informal neighbourhoods, a direct consequence of urbanisation, is largely due to market forces in the inner cities. Low-income earners are constantly being pushed out of Kigali's city centre due to the high cost of living. It has been estimated that more than 340,000 housing units will be needed by 2022 to supply the growing number of city dwellers. Recently there has been a development of many informal enclaves where housing structures are of poor quality. The existing urban districts are characterised by the lack of adequate waste and sanitation facilities, as well as limited space and hilly landscape. In the last two decades, attempts to modernise Kigali have resulted in the expropriation of many informal settlements in the name of public interest.[21]

The development of the Project can alleviate the present housing situation in Kigali by creating affordable and socially equitable housing for low to middle-income inhabitants as part of a culturally sensitive urban development including commercial spaces, light industrial areas, schools, hospitals, recreational areas, sports facilities, and green areas. The result from no-project development would probably impose further constraints on the current housing situation and housing development due to the expected increase in urbanisation in Kigali.

21 Baffoe, G.; Malonza, J.; Manirakiza, V.; Mugabe, L. Understanding the Concept of Neighbourhood in Kigali City, Rwanda. Sustainability 2020, 12, 1555. Retrieved from: https://www.mdpi.com/2071-1050/12/4/1555

Further, the development of infrastructure and basic services as part of the Project will improve the quality of life of existing communities in the Project Area. This includes solid waste management, energy and water technology, water and sewage management as well as affordable and smart public transport systems and ICT networks. Such services are a prerequisite to development in any region.

Therefore, it can be concluded that the Project itself will overall have numerous E&S benefits and support long-term sustainable urban development; this is much preferable to the no-project alternative that would likely exacerbate the already existing challenges of less-formal urban growth with poor quality housing and lack of sanitary infrastructure, etc.

2.8.3 Design Alternatives

The scale of the Project is large, and thus the choices of housing types, material, design, etc. may have a significant E&S impact. Alternative design options should be qualitatively analysed and the different impacts posed to the surrounding natural environment and communities need to be compared.

The designs being considered in the GCK SPA Masterplan reflect the overall winning design competition for the Project development. The winning designs of the GCK SPA Masterplan for the layout, building technology and infrastructure etc are based on the wider Project sustainability objectives as reflected in the "GCK Four Foundations" described above in **Chapter 1.3** (affordable and socially equitable development; climate change adaptation and mitigation; resource efficiency; and culturally sensitive urban development).

The following parameters were evaluated and scored as part of the design competition:

- Green plot ratio (Total Leaf Area divided by Total Site Area);
- Permeable surface area;
- Ecological diversity & Ecosystem services appraisal;
- EDGE buildings (Green-building certification system);
- Carbon impact of transport;
- Solid waste;
- Communal spaces and cultural venues;
- Mixed community; and
- Affordable.

The winning design, as based on the above sustainability factors, is reflected in the GCK SPA Masterplan that now serves as the basis for Project development. As such, the design competition has provided a comprehensive assessment of design alternatives for the Project, and the overall most suitable design was selected by the independent review panel.

During the detailed design phase of the sub-components, there will be verification that designs continue to meet these parameters, and mechanisms will need to be put in place at Project-level to ensure compliance during project construction.[22]

22 Sweco (2020) Final Feasibility Study

3. INSTITUTIONAL, POLICY, LEGAL AND REGULATORY FRAMEWORK

This Chapter presents the most important aspects of the Rwandan institutional, legal and regulatory framework applicable to the Project.

3.1 Institutional Framework

All entities involved in the Project implementation are required to meet a number of key E&S requirements, regulations and standards as outlined in this section. The ESMF is intended to support their transposition into Project implementation (i.e. at sub-components level).

In cases where the indicated requirements, regulations and standards are inconsistent or conflicting, sub-components Developers and Contractors are bound to applying the most stringent requirement.

3.1.1 FONERWA

FONERWA is the Rwanda green fund with a purpose to be the engine of green growth in Rwanda. It is one of five agencies under the supervision of the Ministry of Environment (MoE) in Rwanda. Its vision is to respond to Rwanda's current and future financing needs for environment, climate change, green growth to accelerate goals of national sustainable economic development. It also provides expert technical assistance to ensure the success of its investments. Financial support of GCK Project from government and development partners will be managed by FONERWA. FONERWA is thus considered the Project Executive Agency (PEA).

FONERWA's Environment and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF)[23] are developed with respect to FONERWA's wide range of projects types funded, as well as the different needs and capacities of funding applicants that include public and private sector applicants as well as CSOs. For the purpose of single/multiple sub-components implementation, a subsidiary of FONERWA will be created, through the means of a Special Purpose Vehicle (SPV), this SPV shall consider the FONERWA ESMF/RPF as the "umbrella" management framework. GCK Company (GCKC) has been established for the development and management of the 16 ha pilot site.

The Rwandan and International requirements for FONERWA Project Environmental and Social Safeguarding and Public Consultation and Disclosure (PCD), are considered where applicable to the environmental and socio-economic and socio-political context of Rwanda. Policies, laws, regulations and institutional framework relevant, to a particular FONERWA funded project have to be assessed at International, National and District level (& included understanding of community level structures). This chapter includes the relevant national and international policy and legislation, E&S management and resettlement procedures as applied to the FONERWA ESMF, establishing the framework for a prospective Project's E&S management processes.

3.1.2 Statutory Organisations

Ministry of Environment (MoE)

Ministry of Environment (MoE) is the government entity responsible for establishing norms and practices for rational exploitation and efficient land management, environment protection, water resources and evaluating their implementation. This implies that it prepares policies related to environmental conservation and protection. It also shall oversee all aspects regarding environmental monitoring and appropriate natural resources exploited through programme activities. To implement the obligations of environmental protection, management and monitoring, MoE has delegated this task to REMA.

23 "FONERWA´s ESMF and RPF, Volume 1: Climate Issues Awareness Raising with Introduction to ESMF & RPF Processes, Needs and Capacity", FONERWA, October 2020

Rwanda Environment Management Authority (REMA)

Rwanda Environment Management Authority (REMA), is the authorised Government institution to determine modalities of protection, conservation and promotion of the environment in Rwanda. REMA shall periodically monitor the Project activities to ensure mitigation measures are implemented and that it has no adverse impacts on the environment. The Government of Rwanda established the REMA under the Organic Law No.04/2005 of 08/04/2005 Article 64, to coordinate and oversee all aspects of environmental management for sustainable development. REMA is a government organisation with distinct legal status and financial and administrative autonomy. It is charged with the administration of many environmental objectives in Rwanda – not just EIA. One of REMA's principal functions is to oversee the conduct of EIA and take a decision on proposed development projects to be undertaken. The REMA operates under the Ministry of Natural Resources (MINIRENA), which supervises the REMA.

REMA is required by law to oversee environmental assessment requirements in policies, plans and programs and advice the Government on policies, strategies, and legislation related to the management of the environment. Under this mandate, REMA develops facilitative and legal instruments, such as EIA and SEA guidelines.

In 2008, REMA transferred some of its responsibilities concerning the management of the EIA process to the Rwanda Development Board (RDB) while respecting the legal provisions. This was done to facilitate the procedures for establishing businesses, as RDB's work includes the promotion of economic development and investment by the private sector. RDB is undertaking screening, guides developers on assessment procedures, conducts public hearings, reviews EIA reports based on the Terms of Reference (ToR) and takes decisions on approval or disapproval of proposed projects. REMA remains responsible for monitoring implementation of environmental protection measures recommended by EIA studies and the conduct of Environmental Audits.

Rwanda Development Board (RDB)

Though REMA is the authorised Government institution to determine modalities of protection, conservation and promotion of the environment in Rwanda, it has since 2009 delegated responsibility to review EIA reports to Rwanda Development Board (RDB). With regard to this study, RDB shall authorise the project to proceed by issuing an EIA certificate and periodically monitor the project activities to ensure mitigation measures are implemented and that it has no adverse impacts on the environment.

Rwanda Land Management and Use Authority (RLMUA)

Rwanda Land Administration and Use Authority (RLMUA) is a key Institution set up to implement the National Land Tenure Reform Program as provided for by the National Land Policy and the Organic Law determining the use and management of land in Rwanda. This program aimed at improving land tenure security by putting in place an efficient, transparent and equitable system of land administration. Cadastral surveys, mapping and land registration are the core components of land administration. The new and modern land administration is embedded in a broader land information system, fully co-ordinated and automated, without separation of land registration, cadastral surveys and mapping, because they complement each other; more importantly, they belong together as a whole.

The Authority has among others, the following missions:

- Register land, issue and keep land authentic deeds and any other information relating to land of Rwanda;
- Supervise all land-related matters and represent the State for supervision and monitoring of land management and use;

- Set up principles and guidelines related to use of land; - to issue technical instructions related to land management and use to district land bureau and follow up their implementation;
- Receive and evaluate proposals to purchase or lease private state-owned land and to issue, on behalf of Government, long term leases and permits to occupy such lands in accordance with the Law governing land in Rwanda;
- Resolve conflicts relating to land use and management which were not resolved at the district or City of Kigali levels; and,
- Establish cooperation and collaboration with other regional and international institutions with an aim of harmonising the performance and relations on matters relating to management of land.

So, as the authority tasked to implement national policies, laws, strategies, regulations and Government resolutions related to the management and use of land the GCK expects to be in highly coordination with RLMUA.

Ministry of Infrastructure (MININFRA)

Ministry of Infrastructure (MININFRA) is the government authority mandated to ensure sustainable infrastructure development covering transport, energy, water supply and sanitation, housing and human settlement sectors aiming to drive Rwanda's economic growth and enhance quality of life of the citizen. MININFRA prepares policies regarding its aforementioned mandate and oversee the implementation of these policies. Subordinate agencies are tasked to implement its mandate comprising; Rwanda Housing Authority (RHA) to oversee the housing sector, Rwanda Transport Development Authority (RTDA) to oversee the transport sector, Rwanda Energy Group (REG) to oversee electricity generation and supply and Water and Sanitation Corporation (WASAC) to oversee water supply and sanitation.

The Project shall seek all these services from these mentioned delegated agencies.

Rwanda Housing Authority (RHA)

It is the implementing agency operating under the MININFRA, established in order to organise the construction industry as a whole and by doing so to spur the National Strategy for Transformation (NST). RHA has been mandated to manage the urban and rural settlement strategy of the Nation, in which most importantly is achieving green settlements with affordable housing.

Ministry of Local Government (MINALOC)

The Ministry of Local Government (MINALOC) ensures the coordination of good governance and high quality territorial administration programs that promote economic, social and political development throughout the nation. It is responsible for developing, disseminating and coordinating the implementation of policies, legal framework, strategies and sector programs through the formulation of national policies, strategies and programs in those areas. Under MINALOC is a structure of local governance entities that implement these policies, legal framework and strategies and these entities hierarchically comprise; Provinces, districts, sectors, cells and finally villages.

Projects such as GCK require the support of MINALOC and its governance entities to mobilise the population in understanding the Project, in the acquisition of land and other assets, construction and operation phase of the Project.

Ministry of Agriculture (MINAGRI)

The Ministry of Agriculture and Animal Resources (MINAGRI) is a Public Institution with a mission of initiating, developing and managing suitable programs of transformation and modernisation of agriculture and livestock to ensure food security and to contribute to the national economy. The vision

of the Ministry, as defined by the National Agricultural Policy (2018)[24], is for Rwanda to become "*a nation that enjoys food security, nutritional health and sustainable agricultural growth from a productive, green and market-led agricultural sector*".

The policy actions are organised under four broad policy pillars: 1) Enabling environment and responsive institutions; 2) Technological Upgrading and Skills Development; 3) Productivity and Sustainability; 4) Inclusive Markets and Off-Farm Opportunities.

Pillar 1 specifies that greater private sector participation will require a shift in the role of the government from being a market actor to becoming a market enabler. The pillar 4 promotes improved productivity and inclusiveness of agricultural market systems and increased off-farm opportunities of diversified for agricultural products for domestic, regional, and international markets. Moreover, the objective is to promote reliable access to affordable and healthy diets for the Rwandan consumer in order to meet national objectives on poverty reduction, food security, and nutrition.

The Project plans to promote both horticulture and peri-urban agriculture. Green swathes of landscape each side of the developed landscape run form the hilltop plateau to the wetland below. These allow for traditional agriculture. The Project will comply with respective legislation regarding agriculture.

Rwanda Standards Board (RSB)

Rwanda Standards Board (RSB) is a public institution established by government to undertake all activities pertaining to the development of standards, conformity assessment and metrology services in the country. It is associated to the Ministry of Trade and Industry (MINICOM).

The Project is expected to comply to national standards set by RSB and international standards where national standards do not exist for items such as effluent wastewater discharged, noise levels, dust and air pollution levels, construction material. Rwanda Water and Forest Authority (RWFA)

Rwanda Water and Forestry Authority (RWFA) is a public institution that implements policies, laws, strategies and Government decisions related to the management of forests and natural water resources. It is associated to the Ministry of Lands and Forestry (MINILAF). Its missions also include:

- Assist public and private institutions in charge of management of forests and natural water resources in a bid to fight erosion;
- Prepare programmes of reforestation, forest promotion and appropriate management and support districts in the management of forests and natural water resources; and,
- Cooperate with other institutions and international organisations whose mission is related to forests and natural water activities.
- The Project might need to design green areas, and if so comply with RWFA policies.

City of Kigali (CoK)

City of Kigali is one of the five Provinces of Rwanda. CoK has the mission to build and sustain a city of character, vibrant economy and diversity through strong partnership with stakeholders in order to provide responsive, rapid and effective urban development. CoK's responsibilities include as delivered through relevant statutory bodies as appropriate:

- to ensure the implementation of national policies;

24 MINAGRI (2018), available at:
https://www.minagri.gov.rw/fileadmin/user_upload/Minagri/Publications/Policies_and_strategies/National_Agriculture_Policy_-_2018___Approved_by_Cabinet.pdf

- to prepare the development plan of the CoK and ensure its implementation;
- to prepare the master plan of the CoK, specific master plans and to ensure their implementation,
- to develop infrastructure and urbanization of the CoK;
- to ensure the safety of people and goods in the CoK;
- to issue guidelines and to coordinate activities of districts;
- to ensure hygiene, sanitation and water treatment in the CoK;
- to develop and implement the plan of action for the transport of persons and goods in the CoK;
- to mobilise resources and put in place strategies for collection of taxes and fees in accordance with relevant laws;
- to promote and follow up investment activities in the CoK;
- to provide services that are not rendered by other administrative entities of the CoK; and
- to promote cooperation and partnership with other organs at national or international levels.

To develop infrastructure and urbanization of the CoK launched on September 4, 2020 a new and accommodative master plan that will allow city dwellers to know what and where to invest their resources. The new City of Kigali Master Plan 2050 brings flexibility in building and also enhances social inclusion, among others.

According to the new Kigali Master Plan, the Kinyinya Project Area has 4 zoning regulations:

- R1-Low density residential zone;
- R1A-Low density residential densification zone;
- R2-Medium density residential - Improvement zone;
- R3-Medium density residential - Expansion zone: This is where is falling the Pilot and Upgrade zones.

While the City of Kigali Masterplan 2050 is binding, consultations with CoK One Stop Centre for any proposal regarded as exception or changes on the City of Kigali Masterplan 2050 are possible.

With regard to the Project, Gasabo district is the local entity responsible for coordination of good governance and administration programs to promote economic, social and political development. With the Project located in Gasabo district, it falls under the jurisdiction of Gasabo district and shall engage with the public in the Project Area of intervention towards the implementation of the Project. Kinyinya sector covers the two cells of Gasharu and Murama and specifically the villages of Agatare, Ngaruyinka, Rusenyi, Gasaharu, Taba and Binunga in the two cells.

Kinyinya sector and Project affected cells are essential in stakeholder engagement towards Project implementation, land and asset acquisition where required by the Project, access to basic services such as water, roads, electricity, health services, education services.

Rwanda Social Security Board (RSSB)

Based on the law No. 45/2010 establishing RSSB, the main responsibilities of RSSB are to: monitor and promote pension, the insurance on occupational hazards, the insurance on maternity leave, the anticipated old age pension and other necessary branches, to register employers, employees, beneficiary and person for whom subscription was made in various RSSB branches, to pay social security benefits to beneficiaries, to guarantee health insurance services rendered to beneficiaries, to engage in investments as provided by law. It is associated to the Ministry of Finance and Economic Planning (MIBECOFIN).

The entities involved in construction and implementation of the Project will be required to pay pension and health insurance for its workers. RSSB is also a potential collaborator in the development of the pilot element of the Project.

3.2 National Policy, Legal and Regulatory Framework

3.2.1 National Policies, Laws and Regulations

Table 3-1 lists the policies, laws and regulations most relevant to the Project. It also gives a brief content description of the listed legislations as well as states the relevance in a line with the Project context. The table is not an exhaustive list of all laws that may be relevant to the Project.

Table 3-1 List of selected relevant National Policies, Laws and Regulations

Rwandan Policy/ Law	Content	Relevance for ESMF/GCK Project
Constitution, of 2003 revised in 2015.	■ Everyone has the right to a clean and healthy environment. ■ Everyone has the duty to protect, safeguard and promote the environment, while the state ensures environmental protection ■ Mentions that there is a law determining modalities for protecting, conserving and promoting environment. ■ Prohibits any international agreements permitting transit or dumping of hazardous waste in the country.	■ Establishes the right and importance of conservation of the environment. ■ Validates the importance of the law to ensure conservation and promotion of the environment. ■ Ensures the access to information for all citizens.
Environmental Policy	■ Provides improvement of the population's wellbeing, the judicious utilisation of natural resources and the protection and rational management of ecosystems for sustainable and fair development. ■ Provides for decentralisation of environmental management. ■ Assigns the district or Towns the responsibility for the day-to-day management of the environment and the implementation of policies and programmes for the protection of environment at the local level.	■ This Policy relates to FONERWA's project management, by requiring, through the EIA regulations that for each sub-component an environmental assessment is carried out. The Policy also puts the responsibility for monitoring and E&S performance to the implementers.
Law conserving and promoting environment, No. 04/2005 of 08/04/2005	■ SEA (and EIA) were implicitly introduced into legislation. It required that programmes, plans and policies that may affect the environment shall be subjected to environmental impact assessment before obtaining authorisation for implementation. ■ Chapter II, Article 7, Principle 1 stipulates that precaution or preventive measures result from an environmental evaluation of policies, plans, projects, development activities, and the social welfare of the population	■ Incorporates the assessment of PPP's into the Rwandan legal framework.
General Guidelines and Procedures for Strategic Environmental Assessment (SEA)	■ Describes procedures that will enable policy-making, macro or strategic planning, and program formulation processes to assess and integrate environmental considerations using participatory methods based on quantitative and qualitative evidence..	■ Provides a framework over which the SESA can be based on.

Rwandan Policy/ Law	Content	Relevance for ESMF/GCK Project
June 2011		
Law on Environment N 48/2018 of 13/08/2018	■ Determines modalities for protecting, conserving and promoting the environment. ■ Based on article 30 of this law, a list of projects that must undergo an environmental impact assessment (EIA) before authorization for their implementation is established by an order of the minister. ■ Environmental impact assessments, environmental audits and strategic environmental assessments must be approved by the REMA or another State organ authorised in writing to do so by the Authority.	■ Legalises the need for carrying out an EIA for a project. ■ Provides the enabling framework for SEA. ■ REMA is the authorized Institution to license EIAs or any authorised person and ensure conservation of environment.
Ministerial order N 001/2019 of 15/04/2019	■ Establishing the list of projects that must undergo EIA, ■ Instructions, requirements, and procedures to conduct EIA	■ Project sub-components are eligible for a full EIA. ■ EIA procedure in Rwanda: - Application for authorisation to conduct the EIA, - Selection of EIA expert from the list, - Reception and analysis of the project brief and proposed terms of reference, - Issuance of ToRs for EIA within 14 days. ToRs may also be prepared by the developer and approved by the authority (REMA), - EIA is done with due consideration of the opinion of all the relevant stakeholders, - Review of EIA by authority (REMA) in 20 days, public participation where necessary an addition 15 days (disclosure) and decision making & authorization (Project licenced).
The Environmental Impact Assessment Regulations, 2007	■ REMA has developed the EIA regulations that provide the requirements for an EIA in Rwanda. Under these new regulations, Sub Article 1 makes it mandatory for all the projects listed under Schedule I to be subjected to a full-scale EIA. The Sub Article further states that: ■ No environmental authorization shall be granted by the Authority for any project in Schedule I to these Regulations if no Environmental Impact Assessment has been submitted to the Authority in	■ The GCK falls in this Schedule 1 category and thus must be subject to a full-scale EIA. ■ As per the Project details and its screening, the Project will be classified as per categorization of World Bank guidelines and Rwanda EIA guidelines. In case the classification results

Rwandan Policy/ Law	Content	Relevance for ESMF/GCK Project
	accordance with the provisions of these Regulations. ■ Any project listed under Impact Level III of Schedule I to these Regulations shall require a full environmental impact assessment by the preparation of an environmental impact report, unless the Authority refuses permission.	differ, the most stringent one will apply.
Biodiversity Policy (2011)	■ Goal is to conserve Rwanda's biological diversity, to sustain the integrity, health and productivity of its ecosystems and ecological processes, whilst providing lasting development benefits to the nation. ■ States that urgent attention is required to ensure that biodiversity is conserved not only within protected areas, but also across the landscape, and that sustainable development is promoted throughout Rwanda.	■ Design and implementation of the Project in an environmentally sound and sustainable manner to conserve indigenous biodiversity will be a clear compliance to this policy's goal of conserving Rwanda's biological diversity. ■ This policy shall apply to not only to construction at the Project site but also its surroundings and affiliated areas such as; restoration of borrow pits for stabilized soils and mined quarries for construction material.
Biodiversity Law N 70/2013 of 02/09/2013	■ Determines modalities for management and conservation of biological diversity within Rwanda. ■ Article 3 states that the Minister shall monitor the conservation status of various components of Rwanda's biodiversity and promote biodiversity research.	■ The Project developer shall consider the list of protected species during the preparation of the ESIA, during the construction and operation of the Project, as a measure to avoid negatively affecting protected species. ■ Avoid introduction of alien species to the site as instructed by this law.
National Environment and Climate Change Policy (2019)	■ Policy Objectives include: 1. Greening economic transformation, 2. Enhancing functional natural ecosystems and managing biosafety, 3. Strengthening meteorological and early warning services, 4. Promote climate change adaptation, mitigation and response, 5. Improve environmental well-being for Rwandans, 6. Strengthen environment and climate change governance, and 7. Promote green foreign and domestic direct investment and other capital inflows.	■ Most relevant to the Project are policy objectives 1, 4 and 7.
Green Growth Climate Resilience (2011)	■ Proposes to adopt energy and water efficiency standards into building codes; ■ Proposes to establish an integrated multi-node urban transport system;	■ Project should consider to include efficient use of land through high density buildings, energy and

Rwandan Policy/ Law	Content	Relevance for ESMF/GCK Project
	■ Proposes to employ low carbon urban planning and ■ Proposes to fully utilise urban waste as a high-value resource stream.	water efficiency, waste in the Project design.
National Land Policy (2004 revised 2019)	■ The Policy provides for productive use of land based on suitability of specific land units. It also provides for recognition and safeguarding of land ownership rights, and for the development and maintenance of land registry and documentation centre.	■ Some subprojects are expected to cause land acquisition. In such a scenario, the Land Policy applies, requiring the landowners to be duly consulted and compensated for any involuntary land losses.
Law on management of land, N°43/2013 of 16/06/2013	■ Guides modalities of allocating, acquiring, transfer, use and management of land in Rwanda. ■ Under this law and relevant to this study are the definitions given to: ■ Land tenure: the system by which land is held, describing the rights, responsibilities and restrictions that are attached to the land holder. ■ Expropriation: an act of taking away individuals' land by the State due to public interest in circumstances and procedures provided by law and subject to fair and prior compensation.	■ Equal rights to all to own land, prohibiting any form of discrimination. ■ 2 types of land ownership; Freehold title (owns land forever) and lease hold (land leased from state for a period of 20, 49 or 99 years. This is most common land ownership). ■ Article 30 says: “It is prohibited to subdivide plots of land reserved for agriculture and animal resources if the result of such subdivision leads to parcels of land of less than a hectare in size for each of them”
Law to expropriation in public interest, N°32/2015	■ Guides procedures relating to expropriation in the public interest	■ Expropriation can be done by the Government in case of public interest. ■ Fair compensation recommended on agreement between the two parties (developer and asset owner). ■ Compensation- monetary or alternative land/ building. ■ Compensation based on market price & done by certified property valuers. ■ Compensation done within 120 days (penalties of 5% paid by the expropriator in case of fail compensation). ■ 5% added to asset value as disruption fee.
Agriculture Policy	■ The Rwandan Government formulated this Policy to contribute to the achievement of food security, integrate agriculture and livestock in a market oriented economy	■ Some of the Project sub-components could cause impacts on agriculture, soil and water resources.

Rwandan Policy/ Law	Content	Relevance for ESMF/GCK Project
	and to generate increasing income to the producers. ■ The policy addresses three (3) sub sectors: (i) Agriculture, (ii) Animal resources, and (iii) soil and water management. ■ The Policy puts emphasis on marshland development for increased food production because soils on hills are degraded by erosion and not sufficient. The policy promotes small-scale irrigation infrastructure development in the country's selected marshlands while preventing Environmental degradation.	
National Forest Policy (2018)	Defines, medium to long-term intentions for the development and management of the national forest resources. Policy statement 5, proposes intervention areas as; management and maintenance of forest resources to ensure biodiversity conservation and sustainable provision of ecosystem goods and services and identification and protection of threatened species. Policy statement 7, which concerns trees in cities, on farms, along roads and in many other locations not considered forests. This statement highlights important areas of intervention to focus during the implementation of this policy as; developing and implementing urban forest management plan, mainstreaming trees outside forest practices in forest management planning processes, putting in place mechanisms for incentives to attract private landowners to plant forest trees on their land.	■ The Project could need to design green areas as part of the project design in which trees can be planted as a contribution towards agroforestry outside forests and forest conservation.
Law N°47bis/ 2013 determining the management and utilization of forests in Rwanda	■ Determines the management and utilisation of forests in Rwanda.	■ In case timber for construction is required, the Project shall need to take precaution to engage suppliers that comply to requirements of this Law.
National Water Resources Management Policy	■ This Policy was designed to manage and develop the water resources of Rwanda in an integrated and sustainable manner, to secure and provide water of adequate quantity and quality for all social and economic needs of the present and future generations with the full participation of all stakeholders in decisions affecting water resources management. The Policy is based on the principle that water is a finite resource, as well as economic, environmental and social good. The Policy also recognised that water management must be integrated and catchment-based to be efficient. Climate change is also recognised as a threat to water sources in the Policy.	■ Water Supply is expected to be an important topic throughout the development of the Project and its future sub-components.
Law N°62/2008 of 10/09/2008 putting in place the use,	■ Defines applicable rules to the use, conservation, protection and management of water resources.	■ The Project, in accordance to this law, is required to abide to all relevant requirements

Rwandan Policy/ Law	Content	Relevance for ESMF/GCK Project
conservation, protection and management of water resources regulations	■ Provides for the application and management of water resources in accordance with some of the following principles; the principle of prevention of the pollution with priority to the source, the principle "user-payer and polluter-payer" according to which the user of water and the polluter support a significant part of expenses resulting from measures of prevention, of pollution reduction and restoration of the resource in quality and in quantity, the principle that users of the public distribution services of drinking water and sanitation should play a major role in these services provided to them, according to the contributory capacity of users.	towards conservation, protection and management of water resources, some already mentioned above comprising of; which body to go to for public water network, who pays for damages caused to a public water source and how to handle wastewater generated from the project before discharge to the environment.
National Sanitation Policy (2016)	■ Concepts of significant importance to the policy and relevant to the Project are; Urban stormwater management and Faecal sludge management.	■ The policy direction on off-site collective sanitation, storm water management and solid waste management shall be considered in preparation of the Project masterplan and affiliated sub-project designs.
National Transport Policy	■ The National Transport Policy provides guidance on the management of various modes of transport in Rwanda. Road transport is responsible for more than 80% of human and goods traffic in the country The Policy, in this respect, guides on the management of the road sub-sector in Rwanda, which includes construction, maintenance and rehabilitation of roads. ■ Accordingly, a Road Maintenance Fund has been established to provide adequate, reliable financing for road maintenance activities; and a Road Maintenance Strategy formulated to guide the process.	■ This Policy is relevant to development of roads within the Project Area, since the planning, funds allocation, monitoring and evaluation are all to be aligned to the Policy requirements.
National Urbanisation Policy (2015)	■ Sets well-coordinated urban settlement and development to positively transform the economy of the country, improve the socio-economic conditions for all, and preserve resources to sustain the life of future generations. ■ Integrates urban planning and management in order to achieve resource-efficient and compact growth	■ The densification strategy could apply to the design of the Project by optimising urban land use, urban compactness, well-structured functionality and connectivity with-in urban areas with a low ecological footprint by integrating green principles

Rwandan Policy/ Law	Content	Relevance for ESMF/GCK Project
National Housing Policy (2015)	■ Ensures adequate living conditions, to enable all residents to access housing, and to establish and anchor both objectives within national policies and programs, thereby positively impacting on the needs of a human, including shelter, income, food security, social inclusion, knowledge and personal productivity. ■ Sets three pillars comprising public benefit, resource-efficient planning, green technology and professionalism, and governance and partnership.	■ Essential towards developing a sustainable Project design.
Law N°10/2012 governing urban planning and building in Rwanda	■ Covers topics on; rules in building planning, real estate development regulations, liability of construction professionals, masterplan for land management and urban planning, local and specific land development plans ■ Covers the purpose for building planning, which is to promote harmonization of professional practice in construction. ■ Covers the modes of land acquisition including expropriation in the public interest as well as the qualifications for occupancy and building permits. ■ Requires urban planning to perform with the aid of the following documents: - (a) master plan for land management and urban planning; - (b) local land development plans; - (c) specific land development plans; and - (d) land subdivision plans. ■ Requires building planning (architectural project) is to be carried out using the following documents: - (a) the cadastral register; - (b) the layout of structures; - (c) the graphic document; - (d) the composition of the graphic document and cost estimates; - (e) stability calculations of the structure; and - (f) aspect of the structure.	■ As a housing project, the Project is required to refer and apply its housing and real estate procedure in compliance to provisions in this law. ■ States that the City of Kigali and districts shall have Masterplans for land management and urban planning in conformity with the pattern of rational land use in Rwanda. ■ The development will be implemented after effective expropriation and compensations of affected parties.
Energy Policy	■ Ensures that all residents and industries can access energy products and services that are sufficient, reliable, affordable, and sustainable. ■ Encouraging and incentivizing more rational, efficient use of energy in public institutions, and amongst industrial and household end-users	■ The Project may look into benefits and incentives arising from introduction of off-grid renewable energy solutions (e.g. solar power for heating and lighting) and cleaner cooking fuels (such as LPG for cooking) in the design and implementation of the project, as a means of achieving sustainable, affordable, reliable

Rwandan Policy/ Law	Content	Relevance for ESMF/GCK Project
		energy for Project activities.
Sector Strategic Plan (SSP) (2018-2024)	■ The ICT sector has set out priority areas of intervention including universal broadband usage by all sustainable development through smart cities.	■ The Project is required to understand the weight by this SSP given to universal broadband usage by all and sustainable development of smart cities, in developing the design and implementation of the GCK.
EDPRS II (2013-2018)	■ National Economic Development and poverty Reduction strategy for the period 2013-2018. ■ Guiding blue print towards the nations development	■ All district development plans are directed to address its priority areas. ■ E&S is acknowledged as a cross cutting issue to be considered in all major projects. ■ Example of action taken is Budget Call circular included Environment & climate change mainstreaming guidelines. ■ Priority 5 is to pursue a green economy approach to economic transformation, i.e. green urbanisation, regulation on green urban development, green innovation centres. ■ National recognition of environment and climate change. ■ Adoption of the National Green growth and climate change strategy shows the importance given to this issue.
National Strategy for Transformation and Vision 2050	■ Rwanda has embarked on Vision 2050 with five broad priorities, most relevant to the Green city Kigali (GCK) project is the Priority 2 “Developing modern infrastructure and livelihoods” and Priority 3 “Transformation to prosperity”. ■ The National Strategy for Transformation (NST1) 2017-2024, is the implementation instrument for the remainder of the country’s Vision 2020 and the first four years of Vision 2050.	■ Guidance in developing criteria to consider for project masterplan and designs, e.g. project concept to consider modern and smart infrastructure, green eco-friendly initiatives, use of local construction material and employment mostly of Rwandans.
City of Kigali Masterplan 2050 2050	■ Introduces a more equitable, flexible and incremental approach to city development, aligned with UNHABITAT principles and supporting the United Nations Sustainable Development Goals. ■ It will guide Kigali city planners in their plans to accommodate a population of 3.8	■ According to the new City of Kigali Masterplan, the Kinyinya Project Area has 4 zoning regulations. ■ R3-Medium density residential - Expansion zone: This is where is

Rwandan Policy/ Law	Content	Relevance for ESMF/GCK Project
	million residents and provide 1.8 million jobs by 2050.	falling the Pilot and Upgrade zones. ■ R1-Low density residential zone ■ R2-Medium density residential - Improvement zone ■ R1A-Low density residential densification zone ■ The City of Kigali Masterplan 2050 is binding on the Project development. Possibility for consultations with CoK One Stop Centre for any proposal regarded as exception or changes on the City of Kigali Masterplan.

3.2.2 National EIA process

Laws relevant to the national EIA process are listed in **Table 3-1** above. More specific details are provided below for applicable laws.

Law N° 48/2018 of 13/08/2018 on Environment[25]

The purpose of the Law N°48/2018 on environment is to determine modalities for protecting, conserving and promoting the environment.

Based on Article 30 of this Law, a list of projects that must undergo an environmental impact assessment (EIA) before authorisation for their implementation is established by the Ministerial Order N°001/2019.

Article 31 states that every policy, strategy, plan and programme must undergo a strategic environmental assessment. With the procedures for conducting strategic environmental assessment are determined by an Order of the Minister (refer to 2011 SEA Guidelines from REMA in **Table 3-1).**

Article 32 of the Law further states that every project that may have significant impact on the environment must undergo an environmental audit during and after its implementation. The Order of the Minister provides instructions and procedures for conducting an environmental audit.

Article 33 states that the Authority in charge of conservation and environment (in this case Rwanda Environment Management Authority – REMA, or another state organ authorised in writing to do so by the Authority) must approve the environmental impact assessment, environmental audit and strategic environmental assessment. As stated in article 34 the consultancy cost for EIA preparation and environmental audit are borne by the project initiator, whereas the consultancy cost for strategic environmental assessment are borne by the recipient public institution.

Article 46 of the Law states that any entity, which does not carry out an EIA before launching any project that may have harmful effects on the environment, while it is required, is punished by suspension of project activities or closure of his/her association and ordered to rehabilitate the damage to environment, persons and property. He/she also pays an administrative fine of 2% of the total cost of the project.

25 REMA (2018), available at: https://rema.gov.rw/fileadmin/templates/Documents/Law_on_environment.pdf

As requested in the law mentioned above, the Ministerial Order N°001/2019 establishes the list of projects that must undergo environmental impact assessment, instructions, requirements and procedures to conduct an EIA. Annex 1 of the Ministerial Order contains the list of projects that must undergo a full EIA. The projects of Annex 1 are all buildings classified as residential, commercial, administrative or institutional sports facilities, social, cultural, and assembly and religious buildings, hotels, health facilities, educational buildings, or other publicly accessible facilities fulfilling at least two of the following conditions: having capacity to host more than 500 people or having a total floor area exceeding 1,500 m², or built in plot size exceeding 1,000 m². Identified Project components exceed these conditions and need therefore to carrying out a full EIA. In addition, projects with a lower impact level do not necessitate a full EIA, but a further level of assessment is required. Finally, projects not expected to have significant impacts, do not require any environmental assessment.

As required by this Ministerial Order, an expert from the published list of environmental assessment practitioners have to be recruited to conduct this study.

Article 17 of the law instructs that collection, transport and disposal of wastewater are conducted in accordance with special regulations and guidelines issued by the competent authority (currently, the Rwanda Utilities Regulatory Authority). Liquid waste must be collected in treatment plants for purification and serve thereafter to perform hygiene, sanitation and developmental activities. Water efficiently purified to standards may be discharged into streams or lakes.

Regarding solid waste management, article 18 informs that no person is authorised to discard solid waste in an inappropriate place. Solid waste must be sorted, collected and transported to appropriate facilities in accordance with relevant laws. Solid waste must be disposed of in appropriate landfill or in a waste processing factory for production purposes.

As part of the Law obligations, decentralised entities and local communities are obliged to protect and conserve soil, biodiversity, energy use. Furthermore, article 23 requires Public organs in charge of housing and infrastructure to ensure the integration of green spaces in the masterplan as well as in individual construction plans.

This Environmental law is therefore the guiding blue print of instruction to the Project implementation with regard to obligations of; performing an EIA, conserving and protecting the environment through soil protection and conservation, biodiversity protection, liquid and solid waste management, provision of green space in project design and mitigation of other possible adverse impacts to the environment.

Ministerial Order N°001/2019 establishing the list of projects that must undergo EIA, instructions, requirements and procedures to conduct EIA.

The Order establishes the list of projects that must undergo an environmental impact assessment before they obtain authorisation for their implementation. The Order contains instructions, requirements and procedures for conducting environmental impact assessment.

Article 3 of the order states that no public institution is authorised to take a decision, to warrant a certificate, approve or authorise the commencement of a project mentioned in the annexes of this Order without prior environmental impact assessment. The list of works, activities and projects that must undergo a full environmental impact assessment before being granted authorisation for their implementation is in Annex I of this Order.

Article 4 further indicates that the list of works, activities and projects that must undergo a partial environmental impact assessment before being granted authorisation for their implementation is in Annex II of this Order. The works, activities and projects referred to in Paragraph 1 of this Article are subject to assessment for environmental clearance certificate.

Projects, works and activities, which are not listed in the Annex I and II to this Order are not subject to the environmental impact assessment. However, when it is evident that works, activities or projects not listed on the Annex I and II to this Order have a negative and irreversible impact on the environment and are similar in nature to the work, activity or project listed in Annex I and II of this

Order, the Authority or authorised organ may request the developer to conduct an environmental impact assessment.

Concerning procedures to conduct EIA; articles 6, 7, 8 and 9 of this Order instruct that the developer whose project require preparation of an EIA, selects an expert from the list of environmental assessment practitioners published in accordance with relevant laws to conduct the study. The selected expert must not have any direct or indirect interests in that project.

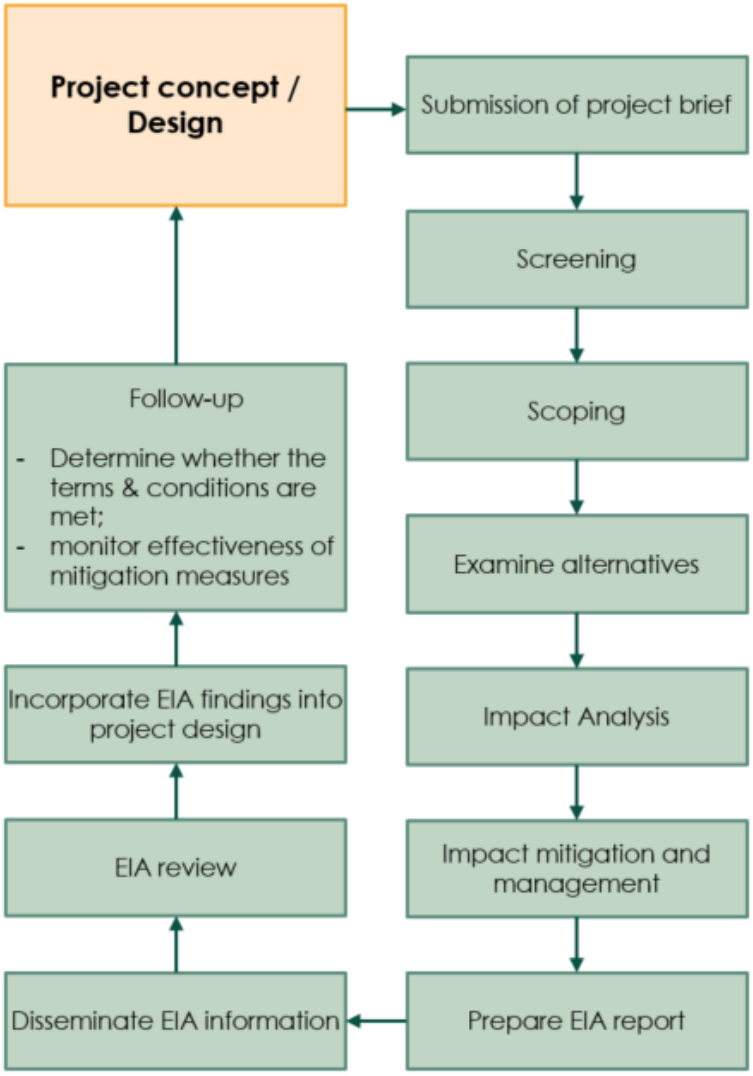
The selected environmental impact assessment expert, on behalf of developer, submits an official application for EIA of the proposed project to the authorised organ in form of a project brief together with proposed terms of reference for review and approval. The details of the required information are found in the EIA guidelines provided by the Authority.

After reception and analysis of the project brief and proposed terms of reference, within fourteen (14) days, the authorised organ approves or request for upgrade of terms of reference for conducting the environmental impact assessment.

The EIA must be based on the terms of reference mentioned in Article 6 of this Order. Upon completion of the EIA, the expert submits it to authorised organ (in this case the Rwanda Development Board- RDB). The authorised organ, within twenty (20) working days, after reception of the EIA report, accepts by issuing an EIA certificate or requests for additional information from selected EIA expert. If it is necessary to hold public hearing, the authorised organ requires an additional period of fifteen (15) working days from the date of public hearing notification.

Overview of National EIA Procedure

The EIA legislation distinguishes the following phases of the EIA process in Rwanda:



Source: REMA, 2009

Figure 3-1 Example of the EIA process for a housing project

3.3 Relevant International Treaties and Conventions

Rwanda is a signatory to a number of conventions on sustainable development and is a member of various bilateral and multilateral organizations. This assessment has identified some of the relevant conventions and treaties that Rwanda ratified or signed.

- EAC Protocol on Environment and Natural Resources Management, 2006. Article 3 of this Protocol states that "it is a protocol of general application and shall apply to all activities, matters and areas of management of the environment and natural resources of the Partner States, including environmental impact assessment and environmental audits";
- East African Transport Strategy and Regional Road Sector Development Program, 2011;
- The EAC Regional Environment Impact Assessment Guidelines for shared ecosystems, 2005;
- The International Convention on Biological Diversity 1992, as approved by Presidential Order N°017/01 of 18 March 1995;

- The Cartagena Protocol on Biodiversity 2000 as authorized to be ratified by Law N°38/2003 of 29 December 2003;
- Convention on the Conservation of Migratory Species of Wild Animals, 2003;
- The United Nations Framework Convention on Climate Change (UNFCCC) 1992, as approved by Presidential Order N°021/01 of 30 May 1995;
- The Kyoto Protocol to the framework on climate change, 1998 as authorized to be ratified by Law N°36/2003 of December 2003;
- Paris Agreement on Climate Change 2015, signed April 2016 and ratified October 2016.
- The Ramsar Convention, 1971 on Wetlands of International importance, especially as water flows habitats as authorized to be ratified by Law N°37/2003 of 29 December 2003;
- The Stockholm Convention on Persistent Organic Pollutants, 2001, as approved by Presidential Order N°78/01 of 8 July 2002;
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal 1989, and approved by Presidential Order N°29/01 of 24 August 2003 approving the membership of Rwanda;
- The Montreal Protocol on Substances that Deplete the Ozone Layer of 1987, amendments as approved by Presidential Order N°30/01 of 24 August 2003 related to the membership of Rwanda. Further amended by the Twenty-Eighth Meeting of the Parties (Kigali, 10-15 October 2016).
- The National Adaptation Programme of Action to Climate Change (NAPA-Rwanda), December 2006. The project's role in ensuring promotion of non-agriculture income generating activities, one of the relevant six priorities adaptation options to climate change.
- Agreement on International Trade in endangered species of wild flora and fauna (CITES), 1973.

The foregoing notwithstanding, the developer and contractor will have a contractual obligation to avoid impacts that may violate above conventions, wherever encountered.

3.4 International Requirements

In addition to the national requirements, the Project has to comply with international Standards. The Project level E&S assessment and management meets the below listed international Standards.

3.4.1 KfW Sustainability Guideline

The KfW Sustainability Guideline on the *Assessment and management of Environmental, Social and Climate Aspects: Principles and Procedures* (February 2021) aims to promote sustainability and avoid adverse environmental, social and climate impacts and risks. The Guideline describes procedures to assess the environmental, social and climate aspects during the preparation and implementation of financial cooperation measures financed by KfW Development Bank along the following core principles:

- to avoid, reduce or limit environmental pollution and environmental damage including climate-damaging emissions and pollution;
- to preserve and protect biodiversity and tropical rainforests and to sustainably manage natural resources;
- to consider probable and foreseeable impacts of climate change including utilising the potential to adapt to climate change. In this context climate change is understood as climate variability and long-term climate change;

- to avoid adverse impacts upon the living conditions of communities, in particular indigenous people and other vulnerable groups, as well as to ensure the rights, living conditions and values of indigenous people;
- to avoid and minimise involuntary resettlement and forced eviction of people and their living space as well as to mitigate adverse social and economic impacts through changes in land use by reinstating the previous living conditions of the affected population;
- to ensure and support occupational health and safety as well as health protection in the workplace;
- to condemn forced labour and child labour, ban discrimination in respect of employment as well as occupation and support the freedom of association and the right to collective bargaining;
- to avoid all forms of discrimination;
- to avoid negatively influencing existing conflict dynamics;
- to protect and preserve cultural heritage;
- to support the executing agency in the management and monitoring of possible adverse environmental, social and climate impacts and risks associated with the implementation of the financial cooperation measure.

According to the KfW Sustainability Guideline (2012)[26], the World Bank Environmental and Social Standards (ESS, 2018)[27], World Bank Group General EHS Guidelines & sector specific EHS Guidelines[28] as well as general international best practice procedures must be applied.

3.4.2 World Bank Environmental and Social Standards

The World Bank Environmental and Social Standards (ESS, 2018) are considered a benchmark for good practice for E&S risk management in investment project financing. The WB ESS set out a number of specific E&S requirements and includes specific guidance to be applied during the planning phase and through the project lifecycle.

The ESS have been reviewed, and topics likely to be applicable to the Project are pointed out. The objective is to ensure that subsequent ESIAs for the Project are carried out in-line with such standards, in addition to national legislation and regulations in Rwanda. All of the ESS will likely be triggered by the Project development (though not necessarily each sub-component), with exception of:

- ESS-7, as there are no indigenous peoples in the Project Area, and
- ESS-9, as this Project does not involve a financing intermediary.

Table 3-2 World Bank Environmental and Social Standards (ESS)

ESS	Name/ Topic	Objectives of the ESS	Triggered
1.	Assessment and Management of Environmental and Social Risks and Impacts	■ To identify and evaluate E&S risks and impacts of the project. ■ To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for	yes

26 https://www.kfw.de/PDF/Download-Center/Konzernthemen/Nachhaltigkeit/englisch/Nachhaltigkeitsleits%C3%A4tze-der-KfW-Bankengruppe_E.pdf

27World Bank (2018), available at: http://pubdocs.worldbank.org/en/837721522762050108/Environmental-and-Social-Framework.pdf

28IFC (2007), available at: https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines

ESS	Name/ Topic	Objectives of the ESS	Triggered
		risks and impacts to workers, affected communities, and the environment. ■ To promote improved E&S performance of clients through the effective use of management systems.	
2.	Labour and Working Conditions	■ To promote the fair treatment, non-discrimination, and equal opportunity of workers. ■ To establish, maintain, and improve the worker management relationship. ■ To promote compliance with national employment and labour laws. ■ To protect workers, including vulnerable categories of workers such as children. ■ Applies to direct workers, contracted workers and supply chain workers. ■ If applicable also requirements stemming from the corresponding Guidance Note related to prisoner work will have to be considered.	yes
3.	Resource Efficiency and Pollution Prevention	■ To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities; ■ To promote more sustainable use of resources, including energy and water. ■ To reduce project-related GHG emissions.	yes
4.	Community Health, Safety, and Security	■ To anticipate and avoid adverse impacts on the health and safety of the affected community during the project life from both routine and non-routine circumstances. ■ To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the affected communities.	yes
5.	Land Acquisition, Restrictions on Land use and Involuntary Resettlement	■ To avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs. ■ To avoid forced eviction. ■ To anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. ■ To improve, or restore, the livelihoods and standards of living of displaced persons. ■ To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.	yes
6.	Biodiversity Conservation and Sustainable Management of Living Natural Resources	■ To protect and conserve biodiversity (e.g. species of conservation concern seen in Project Area). ■ To maintain the benefits from ecosystem services. ■ To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.	yes
7.	Indigenous Peoples	■ No indigenous people (according to WB definition) in Project Area.	no
8.	Cultural Heritage	■ To protect cultural heritage from the adverse impacts of project activities and support its preservation.	yes

ESS	Name/ Topic	Objectives of the ESS	Triggered
		■ To promote the equitable sharing of benefits from the use of cultural heritage.	
9.	Financial Intermediaries	Not applicable	no
10.	Stakeholder Engagement and Information Disclosure	■ To establish a systematic approach to Stakeholder Engagement ■ To build and maintain a constructive relationships with relevant Stakeholders ■ To promote inclusive engagement ■ To ensure adequate disclosure of information	yes

3.4.3 Additional Applicable International Standards

In addition to the above, the following standards will be applied to the Project:

- ILO International Labour Standards;
- The International Labour Standards are legal instruments that set out basic labour principles and rights at work.
- World Bank Group's General Environmental Health and Safety (EHS) Guidelines[29];
- The WB General EHS Guidelines contain information on environmental, health, and safety issues applicable to the Project as a whole and its sub-components. They are to be applied together with the sector-specific EHS guidelines (mentioned below).
- World Bank Group's Industry Sector EHS Guidelines[30], depending on the specific type of Project component or sub-component, for example EHS Guidelines:
  - Health Care Facilities (2007),
  - Telecommunications (2007),
  - Waste Management Facilities (2007),
  - Water and Sanitation (2007), and
  - Electric Power Transmission and Distribution (2007).
- UN Basic Principles and Guidelines on Development-based Evictions and Displacement, namely §§ 42, 49, 52, 54 and 60)[31];
- IFC (2002)[32] Handbook for Preparing a Resettlement Action Plan and World Bank (2004) Involuntary Resettlement Sourcebook[33];
- Human Rights Principles outlined in the BMZ Strategy "Human Rights in German Development Policy" and specified in the BMZ "Guidelines on Incorporating Human Rights

29IFC (2007), available at: https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES&CVID=jOWim3p

30 IFC (2007), available at: https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines

31OHCHR (2007), available at: https://www.ohchr.org/Documents/Issues/Housing/Guidelines_en.pdf

32IFC (2002), available at: https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_rap__wci__1319577659424

33 World Bank (2004), available at: http://documents.worldbank.org/curated/en/206671468782373680/pdf/301180v110PAPE1ettlement0sourcebook.pdf

Standards and Principles, Including Gender, in Programme Proposals for Bilateral German Technical and Financial Cooperation"[34]; and

- Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests (VGGT)[35].

3.5 Conformance of Rwandan Legal Framework and WB ESS

The following table presents a high-level comparison between the Rwandan E&S legislative framework and the international requirements (of WB ESS), and presents the additional requirements for the Project stemming from the international standards.

Risks and impacts of each sub-component will need to be addressed in accordance with both national and international requirements.

34 BMZ (2013), available at: https://www.bmz.de/resource/blob/70448/14b3b6b3fe59eab4dcc05efe266e57b4/guidelines-human-rights-bilateral-cooperation

35 FAO (2012), available at: http://www.fao.org/docrep/016/i2801e/i2801e.pdf

Table 3-3 Gap Analysis on Relevant Local Legislation against WB ESS

WB Environmental and social standards (ESS)	Rwandan National Environmental and Social framework	Additional Requirements stemming from WB ESS
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	■ Law conserving and promoting environment, No. 48/2018 of 13/08/2018 requires an EIA is prepared for all projects before implementation. ■ Ministerial order No.001/2019 of 15/04/2019 indicates a list of activities that have to undergo an EIA as well as it reflects EIA procedure to follow. ■ Differentiation between full and partial EIA	■ ESMPs for every project and activity although not directly required by national legislation. ■ Associated facilities need to be considered as per the WB ESF definition. ■ Cumulative impacts to be considered (specifically during construction). ■ Social aspects to be considered during preparation of EIA. ■ Management of contractors and development partners as per WB ESS.
ESS 2: Labour and Working Conditions	■ Rwanda has ratified the Fundamental ILO Conventions. ■ Law N° 66/2018 of 30/08/2018 regulating Labour in Rwanda Labour law addresses the following: ■ Prohibits child labour, forced labour and discrimination. ■ Protection of workers against violation or harassment, freedom of opinion and mentions general guidance on how employment contractual terms are followed and disputes can be resolved Ministerial order No.01 of 17/05/2012 on OHS conditions indicates duties of employers and self-employed persons. ■ Gives powers of an occupational safety and health expert and labour inspector. ■ Gives general provisions of health and hygiene, machinery safety, safety measures like safety signs, fire risk, air and noise pollution. ■ Elaborates on workplace welfare, health and safety ■ Precaution measures for vulnerable groups.	■ Development and implementation of an overall labour code of conduct; ■ Development and implementation of written labour management procedures applicable to the Project (this includes a workers' grievance mechanism). ■ Enforcement and monitoring specifically observed with regard to H&S. Common practice at construction sites shows H&S is neglected, e.g. no protective wear (helmets, boots, overalls, gloves), safety equipment is lacking (safety belts on scaffoldings), health of workers (drinking water, site first aid kits or mini-clinics) ■ Development and implementation of H&S plans according to international best practice and industry-specific guidelines.

WB Environmental and social standards (ESS)	Rwandan National Environmental and Social framework	Additional Requirements stemming from WB ESS
ESS 3: Resource Efficiency and Pollution Prevention	■ Law No. 18/2016 of 18/05/2016 governing the preservation of air quality and prevention of air pollution in Rwanda ■ Law N°62/2008 of 10/09/2008 Putting in place the use, conservation, protection and management of water resources regulations ■ Green Growth and Climate Resilience Strategy 2011 (GGCRS) set out a vision for low carbon growth (low carbon economy by 2050)	■ Development and monitoring of specific pollution control management plans (especially for the management of pollution prevention during construction): - Specific waste management plan during construction - Specific wastewater management plan during construction.
ESS 4: Community Health and Safety	■ Constitution states that everyone has the right to live in a clean and healthy environment ■ Ministerial order No2 of 17/05/2012 determining conditions for OHS provides for the protection of persons other than those at work against hazards to health and safety arising out of or in connection with activities of persons at work.	■ Development and implementation of community H&S and security plan, specific emphasis on: - Workers' influx management plan including unplanned influx (including accommodation, and workers demobilisation procedures) - Gender Based Violence prevention and management plan - Focus on needs and vulnerabilities of vulnerable groups in relation to influx of workers.
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Law to expropriation in public interest, No. 32/2015 states that: ■ Only government shall perform expropriation for public interest. ■ Public consultation to inform of expropriation. ■ Fair compensation based on market value for affected assets ■ An independent real property valuer performs valuation of assets affected. ■ District council approves asset valuation before compensation is officially accepted. ■ Compensation paid within 120 days from agreement between affected land owners and developer ■ 5% added to compensation price to cover displacement disturbance. ■ 5% penalties for delays in compensation. Law relating to expropriation in public interest, No. 18/2007 states that: ■ Project Budget must have funds available for asset inventory and just compensation.	Non-conformances identified regarding Involuntary resettlement Development of RAP or Livelihood restoration plan (LRP)., including: ■ entitlement matrix ■ Compensation considerations also for informal landowners. ■ Compensation cost at 'replacement value' (including current market price, to be identified by valuers, AND transaction costs). ■ cut-off date. ■ social baseline survey to monitor against. ■ monitoring & evaluation procedures of the resettlement process.

WB Environmental and social standards (ESS)	Rwandan National Environmental and Social framework	Additional Requirements stemming from WB ESS
	■ Expropriation shall be initiated by Executive committee at the district level. ■ Expropriation shall be approved by District Councils after considering decision of the land commission at the district level. ■ Through agreement compensation may be monetary, alternative land, a building equivalent to the determined valuation. Law relating to Real Property valuation profession, 2010 ■ Establishes and organises the profession of land valuation. ■ In terms of valuation, it instructs valuers to compare prices in determining a fair market price. Ministerial order no. 001/16 of 2009 determining the reference land prices in the city of Kigali and Ministerial order no. 002/16.01 of 2010 determining land price outside the Kigali city determines reference land prices used in districts outside Kigali city.[36]	
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	■ Law conserving and promoting environment, No. 04/2005 of 08/04/2005 requires the EIA to address the environmental conditions of the Project Area. ■ Ministerial order No. 007/2008 of 15/08/2008 establishing a list of protected animal and plant species. ■ Law on management of land, No. 43/2013 of 16/06/2013 classifying protected areas on state land. e.g. National parks. ■ Ministerial Order No. 007/16.01 of 15/07/2010 on management of land on shores of lakes, rivers ■ Ministerial Order No. 006/MINIRENA/2015 of 18/06/2015 on management of state protected forests ■ Law on forest management and utilization No. 47 bis/2013 of 28/06/2013 encourages planting and conservation of forests. It also instructs on how forest clearing licensing is obtained and how forests can be harvested. It gives guidance on management of state, district and private forests.	■ Critical habitat screening and assessment. ■ Biodiversity management in case of presence of critical habitat.

36 Both Ministerial Orders are currently not widely applied by land valuers as they are out-dated.

WB Environmental and social standards (ESS)	Rwandan National Environmental and Social framework	Additional Requirements stemming from WB ESS
ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	■ Rwanda is a country with a single/common culture, tribe and language, with a National constitution that recognises all Rwandans are born and remain equal in rights and freedom (article 16 of Rwandan Constitution, 2015).	■ The Project currently does not trigger ESS 7. ■ None of the sub-component activities within the 600 ha Project Area will trigger ESS7. Any off-site Associated Facilities (eg. quarries) will be selected such that they do not trigger ESS7.
ESS 8: Cultural Heritage	Law No. 28/2016 of 22/7/2016 on preservation of cultural heritage and traditional knowledge address the following: ■ Defines cultural heritage as both tangible and intangible, how they are classified. ■ Stipulates how cultural heritage and traditional knowledge can be preserved and protected.	■ Development and implementation of Chance Finds Procedure of cultural resources that could be found during project construction and operation phase.
ESS 10: Stakeholder Engagement and Information Disclosure	Ministerial order No.003/2008 of 15/08/2008, EIA general guidelines and procedure 2006 require: ■ Public consultation done during EIA preparation. Public hearing and post consultation is conducted in the presence of REMA after the EIA report has been submitted. Licensing will only be issued after this session. Communication of public hearing is done through radio, newspapers or posters.	No gap in regulations except that common practice is that public hearing or disclosure is done by RDB and not done for all projects but for only complex ones. Also its not common practice to disclose the EIA report via media. Only donor-funded projects require more extensive disclosure at community level. ■ SEP and continuous engagement. ■ Project specific grievance mechanism.

4. IMPACT ASSESSMENT METHODOLOGY

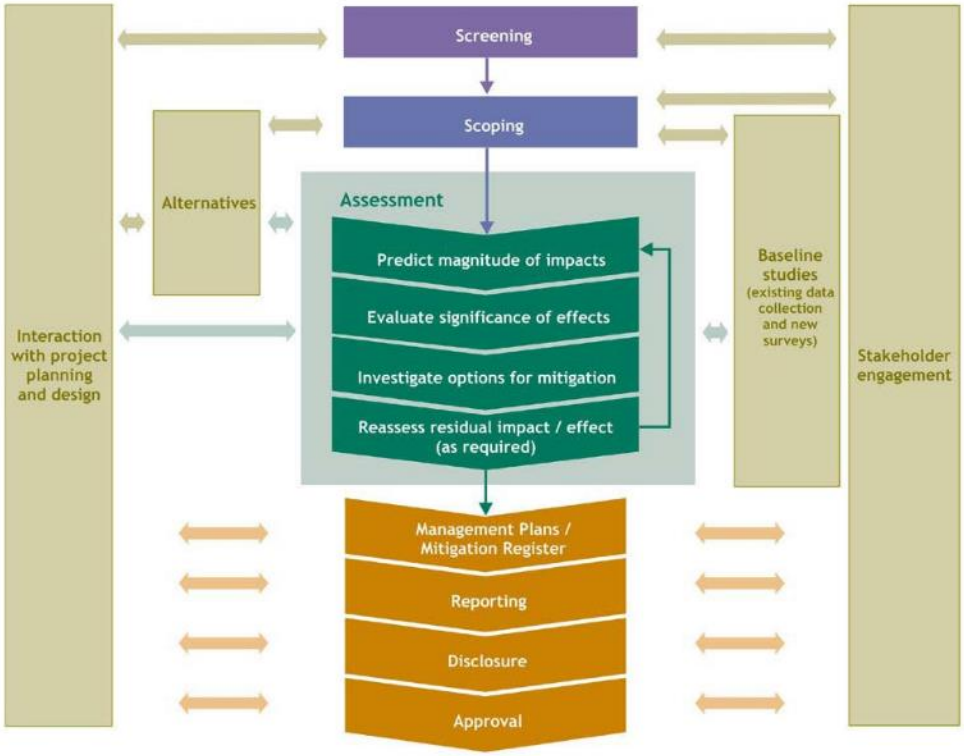
4.1 Introduction

This section presents a methodology typically used to conduct an ESIA. This High-level ESIA follows the general ESIA concept outlined below to the extent relevant in accordance with the objective and scope (depth and level of detail) of this high-level ESIA.

This methodology can also be used as a guidance for development of sub-component ESIAs, in addition to the guidance provided in the ESMF.

The overall ESIA approach is illustrated in **Figure 4-1**.

The High-Level ESIA has been undertaken following a systematic process that predicts and evaluates the risks and potential impacts the Project could have on physical, biological, social/ socio-economic and cultural aspects, and identifies high-level measures that the Project will take to avoid, minimise/reduce, offset or compensate adverse impacts. It also seeks to identify and enhance positive impacts. In addition, reference is made to future actions that should be taken during the next phase of Project planning, design and construction of the sub-components. The following sections present each of the following steps: screening, baseline definition, scoping and impact assessment.



Source: ERM, 2020

Figure 4-1 General Impact Assessment Process

4.2 Screening

Screening is the first step in ESIA process to determine whether an ESIA is needed or not. As the overall development of the Project has been categorized as Category A[37] as per KFW Sustainability Guideline due to its potential diverse significant E&S risks and impacts on the environment or

37 Refer to Section 1.4 for background information on the categorisation process. Refer to the Project ESMF for guidance on categorisation process.

receptors in the Area of Influence (AoI), an ESIA is required. At the initial stage of the ESIA, preliminary information e.g. from the pESIA was used to aid in the determination of what legal and other requirements apply to the Project including the Applicable Standards and the associated level of detail, given the planning and design status of the Project. This step has been conducted utilising a high-level description of the Project and its potential associated facilities.

4.3 Project and Baseline Definition

The Project characteristics and planned activities are provided above in **Chapter 2**, as outlined by the GCK SPA Masterplan.

The purpose of the baseline is to describe the physical, biological, social / socio-economic and cultural conditions in the Project Area at the present time – prior to further development. It is on this the impacts of the Project can be assessed. The Baseline includes information on all key resources/receptors that were identified having the potential to be significantly affected by the Project.

For this High-Level ESIA, certain baseline information was already existing and this was supplemented by a limited set of additional baseline studies. The High-level ESIA is based on existing secondary data and qualitatively collected field-based information. Quantitative studies and stakeholder engagement were not conducted for the purpose of baseline data collection.

- **Desktop study:** Baseline data were collected through desktop review and evaluations conducted in 2020. This was done through literature review of Project documents publicly available including the existing baseline data obtained through the pESIA (Sweco 2019), the Final Feasibility Study (Sweco, 2020) and the GCK SPA Masterplan. The information was retrieved *inter alia* from Sweco, from relevant ministries such as the Ministry of Infrastructure (MININFRA) or the Rwanda Environment Management Authority (REMA).
- **Site walk-over**: A site walkover was conducted in December 2020[38] to gain a deeper understanding of the Project Area and existing baseline conditions. The site walk-over enabled the High-Level ESIA team to understand sensitivities including surrounding human activities and land uses, physical aspects (topography, visual aspects, noise, soils, potential water sources and aesthetic quality) and biological aspects. Photographs were taken to supplement the understanding of the Project Area.

In using existing secondary data sources, important gaps with regard to coverage and currency of data were identified. In some cases there was no up-date-availability of certain data. For example, current available demographic data is drawn from the 2012 census, which targeted 20% of households living within 600ha of the Kinyinya Hill site. Data and information are therefore generic and suitable for assessing high level social risks and impacts (as presented in this Report). In addition, while the results of the Fifth Integrated Household Living Survey (EICV5) conducted from October 2016 to October 2017, provide more recent data, the level of detail does not allow for relevant information specific to the Project Area. To account for these limitations, the sub-component ESIAs will therefore need to include a more precise and specific baseline than is possible currently in this High-Level ESIA. A more complete and accurate baseline data collection (e.g. survey focusing on potential Project Affected Persons (PAPs), as well as their livelihood sources and assets), will be conducted once specific sub-component detailed designs are completed.

4.4 Scoping and High-Level Impact Assessment

Scoping has been undertaken in an iterative approach to identify the potential AoI for the Project (and thus the appropriate Study Area), to identify potential interactions between the Project and resources/receptors in the AoI and the impacts that could result from these interactions, and to prioritize these impacts in terms of their likely significance. This stage is intended to ensure that the

38 Site-walk over was performed by a local E&S subcontractor in December 2020; (the international ERM E&S consultant was unable to attend due to Covid-19 travel restrictions). The visit was prepared and guided by ERM's E&S experts remotely.

High-Level ESIA, as well as the ESIAs for future components focus on those issues that are most important for design, decision-making and stakeholder interest.

4.4.1 Definition of Area of Influence

The Area of Influence (AoI) is the area, which is likely to be directly or indirectly affected by a project, including all permanent project facilities and temporary activities during construction (e.g. access roads, disposal areas, construction camps).

The AoI for the Project is defined as:

- the 600 ha Project site on Kinyanya Hill (also referred to as Project Area or Project footprint);
- the neighbouring communities within the Gasabo district and Kinyinya Sector, whose environmental, social and cultural features might be affected;
- any areas affected by associated facilities/offsite areas such as material source points, access routes to the site and to associated facilities, dump sites, deposition sites for excess material, etc.; and
- potentially nearby sensitive receptors located outside the Project site such as wetlands, streams, settlements and other developments in the vicinity.

The **Figure 4-2** below provides an illustrative example of an AoI. The exact AoI could be significantly larger depending on e.g. the location of associated facilities and nature of activities. The Project AoI can be identified once the exact Project features including associated facilities and any activity beyond the Project area are yet to be defined.

The High-Level ESIA covers the physical, biological, socio-economic and cultural environments within the Project Area (and the wider district, as appropriate) and identifies the key issues relevant to the Project to be considered in the subsequent ESIAs.

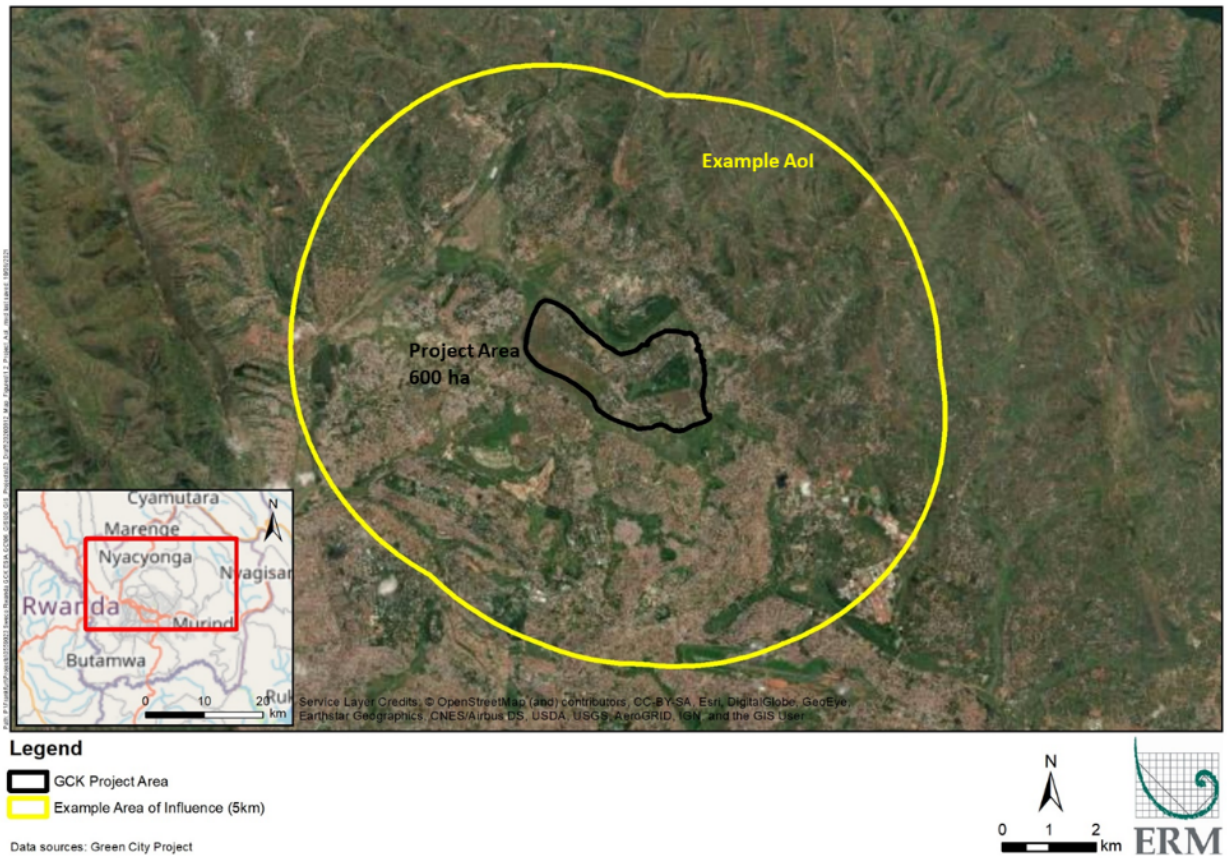


Figure 4-2 Example Illustration of AoI

4.4.2 Prediction of Impacts

Prediction of impacts is essentially an exercise to determine what is likely to happen to the environment as a consequence of the Project and its associated activities. From the potentially significant interactions identified in Scoping, the impacts to the various resources/receptors are elaborated and evaluated. The diverse range of potential impacts considered in the impact assessment process typically results in a wide range of prediction methods being used, including quantitative, semi-quantitative and qualitative techniques.

4.4.3 Evaluation of Significance of Impacts

For the relevant topics, the potential impact significance is evaluated based on the impact magnitude and the receptor's sensitivity. Once the magnitude of potential impacts and the sensitivity/vulnerability/importance of resource/receptor have been characterised, the significance can be assigned for each impact. Assigning significance to each impact will support defining the scope of mitigation measures. Impact significance is designated using the matrix shown in **Figure 4-3.**

		Sensitivity/Vulnerability/Importance of Resource/Receptor		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

Source: ERM, 2020

Figure 4-3 Impact Significance Matrix

Magnitude is typically a function of some combination (depending on the resource/receptor in question) of the following impact characteristics:

- Type
- Extent
- Duration
- Scale
- Frequency

Table 4-1 Impact Characteristic Terminology

Characteristic	Definition	Designations
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect).	Direct Indirect Induced
Extent	The "reach" of the impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc).	Local Regional International
Duration	The time period over which a resource / receptor is affected.	Temporary Short-term Long-term Permanent
Scale	The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc)	[no fixed designations; intended to be a numerical value or a qualitative description of "intensity"]
Frequency	A measure of the constancy or periodicity of the impact.	[no fixed designations; intended to be a numerical value or a qualitative description]

Additionally, for unplanned activities only, magnitude incorporates the 'likelihood' discussed above.

Magnitude essentially describes the intensity of the change that is predicted to occur in the resource/receptor as a result of the impact. As discussed above, the magnitude designations themselves are universally consistent, but the descriptions for these designations vary on a resource/receptor-by-resource/receptor basis. The universal magnitude designations are: Positive; Negligible; Small; Medium; and Large.

In the case of a positive impact, no magnitude designation (aside from 'positive') is assigned. It is considered sufficient for the purpose of the impact assessment to indicate that the Project is expected to result in a positive impact, without characterising the exact degree of positive change likely to occur.

In the case of impacts resulting from unplanned events, the same resource/receptor-specific approach to concluding a magnitude designation is utilised, but the 'likelihood' factor is considered, together with the other impact characteristics, when assigning a magnitude designation.

In addition to characterising the magnitude of impact, the other principal impact evaluation step is definition of the sensitivity/vulnerability/importance of the impacted resource/receptor. There are a range of factors to be taken into account when defining the sensitivity/vulnerability/importance of the resource/receptor, which may be physical, biological, cultural or human. Other factors may also be considered when characterising sensitivity/vulnerability/importance, such as legal protection, government policy, stakeholder views and economic value.

As in the case of magnitude, the sensitivity/vulnerability/importance designations are universally consistent, but the definitions for these designations vary on a resource/receptor basis.

4.4.4 Associated Facilities

The Impact Assessment process should include the consideration and assessment of any impacts resulting from activities of Associated Facilities. The process for Associated Facilities will follow the general methodology for impact assessment described above.

4.4.5 Cumulative Impact

The Impact Assessment process should predict any cumulative impacts/effects to which the project may contribute. Cumulative impact and effects are those that arise as a result of an impact and effect

from a project interacting with those from another activity to create an additional impact and effect. Other projects can be projects already in existence and operating, approved or realistic proposition of projects which are not as yet built (but planned to be implemented in near future and the construction timing may overlap).

The approach for assessing cumulative impacts and effects resulting from the Project and another activity affecting the same resource/receptor is based on a consideration of the approval/existence status of the 'other' activity and the nature of information available to aid in predicting the magnitude of impact from the other activity.

4.4.6 Identification of Mitigation and Enhancement Measures

Once the significance of an impact has been characterised, the next step is to evaluate what mitigation and enhancement measures are warranted to minimise the significance of the impact. For the purposes of this High-Level ESIA, the Project will adopt the following Mitigation Hierarchy:

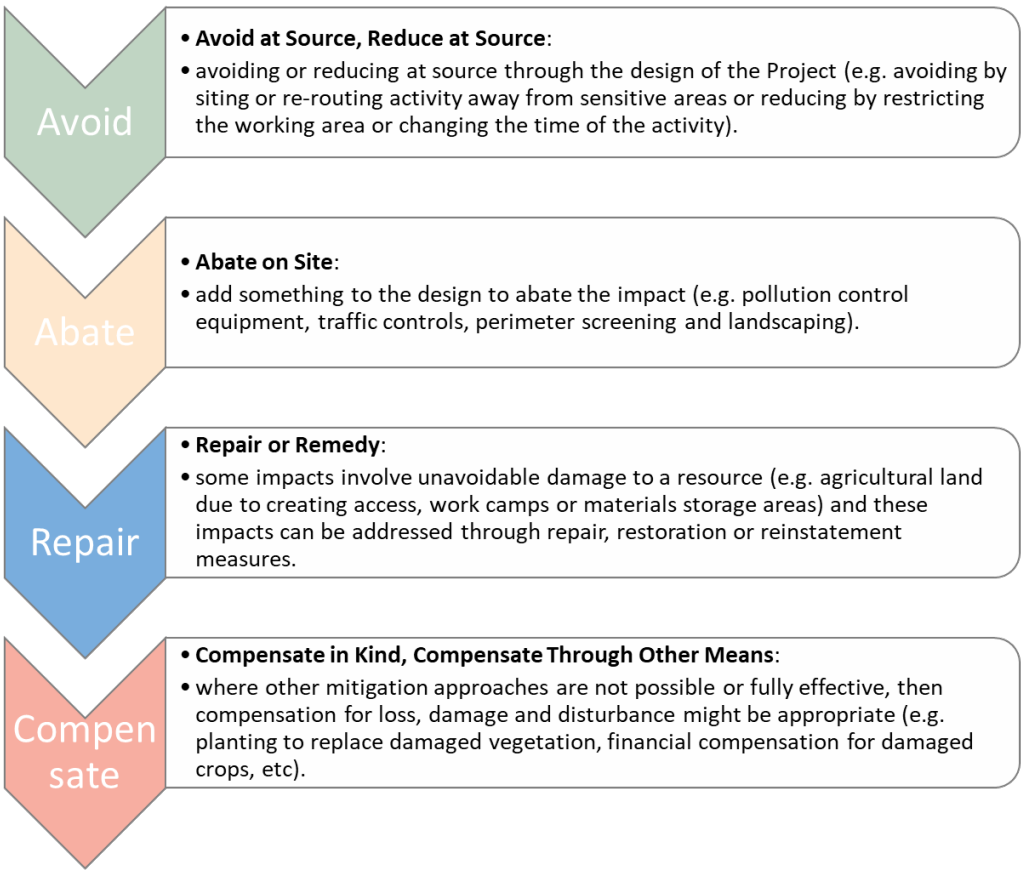


Figure 4-4 Mitigation Hierarchy

The priority in mitigation is to apply mitigation measures to the source of the impact (i.e. to avoid or reduce the magnitude of the impact from the associated Project activity). Then the resultant effect to the resource/receptor via abatement or, as a last resort, compensatory measures or offsets (i.e., to reduce the significance of the effect once all reasonably practicable mitigations have been applied to reduce the impact magnitude) has to be addressed. The GCK Project, including all sub-components, are to apply the above outlined Mitigation Hierarchy.

When developing relevant mitigation measures, impacts rated as major or moderate significance are focused on. Minor or negligible impacts are often automatically mitigated by applying best practice E&S management procedures or simple and embedded mitigation measures. In the case of positive impacts, the objective is to consider measures to further enhance the positive impacts (e.g. maximise employment opportunities to local persons).

5. ENVIRONMENTAL AND SOCIAL BASELINE

5.1 High-level Baseline

The primary objective of the High-Level ESIA process is to appraise the potential changes that the proposed Project may have upon the existing environment and society and how this can be avoided or mitigated. Thus, it is necessary to first establish an understanding of the existing physical, biological or social environment before any clearing of the site to make way for development.

The baseline studies for the Project present here rely mostly on the dataset provided within the pESIA and the Final Feasibility Study. Additional data was obtained through a site walkover, Integrated Biodiversity Assessment Tool – IBAT reports, and further online research. The description of the existing environment thus provides a snapshot of the current overall conditions in the Project Area and the wider district where relevant. The exact AoI is yet to be defined as Project features and associated facilities will be identified. For subsequent ESIAs for sub-components, further baseline studies (site-specific and for the wider AoI as applicable) will usually need to be conducted for certain topics as appropriate to the scope of the respective sub-component. Every topic described in this Baseline chapter includes a short summary and recommendations for the development of baseline description in future sub-component ESIA based on the outcome of this High-Level ESIA. The baseline of sub-component ESIAs should be oriented on the high-level baseline and taking into account the recommendations made. Additional field studies are recommended if deemed necessary according to this High-Level ESIA.

As the Project progresses and the development of individual sub-components will change the physical, biological and social environment in the Project Area, sub-component assessments are to include an updated baseline information relevant to the scope of the individual sub-component.

All frameworks included in the E&S documentation for the Project (i.e. ESMF, SEF and RPF) are living documents that maybe periodically updated by FONERWA as the Project progresses. Refer to **Chapter 8.3** for further information on change management.

5.2 Physical Environment

5.2.1 Climate

Rwanda lies within the equatorial zone, but has mountains and hills that moderate its climate. Kigali has tropical savannah climate (Aw) according to Köppen-Geiger classification. Typically for Aw climate, there is much more rainfall in summer than in winter. There are two rainy seasons from March-May and from September-December[39].

The Kinyinya sector has two major climatic seasons in a year, namely, the dry and rainy seasons. The two major climatic seasons alternate within the course of a year; hence, the sector is experiencing two dry seasons and two rainy seasons per year as described in the **Table 5-1**. However, it is important to note that duration of the seasons is irregular.

Table 5-1 Average duration of climate seasons in Kinyinya sector

Seasons	Period
Short dry season	December, January and February
Long rainy season	March, April and May
Short dry season	June, July, August and September
Long rainy season	October and November

39 World Bank Climate Knowledge Portal (2021) available at: https://climateknowledgeportal.worldbank.org/country/rwanda/climate-data-historical

Figure 5-1 shows the average temperatures and rainfall in Kinyinya. The average annual temperature is 20.6°C, with only very slight monthly deviation during the year of about 1.1°C. With an average of 21.1°C, August is the warmest month. With an average of 19.9°C, June is the coldest month of the year. The average annual rainfall is about 949 mm, with June-July-August being the driest months (only 7 mm in July), while April is by far the wettest month reaching an average of 180 mm.

Figure 5-2 shows the monthly rainfall and **Figure 5-3** indicates the overall steady temperature throughout the year in Kinyinya. Rwanda has experienced an average temperature increase of 1.4°C since 1970, higher than the global average.

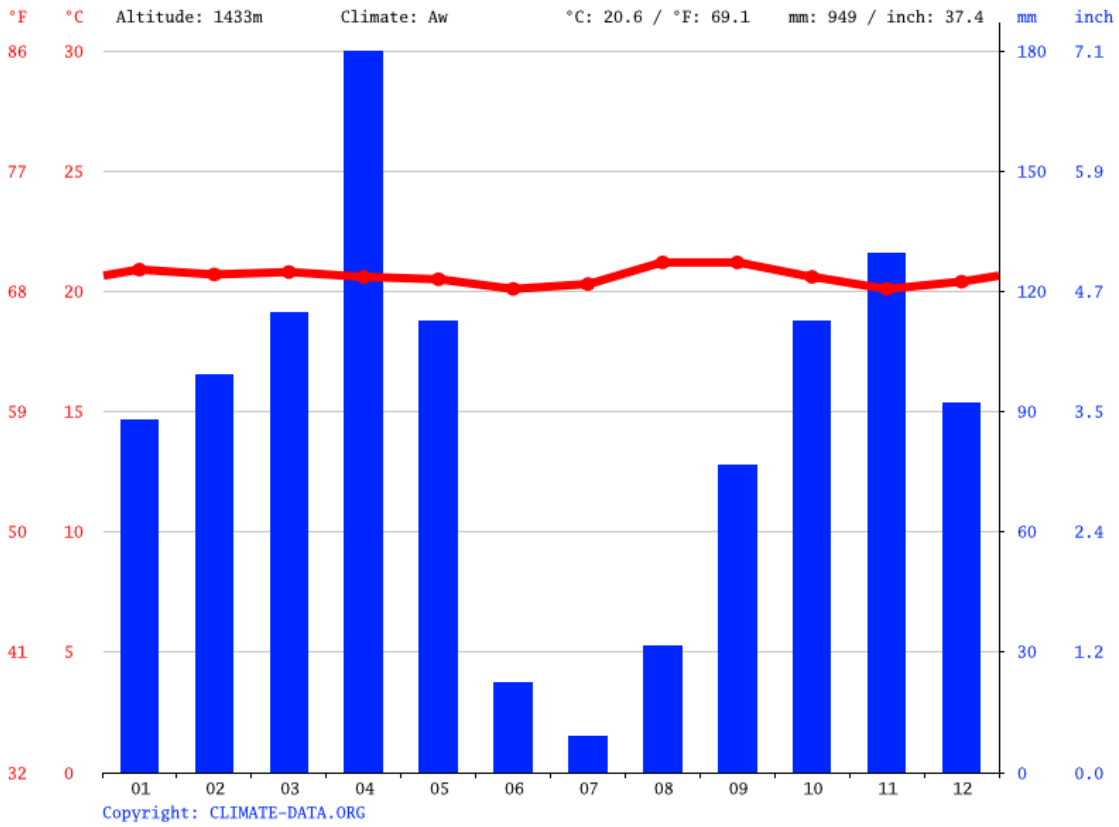
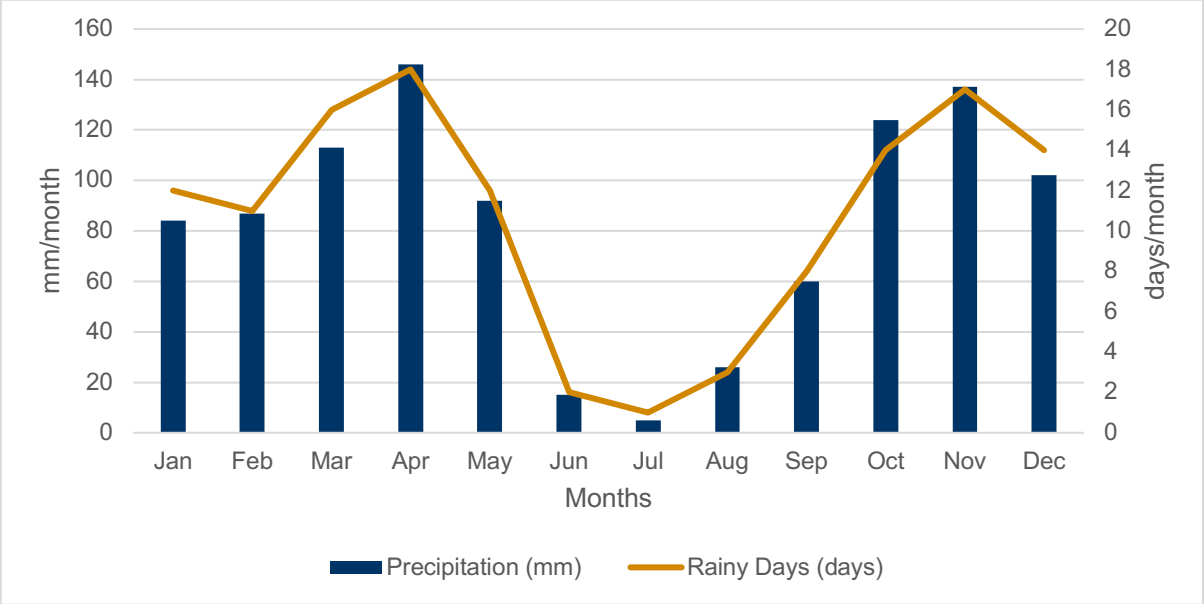


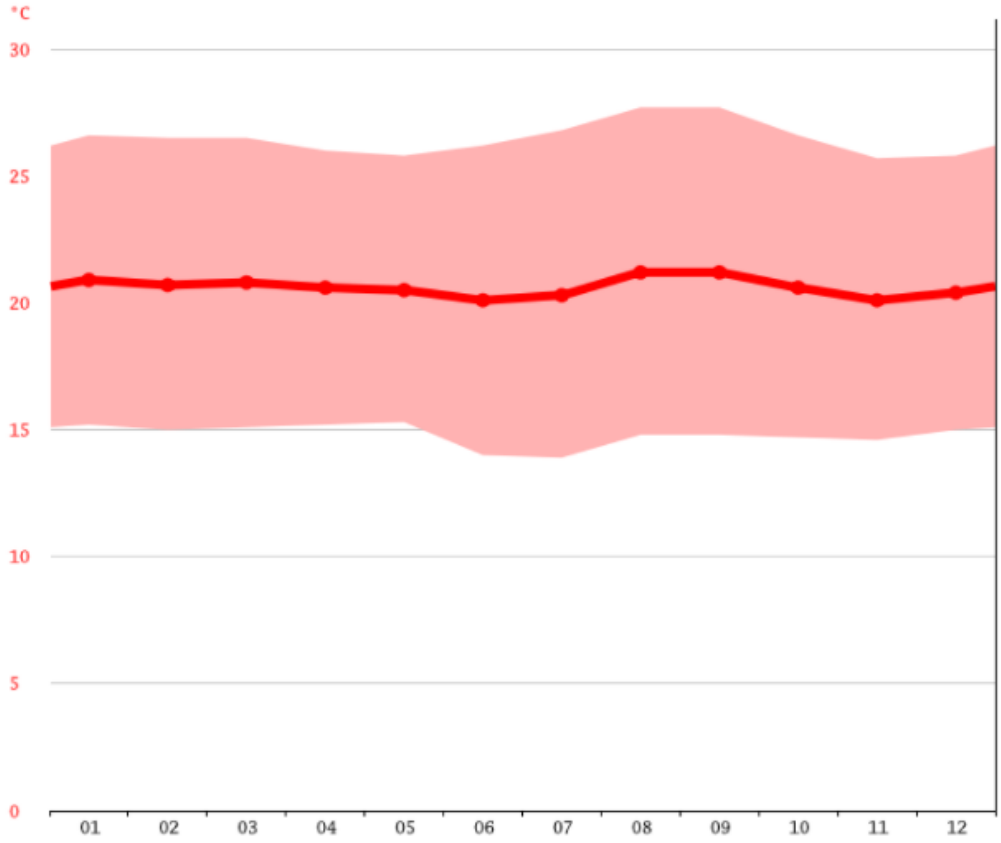
Figure 5-1 Climate graph showing the average weather in Kinyinya by month[40]

40 Climate-data.org (2020), available at: https://en.climate-data.org/africa/rwanda/kigali-city/kinyinya-224166/



Source: ERM, 2021[41]

Figure 5-2 Average Monthly Rainfall in Kinyinya



Source: Climate-Data.Org, 2021[42]

Figure 5-3 Average Monthly Temperature in Kinyinya

41 Climate-data.org (2020), available at: https://en.climate-data.org/afrika/ruanda/kigali/kinyinya-224166/

42 Climate-data.org (2020), available at: https://en.climate-data.org/afrika/ruanda/kigali/kinyinya-224166/

Table 5-2 shows some of the historical and future climate trends for Rwanda indicating a rise in temperature. Observed annual mean temperatures showed a statistically significant increase in the last 30 years. For the future, climate model calculations project a moderate rise in temperature for the region. At the end of the century, a temperature increase between 1.1 and 5.1 °C compared to the base period from 1971 to 2000 can be considered likely. Along with the rise in temperature, there is a strong extension of hot periods and a significant reduction in cold periods.

A slight decrease in annual precipitation has been observed over the past 30 years. For the future, however, the climate model calculations do not project a clear precipitation trend. At the end of the 21st century, a change in precipitation between -3 and + 10% compared to the base period from 1971 to 2000 can be considered probable. Furthermore, a tendency towards somewhat more intensive and significantly more frequent heavy precipitation and longer dry periods is projected.

Table 5-2 Historic and Projected Temperature Data for 2085 for Rwanda

Historical Climate Trends	Projected Future Climate Trends[43]
■ Observations of mean annual temperature shows the average temperature has increased. ■ Temperatures rose by about 1.2°C at Kigali Airport station during 1971-2009.	■ The very likely range of projected change in annual mean temperature is from +1.1 to +5.1°C by 2085. Confidence in these figures is medium. The change in temperature can be considered to be medium-strong.
■ Mean annual rainfall has declined by 80 mm from 1961 until 2006 at the Kigali Airport meteorological station. ■ Observations of the extent of the rainy seasons (March-May and September-November) exhibit a shortening trend.	■ Tendency towards an increase in future precipitation by 2085 during the main rainy season (likely range from -13 to +20%, December to April), whereas for the other months of the year a tendency towards drier conditions is projected (likely range from -30 to +17%).

Climate Change Risk

The following projections are done based on the historical and projected data from World Bank Climate Change Knowledge Portal[44]. This open source portal provides combined data from the Coupled Model Inter-comparison Project (CMIP5). The objective of the CMIP is to better understand past, present and future climate changes. This understanding includes assessments of model performance during the historical period and quantifications of the causes of the spread in future projections. The multi-model output publically available includes information from 35 available global circulation models (GCMs) used by the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report and provides projections using different representative concentration pathways (RCP). RCPs describe the different climate futures depending of the GHG emissions emitted in the years to come. **Table 5-3** lists the RCP so far adopted by the Intergovernmental Panel on Climate Change (IPCC).

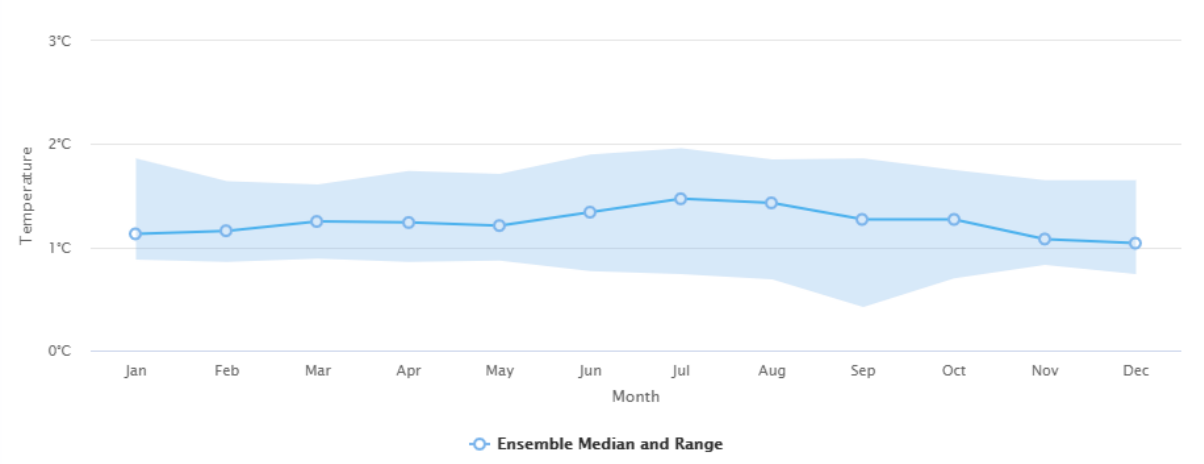
43 Gerics (2016) Climate-Fact-Sheet

44 World Bank (2020) Climate Data Projections Rwanda, available at: https://climateknowledgeportal.worldbank.org/country/rwanda/climate-data-projections

Table 5-3 Representative Concentration Pathways

RCPs	Scenario
2.6 (low emission)	Stringent pathway that limits global warming below 2°C, requiring CO_2 emissions start declining by 2020 and go to zero by 2100.
4.5 (medium-low emission	Intermediate pathway requiring that CO_2 emissions start declining by approximately 2045 to reach roughly half of the levels of 2050 by 2100.[45]
6.0 (medium-high emission)	Intermediate pathway where emissions peak around 2080 and then decline.
8.5 (high emission)	Pathway where emissions continue to rise throughout the 21st century (business-as-usual scenario). Suggesting society does not make efforts to reduce GHG emissions and therefore reflect their worst case scenario for the physical impacts of climate change.

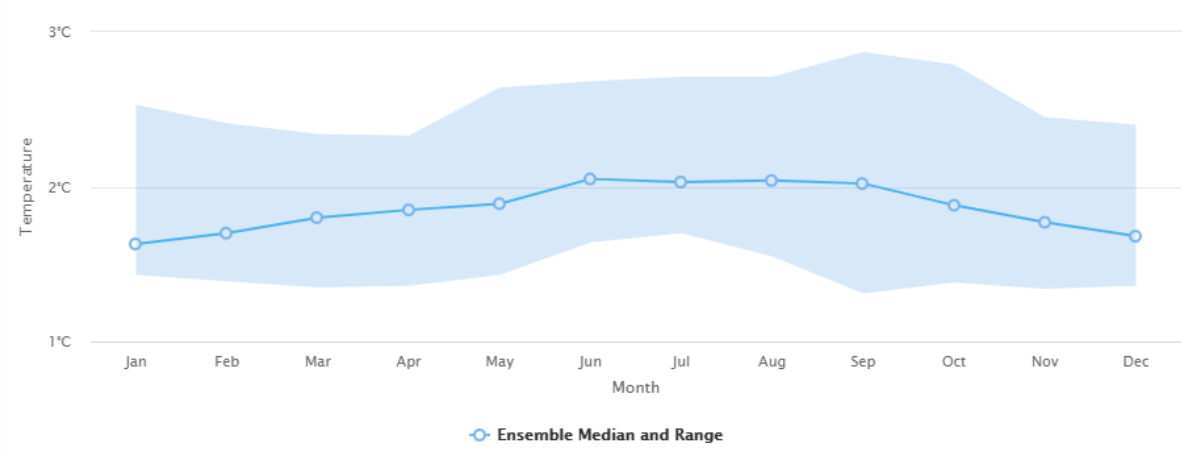
Figure 5-4 and **Figure 5-5** show projected change in monthly temperature for Rwanda for the years 2040-2059. The projected change in monthly temperature using the intermediate RCP 6.0 scenario show an average rise in temperature of 1.2 °C. In the worst-case scenario the average change in monthly temperature in Rwanda would compared to the reference period (1986-2005) increase by 1.9 °C.



Source: World Bank, 2020

Figure 5-4 Projected Change in Monthly Temperature for Rwanda for 2040-2059, RCP 6.0 scenario

45 Many plant and animal species will be unable to adapt to the effects of RCP 4.5 and higher RCPs.



Source: World Bank, 2020

Figure 5-5 Projected Change in Monthly Temperature for Rwanda for 2040-2059, RCP 8.5 scenario

Predictions of the same scenarios[46] but for the years 2080-2099 show, that in 60 years without any serious climate change mitigation measures, the monthly temperature in Rwanda will increase by an average of 3.9 °C and for the intermediate scenario RCP 6.0 around 2.3 °C. With a tendency in all scenarios to increase the temperature more strongly in the summer months May - September. Further, the number of 'warm days' is projected to increase markedly by the middle and end of the century for all emissions scenarios. 'Warm nights' are projected to increase substantially by middle and late 21st century under each emissions scenario. Over 80% of nights are projected to be 'hot' by 2100.

Extreme Weather Events

Modelled projections of future climate identify a likely increase in the frequency of 'fire weather' occurrence in this region, including an increase in temperature and greater variance in rainfall. In areas already affected by wildfire hazard, the fire season is likely to increase in duration, and include a greater number of days with weather that could support fire spread because of longer periods without rain during fire seasons. In Gasabo district the wildfire hazard is classified as high. This means that there is a greater than 50% chance of encountering weather that could support a significant wildfire that is likely to result in both life and property loss in any given year[47].

In addition, the region is at medium risk of landslides and water scarcity. In April 2018 and February 2020, storms brought flooding and landslides to Kigali and surrounding districts, including Gasabo causing severe material damages and loss of life.[48]

Summary:
The climate has alternating dry and rainy seasons. The dry season can be severe and drought conditions often prevail during the year.
Chronic climate change has been identified, leading to warmer weather including temperature increase, warmer nights as well as a trend of increase in the frequency of 'fire weather' occurrence in the region was identified. There is a tendency towards an increase in future precipitation during the main rainy season. In addition, the region is at medium risk of landslides and water scarcity.

46 World Bank (2020) Climate Data Projections Rwanda, available at: https://climateknowledgeportal.worldbank.org/country/rwanda/climate-data-projections

47 Think Hazard (2020), available at: https://thinkhazard.org/en/report/21977-rwanda-kigali-city-umujyi-wa-kigali-gasabo/WF

48 http://floodlist.com/africa/rwanda-floods-landslides-february-2020

Baseline recommendation for future sub-component ESIA:
The climate hazards have been identified. What needs to be further evaluated in future sub-component ESIAs is the vulnerability and exposure of the individual projects towards these identified climate hazards.
For this it is necessary to receive information on sub-component project details and design specifics related-to climate exposure but also adaptive capacity of the sub-component. For instance, it should be investigated:

- If high temperature conditions are considered in design/construction planning, including the types of materials and equipment to be used and if the workforce is expected to work outside for extended periods of time;
- The water need for the sub-component, included the quantities of water required and the water source(s); what other water users there will be for the planned water source for the sub-component. It is suggested that this includes a consideration of personnel and stakeholders that will used the same water source;
- Identify any specific sections of the Project where combustible materials is planned to be used (e.g. trees, scrubland) to identify exposure to wild fire; and
- Identify if areas of development are exposed to the risk of flooding (proximity to the Nyabarongo River and the wetlands).

5.2.2 Geology, Hydrogeology, and Soils

Kinyinya planning area and the surroundings are characterized by the hills with average altitude of 1,504 m - mainly located in the rural zone. The southern, northern and western parts outside of the proposed planning area are dominated by wetlands.

The area around Kinyinya Hill has rainfall patterns, terrain slope, geology, soil, land cover and earthquakes that make localized landslides an infrequent hazard phenomenon. **Figure 5-6** below shows the soil types in the Project Area and their classification. The soil on Kinyinya Hill mostly consists of Cambisols and Alisols, which are moderately deep and more fertile than Ferrasols. On steep slopes the soil is susceptible to erosion. The wetlands mainly consist of clayey soils with low infiltration capacity.

Groundwater resources management of the area, requires information geology, is dominated by granite and pegmatite. In essence, this indicates low groundwater recharge rates and baseline flows. The contribution of groundwater in the Project Area should be considered. It is a clean and sustainable water on the changes in the status of the water resources which is based on rainfall data, rock type, groundwater and surface water abstraction data, groundwater levels and stream discharges and water quality information. There are no existing information and data on groundwater potential in the Kinyinya Hill. Proper groundwater management needs to be based on reliable groundwater data.

Geohazards

According to different sources[49], the areas most at risk of seismic hazards in Rwanda are located in the Western Province. Between 2002 and 2008, earthquake events struck the Western Province causing deaths and many other damages. The districts most impacted are Rubavu, Rusizi and Nyamasheke.

Different earthquakes striking the Western and Northern Provinces are sometimes felt in Gasabo district and Kinyinya sector at lower levels that would not cause damage to well-constructed housing infrastructures.

49 USGS (2008), MIDIMAR (2013)

Reportedly there is only one operational seismographic station in Rwanda, therefore exact locations of earthquakes cannot always be accurately determined.

Summary:
The Project Area and the surroundings are characterized by hills and wetlands. On steep slopes the soil is susceptible to erosion. The wetlands mainly consist of clayey soils with low infiltration capacity. Earthquakes striking the Western and Northern Provinces of Rwanda are sometimes felt in Gasabo district and Kinyinya sector. They have low levels and potentially would not cause damage to well-constructed housing infrastructures.

Baseline recommendation for future sub-component ESIA:
Given the potential for using the groundwater as a sustainable water source, adequate groundwater studies and reliable groundwater baseline is required including groundwater level variations and hydrogeological properties of the water bearing strata and groundwater quality analyses.

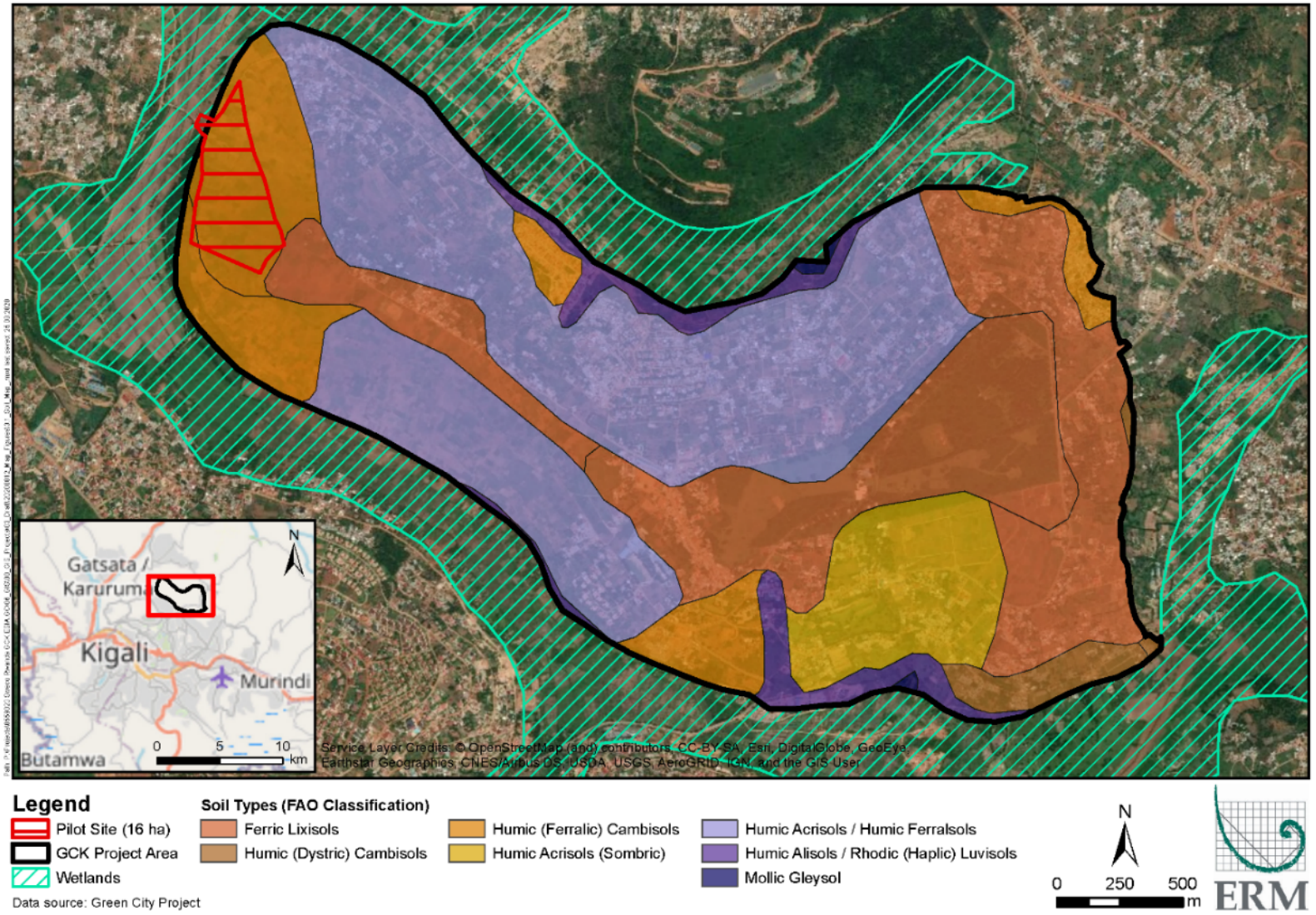


Figure 5-6 Soil Types and Classification

5.2.3 Landscape and Visuals

The natural setting of Kigali City is characterized by steep forested hills and farmlands on the northern and western hilly regions. Steep slopes greater than 20% occupy 35% of City's land area. Rivers and wetlands dominate the landscape and provide easy accessible recreational opportunities. So all together, rivers, streams, wetlands, forests and steep slopes combined with the existing agricultural areas constitute to 83% of the City's land area. Apart from the numerous environmental benefits, natural landscapes provide scenic views, educational and lot of active and passive recreation opportunities for it residents.

Kinyinya Hill and the surroundings are characterized by a mixture of hilly terrain with an average altitude of 1,504 m and sloping basins and valleys as shown in **Figure 5-9**. In terms of land use, data from RPHC 2012[50] for the whole Kinyinya sector suggested that around 91.90% of current use of the area can be described as peri-urban with fragmented urban and rural features. There are residential areas, paved and unpaved roads, public utilities, agricultural and village community areas with social housing. The majority of the settlements are concentrated in the surroundings of the hill with considerable distance from the main tarmac road that connects different areas of the hill and surrounding sectors.

The southern part of the proposed Project Area is dominated by wetlands that regulate the flow and flooding of Kinyinya Hill. The wetlands are connected to the Nyabarongo River (**Figure 5-7**). Kigali City has more than 30 wetlands comprising a total area of approximately 7,700 ha. Vegetation occupies 66.9% of the Kinyinya Hill and the built areas cover around 11.3%.

Source: Surbana, "Kigali City Master Plan Report", 2013

Figure 5-7 Nyabarongo River valley and Wetlands along

The following **Figure 5-8** includes the Project Area from a point where general land cover of the Project Area can be seen. The Project Area is present with a variety of crops as well as a few

50 National Institute of Statistics of Rwanda (2012) Fourth Population and Housing Census: Provisional results, Rwanda. Available at: https://microdata.statistics.gov.rw/index.php/catalog/65

scattered trees (for more info see **Chapter 5.3.1**); these will inevitably have to be removed to make way for the construction of the Project and its sub-components.

Source: ERM, 2020

Figure 5-8 General land cover within and around the Project Area

Summary:

The Project Area and the surroundings are characterized by hills and wetlands. The current use of the area can be described as peri-urban with fragmented urban and rural features.

Baseline recommendation for future sub-component ESIA:

Temporary changes to the landscape, including the introduction of above-ground installations, may alter the views to, from or beyond the site. The Project Area is located in a peri-urban location, depending on the sub-component activities and exact location, a detailed baseline description on landscape and visuals can be added, if deemed necessary.

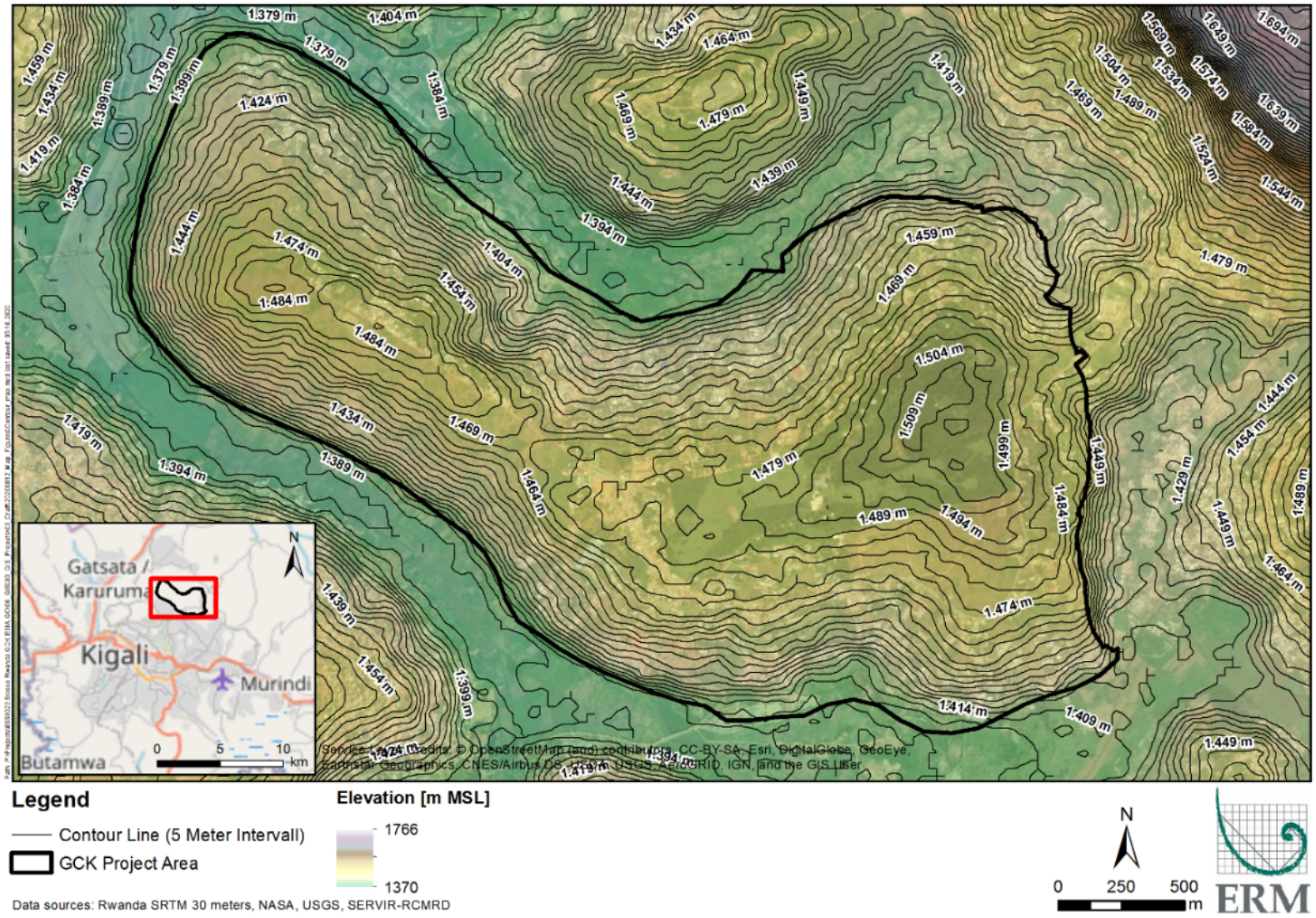


Figure 5-9 Topography of the Project Area

5.2.4 Hydrology

Kigali City underlying hydrology is governed by 25 watersheds within the city limits and is part of the Lake Victoria basin. In central and northern Kigali, the topography is relatively steep and drained by the Nyabugogo River, which is the main watercourse in the northwest quadrant. The Nyabugogo is fed by various smaller streams in the city (such as the Yanze, Kibumba, Rwazangoro and Ruganwa), and its drainage area covers most of the territory of Kigali City. There are some streams that flow directly into the Nyabarongo River from the city's southern hills. The Nyabarongo River is the main watercourse that borders the western and southern edges of the city limits[51]. Wetlands are another of Kigali's key hydrological features, located mainly in the river valleys of the rivers described above; they presently cover about 12.5% of the city's total area. The wetlands are lying between Kinyinya and Kagugu sectors and regulating the flooding from its surroundings. They have important environmental functions, such as storing and releasing water and buffering the impacts of floods.

The Kinyinya sector has an excess of 30 wetlands and small rivers traversing through the valleys. The main unique long river of about 50 km long and 1,000 m wide, is the one that originates from Lake Muhazi and traverses through marshy and boggy valleys before emptying into the Nyabugogo River and thereafter connecting to the Nyabarongo River. Also, Lake Muhazi in the north and part of the east borders of Gasabo district.

Narrowing down to the Project Area and the surroundings there are limited river or streams within Kinyinya Hill and close to the Project except the wetlands that surround it, regulating the flow and flooding of Kinyinya area. The wetlands are connected to the Nyabarongo River and regularly contribute to the river overflow during rainy season. Rainy season lasts from about March to May, when the rain is heavy and persistent. The average annual rainfall is about 949 mm. The following **Figure 5-10** shows the Project Area, as well as the wetlands area and different types of drainage areas regarding speed of flow.

Summary:

There are no waterways within the Project Area, however, it is surrounded by the Nyabugogo River and 25 watersheds within the city limits of Kigali. Another key hydrological feature is the presence of more than 30 Wetlands in the Kinyinya sector, located mainly in the river valleys. The wetlands are lying between Kinyinya and Kagugu sectors and regulating the flooding from its surroundings. They have important environmental functions, such as storing and releasing water and buffering the impacts of floods. The wetlands are connected to the Nyabarongo River and regularly contribute to the river overflow during rainy season (March to May).

Baseline recommendation for future sub-component ESIA:

Due to the proximity of the Project and its various construction sites to the Nyabarongo River and the wetlands, as well as climate conditions including rainy seasons, detailed baseline descriptions on surface water and groundwater are recommended for further sub-component ESIAs.

51 REMA (2013) CHAPTER 7: WATER AND WETLANDS RESOURCES, available at: https://www.rema.gov.rw/soe/chap7.pdf.

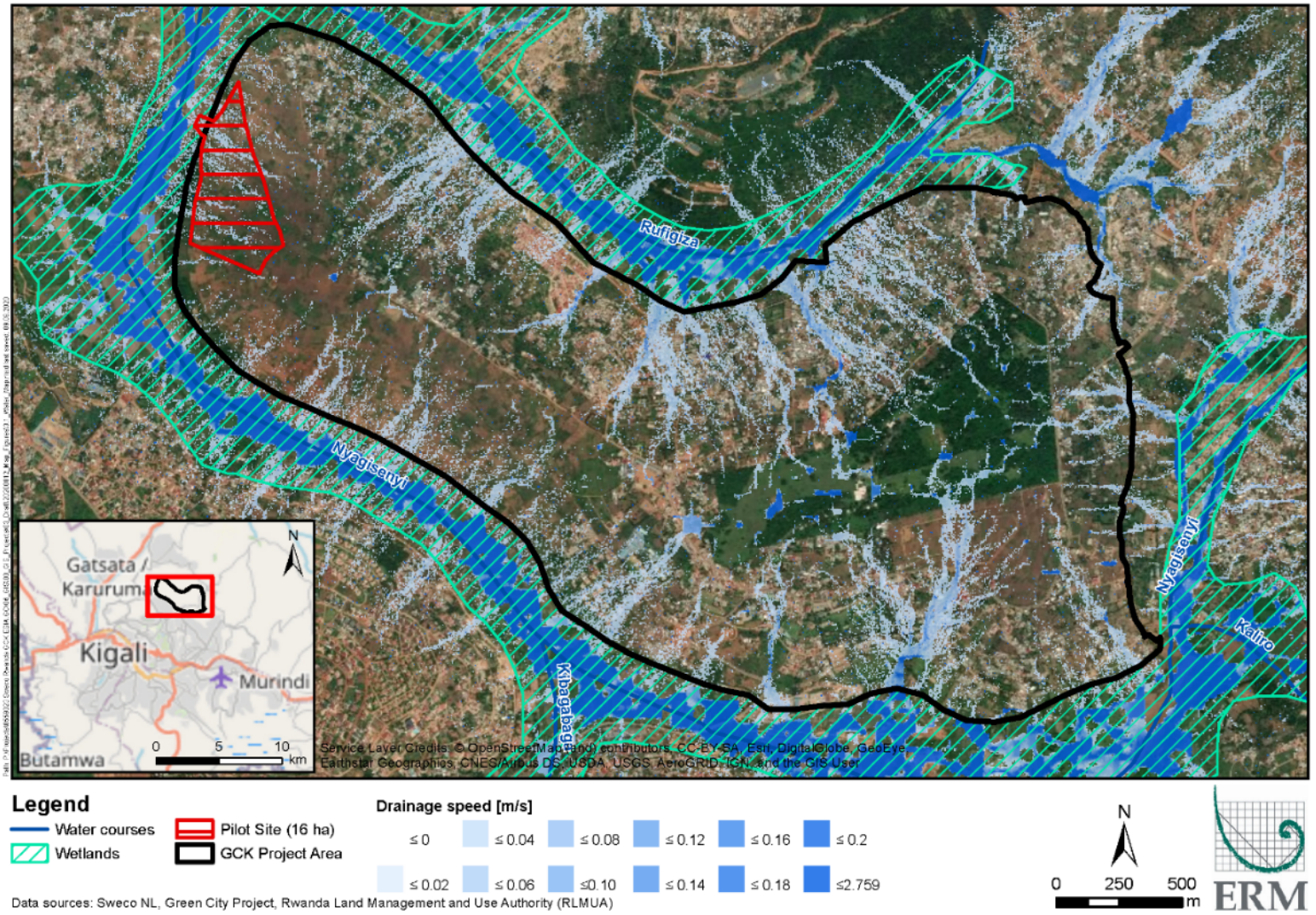


Figure 5-10 Existing Hydrology and Drainage Regime

5.2.5 Air Quality

According to results from available studies[52] and the pESIA, inhabitants of Kigali are exposed to high levels of airborne particulate matter with a diameter of 10 microns or less (PM_{10}). PM_{10} levels are increasing in areas with high rates of traffic due to the exhaust of vehicles and the lift off of dust from the ground generated by tyres, but also due to burning biomass (e.g. for cooking etc.) within the residential districts. Generally, concentrations are above those recommended by WHO. Particularly, the PM_{10} concentration in the air suggests that air pollution creates a great risk to the inhabitants' health. The meteorological conditions in Kigali further contribute to this health risk due to limited air exchange and because of an increasing effect of urban heat island. This results in a lower dispersion of the polluted air, hence causing accumulation of the airborne pollutions within the small valleys and the residential areas respectively. The increasing rate of urbanization of Kigali is contributing to air pollution.

Beside emissions from the traffic and cooking, emissions of concern in Kinyinya Hill are associated with the operation of a concrete batching plant in residential areas. Concrete batching and product manufacturing generate emissions of PM_{10}.

Summary:

Inhabitants of Kigali are exposed to emissions from high rates of traffic, cooking as well as the operation of a concrete batching plant in residential areas. Available studies state that residents are exposed to high levels of PM_{10}, which are above those recommended by WHO. Such exposure potentially causing health risks for inhabitants. The meteorological conditions in Kigali further contribute to health risk due to limited air exchange and because of an increasing effect of urban heat island.

Baseline recommendation for future sub-component ESIA:

As the Project Area and consequently sub-components, located in urban area with dry weather conditions dust monitoring is recommended. Further, due to high PM10 levels, a baseline air quality monitoring should be undertaken at several monitoring points. Monitoring can be undertaken (but not limited to) for e.g. PM10, PM2.5 and total suspended particulates (TSP). For sub-components such as housing, business or public buildings it is recommended to consider high air pollution level during design phase (e.g. consider sustainable and effective air conditions systems build-in).

5.2.6 Noise

According to the pESIA, noise levels were measured at different points on the hill with sound meters during the night and during the day. Background data show that the noise levels are within the limit values (55 dBA day-time and 45 dBA night-time) except around the bus station, around the batching plant and along the main tarmac road where the recorded noise level varies between 52 and 69 dBA.

The noise levels along the road that exceed the limit value are caused by engines of vehicles and motorcycles. Notably that noise emitted by motorcycles are higher than those emitted by most of the cars.

Summary:

Data show that the noise levels are within the limit values for residential areas (55 dBA day-time and 45 dBA night-time) except around the bus station, around the batching plant and along the main tarmac road where the recorded noise level varies between 52 and 69 dBA. The noise levels along the road emitted by motorcycles are higher than those emitted by most of the cars.

52 Compendium of environment Statistics of Rwanda, 2018; REMA, 2018

Baseline recommendation for future sub-component ESIA:

As high noise levels are mostly caused by engines and present in crowded traffic arias (e.g. public transport stop stations, roads with several lines), it is recommended to consider noise pollution during all development phases of sub-components. This is to be supported by adequate noise baseline information based on pre-construction noise levels measurements at relevant locations.

5.2.7 Waste

Solid waste

Gasabo district and Kinyinya sector are facing significant challenges in relation to solid waste management. Waste generation is increasing, while a sizeable portion of it is disposed on improperly located and inadequately operated dumpsites, resulting in adverse impacts on environment and health. Solid wastes composition in Kinyinya sector is consist of up to 68% of food residues, 9% of paper 9%, 2% of metal, and 1% of textiles.[53]

Waste collection services are provided by private operators based on door-to-door collection; each household pays waste collection fees monthly. The companies´ workers collect waste from each household with companies´ trucks, which transport the waste to Nduba dumpsite, located around 15 km north of Kinyinya Hill.

Nduba dumpsite is causing severe E&S problems. The leachate of unsanitary dumpsites bears a potential high risk of soil and groundwater contamination. Lack of proper management causes overflows and harm to surface waters. There are no waste treatment facilities like community composts at Kinyinya Hill, nor small-scale recyclers or scrap collectors. However, plans to improve Nduba dumpsite to a modern landfill to treat solid waste already exist.[54]

Waste collection is not done regularly. The irregular service is mostly justified by limited capacities of collection companies and poor management system. The company in Kinyinya (Isuku Kinyinya Company Ltd) owns one or two collection trucks to provide services both to household and business entities. The business entities are considered the main customers of the service with higher priority. In Kinyinya sector, generally households are daily charged with FRw 2,000 (USD 2.10) for low and middle-income households and FRw 5,000 (USD 5.25) for high-income households. The business entities are charged based on the volume of waste daily produced.

A survey[55] assessing the waste disposal habits of 99 households in Kinyinya, found out that only 13% of the households separate biodegradable and non-biodegradable solid waste. Many households deposited their waste around the house or pile the waste in an improper area, which present threats to inhabitant´s health and spread of vermin as well as flies to the surrounding population. As a result, 58.6% of households reported that members of their families had contracted with waste-borne diseases, including skin infection, diarrhoea and tuberculosis.

Domestic Wastewater

There is no central sewage system for Kigali City nor for Kinyinya Hill or for the surroundings. Most of the houses in Kinyinya use septic tanks or pit latrines. These act as anaerobic systems that develop in the tanks and which decompose or mineralize the waste discharged into the tanks. The collected sewage water is discharged to 20 m to 10 m in depth soak pits, with suitability of the natural ground to receive and dispose of the water without causing damage or pollution to the nearby surface water.

53 Victoire, A. et al. (2020). Solid Waste Management Challenges and Its Impacts on People's Livelihood, Case of Kinyinya in Kigali City. Journal of Geoscience and Environment Protection, 8, 82-96. https://doi.org/10.4236/gep.2020.86007

54 WASAC, available at: https://www.wasac.rw/fileadmin/user_upload/Nduba_sanitation.pdf

55 Victoire, A. et al. (2020). Solid Waste Management Challenges and Its Impacts on People's Livelihood, Case of Kinyinya in Kigali City. Journal of Geoscience and Environment Protection, 8, 82-96. https://doi.org/10.4236/gep.2020.86007

Information collected from the Project Area confirmed people in the area also are using water from the wetlands for domestic purposes as cleaning and laundry.

Summary:

Gasabo district and Kinyinya sector are facing significant challenges in relation to waste management. Waste generation is increasing and waste collection is not done regularly due to limited capacities of collection companies and poor management system. This results in overflows and harm to surface waters as there are no waste treatment facilities. Many households deposited their waste around the house or pile the waste in an improper area, which present threats to inhabitant´s health and spread of vermin as well as flies to the surroundings.

Domestic wastewater management also poor, as there is no central sewage system for Kigali City nor for Kinyinya Hill or for the surroundings. Consequently, most households rely on septic tanks or pit latrines, improper management of which cause health risks for residents as well as high chances for surface or underground water contamination.

Baseline recommendation for future sub-component ESIA:

Up-to date information on waste management in the Project Area is required in future sub-component ESIAs. Key aspects to be included in the baseline should include identification of available waste disposal services and facilities including information on their conformance with the applicable standards and their environmental safeguards status.

5.3 Biological Environment

The location is naturally defined by the topography and its surrounding wetlands which are included in the boundaries of the 600 ha Project site.

5.3.1 Flora and Fauna

Flora

Gasabo district has the largest forest cover compared to the other districts in Kigali City and is well linked to a large rural zone area. However, the natural flora of Gasabo district and Kinyinya Sector has been depleted and replaced with non-native species (mainly eucalyptus trees). The eucalyptus trees were planted in the context of mitigating climate change impacts. Planting trees is a government strategy and initiative to cope with greenhouse gas effects and are implemented by the populations in the area. As a consequence, trees influence the local climate and air quality. The trees provide shade, and a small forest that can be seen in the north and western parts of the area influences rainfall. The forest and vegetation cover prevent soil erosion and maintains fertility through natural biological services such as nitrogen fixation.

The small area of remaining natural vegetation is found in the wetlands and in uncultivated smaller areas. The natural vegetation type occupying the low plains includes papyrus *Typha latiforia* (umuberanya), *Cyperus latiforialius* (urukangaga) while those in stagnant water or slow-flowing waters of Lake Muhazi are *Phragmites spec* (imiseke) and *Nymphea maculate* (amarebe), which is not present in the Project Area. *Muhlenbergia capillaris* is the dominating species. Tree species include avocado, lemon, mango, and agave (*Agave braceosa)*.

The vegetation on the 600 ha Project Area includes subsistence crops such as sorghum, banana, maize, beans, cassava, etc. these are being farmed on small, family-sized plots by local residents (**Figure 5-11**).

Fauna

The fauna of the district is characterized by a large diversity of bird species and small wild animals compatible with the existing vegetation cover in the sector. A biodiversity survey in the Project Area has revealed that, except for the Deutsche Welle site no other areas can be characterised as habitat for wild/protected species. The Deutsche Welle site, a 70 ha biodiverse and forested area with no public access, comprises a large number of mature trees and is home to more than 50 species of birds and other small wild animals rarely seen in proximity to the capital.

No fauna species can be seen on the Project Area except for farm animals such as goats, sheep and migratory birds that are non-protected and move from wetlands to different areas of dry land. The birds include Red-billed Firefinch (*Lagonosticta senegala*), Yellow-billed Kite (*Milvus aegyptius*), Pied Crow (*Corvus albus*), Tawny-flanked Prinia (*Prinia subflava*), Brimstone Canary (*Crithagra sulphurata*), Dark-capped Bulbul (*Pycnonotus tricolor*), etc. The wetlands surrounding Kinyinya Hill are not part of the Project Area but may be habitat of protected species and provide important ecological functions.

According to the pESIA, there was no evidence of wildlife observed within and around the Project Area during field visits.

Summary:

Gasabo district has the largest forest cover compared to the other districts in Kigali City. However, the natural flora has been depleted and replaced with non-native species (mainly eucalyptus trees). Natural vegetation is represented mainly by small plants to be found in the wetlands and in small uncultivated areas.

The fauna of the district is characterised by a large diversity of bird species and small wild animals compatible with the existing vegetation cover in the sector. The wetlands, which are surrounding the Project Area, have great potential to be a place of habitat for protected species. Besides, in the Project Area could be noticed only some goats, sheep and migratory birds that are non-protected.

Baseline recommendation for future sub-component ESIA:

It is recommended that a comprehensive desktop biological baseline of the Projects Area of Influence be prepared, considering major fauna groups such as mammals (terrestrial and flying); birds, herpetofauna (amphibians/reptiles), invertebrates and fish. International as well as available local datasets may be employed (e.g. IFC Integrated Biodiversity Assessment Tool – IBAT, IUCN Red List, Birdlife, etc.) Desktop baseline should provide prospective presence in the area based on their distribution and information on their Global/local conservations status (e.g. IUCN/Rwandan). Based on its outcomes it would inform a specific field survey (which may span from basic walkover surveys to more specific sampling surveys if warranted). Field survey data may allow to indicate relative abundance (specific to season of survey) within the Project Area and it Area of Influence; which may cover both direct Project footprint and extend towards sensitive areas such as identified wetlands.

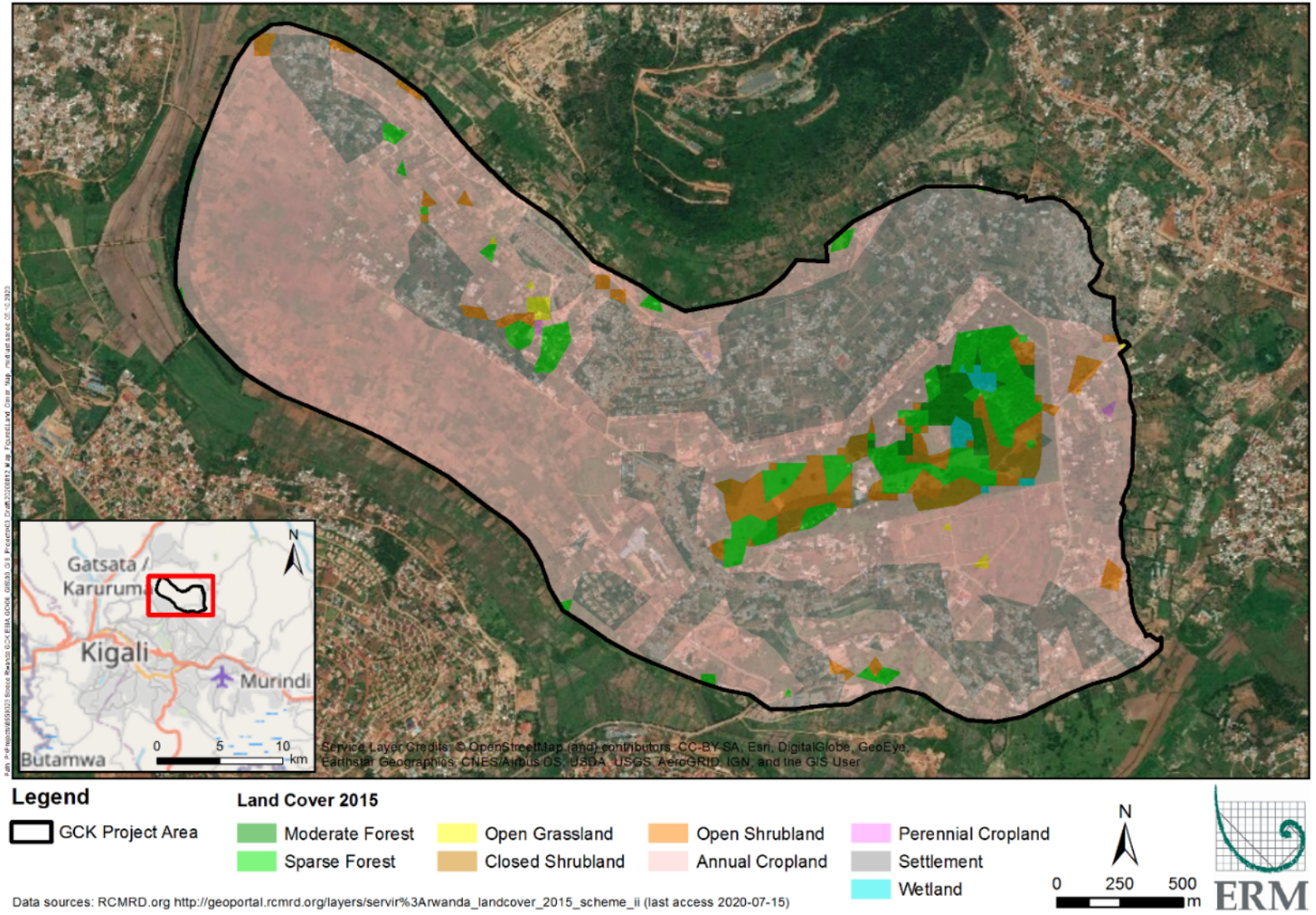


Figure 5-11 Land Cover and Habitat Types

5.3.2 Invasive Species

The term “invasive species” applies to introduced species (also called "non-indigenous" or "non-native") that adversely affect the habitats and bioregions they invade economically, environmentally, or ecologically.

The following invasive species have been found in wetlands and urban areas of Rwanda: *Eichhornia crassipes* (aquatic plant), *Imperata cylindrical* (grass), *Lantana camara* (shrub), and *Leucaena leucocephala* (tree).[56]

In the pESIA no indication of invasive species in the Project Area was described. A quick survey on invasive species was conducted during the site visit to the Project Area for the purpose of this High-Level ESIA. No invasive species in the area were recorded.

Summary:

No invasive species except Eucalyptus trees were recorded during the site visit or otherwise identified in the existing documentation.

Baseline recommendation for future sub-component ESIA:

During baseline field survey, specific attention should be paid towards prospective presence of invasive species, if possible being able to map location where these concentrate. It is important to verify which species have settled and that no new species are introduced derived from the Project construction activities (e.g. material transport from other areas). Project landscaping work may replace such species (where possible) with local species.

5.3.3 Protected Areas

According to the pESIA the wetlands in the southern part of the Project Area were marked as a sensitive ecosystem. The wetlands regulate the flow and flooding of the valleys around Kinyinya. The wetlands are connected to the Nyabarongo River.

The Nyabarongo River and wetlands have been identified as an Important Bird and Biodiversity Area and Key Biodiversity Area[57]. Besides the Nyabarongo River and wetlands there are also the following protected areas within a radius of 50 km around the Project Area: Forêt de Murehe, Lacs du Nord, Rugezi Marsh and Rugezi-Bulera-Ruhondo a Ramsar (wetland of international importance) site north-east of the Project Area[58].

Summary:

There are wetlands in the proximity of the Project Area considered sensitive habitats and providing ecosystem services. The Nyabarongo River and wetlands have been identified as Important Bird and Biodiversity Area and Key Biodiversity Area. Main associated features to these sites are fish and bird species.

56 Global Invasive Species Database. Retrieved from on 22.02.2021, available at: http://issg.org/database/species/search.asp?sts=sss&st=sss&fr=1&x=25&y=5&sn=&rn=Rwanda&hci=11&ei=-1&lang=EN

57 IBAT PS6 & ESS6 Report. Generated under licence 1605-11418 from the Integrated Biodiversity Assessment Tool on 24 September 2020 (GMT). www.ibat-alliance.org

58 IBAT PS6 & ESS6 Report. Generated under licence 1605-11418 from the Integrated Biodiversity Assessment Tool on 24 September 2020 (GMT). www.ibat-alliance.org

Baseline recommendation for future sub-component ESIA:

Similar to flora/fauna desktop baseline preparation, a similar approach be followed in order to appropriately describe these sensitive areas and what biodiversity features of importance they support. Though these areas are considerably far from what could be considered direct project footprint; Project construction/operation could affect these through erosional processes, waste and storm water management. It is advised that should prospective impact pathways be identified (e.g. discharge locations, watershed ramifications, etc.) that areas potentially affected be also visited by the baseline field survey.

5.3.4 Critical Habitats

Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes.

Within a radius of 50 km of the Project Area, currently 35 species on the IUCN red list have been identified. The following **Table 5-4** lists the IUCN Red List of Critically Endangered (CR) and Endangered (EN) species within 50 km of the Project Area. Areas used by these species is likely to be classified as critical habitat. Based on desktop review, there is no indication of presence of critical habitat in the Project Area itself[59].

Table 5-4 IUCN Red List of Critically Endangered and Endangered Species within 50 km of the Project Area[60]

Species Name	Common Name	Population Trend	Biome
Critically Endangered			
Ceratotherium simum ssp. cottoni	Northern White Rhino	Decreasing	Terrestrial
Diceros bicornis	Black Rhino	Increasing	Terrestrial
Diceros bicornis ssp. michaeli	Eastern Black Rhino	Increasing	Terrestrial
Diceros bicornis ssp. minor	South-eastern Black Rhino	Stable	Terrestrial
Labeo victorianus	Ningu	Decreasing	Freshwater
Labeobarbus ruasae	-	Unknown	Freshwater
Varicorhinus platystoma	-	Unknown	Freshwater
Gabbiella parva	-	Unknown	Freshwater
Xyris exigua	-	Decreasing	Terrestrial, Freshwater
Rotala robynsiana	-	Unknown	Freshwater
Necrosyrtes monachus	Hooded Vulture	Decreasing	Terrestrial, Freshwater
Gyps africanus	White-backed Vulture	Decreasing	Terrestrial, Freshwater
Gyps rueppelli	Rüppell's Vulture	Decreasing	Terrestrial

59 IBAT PS6 & ESS6 Report. Generated under licence 1605-11418 from the Integrated Biodiversity Assessment Tool on 24 September 2020 (GMT). www.ibat-alliance.org

60 IBAT PS6 & ESS6 Report. Generated under licence 1605-11418 from the Integrated Biodiversity Assessment Tool on 24 September 2020 (GMT). www.ibat-alliance.org

Species Name	Common Name	Population Trend	Biome
Trigonoceps occipitalis	White-headed Vulture	Decreasing	Terrestrial
Capparis lucens	-	Decreasing	Terrestrial
Stemodiopsis ruandensis	-	Unknown	Terrestrial
Rhamnus mildbraedii	-	Unknown	Terrestrial
Endangered			
Smutsia gigantea	Giant Ground Pangolin	Decreasing	Terrestrial
Phataginus tricuspis	White-bellied Pangolin	Decreasing	Terrestrial
Potamonautes mutandensis	Lake Mutanda Crab	Unknown	Freshwater
Haplochromis erythromaculatus	-	Decreasing	Freshwater
Genlisea angolensis	-	Unknown	Terrestrial, Freshwater
Psilotrichum axilliforum	-	Unknown	Terrestrial
Carpha angustissima	-	Unknown	Terrestrial, Freshwater
Balearica regulorum	Grey Crowned Crane	Decreasing	Terrestrial, Freshwater
Neophron percnopterus	Egyptian Vulture	Decreasing	Terrestrial, Freshwater
Torgos tracheliotos	Lappet-faced Vulture	Decreasing	Terrestrial
Aquila nipalensis	Steppe Eagle	Decreasing	Terrestrial
Ardeola idae	Madagascar Pond-heron	Decreasing	Terrestrial, Marine, Freshwater
Bradypterus graueri	Grauer's Swampwarbler	Decreasing	Terrestrial, Freshwater
Cryptospiza shelleyi	Shelley's Crimsonwing	Decreasing	Terrestrial
Psittacus erithacus	Grey Parrot	Decreasing	Terrestrial, Freshwater
Helichrysum Ruandense	-	Unknown	Terrestrial
Bradypterus Graueri	Grauer's Swampwarbler	Decreasing	Terrestrial, Freshwater
Cryptospiza shelleyi	Shelley's Crimsonwing	Decreasing	Terrestrial

Summary:

The Project Area is not located within a critical habitat. The majority of vegetation is associated with agricultural land (scrub) and eucalyptus trees which are non-native. Nonetheless, the basic screening provided has identified a number of species of conservation concern and thus require that a formal Critical Habitat Assessment be undertaken to verify that the area of analysis does not constitute Critical Habitat.

Baseline recommendation for future sub-component ESIA:

A formal Critical Habitat Assessment should be undertaken considering both desktop and survey data. The initial desktop screening may be able to identify species whom are worthy of carrying out specific observations/sampling in order to verify their presence/absence and local distribution. Assessment should also focus at "habitat" level taking into consideration wetland areas (whether protected or not) considering their importance to biodiversity. The Critical Habitat Assessment should follow the methodologies and thresholds for the different Critical habitat criteria set in ESS6 and its respective guidance note.

5.3.5 Ecosystem Services

Ecosystem services are the benefits that people, including businesses, derive from ecosystems. Ecosystem services are organized into four types: (i) provisioning services, which are the products people obtain from ecosystems; (ii) regulating services, which are the benefits people obtain from the regulation of ecosystem processes; (iii) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (iv) supporting services, which are the natural processes that maintain the other services.

Rwanda is committed to follow sustainable economic development pathways that maintain their natural capital to secure ecosystem services that are critical for livelihoods and economic development. This imbedded in the new national environment and climate change policy 2019[61].

Over the past two decades, the Government of Rwanda has enacted policies and legislation governing land use, to ensure sound land use and environmental protection for sustainable development. The Government of Rwanda has been working with national and international partners to implement forestry and soil conservation programmes that contribute towards meeting the National Strategy for Transformation (NST1) and Vision 2050 goals.

As indicated earlier, planting trees to cope with drought, improve the rainfall and maintain the quality of air and soil is a government plan and strategy implemented by decentralized entities. It goes from the government to the provinces and so Kigali City, districts, sectors, cells and villages with participation of Non-Government-Organisations, public and private institutions depending on the mandate and activities.

Regarding the ecosystem services used by the population in the Project Area and close proximity, Mbonwa wetlands is used for brickmaking. In addition, small scale farming activities are implemented in various areas (mostly the south-western part). The use of ecosystem services should be assessed in more detail in the ESIAs for the Project's sub-components.

Summary:

Ecosystem services in the Project Area have influence from national and local level. On the national level Rwanda pledged to pursue sustainable economic development, therefore local government planting trees to cope with drought, improve the rainfall and maintain the quality of air and soil. Among existing ecosystem services from which benefiting local residents in the Project Area are small scale farming activities and brickmaking in wetlands areas.

Baseline recommendation for future sub-component ESIA:

Depending on the sub-component nature and activities the use of ecosystem services should be assessed in more detail in the ESIAs for the Project's sub-components. Wetland areas should benefit of particular attention as part of the baseline as they may provide valuable ecosystem services. The

61 Ministry of Environment, Rwanda (2019), available at:
http://www.fonerwa.org/sites/default/files/Rwanda%20National%20Environment%20and%20Climate%20Change%20Policy%202019.pdf

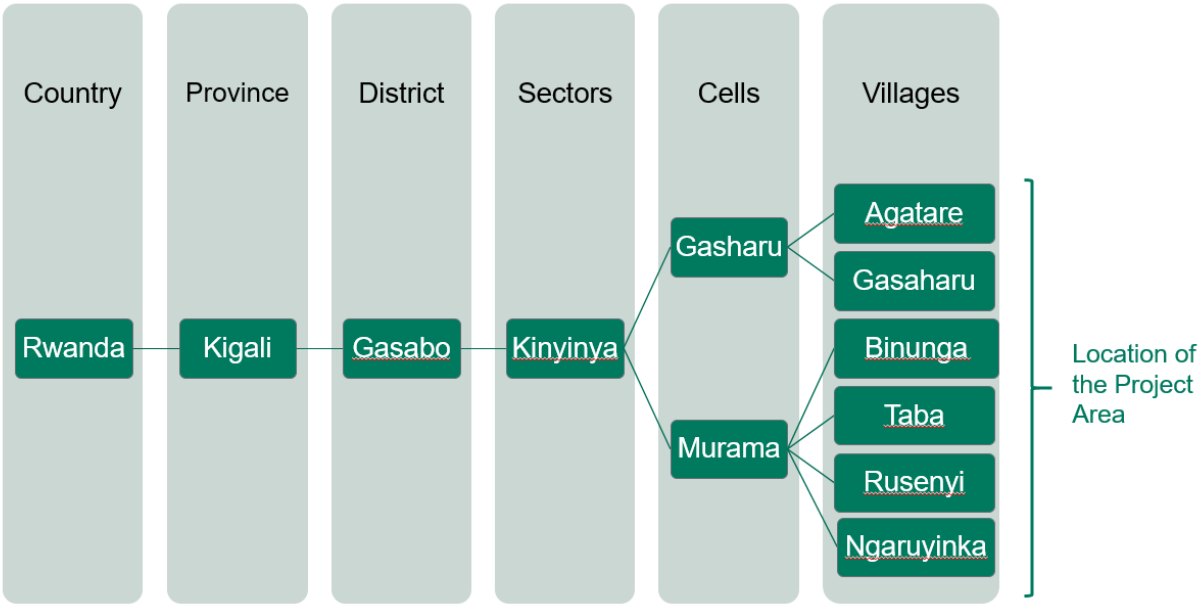
baseline will therefore aim at supporting inclusion of any required wetland restoration and protection into the Project (e.g. wetland profile re-shaping, riparian areas restoration, natural habitats increase, flow and erosion control structures, flood reduction features etc.) to enhance associated ecosystem services.

5.4 Social Environment

5.4.1 Administrative Division

This section outlines the overall administrative division relevant for the Project. Administratively, a district has four levels as defined by the National's Decentralization Policy. The top-bottom structures are: District (Akarere) level, Sector (Umurenge), Cell (Akagali) and Village level (Umudugudu). Currently, the Gasabo district has 15 Sectors, 73 Cells and 501 Villages.

Figure 5-12 below illustrates the administrative division relevant for the Project. The Project is located in Gasabo district, Kinyinya sector, specifically covering two cells of Gasharu and Murama within the sector and the villages of Agatare, Ngaruyinka, Rusenyi, Gasaharu, Taba and Binunga in the two cells.



Source: ERM, 2020

Figure 5-12 Overview of administrative division of the Project Area location

5.4.2 Population

According to the preliminary results of the 4th Population and Housing Census (RPHC, 2012)[62] the Kinyinya sector had in 2012 a population of 57,185 inhabitants representing 10.77% of the total population for Gasabo district (530,907 people) and 5.04% of the total population of Kigali City (1,135,428). Kimironko and Kinyinya are the sectors with the highest population inside the Gasabo district, constituting 5.22% and 5.04% of the total Kigali population respectively. The population of Kinyinya Hill are distributed into the two cells Gasharu (36.36%) and Murama (63.64%). The majority live in Agatare (24.19%) and Ngaruyinka village (22.40%). The following **Figure 5-13** shows the distribution of the population in the six villages. However, there are no more recent population data for

62 National Institute of Statistics of Rwanda (2012) Fourth Population and Housing Census: Provisional results, Rwanda. Available at: https://microdata.statistics.gov.rw/index.php/catalog/65

the Kinyinya sector and its villages, but the Integrated Household Living Conditions Survey 5 (EICV5)[63] from 2016/2017 provides more recent data for the whole Gasabo district. In comparison to the 2013/14 identified 645,251 residents, in 2016/2017 the number of residents increased to 898,764 people. The total number of residents living in Kinyinya Hill is estimated[64] to be around 37,200 people.

The RPHC 2012 data shows that in Kinyinya sector average annual population growth rate during 2002-2012 period was 9.8% what brings to 155.7% of the total population change during that period. It is much higher than the numbers for the whole Gasabo district, which has only 65.8% of total and 5.2% of average annual population growth during mentioned 10 years.

The EICV5 states that the average household size is currently 4.4 persons. As per the RPHC, 2012 (Provisional Results Report)[65], the gender of the population of Kinyinya is relatively evenly distributed with 53% male (29,740) and 47% female (27,445). The households of Kinyinya are with 83.6% predominantly male headed, while 17.4% are female headed households. The sector is heavily urbanised with 91.9% of the population living in urban areas.

Most recent data from EICV5 suggests that in Gasabo district 73.7% of the households are male headed. It also states that 63.2% of district population are above 30 years old and 23.9% are below 26 years old.

Summary:

The Project Area is in the Kinyinya sector within the district of Gasabo. Six villages lie within the Project Area. There is no recent population data for the Project Area. Available data is limited to the district level only. Estimated calculation suggests that total number of residents living in Kinyinya Hill is 37,200 people. Satellite data from 2015 approximate that most populated villages in the Project Area are Agatare (24.19%) and Ngaruyinka village (22.40%). On a district level, data from 2017 indicates that 73.7% of the households are male headed and 63.2% of district population are above 30 years old.

Baseline recommendation for future sub-component ESIA:

Up-to date population data of all villages on Kinyinya Hill and bordering areas need to be obtained. This includes information on population numbers, gender and age distribution, population growth, household composition and size, ethnicity and religion.

63 Integrated Household Living Conditions Survey 5 (EICV5), Thematic Report Youth, Rwanda, 2016/17. Available at: https://www.statistics.gov.rw/publication/eicv5thematic-reportyouth

64 According to calculations in the SWECO (2020) Final Feasibility Study.

65 National Institute of Statistics of Rwanda (2012) Fourth Population and Housing Census: Provisional results, Rwanda. Available at: https://microdata.statistics.gov.rw/index.php/catalog/65

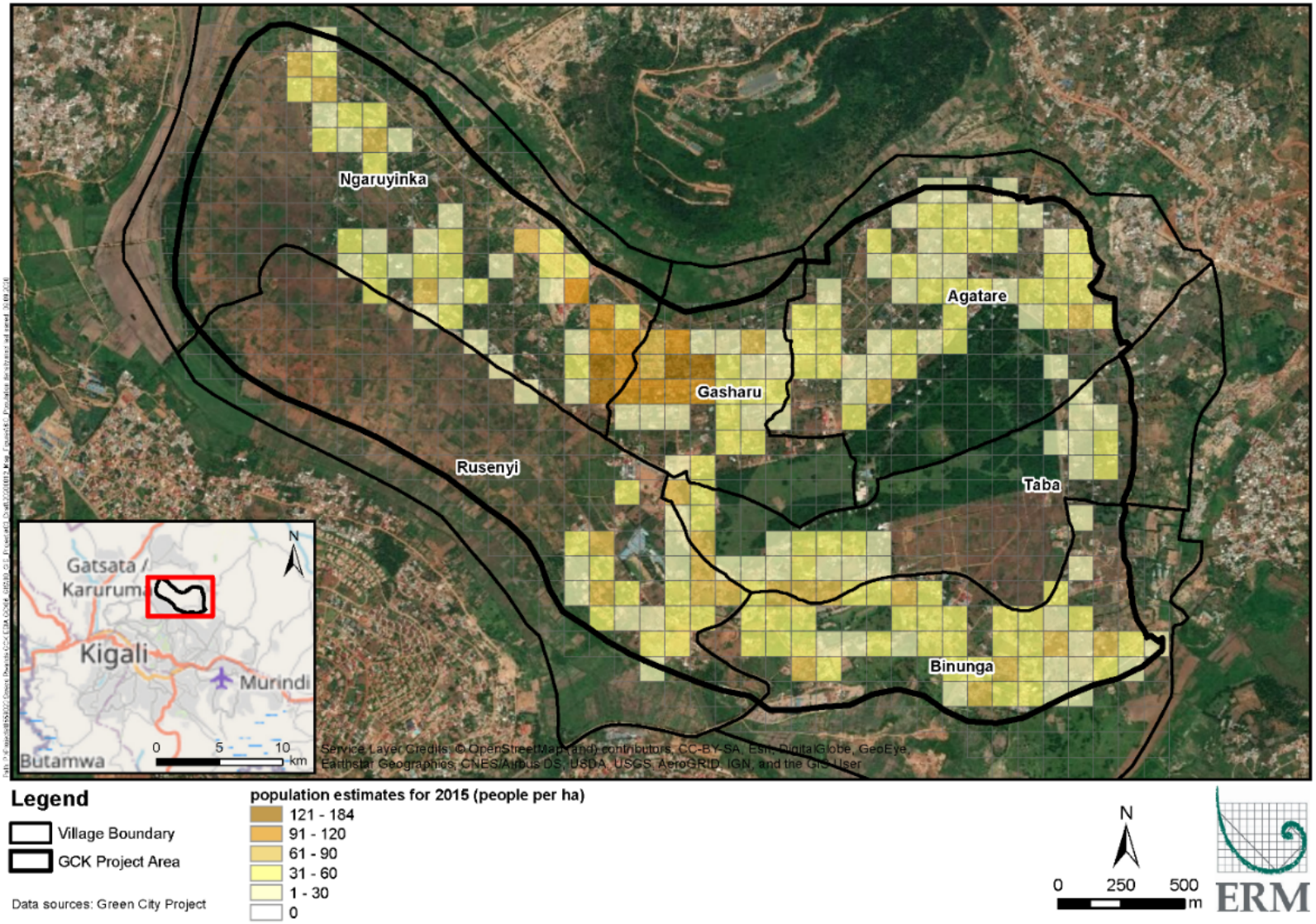


Figure 5-13 Population Estimate and Density (2015 Data)

5.4.3 Socio-Economic Characteristics

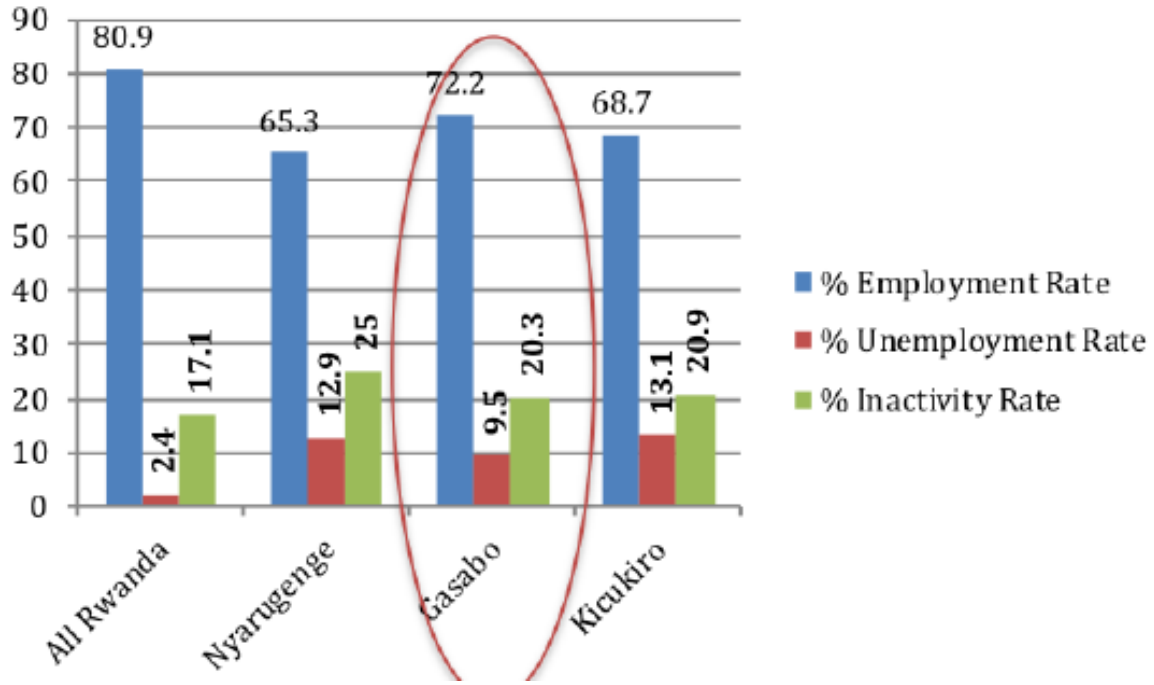
The EICV3[66] survey results indicated that the district's labour force (working population of above 16 years) is 280,000 people constituting 4.8% of the country's labour (5,888,000 people). While, the active labour force in the district totals 223,000 representing 79.6 % of the total labour force of 280,000. Similarly, the results showed the district has the highest labour force compared to the two districts in Kigali City: Nyarugenge (173,000) and Kicukiro (186,000).

Further assessment of the district's active population, from EICV3 data, indicates that approximately 115,000 are employed in the public and private sector representing 51.6 % and the majority is employed in private informal followed by private formal, public and parastatals as detailed in the **Table 5-5** below.

Table 5-5 Main sources of Employment for the Districts and the National Average[67]

	Public	*Parastatals*	*Private, formal*	*Private, informal*	*Others*
National	*9.1*	*3.4*	*16.2*	*69.5*	*1.7*
Nyarugenge	*11.5*	*4.9*	*35.3*	*45.5*	*2.8*
Gasabo	*10.6*	*3.1*	*25.8*	*57.4*	*3.2*
Kicukiro	*8.6*	*6.4*	*27.9*	*53.5*	*3.6*

In terms of the employment rate, a key indicator for enhancing economic growth and poverty reduction, the Gasabo district is well positioned, as evidenced in the following **Figure 5-14** below.



Source: NISR (EICV3 dataset), 2012

Figure 5-14 Employment Status for the Different Districts in Kigali City

66 Integrated Household Living Conditions Survey 3 (EICV3), Rwanda, 2010/11. Available at: https://www.statistics.gov.rw/publication/eicv-3-gasabo-district-profile-4

67 EICV3 Survey, 2012

The population of Kinyinya belongs to the medium and low-income class. Further assessment of the district's active population indicates that half of the population depends on farm wages[68].

Important to note is that Gasabo district has a high number of labour force (16+ years) migrating for work compared to the other districts in Kigali City Province, both in terms of arrivals and departures. Gasabo registers approximately 41,000 arrivals and 30,000 departures compared to 37,000 and 28,000 arrivals realized in Kicukiro and Nyarugenge respectively (EICV3, 2012). The high number of labour force for Gasabo compared to other districts can be explained by the big share of the Kigali populations for Gasabo district. In fact, Gasabo has almost the double of the populations of Nyarugenge and Kicukiro districts.

The district's employment rate is approximately 72% in 2012 (EICV3, 2012). However, the district has the highest poverty rate of 15.8% compared to the sister provincial districts Kicukiro with 11.4% and Nyarugene with 11.8%. Extreme poverty rates are similar, with 3.5% extreme poverty in Kicukiro, 4.5% in Gasabo, and 4.6% in Nyarugenge[70]. Nevertheless, the Gasabo district's rates are better than the national rates of 39.3% and 16.5% for poverty and extreme poverty rates respectively and the revised target of 20% of extreme poverty by year 2020.

The Agricultural Household survey[69] states that in the Gasabo district during 2016/17 there were 2,292 listed households from which 615 (26.8%) were identified as a household whose largest source of income is derived from agricultural production (crop production and/or livestock). Furthermore, 34.4% are involved in crop production only, 6.9% only in livestock and 56.5% in both (crop production as well as livestock), the rest 2.2% were involved in both agricultural and non-agricultural activities. The average size of the agricultural household was 4.6.

The vast majority of households (87%) in Kigali live on a monthly income below RWF 500,000 and a large portion of households (30%) in Kigali live on an income below RWF 100,000. Wages and salaries of households in Kinyinya have an average of 227,387 RWF.[70].

The number of workers expected to be working in the different Project sub-components at the same time will depend on the planning of the construction phase and its coordination through the components. While availability of the non-skilled workers should not be seen as issue in Project Area and the immediate surroundings, the skilled workers can be recruited from the district and other districts of Kigali City.

Household vulnerability in Rwanda is often defined not only by pure consumption poverty but also by households' ranking under the system known as *ubudehe*.

The categories of *ubudehe* are classified in A, B, C, D & E (Special Category). The categories mean:

A & B: Category of households with diverse life choices and self-reliant that spur community empowerment and graduation from poverty;

C & D: Category of self-reliant households that benefit from social protection interventions and multi-sectoral interventions and have to sign performance contracts (*Imihigo*) for graduation within a period of 2 years;

Special category E: This category of households is expected to benefit from full state social protection and individuals in this category are not expected to graduate and will not sign performance contracts.

It might be expected that the majority of the populations of the hill will be distributed in category C & D. The Resettlement Policy Framework (RPF) recommends to conduct a detail socio-economic-

68 https://gasabo.gov.rw/fileadmin/_migrated/content_uploads/Gasabo_DDP_2013-2018.pdf

69 The National Institute of Statistics of Rwanda (NISR): Agricultural Household Survey 2017. Available at: https://www.statistics.gov.rw/publication/agricultural-household-survey-2017

70 The Fifth Integrated Household living conditions survey, EICV5 (2016/17)

survey to assess the impact of land acquisition for the Project and sub-components on households including the distribution of *ubudehe* categories (refer to RPF for further details).

Agricultural activities

As per EICV3 in 2012, Gasabo district's agriculture sector is mostly based on cultivation of avocado (42.9%) and French beans (36.1%), as well as on cash crops like sugar cane (5%) and coffee (2.8%) (see **Table 5-6**). On a national level, the majority of households are growing French beans (65.8%), avocado (37.4%), squash (26.2%), sugar cane (10.9%) and coffee (10.8%).

Table 5-6 Percentage of cultivating households producing fruit, vegetables and export crops

	No. of HHs cultivating land for crop production (000s)	% of HHs producing selected fruit and vegetation					% of HHs producing export crops			
		French bean	Avocado	Squash	Pepper	Papaya	Coffee	Tea	Cane sugar	Sunflower
Gasabo	68	36.1	42.9	24.9	26.2	21.1	2.8	0	6	1.4
Rwanda	2,095	65.8	37.4	26.2	19.4	16.8	10.8	0.9	10.9	6.8

Source: EICV3, 2012

Agro-business opportunities

Agriculture offers agro-business opportunities through the commercialization of crop production. These opportunities are measured by the share of harvest sold (including households selling zero crops) which is 19.6% in Gasabo district and below national level (20.9%). The mean share of harvest sold for fruits and vegetables is lower (16.3%) than that of staple crops (20.1%) in Gasabo district. Gasabo district is using improved seeds and chemical fertilizer in an insufficient way.

Livestock production and productivity

The main type of livestock raised by Gasabo district's households are hens, goats and cattle. Gasabo district counted only one milk collection centre (March 2013), but it is not currently operational. Since 45.3% of the district's households own cattle already, the expansion of milk commercialization and investment in milk collection centres could be profitable for the district's economic development[71].

Tourism industry infrastructure

The tourism sector in the district and Kinyinya Sector can be a source of employment for a large share of the population, given the comparative advantage Gasabo has in education. However, tourism is not yet well developed in the district and Kinyinya. The fact that Kigali City hosts the largest portion of tourists in the country should provide an impetus for developing Kinyinya Sector as a tourist destination.

Hotel and restaurant facilities and businesses

According to the Establishment Census on Formal and Informal sector by economic sector (NIS 2011) Gasabo district counts 1,666 accommodations and food service activities.

Tour operation businesses

The tour operation businesses are concentrated in Kigali City. Eleven tour operation agencies are currently operating in Gasabo district.

71 "Gasabo District Development Plan 2013-2018", Gasabo District, City of Kigali, 2012

Summary:

The data used provides an overview of the socio-economic characteristics on a district level. The 2012 survey indicates that Gasabo district´s labour force is accounted for 4.8% (280,000 people) of total country wide labour force. The district's employment rate is approximately 70% and 50% of active labour force (223,000 people) are employed in the public and private sector. The district has a higher number of labour force migrating for work compared to the other districts in Kigali City Province.

On the district level, Gasabo has the highest poverty rate (15.8%) compared to other districts in the province. The population of Kinyinya belongs to the medium and low-income class, and half of it depends on farm wages.

Overall agriculture is an important source of income for the district, agro opportunities are mostly realised through the commercialization of crop production. Common crops cultivated in the district are avocado (43%) and French beans (36%). Regarding livestock activities in the district, residents prefer to raise hens, goats and cattle.

Another economic sector with good potential in the district is tourism. However, it is still poorly developed and needs significant improvements, even though it is located in close proximity to Kigali City, which hosts the largest portion of tourists in the country.

Baseline recommendation for future sub-component ESIA:

Specific information on socio-economic activities and characteristics of all villages in Kinyinya Hill and surrounding areas needs to be obtained. Existing key livelihood strategies and income levels need to be identified and the dependency on agricultural activities needs to be confirmed. Vulnerabilities of residents in Kinyinya Hill need to be identified especially relating to unemployment and poverty levels.

Key socio-economic baseline conditions to be considered in the sub-components ESIAs should include (but not be limited to);

- livelihoods including formal and informal businesses (e.g. informal street vendors or other potential economically-displaced persons etc., particularly in the informal settlements, but not only);gender aspects in relation to livelihoods;
- vulnerability/vulnerable groups;
- poverty and social inclusion;
- education and skills in the sub-component footprint and in the area of influence.

5.4.4 Land Use and Tenure

The approximate General Land Use Allocations (ha) of the Project Area (600 ha) are currently divided as shown in **Table 5-7** below:

Table 5-7 Current General Land Use Allocations (ha) of the Project Area

Land Use	Area
Residential	81 ha
Agriculture	225 ha
Industries	5 ha
Public Facilities	9 ha
RSSB	130 ha
Infrastructure	69 ha

Deutsche Welle Site	70 ha
Cactus Project	14 ha

The current land uses are illustrated in **Figure 5-15** and can be summarized into the following categories:

- Commercial
- Education/Religion
- Health
- Industry
- Residential formal
  - Large, medium and small houses
  - Under construction
- Residential informal
- Open Space/Park
- Workshops
- Other

The planning area features a mix of formal and informal residential communities. Formal residential areas are generally clustered toward the ridge, neighbourhood centre and Deutsche Welle site, with informal settlements based away from the ridge and toward the wetlands (in particular the north side of the hill). All residential is low rise, single family housing with little to no multistore development identified.

Land tenure

Article 35 of the Rwandan constitution (as amended in 2015) stipulates that private ownership of land and other rights related to land are granted by the State. The 2005 Organic Land Law created a land tenure regularization process and the formalization of all land in Rwanda through the issue of leasehold titles. Therefore, properties are generally noted as informal by local authorities because the buildings are not compliant with planning or building guidelines or codes. Upon development of a property and provision of legal occupancy permit a leasehold title may be converted to a freehold upon application.

The structures in the area are mixed formal and informal. The share of informal settlements in consideration of formal settlements is not determined. However, information collected from the site states that informal settlements are around 96% of the total settlements with estimated 36,120 people living in in informal settlements. Most of those people living in informal settlements have no land titles.

Land availability and productivity

As Kigali urban areas grow, the total agricultural land area in Gasabo district shrinks. The sector development strategy is focusing on techniques to intensify crop production on a smaller land base. Land consolidation and bench terracing have been vital in these efforts (which have also provided employment to 1,899 people through VUP Public Works).

According to EICV3, NISR (2011), farming households in Gasabo district which rely on crop cultivation utilize on average a 0.8 ha parcel of land, which is above the national average (0.59 ha), the rural average (0.6 ha) and the urban average (0.46 ha). Land use includes agricultural activities, livestock, fisheries and forestry.

Summary:

The Project Area features mainly informal residential communities. Information collected from the area estimates that 36,120 people (96%) are living in informal settlements and mostly based away from the ridge and toward the wetlands. While formal settlements are generally clustered toward the ridge, neighbourhood centre and Deutsche Welle site.

In general, agricultural land in Gasabo district is decreasing and urban areas are increasing. Households in Gasabo district which rely on agriculture utilize a parcel sized 0.8 ha on average, which is above the national average. Land use activities in the district include agricultural use, livestock, and forestry.

Baseline recommendation for future sub-component ESIA:

Sub-component ESIAs will have to include a detailed land use analysis where relevant. For example, where land is acquired for the Project development, the RAP and/or LRP will have to cover land acquisition impacts. Therefore, detailed information on existing land use and tenure will be required for each affected person (as indicated in the RPF).

Key particular baseline conditions of relevance from land use and tenure perspective to be provided in the sub-components ESIAs should include (but not be limited to):

- Land ownership and use in the sub-component footprint and in the area of influence,
- gender aspects in relation to property rights,
- vulnerability/vulnerable groups,

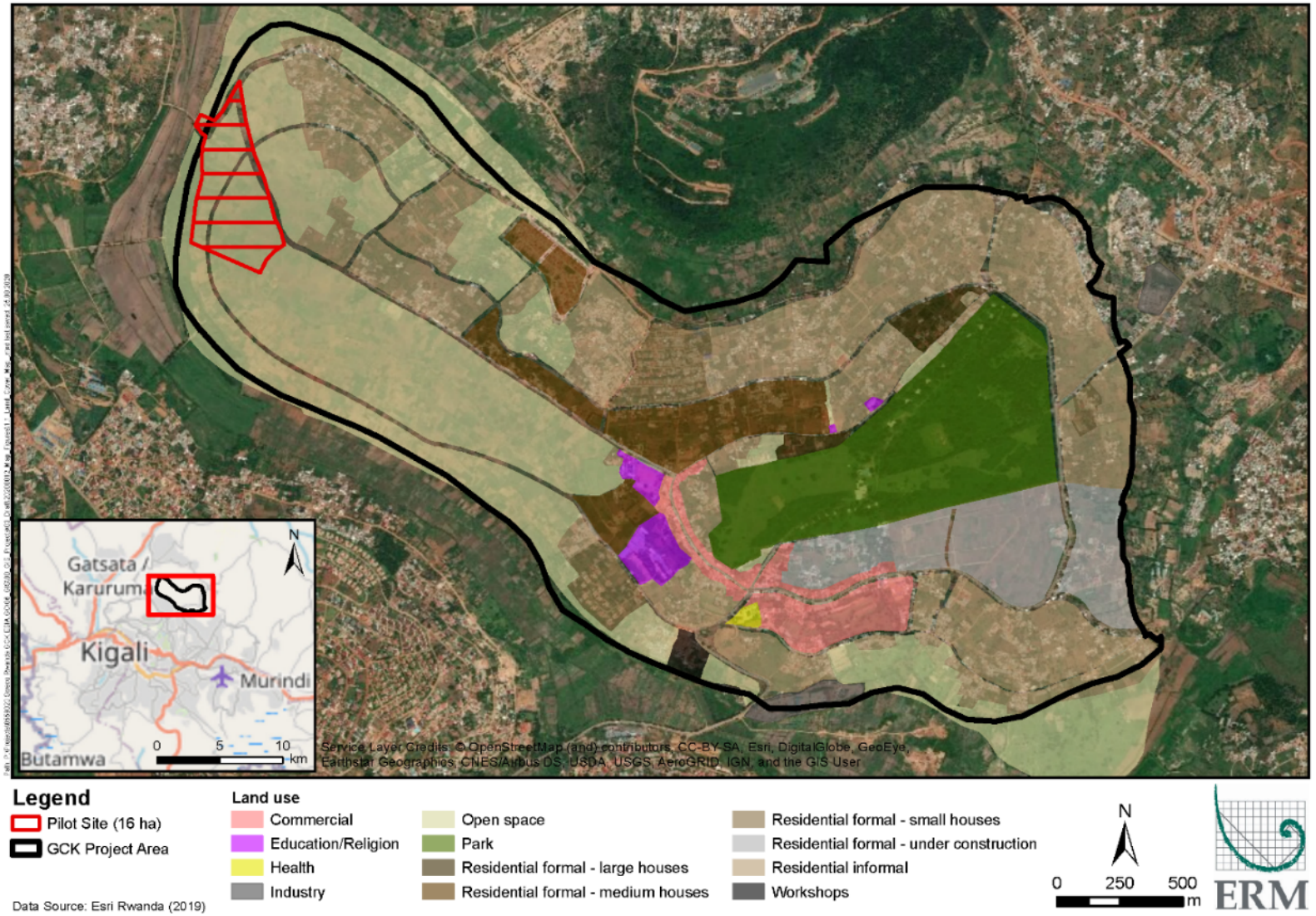


Figure 5-15 Land Use

5.4.5 Cultural Heritage

Rwanda has no properties inscribed on the World Heritage List. On its tentative list are Rwanda's genocide memorial sites, one of them[72] is near Kinyinya sector in Gisozi (see **Figure 5-16**Error! Reference source not found.), approximately 10 km southeast from the Project Area. No single burial site was recorded in the area, and the probability to find a grave in the individual properties is low considering Rwandan practice of using government approved burial sites.

Source: ERM, 2020

Figure 5-16 Kigali Genocide Memorial

There are a number of churches distributed in the area and people go to the church of choice based on belief. The churches include Church of Association of Pentecostal Churches of Rwanda (ADEPR), Jehovah, Catholic Church[73] (see **Figure 5-17**).

Source: ERM, 2020

Figure 5-17 ADEPR Church, Jehovah, and Catholic Church (from left to right)

72 ERM (2020) Site Walk-Over in December 2020.

73 ERM (2020) Site Walk-Over in December 2020.

Summary:

Rwanda has no properties inscribed on the World Heritage List. There are no known or suspected cultural heritage sites in/adjacent to the Project Area. The chance of finding unmarked graves in the individual properties is low.

Baseline recommendation for future sub-component ESIA:

There is no indication for tangible finds from the high-level baseline. Each sub-component ESIA should however include adequate cultural heritage baseline (covering both tangible and intangible cultural heritage), in line with ESIA best practice.

5.4.6 Infrastructure and Public utilities

Housing and urbanization

The current settlement morphology of the Kinyinya Hill comprises three categories of neighbourhoods, namely planned, informal and mixed. Planned neighbourhoods are characterized by clearly demarcated plots, separated by the main tarmac road. These are very few high-income neighbourhoods and the residents also enjoy a greater access to urban infrastructures and services. On the other hand, informal neighbourhoods are precarious and mostly concentrated in the areas with difficult access to the main road. Houses are intersected with narrow paths and poor drainage system. They can be classified as 'spontaneous neighbourhoods' which are full of small individual houses made with bricks (often of the adobe type) or with breeze blocks but without any modern comfort and equipment. They look less attractive in terms of urban infrastructure and are commonly referred to as akajagari. These mixed neighbourhoods are hybrid of both planned and informal neighbourhoods, characterized by separate and demarcated plots on one part and small houses squeezing on the other smaller part. These neighbourhoods result from either unplanned growth of the planned settlements or upgradation of informal settlements.

Currently, 71.2% of Gasabo's households and 78% of Kigali's households are unplanned informal urban housing. In the Project Area, as mentioned above, informal settlements are predominant[74]. The informal settlements are found in areas with greater distance from nearby earth roads and the main tarmac road that connects different areas of Kinyinya Hill. In this context it should be noted, that the designation of informal is not equal with a missing land title. Rather it is noted as informal by local authorities because the buildings are not compliant with planning guidelines or are built of what are considered to be insufficient materials.

There are several existing settlements within the Project Area (Figure 5-18) with a significant number of informal settlements and several developments planned or under consideration.

The key driver for the creation and growth of Informal Settlements in Kigali is from migrants to the city in search of jobs and economic opportunities, many of which are willing to settle in inadequate less inexpensive conditions (low-quality housing on small plots). This form of land usage creates a more competitive individualistic social context thus eroding the traditional social cohesion.

The Cactus Project of 14 ha and the RSSB/IFC Project of 22 ha are under development in the South East and South West of the Project Area. Figure 5-20 below provides an overview of the existing situation on the Project Area highlighting existing roads, community focal points and blue/green infrastructure[75].

74 ERM (2020) Site Walk-Over in December 2020.

75 ERM (2020) Site Walk-Over in December 2020.

79.5% of the population of Kinyinya sector have declared to live in family or own properties while only 14.9% are renting. Others live in community provided shelter or shelter provided by the employer or neighbour (5.5%).

Consequently the majority of 75.77% have a single-family dwelling, followed by Single/Two Family Bungalow (16.40%), Single/Two Family Villa (3.75%), Multi-Family buildings (0.72%) (**Figure 5-19**).

Source: ERM, 2020

Figure 5-18 Informal settlement in the Project Area on the left and formal settlement (Dubai Estate) on the right

Source: ERM, 2020

Figure 5-19 Low and High Standing households in the Project Area (from left to right)

Source: ERM, 2020

Figure 5-20 Typical road within the Kinyinya Hill and Bus station in Kinyinya centre

The Project commits to address the issues raised by the existing informal settlements following two approaches i.e. Upgrading and Land Readjustment (densification). Through upgrading the goal is to include and retain the existing communities thus minimizing displacement and creating a more inclusive and diverse community. The possibility of creating citizen engagement via scheduled community work days will be explored during the Project implementation.

Upgrading aims at improving the existing footprint with an emphasis on community engagement at an early stage. The main interventions proposed are i) clustering and densification ii) the improvement of basic urban service provisions iii) creation and enhancement of public and green areas.

In practice, interventions focusing on the following improvements would be of benefit: i) environmental restoration by achieving a balance between human and natural activity ii) Using public transport to reconnect segregated areas into the local network iii) Provision of quality social services. The Informal Settlements at the Project site typically represent buffer zones between urban and rural land uses. This offers additional opportunities during their upgrading including irrigation strategies, security of tenure, agribusiness and small industry opportunities amongst other interventions.

The Land Readjustment approach will be preferred at areas with low density and where the units are dispersed within the site in an inefficient manner. The goals is to reconsider the layout of the plots and adjust them into a configuration that has more efficient land use and legibility in regards to infrastructure, circulation and community enhancement. There are several informal settlements on the site that fall into this category and could benefit from the principles promoted via Land Readjustment. This approach promotes bringing a group of adjacent landowners into a partnership of land contribution or an agreement of joint planning and servicing of their adjoining plots. Therefore Land Readjustment requires the selling or surrendering of land to finance infrastructure costs and public space requirements[76], therefore it will likely involve displacement.

Overall the Project will determine greater land use efficiency and connection to infrastructure. The above-indicated measures aim at avoiding displacement of people whenever possible, so that the existing residents can further stay within the 600 ha area of the Project. In cases when displacement cannot be avoided (see Land Readjustment approach), it will be performed according to on Resettlement Action Plans (RAPs) developed and implemented on the basis of the principles set out in the RPF.

Transportation and traffic

While standards in the transport sector in the district are still below other districts in Kigali City, improvements have been made over the past years as measured by usage rates for all-weather roads. Gasabo's usage rate stands at 86.2% compared to Kicukiro and Nyarugenge at rates of 97.4% and 95.9%. The satisfaction level for usage of all-weather roads indicates that 75.2% are satisfied, while 24.8% are not satisfied. However, the usage of public transport in the district is considered poor, with 40.4% regularly using public transport compared to 82.6% and 74.1% for Nyarugenge and Kicukiro respectively. This is because the majority expressed that they do not need it (67.2%) and around 29.3% said the bus stops are too far[77].

Kinyinya Hill has a main tarmac road that connects Kibagabaga to the bus station[78]. Other areas of the hill are connected by earth roads that need to be upgraded to acceptable standards. Buses and motorcycles are the most reliable means of transport. A few number of people have their own cars and most of the population walk from one area to the other within the Gasabo district.

76 Urban Design Handbook (2019), available at: https://greencitykigali.org/wp-content/uploads/Urban-Design-Handbook.pdf

77 Gasabo district Development Plan, 2013-2018

78 ERM (2020) Site Walk-Over in December 2020

Information and communications technology

Internet access in Kigali City, including access via mobile phone, present within 39.1% of households, as reported in 2016/17, which can be compared to all Rwanda where access is reported to 17.2% households. In modern planned areas reported the highest access to internet 58.9%)[79].

Regarding the ICT usage 41.4% of the people in Gasabo district have never used internet and 33.3% are not aware of the service. 78.2% of the population of 6+ years have never used a computer[80].

The district of Gasabo including Kinyinya sector has a fiber internet network provided by Liquid Telecom and private individuals use internet and cell phones through the telephony networks of MTN and AIRTEL/TIGO[81] (**Figure 5-21**).

Source: ERM, 2020

Figure 5-21 Airtel Telecommunication Towers

Energy

The energy demand for households and in the service sector in Rwanda would typically be divided into energy for cooking/heating, and electricity.

In 2016, 77.4% of urban households in Rwanda were connected to the grid as compared to 15.6% of rural households[82]. The cost for a connection to the electric grid for any new installation is charged according to an established cost table. There is a connection fee as well as a cost for the extension. Kinyinya Hill falls within the scope of Kigali City Master Plan and its anticipated grid expansion.

Water and Sanitation

Access to improved drinking water' indicators[83] show that 84.7% of the households in the district have improved water sources with 36.9% households receiving water from a public standpipe[84] (**Figure 5-22**), 16.7% from a protected spring and 4.8% from protected wells. In addition, based on district data the households that have access to clean water represent 82.0% of all households.

79 "Main Indicators Report". Kigali, National Institute of Statistics Rwanda (NISR). November.The Fifth Integrated Household Living Conditions Survey EICV5 (2016/17)

80 Gasabo district Development Plan, 2013-2018

81 ERM (2020) Site Walk-Over in December 2020

82 Koo, Rysankova et al. 2018

83 Gasabo district Development Plan, 2013-2018

84 ERM (2020) Site Walk-Over in December 2020.

The Water and Sanitation Corporation's (WASAC) central water supply system serves parts of Kinyinya Hill, as shown in the map below (**Figure 5-24**). Many households and businesses are connected to this central supply. Those without a connection typically walk to a water kiosk to purchase water from the central water supply. Currently there is a need to do intermittent rationing of water in the system (for instance, supply water 3-4 days/week) since the demand in Kigali exceeds the supply.

It is indicated that 74.3% household have improved sanitation. The majority of households use pit latrines with solid slab (67.2%) and pit latrines without slab (23.6%). The households using flushing toilets are only 7.1%.

Both the Gasabo district and Kinyinya Hill need to improve water and sanitation access in order to reach the Vision 2020[85] targets of 100% of population having access to improved sanitation and access to clean water.

There is no central sewage system for treatment of domestic wastewater in the Kinyinya Hill nor in Kigali City in general. No industrial sewage water is discharged from the hill as there are no heavy or light industries located in the areas. Unimproved pit latrines are used by the majority of the people living in the Kinyinya Hill. The future plan of the Project is to provide improved sanitation.

Source: ERM, 2020

Figure 5-22 Public standpipe

Summary:

The principal infrastructures in the Project Area are roads, social infrastructures such as health centres, schools and churches, transport facilities, electricity, water networks, sport centres and environmental infrastructure such as parks and recreational spaces.

The Kinyinya Hill comprises three categories of neighbourhoods, namely planned, informal and mixed. In the Project Area mixed neighbourhoods could be observed with a majority of informal

85 Ministry of Finance and Economic Planning (MINECOFIN) (II), Republic of Rwanda (2012) Rwanda Vision 2020 Progress and Way Forward" (PDF) available at: http://www.devpartners.gov.rw/fileadmin/templates/docs/Events/DPR/2011_DPR/Day%201/Vision%202020%20Progress%20and%20Way%20Forward.pdf

settlements. Furthermore, a significant number of informal settlements and several developments planned or under consideration in the Project Area.

On the district level, the transportation infrastructure development is still lower than in other districts in Kigali City. Buses and motorcycles are the most reliable means of transport. Kinyinya Hill has a main tarmac road that connects Kibagabaga to the bus station. Other areas of the hill are connected by earth roads that need to be upgraded to acceptable standards. In Kigali City, 39.1% of households have internet access (including via mobile phone). This is about twice higher than national level (17.2%). The energy demand in Rwanda would typically be divided into energy for cooking/heating, and electricity. Based on district data, 84.7% of the households in the district have improved water sources and 82.0% of all households have access to clean water. There is no central sewage system for treatment of domestic wastewater in the Kinyinya Hill nor in Kigali City. No industrial sewage water is discharged from the hill as there are no heavy or light industries located in the areas. The majority of households use pit latrines with solid slab (67.2%) and pit latrines without slab (23.6%). While the households using flushing toilets are only 7.1%. The future plan of the Project is to provide improved sanitation in the Project Area.

Baseline recommendation for future sub-component ESIA:

The environmental and social impact assessment performed for each sub-component is to comprise (but not be limited to) detailed baseline information on :

- housing conditions and social context in the sub-component’ s area of influence;
- existing infrastructure conditions including roads;
- transportation and traffic;
- water and sanitation;
- energy supply system;
- information and communication infrastructure.

Further, the baseline is to be adequate to inform on the resettlement action planning that may be required by the Upgrading and Land Readjustment associated with each sub-component. Any such displacement will be subject to a Resettlement Action Plan defined and implemented on the basis of the principles set out in the RPF.

5.4.7 Health

The Rwandan health system has seen an improved performance in recent years, based on quality of care and decentralization of health care systems. Policies and programmes have been developed in an effort to respond to the population’s health care needs and to align the health system with the global health agenda. In 2015, Rwanda spent 11.2% of its gross domestic product on the health sector. The CoK is the main provider of primary health care services, in conjunction with the Ministry of Health. Funds come from government contributions, development partners, health insurance contributions, social solidarity funding and cross subsidizing among the community. The district of Gasabo relies on two public hospitals, one private hospital and 18 health centres. Most of the villagers from Kinyinya get their health care at Kibagabaga hospital. In Kinyinya Hill, the most frequently used health facility is the Kinyinya Health Centre in Murama Cell.

Summary:

The CoK is the main provider of primary health care services, mainly through clinics distributed throughout the city. On the district level, residents of Gasabo rely on two public hospitals, one private hospital and 18 health centres. Most of the villagers from Kinyinya get their health care at Kibagabaga

hospital. In Kinyinya Hill, the most frequently used health facility is the Kinyinya Health Centre in Murama Cell.

Baseline recommendation for future sub-component ESIA:

Up-to date information on health status of residents on Project Area is required. This includes information on key health challenges (e.g. communicable diseases, chronic conditions, etc.) as well as accessibility, quality and adequacy of available health care infrastructure and emergency services.

5.4.8 Education

There are currently three schools within the Project Area:

- Pefa Nursery School: primary level;
- Groupe Scholaire de Kinyinya: secondary A level[86] (**Figure 5-23Error! Reference source not found.**); and
- College Amis Des Enfants: secondary A level.

Further, a new academic campus of the Kigali International Community School (KICS) will be developed on 8 ha of the RSSB land. **Figure 5-25** gives an overview of educational facilities in a close proximity to the Project Area at the present moment.

Source: ERM, 2020

Figure 5-23 Groupe Scholaire de Kinyinya (Secondary School)

In relation to education the most recent data from EICV5[70] states, that 92.8% of the population aged 6 and above (92.0% of female and 93.3% of male) in the Gasabo district have attended school. It brings the district on the second place compare to other districts in Rwanda, when Kicukiro district with 95.0% is on the first place. The average national rate of the population aged above 6 who have ever attended school is 87.2%. Net attendance rate at primary school in the Gasabo district is with 86.4% slightly below the national level of 87.6%. The girl/boy attendance at primary level is equally balanced with 86.5% and 86.3%. In secondary school the net attendance rate is 33.0% (28.7% for female and 37.7% for male) which is above the 23.2% rate in whole Rwanda. In terms of literacy levels, the EICV5 states that the district's literacy rate of the population aged 15 and above is 87.7% (83.4% for female and 89.0% for male) and rates registered in Kicukiro and Nyarugenge are at 90.5% and 87.7% respectively. This is above the national average rate of 73.2%. The district level is below the country's target of 90% and 100%, as stipulated in the 7YGP and Vision 2020 respectively. The computer literacy rate for persons of 15 years and older stands at 20.3% (18.8% for female and 21.9% for male) what is above the national rate of just 8.9%. The district recognizes the need to improve the computer literacy rates to boost up ICT innovations and private sector led economy. The data for the Gasabo

86 ERM (2020) Site Walk-Over in December 2020.

district from the Ministry of Education[87] shows that the students-per-classroom ratio for primary level is at 35.9, below the national standard of 46 pupils per classroom. Computer and internet usage in primary schools is through 254,602 computers and 1,029 schools nationwide in Rwanda have internet access.

Summary:
Data about education situation is available only on the district level. Survey from 2017 states that 92.8% of the population aged 6 and above (92.0% of female and 93.3% of male) in the Gasabo district have attended school. This supports also the fact that literacy rate in the district is higher compared to the national level (87.7% and 73.2% respectively). Three schools exist in the Project Area and a new academic campus of the Kigali International Community School (KICS) will be developed on 8 ha of the RSSB land as part of the Project.

Baseline recommendation for future sub-component ESIA:

Up-to date information about education infrastructure and education levels in the specific Project Area needs to be obtained for subsequent ESIAs. This will include education system and facilities, education and skill levels and will feed into the identification of vulnerabilities to be taken into account when implementing and managing the Project's sub-components as relevant.

87 Ministry of Education: 2018 Educational Statistic. Available at: https://www.statistics.gov.rw/publication/2018-education-statistics-report

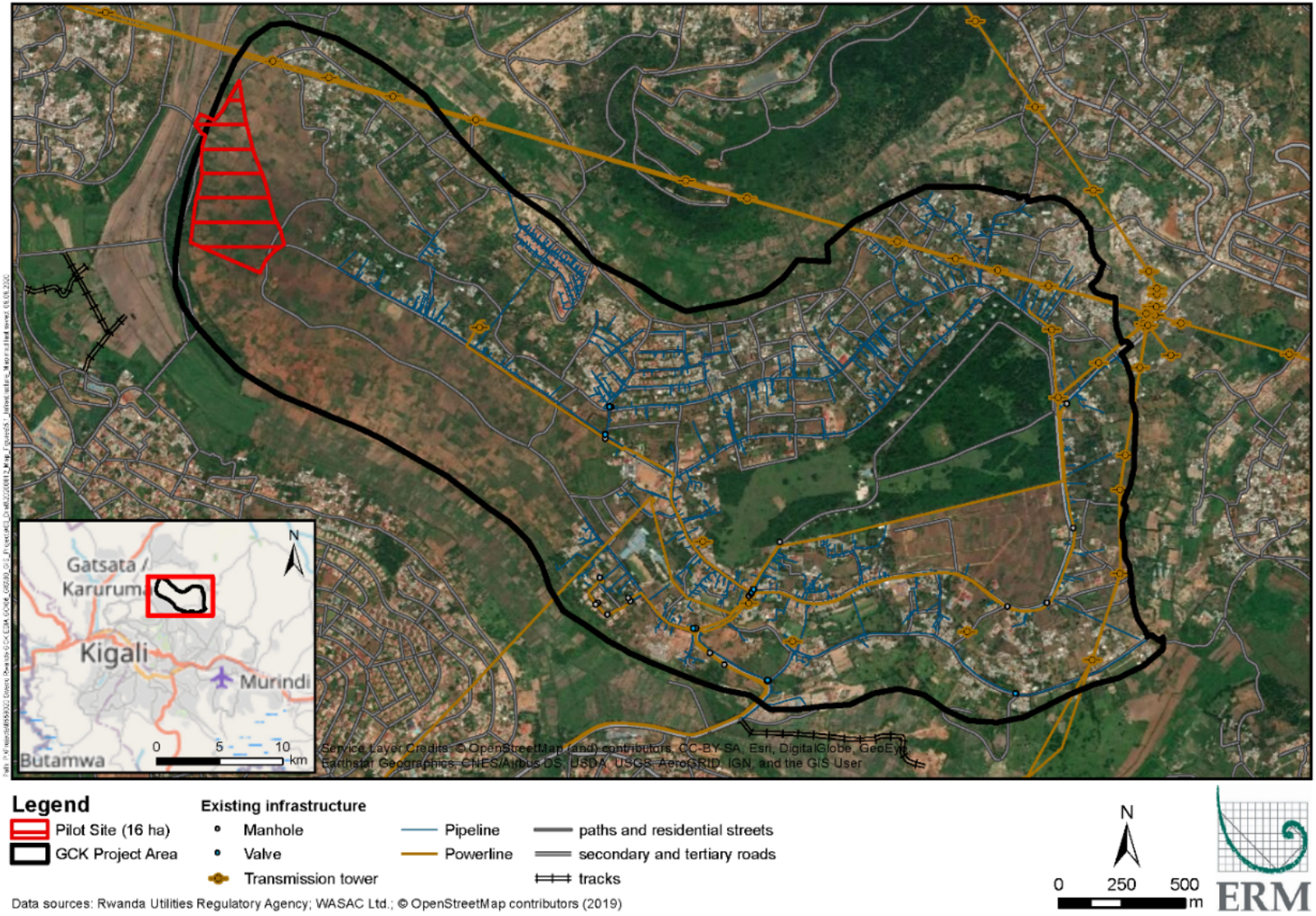


Figure 5-24 Existing Infrastructure

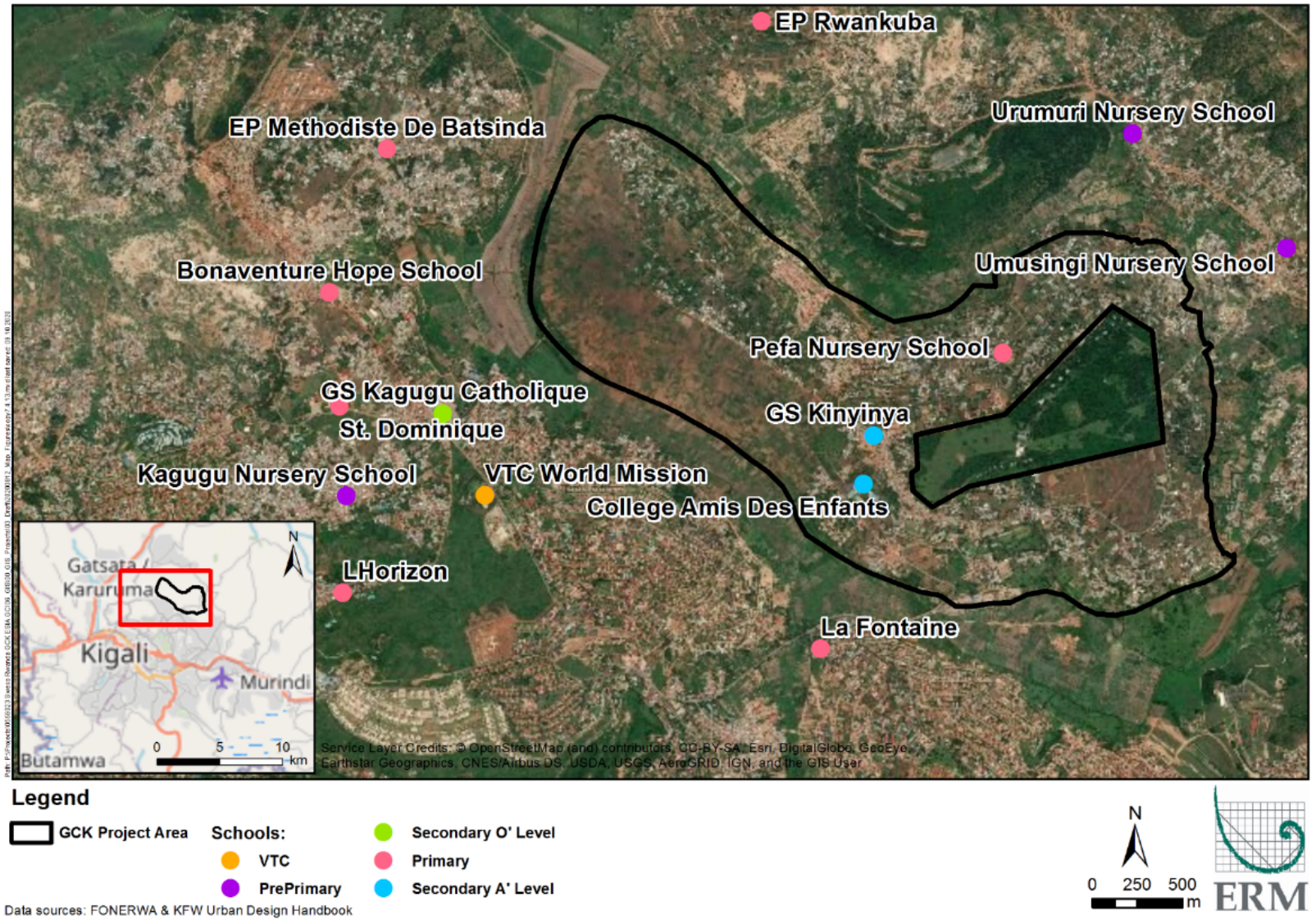


Figure 5-25 Schools in the proximity of the Project Area

6. POTENTIAL SIGNIFICANT ENVIRONMENTAL AND SOCIAL IMPACTS

6.1 Identification of Project Potential Significant Effects

This Chapter provides an overview of the sources of potential E&S issues related to the proposed Project based on the on the proposed Project description as set out in the GCK SPA Masterplan and the results of the baseline. The impact assessment is structured as per the World Bank Environmental and Social Standards (WB ESS) and was conducted as per the methodology proposed in **Chapter 2**.

The initial identification of potential impacts is based on the prospective Project features and their interaction with existing receptors; the development of a high level matrix of potential interactions (i.e. a modified Leopold matrix) is devised with proposed activities (rows) and the relevant environmental/social aspects in the project area (columns). The key objective of this exercise is to focus the subsequent stages of the assessment on those impacts[88] that are likely to result in significant effects[89]. To achieve this, the following were performed:

- Identification of potential interactions between the Project and the physical, biological and socioeconomic environment that may be affected (intersections in the Leopold matrix); and
- Identification of potential significant impacts of the Project that will require investigation in subsequent stages (using a colour coding for the intersections in the Leopold matrix).

Environmental and social resources and receptors that could potentially interact with the Project include:

Physical Environment

- Air quality (e.g. atmospheric emissions from stationary sources and from vehicles and machinery);
- Noise and vibrations;
- Surface water quality (e.g. from wastewater discharges and due to storm water runoff);
- Groundwater quality (e.g. due to spills and discharges);
- Soil conditions (e.g due to soil sealing/covering, topsoil management, spills);
- Landscape and visual.

Biological Environment

- Habitat loss and transformation (including terrestrial habitats and aquatic habitats as result of effects on water flow patterns and water quality);
- Flora and fauna (i.e. effects to natural plants and animals through direct loss and/or disturbance, introduction of invasive species, pests and nuisances);
- Ecosystem Services.

Socio-Economic and Cultural Environment

- Physical and economic displacement (physical displacement of people, economic displacement, permanent or temporary due to Project land take and land access);
- Implications to the human society distribution, demography, settlement patterns, changes to the cultural lifestyle and indigenous knowledge of the local society;

[88] Any alteration of existing conditions, adverse or beneficial, caused directly or indirectly by the Project

[89] The specific consequence (to a resource/ receptor) arising from an alteration of existing conditions caused by the Project. In this sense, it is technically the effect whose significance is assessed in the Impact Assessment process. However, it is recognized that the predominant practice in the industry is to report on the significance of “impacts” rather than “effects”.

- Changes in land use systems and the general land utilization types where applicable;
- Infrastructure and services (due to landscape alterations and changes to infrastructure facilities);
- Local economy (effects associated with income generation opportunities created by the project due to the prospective construction and operations);
- Community health and safety (effects associated with the construction and operation activities and related handling and disposal of generated wastes, construction workforce interactions and related hazards/risks such as HIV/AIDS, disease out breaks, use of medical/sanitary facilities, etc_ ;
- Cultural Heritage.

The potential interactions between the Project and the resources and receptors were analysed and indicated in **Figure 6-1**. The matrix displayed generic Project activities (through entire life cycle) against resources/receptors and allowed a preliminary identification of the potential interactions each activity may have on the range of resources/receptors. This exercise allowed the preliminary identification of potential interactions between Project activities and resources/receptors to develop generic conclusions as to the interactions likely to lead to significant effects. This exercise is to be performed on case-by-case basis for each for each sub-component as part of the environmental and social impact assessment to allow identification of interactions leading to significant effects in each particular sub-component case.

The exercise performed indicated that while potential impacts would be expected for all Project phases, Project activities during the construction phase are typically expected to cause the majority of potential impacts. It also indicated that implementation of adequate mitigation strategy in line with the approach set forth in the ESMF may result in a number of **Positive Impacts** including:

- Avoiding unsafe informal settlement by providing affordable and inclusive housing;
- Hiring temporary and permanent workers for construction and operation of the Project will create jobs and boost the local economy;
- Water design included in the GCK SPA Masterplan will ensure reduced and delayed storm water runoff volumes, reduced localised floodings and a storm water pollutant reductions;
- Improved waste and waste water management will have a positive impact on the community;
- Project design focuses on increasing resilience to climate change by incorporating energy efficiency (e.g. water use, green energy, etc.) and resilient housing into planning and design;
- Improvement of transportation, sewerage, water and energy supply, ICT networks;
- Improvement of security; and
- Improvement of quality of life (e.g. less air pollution due to alternative transportation systems, sufficient public parks for recreation).

A colour code was used to display the results of the performed analysis of Project activities - receptors interactions as indicated in the legend embedded in the Leopold matrix.

Activity/Aspect/Receptor Aspect Key: An interaction: - that may have a positive impact with implementation of Project-embedded and ESIA-defined mitigation **(Green)** - that is unlikely to have an interaction or of minor consequence **(White)** - that may have a significant negative impact **(Orange)**	Environmental and Socio-economic Aspects															
	Physical / Biological										Socio-economic					
	Air Quality and Climate Change	Noise and vibration	Surface water quality	Groundwater quality	Geomorphology and Soil quality	Visual Landscape	Habitats	Flora	Fauna	Ecosystem Services	Displacement	Demography, cultural & local society	Local Economy	Community H&S	Infrastructure and Services	Cultural heritage
Pre-Construction Phase																
Land acquisition and land access																
Construction Phase																
Site preparation works: land clearance and earthworks																
Land occupation (permanent + temporary)																
Use of vehicles and heavy machinery																
Masonry and concrete works; steel works, roofing; electrical/power distribution, plumbing.																
Presence of workers (including recruitment and influx)																
Waste production and management																
Water abstraction and use																
Materials abstraction and transport (aggregates, steel, timber, use of quarries)																
Landscaping works																
Demobilisation of construction front																
Operation Phase																
Storm water management																
Solid waste/wastewater management																
Utilities operation (lighting, electricity, running water)																
Residential activities: Presence of housing Project and associated population and traffic																
General maintenance services																

Figure 6-1 Generic Project Activities - Receptors Interactions Matrix

As per the generic Project matrix, given the nature and size of the Project (e.g. magnitude of construction activities, sensitivity of receptors, etc.), major E&S impacts may be expected. This High-Level ESIA identified a number of potential impacts associated with the overall Project based on the assumed activities and possible sub-components of the Project outlined in the masterplan to be implemented on the 600 ha Project Area. The following Project aspects associated with potential significant impacts were identified:

- Air Quality;
- Water/Groundwater;
- Waste Management;
- Noise and Vibration;
- Landscape and Visual;
- Flora and Fauna;
- Ecosystem Services;
- Community and workers H&S; and
- Displacement (economic and physical) as result of Project land acquisition and land access.

The below Sections summarize the main impacts identified. **Table 6-1** provides a complete list of potential significant impacts and refers to the whole Project Area (600 ha) aiming to provide an overview of the relevant E&S topics that need to addressed or further assessed during pre-construction construction and operation phases. With its objective and vision for a sustainable city, the Project is expected to have an overall positive impact on environment and people in comparison to a possible unplanned development characterized by informal settlements. The Project benefits are outlined in **Chapters 1** and **2** and a number of positive impacts are identified in **Table 6-1.** However, as the objective of this impact assessment including the associated ESMF is to identify required mitigation strategies aimed at addressing the potential adverse impacts.

In terms of mitigation strategies to be implemented in the case of all sub-components, a high-level ESMP is included in **Chapter 7** of this HL-ESIA and further, more detailed guidance is provided in the ESMF. The High-Level ESMP and the ESMF provide E&S management guidance for implementation at each sub-component level, on case by case basis, as informed by the E&S assessment as summarised in **Chapter 8**.

6.2 Physical Environment

The Project will likely have significant impact on the physical environment in the AoI. During construction of the Project especially air quality and noise are expected to have a significant impact. Ambient air quality is expected to be affected during construction, due to emissions and dust generation. The Project-related activities during construction and operation causes the release of GHG emissions into the atmosphere. In the long-term view of the Project operation, the design incorporating energy efficiency (e.g. water use, green energy, cooking method, etc.) will have a positive impact by avoiding GHG emissions.

Project works execution may be associated with a number of key areas of impact including:

- Noise and dust;
- Excavations and earthworks resulting in erosion and sediments transport by storm water runoff;
- Solid waste generation (construction debris, metal, wood and paint wastes, and other residues); and
- Vegetation removal.

The Project implies extending the areas occupied by constructions and infrastructure. This will determine generation of high volumes of stripped topsoil which represent a valuable resource to be appropriately managed and reused. Adequate enforcement of specific procedures for topsoil management (stripping, storage handling and reuse) is therefore required during Project implementation (further guidance provided in the ESMF).

Noise and vibration during construction poses a potential risk to the health of workers and to sensitive neighbouring receptors such as residential areas, schools, hospitals, churches and recreation areas. In addition, vibration can disturb people and cause damage to buildings.

The Project may have a moderate significant impact on Landscape of the Project Area. The planned interventions such as permanent aboveground structures including housing and infrastructure are expected to alter the landscape of the Project Area. However, the sub-components are not deemed adequate to significantly affect the landscape, therefore a *moderate* significance is assigned to the impact. **Figure 6-2** shows how the Project can be integrated in the natural landscape at proposed hillside settlements.

Source: GCK SPA Masterplan, 2020

Figure 6-2 An overview of the Pilot Site proposal in the GCK SPA Masterplan

Change of surface water regime due to Project activities may be associated with the civil works including excavation, earthworks and slope cuts. The discharge of site runoff during construction may lead to water pollution from leaks and spills of hydrocarbons, wastewater and other materials, as well as due to insufficient construction runoff control. Due to the sensitivity of the surrounding wetlands and the proximity to Nyabarongo River, as well as the likelihood of occurrence, the impact is evaluated as m*ajor*. The water design included in the GCK SPA Masterplan will ensure reduced and delayed storm water runoff volumes, reduced localised floodings and a storm water pollutant reductions which will have a positive impact on the water quality during operation.

The Project will generate substantial construction wastes. During operation, the Project is considering incorporating waste management and treatment facilities for organic waste within the Project Area. Local collection and recycling stations are planned as well. This will have a positive impact on the waste treatment at Kinyinya Hill.

6.3 Biological Environment

Biodiversity & Nature Conservation can be impacted by temporary and permanent land-take for the Project, loss of vegetation and biodiversity and impact on fauna.

Although no critical habitat was identified in the Project Area, land will be occupied permanently and temporarily during construction requiring clearance of existing vegetation and possible removal of habitats and species of nature conservation interest. The majority of vegetation is associated with agricultural land (scrub) and eucalyptus trees which are non-native. The significance is minor due to the urban/agricultural character of the area.

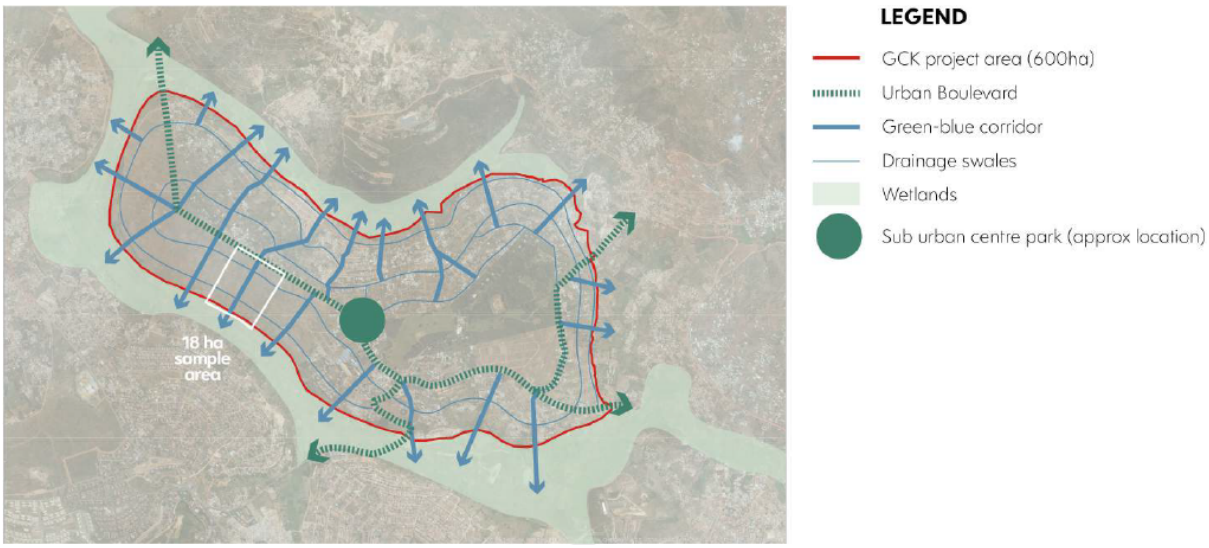
There are wetlands in the proximity of the project site that the baseline information indicate as sensitive. Overall, the Project is expected to have positive effects for recovering the structure and functions of wetlands. However, during construction, adequate runoff control and drainage is required to mitigate impacts on the wetlands ecosystems and surface water bodies. Furthermore, adequate site restoration using native species is required at the end of construction.

The Nyabarongo River and wetlands have been identified as Important Bird and Biodiversity Area and Key Biodiversity Area. The significance is *major* due to the close proximity to the wetlands.

A detailed assessment of the wetlands shall be conducted as part of the future Project ESIA and in the framework of required primary data collection, and if deemed necessary a critical habitat assessment including suitable mitigation measures. This shall also include the wetlands potentially affected by the land conversion.

The Project will include the development of a blue-green system, as a network of connected corridors aimed at managing the Project land and the water in a way inspired by nature and designed to replicate natural functions and provide ecosystem services. The envisaged blue-green system seeks to protect the ecological and social values of the urban landscape and water cycle, also providing flood management and increased connectivity functions, while enhancing residents' access to nature.

The green-blue network will connect and utilize the existing wetlands, local natural systems and ecosystem services. This network will follow the natural contours and will interconnect newly-created green spaces such as local parks, green streets and green and blue corridors (see **Figure 6-3** below).



Source: GCK Urban Design Handbook, 2020

Figure 6-3

6.4 Social Environment

Permanent and temporary land acquisition for development of the Project may lead to displacement of existing land uses, property and people. Physical or economic displacement are expected. Current residential land is expected to be majorly used as residential areas by the Project, so physical displacement could be temporary (for the duration of construction of new housing) in specific cases. Land currently used for agriculture is expected to receive other uses causing permanent economic displacement. Impact on vulnerable groups is expected (e.g. informal land users, etc.). The impacts on livelihoods and the potential physical or economic displacement are evaluated as *major*.

As indicated in **Section 5.4.6** the project is committed to implement a number of measures aiming at avoiding displacement of people whenever possible, so that the existing residents can further stay within the 600 ha Project area. This will be attained due to a more efficient land use, through Upgrading and Land Readjustment (densification).

Through Upgrading (i.e. improvement of the existing footprint) the goal is to include and retain the existing communities thus minimizing displacement and creating a more inclusive and diverse community. It is envisaged that the Upgrading approach will be primarily applied at existing denser populated areas. The Land Readjustment (i.e. adjusting land plots configuration for increased land use efficiency, typically trough landowners' partnership in joint planning and servicing) will be preferred at areas with lower density and where the units are dispersed within the site in inefficient manner. The goals is to reconsider the layout of the land plots and adjust them into a configuration that has more efficient land use and legibility in regards to infrastructure, circulation and community enhancement.

While above approach aims at applying the displacement avoidance principle, the displacement will likely not be possible to be completely avoided.

In particular, the Land Readjustment approach implies bringing a group of adjacent landowners into a partnership of land contribution or an agreement of joint planning and servicing of their adjoining plots. Commonly this requires the selling or surrendering of land to finance infrastructure costs and public space requirements. In all cases when displacement cannot be avoided, the displacement will be performed based on Resettlement Action Plans (RAPs) developed and implemented on the basis of the principles set out in the RPF.

Through adequate stakeholder engagement it will be essential to encourage the local community's input (in addition to land owners and local government stakeholders' involvement) at an early stage to foster a sense of joint ownership and responsibility over the long term.

Further, Project works execution may be associated with a number of key areas of impact including:

- Disruption of traffic and day-to-day life in populated areas;
- Temporary constraints in access to properties (houses, schools, public spaces, etc.);
- Damages in public services (roads, electricity or water supply);
- Road accidents;
- House damages (e.g. structural damages/cracking) due to vibrations from operating heavy equipment; and
- Open excavations/ditches posing community safety accident risks workers and pedestrian accidents and injuries).

Part of the sub-components will be implemented in populated areas and will use the existing basic infrastructure (road network, water and electricity supply, public transport infrastructure). Part of the construction sites will be located in the vicinity of residential areas, schools and other public facilities which are likely to be affected by project construction works.

Construction work-force related risks include occupational health and safety, non-discrimination and equal opportunity in employment, worker's organizations, child labour, forced labour, grievance

mechanism. These are to be applicable to employed direct and contracted workers and primary supply chain workers.

During construction the Project has the potential to impact on neighbouring communities' health and safety through e.g. increased traffic and increased risk for accidents. Noise and dust emissions from construction activities could impact community and labour health (refer to impacts to physical environment). Also, the influx of workers to the Project Area during construction is likely to result in potential social impacts e.g. increased local population, demand on public and social services, and community stability. Anti-social behaviours, gender-based violence and/or the spread of transmissible disease (including e.g. Covid-19, or sexually infectious diseases) could also increase due to the itinerant nature of the construction workforce. However, during operation a positive impact for the community, including better quality of life e.g. due to improvement of transport, sewerage, water supply and ICT networks, is anticipated.

Continuous Stakeholder Engagement throughout project implementation is required. The objective of the SEF prepared for the Project is to provide applicable guidance and set requirements for the various elements of adequate stakeholder engagement and grievance management for the Project.

Stakeholder Engagement refers to a process of sharing information and knowledge, seeking to understand and plan to address stakeholder needs and interest in the Project and building relationships based on collaboration. Stakeholder consultation and disclosure are key elements of engagement and essential for delivery of successful projects ensuring adequate E&S performance.

6.5 Associated Facilities

Associated Facilities include all activities that are not developed under the umbrella of the 600 ha GCK development but are a consequence of the Project. Associated Facilities may include new access roads, public transport systems, transmission lines, substations, pipelines, and expansion of brickmaking in the wetlands, new quarry sites and borrow pits developed solely for the purpose of the Project. Associated activities may include traffic and transport, construction material sourcing and – deposition, major construction activities, presence of large numbers of workforce, water provision and wastewater treatment, waste management, other utilities.

Associated facilities will have additional impacts on the ecological and social environment, e.g. land acquisition, construction disturbances, land clearance in case the associated facilities are not included in the national impact assessment requirements, either as part of the future components, or standalone projects. The impacts and risks resulting from the Associated Facilities should be assessed and considered in the ESIA and control measures (including monitoring) should be included in the ESMP.

Example:

The development of the Project including housing and infrastructure requires a certain amount of raw material e.g. stone and sand. A strong increase of these local construction materials can lead to the development of new quarries as a direct result from the Project. If the quarries are solely developed due to the Project – but not financed as part of the Project - then they are considered Associated Facilities (otherwise if financed as part of the Project then they would be considered a component of the Project itself). Stone and sand quarrying causes damage to property, depletion of ground water, loss of fertile top soil, degradation of forest land, adverse effect on the aquatic biodiversity and public health. The impacts and risks resulting from the Associated Facilities should be assessed and considered in the ESIA and control measures (including monitoring) should be included in the ESMP.

It is important that development activities, whether servicing the Project as a whole or its sub-components, include an assessment of E&S risks and impacts inclusive of Associated Facilities, as well as management and monitoring proposals to control for such risks and impacts. This will also be necessary where the national legislation does not require any E&S assessment. Associated Facilities

will meet the requirements of the ESSs, to the extent that the Implementing Entity has control or influence over such Associated Facilities. It will be required to demonstrate the extent to which exercise cannot be controlled or influenced over the Associated Facilities by providing details of the relevant considerations, which may include legal, regulatory and institutional factors.

Recommendation for future sub-component ESIA:

Creating a list of pre-approved facilities could minimize the risks. The previously evaluated facilities such as quarries and borrow pits used for the Project will be listed to ensure that associated E&S risks are avoided and mitigated and only certified facilities are used for the Project. In addition, the individual sub-component ESIAs can refer to this list. This can avoid a simultaneous or repetitive assessment of the same Associated Facilities.

On a sub-component level the different sub-components of the Project might need to be considered associated facilities to each other, when they are financed differently. To avoid the moderate risk of neglected or ignored impacts of Associated Facilities, every sub-component ESIA needs to identify and assess the Project's Associated Facilities as per the WB ESS definition.

6.6 Cumulative Impact

A cumulative impact is defined as follows: the impact on the environment and community resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative effects can be positive as well as negative, depending on the discipline being evaluated. It is possible that some environmental disciplines can be negatively affected and others positively affected.

The Project will include several developments and interactions among existing features and future components. Sub-components being developed at the same time can cause cumulative impacts (e.g. land clearance, construction noise and other impacts, erosion, drainage, etc.).

Cumulative impacts are likely to occur in case different sub-components are built at the same time. In addition, other projects being realized in line with the rapid urbanisation in Kigali are likely to cause cumulative impacts as well.

- The impact's significance is expected to be moderate, due to the uncertainty and extent of the future activities planned.
- Other sub-components to be identified having a potential to cause cumulative impacts with the Project.

The cumulative impact of the works and presence of contractors and construction equipment at each sub-component area requires careful supervision to minimize risk of accidents and potential conflicts with the vehicle and pedestrian traffic. Cumulative impacts may also occur as result of concurrent activities of a number of contractors at the same area and which may apply different health and safety management processes. The subcomponents' ESMPs will require consideration of adequate safety culture and its constant reinforcement throughout implementation.

The sub-components that will be planned and assessed individually may have cumulative effects. Potential cumulative impacts will be considered during the assessment of future sub-components, as well as the overall E&S management and monitoring throughout the Project development.

Example:

Cumulative impacts occur from the combined effects over a given resource of a mix of different types of projects; for example, the development of a housing project, (access) roads and public

transportation system such as a metro line, transmission lines, telecommunication services such as telephone lines and broadband systems, water and sewer pipelines and other adjacent land uses happening simultaneously. Therefore, the impact from each individual project on the environment can be minor but the cumulative impact increases the significance of the impact. If all the above mentioned sub-components are developed at the same time, an increased impact of construction noise or community safety is highly likely.

6.7 Impact Assessment Overview

The following **Table 6-1** lists all potential impacts identified during this high-level assessment. The list is structured according to the World Bank ESS and shows not only the source of impact and the initial assessment, but also indicates the impact significance and proposed assessment and mitigation approach. Impact significance is shown colour-coded as:

- Minor (yellow)
- Moderate (orange)
- Major (red), or
- Positive impact (green).

The significance is assessed PRIOR to the application of the mitigation measures in the right-hand column. Assuming the appropriate implementation of these measures, the resulting impact significance should then be at a reduced significance level.

Table 6-1 Impact Assessment Table

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
1	Environmental and Social Management Plan (ESMP) and Management Plans (ESS1)	Major activities of the Project and sub-components will have E&S Impacts. Land clearance for construction activities will impact physical, biological and social environment. In addition, small works or activities not requiring an ESIA as per Rwandan legislation might cause impact on the physical, biological or social environment	Every project, component or activity needs to have a certain level of assessment, management and monitoring in place. All contractors engaged need to operate in a manner consistent with the requirements of the ESSs	*Moderate* significance, because some impacts might be neglected or ignored by these activities, which currently not require any assessment or action.	■ Apply the impact assessment and management processes defined in the ESMF, as well as the attached tools. ■ Develop and implement a robust and detailed ESMP or equivalent for all Project activities. The ESMP needs to include the mitigation measures, monitoring requirements, responsibility, frequency, timeline, and costs for implementation. ■ The general ESMP needs to be accompanied by a set of specific management plans, as outlined in the ESSs below.
2	Associated Facilities (ESS 1)	May include access roads, transmission lines, pipelines, quarry sites etc. and associated activities such as traffic and transport, construction material sourcing and deposition, major construction activities, presence of large numbers of workforce, water provision and	Associated facilities will have additional impacts on the ecological and social environment, e.g. land acquisition, construction disturbances, land clearance in case the associated facilities are not included in the national impact assessment requirements, either as part of the future components, or standalone projects.	*Moderate*	■ Identify and assess the Project's associated facilities as per the WB ESS definition. ■ Include considerations for the associated facilities in all management and monitoring plans to be prepared in the future.

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
		wastewater treatment, waste management, other utilities, etc.			
3	Cumulative Impacts (ESS 1)	The Project will include several developments and interactions among existing features and future components. Sub-components being developed at the same time can cause cumulative impacts (e.g. land clearance, construction noise and other impacts, erosion, drainage, etc.).	There may be cumulative impacts related to land conversion, as well as livelihoods, emissions during construction etc. The cumulative impacts will result mainly during future stages, e.g. during construction of the Project's sub-components. Cumulative impacts are likely in case different sub-components are built at the same time. In addition, other projects being realized in line with the rapid urbanisation in Kigali are likely to cause cumulative impacts	The impact's significance is expected to be *moderate*, due to the uncertainty and extent of the future activities planned.	■ Other components to be identified having a potential to cause cumulative impacts with the Project. ■ The Project components that will be planned and assessed individually may have cumulative effects. ■ Potential cumulative impacts will be considered during the assessment of future components, as well as the overall E&S management and monitoring throughout the Project development.
4	Labour and Working Conditions (ESS 2)	Occupational Health and Safety during construction and operation of the Project	Construction projects can present risks to workers from small incidents to major accidents. This Project will involve major construction activities including earth works	Impact significance is rated as *moderate* since project activities such as housing/road construction are very common and standardised practices can be used.	■ Address workers' H&S and describe requirements for the H&S management. ■ Each sub-component to identify OHS hazards and risks. ■ Ensure that the occupational health and safety management and risk mitigation measures are detailed described in the ESMP. Consider the development of Project specific Occupational Health and Safety Management Plan, compliant with both the national requirements and international standards (WB) and best practice. ■ Ensure that adequate resources are dedicated for the OHS management

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
					during construction and include the requirement for HS performance in the contractors. ■ Monitor and report on OHS incidents and accidents. ■ Apply a worker's grievance mechanism (including access to workers engaged by contractors and subcontractors). ■ Include the OHS plan in all supplier contracts and evaluate the performance of the contractors based on the plan measures.
5		Worker's influx and management of worker relationships	Working conditions, terms and conditions of employment, as well as potential discrimination, and child labour (underage 16-18 years) poses a risk if not addressed adequately.	M*ajor* significance due to (i) expected workforce/workers influx, as well as amount of contractors and activities taking place simultaneously and (ii) influx construction workforce interaction with local residents with potential for GBV.	■ Develop and implement an HR/Labour Policy and a Labour Force Management Plan (or include equivalent mitigation measures in the ESMP) in line with Rwandan law, and where gaps exist, requirements of WB ESS2. The Plan should include requirements and mitigation/monitoring measures related and limited to the following topics: ■ Specific terms and conditions of employment (e.g. hours of work, wages, overtime, compensation, workers accommodation, etc.) need to be communicated to employees and contractors prior to any works conducted. They should be included in all the employment and supplier contracts. ■ Requirements to avoid (gender) discrimination (i.e. hiring process, compensation (including wages and benefits), working conditions and terms of employment, access to
6		Hiring temporary and permanent workers for construction and operation of the Project	The Project will provide a number of temporary and permanent employment opportunities Enhance local employment and procurement.	Implementation of adequate workforce management planning at the level of each sub-component has the potential for *positive* impacts on local employment and local economy in general.	

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
					training, job assignment, promotion, termination of employment or retirement, or disciplinary practices, measures to prevent and address harassment, intimidation and/or exploitation). ■ Exclusion of child and forced labour as per WB definition. Requirement for workers' rights to form and to join worker's organizations of and bargain collectively without interference. ■ Workers grievance mechanism and means of information, submission of grievances, follow up procedures, responsibilities, etc. ■ Procedures for demobilisation of the workforce are to be determined and support with finding new employment on completion of the Project. ■ It has to be ensured that clear management and monitoring procedures and indicators need to be formulated in the specific Plan or ESMP. These will also apply to contracted employment, community and primary supply workers (if employed by the Project). ■ As part of each sub-component ESMP, develop and implement, a GBV Management Plan at sub-component level, on the basis of the Gender Action Plan prepared for the Project.
7	Resources (ESS 3)	Raw materials and resources required for the construction and operation of the Project	Construction of the Project will potentially require substantial quantities of materials for construction and operation. Existing quarry sites could be utilized.	The sustainability of such resources at the extraction sites will be negatively affected, as they are not renewable in the short term. The extraction sites	■ The sources of raw materials shall be screened and considered as associated facilities. ■ The future ESIAs of project components shall provide information

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
				may be *moderately* affected in several ways including landscape changes, displacement of animals and vegetation, poor visual quality and opening of depressions on the surface leading to several human and animal health impacts.	on the suppliers and estimates of the quantities of materials that will be required for the construction and operation of the Project and will define the principles and practices to be adopted in sourcing materials. ■ Develop mitigation measures to be included into the ESMP with regard to resource use and efficiency.
8		Energy consumption	The Project will use energy during construction and operation. The Project needs to be designed and planned as energy efficient as possible.	*Minor* significance since energy efficiency is one of core principles of Project overall objectives,	■ Design of sub-components is to be planned in an energy efficient manner, including energy management considerations. Potential impacts need to be addressed in the ESMP developing specific mitigation measures with regard to energy use and efficiency. ■ The mitigation measures include the development of an energy management plan, choosing state of the art, energy efficient over inefficient technology and equipment
9	Soils (ESS 3)	Construction activities	There is a risk of spills of oils, fuel or other materials causing contamination of soils during construction.	*Moderate* risks associated with fuel storages and handling on unprotected land.	■ Adequate spill control and preventive erosion control and soil management measures will be applied as described in the ESMP (e.g. plan to retain trees and other vegetation, use of natural contours for roads and drainage networks, excavated drainage channels, design of drainage system)
10		Soil erosion	Due to the hilly nature of the Project Area, construction works and daily activities may cause soil erosion following vegetation clearing during rainy periods.	*Moderate* due to the construction activities taking place on hillsite.	
11	Water Environment (ESS 3)	Change of surface water regime due to Project activities Groundwater abstraction for	Impacts caused by use and abstraction of surface water and groundwater during construction and operation phase.	Although the sensitivity of the surrounding wetlands might imply a major risk, no high amounts of water abstraction are expected during construction.	■ An assessment of the affected rivers including baseline description (ecology, water flow and downstream users) against which potential impacts shall be conducted and

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
		construction and operation needs		Therefore, the potential impact is evaluated as *moderate*.	mitigation and monitoring measures need to be included in the ESMP. ■ Mitigation measures as per the ESMP include prioritising the use of rainwater/ storm water over surface water/groundwater abstraction by using harvesting equipment and systems on site.
12		Discharge of site run off during construction and operation (e.g. accidental spills)	There is a risk of water pollution from leaks and spills of hydrocarbons, wastewater and other materials, as well as poor management of construction runoff. Further, given the hilly site configuration, erosion and sediments transportation with the stormwater runoff into the water bodies is considered a risk for the project.	Excavation, earthworks and hilly configuration of the site poses risks for erosion sediment transport with the runoff into the water bodies. Due to the sensitivity of the surrounding wetlands and the proximity to Nyabarongo River, as well as the likelihood of occurrence, the impact is evaluated as *major*.	■ The ESMP will set out good site practices that will be adopted to minimise these risks. ■ Ensure implementation of adequate erosion control, sediment retention and storwmwater runoff management. ■ Ensure appropriate containment and disposal of construction wastewater, including sanitary water. ■ Ensure appropriate and safe storage of contaminants such as fuels, construction materials and wastes. Provide absorbent and intervention materials in sufficient quantities and at relevant locations for intervention in case of leakages/spills.
13		Improved Storm Water Runoff collection and discharge	Following the construction stage, during operation the Project infrastructure will result in improved storm water runoff collection, peak flows buffering/attenuation by employing green infrastructure techniques and measures aimed at increasing storm water infiltration rates.	*Positive* impact with implementation of embedded mitigation measures considered in the Project design.	■ Ensure overall concept as laid out in the masterplan regarding water design plan are integrated in detailed design of relevant sub-components.
14		Reduced Localized Flooding	GCK will increase the absorption of rain through various green infrastructure approaches, there will	*Positive* impact with implementation of embedded	

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
			be less storm water available to pond in roadways, homes and businesses.	mitigation measures considered in the Project design.	
15		Storm water Pollutant Reductions	Green Infrastructure techniques infiltrate runoff close to its source and help prevent pollutants from being transported to nearby surface waters. Once runoff is infiltrated into soils, plants and microbes can naturally filter and break down many common pollutants found in storm water.	*Positive* impact with implementation of embedded mitigation measures considered in the Project design.	
16	Waste (ESS 3)	Waste generated during construction and operation	The Project will generate construction wastes. Where these cannot be re-used or recycled, they will require disposal with the potential for impacts during transport and at the disposal site. During operation waste will be generated. Currently, final disposal point is an unsanitary landfill.	The magnitude of negative consequences related to E&S issues occurring from insufficient waste management is high. The current waste management situation In Kinyinya Hill combined with an nsanitary landfill as endpoint suggests a high likelihood and thus suggests a *major* significance of the topic.	■ Waste management related activities and/or components should be considered in the future assessment. The ESMP will define the principles and practices to be adopted in disposing of waste. This includes collecting and segregating wastes and ensuring safe storage and in line with legal requirements. Ensure disposal through waste contractors licensed for treatment/ removal/ recycling of each of the waste types. Excavation and construction activities might produce hazardous substances. Develop and implement a waste management plan including sound handling of hazardous waste (storage, transport, disposal) comprise emergency response provisions. ■ Waste streams shall be quantified based on the detailed design, including an assessment of potential waste minimization, recycling and re-use in the local economy.
17		Hazardous waste	Hazardous waste generated during construction may include spent oils, paints, solvents, batteries, chemicals, asbestos etc. These require sound on-site management that can be ensured trough adequate construction procedures enforcement. However available receiving facilities and infrastructure is limited.	Given limited availability of adequate hazardous waste disposal and management facilities the significance of risks associate with hazardous wastes disposal is considered *major*.	
18		Project Waste Management facilities	Project is considering incorporating waste management and treatment facilities for organic waste within the Project Area. Local collection and recycling stations are planned.	*Positive* impact with implementation of embedded mitigation measures considered in the Project design.	

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
19		Reduced Sewer Overflow Events	Using the natural retention and infiltration capabilities of plants and soils, the Project infrastructure will reduce the frequency of sewer overflow events by reducing runoff volumes and by delaying storm water discharges. This benefit may be critical in Kinyinya Hill, where there is no central sewage system, only septic tanks were constructed for some houses.	*Positive* impact with implementation of embedded mitigation measures considered in the Project design.	■ The preparation of a Waste Management Plan including considerations for hazardous streams and substances needs to be considered.
20	Air Quality & Climatic Factors (ESS 3, ESS 4)	Generation of construction dust	Various construction activities can cause dust generation. Dust can have a negative impact on the local communities and can also affect flora and fauna, as well as water quality. Construction of sub-components could take place at the same time, impacting dust generation in a cumulative way. In addition, air pollution is already a problem in Kigali in general.	*Major* significance, , dust and air pollution is already a problem in the area with Project construction activities only adding on to this issue. Sensitive receptors like the wetlands have been identified within the Project Area. In addition, cumulative impacts due to several sub-components built simultaneous are likely.	The ESMP will set out measures to minimise dust emissions during construction: e.g. traffic routes shall be selected carefully, modern vehicles shall be used which are maintained regularly. ■ Ensure watering of transportation roads during dry and windy conditions. Generally keep roads in good condition. Minimise areas of land cleared and undeveloped at any one time. ■ Cover truck loads with canvas to avoid dust blow. ■ Ensure optimal traffic routes. Enforce vehicle speed limits on unpaved roads. ■ Ensure appropriate stockpile management (friable materials) to minimise dust blow. Minimise drop heights for material transfer activities such as unloading of friable materials. Project needs to develop an Air Quality Management Plan as well as a traffic management plan (see ESS 4).
21		Increased road traffic	Increased traffic during construction and operation is source of dust generation due to the poor road conditions. Emissions from the trucks have the potential for adverse impacts on local air quality both in the vicinity of the Site.	*Major* significance, due to the cumulative impact of construction activities and related emissions to already existing air pollution issues in Kigali	
22		Air quality	Ambient air quality to be affected during construction, due to exhaust emissions and dust.	*Major* significance, due to the cumulative impact of construction activities and related emissions to already existing air pollution issues in Kigali	
23		GHG emissions	The Project-related activities during construction and operation causes	The effects are long-term.	■ Planned planting of trees and other vegetation supporting carbon sinking.

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
			the release of GHG emissions into the atmosphere.	Sustainable green infrastructure and design will be used to minimise GHG emissions and improve energy efficiency. Which leads to a *minor* significance of the impact.	In addition, energy efficient housing approaches will support the minimisation of emissions. ■ Quantifying GHG emissions during planning and monitoring during operations, in case of exceeding international thresholds for GHG emissions. ■ Annual monitoring is required ■ Appropriate mitigation measures will be defined in the ESMP.
24		Climate adaptation and resilience	Future climate change characteristics may have potential impacts on the Project design and integrity of the road and building structures. The core of the Project design focuses on increasing resilience to climate change by incorporating energy efficiency (e.g. water use, green energy, etc.) and resilient housing into planning and design.	The Project will incorporate and enhance the benefits of green infrastructure strategies for adapting to climate change, including *inter alia* reducing storm water flows, lowering heat stress e.g. by implementation of the green-blue corridors	■ The detailed design of the Project components shall consider climate change risks and hazards for the Project and appropriate adaptation measures will be defined in the ESMP. ■ Cumulative effects of the Project and its contribution to climate adaptation and resilience should be evaluated and communicated.
25	Noise & Vibration (ESS 3, ESS 4)	Noise and vibration generated by movement of construction vehicles on and offsite, operation of construction equipment, piling or blasting, diversion of existing local traffic during construction	Noise and vibration during construction poses a potential risk to the health of workers and to sensitive neighbouring receptors such as residential areas, schools, hospitals, churches and recreation areas. In addition, vibration can disturb people and cause damage to buildings.	*Moderate* significance, because although the duration of construction activities will be limited, sensitive receptors have been identified within the Project Area. During operation increased traffic might potentially have noise effects.	The ESMP will set out measures to be taken to minimise these risks including limits of working times and informing people about exceptionally noisy activities, which cannot be avoided. The ESMP will include provisions for noise and vibration management and follow international best practice according to IFC EHS guidelines. ■ Limit the hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas or close to residential houses (typically between 10 pm and 7 am). Avoid vehicle movements at night.

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
					■ Inform the affected communities about activities and mitigation measures. ■ Use of state-of-the-art technology and limit the number of machines operated simultaneously. ■ Ensure the use of modern and well-maintained equipment (e.g. use of silencers). ■ Set traffic speed limits. Verify drivers' behaviour with respect to driving speed and safety.
26	Landscape and Visual Component (ESS 3)	Presence of above ground structures during construction and operation.	Permanent aboveground structures such as the housing and infrastructure have the potential to impact on the landscape setting. Construction activities will result in a temporary effect.	The planned interventions are expected to permanently alter the landscape and current visuals of the Project Area. However, the consider components are not deemed adequate to significantly affect the landscape, therefore a *moderate* significance is assigned to the impact.	■ Impacts on landscape need to be taken into consideration during detail design of components. ■ Cumulative impacts of all components need to be considered. ■ During construction, effort will be made to reduce visual nuisance and landscape impacts.
27	Management of pesticides (ESS3)	Potential use of herbicides during construction and operation for vegetation clearance purpose. Potential use of pesticides for malaria prevention	It is expected that vegetation clearance will be needed for the developed areas. In case herbicides will be applied, this needs to be addressed accordingly. In case the Project activities include prevention of malaria spread, pesticides might have an impact on the surrounding habitats and community health and safety.	*Minor* significance of the impact is expected trough minimization and avoidance of pesticides use.	■ Develop a Pesticide Control Program or include equivalent measures in the ESMP including clear guidelines and instructions on the procurement, storage and use of pesticides. The Project will not use any pesticides or pesticide products or formulations proven to cause adverse impacts on human health and environment. These requirements need to be included in the supplier contracts.
28	Community H&S (ESS 4)	Improved human health	The Project aims for a clean and healthy environment which contributes to a higher quality of life (e.g. less air pollution due to	*Positive* impact on the quality of life for the community.	The following measures should be applied: ■ Include the security requirements in the Community Health, Safety and

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
			alternative transportation systems, sufficient public parks for recreation). In addition, the Project components and related activities are deemed to improve living conditions.		Security Plan based on a risk assessment and ensure that the Voluntary Principles on Human Rights (VPHR) and ESS4 requirements are addressed. ■ Inform the affected communities about activities and mitigation measures. ■ Use of state-of-the-art technology and limit the number of machines operated simultaneously. ■ Ensure the use of modern and well-maintained equipment (e.g. use of silencers). ■ Set traffic speed limits. Verify drivers' behaviour with respect to driving speed and safety. ■ Target signage and outreach activities to improve public awareness of traffic changes and potential hazards for high-risk sections of public roads, including near the site and laydown areas. ■ In case of security personnel at the site, ensure proper training and in the use of force and appropriate conduct toward workers and affected communities. ■ Shield lighting downwards towards the site to avoid side-spill. Avoid tall masts where possible. ■ Ensure vehicles and equipment are switched off when not in use. ■ Ensure optimal traffic routes to minimise lengths of travel while avoiding settlements if possible.
29		Improved Infrastructure	Project activities will lead to improvement of transport, sewerage, water supply and ICT networks. Such services are a prerequisite for the development in the region.	*Positive* impact on the quality of life for the community.	
30		Enhanced Security	During the construction and operation of the Project facilities, security will be enhanced in the premises of Kinyinya Hill and the houses through distribution of suitable security lights and presence of security guards.	This will lead to improvement in the general security in the surrounding area. *Positive* impact on the quality of life for the community.	
31		Construction of the Project	The Project has the potential to impact on local residents and neighbouring communities due to construction noise and air emissions. Accidents risks are associated with the construction traffic and residents access to ongoing construction areas.	Significance of the impact is *moderate*.	
32		Presence of construction	The influx of workers to the Project Area during construction is likely to	High likelihood of occurrence mainly during construction, since	■ Assess the potential resulting impacts and propose appropriate trainings,

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
		workers from outside the area	result in potential social impacts e.g. increased local population, demand on public and social services, and community stability. Anti-social behaviours and/or the spread of transmissible disease (including e.g. Covid-19, or sexually infectious diseases) could also increase due to the itinerant nature of the construction workforce. Gender-based violence is also a potential associated risk. There could also be positive impacts associated with increased local economic activity bought about by the construction workforce which should be captured and maximised.	a large number of workers is needed for the Project development. This concludes to a *moderate* significance.	recruitment procedures and policies in the ESMP to manage potential issues. ■ Ensure and monitor all contractors implement codes of conduct concerning employment and workforce behaviour (including but not limited to safety rules, zero tolerance for substance abuse, environmental sensitivity of the area, dangers of sexually transmissible diseases and HIV/AIDS, gender equality and sexual harassment, respect for the beliefs and customs of the populations and community relations in general). ■ Implement Project Gender Action Plan measures at sub-component level on the basis of a GBV Management Plans, as part of the sub-component's ESMPs.
33		Increased traffic	The Project has the potential to impact on neighbouring communities and those existing in the Project Area by construction traffic and additional traffic generated by the operation of the development. These will affect noise and air quality due to increased truck traffic during construction of the Project. Increased traffic will also affect road safety.	Magnitude of the impact is *moderate*. The magnitude of impact could become *Major* in case of any traffic incidents/accidents (possibly fatal).	Develop measures to mitigate the impacts including speed limits, drivers' training and informing the affected communities. ■ Schedule traffic activities to avoid peak hours on local roads if feasible. ■ Implement the Grievance Mechanism to be used by the community (see Stakeholder Engagement). ■ Ensure safe driving by Project personnel (e.g. through training/induction). ■ Organise carpools/buses for worker transportation where possible to avoid additional traffic pressure.

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
					■ Prevent storage of construction materials, equipment and machineries on traffic lanes. Ensure adequate monitoring and follow up procedures are included in a Traffic Management Plan/ESMP to ensure community safety with regard to traffic/road hazards on public roads. Include these measures in the supplier contracts.
34		Ecosystem services	The Project design integrates ecosystem values into the urban planning. The value of wetland ecosystem services is expected to increase as result of Project implementation with the wetlands being considered as living systems that will maintain or even improve their functionality as result of flood risks reduction, water quality improvement. However during the construction stage, land clearance and changes in land use may cause a temporary loss of and/or difficult access to ecosystem services.	*Moderate* significance due to temporary loss of or difficulties in access to ecosystem services during the construction stage.	On case-by-case basis, sub-components ESMPs are to include management measures aimed at minimizing impacts and access disturbance to ecosystem services by the local residents.
35	Displacement of Existing Land Uses, Property and People (ESS 5)	Permanent and temporary land acquisition for development of the Project	Land acquisition and economic resettlement are expected. Potential physical resettlement might take place.	The impacts on livelihoods and the potential physical or economic displacement are evaluated as *major*.	■ For every activity that might include acquisition of land and resettlement, the principles outlined in the existing Resettlement Policy Framework prepared for the Project need to be followed and included. These need to be considered starting from the initial concept and planning phase (to avoid resettlement to the extent possible, assessment of alternatives etc.) and should extend during the whole
36			Physical or economic displacement are expected. Current residential land is expected to be majorly used as residential areas by the Project, so physical displacement could be temporary (for the duration of construction of new housing) in	A permanent and significantly altered impact with a large magnitude and very likely to happen leads to a *major* significance of the impact.	

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
			specific cases. Land currently used for agriculture is expected to receive other uses causing permanent economic displacement. Impact on vulnerable groups is expected (e.g. informal land users, etc.)		lifetime of the Project and its components. ■ Land acquisition involving expropriation or resulting in physical and/or economic displacement will require the preparation of a LACP/RAP (covering physical and economic displacement aspects) to establish the land acquisition process, compensation and support provisions and grievance management (as part of stakeholder engagement). ■ The following aspects need to be addressed at the next stage of the Project in line with ESS5: ■ Provide a short project description and the impact of the Project on livelihoods. ■ The Project needs to collect baseline data with regard to the current land uses, properties, formal and unofficial land uses, structures, residences, identification of vulnerable people etc. within the area of intervention of the Project. ■ Provide information regarding the land acquisition process conducted to date and a gap analysis between the national standards and ESS5 and international best practice. ■ Demonstrate clearly that all PAPs using the land to be recovered are eligible for resettlement and compensation process regardless the degree of formalization on the land and assets they own and use. ■ Project needs to ensure that all affected people will be able to
37			Land acquisition and resettlement related to informal or non-existing ownership titles. The baseline indicates that informal housing in the Project Area exists. Residents of informal housing are considered vulnerable.	A permanent and significantly altered impact with a large magnitude and very likely to happen leads to a major significance of the impact.	
38		Resettlement during planning of future projects	Land acquisition and physical or economic displacement are expected.	*Major* impact	

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
					improve or at least restore their standard of living/ livelihoods in accordance with ESS 5. ■ The Project needs to ensure and document that assets are compensated to the full replacement costs ■ After investigating the applied compensation methodology and identifying the gaps between agreed payments and current market rates ■ Engagement and grievance mechanism: In line with ESS 10, the Project needs to ensure that meaningful participation of affected communities and persons will take place during the planning, implementation, monitoring, and evaluation of the compensation process, livelihood restoration activities, and relocation process. The Project needs to provide a Stakeholder Engagement Plan with focus on land acquisition and resettlement. This plan must at least allow to identify stakeholders, list all the meetings and events held (participants, subjects, outcomes, concerns) and present the methodology used to ensure the perspective of all stakeholders (including disadvantaged ones) be captured and considered in the resettlement design and implementation process. The plan must provide adequate access to project grievance mechanism in accordance with ESS 10.

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
					■ Vulnerable groups potentially affected need to be included. ■ The Project needs to provide information regarding the collaboration with UIA and other relevant agencies. If applicable, relevant arrangements need to be included in the Livelihood Restoration Plan and/or Resettlement Action Plan, including the specification of financial responsibilities (top-up rates).

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
39	Biodiversity & Nature Conservation (ESS 6)	Temporary and permanent land-take for the Project	Although no critical habitat was identified in the Project Area, land will be occupied permanently and temporarily during construction requiring clearance of existing vegetation and possible removal of habitats and species of nature conservation interest. The majority of vegetation is associated with agricultural land (scrub) and eucalyptus trees which are non native.	The significance is *minor* due to the urban/agricultural character of the area.	■ Primary data collection and field surveys for flora and fauna need to be undertaken to identify types of habitat and typical species in the affected area. This survey shall include the project-site and its surroundings, as well as any associated facilities. Where relevant, a critical habitat assessment shall be conducted (refer to impact on wetlands). The ESMP will include mitigation and compensation measures for the clearance of trees and plants and expected impacts to biodiversity in general. ■ Limit vegetation clearing to areas within the site boundary where it is absolutely necessary. ■ Avoid clearing mature trees. ■ Avoid off-road vehicle traffic. Use existing roads. ■ Ensure revegetation of cleared areas where possible after construction using native species.
40		Loss of vegetation and Biodiversity	Clearance of existing vegetation and possible removal of habitats and species of nature conservation interest.	The significance is *minor* due to the urban/agricultural character of the area.	■ Assess the occurrence of protected areas and/or natural/critical habitats at and around the construction site. Avoid these areas where possible through traffic management and site setup. ■ Carry out an assessment of protected species ■ Develop and implement mitigation and compensation measures for the clearance of trees and plants and expected impacts to biodiversity in general

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
41		Impacts on Fauna	Removal of habitats	The significance is *minor* due to the urban/agricultural character of the area.	See above
42		Encroaching of wetlands	There are wetlands in the proximity of the project site that the baseline information indicate as sensitive. The Nyabarongo River and wetlands have been identified as Important Bird and Biodiversity Area and Key Biodiversity Area.	*Major*	■ A detailed assessment of the wetlands shall be conducted as part of the future Project ESIA and in the framework of required primary data collection, and if deemed necessary a critical habitat assessment including suitable mitigation measures. This shall also include the wetlands potentially affected by the land conversion.
43	Archaeological & Built Heritage (ESS 8)	Excavation works during construction and land conversion	Construction of the Project may result in disturbing archaeological features and the discovery of unknown archaeological finds.	*Minor* significance, since there is no indication for known cultural heritage.	■ A Chance-finds-procedure needs to be prepared for the Project according to ESMF and needs to be shared with the contractors. ■ Ensure all chance finds of cultural heritage (e.g. graves, old ceramic, old building fragments) are reported immediately to the relevant authority. If possible, avoid excavation in the ultimate neighbourhood of a chance find, fence the chance find and await instructions from the competent authority.
44		Intangible Cultural Aspects	Cultural identity and way of living can be altered e.g. influx of foreign workers, increased migration and tourism	Social cohesion and blending with existing communities and the GCK houses and other facilities occupants, as well as workers during construction may pose a *minor* potential impact for conflicts.	■ Stakeholder engagement should take into consideration the cultural heritage aspects as defined in the Project's SEF and SEP-

	Impact Topic (WB ESS)*	Sources of Potential Impact	Initial Assessment	Expected Impact Significance	Proposed Assessment and Mitigation Approach
45	Stakeholder Engagement (ESS 10)	National legislation does not require continuous Stakeholder Engagement	Not conducted yet. Currently, stakeholder engagement is at an initial and non-systematic stage. Engagement has been carried out as per Rwandan legislation. Additional actions to achieve compliance with WB ESS10 are required.	*Major* significance due to the high profile, scale and duration of the Project, relevant number of interested and affected parties including vulnerable groups, potential expropriation and resettlement etc.	■ All the activities should take into consideration the ESS10 requirements and the Project's Stakeholder Engagement Framework and Stakeholder Engagement Plan. Future SEPs are to be prepared in accordance with the SEF, in consideration of gender issues and specifically identifying and addressing the needs of vulnerable groups.

7. HIGH - LEVEL ESMP

7.1 Mitigation Measures Implementation Approach

This High-Level ESIA has been prepared to identify and assess the potential E&S risks stemming from the future development within the 600 ha Project Area. As mentioned throughout the report at hand, the Project will be implemented via a number of sub-components, each of which will be subject to specific E&S assessment (and permits/approvals) as applicable under Rwandan regulations.

This High-Level ESIA provides an overall E&S context to facilitate alignment of the separate studies with the Project goals and standards, as well as to provide a scoping basis for the sub-component ESIAs to be developed.

General mitigation measures for the Project impacts (the future development within the 600 ha Project Area) as identified in **Section 6** above were taken forward and detailed in the high-level ESMP (**Section 7.2**).

On the basis of the high-level ESMP supplemented by the step-by-step, detailed guidance in the ESMF, each sub-component will be subject to specific environmental and social impact assessment, which in turn will inform the sub-component environmental and social management planning.

This staged approach is explained in the following sections and further detailed in the ESMF.

7.2 High-Level Environmental and Social Management Plan

An ESMP is a project-specific package of management plans setting out how the requirements, management and mitigation measures, and the commitments resulting from the Project`s ESIA process will be implemented, managed and monitored. The ESMP will generally lay out information such as the person responsible for implementing the project commitment, any monitoring requirements and associated standards or thresholds, the timing of monitoring, check methods and corrective actions.

The High-level ESMP lays out a set of actions that need to be implemented during the construction and operations of the Project, and by whom.

Table 7-1 sets out a comprehensive list of E&S commitments by key themes that would need to be fulfilled by the Project Implementing Agency and the Project, during the construction and operation activities. As described earlier, key themes may be subject to one or more specific management plans that provide greater detail. The mitigation measures taking into consideration the impacts and the general mitigation measures identified in **Chapter 6**, and thus may change depending on the specificities of final Project design.

Recommendation:

A substantial amount of excavation material is expected from construction activities. It is recommended to set up an interactive management platform to offer the possibility for material exchange amongst the sub-component developers. For example, material that has been excavated at one sub-component construction site can be reused as a filler at a neighbouring construction site to avoid unnecessary transport trips and avoid creating new borrow sites and disposal areas. Coordination between the different sub-components under an overarching plan could enable this exchange of material, so that a surplus of soil in one sub-component of the project can compensate for a shortage in another. The platform could also serve for other types of construction materials.

A further indicative list of best practice mitigation measures according to the IFC EHS Guidelines is included in the Best Practice Mitigation Tool in **Appendix A**. The General EHS Guidelines contain information on cross-cutting environmental, health, and safety issues potentially applicable to

subsequent projects. Other mitigation measures are more tailored towards each individual sub-component project and ultimately based on the outcome of the individual ESIAs.

Environmental and Social Management System

The vehicle for the integrated management and implementation of ESMP and associated Environmental and Social Procedures is an Environmental and Social Management System (ESMS). An ESMS consists of four elements planning, doing, checking and acting (**Figure 7-1**).

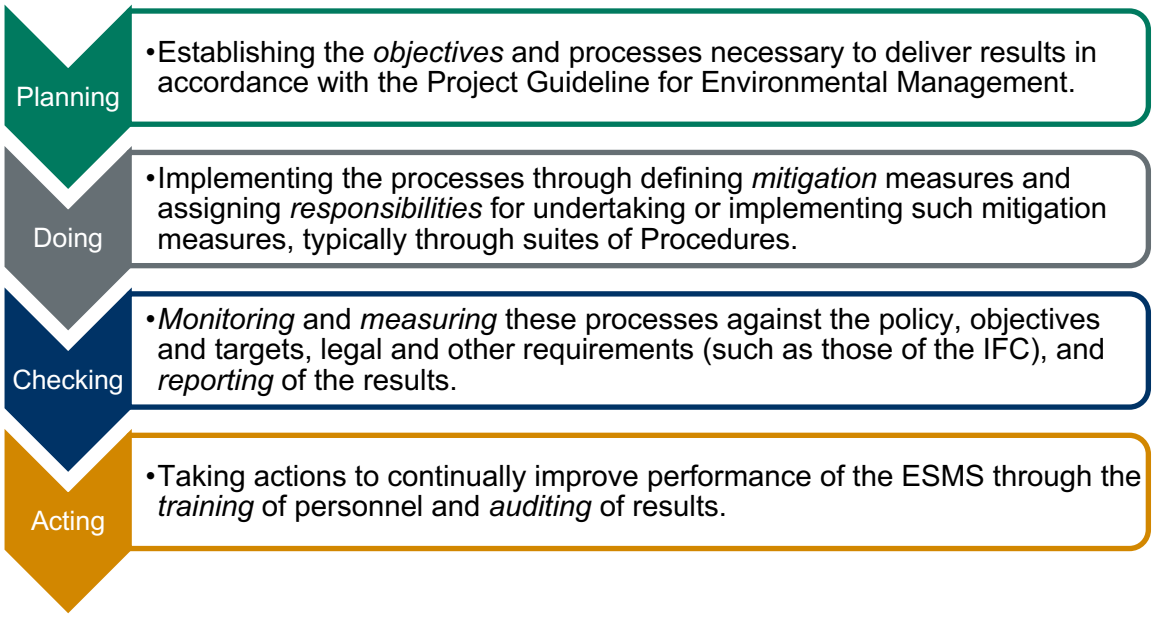


Figure 7-1 Environmental and Social Management System

An ESMS is implemented by the relevant PIE to:

- Assist management in establishing priorities for environmental and social impacts;
- Provide a mechanism for ensuring that the existing ESMP and associated Procedures are updated to include the measures identified in the ESIA, and that these measures are implemented;
- Track changes in national legislation and/or Lender standards so that they can be addressed in a timely manner;
- Provide a framework for compliance auditing and inspection programs;
- Ensure environmental and social (including Project induced health issues) continue to be integrated into business decisions;
- Provide a framework for mitigating impacts that may be unforeseen or unidentified until construction or operation is underway;
- Encourage and achieve appropriate environmental and social performance and awareness from all employees and contractors; and
- Provide assurance to regulators, stakeholders and lenders that their requirements with respect to environmental and social performance are being managed.

The developer and the tendered contractor may already have a corresponding management system in place including e.g. OHS guidelines, code of conducts. Nevertheless, an overarching ESMS is necessary to cover specific topics and guaranteeing the compliance with Applicable Standards.

Monitoring

Further, developers of the sub-component projects will undertake a monitoring program to ensure that the actions of all Project-related organisations and staff are aligned with the requirements in the ESMP. During the construction period this monitoring will be more intensive than during the subsequent operations period. This monitoring will require specialists to be in the field and checking the contractor works with respect to environmental and social protection, as well as health and safety of workers and the public. Where necessary, the relevant PIE may be obliged by international Lenders to provide periodic reports on the monitoring and status of ESMP implementation, and in addition the Lenders will conduct their own monitoring periodically to confirm the status.
The PIE will be required by the Lenders of a sub-component to provide periodic reports on the monitoring and status of ESMP implementation, and in addition the Lenders may conduct their own monitoring periodically to confirm the status.

Table 7-1 High-Level Environmental and Social Management Plan

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
	E&S Assessment and Management					
1	Cumulative impacts from existing features and future components	ESS 1-10	■ Include potential cumulative impacts during the assessment of future components, as well as the overall E&S management and monitoring throughout the Project development	ESIA, ESMPs and monitoring plans in place, addressing cumulative impacts	Sub component developer and contractor	Monitor cumulative impacts during Project development
2	Associated Facilities	ESS 1	■ Identify Associated Facilities as per WB ESF. ■ Assess associated Project facilities/ infrastructures a separate project-related ESIA or in a separate study. ■ Include impacts from associated facilities in Project's management and monitoring plans.	ESIA assessing associated facilities Associated facilities integrated in the Project's E&S processes	Sub-component Developer and Contractor	Review project-related ESIAs
	Occupational and Community HS & Labour and Working Conditions: standalone plans such as: "H&S Management Plan", "Site-security Management Plan", "Workforce Management Plan" can be developed, grouping key mitigations centred on their respective themes.					
3	Occupational Health and Safety; Working Conditions	ESS 2	Prepare an OHS Plan based on the occupational risks and hazards identification	OHS Plan in place	Sub-component Developer and Contractor	OHS performance Incidents/accidents reported
4			Provide H&S Training to the construction workforce (including sub-contractors, temporary workers and drivers)	Training performed and recorded	Sub-component Developer and Contractor/	Check Training records
5			Ensure site premises are provided with appropriate fencing (where applicable) and lighting. Use hazard notices/signs/barriers to prevent access to dangerous areas.	H&S planning of construction site done, items installed	Sub-component Developer and Contractor	Random site inspection
6			Ensure speed limits on site and on transporting routes.	Speed signs installed	Sub-component	Random site inspection

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
					Developer and Contractor	
7			Ensure the use of Personal Protective Equipment (PPE) for workers.	PPE used on-site by workers	Sub-component Developer and Contractor	Random site inspection
8			Maintain high standard in housekeeping on site.	Good housekeeping on-site	Sub-component Developer and Contractor	Random site inspection
9			Ensure the workforce has access to primary healthcare on site, providing prescriptions and vaccinations.	Healthcare available on site Medical surveillance records	Sub-component Developer and Contractor/	Random site inspection Review of grievance records Review of medical records (in case not confidential)
10			In case more than 35 workers are present on site, ensure that a hospital, medical clinic or a health centre can be reached within a period of 45 minutes.	Medical centres in the proximity of the site.	Sub-component Developer and Contractor/	Medical centres in the proximity of the site identified once prior the commencement of works
11			Ensure provision of welfare facilities at the Project site, including shaded welfare areas, bathrooms, and potable water. Provide hygienic, adequate facilities for workers, ensuring toilets and changing rooms be separated to male and female employees.	Welfare facilities provided at site	Sub-component Developer and Contractor	Random site inspection
12			Provide housing conditions in accordance with all applicable health and safety regulations and norms by ensuring the provision of adequate space, supply of water, adequate sewage and garbage disposal system, appropriate protection against heat, cold, damp, noise, fire and disease-carrying animals, adequate sanitary	Appropriate housing conditions for workers	Sub-component Developer and Contractor	Random site inspection Worker interviews

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
			and washing facilities, ventilation, cooking and storage facilities and natural and artificial lighting, and in some cases basic medical services.			
13			Ensure that the workers camp and construction areas are open only to formal employees.	Access controlled	Sub-component Developer and Contractor	Random site inspection
14			Prepare accident and incident reporting	Accident and Incident register Worker's grievance mechanism	Sub-component Developer and Contractor	Workers grievance mechanism log Random site inspection
15	Labour Rights	ESS 2 ESS 1, IFC/EBRD Worker's Accommodation: processes and Standards	Prepare a Workforce or Labour/HR Management Plan	Workforce or Labour/HR Management Plan in place	Sub-component Developer and Contractor	Site Inspection
16			Provide workers access to and ensure awareness about the Grievance Mechanism	Grievance Mechanism in place and grievances recorded	Sub-component Developer and Contractor	Review of grievance register
17			Ensure minimum legal labour standards as per ILO regulations (child/forced labour, no discrimination, working hours, minimum wages) are met	Grievance Mechanism Records, Training recorded	Sub-component Developer and Contractor	Inspection reports (also from labour authorities), Review of grievance register and training record
18	Community Health and Safety	ESS 4	Prepare a Community Health and Safety and Security Plan, along with Code of Conduct.	Plan in place	Sub-component Developer and Contractor	Review of grievance register
19			Ensure all contractors implement codes of conduct concerning employment and workforce behaviour (including but not limited to safety rules, zero tolerance for substance abuse, environmental sensitivity of the area, dangers of sexually	Workers Code of Conduct Grievance Mechanism records	Sub-component Developer and Contractor/	Review of grievance register

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
			transmissible diseases and HIV/AIDS, gender equality and sexual harassment, respect for the beliefs and customs of the populations and community relations in general).			
20			Outreach activities to improve public awareness of traffic changes and potential hazards for high-risk sections of public roads, including near the site and laydown areas. Ensure that site areas are provided with appropriate security, fencing, signage and lighting. Use hazard notices/signs/barriers to protect children and other vulnerable people from harm and prevent access to non-workers.	Warning signs Minutes of Meetings	Sub-component Developer and Contractor	Inspection if traffic routes, Review of grievance register
21			In case of security personnel at the site, ensure proper training and in the use of force and appropriate conduct toward workers and affected communities.	Training Records	Sub-component Developer and Contractor	Review of training records and grievance register
22			Develop and conduct appropriate trainings and apply recruitment procedures and policies to avoid social tensions, increases in crime, prostitution and to pressures on local services (health, leisure, police, etc.) or incidence of diseases such as HIV/AIDS posed by the temporary presence of construction workers.	Recruitment policy	Sub-component Developer and Contractor	Review of training records and grievance register
23	Communicable Diseases: Harming the community's health	ESS 4	Report any occurrence of any communicable diseases amongst the workforce (STD, HIV/AIDS, TB, malaria and Hepatitis B and C) and set up disease prevention programme if needed.	Communicable Diseases Register	Sub-component Developer and Contractor	Review of diseases register and disease prevention programme if available.
24	Housekeeping	ESS 2 ESS 4	Maintain high standard in housekeeping on site. Construction materials and light equipment should be stored properly.	Visual verification of good housekeeping on-site	Sub-component Developer and Contractor/	Random site inspection

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
25	Fire Prevention, Emergency Response Planning	ESS 2 ESS 4	Prepare and implement an emergency response plan.	Emergency response plan	Sub-component Developer and Contractor	Regular site inspection
26			Ensure minimum first aid provisions on site. (suitably stocked first-aid kits; a person, respectively an adequate number of first-aid helpers and ensure that staff and workers are informed about first-aid arrangements)	Suitable first aid kits on site Ensure the presence of first aid helpers in all shifts First aid certificates	Sub-component Developer and Contractor	Regular monitoring of first aid kits Review of First Aider Certificates Review of number of First Aiders required by local legislation
27			Ensure immediate cleaning of any spills and remediation of contaminated areas after construction.	Workers trained. Emergency response team (ERT) is in place	Sub-component Developer and Contractor/	Random site inspection after spill events One-time inspection after construction Review of training records Review of ERT
28			Provide necessary fire prevention equipment on site in line with applicable regulations.	Fire prevention equipment in place;	Sub-component Developer and Contractor	Regular site inspection
29			Provide necessary prevention equipment and teams on site in line with applicable regulations to respond to emergency scenarios e.g. fire, explosion, floods, natural hazards etc.	Prevention equipment and team is in place Training performed and recorded	Sub-component Developer and Contractor	Regular site inspection Review list of equipment Review of ERT Review of training records
	Resource Efficiency: a standalone "Energy Management/Efficiency Plan" can be developed, grouping key mitigations centred on management of resource use.					
30	Energy consumption during construction and operation	ESS 3	Identify energy sources and needs. Include efficiency aspects in the project development.	Monitoring Plan ESMP	Sub-component Developer and Contractor	Monitoring records

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
			Consider energy efficiency aspects in the tender documentation for technology and equipment. Monitor the energy consumption of the Project.			
31	Raw materials	ESS 3	Identify sources of raw materials for construction. Ensure they are included in the assessment and management plans (e.g. as associated facilities)	Monitoring Plan ESMP	Sub-component Developer and Contractor	Monitoring records
	Ambient Air Quality and Climate: a standalone "Pollution Prevention and Control Plan"; can be developed, grouping key mitigations centred on Project atmospheric emissions.					
32	Dust emissions (especially in dry conditions)	ESS 3, ESS 4	Ensure watering of transportation roads during dry and windy conditions. Generally keep roads in good condition.	Watering conducted, roads in good conditions	Sub-component Developer and Contractor	Random site inspection, inspection of roads
33			Cover truck loads with canvas to avoid dust blow.	Trucks covered	Sub-component Developer and Contractor	Random site inspection
34			Ensure optimal traffic routes. Enforce vehicle speed limits on unpaved roads.	Speed limit signs Driver Training Records	Sub-component Developer and Contractor	Random site inspection
35			Ensure appropriate stockpile management (friable materials) to minimise dust blow. Minimise drop heights for material transfer activities such as unloading of friable materials.	No extensive dust blow	Sub-component Developer and Contractor	Random site inspection
36	Emissions from equipment and vehicles	ESS 3, ESS 4	Use equipment and vehicles in appropriate technical conditions. Provide emissions control equipment where applicable (e.g. filters).	Technical Specification Sheet	Sub-component Developer and Contractor	Each time new equipment/vehicle is used at the site Random site inspection on regular basis

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
						Review of grievance records
37			Use low sulphur content fuels, in line with legal provisions in force as well as local availability.	Technical Specification Sheet	Sub-component Developer and Contractor	Random site inspection
38			Ensure optimal traffic routes to minimise lengths of travel while avoiding settlements if possible.	Optimal routes chosen	Sub-component Developer and Contractor	Random site inspection
39			Ensure vehicles and equipment are switched off when not in use. Sensitise drivers.	Engines switched off	Sub-component Developer and Contractor	Random site inspection
40			Quantify greenhouse gas (GHG) emissions. In case of exceeding international thresholds for GHG emissions (100,000 tons of Scope 1 and 2 CO2e emissions per year), conduct annual monitoring. Develop a monitoring plan with baseline data to compare emission rates during construction and operation.	Emissions monitoring plan	Sub-component Developer and Contractor	Monitoring records
	Noise and Vibrations: a standalone "Pollution Prevention and Control Plan"; can be developed, grouping key mitigations centred on management of nuisance such as sounds and vibrations.					
41	Harming health of workers/ employees/ neighbours) at the construction site and from construction traffic	ESS 2; ESS 3; ESS 4; IFC EHS General Guidelines	Limit the hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas or close to residential houses (typically between 10 pm and 7 am). Avoid vehicle movements at night.	No work conducted between 10pm and 7 am/ Grievance Mechanism	Sub-component Developer and Contractor	Random site inspection, Review of filed grievances, review of timesheets of workers
42			Locate stationary equipment (such as power generators) as far as possible from nearby receptors (e.g. worker resting areas, populated areas and environmentally sensitive areas). Make sure that noise levels	Distances between equipment and receptors are kept	Sub-component Developer and Contractor	Once prior to commencement of works

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
			do not exceed 120db in case of equipment or vehicle use.			
43			Inform the affected communities about activities and mitigation measures.	Attendance List, information notification, etc.	Sub-component Developer and Contractor	Monitoring Plan
44			Use of state-of-the-art technology and limit the number of machines operated simultaneously.	Grievance Mechanism	Sub-component Developer and Contractor	Spot checks, Review of filed grievances
45			Ensure the use of modern and well-maintained equipment (e.g. use of silencers).	Technical Specification Sheet	Sub-component Developer and Contractor	Random site inspection
46			Set traffic speed limits. Verify drivers' behaviour with respect to driving speed and safety.	Speed limit signs Driver Training Records as part of Induction training	Sub-component Developer and Contractor	Random site inspection, Review of training records
47			Plan vehicle routes to avoid settlements where possible.	Safest routes selected, Grievance Mechanism	Sub-component Developer and Contractor	Review of traffic routes, Review of filed grievances
48			Use protective hearing equipment for workers conducting noisy activities.	Protective hearing equipment used.	Sub-component Developer and Contractor	Random site inspection
	Traffic and Transport: a standalone "Traffic and Transport Management Plan" can be developed, grouping key mitigations centred on management of vehicle use.					
49	Increased traffic due to construction and operation activities	ESS 4	Prepare a Traffic and Transport Management Plan for the Project.	Traffic Management Plan in place	Sub-component Developer and Contractor	Random site inspection
50			Schedule traffic activities to avoid peak hours on local roads if feasible.	Peak hours on local roads avoided,	Sub-component	Review of filed grievances

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
			Implement the Grievance Mechanism to be used by the community (see Stakeholder Engagement).	Grievance Mechanism	Developer and Contractor	
51			Ensure that work site boundaries and limits are in accordance with plans agreed upon in advance. All construction activities should be carried out within boundaries.	Marking the borders of works site boundaries and usage of warning signs	Sub-component Developer and Contractor	Site inspection prior to commencement of activities.
52			Ensure safe driving by Project personnel (e.g. through training/induction).	Driver Training Records as part of Induction training	Sub-component Developer and Contractor	Review of training records
53			Organise carpools/buses for worker transportation where possible to avoid additional traffic pressure.	Carpools/ buses used	Sub-component Developer and Contractor	None
54			Prevent storage of construction materials, equipment and machineries on traffic lanes.	Dedicated storage areas in place	Sub-component Developer and Contractor	Random site inspection
	Waste, Wastewater, Hazardous Substances: a standalone "Pollution Prevention and Control Plan"; can be developed, grouping key mitigations centred on management of chemical/hazardous substances.					
55	Pesticides management	ESS 3	Avoid the usage of any pesticides or pesticide products or formulations proven to cause adverse impacts on human health and environment. Develop a Pesticide Control Program including clear guidelines and instructions on the procurement, storage and use of pesticides. Include these requirements in the supplier contracts.	Pesticide Control Program Procurement register	Sub-component Developer and Contractor	Random site inspection
56	Waste and hazardous materials	ESS 3	Develop and implement a Waste Management Plan including considerations for hazardous waste and substances	Waste Management Plan in place	Sub-component	Random site inspection, Review of waste inventories

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
		IFC EHS Guidelines Waste Management Facilities IFC EHS Guidelines for Water and Sanitation			Developer and Contractor	
57			Collect and segregate wastes and ensure safe storage and in line with legal requirements.	Waste collection areas existent, waste inventories	Sub-component Developer and Contractor	Random site inspection, Review of waste inventories
58			Identify waste management facilities and waste management contractors.	Waste management contracts Waste transfer notes	Sub-component Developer and Contractor	Inspect waste management facilities Proof of Review of waste transfer records
59			Ensure disposal through waste contractors licensed for treatment/removal/recycling of each of the waste types. Ensure disposal or landfilling compliant with the WBESS.	Disposal through licensed contractors	Sub-component Developer and Contractor	Random site inspection, Inspect offsite waste disposal facilities if feasible contractors' certifications
60			Ensure appropriate and safe storage of contaminants such as fuels, construction materials and wastes. Provide absorbent and intervention materials in sufficient quantities and at relevant locations for intervention in case of leakages/spills.	Safe storage of hazardous materials, Spill remediation equipment in place.	Sub-component Developer and Contractor	Random site inspection
61			Minimise the waste production to the extent possible.	Records of waste production are kept Waste Management Plan Training performed and recorded	Sub-component Developer and Contractor	Monitor (e.g. monthly) the amount of waste produced Review of training records
62			Document all waste related operations (type of wastes, quantities produced etc.).	Storage, transport and treatment of waste is documented Waste transfer notes Waste inventories	Sub-component Developer and Contractor	Review of waste transfer records Review of waste inventories

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
63			Implement appropriate secondary containment and spill controls for maintenance or refuelling works.	Containment and spill controls in place	Sub-component Developer and Contractor	Random site inspection
64			Ensure immediate cleaning of any spills and remediation of contaminated areas after construction.	Workers trained.	Sub-component Developer and Contractor/	Random site inspection One-time inspection after construction
65	Wastewater	ESS 3 IFC EHS Guidelines for Water and Sanitation	Reuse wastewater wherever feasible.	Detailed Design Wastewater reused	Sub-component Developer and Contractor	Random site inspection
66			Ensure appropriate containment and disposal of construction wastewater, including sanitary water.	Water disposal compliant with legal requirements	Sub-component Developer and Contractor	Random site inspection
	Soil: a standalone "Soil and Reinstatement Management Plan"; as well as a Topsoil management and Site Reinstatement Plan can be developed, grouping key mitigations centred on soil protection and site restoration.					
67	Soil erosion, altered soil layers; changes in soil structure (function for habitats, infiltration, etc.)	ESS 3	Ensure appropriate storing of topsoil removed. After construction, topsoil will be used as backfill for restoration of the area.	Topsoil stored and re-used	Sub-component Developer and Contractor	Random site inspection
68			Limit stockpile height to 2 m maximum to avoid soil compensation.	Stockpile height limited	Sub-component Developer and Contractor	Random site inspection
69			Reinstatement of construction working area to the best possible after construction activities are completed.	Reinstatement completed	Sub-component Developer and Contractor	One-time inspection after construction
70			If construction takes place on inclined surfaces/slopes, ensure preventive erosion control measures are applied (e.g. plan to retain trees and other vegetation, use of	Preventive erosion control measures in place	Sub-component Developer and Contractor	Random site inspection

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
			natural contours for roads and drainage networks, excavated drainage channels).			
	Water and Hydrology: a standalone "Water Management Plan" can be developed, grouping key mitigations centred on the management of water abstraction and use.					
71	Water Use: Decreased groundwater tables and changes in surface water course (e.g. discharge) caused by the abstraction of surface water during construction phase	ESS 3	Prioritise the use of rainwater/ stormwater over surface water/groundwater abstraction by using harvesting equipment and systems on site.	Water harvesting equipment and use Measurement of water discharge at different intervals (daily, weekly)	Sub-component Developer and Contractor	Random site inspection
72	Drainage: Increased surface runoff	ESS 3	Include drainage and stormwater management in the Project planning.	Detailed design	Sub-component Developer and Contractor	Random site inspection
73	Increased surface water runoff/ flooding	ESS 3 ESS 4	Ensure to keep the following distances from permanent water course and outside of floodable areas; sensitive urban services and buildings (health centre, school, water supply for populations); any housing;	Marking the borders of works site boundaries in line with given limits and usage of warning signs	Sub-component Developer and Contractor	Site inspection prior to commencement of activities.
74	Surface Water: Degradation of surface water quality due to leaks and spills of hydrocarbons and other materials or poor management of construction runoff.	ESS 3	Restrict excavation activities during periods of intense rainfall. Use temporary bunding to reduce the risk of sediment, oil or chemical spills to the receiving waters.	No excavation during intense rainfall	Sub-component Developer and Contractor	Random site inspection Check weather forecast and inspect the site conditions prior to excavation
75	Surface water/rainfalls: interruption of excavation work due to entering water	ESS 3	Carry out excavation works in cut off ditches to prevent water from entering excavations.	No water entering excavations	Sub-component Developer and Contractor	Random site inspection
	Flora and Fauna: a standalone "Biodiversity and Ecosystem Services Management Plan" can be developed, grouping key mitigations centred on habitats, biodiversity and ecosystem services. In case specific sensitivities are identified on specific habitats/species, a Biodiversity Action Plan can be devised with additional measures.					
76	Areas of high ecological value: Disturbance of ecosystems,	ESS 6	Assess the occurrence of protected areas and/or natural/critical habitats at and around	areas of ecological value avoided	Sub-component	Random site inspection

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
	destruction of habitats including encroaching of wetlands		the construction site. Avoid these areas where possible through traffic management and site setup.		Developer and Contractor	
77			Contractor	Inspection of construction practices.	Avoid natural habitats disturbance.	No habitats disturbed
78			Carry out a wetlands assessment, especially for the Nyabarongo River and wetlands, to propose further management measures.	Wetlands assessment	Sub-component Developer and Contractor	Inspection
79			Ensure to stay out of surrounding wetlands areas.	Pre-construction survey to make sure that site is not in wetlands areas	Sub-component Developer and Contractor	During site selection
80			Carry out a survey or primary data collection or the presence of flora and fauna species in the Project Area.	Protected species assessment	Sub-component Developer and Contractor	Inspection
81	Site Clearance- Vegetation removal and habitat disturbance: Disturbance of ecosystems and violation of ecosystem services	ESS 6	Limit vegetation clearing to areas within the site boundary where it is absolutely necessary.	Vegetation clearing minimal	Sub-component Developer and Contractor	Random site inspection
82			Describe the methods of vegetation clearance. Ensure that no chemicals/pesticides are used, burning of vegetation is restricted etc. Do not clear vegetation more than two months in advance of operations	No use of fires or chemicals on site Marking the borders of works site boundaries Usage of warning signs	Sub-component Developer and Contractor	Site inspection prior to commencement of activities. Site inspection during site clearance
83			Avoid clearing mature trees.	No mature trees cleared	Sub-component Developer and Contractor	Random site inspection
84			Avoid off-road vehicle traffic. Use existing roads.	No off-road traffic	Sub-component	Random site inspection

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
					Developer and Contractor	
85			Ensure revegetation of cleared areas where possible after construction using native species.	Revegetation completed	Sub-component Developer and Contractor	One-time inspection after construction
86			Avoid clearance of trees and plants to the extent possible. Apply offset strategy in case vegetation clearance occurs	List of existing vegetation and overview of compensation means for the respective vegetation to be removed	Sub-component Developer and Contractor	Random site inspection
87	Light: Disturbance of fauna due to light emissions	ESS 6	Shield lighting downwards towards the site to avoid side-spill. Avoid tall masts where possible.	Light nuisance minimised	Sub-component Developer and Contractor	Random site inspection
	Site Rehabilitation: a standalone "Soil and Reinstatement Management Plan"; as well as a "Topsoil management and Site Reinstatement Plan" can be developed, grouping key mitigations centred on site restoration.					
88	Vegetation	ESS 3 ESS 6	Ensure revegetation and restoration of cleared areas where possible after construction using native species.	Revegetation completed	Sub-component Developer and Contractor	One-time inspection after construction
89	Health & safety	ESS 4	Ensure that rehabilitated areas do not pose health and safety risks (such as holes, ponds).	Reinstatement completed	Sub-component Developer and Contractor	Inspection after construction Inspection after heavy rainfalls and snow
90	Infrastructure, logistics		Reinstatement of construction working area to the best possible after construction activities are completed.	Reinstatement completed	Sub-component Developer and Contractor	One-time inspection after construction Inspection after heavy rainfalls and snow
91			Rehabilitate borrow areas, backfill material stockpile sites and access roads, where applicable.	Rehabilitation completed	Sub-component	One-time inspection after construction

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
					Developer and Contractor	Inspection after heavy rainfalls and snow
	Socio-Economic: standalone plans such as: "Stakeholder Engagement Plan", "Livelihoods Restoration Plan", "Land Acquisition and Compensation Plan" can be developed grouping key actions centred on their respective themes.					
92	Stakeholder Engagement and Grievance Mechanism	ESS 10 ESS 1 ESS 5 ESS 8	Engage/ communicate with communities and plan sufficient time for participation. Ensure regular consultations with the local authorities and communities regarding the management of construction. See also SEF/SEP provisions.	Minutes of Meetings Grievance Mechanism	Sub-component Developer and Contractor	Review of grievance register
93			Initiate an efficient Grievance Mechanism to allow potentially affected individuals to voice their concerns on the Project. See also ESMF provisions.	Grievance Mechanism in place, grievances recorded	Sub-component Developer and Contractor	Review of grievance register
94	Land acquisition and land take	ESS 5	Avoid to the extent possible land take of both formal and informal land owners/land users. If land take is inevitable, no forced eviction should take place. Owners should be compensated prior to access to land. Engage with the local community to understand the land ownership and land use.	Grievance Mechanism Management Plan for Land Acquisition and Compensation if needed	Sub-component Developer and Contractor	Once during site selection Review of grievance log Follow up of land acquisition/compensation process
95	Displacement of Existing Land Uses, Property and People	ESS 5	Prepare a resettlement action plan (RAP) or a LACP as per the RPF requirements	RPF and RAP/LACP in place	Sub-component Developer and Contractor	RPF principles fulfilled
96	Resettlement of residents	ESS 5	Prepare a resettlement action plan (RAP) as per the RPF requirements	RPF and RAP in place	Sub-component Developer and Contractor	RPF principles fulfilled
97	Local Employment & Procurement: Employment of locals for project-related activities.	ESS 2 ESS 3	Ensure local population will be preferred for temporary and long-term employment for the Project as Project personnel, where appropriate. To the extent that the supply of	Local Procurement and Employment Records	Sub-component Developer and Contractor	Revie procurement and employment rules and records

	Topic/Potential Impact	Reference Standards	Mitigation, Management and Enhancement Measures	Means of Verification	Re-sponsibility	Monitoring Procedure
			goods and services can be provided locally, the local community and economy (suppliers, service providers) will be selected.			
98	Changes to landscape	ESS 3 ESS 8	Minimise visual impacts	Visual inspection and comparison with adjacent undisturbed areas.	Sub-component Developer and Contractor	Review of grievance records
99	Damage to livelihoods	ESS 5	Engage with the local community and potential affected households to understand their needs and identify the risk of damage to their livelihood basis through the Project (e.g. take of pasture land, lack of access to water).	Minutes of Meetings Grievance Mechanism records	Sub-component Developer and Contractor	Review of grievance register and meeting minutes
	Cultural Heritage: a standalone "Cultural Heritage Management Plan" can be developed, grouping key mitigations centred on the protection of potential cultural heritage features, including the development of the Chance Finds procedure.					
100	Damage of Cultural Heritage (tangible and intangible)	ESS 8	■ Prepare a Chance Finds Procedure which has to be shared with all contractors. ■ Ensure all chance finds of cultural heritage (e.g. graves, old ceramic, old building fragments) are reported immediately to the relevant authority. ■ If possible, avoid excavation in the ultimate neighbourhood of a chance find, fence the chance find and await instructions from the competent authority. ■ Grant access to sacred places (if any) for local communities. ■ Include intangible aspects during project construction and operation.	Chance Finds Procedure in place Training records, records about chance fiends Communication reference to affected communities	Sub-component Developer and Contractor	Random site inspection

8. IMPLEMENTATION AND NEXT STEPS

This High-Level ESIA identified a number of potential impacts associated with the overall Project based on the assumed activities and possible sub-components of the Project outlined in the Project GCK SPA Masterplan. Significant impacts on the following receptors would be expected:

- Air Quality;
- Water/Groundwater;
- Waste Management;
- Noise and Vibration;
- Landscape and Visual;
- Flora and Fauna;
- Ecosystem Services;
- Community and workers H&S; and
- Displacement (economic and physical) as result of Project land acquisition and land access.

Furthermore, cumulative impacts from sub-components being implemented at the same time and other developments in the urban area of Kigali are expected.

The above-indicated impacts are to be managed at the level of each sub-component as explained in the following sections and further detailed in the ESMF.

8.1 Sub-Component ESIA and E&S Management Approach

The detailed design and development of sub-components will apply the listed high-level mitigation measures as part of the design. In addition, a further, iterative assessment will be undertaken to review potential impacts in greater detail. This will also help to provide site-specific mitigation and enhancement measures, as appropriate. Each Project sub-component is to be appraised at an early stage to determine associated E&S risks and impacts. This entails undergoing a screening process aimed at identifying and appraising the type and scale of any E&S risks and impacts that may arise from the sub-component implementation. For this purpose each sub-component will be screened for potential E&S impacts and assigned a category from “A” (high risk) to “C” (low risk). This initial E&S screening and categorization will define the path as well as the type and scope of E&S impact assessment a specific sub-component will undergo. The ESMF details the requirements for E&S assessment of sub-components including screening and categorisation as per good international industry practice. The High-Level ESIA at hand was conducted when no sub-components were yet planned in detail. As soon as sub-components are in the detailed design stage, a further sub-component E&S assessment must be carried out. Further, in accordance with the categorisation outcome, the ESIA process and key requirements are highlighted and exemplification of methodologies and processes to be employed at the various ESIA stages are provided to allow for high-quality sub-components ESIA development, in line with good international industry practice.

The objective of each single sub-component project ESIAs is to identify E&S risks and potential impacts caused by the respective sub-components and to define appropriate management and monitoring measures of these risks applying the hierarchy of avoidance, mitigation and - if avoidance and mitigation are not feasible – compensation of impacts. The impact assessment will be based on primary baseline data collection, as well as site surveys and studies.

The Project, as well as its individual components shall have a robust ESMP and accompanying specific ESMPs in place, as outlined in the high-level ESMP and the requirements of the ESMF. The

sub-component ESIA will identify the embedded E&S controls[90] and will define the mitigation measures required to address the residual E&S impacts and ensure that the Project requirements, regulations and standards are met throughout the sub-component implementation. Addressing the E&S risks and impacts represents a Project commitment, more specifically a commitment by the developer to ensure that these measures will be implemented during the execution of all sub-components through a combination of processes implemented by the sub-components Developers and their contractors.

With regard to the identified potential risks on people and livelihood, the objectives of the RPF need to be taken into consideration during the components' feasibility and design. In case the ESS5 is triggered, a RAP, LRP and/or LACF will be prepared separately to address land requirements, affected properties, displaced persons and livelihoods due to the proposed Project, as per the requirements of ESS5 and the Project's RPF.

The stakeholder engagement activities throughout the project cycle will be guided by the existing SEF and future SEPs.

8.2 Responsibilities

The overall Project will be developed, constructed and operated by a Special Purpose Vehicle (SPV) established by FONERWA/Rwandan Government as implementing entity. The SPV will be a company operating under the Rwandan law and will employ required staff to ensure the successful implementation and management of the Project and relevant sub-components.

The developers will be ultimately responsible for ensuring that all Project activities comply with the Project E&S policies, regulations and standards. Developers will therefore establish an appropriate organizational structure, responsibilities and practices and will ensure the resources required for the E&S management during the Project execution. Suggested key E&S management staff roles to be employed by the developers including their envisaged main responsibilities are summarized in the ESMF. The needs of the E&S management and supervision positions may greatly vary pending on number of ongoing sub-components and their stages of implementation at a given time. The developers will therefore have to adjust their organisation in response to staffing needs at a given Project development stage. As flexibility is required, in addition to own/employed staff this could be also supplemented based on external support (e.g. specialist staff seconded specialised services providers for determined period as needed).

It is the responsibility of the sub-component Developer to ensure that E&S compliance is achieved at sub-component level according to the requirements and processes defined in the ESMF. In attaining this objective, the sub-component Developers will establish and maintain through their own E&S Management System a documented process to identify risks and impacts, implements adequate management measures to mitigate these in line with the Project Requirements, Regulations and Standards. Sub-component Developers E&S monitoring of their own activities and of their contractors and subcontractors E&S performance.

The management of Project E&S risks and impacts will follow a "cascade" approach, reflecting good international practice as indicated below:

- The guiding requirements are outlined in the ESMF, the SEF and RPF (collectively, the "Safeguard Documentation" package);
- Developers have overall responsibility for the implementation of the E&S Safeguard measures;

90 The term "Embedded Controls" refers to those protective measures that are anyhow already included in the approved Project Design, such as air filters, wastewater treatment, etc. – therefore such items do not normally need to also be added as a further commitment.

- Sub-components Developers - on this basis – are in charge of developing their own sub-component ESMPs and supporting E&S Management Plans;
- Sub-components Developers must implement and enforce the sub-component ESMP measures in their own activities and in those of any of their subcontractors and other services providers;
- Sub-Components Developers undertake periodic monitoring of the sub-component ESMP implementation ;
- Existing regulatory institutions (CoK/REMA) conducts their own overall monitoring of the sub-components Developers' performance (and reports to Project Lenders, where applicable);
- Project Lenders (when applicable, through in-house experts and external advisors) conduct independent audits of E&S safeguards implementation throughout Project execution.
- In parallel, Project/sub-components go through the established Rwandan environmental permitting framework and monitoring by authorities.

Updates/revisions to the sub-components ESMPs and subordinated E&S management plans will be implemented as appropriate to reflect the ongoing findings of the monitoring and audits, corresponding staff training or in response to regulatory changes affecting the Project. This approach is aimed at providing a robust system with continuous improvement of Project E&S risks and impacts management.

8.3 Management of Change

The High-Level ESIA is an initial screening of the overall development and is not subject to any updates. As the Project progresses and the development of individual sub-components will change the physical, biological and social environment in the Project Area, the sub-component ESIAs will include relevant updates to capture any changing impacts. The baseline section of this High-Level ESIA aims to capture the current environment and provides recommendations for future baseline studies where necessary from the current point of view. The baseline description as well as the respective recommendations might be outdated in the course of the Project progress.

All frameworks included in the E&S documentation for the Project (i.e. ESMF, SEF and RPF) are living documents that may be periodically updated by FONERWA as the Project progresses.

Any subsequent sub-component will create an individual ESIA if deemed necessary according to the categorisation aligned to this High-Level ESIA and commitments/guidance in the corresponding ESMF, SEF and RPF. The frameworks, the High-Level ESIA and where relevant, sub-component ESIAs, will be the key management tools and Project documents to be updated as the Project or sub-components progresses. The ESMF and supporting overarching management plans that may be identified for the overall Project and/or sub-components will adopt a Management of Change process throughout the life cycle of the Project, in accordance with FONERWA's Management of Change Procedure.

The development of the different overarching management plans at the outset of the design phase for the Project/sub-components is a fluid process with the management objectives and performance indicators tailored to the current design and objectives of the Project. The ESMF and these over - arching plans utilize to the extent possible existing Project knowledge to fully address the actual E&S impacts of the Project at the time and allow flexibility in environmental and social management decisions made on the Project.

Management of Change relates to any temporary or permanent alteration (physical/procedural) that deviates from the original design, assets, systems, processes, operations, products, organization and personnel.

Changes covered in the Management of Change approach may include:

- Project design physical changes (e.g. layout, location, constructions methods, etc.);
- Baseline documents upon which these physical changes are designed and constructed e.g. design documents;
- Organisation changes e.g. patterns of work, changes to key personnel that have the potential to affect HSE, Sustainability (including the transition between current and future arrangements);
- Within E&S changes, high potential risks include:

- any proposed change in the Project which falls outside the area covered by the ESIA and which would require substantial additional environmental and social assessment and mitigation measures to ensure that it does not irreversibly impact important environmental and/or social resources; and/or
- any potential Project impacts on the environment, neighbouring communities, occupied residences, utilized social infrastructure, or cultural resources that are not detailed in the ESIA or which fall outside the Project footprint, where one or more of the following conditions are encountered or otherwise might be irreversibly impacted:
    - Significant cultural properties where physical recovery will be required;
    - Critical habitat or legally protected and internationally recognized areas;
    - Endangered or critically endangered species; and/or
    - Permanent exceedance of Project environmental effluent and emissions standards; and/or
    - Physical relocation or economic displacement of households not covered by the principles and types of compensation measures addressed in the relevant plans (e.g. Resettlement Framework).

To ensure management of change of the ESMP, the following actions will be implemented:

Request for change: including details on the type and timing of changes and nature of change. The proposed change will be assessed by a MoC Team that will be formed by the change requestor and technical/HSE departments involved, depending on the complexity and criticality of the change, other figures might be also involved.

Risk evaluation: being a crucial step in the MoC process. The objective of the risk assessment is to fully assess the potential impact of the change and ensure that no new or additional risks are introduced. All existing inherent risks (including environmental, health, safety and social risks and contextual risk changes) will be identified, analysed and treated.

Potential risks shall be categorized as follows:

- High potential means that risk-reducing measures need to be implemented with immediate effect;
- Medium-high potential means that risk-reducing measures need to be implemented in the short term;
- Medium potential means that risk-reducing measures can be implemented if deemed necessary based on a cost/benefit evaluation;
- Low potential means that no further measures are deemed necessary.

Review and implementation of measures: including the preparation of a plan for implementing the measures that the Change Owner shall ensure application. The plan should establish specific deadlines and responsibilities for each of the identified measures, including also a communication strategy to make all affected parties aware.

Approval and Closeout: documenting of the results of the review.

As a result of the change, some internal Project documentation might need to be updated or simply new ones issued, these shall be listed with the appropriate due and completion dates, responsibilities and verification. Likewise any training needs identified, shall be presented with the type of training, the target staff that will take part of the training and due and completion dates.

Project leadership (i.e. FONERWA) will be notified for major / significant changes proposed by the project classified as having high potential HSE/Sustainability risks. No notification will be for changes with low or medium potential risk. For medium and medium-high potential risk changes, a description will be included in the monthly and annual report, as applicable. A medium-high and high potential risks change will be notified to the Implementing entity of at least 15 days before the relevant change is implemented. For high potential risk and medium and medium-high risk changes, Implementing entity and Project leadership may require the Independent E&S Consultant to review and provide comments and confirm that the change does not affect the significance of the HSE/Sustainability risks.

APPENDIX A BEST PRACTICE MITIGATION TOOL