



Environmental Social Impact Assessment (ESIA)
Byumba Urban Roads Rehabilitation/Upgrading Project (15.53Km)

REPUBLIC OF RWANDA

MINISTRY OF INFRASTRUCTURE

RWANDA TRANSPORT DEVELOPMENT AGENCY (RTDA)

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

FOR

REHABILITATION, UPGRADING OF BYUMBA URBAN ROADS IN GICUMBI DISTRICT
(15.53Km)

GICUMBI DISTRICT

December 2022



Environmental Social Impact Assessment (ESIA)
Byumba Urban Roads Rehabilitation/Upgrading Project (15.53Km)

DECLARATION





We, the undersigned, hereby declare that this ESIA Study Report represents the facts pertaining to the proposed **Rehabilitation, Upgrading of Byumba Urban Roads in Gicumbi District** by Ministry of Infrastructure (MINIFRA) and Rwanda Transport Development Agency (RTDA), Rwanda.

ON BEHALF OF RWANDA TRANSPORT DEVELOPMENT AGENCY (RTDA)

Sign: _____

Dated: 22nd December 2022

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**Environmental Social Impact Assessment (ESIA)
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ACRONYMS

AADT	Annual Average Daily Traffic
AfDB	Africa Development Bank
AIDS	Acquired Immune Deficiency Syndrome
AMSL	Above Mean Sea Level
BP	Bank Procedure
CBD	Convention on Biological Diversity
CESMP	Contractor Environmental and Social Management Plan
DDS	District Development Strategy
DPR	Detailed Project Report
DPs	Displaced Persons
EA	Environmental Assessment
EAC	East Africa Community
EDPRS	Economic Development and Poverty Reduction Strategy
ESAPs	Environmental and Social Assessment Procedures
EIA	Environmental Impact Assessment
EICV	Integrated Household Living Conditions Survey
EMP	Environmental Management Plans
GBV	Gender-Based Violence
IESIA	Integrated Environmental and Social Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standard
EUCL	Energy Utility Corporation Limited
FS	Feasibility Studies
GDM	Road Geometric Design Manual
GDP	Gross Domestic Product
GRC	Grievance Redress Committee
GoR	Government of Rwanda
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
BUR	Byumba Urban Road
HIV	Human Immune Deficiency Virus
IL	Impact Level
IWRM	Integrated Water Resources Management
LCV	Light Commercial Vehicle
LHS	Left Hand Side
MDGs	Millennium Development Goals
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government
MoH	Ministry of Health
MoE	Ministry of Environment
MIDIMAR	Ministry of Disaster Management and Refugees
MININFRA	Ministry of Infrastructure



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OHS	Occupational Health and Safety
OS	Operational Safeguard
OSC	One Stop Center
NAP	National Action Plan
NAPA	National Plan of Action
NBSAP	National Bio-diversity Strategy and Action Plan
NCC	National Consultative Committee
NGOs	Non-Governmental Organizations
NFP	National Forest Policy
NMT	Non-Motorized Transport
NR	National Road
NWP	National Water Policy
PAPs	Project Affected Persons
PCRMP	Physical Cultural Resources Management Plan
POL	Petroleum, Oils and Lubricants
PM	Particulate Matter
QA	Quality Assurance
RAP	Resettlement Action Plan
REG	Rwanda Energy Group
REMA:	Rwanda Environment Management Authority
RFA:	Rwanda Forest Authority
RoW	Right of way
RMB:	Rwanda Petroleum and Mining Board
RSB:	Rwanda Standards Board
RTDA	Rwanda Transport Development Agency
RURA	Rwanda Utilities Regulatory Agency
RWB	Rwanda Water Board
RSTMP	Strategic Transport Master Plan for Rwanda
SEA	Sexual Exploitation Abuse
VAC:	Violence Against Child
VCT	Voluntary Counseling and Testing
WASAC	Water and Sanitation Corporation
WMP	Waste Management Plan



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EXECUTIVE SUMMARY

Introduction

Rwanda a landlocked country with a high population density, is not linked to the regional railway networks and the road sub-sector represents more than 80% of transport services. Recently, the Government of the Republic of Rwanda (GoR) received funding from the African Development Bank (AfDB) for the Transport Sector Support Project aiming to improve accessibility and mobility between the towns of Base, Gicumbi, Rukomo, and Nyagatare and the living conditions of the population within its zone of influence. The Upgrading works of Base – Gicumbi – Rukomo road (51.54 km) was completed while the financial commitment stood at 69% with 31% anticipated project savings. The Government of Rwanda therefore proposed that project savings be utilized for additional works of rehabilitation and upgrading of Byumba urban roads (15.53 km) Project in Gicumbi District. The project financing agreement is valid till 31st December 2022 with possibility of period extension and the implementing agency is Rwanda Transport Development Agency (RTDA).

As per the environmental requirements and guideline for the development projects in Rwanda, this project of rehabilitating and upgrading Byumba urban roads in Gicumbi District will trigger negative environmental and social impacts therefore should undergo the Environmental and Social Impact Assessment (ESIA). Both the AfDB Integrated Safeguards System (ISS) and Rwanda’s EIA regulations categorizes this project as category 1 – high risk, meaning that it is likely to cause significant and irreversible adverse environmental and social impacts. An Environmental and Social Monitoring Plan (ESMP) has been developed as the implementable piece of this ESIA summarizing and encompassing all identified impacts associated with different project activities, corresponding mitigation measures, cost implications as well as their implementation and monitoring responsibilities.

The activities to be undertaken include mainly the rehabilitation and upgrading of selected five urban roads in Gicumbi District to 6 and 7m. The selected five roads are Byumba-Ngondore Road (11.7km), road to Cathedral (2.00km), road to Byumba Stadium (0.77 km), Access road to Miyove (0.72km) and Byumba Center to Market road (0.34km). The main objective of the ESIA study is to identify environmental and social impacts associated with the rehabilitation and upgrading works of Gicumbi urban roads and also develops the appropriate mitigation measures for each identified negative impact to ensure that roads rehabilitation and upgrading works under this project are environmentally sound and contribute to the development of environmental assets and that the project complies with Rwanda laws and AfDB’s E&S policies.

The methodology used to carry out the environmental and social impact assessment for this project include scoping to highlight key issues, impacts and boundaries; literature review of project documents, key E&S legislations and policies; site visits; baseline studies; stakeholder consultation and engagement which was undertaken in the month of September 2021 and reached more than 651 people comprising of 521 males and 130 females; analysis of the project alternatives, impacts assessment and development of Environmental and Social management and monitoring plan and compilation of this study report.

Project Description

The proposed project is to be implemented in Gicumbi district located in the Northern province. The project will cross two out of twenty-one sectors of Gicumbi district. The sectors to be crossed by the project are Byumba and Miyove. The main objective of the project is to improve transport infrastructure within the city of Gicumbi to support the project area’s social-economic



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development through improved transportation of goods thus improving the life of residents of Gicumbi District. The project is also expected to boost the development and expansion of Gicumbi City, especially along the Byumba-Ngondore road which connects the new residential area targeted by Gicumbi City's Master Plan. The current condition of these roads is that two roads are earth and need upgrading, while the remaining three are asphalt and cobblestone roads in need of rehabilitation of the road surface and the drainage system. The project components include the rehabilitation of right of way, construction of culverts, and longitudinal drainage structures as well as construction of walkways as shown in the table below. Expansion of the carriageway and the sidewalk triggered involuntary resettlement and land acquisition as the project require 10.5 ha of land. A Resettlement Action Plan (RAP) has however been prepared to mitigate on the negative impacts affecting 436 PAPs.

Road ID	Length (Km)	Number of Culverts		Design speed	Carriageway width (m)	Shoulder/sidewalk width (m)
		Pipe culvert	Box Culvert			
BUR 1	11.7	43	6	50/80	7.0	1.0/1.5
BUR 2	2.00	4	-	50	6.0	1.5
BUR 3	0.77	2	-	50	6.0	1.5
BUR 4	0.72	2	-	50	6.0	1.5
BUR 5	0.34	1	-	50	Keep existing	1.5
Total	15.53	52	6			

Additionally, the implementation of the project will require sources of construction materials and facilities such as campsites, borrow pits, dumping sites, quarry areas, crusher sites, etc. to support the project operation. Given that the ancillaries facilities sites have not been identified at this stage, once the contractor will be on board, he will be responsible to identify the location of these sites in compliance with environmental and social consideration. The ESIA has also assessed the availability of construction materials such as steel, cement, sand, water, aggregates, murrum and stones as well as man power. The project is expected to cover 18 months with a budget of 18.4 million USD for the rehabilitation works of Gicumbi urban roads and 0.86 million USD for consultancy services for monitoring and supervision of the rehabilitation works.

Baseline conditions

The baseline environmental conditions focused on the physiography of Gicumbi District including the relief, geology of soil, the climatic condition, water environment, ambient air quality and noise environment. Briefly, Gicumbi district is characterized by hilly and mountains area with altitude ranging between 1500 to 1800m (AMSL) and 90.4 % of the district land is hilly. The dominant soils (90%) are lateritic and granites. For the climatic condition, Gicumbi district receive an annual rainfall of between 1,300 mm and 1,600 mm and experience annual mean temperatures between 10°C and 18°C. Overall, the country's four climatic seasons are represented by the long rainy season: March to May, and the short rainy season: September to November. These seasons alternate with the long dry season: June to August, and the short dry season: December to February.



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Rwanda's hydrological network is divided into two main drainage basins: the Nile Basin covers 67 % of the Rwandan territory and drains 90 % of the country's waters, and the Congo basin covers 33 % of the Rwandan territory and drains 10 % of the country's water. Gicumbi District hydrography belongs to the Nile basin in the catchment of Muvumba and Nyabarongo with hydrographic networks consisting of rivers and streams. Gicumbi District has many rivers and stream which guarantee the availability of water in the district for various uses as well as for the proposed project. These streams and rivers lie in the plain forming swamp. Such rivers include Mwange, Mulindi, Mutulirwa, Walufu, Muyanaza, Yaramba and Gaseke among others. All the mentioned rivers are not crossed by the project roads, but two of them are located in the vicinity of project roads; including Mulindi river located at 230 m from the endpoint of Byumba-Ngondore road, and Yaramba river located at 6.8km from the mid-point of Byumba-Catedral road, and the starting point of Byumba-Ngondore road. Gicumbi district has one lake; Muhazi which spreads on four districts including Gicumbi, Gatsibo, Rwamagana, and Gasabo. Lake Muhazi is located at a 45.6km of aerial distance from the project zone.

The ambient air quality in Gicumbi is good based on the record of the air quality monitoring station in Gicumbi. For the noise environment, there are no statistics on noise pollution in Rwanda. However, in Gicumbi District; the status is good given that it is a rural district with little activities that may produce noise. In term of social baseline conditions, the District covers a surface area of 829 sq. km. Its population in the last population census of 2012 was 572,000 (EICV3, 2012) of which 298,012 (52.1 %) are women and 273,988 (47.9 %) are men, with a density of 480 inhabitants per sq. km; the population is more in rural than urban area. Gicumbi district is ranked eleventh at the national level and fourth in Northern Province with 83.7% of individuals aged six having at some time attending school. At the national level, the average level of literacy rate is 69.7% and it is 82.6% in urban road areas and 67.3% in rural areas. The study also included a socio-economic survey of the PAPs which provided information such as age, sex, marital status, level of education, family size, employment status, economic activities and sources of income, vulnerability, livestock data and housing conditions. More details on the baseline condition of the project area are presented in chapter 4.

Legal, Policy and Institutional Framework

The proposed project is also expected to align with and or governed by the policy, legislative and regulation frameworks of Rwanda as well as those at international level ratified by the Government of Rwanda. Some of the relevant policies and legal requirements that are relevant and was applied to this ESIA include:

- The Constitution of the Republic of Rwanda 2003, as amended in 2015
- National Policy on Environment for Rwanda 2003
- National Land Policy 2004
- National Transport Policy 2008
- Intergrated Water Resources Management Policy 2011
- Environmental Health Policy
- Mining Policy 2010
- National Sanitation Policy 2016
- National Forestry Policy 2010
- Revised National Gender Policy 2021
- Law N° 70/2013 of 02/09/2013 governing biodiversity in Rwanda
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- Sector guidelines for Environmental Impact Assessment (EIA) for road development projects in Rwanda
- Covid-19 management guidelines
- National Strategy for Transformation (NST1/2017-2024)
- National Wetlands Conservation Program
- Road Maintenance Strategy 2008
- National Biodiversity Strategy and Action Plan 2003
- Sustainable Development Goals (SDGs)
- The African Development Bank's Integrated Safeguards System (ISS) including the five Operational Safeguards (OS)

The institutional framework is diverse and include Gicumbi District, MINALOC, RTDA, MININFRA, MoE, RFA, RWB, RLMUA, RMB, RDB, REMA. They are expected to contribute in the implementation of the proposed project with the aim of providing guidance on the requirements of the policy, legislative and regulations discussed in this environmental impact assessment report. In addition to the national institutions, the Africa Development Bank (AfDB) as the sponsor of the project is also expected to support and enforce compliance of the project with E&S requirements.

Public Consultation and Participation

During the preparation of this ESIA, the public consultation was carried out as an integral part of the social assessment process of the project. The consultation was used as a tool to inform and educate stakeholders about the proposed project to collect their concerns including worries, interest and expectation on the proposed project, thus informing its planning and implementation arrangements. The consultation done focused on the local authority, local community and PAPs. The dates for those consultation meeting are 07th, 08th and 09th September 2021 for the District authorities, local authorities at Sector, Cell and Village level, and finally for the local community around the project roads respectively. The total participants in those meeting are 651 people including 130 females and 521 males. The main output from the consulted group is that they all appreciate the intervention of the project as it is expected to boost



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the income and improve their wellbeing. However, the worries and perceptions on the compensation of the properties to be affected by the project, the employment of local community, the road safety concerns, the relocation of utility in the right of way of the roads, issue of storm water from the road that may affect the community properties were pointed out and would be given attention during the project implementation.

Impacts Identification & Mitigation

From the identification of the potential impacts of the proposed project, the following are the most likely negative impacts to be caused by the project in its all phases (Construction, decommissioning and operation phases): Air pollution, increased noise Levels, Increased generation of solid waste and spoil soils from borrow and quarry sites, Land use change and loss of vegetation and biodiversity, Soil Pollution, Disruption in drainage pattern, water pollution, increased road embankments' landslides, increased Water Demand, Public Occupational Health and Safety risks, Temporal road congestion or closure, displacement of PAPs, Loss of water points, Road incidents and accidents, Encroachments into road reserve, Landscape degradation among others. The proposed mitigation measures of these negative impacts are described in chapter seven. Among the proposed measures there are compensation of the properties to be affected by the project, adopting sound storm water and wastes management practices, relocation of utilities to be affected, ensure that equipment in use is in good condition to limit the emission of gases and noise level, providing temporal and permanent roads signs to enforce road safety during construction and operation phases. The details of the proposed mitigation measures are summarized in chapter seven of this report.

Project Alternatives

This ESIA analyzed several alternatives with the aim of arriving at a development option, which maximizes the benefits while minimizing the adverse impacts. The "Do nothing"/without project alternative option for the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference of impacts with the existing environmental conditions. It however, involves the losses of potential environmental and socio-economic benefits to the local population and the nation as a whole, and quality of life would remain at a low level for many of those who live in the project intervention area.

The with project alternative will contribute to the socio-economic improvement and will have positive impacts on residents' life quality. It will improve and assure transport facilities for the residents of Gicumbi District stimulating socio-economic development of the area. The project scenario will catalyze commercial growth in the different centers and there will be better business opportunities for locals. There will also be savings in the vehicle operation cost (fuel, operation, and maintenance) due to the better road condition. Unfortunately, this option will negatively impact on land use, forests/trees, water, and noise and air pollution during the construction and operation phases. About 10.05ha of land is likely to be acquired for road rehabilitation and widening. However, the implementation of the project will take adequate consideration to avoid/minimize and mitigate the anticipated impact through the implementation of the ESMP. By analyzing both scenarios, With Project Alternative and "Do Nothing"/Without Project Alternative; the without project Alternative has been rejected, and with Project alternative is adopted.



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The following are the environmental and social management plan (ESMP) and environmental and social monitoring matrices developed in this study.

Environmental and social management plan matrix

Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
PROJECT PLANNING AND DESIGN PHASE					
Selection of Byumba Urban Roads	Conflict over project beneficiaries	Involve all the stakeholders in roads selection (organizing meetings, sites visits with stakeholders)	Planning stage	Districts Authorities, Opinion leaders, Private Sector, Local community	Covered
Road realignment	Loss of properties (land, houses & crops)	Integrate representatives of PAPs in the Project	Feasibility/Scoping study	Consultant, District, RTDA	Covered
		Compensate for lost assets as per the Rwanda Expropriation Law and AfDB involuntary resettlement operational safeguards	Planning stage	Gicumbi District, RTDA	Included in compensation cost (RAP)
Capacity building of staff	Poor monitoring of roads activities	Training on safeguards and monitoring	Planning & Construction	Gicumbi District, RTDA/SPIU Project staff	3,000,000
PROJECT CONSTRUCTION PHASE					
Earthworks (Roads construction)	Lack of follow-up of ESHS concerns during civil works on project sites	Mobilization of safeguards staff (Environmentalists, Social specialists; Occupational and Safety officers) to follow and implement various	Construction phase	Contractor	54,000,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
	Loss of beneficiaries' properties (land, trees, crops, houses & other structures)	Compensation for lost properties	Construction phase	Gicumbi District: Local authorities, District Land valuer & Hired a Certified valuer. GRCs members RTDA/SPIU Social Safeguards Specialist, Supervising Firm: Social	Included in compensation cost (RAP)
	Damages to public utilities (water supply line and electricity poles)	Relocation of public utility before its damages	Construction phase	Contractor, Supervising consultant, District authority, Utilities responsible institutions, RTDA Project Engineer)	Contract provisions
	Disruption in the drainage pattern	Proper design of drainage canals Construction of drainage canals as per the designs	Feasibility study phase	Contractor, Supervising consultant	Project cost
		Proper conveyance of excess water from the roads	Construction phase	Contractor, District road Engineer, Supervising consultant Environmentalist, RTDA-Project Engineer,	1,500,000
	Soil erosion causes water quality degradation and property damages	Avoid earthworks during heavy rains (mid-March to mid-May);	Construction works schedule	Contractor, Supervising Firm, District, RTDA Project	
		Disposal of unused stockpiled top soils before	Construction phase	Contractor, Supervising consultant (RE &	To be covered in ESMP for ancillary



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		rains		Environmentalists), RTDA-Project Engineer & Environmentalist	facilities
		Protection of road embankments/ slopes with vegetation to reduce landslides	Construction phase	Contractor and Supervising Consultant Environmentalists, District Agronomist & Environmentalists, RTDA Environmental Specialist	2,500,000
		Install proper road drainage, and silt traps were necessary to reduce silt	Construction phase	Contractors, Supervising Consultant-RE, District Road Engineer, RTDA - Project Engineer	Included in the project cost
	Soil pollution	Maintenance of motorized machinery and equipment in service stations	Construction phase	Contractor,	Included in the project cost
		Cleaning of the site and dispose of the construction spoils at the dumping site approved by the District	Construction phase	Contractor Engineer & Social/Environmental safeguards staff, Supervising Consultant: Resident Engineer and Environmental safeguards Expert, District Engineer and Environmental Officer /RTDA Environmentalist	Included in the above budget for the borrow/quarry management plan



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
	Water pollution	Provision of sanitary facilities (Mobile toilet, water, hand washing facilities)	Construction phase	Contractor Engineer & Environmental & Safeguards Expert, Resident Engineer & Environmental & Safeguards Expert, Supervising Firm, RTDA Environmentalist	5,000,000
		Provide impermeable area for bitumen storage, oil leakage and bitumen wastes	Construction phase		4,000,000
		- Provision of dustbins for waste collection, - Prevent runoff loaded with sediments and other materials from discharging to water causes. - Construction vehicles are to be washed at designated points and water containing pollutants such as cement, concrete, and fuels are to be discharged as per the environmental regulations.	Construction phase	Contractor	3,000,000
Increased road embankments' landslides		Construction works should be done during dry periods or low-intensity rainfall	Construction phase	Contractor Engineer, Resident Engineer, District road Engineer RTDA/Project Engineer	



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		Construction of stone masonry/pitching, retaining wall, and gabions on critical road embankment slopes	Construction phase	Contractor Engineer, Resident Engineer District road Engineer RTDA/Project Engineer	Included in the project cost
		Construction of diversion ditches upstream of the slopes with high landslide risks to control runoff water causing embankment sliding	Construction phase	Contractor Engineer, Resident Engineer District road Engineer RTDA/Project Engineer	Included in the project cost
		Planting trees along roads embankment	Construction phase	Contractor and Supervising consultant Environmentalists, District Environment and Forest Officers, RTDA Environmentalist	19,200,0000
	Health risks	Developing an Occupation Health and Safety management plan	At the start of the construction phase	Contractor Engineer & Environmental & Safeguards, Supervising consultant: Resident Engineer & Environmental & Safeguards Experts	1,000,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		Provision of protective equipment to workers	Construction phase	Contractor Engineer & Environmental & Safeguards Expert, Resident Engineer & Environmental & Safeguards Expert, Supervising Firm, RTDA/ Environmentalist	15,000,000
		Provision of sanitary facilities (Mobile toilet, water, hand washing facilities)	Construction phase	Contractor Engineer & Environmental & Safeguards Expert, Resident Engineer & Environmental & Safeguards Expert, Supervising Firm, RTDA Safeguards team	Included in the Water pollution Cost above
		Awareness campaigns for the prevention of communicable diseases (HIV/AIDS, Covid-19 etc.) for workers	Construction phase	Contractor & Supervising consultant Environmental and social Safeguards, RTDA-Project Safeguards staffs Environmentalist	4,5000,000
		Awareness campaigns for the prevention of communicable diseases (HIV/AIDS, Covid-19 etc.)	Construction phase	Contractor & Supervising consultant Environmental and social Safeguards,	1,500,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		<p>for the local community</p> <p>Awareness, sensitization and pieces of training to workers on occupational health and safety</p> <p>Undertake regular health checkups for employees</p> <p>Prepare emergency preparedness and response plan</p> <p>Appropriate health and safety measures such as fencing dangerous areas, and placing warning and safety signs.</p> <p>Undertaking annual health and safety audit of machinery and construction materials.</p>		<p>RTDA-Project Safeguards Environmentalist</p> <p>staffs</p>	
		<p>Availing of well-equipped First Aid facility</p>	<p>Construction phase</p>	<p>Contractor</p>	<p>2,500,000</p>
		<p>Provision of medical insurance to workers</p>	<p>Construction phase</p>	<p>Contractor, Workers</p>	<p>5,000,000</p>



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
	Increase of gender based violence cases, prostitution, and use of child labor	Reinforcement of the laws on child labor, sexual harassment/prostitution, and gender equity, child labor, sexual harassment/prostitution, and gender equity	Construction phase	Contractor, District, Supervising Consultant, RTDA, and other stakeholders in the District	1,000,000
		<p>Awareness meetings on GBV and VAC for local community and workers</p> <p>Preparation of gender mainstreaming plan to be implemented throughout the project duration.</p> <p>All employees are to sign a code of conduct against SEA, discrimination, and GBV</p>	Construction phase	Contractor, Supervising consultant, RTDA safeguards staff, District Vice Mayor in Charge of Gender and Family promotion, District Gender Officer, and other Stakeholders in the District	1,000,000
Other subproject management issues		Discussion meeting to resolve issues raised	Once two weeks during the Construction phase	Supervising Firm Contractors, Local Community, GRCs	2,400,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
	Air pollution due to dust and exhaust fumes	Spray water regularly when constructing roads to reduce the dust Cover stockpiles of sand, and soil during transportation. Wet crushing in quarries	Construction phase	Contractor's Engineer Supervising firm Engineer District Environmental Officer, RTDA Project Engineer & Environmentalist	Included in the project budget
		Use equipment and automobiles with certification of good working conditions from the "National Automobile inspection center" to avoid exhaust fumes	Construction phase	Contractor and Supervising consultant-RE	The contractor bidding cost
		Routine maintenance, and repair of trucks and machines by the contractor	Construction phase	Contractor	The project cost
	Noise Pollution	Restriction of activities creating lots of noise or irritations to normal working hours (7h00-18h00) to prevent noise for neighbors at night	Construction phase	Contractor Engineer & Supervising consultant-RE, Safeguards Expert, District	-



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		<ul style="list-style-type: none"> - Use equipment and automobiles with certification of good working conditions from “National Automobile inspection center” to avoid noise - Fit onsite generators with noise mufflers to prevent noise pollution. <p>Obtain relevant noise and vibration permits</p>	Construction phase	Contractor and Supervising consultant-RE	Coved above
	Loss of flora and fauna habitat	Limiting the construction activity within the RoW to reduce the extent of losing flora and fauna.	Construction phase	Contractor Engineer, Supervising consultant Engineer, District road engineer, RTDA project Engineer	
		Reinforcement of the law on environment protection and conservation	Construction phase	Contractor and Supervising Consultant Environmentalist & District and RTDA Environmentalist	1,000,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		Tree planting program to replace affected trees	Construction phase	Contractor Environmental & Safeguards Expert, Supervising Firm's Environmental & Safeguards Expert, District Environmental & Forest Officers, RTDA/ Environmentalist	Included in the budget for tree plantation
		Compensation for lost assets	Construction phase	Contractors Environmental & Social Safeguards Expert; -Environmental & Social Safeguards Expert of the Supervising Firm - District Land valuation & Environmental Officers RTDA/Social safeguards Specialist	Included in the cost for lost assets
	Road congestion /closure	Application of traffic management measures Traffic management plan, employ flag persons to guide traffic during construction, temporal road signs to guide road users	Construction phase	Contractor's Engineer, District Road Engineer, RTDA/Project Engineer, Monitoring Consultant, Rwanda National Police	Included in the project cost



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
	Disruption of domestic access due to soil cutting, drainage channel construction	Rehabilitate domestic access roads/paths, provision of access slabs	Construction phase	Contractor's Engineer, District Road Engineer, RTDA/Project Engineer, Monitoring Consultant,	Included in the project cost
	Road accidents/incident	Enforce road safety measures on project site	Construction phase	Contractor's Engineer, District Road Engineer, RTDA/Project Engineer, Monitoring Consultant, Rwanda National Police	
		Prepare and implement the Traffic Management Plan (Use of temporal roads sign, mobilization of flaggers on project sites, use of speed reduction measures)	Construction phase	Contractor's Engineer, Environmentalist and Safety Officer, Supervising Consultant, RTDA/Project Engineer& Environmentalist.	15,000,000
		Community and workers' sensitization on road safety	Construction phase	Contractor's Engineer, Environmentalist, and Safety Officer, Supervising Consultant, RTDA/Project Engineer& Environmentalist.	3,000,000
	Increased water demand	<ul style="list-style-type: none"> - Water supply to the project campsite, - Promotion of rainwater harvesting at the project 	Construction phase	Contractor team	Included in the project site installation and utility relocation



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		<ul style="list-style-type: none"> - campsite - Rapid repair of damaged water facility, 			budget
	Loss of water points	Relocation and construction of new water points	Construction phase	Contractor's Environmental & Social Safeguards Expert; Environmental & Social Safeguards Expert of the Supervising Firm, District Environmental Officer, RTDA/ Social safeguards Specialist	400,000
	Climate change	<ul style="list-style-type: none"> - Use of equipment in good mechanical condition, - Optimizing works zone traffic management, - Use of existing material sources, - Tree planting along the road 	Construction phase	Contractor's Environmental Expert; Environmental Experts of the Supervising Firm, RTDA Environmental Specialist, District Environmental Officer.	Captured in the project cost,
OPERATION PHASE					



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
Fast moving vehicles bringing noise and dust	Air pollution causing health risks due to dust and exhaust gas from vehicles	Provision of speed restriction measures (speed limit signs, bumps) near villages and special facilities (schools, health posts, markets)	Operation phase	District Road Engineer	Project cost
	Noise pollution causing health risks due to noise from vehicles	Provision of speed restriction measures (speed limit signs, bumps) near villages and special facilities (schools, health posts, markets)	Operation phase	District Road Engineer	Project cost
		Adhere to speed limits	Operation phase	Roads users, Rwanda National Police	
Road safety	Reduced traffic safety due to improved roads, inducing drivers to exceed the speed limits and cause accidents (mostly to pedestrians)	Provide traffic control signage prominently at the entrance and throughout populated village areas prominently at the entrance and populated	Operation phase	Contractor, Supervision consultant and District authority	Covered in the project cost
		Provision of speed bumps in the vicinity of populated areas where needed	Operation phase	Contractor, Supervision consultant and District authority.	Covered in the project cost.
		Wear helmets when driving two wheeler	Operation phase	Road users	
		Community awareness meetings on traffic safety	Operation phase	District Authorities, National Police	District and police functioning budget



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		issues			
Heavy rains that cause embankments landslide, bringing debris and clogging the drainage system and roads	Water pollution and Property damages	Regular maintenance of the road drainage system	Operation phase	Local Community Association (LCAs), District Road Engineer	Road maintenance budget
	Landslides of roads embankments	Protection of slopes with vegetation and regular maintenance of the embankments and their upstream part	Operation phase	Local Community Association (LCAs), District Road Engineer	
DECOMMISSIONING PHASE					
Demolition of project facilities	Occupational Health and safety risks	<ul style="list-style-type: none"> - Provide appropriate PPEs to the labors in demolition works, - Use lift crane whenever required to dismantle material in elevated height, 	Decommissioning phase	Contractor's Environmental & Social Safeguards Expert; Environmental & Social Safeguards Expert of the Supervising Firm	5,000,000
	Generation of solid wastes	Collect residual wastes for reuse, recycling and or proper disposal.	Decommissioning phase	Contractor's Environmental & Social Safeguards Expert; Environmental & Social Safeguards Expert of the Supervising Firm,	3,000,000
	Increased in noise	- Consider the mitigation	Decommissioning	Contractor's	



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
	and vibration	of the construction phase, Avoid demolition works in the night hours beyond 18h00.	phase	Environmental & Social Safeguards Expert; Environmental & Social Safeguards Expert of the Supervising Firm,	
	Landscape degradation	<ul style="list-style-type: none"> ✓ Ensure proper leveling of the areas with the demolished facility, ✓ Collect and level all hips of soil around the roads and or in the demolished areas, ✓ Reinststate the area with the demolished facilities according to the future use of that area (agricultural, forest, garden lands, etc.) 	Decommissioning phase	Contractor's Environmental & Social Safeguards Expert; Environmental & Social Safeguards Expert of the Supervising Firm, District Environmental Officer, RTDA/ Environmental and Social Safeguards Specialists	Included in the ESMP budget for project ancillary sites
Total					153,100,000
Contingency (10%)					15,310,000
GRAND TOTAL					168,410,000



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Environmental and social monitoring matrix

S/ No	Adverse Impact	Parameter to be Monitored	Indicator	Method	Frequency	Responsibility	Cost Estimates
CONSTRUCTION PHASE							
1	Loss of properties (houses, trees, crops) and relocation of affected households	Compensation for lost assets/ RAP implementation and monitoring	Lists of PAPs & their affected assets, Lists of paid PAPs	Site visits for meeting with PAPs and cross-checking at the Banks	Continuous	District authorities, RTDA	2,000,000
2	Grievances raised by affected families	Complaints raised by PAPs	Number of complaints recorded	Meetings, site visits	As and when required	Grievance redress committees, District	1,080,000
4	Soil Pollution	Soil Chemical properties,	Soil nutrient loads	Soil sampling and laboratory analysis	As and when required	Monitoring consultant, District, RTDA	500,000
5	Water pollution	Baseline Water chemical properties to be monitored	<ul style="list-style-type: none"> - Storage and disposal and management of bitumen, oil leakages, - Wastes management, - Erosion control on project sites (Campsite, borrow pits, dumping sites, 	Site visit and water parameter analysis	Rain period	Contractor, Monitoring consultant, District, RTDA	500,000



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6	Air pollution	Number of watering on site to prevent dust pollution, - Life conditions of project vehicles as old vehicle can emit much gases.	- Number of complaints related to noise pollution, - Technical control certificate for project trucks	Site visits and technical control of project vehicles			250,000
7	Noise pollution	Working hours for machines and engines that produce noise on sites.	- Number of complaints related to noise pollution, - Technical control certificate for project trucks and vehicles.	Record of complaints	Construction phase	Contractor, Monitoring consultant, District, RTDA	250,000
5	Loss of trees	Tree species along roads and other identified areas	Number/area of planted trees by the contractor	Field observations	Twice a year	District, Monitoring Consultant/ RTDA Environmental	1,500,000
6	Safety hazards	safety at the site	Incidences, accidents, diseases,	Review and evaluation of incidences, accidents register, disease records,	Continuous	Gicumbi District, Consultant and RTDA	2,000,000
		Accidents frequency	Number of accidents per month	Review of police records on roads accidents	Continuous	National Police, District, Monitoring Consultant, RTDA	2,000,000



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7	Low capacity of contractor labors to comply with ESHS requirement	Capacity building of contractor labors in ESHS maters	training reports, number of trained staff	Training of contractor labors in ESHS maters	Twice a Year	Monitoring consultant, District, RTDA	2,000,000
8	Solid and liquid wastes generation	Disposal of solid and liquid wastes	Availability of wastes bins on project sites	Inspection on wastes management	Continuous	Monitoring consultant, District, RTDA	1,000,000
9	Any form of violence (GBV, SEA, VAC)	Project appreciation by the community	Community wetness in local meeting (Inteko z'abaturatione)	Participation in the community meeting	Continuous	Contractor, Monitoring consultant, District, RTDA	1,500,000
OPERATIONAL PHASE							
1	Roads incident and accidents	Occurrence of the incident on the new roads	Number of incidents	Accident record	Operation phase	Rwanda National Police	Police budget
2	Encroachment to the road reserve	Construction in the road reserve	Construction without permit	Inspection	Operation phase	District authority	District budget
3	Interference with the traffic flow	Occurrence of traffic jam in new roads	Time taken to travel in the project roads & Regulating the traffic flow in the peak period.		Operation phase	Rwanda National Police	Police budget
DECOMMISSIONING PHASE							
1	OHS risks	Work plan, labor and equipment mobilization for decommissioning	Required material and PPEs mobilized	Works approval before commencement	Decommissioning phase	Monitoring consultant	Monitoring consultant budget



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2	Generation of solid wastes	Disposal of solid wastes from decommissioning activities sites	End use of solid wastes from project sites	Site inspection	Decommissioning phase	Contractor, Monitoring consultant, District, RTDA	500,000
3	Increased in noise and vibration	Work plan and methodology		Project monitoring activity	Decommissioning phase	Monitoring consultant & Local authority	Monitoring consultant budget
Total							15,080,000
Contingency (10%)							1,508,000
Grand Total							16,588,000



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Grievance Redress Mechanism

Considering that during the implementation of the project, disputes or grievances are likely to arise; the ESIA study has established the mechanism for handling disputes and grievances that may occur. The mechanism recognized the three types of dispute and grievances that may arise. The first type refers to the dispute between the project and/or the contractor and the local community, the second one refers to the dispute between the contractor and its workforce and the third to the dispute between the contractor and the client. To address these dispute, this ESIA has described the procedures for settling all those disputes for each category. For the category one, procedures related to amicable settlement, adjudication or arbitration, and litigation have been proposed. However, the contract to be signed by these two parties will provide clarification on the mechanism to be used. For the dispute between the contractor and labors, the internal regulation of the contractor including application of the code of conduct to be signed by each labor, the analysis of the worker's grievance redress committee to be established once contractor is on board will be given priority. This mechanism will be supported by the district labors inspector so that the decision taken are complying with the requirement of the labor law in Rwanda. In case of no agreement is reached, the dispute can be transferred to court by the party considered not satisfied. For the third category including the dispute between the community on the project, the grievance redress composed by the representatives of the local community and local authority at Cell level, the contractor, the supervision consultant and client will be work together to handle all community grievances as described in chapter eleven of this report.

Budget Estimates

The proposed Byumba urban roads project in Gicumbi district is expected to cost the government of Rwanda and the Africa Development Bank (AfDB) as the sponsor of this project the total amount of 19.26 million USD, including 18.4 million USD for the rehabilitation works of Gicumbi urban roads and 0.86 million USD for the consultancy services for monitoring and supervision of the rehabilitation works, for a period of 18 months for the roads rehabilitation works.

The implementation of the ESMP and ES monitoring plan is expected to cost the total budget of 1,756,075,945Rwf including 1,571,077,945Rwf for the RAP implementation or compensation of the properties to be affected by the project, 168,410,000Rwf for the implementation of ESMP and 16,588,000Rwf for the environmental and social monitoring plan.

As conclusion, the rehabilitation and upgrading of selected five Byumba urban roads project in Gicumbi district is the best alternative adopted by this ESIA study; based on positive socio-economic benefits that will be accrued by the local community and the government of Rwanda as a result of the project implementation. However, the project implementation has also some negative environmental and social impacts, but most of them are reversible and are within manageable limits. The present ESIA study has therefore proposed different mitigation measures for the residual environmental and social impacts of the mentioned project. To achieve this, the project implementation should promote and consider a high momentum level of all stakeholders' consultation, engagement and information sharing about the project implementation. The environmental and social mitigation measures as stipulated in ESMP should be monitored during the implementation of Byumba Urban roads project.

To ensure the effective implementation of the proposed mitigation measures, the following recommendations have been formulated:



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- RTDA and Gicumbi District authorities should make a joint effort and collaboration during the project implementation to ensure that a high momentum level of all stakeholders' engagement and information sharing, and that each involved parties do its responsibilities to their best level and on appropriate time,
- The project implementation should respond to the expectation of the local authorities and community to achieve its objectives without adversely affecting them, The contractor has to prepare different Management Strategy and Implementation Plans (MSIPs) list above associated with detailed requirements for the effective implementation of Environmental and Social Management Plan (ESMP), or any other management plan that would appear necessary during the construction phase; so that the project implementation is environmental and social sound,
- The contractor should ensure that the staffs and labors involved in the implementation of environmental and social mitigation measures have the necessary knowledge, skills, and ethic to do so,
- The contractor once on board after identifying sites for project ancillary facilities (borrow pits, dumping sites, crusher sites, Campsites, etc.) will be required to prepare a separate ESIA study and ESMP for those sites before its exploitation,
- The availability of supervising consultant experts in matters of environmental and social should be ensured on-site to interact with the contractor's safeguards staff whenever needed for a smooth implementation of the project under environmental and social safeguarding requirements,
- Tree planting along the Byumba-Ngondore road should be planned as an environmental enhancement measure to replace the lost trees as well as to avoid the landslides likely to occur on the section of this road at its end towards the National road (NR-3) to Gatuna border with Uganda Country.



**Environmental Social Impact Assessment (ESIA)
Byumba Urban Roads Rehabilitation/Upgrading Project (15.53Km)**

1. INTRODUCTION

1.1 Background of the project

Rwanda covers 26,338 km², and its population was estimated to be about 12,955,736 inhabitants in 2021 as per the projection of the National Institute of Statistics of Rwanda¹. Rwanda is bordered in the North by Uganda, East by Tanzania, South by Burundi, and West by the Democratic Republic of Congo. The transport sector in Rwanda comprises road transport, air transport and inland waterways transport limited mainly to Lake Kivu which demarcates the border between Rwanda and the Democratic Republic of Congo. The Country is not linked to the regional railway networks and the road sub-sector represents more than 80% of transport services. The nearest port of Dar-es-Salaam in Tanzania is around 1,400 km from Kigali, the capital city of Rwanda. The national road network comprises 14,000 km in length corresponding to a road density of 0.53 km/km. The length of the classified road network is 4,698 km comprising: 2,860 km of the national road network which is the responsibility of RTDA (of which 1,172 km are paved), and 1,837 km of secondary unpaved network, which is the responsibility of the Districts.

The Government of the Republic of Rwanda received funding from the African Development Bank (AfDB) for the Transport Sector Support Project aimed at improving accessibility and mobility between the towns of Base, Gicumbi, Rukomo and Nyagatare and the living conditions of the population within its zone of influence. The project comprised of four components:

- 1) Upgrading of 51.54 km between Base and Rukomo, including a component for the sensitization of local communities on sexually transmitted diseases, environmental protection and road safety;
- 2) Related improvements comprising the construction of multifunctional centers and rehabilitation of school facilities along the main road;
- 3) Institutional support to the project executing agency, and
- 4) Clearing the right-of-way.

The Upgrading works of Base – Gicumbi – Rukomo road (51.54 km) was completed while the financial commitment stood at 69% with 31% anticipated project savings. The Government therefore proposed that project savings be utilized for additional works of rehabilitation and upgrading of Byumba urban roads (15.53 km) Project in Gicumbi District. The project financing agreement is valid till 31st December 2022 with possibility of period extension. Therefore, Rwanda Transport Development Agency (RTDA) which is the implementing agency will thus follow up on the design and implementation of additional works for Byumba urban roads on behalf of The Ministry of Infrastructure (MININFRA).

Gicumbi District is one of the five Districts of the Northern Province. It is made up of 21 sectors which are Bukure, Bwisige, Byumba, Cyumba, Giti, Kaniga, Manyagi, Miyove, Kageyo, Mukarange, Muko, Mutete, Nyamiyaga, Nyankenke II, Rubaya, Rukomo, Rushaki, Rutare, Ruvune, Rwamiko, and Shangasha. These sectors are subdivided into 109 cells and 630 villages. Gicumbi District is located in the East of the Northern Province. It is bordered by Burera district and Uganda Country in the North; Nyagatare, Rwamagana, and Gatsibo in the East, Rwamagana and Gasabo in the South, and in the West by Gasabo, Burera, and Rulindo districts.

The figure below shows the location of Gicumbi District on the map of Rwanda.

¹ <https://www.statistics.gov.rw/publication/size-resident-population>, 17th January 2022.



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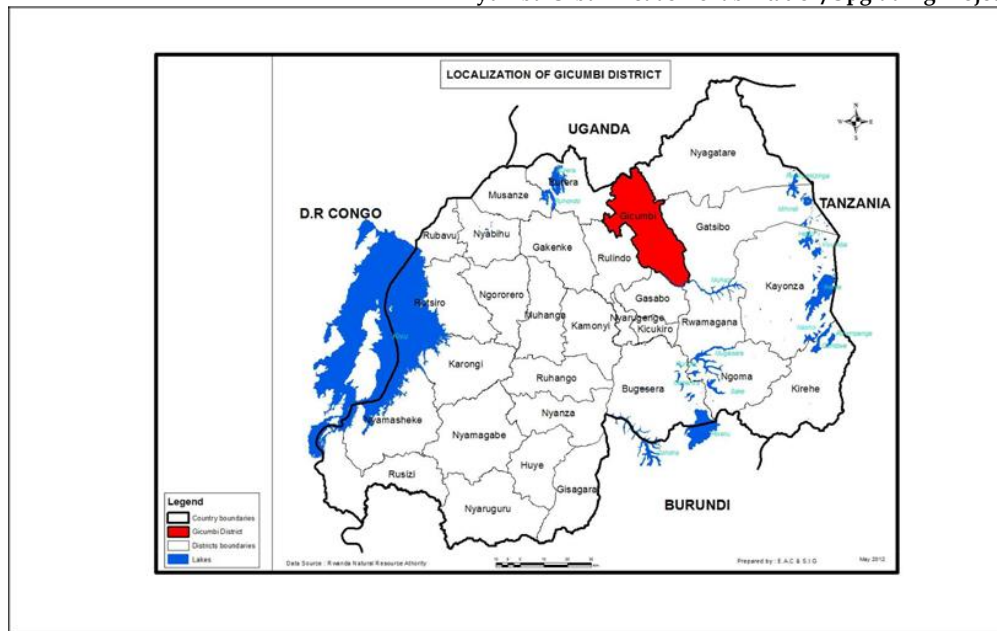


Figure 1: Map of Rwanda showing the location of Gicumbi District

The selected five urban roads in Gicumbi District have a total length of 15.53km. These roads include Byumba-Ngondore road (BUR1: 11.7km); Road to the Catholic Cathedral (BUR 2: 2km); an Access road to the stadium (BUR 3: 0.77km), an Access road to Miyove (BUR 4: 0.72Km) and Town Center road to Byumba Market (GUR 5: 0.34km). The major activities associated with the rehabilitation/upgrading of the selected urban roads in Gicumbi District include rehabilitation/upgrading of carriageway pavement with a standardized width, rehabilitation, and upgrading of the cross and side drainage structures as well as construction of walkways.

The rehabilitation and upgrading of Byumba urban roads require the preparation of an Environmental and Social Impact Assessment/ Environmental and Social Management Plan (ESIA/ESMP) to ensure that the planned activities are implemented in an environmentally friendly and socially acceptable context with full compliance with Rwanda's environmental and social regulation and Africa Development Bank's Integrated Safeguards System (ISS).

1.2 Objectives of the ESIA

The main objective of this assessment study is to carry out a comprehensive Environmental and Social Impact Assessment (ESIA) for the selected five urban roads (15.53km) in Gicumbi District. This study identifies environmental and social impacts associated with the rehabilitation and upgrading works of Gicumbi urban roads and also develops the appropriate mitigation measures for each identified negative impact to ensure that roads rehabilitation and upgrading works under this project are environmentally sound and contribute to the development of environmental assets.

It is also expected to provide a means whereby the overall environmental performance of this project can be enhanced through attaining the below specific objectives.

These are:

- Describe the bio-physical and socio-economic baseline condition of the proposed Byumba urban roads project.



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- Identification and evaluation of the potential environmental and social impacts associated with Byumba urban roads rehabilitation and upgrading projects in Gicumbi District implementation and subsequent operation.
- The adoption of measures and mechanisms for their incorporation in the project to enhance beneficial impacts and to avoid, minimize or offset adverse impacts.
- Develop environmental and social management and monitoring plan to provide guidance and means for monitoring the implementation of environmental and social management measures and provide guidance;
- Allow the public participation in the project design and implementation for smooth proceeding of the project;
- To lower the project costs in the long run by mitigating negative impacts of the project which would be costing much in the future.
- Produce reports in the format and level that meets the requirements of EIA guidelines, policies, and regulations of the Government of Rwanda (GoR) and the Integrated Safeguard System of the Africa Development Bank.

1.3 Scope and limitation of the Study

1.3.1 Scope of the study

The scope of work for this ESIA included desk review of documents related to the project, field visit of the project area, scoping exercise to establish the scope and boundaries, consultation with the public in the project area, analyses of legal and institutional frameworks for the project, description of the baseline environment in the project zone, description of the project activities, identification of the negative impacts associated with the proposed project and its mitigation measures.

This ESIA, therefore, provides environmental, social, health, and safety safeguards guidance to ensure that the overall implementation of roads rehabilitation and upgrading activities are environmentally friendly, socio-economically sustainable and comply with the General guidelines and procedures for environmental impacts assessment (2006); the ministerial order No 001/2019 of 15/04/2019 establishing the list of projects that must undergo environmental impact assessment, instructions, requirements and procedures to conduct environmental impact assessment and the Africa Development Bank Integrated Safeguards Systems, specifically the Environmental and Social Assessment Procedures (ESAPs), the Integrated Environmental and Social Impact Assessment (IESIA) and the Operational Safeguards (OSs). The project will trigger all five Operational Safeguards:

- ▀ Operational Safeguard 1 on Environmental and Social Assessment
- ▀ Operational Safeguard 2 on Involuntary resettlement, land acquisition, population displacement and compensation
- ▀ Operational Safeguard 3 on Biodiversity and ecosystem services
- ▀ Operational Safeguard 4 on pollution prevention and control, greenhouse gases, hazardous materials and resource efficiency
- ▀ Operational Safeguard 5 on labor conditions, health, and safety

Both Rwanda EIA regulations and the AfDB ISS categorizes this project as high risk, meaning that it is likely to cause significant and irreversible adverse environmental and social impacts. An Environmental and Social Monitoring Plan (ESMP) has been developed as the implementable piece of this ESIA summarizing and encompassing all identified impacts associated with different



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project activities, corresponding mitigation measures, cost implications as well as their implementation and monitoring responsibilities.

1.3.2 Limitations of the study

This Environmental Social Impacts Assessment (ESIA) covers only the project activities in the right of way of the project roads and adjacent area but does not cover further activities like campsite construction, quarrying, borrow pits, and stockpiling of excavated materials that may take place on sites outside of the right of way. To avoid the gap that would be caused by this limitation, the ESIA study recommended a similar study for the sites that will be identified by the contractor for those purposes.

1.4 Approach and methodology

Road construction, upgrading, and rehabilitation projects create a range of direct and indirect impacts on the physical, biological and human environment. Understanding the environmental and social settings and environmental social risk, issues, and constraints along the proposed urban road alignment are essential for the design of road projects. The methodology adopted for the environmental studies is summarized below. The methodology meets the requirements of the GoR EIA and the Africa Development Bank guidelines.

Different techniques were used to collect data required for this study and these include comprehensive literature review, field visits and direct site observations, surveys, interviews, and stakeholder consultation.

The details of the methodology used in the ESIA consisted of the following:

- a) **Scoping:** A scoping exercise was carried out to identify and highlight the key issues and impacts likely to occur during the upgrading, rehabilitation, operation, and decommissioning phases of the project under consideration. The efforts focused on the most important aspects of impact identification, scope and boundaries.
- b) **Literature review:** A review of documentation on policies, laws, regulations, and guidelines related to environmental management, business sector, waste management, land use, EIA process, etc. at the national level as well as the international level has been done.
- c) **Site visit:** during site visits, direct observation of biophysical and socio-economic features of the project area has been performed relative to the proposed project activities to aid in determining the potential environmental and social impacts. Photos have been taken for showing the existing situation of the project.
- d) **Baseline studies:** The findings of the scoping study enabled the identification of the resources/receptors likely to be significantly impacted by the project, and the collection of baseline information relevant to these resources/receptors.
- e) **Stakeholders' identification and consultations:** Public participation and community consultation have been taken up as an integral part of the environmental and social impact assessment process of the project. Consulted stakeholders included government officials and local authorities such as the District officers in charge of infrastructure, RTDA Safeguard Specialist, Rwanda Development Board (RDB) and Rwanda Environment Management Agency (REMA) officers, community opinion leaders (teachers, religious leaders etc.), local community members and Project Affected Persons (PAPs). The public consultation was used as a tool to inform and educate stakeholders about the proposed project as well as get their views, expectations, and considerations. This participatory process enables participation in the decision-making process. Initial Public consultations were carried out in the project areas in two categories. The category



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one public consultation focused on local authorities from village to district levels. The second one was done with the local community around the project roads, especially Byumba-Ngondore road, the long one expected to affect many people compared to other roads under Gicumbi urban roads project. The consultation of local authorities took place at Head Quarter of Gicumbi District on 08th September 2021 and was attended by 45 persons. The consultation of the local community took place at Ngondore Cell office on 09th September 2021 and was attended by 145 persons. People from local authorities and the local community living in the project area were interviewed to determine the perceived benefits of the project and the likely negative impacts on the environment and society as a whole. In addition, the team also held consultations with the PAPs during socio-economic survey out of which 436 PAPs were reached. In summary approximately 651 people were consulted out of which 521 were males and 130 were females.

- f) **Analysis of alternatives:** Alternatives relating to project siting, no project option, with project option, labor requirements, construction materials, and exploitation techniques were analyzed.
- g) **Impact assessment:** This entailed assessment of project aspects to determine the identification of impacts, their significance, and mitigation hierarchy.
- h) **Environmental and Social Management and Monitoring Plans and reporting:** Incorporation of an ESMP that defines the management and monitoring measures that are needed to evaluate whether identified impacts remain in conformance with predictions and applicable standards and whether mitigation and compensatory measures are effectively addressing impacts. The compilation of the ESIA report consisted of arranging all information from the ESIA study to have a consolidated report.

1.5 Structure of the report

The table below describes the structure of the ESIA report according to the sections of the report.

No	Section or chapter	Description
1	Executive Summary	Brief of the project and concisely discusses significant findings and recommended actions of the ESIA study.
2	Chapter 1- Introduction	Discusses the project background and its location. The project rationale, objectives and methodology of the Environmental and Social Impact assessment.
3	Chapter 2: Project description	This chapter discusses the General Description and Location of the Project, objectives of the project, the description of the projects roads to be rehabilitated and upgraded as well as the design standards of those roads.
4	Chapter 3- Legal, policy and institutions frameworks	Discusses policy and laws guiding the preparation of the ESIA report and stakeholder institutions for the ESIA study and project implementation.
5	Chapter 4: Project environment baseline situation	This chapter discussed the existing environmental conditions in the project area ascertained by a reconnaissance survey along with the collection of primary and secondary information. The chapter provides a sense of the existing environment including land



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		environment, water environment, noise environment, biological environment, and baseline data of socio-economic conditions as well as the resettlement implication of the project intervention.
6	Chapter 5: Public consultation and participation	Discusses consultation made in Gicumbi District to inform the preparation of the ESIA report.
7	Chapter 6: Project alternatives	Depicts and analyses the possible alternate options considering the benefits of each option to come up with one option to be adopted. The analysis focuses on with /without project alternatives. The with-project alternative was adopted.
8	Chapter 7: Environmental and social impacts.	Discusses the potential impacts (Positive and negative impacts) likely to be caused by the proposed project activities in all phases (pre-construction, construction, decommissioning, and operation phases) and analyses its severity to inform the mitigation measures to be adopted.
9	Chapter 8: Impacts mitigation measures	Discusses the mitigation measures to be adopted to cope with identified negative impacts to be caused by the project intervention.
10	Chapter 9: Environmental and social management plan	For the identified Environmental Impacts, suitable management/mitigation measures are provided to minimize the magnitude of impacts.
11	Chapter 10: environmental and social monitoring plan	Discusses the various planned environmental monitoring program to monitor the effectiveness of ESMP implementation, by proposing the parameters and indicators to be monitored.
12	Chapter 11: Grievance redress mechanisms	Discusses the approaches of the GRM in solving the social and environmental issues likely to occur during the project implementation. These approaches define the paths to settle different disputes and grievances that would arise between the interested parties. These approaches cover the dispute between the contractor and the client, the contractor and his labor force, and finally the complaint of the community and the project.
13	Chapter 12: Conclusion and recommendations	This chapter discusses the finding of the ESIA study and the proposed recommendations to be considered during the implementation of the project.



2. PROJECT DESCRIPTION

2.1 General Description and Location of the Project

Gicumbi district is one of five districts of Northern Province created by organic law No 29/2005 of 23/11/2005 related to administrative entities of the Republic of Rwanda. Gicumbi District is spread over an area of 829 Sq.km and is composed of 21 Sectors, 109 Cells, and 630 Villages. It is bordered by Uganda Country and Burera District in the North, Nyagatare and Gatsibo Districts in the East, Rwamagana and Gasabo Districts in the South, in the West by Gasabo, Burera, and Rulindo Districts. The eastern part of the District is not hilly and is composed of a valley with Altitudes ranging from 1,500 and 1,800m (AMSL). In the southern part of the District, there is a lake called Muhazi located at an altitude of 1,500m. This lake is also shared by the districts of Gasabo and Rwamagana (DDS, 2018-2024). Gicumbi District is located about 60km from Kigali, the Capital of Rwanda. The total population of Gicumbi district in 2010–2011 was 572,000. This represented 29% of the total population of Northern Province and 5.3% of the total population of Rwanda. Females comprised 52.1% of the population of Gicumbi district (EICV3).²

The figure below shows the administrative map of Gicumbi District with sector names.



Figure 2: Administrative map of Gicumbi District with Sectors names

2.2 Objectives of the project

The main objective of the project is to improve transport infrastructure within the city of Gicumbi to support the project area's social-economic development through improved transportation of goods thus improving the life of residents of Gicumbi District.

The project is also expected to boost the development and expansion of Gicumbi City, especially along the Byumba-Ngondore road which connects the new residential area targeted by Gicumbi City's Master Plan (Informed by District Staff in Charge of Infrastructures)

The purpose of this project is to rehabilitate/upgrade five urban roads in Gicumbi District to meet the following objectives.

² NSIR 2010. EICV 3 District Profile. Gicumbi, 92pages



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- To strengthen roads infrastructures in Gicumbi District by rehabilitating the damaged roads within the city of Gicumbi District and also connecting paved roads within the city;
- To improve the existing transport infrastructures Gicumbi urban area, which will improve the cleanliness, smartness of the city and boost the connectivity and safer movement of goods and people from one place to another in less time,
- To facilitate access to different corners of Gicumbi city with improved road facilities.

2.3 Roads Status in the project area

The Rwanda Strategic Transport Master Plan 2012; consider that transport is a strategic intervention area to enable the expansion of the Rwandan economic base from predominantly agriculture-based into the secondary and tertiary sectors. The rehabilitation and development of transport infrastructures are regarded as crucial aspects to lower the costs of doing business in Rwanda. It also recognizes that the purpose of any road network is to preserve and sustain social and economic development.³

According to the Gicumbi District Development Plan of 2013-2018, the road network in the district is unequally distributed, where some sectors have access to roads while others do not. The majority of the roads are feeder roads that link one sector to the other. However, these are not sufficient especially for a productive district like Gicumbi whose produce would be a waste without road network to link it to the nearest markets. However, one of the outcomes of this plan is to ensure that district road network and existing road infrastructures being well-developed and maintained. The as maintained and rehabilitated roads in the rural and towns/centers of the district link different trading centers to the district and the sectors were one of the strategies to achieve the mentioned outcome.⁴

The road network of Gicumbi district includes two roads falling within the National roads category namely Base-Kiruri - Miyove-Kisaro-Gicumbi - Nyagatare-Ryabega (NR 19) with 141.897km; Kidaho-Butaro-Kivuye-Gicumbi (NR 21) with 74.872km and Kigali-Rukoma-Gatuna (NR 3) with 78.010km. The proportion of the above national roads network in Gicumbi District is paved.⁵ In addition to the national roads, in Gicumbi District; there are also district roads (D1& 2) connecting sectors and centers in the district and unclassified roads P4 & P5.

The selected five roads under the package of Byumba urban roads are Road to Stadium; Access Road to Byumba Catholic Cathedral- Social; Byumba-Ngondore Road; Access Road in Miyove and Town Center to Byumba Market road. The selected roads once upgraded will improve the quality of life of residents by creating a cleaner, safer and livable environment in the Project area. In addition, the Byumba-Ngondore road will facilitate cross-border trade between Gicumbi town and the neighboring country (Uganda).

These selected urban roads for rehabilitation and upgrading project are in poor condition existing two damaged paved roads (Road to Cathedral, Road to Stadium), one cobblestone road (Town center to Byumba market), and two earth roads (Byumba-Ngondore road and Access road in Miyove) in need of rehabilitation and upgrading. The figure below shows the location of the selected urban roads in Gicumbi District.

³ RSTMP,2012

⁴ DDP, 2018

⁵ RTDA,2015. List of approved Classified National Roads



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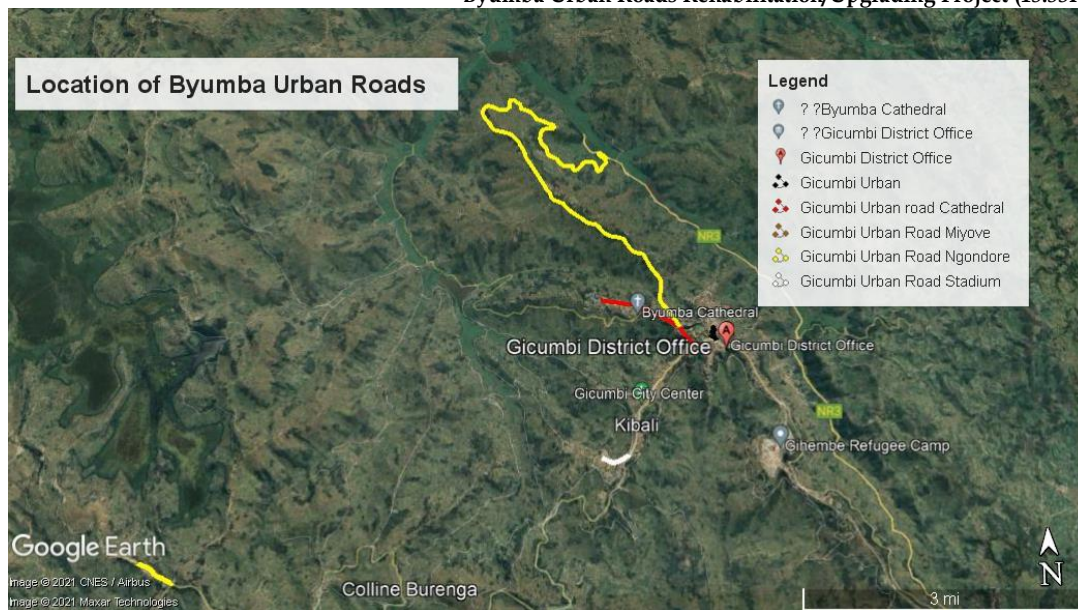


Figure 3: Location of selected five Byumba urban Roads in Gicumbi District

2.4 Project details

The project details are reproduced from the scoping study done for those roads and the field visit. The project components include the rehabilitation of right of way, culverts, and longitudinal drainage structures. The affected areas of Gicumbi urban roads are limited to the existing right of way for four roads plus the widening area required for one road as well as the borrow pits, quarry, and dumping sites. The existing Right of way will be maintained for four roads as it has sufficient width for rehabilitation and one road Byumba-Ngondore to be upgraded will be widened by 0-4.5m to become 10.5m.

It is noted that (the carriageway, drainages, cut slope, and vegetation space) are covered in the additional land to be acquired to 10.5m of RoW. The Project activities include the rehabilitation and upgrading of 5 urban roads in Gicumbi District (15.53km) which comprises one lot. The project components include rehabilitation of right of way, pipe, and box culverts, rehabilitation of the existing drainage channels, and construction of new drains where necessary.

The affected areas for the rehabilitation of the selected urban roads are limited to the Right of way for the four roads (Road to Cathedral, Road to Stadium, Access road to Miyove, and road in Byumba town center with a total length of 3.83km) plus the widening areas for the road Byumba-Ngondore (11.7 km) as well as the borrow pits, dumping and quarry areas. For this road, the existing Right of way will be widened by about 10.5 m.

The rehabilitation of Gicumbi urban roads will have environmental and social issues. Identified risks of assets to be affected in the RoW and downstream of the road during construction will be mitigated by compensation, avoiding dumping in the right of way, and the construction of water channels for storm water conveyance. As explained above, Gicumbi District is subdivided into 21 Sectors, but only two sectors among them are concerned with the project of rehabilitating urban roads in Gicumbi District. The table below shows the size of selected urban roads and crossed sectors.



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Table 1: Length of selected Byumba urban roads and crossed Sectors and Cells

S/N°	Road ID	Gicumbi urban roads	Length/km	Crossed Sectors	Crossed Cell
1	BUR1	Byumba-Ngondore	11.7	Byumba	Gisuna, Nyamabuye, Kibali, Murama, Nyakabungo and Ngondore.
2	BUR2	Road Cathedral	2.00		Nyamabuye & Gisuna
3	BUR3	Road Stadium	0.77		Nyarutarama
4	BUR4	Access road Miyove	0.72	Miyove	Miyove
5	BUR5	Town Center to Byumba Market	0.34	Byumba	Gacurabwenge
TOTAL			15.53		

2.5 Description of the selected Gicumbi urban roads

There are five roads to be rehabilitated and maintained in Gicumbi District under Byumba urban road rehabilitation and maintenance project are generally three junctions paved roads damaged and two earth roads; all bifurcating from the two national roads NR 19 and NR 21 in Gicumbi District. The selected roads have importance in modernizing Gicumbi City based on their importance in the economic and social life of the District's population. The selected five roads once rehabilitated/upgraded will improve the quality of life of residents by creating a cleaner, safer and livable environment in the Project area. The total length of the five selected roads is 15.53km. The brief descriptions of each road are given below:

2.5.1 BUR 1: Byumba-Ngondore Road (11.7km)

This road bifurcates from another urban road (Road to Cathedral) connected to the national road (NR 19) at 410 m and ends at National Road (NR 3) towards the Gatuna border with Uganda. The road is 11.7 km long. It passes entirely in Byumba Sector and crosses six cells, starting from Gisuna Cell and ending in Ngondore Cell. This road constitutes a short link from Gicumbi City to the Gatuna border. From its starting, one-third of this road covers the area currently considered an urban area under the new master plan of Gicumbi city under preparation. The surfacing of the starting section (About 200m) of this road is cobblestone, while the remaining section is an earth road. The scoping study of this road proposes the construction of 7m carriageway width and 2.5m of shoulder and sidewalk. This study also proposes cross drainage structures including about 43 pipe culverts and 6 box culverts to be provided during its rehabilitation. The road predominantly runs on hilly terrain mostly on the top area with steep slopes towards its end. The existing road width varies with site conditions with large and confined sections. Along this road, there are different rural commercial centers (Mukabasaza, Bureshi, Rwambona, and Gitovu commercial centers), residential villages, and scatted settlements. The rest of the residential area is covered by agricultural land with trees plantations and forests.

Therefore, for a confined section with a steep slope of the hills, it is better to widen the road on the hillside to ensure a stable road. However, a landslide in this section might be envisaged which would require retaining walls as a countermeasure. On this road, at approximately PK 10, there is a public water spring that will be affected, and its relocation should be considered.



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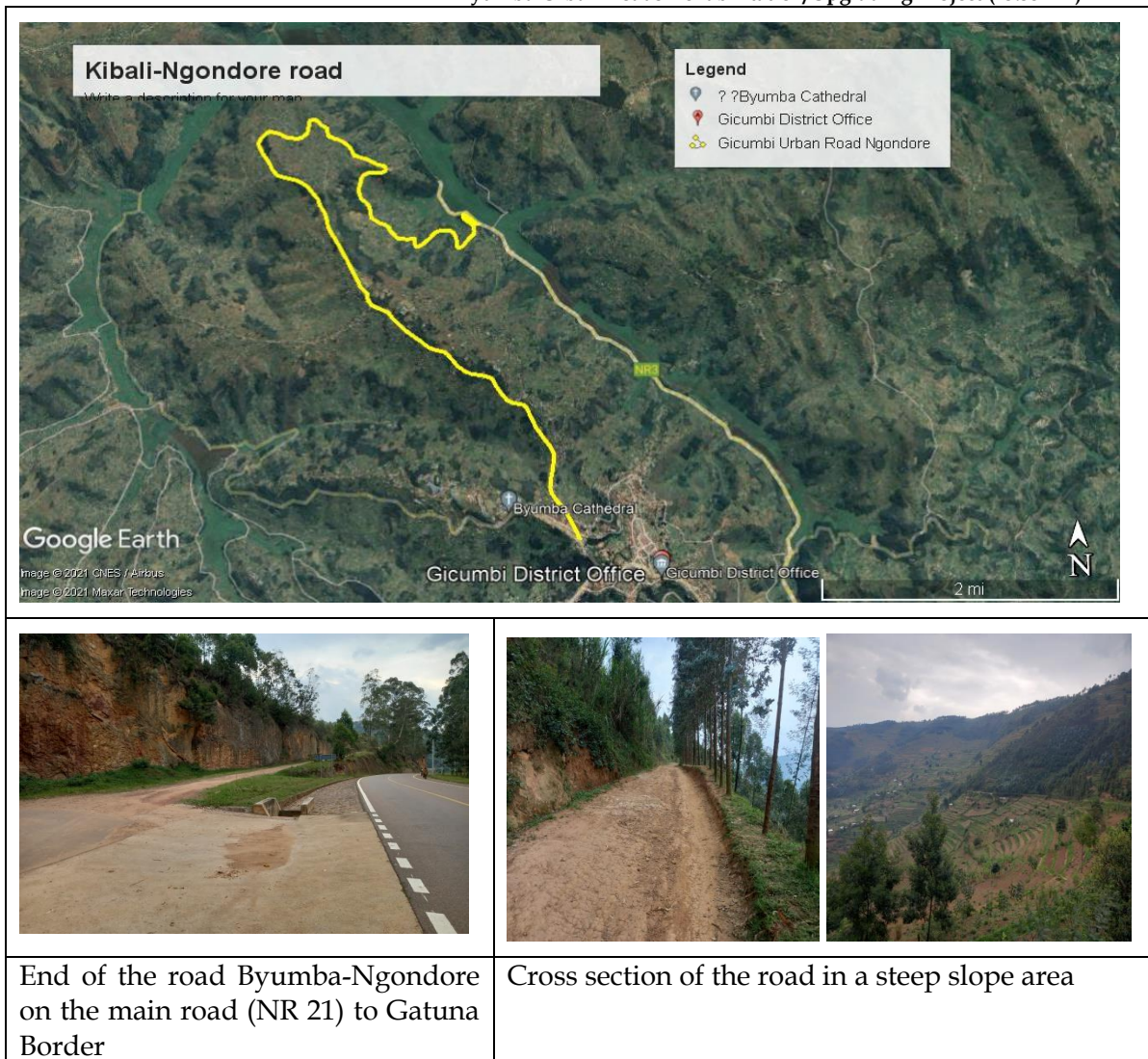


Figure 4: Map and photo of Byumba-Ngondore road

2.5.2 BUR 2: Road to Cathedral (2.00km)

The road bifurcates directly from the national road (NR 19) and runs through a small section of a forest towards residential, religious, and school areas up to its end. The length of this road is 2.00km. About 1.2km section of this road is a paved road while the remaining section is an earth road. Both the paved and no paved sections of this road are in poor condition that needs rehabilitation. The main challenge observed in this road is the water supply pipe and associated structures (manhole) running in the center of this road for about 1.6km and the electrical pole that should be relocated for the proper rehabilitation and sustainability of the road. The scoping study of this road proposed a carriageway of 6m and 4 pipe culverts. The existing width of the road is sufficient for road rehabilitation, especially in the paved section.



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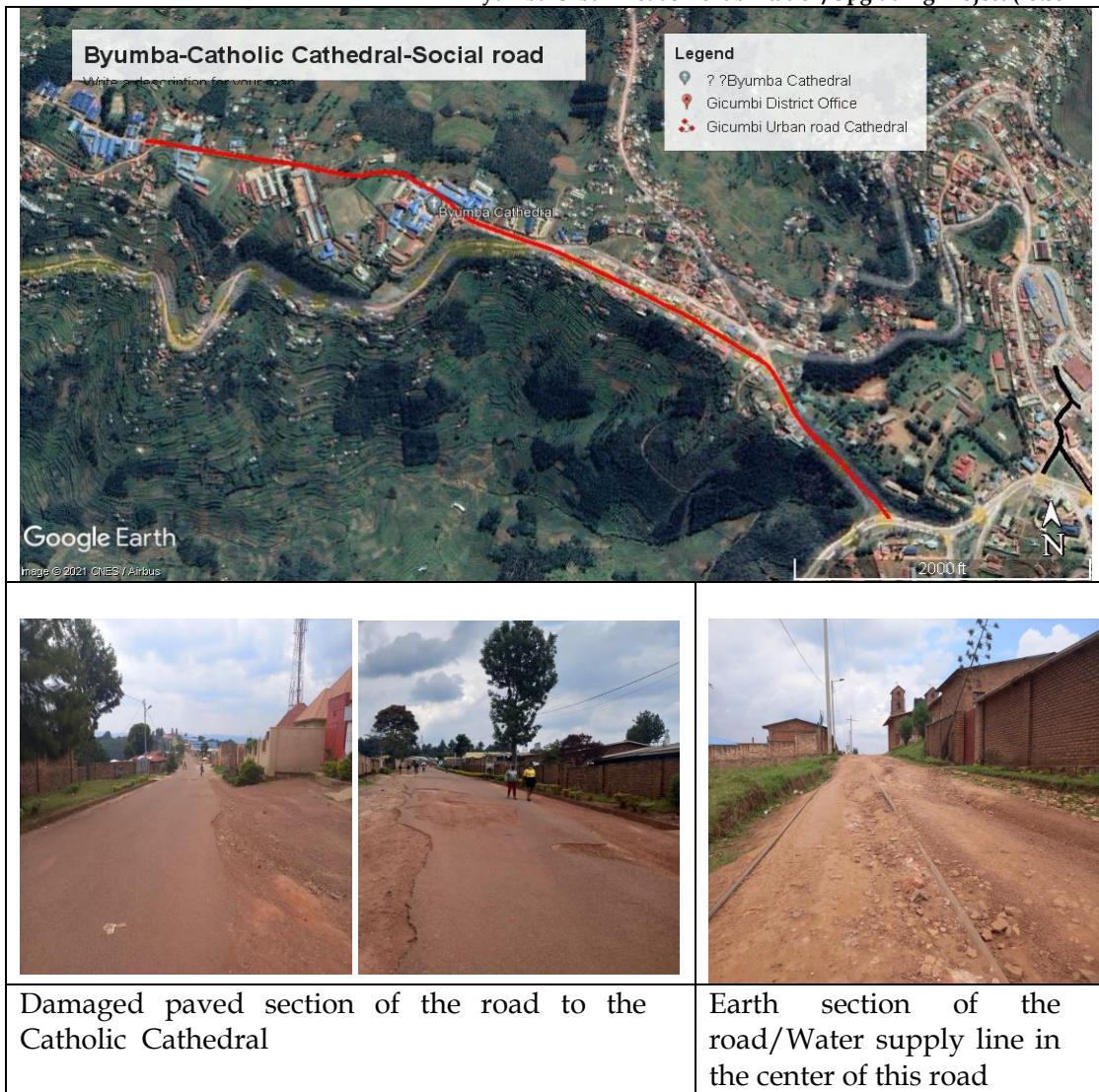


Figure 5: Map and photo of the road to the Catholic Cathedral

2.5.3 BUR 3: Road to Byumba Stadium (0.77 km)

The road bifurcates directly from the national road (NR 19) to Byumba Stadium. The road is 0.77km in length. The entire road is paved and has sufficient width to allow its rehabilitation. There is no challenge related to its rehabilitation. The challenge observed on this road is the outlet of its side drainage channel which needs to be shifted to the drainage channel of the main road (NR19) to avoid damages that would be caused by the storm water currently passing on the ground of the household and the development of gully in the downstream area.



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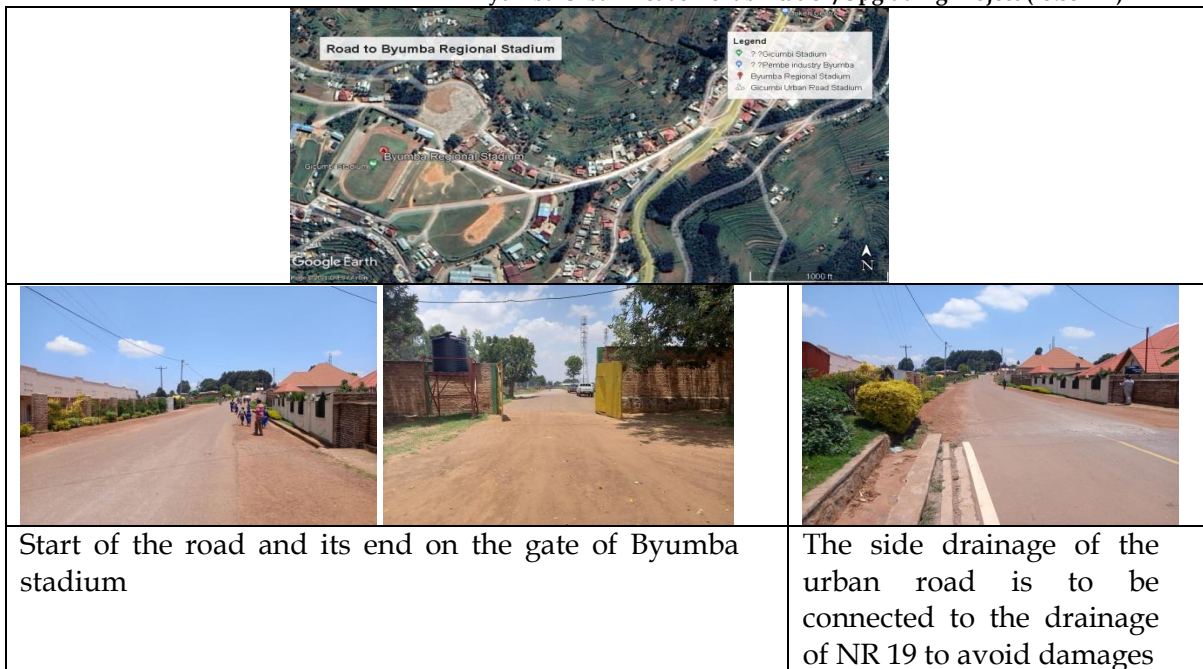


Figure 6: Map and photo of road to Stadium

2.5.4 BUR 4: Access Road to Miyove (0.72km)

This road is an access road to Miyove Center. This urban road starts from and ends at the national road (NR 19) recently upgraded asphalt road from Base-Gicumbi-Nyagatare and runs parallel to it. The length of this urban road is 0.72km. It crosses Miyove trading center, where it passes mainly nearby Miyove market and the administrative office of Miyove Sector. This road will be upgraded to a carriage width of 6m.

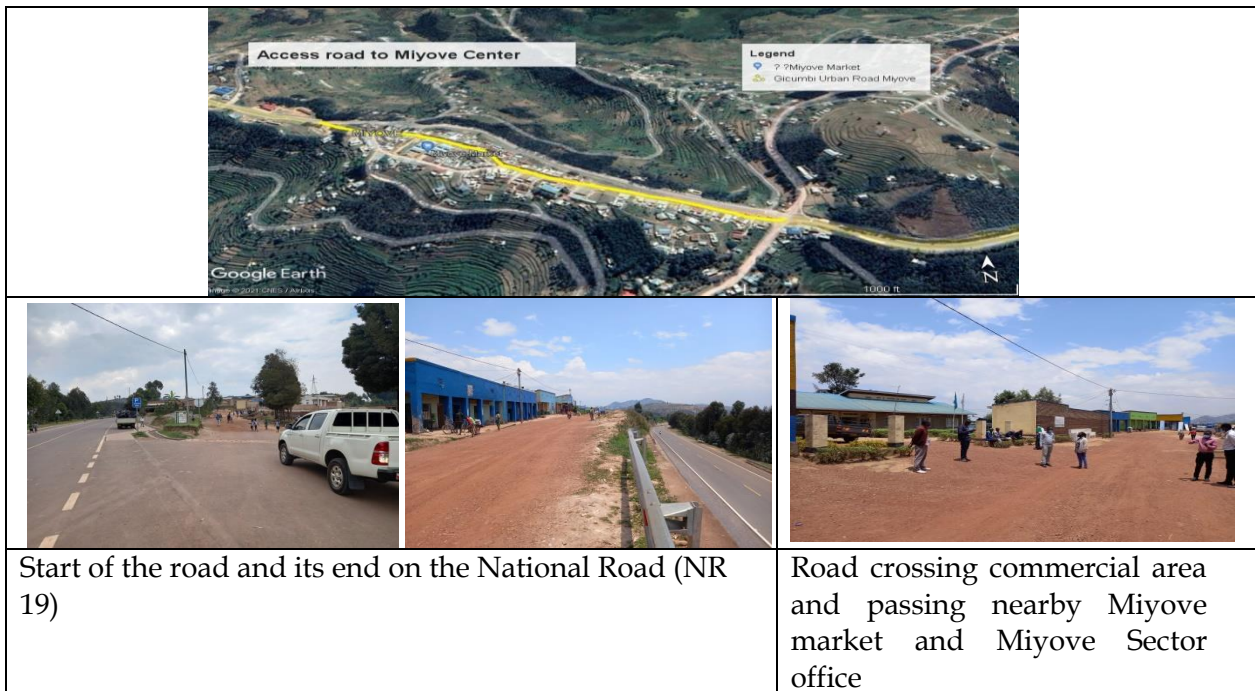


Figure 7: Map and photo of Access road in Miyove



**Environmental Social Impact Assessment (ESIA)
Byumba Urban Roads Rehabilitation/Upgrading Project (15.53Km)**

2.5.5 GUR 5: Byumba Center to Market road (0.34km)

This road is located in Byumba city. It bifurcates from the national road (NR 19) towards Byumba market to connect with other urban roads previously rehabilitated in this center. It is a cobblestone road with side drains. The length of this road is 0.34km. On this road, there is one roundabout to be improved. All along the road, there are commercial houses where different services (Bank, Insurance, pharmaceutical, restaurants, etc.) are provided. In addition to the road about on this road to be improved, there is also a strong need to cover the drainage channels of this road as means of providing access to commercial houses, a walkway for pedestrians as well as safety measures.

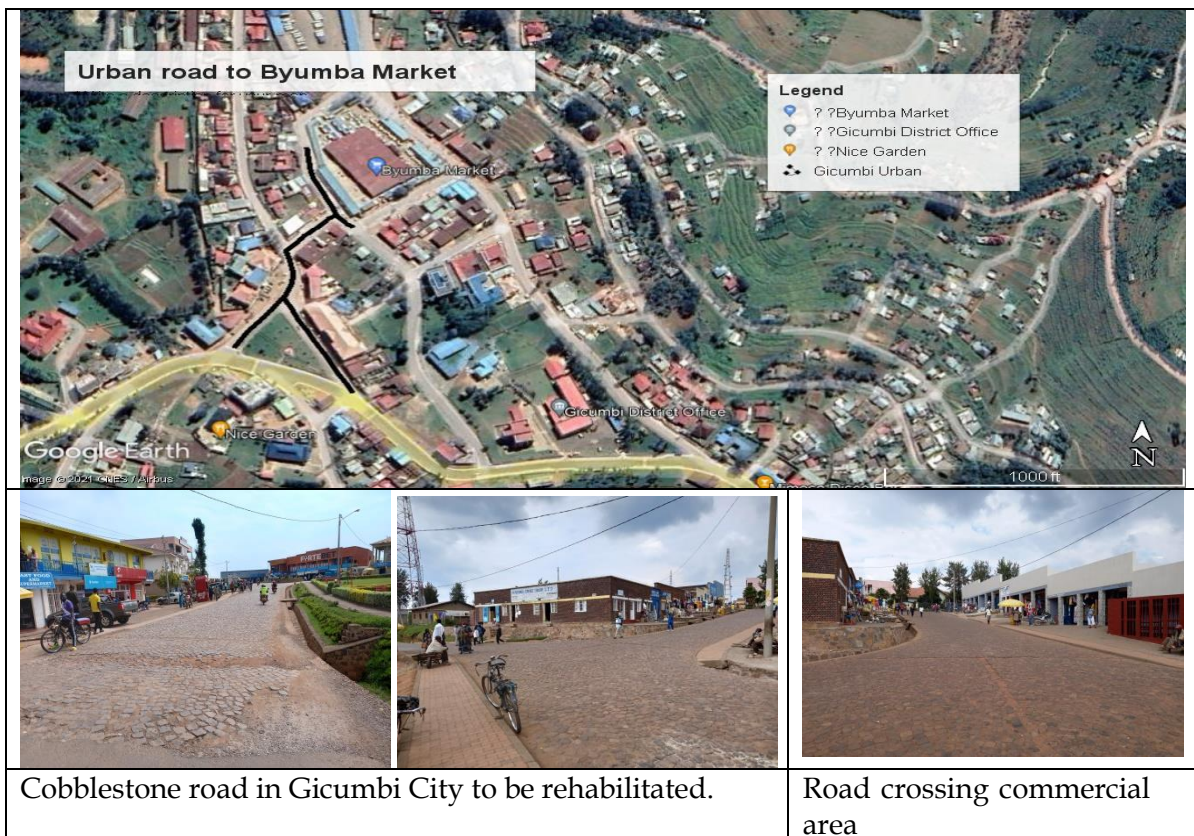


Figure 8: Map and photo of Town center road to Market

The table below provides details on the total length of each of the selected urban roads, the length, and the number of cross-drainage structures proposed by the scoping study of the rehabilitation of these roads.

Table 2: Details on selected roads and structures to be built

Road ID	Length (Km)	Number of		Design speed	Carriageway width (m)	Shoulder/sidewalk width (m)
		Pipe culvert	Box Culvert			
BUR 1	11.7	43	6	50/80	7.0	1.0/1.5
BUR 2	2.00	4	-	50	6.0	1.5
BUR 3	0.77	2	-	50	6.0	1.5



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BUR 4	0.72	2	-	50	6.0	1.5
BUR 5	0.34	1	-	50	Keep existing	1.5
Total	15.53	52	6			

Source: Scoping study report, December 2020

2.6 Design Standards

The design standard adopted for Byumba roads is based on the traffic projection made for the expected design life of the project; Projected traffic is based on a reference scenario. The table below shows the projected traffic composition.

Table 3: Projected traffic composition for Byumba urban roads project

Year	Passenger Car	Pick up, Panel, Vans	Bus	Single unit 2,3 axle trucks	Single trailer,3,4,5,6 and more axel trucks	Multiple trailer, 4.5.6.7 and more axle trucks	Total	Design class
Traffic opening year								
2023	11	18	4	6	34	22	94	Class 5
Projection 20 years								
2024	12	20	4	6	38	24	104	
								Class 4
2030	21	33	7	12	70	44	186	
2031	23	36	7	13	77	49	205	
								Class 3
2042	59	94	19	40	238	151	601	

The mid-design life of the project falls in the range 200-1500 AADT. Therefore, a design standard of class 3 is selected.

BUR 2, BUR 3, BUR 4, and BUR 5 are service roads in town. Existing road conditions, previous design document, Rwanda design manual, traffic conditions, space availability, non-motorized traffic conditions, and sidewalk requirements for pedestrians were considered to classify the road as per RTDA GDM (Road Geometric Design Manual).

2.6.1 Geometric design parameters

The geometric design parameters for the selected design class are shown in the table below.

Table 4: Geometric Design Parameters for Mobility Road Class 3 (Paved Road) (Source Scoping study)

Element of design	Unit	Flat	Rolling	Mountain	Steep	Urban
Design speed	Km/h	100	80	50	40	50
Sight Distances						
Min. Stopping Sight Distance	m	185	130	65	50	65
Min. Passing Sight Distance	m	670	540	345	270	345
% Passing Opportunity	%	50	33	25	0	20



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Horizontal elements						
Transition Curves Required	No	No	No	No	No	No
Maximum Super elevation	%	6	6	6	6	43
Vertical Element						
Maximum Gradient (desirable/ minimum)	%	5/6	7/9	10/12	10/12	10/12
Minimum Gradient	%	0.5	0.5	0.5	0.5	0.5
Minimum Crest Curve	K	52	26	7	4	7
Minimum Sag Curve	K	45	30	13	9	13
Cross Section Elements						
Width of Lane	m	3.5	3.5	3.5	3.5	3.5
Width of Shoulder	m	2.0	1.0	1,0	1.0	1.04
Total Width	m	11	9	9	9	9
Normal Crossfall AC/DBST or stone	%	2.5/3.0	2.5/3.0	2.5/3.0	2.5/3.0	2.5/3.0
Shoulder Crossfall paved/unpaved	%	3.5/5.0	3.5/5.0	3.5/5.0	3.5/5.0	3.5/5.0
Right of Way	M	24	24	24	24	24

1. At 6% maximum super elevation,
- 3 For hairpin curves, the minimum radius is 15 meters,
- 4 If super elevation creates access and/or drainage issues, a normal crown may be specified.
- 5 Parking lanes and footpaths may be required.

2.7 Project ancillary activities

The implementation of the project will require sources of construction materials and facilities such as campsites, borrow pits, dumping sites, quarry areas, crusher sites, etc. to support the project operation. The exploitation or use of those sites has an impact on the biophysical environment since they imply the destruction of vegetation cover and land degradation due to the extraction of construction materials as well as disposing of spoiled materials.

Land acquisition and management for any site has to be performed through the following process and practices:

- The land acquisition process for any type of site (quarry, borrow pit, dumping site, crusher site, etc.) has to involve the landowner, the Contractor, and the District (district environmentalist);
- Borrow pits and dumping sites should be preferably at the same place to minimize land degradation but also it will facilitate future rehabilitation of the borrow pits due to available spoil materials nearby to fill created holes after exploitation of the borrow pits;
- Borrow pits and dumping should be preferably on the cut slope side unless a given dumping site serves to support the embankment of the road;
- Avoid dumping soils on the embankment side of the road where the soil is likely to be eroded and cause sedimentation of rivers, streams, sources, and swamps.



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The project will have some temporary project campsites, which will be constructed after approval of the proposed campsite and its management plan. The establishment of the Campsite will take into consideration environmental management issues and will not be located in areas of high conservation values, where potential environmental impacts will be aggravated by location characteristics. The priority environmental measures will be considered to ensure compliance with relevant RDB, RTDA, Africa Development Bank, and REMA requirements.

After the establishment of the campsite, a close follow-up will be done by the client and the monitoring consultant to ensure that appropriate mitigation measures have been designed and are being implemented to avoid environmental and social issues including waste management, erosion control, safety, water and soil pollution, etc.

Given that the ancillaries facilities sites have not been identified at this stage, once the contractor will be on board he will be responsible to identify the location of these sites in compliance with environmental and social considerations. To enforce compliance with requirements, the contractor will have also to prepare the environmental and social impact assessment of these sites which will be approved by the Rwanda Development Board (RDB) before its exploitation. After the approval of the related ESIA, the contractor will be also required to prepare the management plan for each site.

2.8 Availability of construction materials

The rehabilitation and upgrading of Byumba urban roads in Gicumbi District will require different construction materials including sand, stone, marram, steel, cement, and water. The availability of those materials in the project area has a considerable contribution to the successful implementation of the project. The assessment for the availability of those materials is discussed below.

2.8.1 Materials from borrow-pits and quarries sites

Construction materials like marram, sand, and stones will be extracted from the borrow pits, and quarries that are locally available in Gicumbi District. One of the quarries used in road construction projects is located in Rulindo District, Base Sector located 30km from Byumba city. For the marram, the borrow pits in Kageyo Sector of Gicumbi District (5km) from Byumba City to Rukomo center and Kisaro Sector in Rulindo District (6Km from Byumba City) can be used to supply construction materials to Gicumbi Urban roads project in Gicumbi District.

2.8.2 Manufactured construction materials

Manufactured construction materials like steel and cement that would be required in the rehabilitation and upgrading of Gicumbi urban roads are available in the local markets since manufacturing factories are available in Rwanda. For cement, in Rwanda, there are two factories namely Prime Cement Limited located in Musanze District, Northern Province, and Cimerwa Cement Limited located in Rusizi District, Western Province. For steel, in Rwanda, there are two manufacturing factories including Master Steel Ltd located in Kigali City, and SteelRwa Industries Ltd located in Rwamagana District.

In addition to the local cement and steel manufacturing factories, there are also different importers and distributors of those construction materials which supply the whole country. The importers and distributors of cement and steel in Rwanda include but are not limited to Importer International Rwanda Ltd (IITL), Sulfo Rwanda Industries, Expogroup, Master Steel Ltd, and



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Sanfintra Rwanda Ltd. From the above assessment, it is concluded that manufactured Construction materials will be available in the local markets to supply the mentioned project.

2.9 Availability of water for construction

Water for road construction activities will be available from different rivers available in Gicumbi District. The most expected river to be used during the construction of Gicumbi urban roads is the Yaramba river, located at 6.8km of the roads two roads to be rehabilitated.

2.10 Proposed project schedule

The project for the rehabilitation and upgrading of Gicumbi urban roads is expected to cover 18 months of the rehabilitation period.

2.11 Proposed project cost

Based on the report of the scoping study for the rehabilitation of urban roads in Gicumbi District completed in December 2020, the estimated cost for this project is 10,657,570,729.42 billion Rwandan Francs covering the implementation of civil works to be undertaken and implementation of ESIA/ESMP.

However, based on the fund to be mobilized for this project; RTDA as the client of this project RTDA has estimated a total budget of nineteen million and twenty-six thousand (19.26million USD) in June 2021. This budget includes 18.4 million USD for the rehabilitation works of Gicumbi urban roads and 0.86 million USD for consultancy services for monitoring and supervision of the rehabilitation works.



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3. LEGAL, POLICY, AND INSTITUTIONAL FRAMEWORK

This chapter describes the relevant policies and strategies, legal instruments, institutional arrangements, and international framework applicable to the rehabilitation and/or upgrading of Byumba urban roads in Gicumbi District. It summarizes the National Laws and describes the procedure for obtaining environmental permits to allow project implementation. In August 2018, Rwanda adopted a legal framework following its National Policy on Environment, the new Environmental Law n° 48/2018 of 13/08/2018 determining the modalities of protection, conservation, and promotion of the environment in Rwanda. Ministerial order no 001/2018 of 15/04/2019 lists the projects that must undergo Environmental Impact Assessment before their commencement and where possible surpass legal stipulations/obligations to minimize or avoid negative impacts on the existing environmental status. This applies to programs and policies that may affect the environment. An order of the Minister having environment in his or her attributions shall determine the list of projects mentioned in this organic law”.

More specifically, ESIA must be carried out for large-scale infrastructure projects, such as the proposed project for the Rehabilitation/ Upgrading of selected five urban roads (15.53Km) in Gicumbi District and outlines the costs and benefits of the protection of related ecosystems. The ESIA must be submitted to the Rwanda Development Board (RDB). The Environmental Compliance and Cleaner Production Unit within RDB provides advice on EIA.

3.1 The Constitution of the Republic of Rwanda 2003, amended in 2015

As the supreme law of the country, the constitution of the Republic of Rwanda stipulates that the state shall protect important natural resources, including land, water, air, wetlands, minerals, oil, fauna and flora on behalf of the people of Rwanda. This constitution entrusts the government with the duty of ensuring that Rwandese enjoy a clean and healthy environment. Some of the articles related to environments are:

Article 22: Right to a clean environment: Everyone has the right to live in a clean and healthy environment.

Article 53 states that everyone must protect, safeguard and promote the environment. The State ensures the protection of the environment. A law determines modalities for protecting, conserving, and promoting the environment.

Article 34: Right to private property: Everyone has the right to private property, whether individually or collectively owned. Private property, whether owned individually or collectively, is inviolable. The property right shall not be encroached upon except in the public interest and the provisions of the law.

Article 35: Private ownership of land and other rights related to land are granted by the State. A law determines modalities of concession, transfer, and use of land. The constitution of the republic of Rwanda is important law guiding the implementation of the project. The project should abide by the provision of this law in terms of environment protection and promotion, as well as the properties ownership. Hence, the project implementation should avoid any violation of the property's ownership.

3.2 Policy Framework for Rwanda

3.2.1 National Policy on Environment for Rwanda 2003

The National Environment Policy was adopted by the Cabinet in November 2003. This policy aims at the following:



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- To enable the country to strike a dynamic balance between population and re- sources while complying with the balance of ecosystems.
- To contribute to sustainable and harmonious socio-economic development such that, both in rural and urban areas, men and women may realize their development and well-being in a sound and enjoyable environment; and
- To protect, conserve and develop the natural environment.

This policy, therefore, pursues to achieve its overall objective of the improvement of human wellbeing, the judicious utilization of natural resources, and the protection and rational management of ecosystems for sustainable and fair development through improved health and quality of life for every citizen and promotion of sustainable socio-economic development through rational management and utilization of resources and environment, integrating environmental aspects into all the development policies, planning and in all activities carried out at the national, provincial and local level, with the full participation of the population, conservation, preservation and restoration of ecosystems and maintenance of ecological and systems functions. This policy also seeks to integrate environmental sustainability principles into all development processes, programs, and projects. For roads, the nature of the terrain in Rwanda makes environmental issues (e.g. water runoff and landslides), the main threats to sustainable road maintenance. The terrain and the settlement patterns also indicate that roads which are the most common mode of transport could be a potentially dangerous development, unless environmental and social considerations of human safety, and risk of losses, are prior anticipated, identified, analyzed, and integrated into the project de- sign and implementation

The key principles mentioned among others:

- It is every person’s right to live in a safe and stable environment, but on the other hand, they must keep it healthy.
- National economic growth must be based on the rational use of resources and consider account environmental dimensions.
- Active and effective participation of the whole population for environment protection and management.
- A special emphasis must be laid on environmental education and sensitization program at all levels with more involvement of women and the youth.
- Environmental impacts are to be analyzed while conducting studies of development projects.
- Further, the policy proposes the elaboration or updating of master plans and special planning in urban areas regarding population and land development aspects. In natural resources management (including land and water), the policy proposes:
 - Ensure the preservation and protection of soils against any form of degradation.
 - Ensure that a prior study of environmental impact which underlines costs and benefits from slopes and underlying ecosystems protection is conducted for any development projects
 - Encourage programs for rainwater collection, stocking, and use.
- The policy also proposes the following about biodiversity, forests, wetlands management, and other natural reserves and or ecosystems:
 - Set up protection measures for slopes to avoid the degradation of swamps.
 - Promote the rehabilitation of ecosystems under degradation and restore endangered species.
- On the issue of environmental education, information, and research, the policy proposes among others to reinforce human and institutional capacity building about the environment and to sensitize the population to protect the environment.



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- On health and sanitation, the policy proposes among others:
- Set up a system of waste collection, transport, disposal, and elimination.
- Establish norms of zone protection between dumps, human buildings, and water sources.
- Set up an appropriate canal and evacuation system for waste water and rainwater in towns and resettlement sites “Umudugudu”.
- The National Policy on Environment for Rwanda harmonizes other policies like agriculture and energy. The policy further proposes that the Central Government will be concerned with conservation and protection policies while tourism and environmental management will be transferred to the District and Kigali City levels.

This underscores the importance of EIA in road projects. This policy provides a framework for the reconciliation of the three pillars of sustainable development, namely environment, social and economic issues. Rwanda's environment policy also advocates ensuring compliance with the environment in all transport and communications activities which includes the following:

- To ensure that land, lake, and air transport regulations minimize pollution.
- To prevent air and soil pollution by emissions of gases and heavy metals from transport equipment.
- To ensure the protection of areas bordering roads; and
- To protect the population against noise nuisances and dangers from air, lake, and land transport.

The national policy on the environment is linked with Byumba urban roads project as it provides the basis and orientation on environmental considerations to be taken into account in the project preparation and implementation.

3.2.2 National Land Policy 2004

In the past, apart from a few scattered land regulations, most of which date back to the colonial period, Rwanda has never had a proper land policy nor has it ever had a land law, a situation that enhances the existing duality between the very restrictive written law and the widely practiced customary law, giving rise to insecurity, instability, and precariousness of land tenure.

The Rwandan Government, therefore, found it compelling and necessary to establish a national land policy that would guarantee a safe and stable form of land tenure, and bring about a rational and planned use of land while ensuring sound land management and efficient land administration. Currently, the land tenure system in Rwanda operates in a dual legal system:

- The customary law governs almost all the rural land and promotes the excessive parceling out of plots through the successive father-to-son inheritance system.
- The written law mostly governs land in urban districts and some rural lands managed by churches and other natural and legal persons. This law confers several land tenure rights to individuals such as land tenancy, long-term lease, and title deeds.

Overall, Rwanda's land tenure system requires comprehensive reforms, from the elaboration of a national land policy to the establishment of land law and land code, which will guide the judicious use and management of the land resource for the economy to be able to take off in such a way that our country is freed from the grips of poverty. The national land policy was adopted in February 2004.

This policy provides a register and transfer of land and the possibility of investments in land. It also highlights key principles of land use and land management. The policy advocates the protection of green areas, marshy land, valley, and protected areas in Rwanda. These protected areas are classified as such because of their multiple roles, namely ecological, economic, cultural,



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and social. The main objective of their preservation was the conservation of different species and different habitats of biodiversity for educational, touristic, and research purposes. These areas have been affected by various changes, one of which is the spatial reduction due to the resettlement of the population. For road scheme development, the implications of this policy relate to resettlement and compensation; assessing the suitability of particular areas for road infrastructure, and the influence of infrastructure development on the changing value and use of land.

From the perspective of harmonious and sustainable development, the overall objective of the national land policy of Rwanda is to establish a land tenure system that guarantees tenure security for all Rwandans and gives guidance to the necessary land reforms with a view to good management and rational use of national land resources. The policy introduces the consideration of master plans for the use and sound management of land resources. The policy also provides development of land use plans based on the suitability of the areas/lands thus distinguishing the different categories of land and their purpose. The national land policy described above applies to Byumba urban roads rehabilitation and upgrading project as it provides clear guidance on land use, including transportation land. The policy highlights the land of interest that need to be protected. Even though the project roads do not cross the protected land including marshy, valley land, etc. the project should integrate the policy considerations in its entire scope including the establishment of dumping sites and waste disposal for the safety of such areas beyond the project road boundaries.

3.2.3 National Transportation Policy 2008

The National Transport Policy was approved in December 2008. This policy takes into account the action plan of the Sub-Saharan Africa Transport Policy and cross-cutting issues such as HIV/AIDS, gender mainstreaming, socio-economic and environment. The transport infrastructure sector must be effective to facilitate the other socio-economic sectors and thus stimulate the growth for the achievement of the objectives of Vision 2050.

This policy highlights the main objective of the road sub-sector in Rwanda as to Maintain, Rehabilitate and Develop the National Road Network, which is responsible for more than 80% of human and goods traffic in the country. The policy's strategies to meet these objectives are:

- a) Expanding and improving Rwanda's road infrastructure, protecting existing capital investments, and improving road safety;
- b) Establishing an appropriate institutional framework for the accelerated development of the road sub-sector;
- c) Financing road maintenance works through multi-year maintenance contracts, renewable under-performance evaluation;
- d) Encouraging community participation in road maintenance through the district development committees;
- e) Improving the ability and quality of local road infrastructure, thereby enabling the rural community to market its crops; and
- f) Creating an environment conducive to the encouragement of Private Sector participation in rehabilitating, maintaining, and developing road infrastructure.

Accordingly, a Road Maintenance Fund was established to provide adequate, reliable financing for road maintenance activities; and a Road Maintenance Strategy was formulated to guide the process. The mission of the transport sector is to strengthen the institutional framework and capacity of transport institutions and stakeholders in the planning and management of the sector.



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The objectives are to:

- Reduce and control transport costs
- Assure the quality and durability of the rural, urban and international transport network
- Improve safety for goods and passengers on the principle modes of transport
- Increase mobility of the population by improving access to essential services, education, and employment
- Establish a system to ensure sustainable financing of road maintenance
- Facilitate access to cost-effective transport services

The proposed Byumba Urban Road project is linked with the national transport policy. The policy supports the project intervention as the project also contributes to the policy objectives and mission of the transport sector including but not limited to: policy objectives by expanding and improving Rwanda's road infrastructure, protecting existing capital investments, and improving road safety; transport mission by reducing and controlling the transport costs in the project area.

3.2.4 Integrated Water Resources Management Policy of 2011

This policy aims at fair and sustainable access to water, and improvement of the management of water resources among others through reforestation and afforestation of hillsides and water catchment areas. There is a need to harmonize this policy with other policies like agriculture and mining policies by specifying the distances vis-à-vis other economic activities like marshland development. The policy also needs to adopt a holistic approach to the management of water resources and integrate other policies related to it including the forest, wetlands, agriculture, infrastructure development along water bodies, and land use.

3.2.5 Environmental Health Policy

The Environmental Health Policy is articulated on four following priority programs:

- **Environmental education:** This policy provides a way to improve hygienic and sanitary conditions in urban and rural areas.
- **Promotion of food security and water:** Food security and water issues constitute the basic problems in many areas, particularly in restaurants, bars, and public places. Environmental health officers will be in charge of monitoring and following through with the inspection of water and food quality. The inspection and monitoring will be conducted in all **areas** where water and food are stored for human consumption.
- **Compliance with safety and environmental standards in construction activities:** Environmental health officers will be involved in the application of plans and layouts of buildings, particularly the sanitation facilities designs.
- **Promotion of efficient management of solid and wastewater:** Environmental health officers in collaboration with learning institutions will propose efficient and cost-benefit technologies for solid waste and wastewater in communities, families, and enterprises. This will contribute to avoiding pollution and achieving sustainable development. The selection criteria for these technologies are their accessibility, affordability for people to acquire them, and their ability to reduce the contamination and pollution of water, food, air, and the environment in general. The implementation of this project will comply with safety, environmental education, and environmental standards in construction activities and efficient management of solids and wastewater.

The environmental health policy is also important in the preparation of this environmental social impact assessment for the proposed Byumba urban roads project as it highlights the priority programs described above to be reflected in the project implementation.



3.2.6 Mining Policy, 2010

The policy replaced one of 2004 and covers wider aspects of regulation, institutional and investment framework for the mining industry, value addition, and capacity-building strategies as well as providing a clear plan of action to support the sector's growth. The mining policy covers not only the mineral extraction, processing, and export, but also the quarrying, production of construction materials, and extraction and processing of semi-precious stones.

The proposed Byumba urban roads project is subject to the mining policy as the project will require the quarry for the production of road construction materials. Therefore, the exploitation of the quarry should be in line with this policy.

3.2.7 National sanitation policy 2016

The National Sanitation policy of 2016 recognizes that Rwanda's economic growth and poverty reduction goals are hampered by a lack of improved sanitary facilities as well as limited service provision for excreta disposal, and management of solid and liquid wastes, combined with inadequate hygienic practices, and storm water risks.

To increase sanitation coverage, Rwanda can build on some valuable scalable sanitary achievements. Most Rwandan households have already financed and built their waterless sanitary facilities and adhere to basic principles regarding garbage disposal and recycling (composting). The decentralization process provides an adequate framework for community participation and sensitization. Modern sanitation service provision, solid waste, and storm water management require efficient institutional capacities and somewhat costly infrastructure. Investments with high economic but low financial returns are usually not very attractive for the private sector and may need public finance and/or subsidies.

The policy principle is built on the fact that most of the Rwandese population relies on individual sanitation, and specific approaches for both individual and collective services must be considered. Households have demonstrated their willingness and capacity for building their sanitation facilities in most areas of the country – although many of the facilities do not yet comply with the definition of the improved facility. The willingness and sense of responsibility existing among the population is a strong asset that should be acknowledged and supported. A second asset is certainly the dynamic of the Rwandan business sector.

The proposed Byumba urban roads project is subjected to sanitation policy as the project is required to have and promote collective sanitation facilities at its premises including the campsite, crusher site, and working areas on the roads. In addition to sanitation facilities, the project is also required to ensure the proper management of solid and liquid wastes in the surrounding environment.

3.2.8 The National Forestry Policy, 2010

The overall goal of this policy is to promote the forestry sector as one of the bedrocks of the economy and national ecological balance for sustainable benefits to all segments of society.

The objectives of the policy include:

- 1) To encourage the participation of the private sector to invest in the forest sector for poverty reduction, employment creation, and improvement of livelihood through sustainable use, conservation, and management of forests and trees;



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- 2) To contribute to sustainable land use through soil, water, and biodiversity conservation, and tree planting through sustainable management of forests and trees;
- 3) To strengthen the participation of communities and other stakeholders in forest management, to conserve water catchment areas, and forest biodiversity, and ensure sustainability in the forest sector;
- 4) To promote farm forestry to produce timber, wood fuel, and supply wood and non-wood forest products; and
- 5) To promote forest research, training, and education to ensure a vibrant forestry sector.

The Proposed Project comprises different trees along the road alignment, and a large area of vegetation and trees will be cleared. Specific aspects of the policy will need to be considered. The proposed Byumba urban roads project is aligned with the National Forest Policy as the project will affect vegetation and trees in the right of way of the roads. However, the project is also expected to contribute to one of the policy objectives of sustainable land use through the soil, water, and biodiversity conservation, and tree planting through sustainable management of forests and trees.

3.2.9 The Revised National Gender Policy, 2021

The Vision of the revised National Gender Policy is to have a nation that enjoys gender equality and equity toward national and sustainable transformation. The mission of this policy is to ensure that gender gaps across sectors are addressed through accelerating effective gender mainstreaming, gender-responsive interventions, and gender accountability mechanisms to position Rwanda as a global model in promoting gender equality.

The guiding principles of this policy are:

- ✓ **Gender equality** is about women and men or girls and boys: gender should be understood as a status where women and men or boys and girls have equal rights and opportunities rather than being a social or a women issue.
- ✓ **The cross-cutting nature of gender** should not compromise its relevance across sectors: gender being a cross-cutting issue implies its high relevance in all sectors instead of being overlooked and lacking ownership.
- ✓ **Gender equality** is not only a social issue and human right principle but also an important approach to a country's transformation and sustainable development.
- ✓ **Women's empowerment** is seen both as social and economic capital for national development programs.
- ✓ **Political Will:** there is enough political will from the government and all players at all levels of governance including the Executive, Legislature, Judiciary, Civil Society, the Media, Private Sector, Youth, and Faith-Based Organizations in gender mainstreaming and accountability.

3.3 The Government of Rwanda Strategies

3.3.1 National Strategy for Transformation (NST1/2017-2024)

The National Strategy for Transformation (NST1/2017-2024) which is a 7 Government Programme, takes the environment and climate change as one of the cross-cutting areas which will be embedded within Sector Strategic Plans and District Development Strategies. In the area of environment and climate change, Rwanda has made significant progress in the environment and climate change mainstreaming, as reported in State of Environment Reports (SEORs, 2009 and 2015). The environment is protected by relevant environmental laws and regulations that are



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captured under the Environmental Organic Law of 2005, as revised to date, and Climate Change has been addressed and informed by cross-sectoral strategies, including the Green Growth and Climate Resilient Strategy (GGCRS) and the Nationally Determined Contributions (NDCs) for climate change mitigation and adaptation.

In this regard, the focus will be on improving cross-sectoral coordination to ensure the smooth implementation of environmental policies and regulations. In this regard, critical sectors identified for strengthening include agriculture, urbanization, infrastructure, and land use management. Additional emphasis will be put on strengthening monitoring and evaluation. High-impact areas selected include the implementation of environmental and social impact assessments, biodiversity and ecosystem management, pollution and waste management

3.3.2 National Wetlands Conservation Program

The program aims at engaging various government ministries in wetland conservation and ensures a holistic approach to wetland management. Rules governing wetlands in the country were put in place to enhance wetland conservation and enable environmentally adequate management of all development project activities, roads inclusive that may negatively impact wetlands. All wetlands crossed by the roads under study are currently used for agricultural production.

3.3.3 Road Maintenance Strategy 2008

The Road Maintenance Strategy of May 2008 emphasizes routine maintenance as a more cost-effective tool for establishing and managing road infrastructure. The strategy aims to: a) Provide a policy framework to guide RTDA and Districts staff in maintenance programming, planning, and execution; b) Ensure that investments are made in the development of roads; c) Ensure that infrastructures are safeguarded and allowed to deliver their maximum benefit, and to allow all stakeholders to understand the investment decisions taken by MININFRA.

This strategy emphasizes on building capacity, fostering public-private partnerships, and a long-term project cycle involving multi-year contracts management. Environmental management is a key aspect of the Road Maintenance Strategy, as this is critical for cost-effective road maintenance and rehabilitation.

3.3.4 National Biodiversity Strategy and Action Plan 2003

The first NBSAP for Rwanda has been developed in 2003 and defined the objectives and priorities for the conservation and sustainable management of biodiversity. The revised NBSAP, as a key tool for the implementation of the CBD objectives and its Aichi Targets, has been developed based on national needs and priorities for biodiversity conservation, in response to threats that are facing biological resources at the country level. It spells out a range of 5 objectives and 19 national targets that aim to stop biodiversity loss and increase the economic benefits associated with biological resources utilization and ecosystems' services. It defines strategies to address the pressures on national biodiversity and for the integration of biodiversity conservation issues into broader sector policies, strategies, development programs, and actions and creates more coherence in understanding biodiversity conservation and serves as a reference for the development and updating of biodiversity strategies and actions implemented in other development sectors.



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Finally, the revised NBSAP reflects the country's vision for biodiversity and the broad strategic mechanisms that Rwanda will take to fulfill the objectives of the Convention, while the action plan comprises the concrete actions to be taken to achieve the strategy.

3.3.5 Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) are a set of 17 goals the world will use over the next 15 years to end extreme poverty, fight inequality and injustice, and fix climate change. Formed through extensive consultation with all levels of society, the SDGs are a comprehensive development plan to leave no person behind. With the SDGs, Rwandans have the opportunity to act upon their vision for the future. No poverty, zero hunger, good health, gender equality, and infrastructure are among 17 set goals.

3.4 The Legal Framework

3.4.1 Law N° 70/2013 of 02/09/2013 governing biodiversity in Rwanda

Purpose of this Law: This Law determines modalities for the management and conservation of biological diversity within Rwanda.

3.4.2 Law N°55/2011 of 14/12/2011 governing roads in Rwanda

Purpose of this Law

This Law regulates the road network in Rwanda and determines its reserves, classification, and management.

- Article 22: Road reserve for national roads, Districts, and City of Kigali roads and those of other urban areas
- The road reserve for national roads, Districts, and City of Kigali roads and those of other urban areas –Class One shall be demarcated by two parallel lines at twenty-two (22m) meters on both sides of the road from the median line.
- The road reserve for Districts and City of Kigali roads and those of other urban areas – Class 2, shall be delimited by two parallel lines at twelve (12) meters on both sides of the road from the median line.
- The indicative feeder road project is classified as a District Road.

Article 27: Restrictions within the public road reserve

The following activities are prohibited on the road reserve for national roads, Districts, and City of Kigali roads, and those of other urban areas roads:

- 1° to erect new buildings modify or rehabilitate existing ones.
- 2° to induce land degradation by using materials that constitute such land.
- 3° to plant any type of trees without authorization of the authority responsible for the concerned road.
- 4° to mount any advertising billboard without authorization of the authority responsible for the road depending on its class

3.4.3 Law on Environment No 48/2018 of 13/8/2018

The most relevant legal provisions for road rehabilitation works are stated in the following chapters and articles:



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- Chapter IV: Conservation and protection of the built environment, specify modalities of wastes management in Article 17, Article 18, Article 19, and Article 20, respectively indicating the way liquid wastes, solid wastes, hazardous and toxic wastes, and electronic wastes; and
- Chapter VI: Prohibited Acts and Penalties in Article 42, and Article 46, respectively stating, prohibitions in wetlands and protected areas, and implementing a project without EIA.

Key articles and statements related to this study are described below:

Article 17: Liquid waste management

- The collection, transport, and disposal of wastewater are conducted by following special regulations and guidelines issued by the competent authority.
- Water from the sewage system and any type of liquid waste must be collected in treatment factories for purification and served thereafter to perform hygiene, sanitation, and developmental activities.

Article 18: Solid waste management

- No person is authorized to discard solid waste in an inappropriate place.
- Solid waste must be sorted, collected, and transported to the appropriate destination in line with relevant laws.
- Solid waste must be disposed of in an appropriate landfill or a waste processing factory for production purposes.

Article 42: Prohibitions in wetlands and protected areas

Acts prohibited in wetlands and protected areas are as follows:

- to dump any solid, liquid waste, or hazardous gaseous substances in a stream, river, swamp, pond, lake, and their surroundings
- to damage the quality of the surface or underground water
- to dump, spill or deposit materials of any nature that may cause or increase water pollution
- to dump, make flow any hazardous waste, wastewater, except after treatment to dump, make flow, dispose of and store any substance in a place where it may cause or facilitate pollution of national water

Article 46: Implementing a project without environmental impact assessment clearance

- Any person who does not carry out an environmental impact assessment before launching any project that may have harmful effects on the environment while it is required is punished by suspension of his/her activities or closure of his/her association and ordered to rehabilitate the damage to the environment, persons and property. He/she also pay an administrative fine of two percent (2%) of the total cost of the project.

Article 83: It is prohibited to dump in wetlands:

1° wastewaters, except after treatment as per instructions that govern it;

2° any hazardous waste before its treatment. Any activity that may damage the quality of water is prohibited.



3.4.4 Environmental Impact Assessment legislation in Rwanda

The Rwandan legislation governing EIA concerns also the construction or rehabilitation of national roads, district roads, and the repair of large bridges.

3.4.5 Law No. 43/2013 of 16/06/2013 governing land in Rwanda

The law entrusts the state with ownership over land including lakes, rivers, natural forests, national parks, swamps, and tourist sites among others. The law calls for an inventory of all the swamps and their boundaries the structure of the swamps, their use, and how they can be organized. For the swamp land to be efficiently managed and exploited, a Minister must give an order having the environment in his or her attributions that shall determine a list of swamps and their boundaries. The law further requires that such a list shall indicate the structure of the swamps, their use, and how they can be organized so that they can be beneficial to Rwandan nationals on a sustainable basis. The ministerial order must also certify the modalities of how swamp land shall be managed, organized, and exploited.

3.4.6 Law N° 32/2015 of 11/06/2015 Relating to Expropriation in the Public Interest

This Law determines procedures relating to the expropriation of land in the public interest. Article 3 of the law stipulates that the government has the authority to carry out expropriation. However, the project at any level which intends to carry out acts of expropriation in the public interest shall provide funds for an inventory of affected assets of the person to be expropriated.

The law defines the activities or projects that can be classified as public interest and process and requirements for expropriation activities as well as the cost for goods and other infrastructure to be expropriated. The law provides a window for appeal for somebody who is not satisfied by the cost of compensation.

3.4.7 Law N° 13/2014 of 20/05/2014 on mining and quarry operations

Mining and quarry exploitation laws provide the process of acquiring quarries for mining activities, the licensing process, and the environmental consideration in exploiting a quarry. Nevertheless, the quarry component will be conducted by a contractor who will be required to fully respect strictly the process. An EIA Certificate will be required for each quarry to be exploited in the framework of this project.

3.4.8 Ministerial Order No 001/2019 of 15/04/2019 establishes the list of Projects that must undergo environmental impact assessment, instructions, requirements, and procedures to conduct an environmental impact assessment.

Article 3 talks about the list of works, activities, and projects that must undergo a full environmental impact assessment. No public institution is authorized to take a decision, warrant a certificate, or approve or authorize the commencement of a project mentioned in the annex⁶ of this Order without a prior environmental impact assessment. The list of works, activities, and projects that must undergo a full environmental impact assessment before being granted authorization for their implementation is in Annex I of this Order. Paragraph 11 of this list includes the construction and repair of international, national, and District roads and the repair of large bridges.

⁶ List of works, activities and projects that must undergo a full environmental impact assessment



3.4.9 Ministerial Order N°004/16.01 of 24/05/2013 determining the list of water pollutants

Purpose of this Order: This Order determines the list of water pollutants. A water pollutant is any substance that may contaminate a water body that is directly or indirectly discharged into such a water body and produces harmful effects on aquatic life

3.4.10 Ministerial Order N° 001/16.01 of 03/01/2012 on explosives used in mining, quarrying, and infrastructure activities

This Order determines the requirements for importing and exporting, manufacturing, transporting, trading, and using explosives and their accessories used in mining and quarrying activities and civil engineering works.

Principles of environmental protection and security safeguard

Any person who imports or exports, transits, transports, uses or manufactures explosives and their accessories or trades in Rwanda, must abide by legislation relating to the environment and security preservation.

3.4.11 Ministerial Order N°003/MINIRENA/2015 of 24/04/2015 determining modalities for application, issuance, and use of Mineral and Quarry Licenses

This Order determines:

- 1° modalities for the application of mineral license;
- 2° modalities for the transfer of a mineral license between the holder thereof and a third party;
- 3° modalities for application for the renewal of a mineral license;
- 4° modalities for application for the grant or renewal of a quarry license;
- 5° requirements and conditions for the transfer of quarry licenses;
- 6° content of reports and their intervals;
- 7° non-refundable fee to be paid by an applicant for the grant, transfer, or renewal of mineral or quarry license;
- 8° annual fees to be paid by the holder of a mineral or a quarry license for the surface area covered by the license.

3.4.12 Ministerial Order N°02 of 17/05/2012 determining conditions for occupational health and safety

This Order determines the general and specific rules and regulations relating to health and safety at the workplace to secure the safety, health, and welfare of persons at work and protect them against risks to safety and health arising from work. It also determines the types of work prohibited for pregnant or breastfeeding women. In terms of scope, this Order shall apply to workers in formal and informal sectors and self-employed persons. Enterprises may request practical guidance from competent authorities when they want to set up regulations on safety and health.

3.4.13 Law No 59/2008 of 10/09/2008 on prevention and punishment of gender-based violence

This Law is aimed at preventing and suppressing gender-based violence, defined as:



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Gender-Based Violence: any act that results in bodily, psychological, sexual, and economic harm to somebody just because they are female or male. Such act results in the deprivation of freedom and negative consequences. This violence may be exercised within or outside households.

In article 2, the law states that it is forbidden to use the threat of depriving someone of certain rights to have them indulge in any gender-based violence act.

3.4.14 The Law N° 66/2018 of 30/08/2018 regulating labor in RWANDA

The article 6 states that it is prohibited to subject a child below the age of eighteen (18) years to any of the following forms of work:

- forms of work that are physically harmful to the child.
- work with dangerous machinery, equipment, and tools, or which involves the manual handling or transport of heavy loads.
- work in an environment that exposes the child to temperatures, noise levels, or vibrations damaging to his/her health.

Article 8: states that Sexual harassment in any form against the supervisee is prohibited.

3.4.15 EIA Guidelines for Rwanda, 2006

EIA guidelines serve as a protocol for use by various stakeholders involved in the conduct of environmental impact assessments.

Guidance is needed of a more technical nature to streamline the conduct of EIA and appraisal of EIA reports. As such, the establishment of “General Guidelines and Procedures for Environmental Impact Assessment”, which unifies the legal requirements with the practical conduct of EIA, meets a need in the pursuit of sustainable development in Rwanda. EIA is a tool for the prevention and control of environmental impacts caused by socio-economic development. The “General Guidelines and Procedures for Environmental Impact Assessment” were prepared to contribute to the improvement of EIA practice in Rwanda and they aim to serve agencies and individuals taking part in the EIA process. These guidelines were designed to ensure that participants in the EIA process understand their roles and that laws and regulations be interpreted correctly and consistently.

Two main principles underlie these general guidelines:

- they comply with the legal and institutional frameworks on environmental protection in Rwanda and;
- They contribute to the improvement of quality and efficiency of the EIA process in the country, and as such merge, step by step, with general global trends and practices of conducting EIA.

These general guidelines were developed to provide information necessary when carrying out an environmental impact assessment. It should be noted that our team carried out this EIA study under the guidance of these general guidelines.

3.4.16 General EIA Guidelines for Rwanda, 2009

These guidelines were developed by REMA in August 2009 to assist project developers, Contractors, and EIA practitioners. An EIA process in Rwanda includes 5 steps: (i) project application and registration, (ii) screening, coping, and terms of reference, (iii) EIA study and report, (iv) submission of an EIA report, and finally (v) decision making. The figure below



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summarizes the EIA procedure in Rwanda including a timeline for each stage. Screening enables the categorization of projects according to their Impact Level (IL) as follows:

Category 1: (Impact level IL1): Full EIA not required. Rwanda Development Board (RDB) advises on the appropriate environmental management measures (plan). The Exercise may take 14 days from the day received the project brief; (days may be less or more depending on the nature of the project);

Category 2: (Impact level IL2): The proposed projects under this category are screened to determine whether or not a full EIA is needed.

In this connection, RDB provides the developer with a clear indication of the additional information required. Once this information is received, RDB will determine whether or not a full EIA of the project is needed.

Category 3: (Impact level 3): Full EIA is required.

From the above categorization, the Byumba Urban Road project falls under category 3 requiring full environmental impacts assessment. This is also supported by Ministerial Order No001/2019 of 15/04/2019 Establishing the List of Projects that Must Undergo Environmental Impact Assessment, Instructions, Requirements, and Procedures to Conduct Environmental, where construction and repair of international, national, and District roads and repair of large bridges; are among the list of works, activities, and projects that must undergo a full environmental impact assessment.



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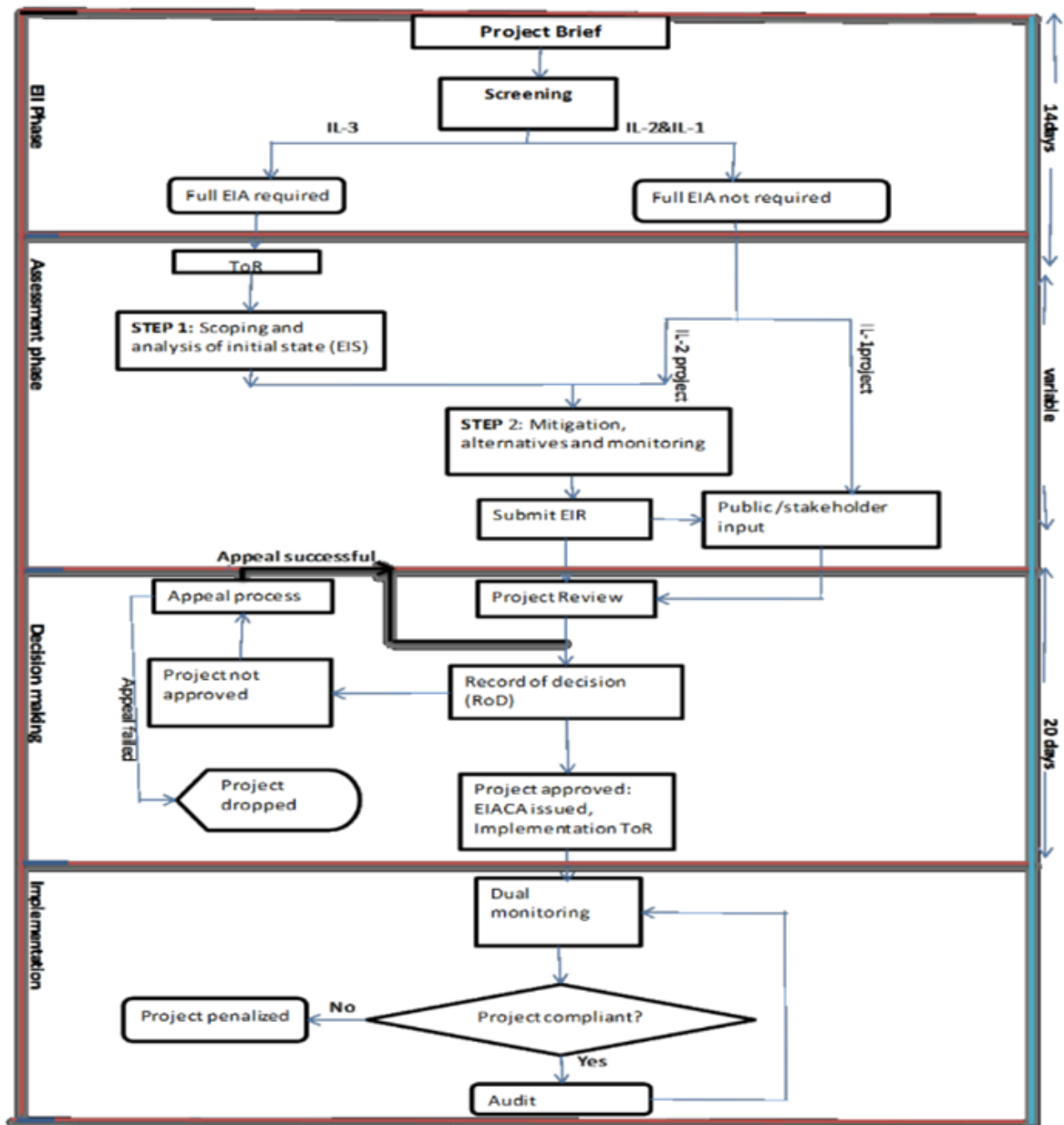


Figure 9: EIA Procedure in Rwanda

3.4.17 Sector guidelines for Environmental Impact Assessment (EIA) for road development projects in Rwanda

The sector-specific Guidelines for Road construction, rehabilitation, and upgrading have been developed by REMA in collaboration with other stakeholders. They recognize the role that the road networks play in Rwanda's development process and underscore the need to ensure that these developments continue to take place in harmony with environmental aspirations, use, and Management of Land legislation in Rwanda.

3.4.18 Covid-19 management guidelines

An outbreak of the coronavirus disease (COVID-19) caused by the 2019 novel coronavirus (SARS-CoV-2) has been spreading rapidly across the world since early 2020, following the diagnosis of the initial cases in Wuhan, Hubei Province, China. On 30th January 2020, the World Health



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Organization (WHO) through its International Health Regulations Emergency Committee declared the Coronavirus Diseases-19 (Covid-19) a Public Health Emergency of International Concern (PHEIC). Since the beginning of March 2020, the number of cases outside China increased tremendously and the number of affected countries has also gone up. On March 11, 2020, the World Health Organization (WHO) declared a global pandemic as the coronavirus rapidly spread across the world.

Rwanda reported the first individual positive for Covid-19 on 14th March 2020. The Government of Rwanda has taken swift action to tackle the risks associated with the ongoing pandemic. The Covid-19 containment measures have been evolving and the government has kept the public updated on the applicable measures at any given period. The government has taken several other complementary actions to enhance preparedness and response to the pandemic. The effort to contain the potential spread of COVID-19 is led by the Office of the Prime Minister under the National Epidemic Preparedness & Response Committee (NEPRCC), in collaboration with the Ministry of Health, Ministry of Local Government, and Ministry of Foreign Affairs. The Ministry of Health has expeditiously activated its Emergency Operation Centre and has established a Coronavirus National Taskforce to coordinate the national response.

Given the severity of the pandemic and the rapidity with which it spreads, all Rwandans were urged to take appropriate precautions and follow the advice of health professionals. Among the measure to be followed include the following:

- Avoid especially handshaking and close body contact like hugging;
- Avoid unnecessary travel to countries affected by Coronavirus;
- Cover the mouth and nose when coughing and sneezing in public using your elbow or tissue paper and dispose of;
- Wash hands regularly with clean water and soap or hand sanitizer containing at least 70% alcohol;
- Avoid contact with others whenever you have flu-like symptoms, cough, or high fever;
- Contact the nearest health facility if you have one of the following symptoms: flu, fever, difficulty in breathing, and cough with a sore throat.

In addition to the prevention measures, the government of Rwanda also started a vaccination campaign for the population as a long-term solution to contain the pandemic. The updates of the Ministry of Health on the Covid-19 vaccination report 8,638,063 people had received the first dose, 7,208,067 people for the second dose while the booster dose has been received by 1,156,868 people by 07th February 2022. The Government of Rwanda keeps updating and disclosing to the public the measures to be followed by the Rwandans to contain the pandemic. Therefore, the implementation of the Byumba urban roads in Gicumbi District will also abide by the measures that will be in place.

3.5 Institutional Framework

The roads sector is an anchor to social and economic transformation, and for this reason, has spider web-like networks with other sectors, including agriculture, international trade, local governance, education, health; etc. The institutional framework for environmental impact assessment in the feeder roads sector is, therefore, complex. The main institutions involved, and their roles are summarized in the table below.



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Table 5: Key stakeholders Institutions in ESIA implementation for Byumba Urban Roads project

No	Institution/ Agency	Key interests and responsibilities for Gicumbi urban roads
1	Rwanda Environment Management Authority (REMA)	National authority responsible for environmental protection, conservation, and promotion. It oversees the implementation of EIA guidelines. It is responsible for conducting the project environmental audit during project implementation.
2	Rwanda Development Board (RDB)	To facilitate the investors, RDB has been given the responsibility of reviewing the ESIA reports and providing environmental compliance certificates to development projects. RDB will review and clear the ESIA/ESMP and issue the Certificate together with approval conditions before the start of road rehabilitation works.
3	Rwanda Standards Board (RSB)	RSB has a mission to provide standards-based solutions for consumer protection and trade promotion for socio-economic growth in a safe and stable environment in Rwanda. It has developed standards for the design and maintenance of feeder roads (RS 267:2015). It has also developed other standards related to the road sector like the standards on ambient air quality and noise levels.
4	Rwanda Mining Board (RMB)	Formulating policies and regulations for land administration and land use planning; environmental protection and natural resources utilization, including expropriation. In this project, a major responsibility is to allow the exploitation of borrow pits and quarries for the required construction materials given its extent.
5	Ministry of Infrastructures (MININFRA)	Formulating policies and laws for road development in the country. It is also responsible for national roads, highways, and bridges and oversees feeder road development policies.
6	Rwanda Transport Development Agency (RTDA)	Oversees the implementation of the transport policy, including management of roads (National roads, District Roads and Feeder Roads), and initiating public investment in transport services.
7	Ministry of Environment (MoE)	Formulating policies and regulations for land administration and land use planning; environmental protection and natural resources utilization, including expropriation.
8	Ministry of Local Government (MINALOC).	Formulating national policies and laws on decentralization and local governance – Supervising District authorities which is also the beneficiary of this project.
9	Rwanda Land Management and Use Authority (RLMUA)	Land registration and land use planning throughout the country. Compensation and resettlement will depend on legal ownership.
10	Rwanda Water Board (RWB)	Provide relevant authorization that would be required for using water resources when necessary.
11	Rwanda Forestry Authority (RFA)	Provide relevant authorization that would be required for using/removing forest resources when necessary.
12	Rwanda National Police (RNP)	The National police have statutory responsibility for law enforcement including ensuring that road traffic laws are observed; therefore, all roads are constructed in conforming to the appropriate legislation. They also have to provide security to road



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		construction facilities. RNP will also help to educate local people on road safety.
13	Isange One Stop Centre Rwanda	With its initiative to complement existing efforts to prevent, and respond to GBV and child abuse, it will help in awareness campaigns alongside Byumba urban roads and/or investigating GBV and VAC crimes in the project area.
14	Gicumbi District	Gicumbi District is responsible for monitoring the project implementation in close collaboration with all stakeholders mainly RTDA, the Supervision firm, the contractor, and the local community. Conduct expropriation of properties to be affected by the project in line with the Expropriation Law.
15	African Development Bank	Financing the proposed roads project and Clearance of ESIA/ESMP report as well as monitoring compliance with E&S requirements throughout the project duration.
16	Contractor	Once on board, he will be responsible for: Preparing and implementing the site-specific ESMP during the construction phase, including employing environmental and social safeguards experts for the proper ESMP implementation in Gicumbi District. Preparing the environmental social impact assessment for the ancillaries' facilities (Campsite, borrow pits, quarries, dumping sites, etc.) not covered in this report.
17	Supervision Firm	Once on board, he will be responsible for: Supervising the proper implementation of site-specific ESMP

3.6 Africa Development Bank Integrated Safeguards System

The objective of the Africa Development Bank safeguards system is to prevent and mitigate undue harm to people and their environment during the project development process. To avoid adverse negative environmental and social impacts of the proposed urban roads rehabilitation and upgrading project in Gicumbi District, the Environment Social Impact Assessment (ESIA) as well as Resettlement Action Plan (RAP) have been the pre-requisites tools to be prepared before undertaking the road rehabilitation works. As this project is at the preliminary design stage, the ESIA and RAP may have to be updated based on the final design. The ESMP with the management measures is incorporated in the bidding documents, and every person affected by the works on that section has been relocated and/or properly compensated according to Bank policies.

In this regard, this ESIA has been prepared for rehabilitation and upgrading urban roads in Gicumbi District in line with the relevant laws of Rwanda and the Operational Safeguards of the Africa Development Bank, it was found that all five operational safeguards (OS 1: Environmental and Social Assessment, OS2: Involuntary Resettlement, OS3: Biodiversity and Ecosystem Services, OS4: Pollution Prevention and Control, Greenhouse Gases, Hazardous Materials, and Resource Efficiency and OS5: Labour Conditions, Health, and Safety) will be triggered by the project.

3.6.1 Africa Development Bank Operational Safeguards

3.6.1.1 OS 1: Environmental and Social Assessment

The operational safeguard on environmental and social assessment has the objective of mainstreaming environmental and social considerations, including those related to climate change



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vulnerability into Bank operations, thereby contributing to sustainable development. Towards this, the scope of the environmental and social assessment should include the project's area of influence (both upstream and downstream) encompassing the area to be likely affected by the project, related or associated facilities dependent on the project that is not funded by the project and that would not have been implemented if the project did not exist; and a comprehensive scoping of the project's components, consideration of alternatives, and assessment of cumulative impacts, where relevant. The following specific objectives have to be met with the environmental and social assessment of the project:

- Identify and assess the environmental and social impacts and risks including those related to gender, climate change, and vulnerability of Bank lending and grant-financed operations in their areas of influence;
- Avoid or, if avoidance is not possible, minimize, mitigate and compensate for adverse impacts on the environment and affected communities;
- Provide for stakeholders' participation during the consultation process so that affected communities and stakeholders have timely access to information in suitable forms about Bank operations, and are consulted meaningfully about issues that may affect them;
- Ensure the effective management of environmental and social risks in projects during and after implementation.



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Table 6: Africa Development Bank project Categorization

Project Category	Description
Category 1	Projects likely to induce significant and/or irreversible adverse environmental and/or social impacts, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This category also includes any project requiring the displacement of more than 200 people hence a Full Resettlement Action Plan (FRAP) under the provisions of the Bank's operational safeguard on involuntary resettlement is also deemed to be Category 1. Category 1 investment projects require an ESIA, leading to the preparation of an ESMP.
Category 2	Projects are likely to have detrimental site-specific environmental and/or social impacts that are less adverse than those of Category 1 projects. Likely impacts are few in number, site-specific, largely reversible, and readily minimized by applying appropriate management and mitigation measures or incorporating internationally recognized design criteria and standards. An operation that involves resettlement activity for which an Abbreviated Resettlement Action Plan (ARAP) is required under the ESAPs is classified as Category 2. Category 2 projects require an appropriate level of environmental and social assessment (SESA for program operations, investment plans, and some corporate loans, or ESIA for investment projects) tailored to the expected environmental and social risk so that the borrower can prepare and implement an adequate ESMP (for an investment project) or ESMF (for a program operation), to manage the environmental and social risks of subprojects in compliance with the Bank's safeguards.
Category 3	Projects do not directly or indirectly affect the environment adversely and are unlikely to induce adverse social impacts. They do not require an environmental and social assessment. Beyond categorization, no action is required. Nonetheless, to design a Category 3 project properly, it may be necessary to carry out gender analyses, institutional analyses, or other studies on specific, critical social considerations to anticipate and manage unintended impacts on the affected communities.
Category 4	Projects that involve subprojects that may result in adverse environmental and/or social impacts and for which the AfDB's investments are handled by a financial intermediary. These projects must assess the intermediary's capacity to address environmental and social concerns.

From the above categorization, Byumba urban roads rehabilitation and upgrading project falls under Category 1 project. However; based on the Rwanda General guidelines and procedures for environmental impact assessment (2006) this project falls under the category of impact level 3 as discussed in the section above on project categorization. The proposed project is likely to have adverse environmental impacts on human populations or environmentally important areas - including land, forests, drainage patterns, and other natural habitats. These impacts are site-specific and, in most cases, mitigation measures can be designed. Therefore, the EA process for this project examines the potential negative and positive environmental and social impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. An ESMP is to be prepared and integrated during project implementation.



3.6.1.2 OS2: Involuntary Resettlement: land acquisition, population displacement, and compensation

This operational safeguard seeks to ensure that when people must be displaced, they are treated fairly, equitably, and in a socially and culturally sensitive manner; that they receive compensation and resettlement assistance so that their standards of living, income-earning capacity, production levels, and overall means of livelihood are improved; and that they share in the benefits of the project that involves their resettlement. It covers all components of a project, including activities resulting in involuntary resettlement that are directly and significantly related to a Bank-assisted project and necessary to achieve its objectives – whether the resettlement is led by a government, a private sponsor, or both – and carried out or planned to be carried out contemporaneously with the project.

Note that for any project involving the resettlement of fewer than 200 persons; an ARAP, together with the ESIA or ESMP, is disclosed by the borrower in the borrowing country and by the Bank in the Public Information Centre and field offices, and is posted on the Bank Group's website for public review and comment. The resettlement action plan (RAP) prepared for this project indicates the total number of 436 households with 2107 persons will be affected by the project. The compensation cost of the properties to be affected is estimated to be **1,571,077,945Rwf**. The detailed information is in the resettlement action plan (RAP) prepared as a standalone document for this project.

3.6.1.3 OS3: Biodiversity, renewable resources, and ecosystem services

It reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote the sustainable management and use of natural resources. The implementation of this Operational safeguard involves three habitat categories including natural, modified, and critical habitat.

Critical habitats can include areas that are not being protected or managed, and they may be outside legally protected and designated areas. Habitats may be considered critical if their ecosystem functions or species rely on or provide connectivity with other critical habitats, including legally protected critical habitat areas. The Bank does not finance projects in critical habitats downgraded merely to allow the project to proceed. However, the Bank may agree to finance a project in a critical habitat if the borrower or client can demonstrate, the use of appropriate measurement and monitoring methods.

The proposed Byumba urban road project is relevant to this operational standard, as the project is required to protect biodiversity and ecological services. Given that in the project area, there is a critical habitat of Rugezi wetland protected in Rwanda as the RAMSAR site, located to 0.7km from one of the project roads; the project should ensure the full protection of this natural habitat from any impacts of the project.

3.6.1.4 OS4: Pollution prevention and control, hazardous materials and resources efficiency

The objectives of this operational safeguard are to manage and reduce pollutants and set a framework for efficiently using all of a project's raw materials and natural resources, especially energy and water. It also requires compliance with internationally accepted Environmental Health and Safety (EHS) Guidelines.

Relative to the requirements of this OS and the nature of Gicumbi urban roads rehabilitation project, the latter will consider actions related to Pollution prevention and control, resource



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efficiency, Waste management, greenhouse gas emissions, Hazardous materials management, Emergency preparedness, and response, and resource efficiency. For the appropriate management of all issues related to this OS, the borrower or client should have permanent environmental health and safety staff with relevant experience, and a training action plan.

3.6.1.5 OS5: Labor conditions, Health, and safety

This OS considers that labor is one of a country's most important assets in the pursuit of poverty reduction and economic growth. Respect for workers' rights is one of the keystones for developing a strong and productive workforce. This OS outlines the main requirements for borrowers or clients to protect the rights of workers and provide for their basic needs as reflected through the following objectives:

- Protect workers' rights;
- Establish, maintain, and improve the employee-employer relationship.
- Promote compliance with national legal requirements and provide supplemental due diligence requirements where national laws are silent or inconsistent with the OS;
- Align Bank requirements with the ILO Core Labor Standards, and the UNICEF Convention on the Rights of the Child, where national laws do not provide equivalent protection;
- Protect the workforce from inequality, social exclusion, child labor, and forced labor; and,
- Establish requirements to provide safe and healthy working conditions.

The labor conditions, health, and safety operational safeguards are more relevant to the Byumba urban roads project since the latter is also expected to use the labor force in various project activities. Given the importance of the country's labor in poverty and economic growth; the project is required to comply with the objectives of this operational safeguard including but not limited to protecting workers' rights; protecting the workforce from inequality, social exclusion, child labor, and forced labor; and providing safe and healthy working conditions.

3.7 International Multilateral Conventions and Legal frameworks

The following conventions and regulations have been signed and ratified by Rwanda and are to be taken into consideration through the overall project cycle.

- The international Convention on Biological Diversity and its habitat was signed in Rio de Janeiro in Brazil on 5 June 1992, as approved by Presidential Order No 017/01 of 18 March 1995;
- The Cartagena Protocol on biodiversity to the Convention on Biological biodiversity was signed in Nairobi from May 15, to 26, 2000, and in New York from June 5, 2000, to June 4, 2001, as authorized to be ratified by Law No 38/2003 of 29 December 2003;
- The United Nations Framework Convention on Climate Change, signed in Rio De Janeiro in BRASIL on 5 June 1992, as approved by Presidential Order No 021/01 of 30 May 1995;
- The KYOTO Protocol to the framework on climate change adopted at Kyoto on March 6, 1998, as authorized to be ratified by Law No 36/2003 of December 2003;
- The RAMSAR International Convention of February 2, 1971, on Wetlands of International importance, especially as water flows habitats as authorized to be ratified by Law No 37/2003 of 29 December 2003;



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- The Stockholm Convention on persistent organic pollutants, signed in Stockholm on 22 May 2001, as approved by Presidential Order No 78/01 of 8 July 2002;
- The BASEL Convention on the Control of Transboundary Movements of Hazardous wastes and their disposal as adopted at BASEL on 22 March 1989, and approved by Presidential Order No 29/01 of 24 August 2003 approving the membership of Rwanda;
- The Montreal International Conventional on Substances that deplete the Ozone layer, signed in London (1990), Copenhagen (1992), Montreal (1997), Beijing (1999), especially in its article 2 of LONDON amendments and Article 3 Of COPENHAGEN, MONTREAL and Beijing amendments as approved by Presidential Order no 30/01 of 24 August 2003 related to the membership of Rwanda.



4. PROJECT ENVIRONMENT & SOCIAL BASELINE SITUATION

4.1 General

The objective of this chapter is to describe and collect data on the baseline conditions in the environmental and social settings in the areas of the proposed project intervention of rehabilitating and upgrading the selected urban roads (15.53km) in Gicumbi District. The information from this chapter will help in identifying and analyzing the possible negative impacts likely to be caused by the proposed project, thus providing insight into the formulation of the mitigation measures as well as their monitoring during the project implementation. This chapter, therefore, focuses on the identification and collection of project area environmental and social parameters before project intervention.

Considering that the identification of the project area's environmental and social parameters, data collection, and impact predictions are the core of the ESIA process; the impact identification in this study focuses on the zone of influence of the project as well as on the area beyond the zone of influence to identify all possible impacts that would not occur in the absence of the project intervention.

A scoping matrix has been formulated to identify the attributes likely to be affected due to proposed project. In the preparation of this environmental and social impact assessment, the data and information for the following aspects have been collected, compiled, and analyzed :

- ❖ Land Environment (land use, geology, and soils);
- ❖ Water Environment (precipitation, hydrology, and drainage);
- ❖ Ambient Air Environment (air quality and meteorology);
- ❖ Noise Environment (noise levels);
- ❖ Ecological Environment (flora and fauna); and
- ❖ Socio-Economic Environment (demography, livelihood, income socio-economic, etc.).

Based on the environmental and social scoping matrix and project settings, the attributes likely to be affected are identified based on baseline data generation, such as geology, soils, water, air, noise, ecology, and socio-economic which have been collected from various sources including desk review, field visits and interview with different stakeholders. The collected data are presented in this chapter.

A baseline environmental and social condition comprises the features present within the proposed ROW with an average additional width of 4.5m to the width of the existing road to meet the required RoW of 10.5 m. However, by considering the direct or indirect impacts for some urban roads, the required RoW is below 10.5m given that the existing road has sufficient carriageway, and/or the road will be kept as it is. However, for some environmental and social aspects, the baseline conditions will be collected even in the surrounding area of the zone of influence.

The concept is to assess the extent to which the construction and operation of the proposed Gicumbi urban roads project is likely to cause impacts on the above environmental and social attributes. It includes environmental features such as forest areas, ecologically sensitive areas, water bodies (lakes, rivers, marshy and swampy areas and ponds), places of historical importance, tourism, etc. The scope of this chapter is limited to only those issues, which are of concern in the assessment of environmental and social impacts. The major purposes of describing the environmental and social settings of the study area are:



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- Understanding the need of the project and the environmental characteristics of the area,
- Assessing existing environmental quality, as well as the environmental and social impact of the proposed project development,
- Identification of environmentally significant factors or geographical areas that could influence decisions about any future development.

Table 7: Scoping Matrix for the Project

Project Cycle/Phase	Likely Impacts	Baseline Data Review collection
A. LAND ENVIRONMENT		
Design Phase	- Change of land use	- Present land use
Construction Phase	- Increase in soil erosion and soil loss	- Soil characteristics - Land use and land covers
	- Landslide issues	- Soil characteristics and rainfall pattern,
	- Land Pollution by construction spoils, grease and oil spills, and domestic wastes disposal	- Rainfall
B. WATER ENVIRONMENT		
Design Phase	- Erosion of soil	- Drainage Pattern
		- Rainfall
Construction Phase	- Water Quality Impacts due to the disposal of wastes and spoils from construction activities	- Rainfall Storms - Wastewater treatment and disposal from project camp
	- Shortage in water supply	- Watercourses in the project area
Operation Phase	Run-off Problems	- Drainage pattern
C. AMBIENT AIR ENVIRONMENT		
Construction Phase	- Air pollution due to emissions generated by construction machinery	- Ambient air quality in the project area
	- Fugitive emissions from various sources.	
Operation Phase	- Exhaust emission due to road operation	- Ambient air quality
D. NOISE ENVIRONMENT		
Construction Phase	- Noise of construction machinery	- Ambient noise quality in the project zone
	- Vehicle noise	
Operation Phase	- Noise due to road operation	- Ambient noise quality at different locations
E. ECOLOGICAL ENVIRONMENT		



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Project Cycle/Phase	Likely Impacts	Baseline Data Review collection
Construction Phase	- Loss of Forest and Trees	- Forest cover in the project area
	- Migration of Fauna	- Faunal Species
F. PHYSICAL AND CULTURAL RESOURCES		
Construction Phase	- Damages to existing infrastructures in the RoW.	- Status of Infrastructure
	- Impact on Cultural Resources	- Status of Cultural Resources
Operation Phase	- Impact on schools, hospitals, etc.	- Values of environmental attributes at sensitive locations
G. SOCIO-ECONOMIC ENVIRONMENT		
Construction Phase	- Loss of land, houses, livelihood, job potential	- Land, houses, livelihood data
Operation Phase	- Livelihood	- Socio-economic status
	- Increase in road accidents and fatalities from increased use of roads and potentially higher speeds	- Road safety status

4.2 Study Area

The primary baseline data has been collected within the RoW of the roads to be rehabilitated and upgraded. The project influence area has been defined as 10.5 m considered as Right of Way (RoW) for the collection of secondary data. The sites for ancillary facilities like borrow areas, quarry sites, campsites, material storage, disposal areas, and access roads also fall within the study area. The location of the urban roads is shown above under the project area description section. The details of the baseline information are discussed below.

4.3 Land Environment

The land environment includes geology, soils, and land use. In Gicumbi District, the selected urban roads are passing through the land environment with different characteristics including built-up areas, and forest and agricultural lands. The district is located in the highlands area of Buberuka with a succession of steep hills and sometimes separated by deep valleys and high altitudes varying from 1500 to 1800m (AMSL) 90.4 % of the district land is hilly.

4.3.1 Physiography of Gicumbi District

In Gicumbi District, the selected urban roads project area is characterized generally by flat, rolling, and hilly/mountainous areas. Forests in Gicumbi District cover 23,024 ha, about 28% of the total district land area and almost 100% are forest plantations.⁷

4.3.2 Geology and Soils

Due to the mountainous character and dominance of lateritic soils and granites on 90 % of the district, soil erosion is active during the long rainy season. The soils in quartz are also represented on a lot of massifs while the swamps and the shallows are characterized by rich and deep clay soils. Almost all of the soil in the Gicumbi District is shale and quartz rock. In the valleys, the soil

⁷ MoE, 2019. Rwanda Forest Cover Mapping. page 235.



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is peaty, clayey, or sandy. On hillsides, the soil is more or less acidic and suitable for tea cultivation.

4.3.3. Climatic conditions

Rwanda has a tropical climate characterized by its hilly landscape stretching from east to west. The country has four primary climatic regions: eastern plains, central plateau, highlands, and regions around Lake Kivu. The highlands, including the Congo-Nile Ridge and volcanic chains of Birunga, benefit from an annual rainfall of between 1,300 mm and 1,600 mm and experience annual mean temperatures between 10°C and 18°C. Overall, the country's four climatic seasons are represented by the long rainy season: March to May, and the short rainy season: September to November. These seasons alternate with the long dry season: June to August, and the short dry season: December to February⁸ Gicumbi District is also located in the highland climatic region.

According to the findings of the study entitled Developing Capacity for Climate Resilient Road Transport Infrastructure (DCCRR), in the vulnerability assessment report; the historical observed mean annual total rainfall (1981-2016) for Byumba station (Gicumbi District) is 1102.1 mm while it is expected to be 1244.9mm in the future projection of 2021 to 2050 by RCP8.5. The analysis done for the extreme rainfall, historical and future projected maximum rainfall observed in 24 hours showed that at Byumba station was 80.7mm while it is projected to be 91.2mm.⁹ According to the seasonal forecast of September to December (SOND) 2022, No 61 of Rwanda Meteorology Agency, Gicumbi District is expected to receive for the most part rainfall ranging between 300-400mm and in the small part 200-300mm.

4.4 Water Environment

The water environment consists of water resources such as streams, lakes, estuaries, water use, and quality. Understanding the water quality is essential in the preparation of EIA and to identify critical issues to suggest appropriate mitigation measures for implementation. Water availability is essential in the project area for construction and drinking. It is anticipated that water will be available for the above purposes in the project area.

Rwanda's hydrological network is divided into two main drainage basins: the Nile Basin covers 67 % of the Rwandan territory and drains 90 % of the country's waters, and the Congo basin covers 33 % of the Rwandan territory and drains 10 % of the country's water. Gicumbi District hydrography belongs to the Nile basin in the catchment of Muvumba and Nyabarongo with hydrographic networks consisting of rivers and streams.

4.4.1 Rivers and streams

The hydrographic network of Gicumbi District is vast with many rivers and streams. These streams and rivers lie in the plain forming swamp. Such rivers include Mwange, Mulindi, Mutulirwa, Walufu, Muyanaza, Yaramba and Gaseke among others. Some of these rivers have a permanent water flow that would allow irrigation once wetlands developed. Gicumbi district has also abundant water sources scattered here and there with seasonal flow. All the mentioned rivers are not crossed by the project roads, but two of them are located in the vicinity of project roads; including Mulindi river located at 230 m from the endpoint of Byumba-Ngondore road, and

⁸ Climate Risk Profile: Rwanda (2021): The World Bank Group, 36 pages.

⁹ RTDA, 2020. Developing Capacity for Climate Resilient Road Transport Infrastructure (DCCRR), vulnerability assessment report. 203 pages



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Yaramba river located at 6.8km from the mid-point of Byumba-Catedral road, and the starting point of Byumba-Ngondore road.

4.4.2 Wetland and marshlands

Wetlands and marshlands are also important components of the water environment. According to the Ramsar treaty, wetlands are defined as: "...areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters". The relief of the district is characterized by a steeper slope and mountainous topography. The plateau is surrounded by steeper ravines with small valleys segmented by the multiple swamps.

The major floodplains are Mwange, Mulindi, Mutulirwa, Walufu, Muyanza and Gaseke. Hydrography of the District is characterized by the wetlands of Rugezi and Lake Muhazi. Rugezi wetland is protected as a RAMSAR site since 2005.

4.4.3 Lakes in Gicumbi District

Gicumbi district has one lake; Muhazi. It has a large marsh with plenty of water. This lake spreads on four districts including Gicumbi, Gatsibo, Rwamagana, and Gasabo. Lake Muhazi is located at a 45.6km of aerial distance from the project zone.

4.4.4 Water quality considerations in Rwanda.

Water quality is an important aspect to be considered in road construction projects as it may contribute to water pollution differently. Even though the project does not cross an important water body, in any case, it may not be separated from the water resources. Sources of water pollution in Gicumbi District are not different to the National context. According to the National Nile Basin Water Quality Monitoring Baseline Report for Rwanda of 2005; Water pollution in Rwanda is mainly caused by domestic waste, and agro-pastoral and industrial activities. The pollutants which enter water bodies are most commonly contained in effluents derived from a wide range of human activities, as a result of soil erosion, accidental spills, or illegal dumping. Eight groups of pollutants in two categories have been identified.

1. Physico-chemical pollutants:

- Organic residues, such as, sewage, brewery wastes.
- Inert suspensions: soil sediment, mine wastes.
- Fertilizers and detergents.
- Inorganic reducing agents: sulfides, sulphites.
- Petroleum products: waste oil, tanker spills.
- Toxic wastes - heavy metals, pesticides.

2. Biological pollutants:

- Micro-organism - faecal coliforms, cholera bacilli.
- Macro-organisms - parasitic worms, exotic fish species and aquatic weeds.

The table below summarizes different sources of water pollution in Rwanda.

Table 8: Sources of water pollution in Rwanda

No	Sources of water pollution	Pollutants	Negative Effect
1	Domestic waste	Used water from septic tanks, latrines,	diseases such as epidemics of typhoid, cholera, and gastro-intestinal diseases,



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		animal waste, and refuse	dysentery
2	Pollution from agriculture	Fertilizers, pesticides and herbicides, erosion	chemical, biological and geological pollution of water resources
3	Industrial pollution	effluents and by-products	Dangerous chemical components for human and animal consumption and for environment.
4	Natural pollution	parent rocks like ammonium nitrates, fluorides, etc.	underground water pollution
5	Invasive and toxic weeds	hyacinth and other bad weeds	Degradation of quality, the proliferation of agents' carriers of diseases (malaria, encephalitis, bilharzias, filariasis, etc.), increased Turbidity, water losses through evapotranspiration.

Considering the nature of works and equipment including machines to be involved in the rehabilitation of Gicumbi urban roads, it is anticipated that water pollution issues may happen if attention is not taken to avoid the pollutants from reaching or entering the water bodies. As the urban roads to be rehabilitated in Gicumbi city do not cross an important water body (River or stream), it is important to consider also that water pollution may occur, caused by erosion from improper dumping, different solid and liquid wastes including oil from machines as well as bitumen. To cope with these issues; proper waste management will be integrated into the project implementation as a measure to avoid or minimize water pollution issues.

4.5 Ambient air quality

4.5.1 National context on air quality

Poor air quality is considered the world's largest single environmental health risk. Exposure to poor air quality can cause a variety of health problems such as respiratory infections, cardiovascular disease, strokes, and lung cancer. To limit the risk of adverse health impacts from poor air quality, WHO has created air quality guidelines for key air pollutants. Air pollutants can come from a variety of anthropogenic (man-made) and natural sources. In Rwanda, the main sources of anthropogenic air pollution are industry, domestic fuel burning, and road traffic. Key pollutants of concern in Rwanda are: Nitrogen oxides (including oxides of nitrogen (NO_x) and nitrogen dioxide (NO₂), Sulphur dioxide (SO₂), Particulate matter (including particulate matter with an aerodynamic diameter of fewer than 10 microns (PM₁₀), and 2.5 microns (PM_{2.5}), Ozone (O₃) and carbon monoxide (CO)¹⁰

To align with the WHO guideline, the government of Rwanda through the Rwanda Standards Board (RSB) has adopted the East Africa Community standard on-air quality specifications. The Standard gives two types of limits, viz –guidelines and –limit levels. The limit levels are binding and shall be used for regulatory purposes. Limit levels are usually measurable in shorter periods

¹⁰ Mott Macdonald, 2018. Inventory of Sources of Air Pollution in Rwanda, 176 pages



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of averaging. On the other hand, the –guidelines are based on studies that indicate safe levels averaged over relatively long periods, and mostly they are derived from WHO Guidelines.

The following tables show the depicted ambient air emission limits and ambient air quality tolerance limits used in East Africa and adopted by Rwanda Bureau Standards.

Table 9: Ambient Air emission limits

Pollutant	Guideline	Limit Level	Test Method
Sulfur oxides, SO _x *	Annual mean of 40 – 60 µg/Nm ³ (0.05-0.08 mg/kg) Or 24 – hour average 100 µg/Nm ³ (0.129 mg/kg)	The daily average of hourly values shall not exceed 0.1 mg/kg 0.5 mg/Nm ³ for 10 minutes	TZS 837 Parts (1, 2, and 4).
Carbon monoxide, CO	Aims at preventing carboxyhemoglobin levels exceeding 2.5-3% in non-smoking people.	1. A maximum permitted exposure of 100mg/Nm ³ for periods not exceeding 15 minutes. 2. Time-weighted exposures at the following levels: ▪ 100 mg/Nm ³ for 15 minutes ▪ 60 mg/Nm ³ for 30 minutes. ▪ 30 mg/Nm ³ for 60 minutes ▪ 10 mg/Nm ³ for 8 hours. Or Daily average of hourly values shall not exceed 10mg/kg and the average of hourly values in eight consecutive hours shall not exceed 20 mg/kg.	TZS 837 Parts 1,2, and 6
Black smoke and suspended particulate matter (PM 10)	Black smoke 40 to 60 µg/Nm ³ (0.05-0.08 mg/kg) PM 10 60 to 90 µg/Nm ³ (0.05 – 0.116 mg/kg)	Daily average of hourly values shall not exceed 0.10 µg/Nm ³ and hourly values shall not exceed 0.20 µg/Nm ³	TZS 837 Parts 1, 2, and 3.
Nitrogen dioxide. NO _x	The annual mean of 0.1 µg/Nm ³	150 µg/Nm ³ for a 24-hour average value 120µg/Nm ³ for 8 hours	TZS 837 Part 1, 2, and 5
Lead	The annual mean of 0.5 – 1.0 µg/Nm ³	1.5µg/Nm ³ for 24 – hours average value	ISO 9855:1993
Ozone	Annual mean of 10 – 100 µg/Nm ³	120 µg/Nm ³ for 8 – hours average value	

Source: Rwanda Bureau Standards (RS 236:2014)

Table: Ambient Air Quality Tolerance Limits

* To be reported as SO₂



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S/N	Pollutant	Time weighted average	LandUse Area			Test Methods
			Industrial Area	Residential Rural& otherArea	Controlled area	
1	Sulphur oxides(SOx);	Annual Average*	80µg/m3	60µg/m3	15µg/m3	-
		24 hours**	125µg/m3	80µg/m3	30µg/m3	
2	Oxidesof Nitrogen(NOx)	Annual Average*	80µg/m3	60µg/m3	15µg/m3	-
		8 hours				
3	Suspended particulate matter(TSPm)	Annual Average	360µg/m3	140µg/m3	70µg/m3	ISO 9835:1993
		24Hours	500µg/m3	200µg/m3	100µg/m3	
4	Respirable particulate matter(RPMm)	Annual Average	70µg/m3	50µg/m3	50µg/m3	ISO 9835;1993
		24Hours	3	100µg/Nm3	75µg/Nm3	
5	MP2.6	Annual Average	35µg/m3	-	-	ISO 9835;1993
		24Hours	75µg/m3			
6	Carbon monoxide(CO)/ Carbon dioxide(CO ₂)	8hours**	5.0mg/m3	2.0mg/m3	1.0mg/m3	ISO 4224:2000

Source: Rwanda Bureau Standards (RS 236: 2014)

In addition to these standards, the government of Rwanda has initiated an air quality monitoring system. The system provides access to real-time air quality information through a new website and mobile application for 23 sites across Rwanda with highlights indicating the dominant air pollutant responsible for air quality degradation for each station. The air quality monitoring system of Rwanda classifies air quality into seven classes as shown in the figure below.



Health effects

	No data
	Good
	Moderate
	Unhealthy for sensitive groups
	Unhealthy
	Very unhealthy
	Hazardous

Figure 10: Classes of air quality in Rwanda (aq.rema.gov.rw)



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4.5.2 Air quality context in Gicumbi District

Having in mind that the road construction industry is expected to contribute to air pollution through gas emissions by construction machinery and dust pollution, the ambient air quality description in Gicumbi district is deemed necessary to have a general status that would inform the monitoring of the project against air pollution. Besides the general context of air quality in Rwanda. Therefore, the ambient air quality in Gicumbi District is described based on the information from the Station of Gicumbi in the air quality monitoring system.

According to the results from Gicumbi station, REMA indicated that the air quality in Gicumbi District is good and below the World Health Organization (WHO) air quality standard guidelines for all criteria pollutants. Gicumbi District is one of the areas with most of its parts rural with cold weather and a green land area, air pollutants are emitted at a low rate due to cold weather. The dominant pollutants in Gicumbi are, NO₂, PM, and ground ozone. The real-time (present) readings on the station of Gicumbi District on the date of 5th October 2022 showed that the air quality is good for everyone in the morning and afternoon hours (10:00 am and 15:pm respectively)

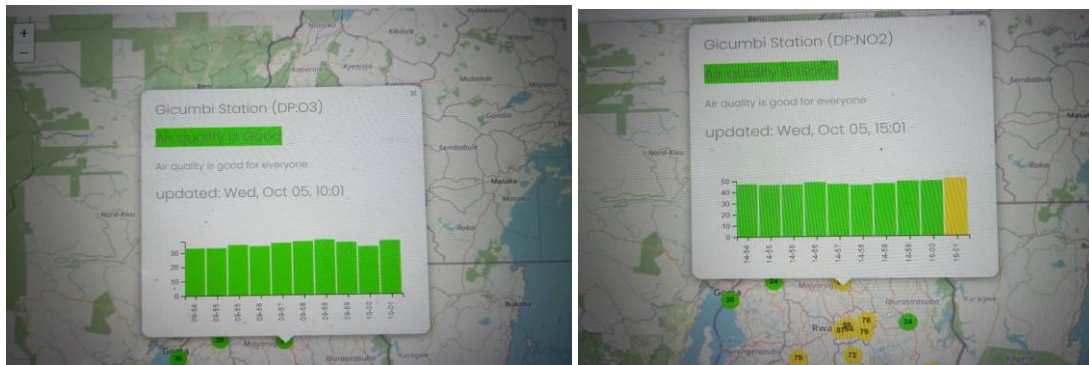


Figure 11: Readings of air quality on Gicumbi Station on 5th October 2022 at 10:00 am and 3:00 pm (aq.rema.gov.rw)

Given that the air pollution is also among the potential impacts likely to occur as a result of road rehabilitation and upgrading activities. Air pollution may be caused by dust and gas emissions from construction machinery. To mitigate or minimize the air pollution risks, the following measures will be adopted:

- Sprinkling of water on dry and dusty surfaces regularly during roads rehabilitation and upgrading phases;
- Special consideration shall be given to sensitive receptors such as schools, churches, residential areas, commercial centers, public offices, etc. where many people are used to gathering;
- Add suitable soil stabilizers on access roads or pave access roads to control dust;
- Erection of dust screens around buildings under construction especially sensitive receptors, like schools and churches;
- Provide adequate PPE to staff; comply with personal protective clothing requirements for dusty areas such as dust masks and protective glasses;
- Enforce onsite speed limit regulations and employ adequate traffic safety risk management;
- Re-vegetating exposed areas during the operation phase of the project.

Even though the project is expected to have negative impacts on the air quality during the roads rehabilitation and upgrading phase by dust pollution and gases emission, it is also expected to



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reduce this kind of impact as the rehabilitated road will reduce the dust and the emission of gases due to the improved road layer.

4.6 Noise environment

Researchers from the World Health Organization (WHO) report that at least 15% of adults have permanent hearing damage due to noise exposure. Based on national standards regulating noise pollution released by Rwanda Standards Board (2014), the National Police has intensified their operations against noise pollution by ensuring that sound level is controlled in a way that doesn't affect the beliefs and wellbeing of others in the neighborhood. So far, there are no statistics on noise pollution in Rwanda, but preventive measures have been taken to control the choice of location, functioning, and furnishing of public places and leisure infrastructures¹¹.

As far as it can be ascertained, there is no information regarding ambient noise levels adjacent to the existing urban roads in Gicumbi District. However, due to the nature of the project area, it can reasonably be assumed that the ambient noise levels near the proposed roads are below the widely accepted WHO guideline value (Leq) of 65 dBA and National standards, which significant noise nuisance may be experienced due to the construction activities. Therefore, it can be concluded that the ambient noise environment in Gicumbi District is not polluted.

Given that excessive noise and vibration are also expected to result from construction machinery and heavy trucks and vehicles engines acceleration, gear changes, braking, or idling during road construction activities including soil excavation, rock blasting, loading, offloading, and compaction; the contractor should be managing noise pollution within these pollutions limits for compliance purposes. The table below shows the

Table 10: Ambient noise level limits for the category of area

Area Code	Category of area	Limit in dB, Max.	
		Day time	Nighttime
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential area	55	45
D	Silence Zone	50	40

Source: Rwanda Standard-RS 236 (RBS-2014)

To avoid and/or minimize the potential impacts the following measures are to be adopted:

- Use of new equipment & machinery with silencers;
- Ensure that all vehicles and construction machinery are kept in good condition all the time to avoid excessive noise generation;
- To avoid/ reduce nighttime disturbance from construction noise, which is unavoidable, the practice of conducting construction activities should be limited to day hours;
- Sensitize drivers of construction vehicles and machinery operators to switch off engines or machinery that are not being used;

¹¹ REMA,2019. Rwanda Compendium of environment Statistics, 158 pages.



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- Ensure that all workers wear earmuffs and other personal protective gear/equipment when working in noisy sections;
- The contractor is required to use equipment and automobiles that have certification of good working conditions from “The National Automobile inspection center” to avoid noise.

4.7 Biological environment

The biological environment of Gicumbi district comprises fauna and flora. The plant biodiversity in Gicumbi district is mainly characterized by forest, grassland and herbaceous plants in the wetland. The forest resources of Gicumbi District are characterized by the absence of natural forests and the dominance of eucalyptus plantations. Forests in Gicumbi District cover 23,024 ha, about 28% of the total district land area and almost 100% are forest plantations. In addition to forest plantation, floral species including *Miscanthidium violaceum*, *Cyperus latifolius* and *papyrus C. papyrus* species are also recognized in Rugezi wetland which extends in Gicumbi District. The rest of the areas feature different crops including tea plantations, bananas, beans, sweet potatoes, etc.

The wildlife diversity of Gicumbi district is poor due to the lack of natural forests, which are the main habitat of the various species. As this district connects with Muhazi Lake and Rugezi wetland, its important wildlife is based on these ecosystems. As Rugezi wetland covers an important bird area, this wildlife includes Grauer's Swamp-warbler (*Bradypterus graueri*), Grey Crowned Crane listed as endangered species other threatened bird species including Papyrus Yellow Warbler "*Bradypterus carpalis*". For the lake Muhazi, its wildlife includes fish species (tilapia, barbus, *Clarias galiepunus*, common carp, hypochromic,) compatible with the aquatic environment. Lake Muhazi is located at a distance of 35km from the nearest road project while the end of Rugezi wetland is located at 0.73km from the nearest road (Access to Miyove road).

The figure below shows the aerial distance between Rugezi wetland and access to Miyove road, the nearest road under Byumba urban road project.

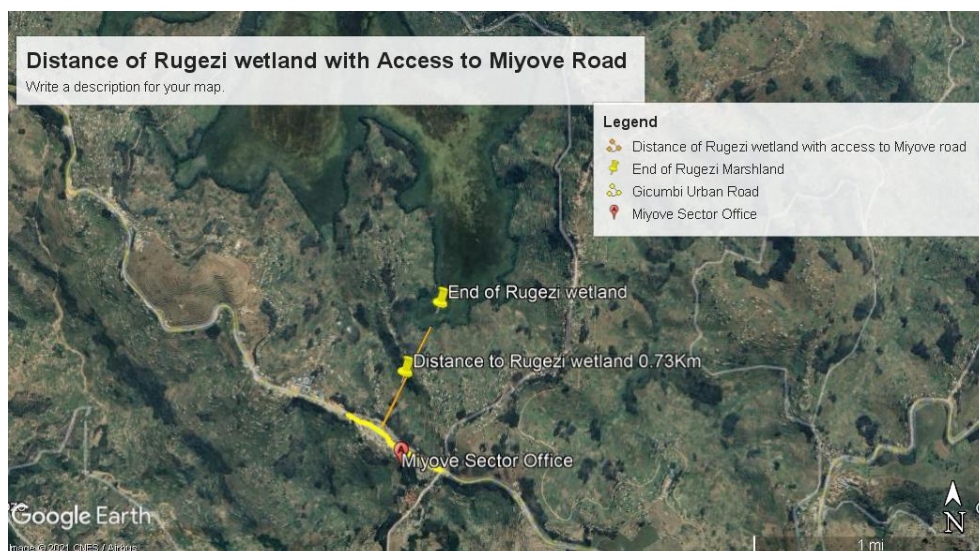


Figure 12: Location of Rugezi wetland versus access to Miyove road



4.8 Socio-economic baseline data of the project area

4.8.1 Demography of Gicumbi District

The District covers a surface area of 829 sq. km. Its population in the last population census of 2012 was 572,000 (EICV3, 2012) of which 298,012 (52.1 %) are women and 273,988 (47.9 %) are men, with a density of 480 inhabitants per sq. km; the population is more in rural than urban area. Gicumbi district is ranked eleventh at the national level and fourth in Northern Province with 83.7% of individuals aged six having at some time attending school. At the national level, the average level of literacy rate is 69.7% and it is 82.6% in urban road areas and 67.3% in rural areas.

4.8.2 Population within the Right of Way

The Urban roads in Gicumbi district pass through scattered settlements, villages, and /or trading centers. The boundaries of urban road expansion have not been transferred to the land. In general, about 4.5m average additional width will be required for the widening of the road to have a right of way of 10.5 m. The widening will have an impact on houses, agricultural land, and other infrastructure facilities. The road widening is likely to affect a total of 436 households. The table below shows the number of affected households per sector.

Table 11: Households per Urban roads in Gicumbi District

No	Sector	Number of Households
1	Byumba	340
2	Miyove	96
Total		436

Source: Field survey and Analysis, September 2021, updated 2022

The total number of households to be affected by the project is 436HHs with 2107 persons.

4.8.3 Socio-economic profile of PAPs within the right of way

A socio-economic profile has been developed for the PAPs. Information from field visits revealed that 436 households are likely to be affected by the project. To develop the socio-economic profile of the PAPs, a survey by questionnaire was used to collect the baseline data (The questionnaire is available in Annex 3). The socio-economic conditions of PAPs within the right of way are discussed in subsequent sections.

4.8.3.1 Sex of Respondents

The researcher wanted to get the views of both male and female respondents to avoid biases in the responses. Both sexes (female and male) can be affected by the project differently; so, it would be unrealistic to get views from one sex. The table below shows that 80% of the PAPs are males whereas 20% are females. This shows that the majority of the respondents are of the male sex. Despite the women's sensitization and involvement, some women were still reluctant to respond to the questionnaire, especially those in rural areas. To ensure their participation, it was required to give them more explanation on the project, and how it can affect them and also benefit them through their participation in the project implementation and during the operation period.



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Table 12: Sex of PAPs in the surveyed households

Sex	Number of Respondents	Percentage (%)
Male	349	80%
Female	87	20%
Total	436	100

Source: Field survey and Analysis, September 2021, updated 2022

4.8.3.2 Age structure of the surveyed household

The age structure of the respondents was a necessary part of the research to determine vulnerabilities whether below 18 are children while over 65 are elderly. The table below gives a clear age structure of the PAPs. It was observed that 54% of the respondents (majority) are in the range of 30-40 years. During this age, it is assumed that people are more active and likely to be involved in various activities. This range is followed by the group age of 20-29, which represents 19%. The group 41-51 which has 15% is followed by the range of PAPs who have 52 year and above representing 12%. These results show that the majority of respondents are mature and active; therefore, they can be reliable.

Table 13: Age of the PAPs in the surveyed households

S/N	Age group	Number of Respondents	Percentage (%)
1	Less than 20	-	-
2	20-29	84	19
3	30-40	236	54
4	41-51	65	15
5	Above 52	51	12
Total		436	100

Source: Field survey and Analysis, September 2021, updated 2022

4.8.3.3 Education of Respondents

The level of education among the PAPs is very low as revealed by the data analysis reported in the table below. Among the respondents (PAPs), 14% are illiterate, primary (elementary level) education represents 50% and 12% have incomplete secondary level. The proportion of 11% representing those who completed the secondary and vocational represents 12%.

The main reason is the poverty of families that could not afford school fees and materials required for the education of their children. But nowadays, due to government policy, elementary education is free of charge; therefore, every parent should send his/her children to school.

Table 14: Level of Education of respondents

S/N	Level of education	Frequency (No)	Percentage (%)
1	Illiterate	59	14
2	Primary	218	50
3	Incomplete Secondary	54	12
4	Secondary	57	13



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5	Secondary vocational	48	11
6	Incomplete Higher	0	0
7	Higher (bachelor's Degree)	0	0
Total		436	100

Source: Field survey and Analysis, September 2021

4.8.3.4 Family Size of the Household of respondents

The table below summarizes the family size of the households' respondents. The Analysis has indicated that 18% of the respondents' families' size is large, which means that the size of the family is above 6 persons per household. While 63% are medium, which means that they are within the range of 4-6 in the family and 19% have small size, which means between 2-4 persons per family. The average size of the household of respondents on the urban roads is between 4-6.

Table 15: Family Size of the households

S/N	Family size	Number of Respondents	Percentage (%)
1	Small (2-4)	275	19
2	Medium (4-6)	79	63
3	Large (Above 6)	82	18
Total		436	100

Source: Field survey and Analysis, September 2021

4.8.3.5 Marital status of respondents

The marital status of the PAP is an important parameter to know the views of different categories of people about the project. The table below shows the marital status of the respondents. About 77% of PAPs are married; single representing 12%, 9% widows, and 2% divorced.

Table 16: Marital Status of Respondents in Household Surveyed

S/N	Marital status	Number of respondents	Percentage (%)
1	Married	337	77
2	Single	53	12
3	Widow	41	9
4	Divorced	5	2
Total		436	100

Source: Field survey and Analysis, September 2021

4.8.3.6 Employment status of PAP

Concerning the surveyed households, about 59% are employed in either their own or at someone else agricultural farm. Moreover, a proportion of 15%, of the PAPs own small businesses, which they combine with agricultural activities. This can be explained by the fact that in the District, agricultural activities (Maize, Banana, Rice, Beans) are dominant and combined with small businesses selling the produce in the local commercial centers. The percentage of PAPs that represents "mason" is 8%, the students/ pupils are 12%; while only 6% of the respondents are



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public servants, especially teachers in the local primary schools. The table below describes the employment status of members in the PAPs surveyed.

Table 17: Employment Status of PAPs

S/N	Employment	Frequency (No)	Percentage (%)
1	Employed (in own agricultural farm)	257	59
2	Pensioner	0	0
3	Student, pupil	52	12
4	Mason	37	8
5	Traders	66	15
6	Civil servant (Teachers)	24	6
7	Military Servant	0	0
Total		436	100

Source: Field survey and analysis, September 2021

4.8.3.7 Vulnerability of PAPs

The vulnerability and social group for individuals in the community are of paramount importance because it gives the idea of the level of vulnerability.

From the socio-economic survey, a total number of 436HH were interviewed. It was established that 37% of the households were male-headed (mostly fathers). However, it is worth noting that there is a significant number of households that may be considered vulnerable as they were (63%) and (0%) female and child-headed households respectively. (Noteworthy is the fact that female and child-headed households are some of the parameters of considering vulnerability - these parameters identified as indicators of vulnerability are not stand-alone qualifications for PAPs to be categorized as vulnerable but rather a combination of these parameters in such a way that the affected PAP or household is considered relatively more disproportionately affected by induced resettlement). Child-headed in this context does not refer to the legal child's age but rather an older child taking care of his/her siblings and other members of the household. This could be due to various reasons such as the death of the parents, divorce, or both parents staying in a different area(s).

The data of the socio-economic survey showed that the minority of the project-affected population (18.7%) are vulnerable including 0.7% of persons living with disability, 5% of orphans, 4% of female-headed households, and 9% of aged persons. The table below shows the detail of the vulnerability of the PAPs along the project roads.

Table 18: Vulnerability in the PAPs

S/N	Social group	Frequency (No)	Percentage (%)
1	Living with disability	3	4
2	Orphans	22	27
3	Female-headed households	17	21
4	Aged people	38	48
Total		80	100

Source: Field survey and Analysis, September 2021



4.8.3.8 Livestock in the surveyed household

The population of Gicumbi District is involved in livestock activities. Some families do not have farming activities but are involved in livestock activities. The numbers of livestock are reported in the table below. Goats dominated the livestock distribution in the project area with 18.6%. The table shows that 57% of the surveyed households owned at least one type of livestock.

Table 19: Number of Livestock in the Family

Livestock Type	Households with livestock	%
Cattle	34	8
Sheep	16	3.6
Goats	80	18.6
Chickens	73	16.8
Ducks	0	0
No Livestock	233	53
Total	436	100

Source: Field survey and Analysis, September 2021

4.8.3.9 Economic Activity and Source of Income

The table below provides details on the main activities and sources of income of the PAPs. The main source of income among the surveyed PAPs is agriculture with 84.6%, while 14.8% are engaged in small businesses.

Table 20: Economic Activity and Source of Income among the PAPs

Main Sources of Income	Frequency	%
Income from own business (Trade, construction, etc.)	65	14.8
Income from Agriculture	369	84.6
Income from the rent of the house	2	0.6
Support from other relatives	0	0
Income from the sale of items of private property	0	0
Total	436	100

Source: Field survey and Analysis, September 2021

4.8.3.10 Housing conditions of the PAPS

Housing condition is an important variable in studying the socio-economic aspects of a family because it gives the idea of the living conditions of family members. About 97.3 % of PAPs live in their own houses, while 2.7 % live are rented houses. 85.5% of these houses are built in mud bricks known as Rukarakara, while 14.5% are built in woods.

4.8.3.11 House Conveniences and their Conditions

The table below summarizes the type of convenience in the house such as electricity, radio, mobile phone, private toilette, etc. These are indicators of development. All the surveyed households (100%) have private toilettes and 61.4% access to electricity. Among the surveyed households,



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only 2 PAPs use solar energy. A significant proportion of the household surveyed has mobile phones 78.5% from different telecommunication companies operating in Rwanda (MTN, TIGO, and Airtel). Furthermore, the contractor was informed that almost all households have a radio, and some of them have also a bicycle.



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Table 21: Housing Conditions

House Type	Frequency	%	House made in	Frequency	%	Owner ship	Frequency	%
Cottage/rural house	0	0	Wood	63	14.5	Owned	424	97.3
Other	436	100	Mud bricks (RUKARAKARA +Cement)	373	85.5	Rented	12	2.7
Total	436	100		436	100		436	100

Source: Field survey and Analysis, September 2021

Table 22: Conveniences in the Surveyed Household and their Conditions

Grid Electricity	Frequency	%	Solar Energy	Frequency	%	Mobile Phone	Frequency	%	Private Toilet	Frequency	%
Functions	306	70.5	Functions	78	17.9	Functions	281	64.5	Functions	436	100
Function with interruption	0	0	Function with interruption	0	0	Function with interruption	41	9.4	Function with interruptions	0	0
Doesn't function	0	0	Doesn't function	0	0	Doesn't function	62	14.2	Doesn't function	0	0
Doesn't exist	130	29.5	Doesn't exist	358	82.1	Doesn't exist	52	11.9	Doesn't exist	0	0
Total	436	100	Total	436	100	Total	436	100	Total	436	100

Source: Field survey and Analysis, September 2021



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4.8.3.12 Access to social infrastructures

The Contractor made an inventory of basic infrastructures along the 1st priority urban roads in Gicumbi District. The Table below presents the number of schools, health centers, churches, markets, and public offices by road.

Table 23: Number of social infrastructures along all urban roads in Gicumbi District

Road Name	Basic Infrastructures				
	Health Center/ Post	School	Public office	Market	Church/ Mosque
GUR1:Byumba -Ngondore	1	2	7	3	4
GUR2: Road to Cathedral	1	6	5	1	4
BUR3: Access to stadium	-	5	1	-	3
GUR4: Access to Miyove	1	2	1	1	4
GUR5: Town Center to Byumba Market	-	1	2	1	1
Total	3	11	16	6	16

Alongside the selected roads, the community travels from 20 minutes to one hour to the social services.

4.9 RESETTLEMENT IMPLICATIONS

The construction and rehabilitation of Urban roads in Gicumbi District will trigger involuntary resettlement and land acquisition. The road will pass through scattered settlements, villages, farms and towns. The widening will have an impact on houses, agricultural land, and other infrastructure facilities. To mitigate on these impacts, the project has prepared separately a Resettlement Action Plan (RAP) that shall be implemented throughout the project cycle. The RAP contains information on project area, project details, regulatory and legislative framework, impacts, socio-economic profiles of PAPs, stakeholder consultation, eligibility criteria, compensation mechanism, grievance redress mechanism, institutional and implementation arrangements as well as RAP monitoring and evaluation. The discussions below show a summary of the losses as captured in the RAP report.

4.9.1 Loss of Houses

The details of houses likely to be affected by road widening are presented in the table below. The total numbers of houses that will need relocation are 65. These houses will be fully affected.



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Table 24: Details of houses on roads side

Road No.	Road Names	Houses
1	Access to Miyove	4
2	Access to cathedral	11
3	Byumba-Ngondore	50
Total		65

Source: Survey, September 2021

4.9.2 Loss of Land

The development in the study area will bring substantial change in the land use pattern as the road modification/ construction will require additional land from the private and government. It is estimated that to achieve the right of way, road widening will require 10.05 ha for the priority urban road improvement. This land requirement for roads rehabilitation will change the land use permanently from barren/agricultural/built-up land into the road (carriageway, drainage system, and tree buffer zone). This impact is permanent and irreversible.

4.9.3 Loss of other structures

Due to expansion, there will be other minor losses. The identified losses include a fence, water valve chambers, and a water pipeline crossing the road.

Table 25: Loss of other structures

Road ID	Road Name	Length (km)	Loss of live Fences (m)	Water Taps	Water Pipes
1	Byumba-Ngondore	11.7	10	1	0
2	Access to Miyove	0.72	0	0	0
3	Access to cathedral	2.00	0	0	1
4	Access to stadium	0.77	0	0	0
5	Town center	0.34	0	0	0
TOTAL		15.53	10	1	1

Source: RTDA Field Surveys and computation, September 2021

4.9.4 Loss of trees and crops

The table below summarizes the type of losses likely to be due to the expansion/widening of urban roads in the District, considering that around 80% of the needed land is under cultivation of potatoes, beans, and maize the civil works will start when most of them are harvested.

Table 26 : Loss of crops and trees

Road ID	Road Name	Length(km)	Number of trees	Crops (ha)
1	Byumba-Ngondore	11.7	1031	10.5
2	Access to Miyove	0.72	0	0
3	Access to cathedral	2.00	45	0



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4	Access to stadium	0.77	0	0
5	Town center	0.34	0	0
TOTAL		15.53	1076	10.5

Source: RTDA computation, September 2021

The photos below show the characteristics associated with socio-economic conditions along the project roads in Gicumbi District.



Miyove Sector office along the Access road to Miyove



Ngondore Cell office and Branch of Byumba Saving Cooperative along Byumba-Ngondore road



Sample of learning institutions along Road to cathedral road (Academy de la Salle and GS Notre Dame du Bon Conseil Byumba)



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Commercial center and Market on Access road to Miyove



Commercial services along project roads (Byumba city and Mukabasaza commercial center on Byumba-Ngondore road)



Agricultural land along Byumba-Ngondore road



Trees plantation along the road Byumba-Ngondore.



Residential houses in Gicumbi city along project roads (Road to stadium and road to Cathedrale)





5. PUBLIC CONSULTATIONS AND PARTICIPATION

5.1 Context of Rwanda

All Rwandans have the right to participate in the Government of the country, either directly or indirectly through their freely chosen representatives, and all Rwandans have the right to equal access to public service under their competence and abilities". Rwanda's Constitution, Chapter Iv: Human Rights and Freedoms Section One: Rights and Freedoms: Article 27: Right to participate in Government and public services.

Law n° 001/2019 of 15/04/2019 requires that all Environmental Assessment processes in Rwanda to incorporate Public Consultation. The aim is to ensure that all stakeholder interests are identified and incorporated in project development, implementation and operation. Public consultation has been carried out in the project areas with the objectives of informing and educating all stakeholders about the proposed project both before and after the development decisions were made. Public consultation sessions were organized to consult the public as well as the local authorities (District, Sector, Cell and Village level), to determine their thoughts, opinions, and feedback on the impact of the rehabilitation of selected urban roads in Gicumbi District.

Public participation and community consultation have been taken up as an integral part of the social assessment process of the project. The consultation was used as a tool to inform and educate stakeholders about the proposed action both before and after the development decisions were made. This participatory process enables participation in the decision-making process. Initial Public consultation has been carried out in the project areas with the objectives of minimizing probable adverse impacts of the project and achieving speedy implementation of the project through bringing in awareness among the community on the benefits of the project.

5.2 Objectives

Public consultations were held with representatives of local authorities and with the local community which at the same time constituted the PAPs. The objective of public consultation includes the followings:

- To inform local authorities of the proposed project, its impacts and solicit their views on the project and discuss their share of the responsibility for the smooth implementation of the overall project operations.
- To inform and discuss with the local community and the PAPs about the nature and scale of adverse impacts of the project on their livelihoods more transparently and directly and seek their participation in the project cycle.
- To give PAPs in the local communities a chance to have a say and express their views in the planning and implementation of the project that affect them directly.
- To obtain qualitative as well as quantitative information required for the preparation of the ESIA, ESMP and RAP and discuss the expropriation process for the project.

In addition, the public consultation process enabled the establishment and boosting of a communication channel between the general public, local authorities, Grievance Redress Committees, the project proponents, and the Contractor; the concerns of the stakeholders to be known to the decision makers at an early phase of project development.



5.3 Public Participation – Methods and Process

The stakeholders had, directly and indirectly, participated in the preparation of this ESIA through various consultation meetings and interviews. These stakeholders include the central and local authorities, local community, PAPs, women, youths, Farmers, Private Sector federations, and other project-interested parties.

During these consultations, the communities were informed about the project, its benefits as well as social and environmental impacts. The participants were encouraged to express their concerns and expectation from the project. The presentation highlighted the project background, objectives, expected upcoming activities, and environmental and social-economic information required to inform the preparation of the ESIA and RAP. For this purpose, the strategy of reaching people in a community assembly known as “**Inteko z’Abaturage**¹²” was exploited.

5.3.1 Stakeholders

Stakeholders’ involvement through participatory direct or indirect consultations is central to the completion of the ESIA & RAP as well as the success of the project. The stakeholders were those who are affected or have interest/influence in the project, and who will be involved in the further consultative process. The main groups of stakeholders met are:

- Local authorities;
- Local community,
- Project Affected Persons (PAP);
- Private Sector Federation members
- Opinion leaders

5.3.2 Location of public consultation and attendance

As described above, the public consultation was done in two different sessions (Session for local authorities and a session for the local community and PAPs. For local authorities, there was a session with the representatives of district officials including the Vice Mayor in charge of economics, the Representative of One Stop Center, the District Environmental Officer, and the sector land Manager. The second session with local authorities was extended to include representatives from Cell and Village levels.

Table 27: Public Consultation meeting and attendance

S/N	Location	Covered urban road	Group participants of	Date of the Consultation meeting	Male	Female	Total participants
1	District office	All urban roads	5 District official Sector Technician	07/09/2021	5	-	5
2	District meeting	All urban	5 District official Sector technician	08/09/2021	36	9	45

¹² **Inteko z’abaturatione:** Community assemblies which are used to take place at Cell level on weekly basis, where the community and local authorities discuss on social and development issues to find appropriate solutions and way forwards.



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	room	roads	Executive secretaries/Cell Village leaders				
3	Ngondore/ Nyakabung o Cells	Byumba- Ngondore	Local Community/ PAPs	09/09/2021	145	25	170
Village leaders							
Executive secretaries/Cell							
Sector land manager							
District official							
Total					186	34	220

5.3.3 Outputs from Public Consultation Meetings

The outputs of the public consultation meetings are mainly based on the project perceptions by local authorities and the local community on the project area. The feedback obtained from public consultation and views as well as concerns from consulted stakeholders are summarized below

5.3.3.1 Consultation with District authorities

The District authorities will play a critical role in the project preparation and implementation. They acknowledged the benefits of the project of urban road rehabilitation in Gicumbi city, as the project is expected to improve the development of the city as well as boost its economic activities. Thus, during the field visits conducted for road reconnaissance; District authorities have been consulted and participated in these visits to capture their concerns on each road to be rehabilitated. In addition to this, these authorities helped to inform the issues to be considered in the preparation of the ESIA as well as the RAP.

Table 28: Authorities Consulted in Gicumbi District

S/N	Names	Function	Contact
1	NTEZIRYAYO Anastase	Vice mayor Economic development	0788849848
2	SINDAMBIWE Theogene	Ag. Director One stop center, Gicumbi District	0788273451
3	TWAGIRUMUKIZA APHRODIS	District Road engineer	0783714939
4	BYIRINGIRO David	District Gender family promotion officer	0783235734
5	LUTAGIRA Jackson	Environment Officer	0786596963
6	RWITARE Lambert	Executive Secretary of Miyove Sector	0788572250
7	NSHIMIYIMANA Valens	Executive Secretary of Byumba Sector	0781038044
8	MUSONERA Ignace	Executive Secretary of Ngondore cell	0788225052
9	Jean Pierre NDAYISENGA	Executive Secretary of Kibari cell	0788539830



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10	HATEGIKIMANA Alphonse	Executive Secretary of Gisuna cell	0785036738
11	NDORIMANA Isdori	Executive Secretary of Murama cell	0788894131
12	NIYIBIZI Jean de Dieu	Executive Secretary of Nyakabungo cell	0783641212

Source: Field Survey, September 2021

The salient features of the meeting are presented below:

(i) Views from district authorities

The consulted district authorities as mentioned above showed their enthusiastic view towards the project. They also reflected the expectations of local community in the urban area of Gicumbi district; to have these roads rehabilitated as in most cases it was their request to District authorities. Therefore, the project is coming as an answer to the district authorities as well as to the local community. Among the interests expected from the project implementation, including easy accessibility of different venues of Gicumbi City, expansion of the urban area in Gicumbi District, especially for the road Byumba-Ngondore which will be connecting the urban area with the Gatuna Border as a short cut road and also facilitating transport services between Gicumbi City and this border. In addition to road infrastructure, the project is also expected to provide jobs to the local community in various forms. From the environmental perspective, the project is also expected to improve the smartness of the city through safer drainage and walkways.

(ii) Views from officials at the Sector level

The consulted officials at the Sector level include the executive secretary and land managers at the Sector level. Their view is not different from that of the authorities at the District level. However, among the roads to be rehabilitated and upgraded; there are some roads or sections which are a little bit away from Gicumbi City; the rehabilitation of these roads will also contribute to the urbanization of the crossed areas as well as commercial centers along the roads.

5.3.3.2 Consultation with the local community

As indicated early, the consultation with the local community was also conducted with different purposes including awareness of the project, engagement, and participation in the project preparation and implementation, impacts identification, and expropriation process of the properties to be affected. Therefore, community feedback on their concerns, perceptions, reactions and fears of the livelihood changes to be brought about as a result/consequence of the rehabilitation of urban roads in Gicumbi District were understood and will be highly considered in the preparation for the ESIA and RAP as well as its implementation.

A total number of 170 people (145 males and 25 females attended the consultation meeting which gathered people from six cells along the road to Cathedral and Byumba-Ngondore road. A good consideration from the consultation meeting with the local community was that they fully support the implementation of the project as they have been waiting for the concerned roads to be rehabilitated.

After the introduction of the project to the local community by the vice Mayor in Charge of Economic Development in Gicumbi District, the team representing RTDA (Environmental



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Safeguards Specialist, Social Safeguards Specialist) continued by providing the details on the project with an emphasis on environmental and social issues occurring in the road construction project to attract the attention of the local community on the identification of impacts that they fear from the project implementation so that the mitigation measures can be also jointly identified. In this description of the project, the local community were informed of their role especially during the valuation and compensation processes of their properties to be affected. In line with this concern, they were informed of the initial socio-economic survey to be done in collaboration with local authorities. The community's responsibility to this socio-economic survey is to provide the required information as it will help to describe the socio-economic condition of the project zone while in the valuation and compensation processes, their responsibilities include the provision of supporting documents (copies of land titles, identity card, and active bank account) required in the compensation payment.

After the description of the project and the expected contribution of the local community, they were given time for presenting their concerns, curiosity, questions, expectations, etc. The feedback from the local community reflects the following aspects which will be considered in the project implementation among others:

- Valuation and compensation of the properties to be affected,
- Employment opportunities by the project,
- Utility relocation concern,
- Road safety issues;
- Storm water management and drainage concerns,
- Disposal and rehabilitation of the dumping sites,
- Availability of land titles,
- Complaint monitoring.

To the above concerns and questions from the local community, the team from RTDA and District explained the proposed way forwards based on responsible institutions. However, for the issues concerning land titles; the concerned people were advised to approach the responsible staff at the Sector office to help them in the process of searching for land titles. In addition to the explanation given to the local community on their concerns, their engagement/participation has been again requested for the smooth implementation of the project. It is in this regard that the grievance redress committee to help in monitoring community complaints was agreed on. The grievance redress committee at the cell level will be composed of the following members from the local community:

- President,
- Vice President,
- Women representative,
- The representative of PAPs,
- The executive secretary of the Cell,

Note: In addition to these members from the local community; the client, consultant, and contractor safeguard team will be also part of this committee once civil works come on board.



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Table 29: Summary of concerns discussed in Public Consultation with the local community

S/N	Gender	Name	Category of issues and opinions by the community are related to:	Feedback from the project
1	Men	SANDE Emmanuel/ Village leader	Issue of safety along drainage channels in the City/ Covering it and provision of walkways	The concern of covering the drainage channel in the city will be recommended as a measure of safety and provision of access to commercial houses and walkways.
2		HARERIMANA Emile/Village leader	Drainage issue of storm water affecting downstream properties	Drainage will consider the condition of the site and its downstream
3		MUGISHA Domitien/ SEDO of Cell	Issues of utility for water supply lying in the lane of the road	The project will propose an arrangement of utility relocation. It can be done by the client or contractor in collaboration with the responsible institution. This will depend on the contract of the contractor.
4		NIYIBIZI Jean de Dieu/ ES of Cell	Location of properties to be valued along the road	The properties to be valued are those lying in the RoW as will be determined by the project boundary.
5		ITANGISHAKA Innocent	Issue of storm water from the road that may affect other infrastructure (Road) downstream	The drainage should be constructed based on the site condition. Where a needed extension of drainage can be done. It will be assessed in during the project implementation.
6		NIZEYIMANA Isdore	An issue on time for compensation payment for affected properties	The properties to be affected should be compensated before its relocated.
7		BAGWIRE	Issue of his land title considered in conflict with his mortgage while no credit he has from any bank	The person has been advised to approach the sector land manager for guidance and assistance.
8	Women	MUKANKERI Assumpta	How the local community can benefit from the Job opportunities of the project	The contractor will be requested to prioritize the local community during labor recruitment (for no skilled/skilled job where possible)









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9	UWICYEZA Jacqueline /Village leader	Issue of road safety during project implementation	During the project implementation, the contractor is required to have on-site measures to ensure the safety of road users. (Flagger person, code of conduct for drivers, awareness of the community on road safety, etc.)
10	MUKAZITONI Dativa	Issue of monitoring PAP's complaint	The project will operationalize the grievance redress committee at the cell level which help to monitor complains arising from the project implementation.

Source: Primary data generated from public consultation, September 2021

Below, there are sample pictures for the local authorities and local community consultation meetings.

District authorities consultation and joint field visit of the roads		
		
The introduction meeting of ESIA and RAP preparation with the Vice Mayor at the District office	Field visit of the urban road with the district official	Field visit of Access road to Miyove and consultation with Miyove Sector Executive Secretary
Consultation with local authorities		
		
Consultation with local authorities	Participants from local authorities	Expression of views
Consultation with the local community		



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<p>Vice Mayor introducing the project to the local community</p>	<p>RTDA and District technician explaining the detail of the project</p>	<p>The community expressed their concerns and questions</p>

Photo 1: Site reconnaissance and public consultation for ESIA and RAP preparation



6. ENVIRONMENTAL AND SOCIAL IMPACTS

6.1 Introduction

In pursuance of the global goals of nature conservation and protection of the environment to which Rwanda is committed, the Government of Rwanda has initiated plans, schemes, and actions to implement various legislations. The new Environmental Law n° 48/2018 of 13/08/2018 determines the modalities of protection, conservation, and promotion of the environment in Rwanda and the Ministerial Order of 2008 determines the requirements and procedures for conducting EIA are the most important legislation for environmental assessments in Rwanda. The Guidelines and procedures for ESIA were issued in 2006 for development projects. The schedule of the notification has categorized the projects from environmental angles as per sectors. The roads/ highways have been kept in infrastructure and need environmental clearance before their implementation.

The selected five urban roads in Gicumbi District with 15.53 km are following the existing road alignment. Three of these roads will be rehabilitated maintaining the existing carriageway while the other two roads will be upgraded to 6 and 7 m carriage width. The area crossed by this project is generally an urban area with residential and commercial services.

6.2 Types of impacts associated with the road project

The environmental impacts arising from road development projects fall into three categories including direct; indirect and cumulative impacts. Direct impacts are those caused by the road itself that is to say, by road construction, rehabilitation, and upgrading processes such as land acquisition, removal of vegetation, and severance of farmland. Direct impacts are generally easier to inventory, assess, and control than indirect impacts since the cause-effect relationship is usually obvious.

Indirect impacts (also known as secondary, tertiary, and chain impacts) are usually linked closely to the project and may have more profound consequences on the environment than direct impacts. Indirect impacts are more difficult to measure, but can ultimately be more important. Over time they can affect larger geographical areas of the environment than anticipated. Examples include the degradation of surface water quality by the erosion of land cleared as a result of a new road and urban growth near a new road.

Cumulative impacts are those originating from the process of cumulative environmental change that can arise from any of the four following events: i) single large events, i.e. a large project; ii) multiple interrelated events, i.e. road projects within a region; iii) catastrophic sudden events, i.e. a major landslide into a river system; and iv) incremental, widespread, slow change, such as a poorly designed culvert or drainage system along a long road extending through a watershed.

These events can generate additive, multiplicative or synergetic effects, which can then result in damage to the function of one or several ecosystems (such as the impairment of the water regulation and filtering capacity of a wetland system by the construction of a road across it), or the structure of an ecosystem (such as placement of a new road through a forest, leading to in-migration or land clearing which results in severe structural loss to the forest). These three groups of impacts (direct, indirect, and cumulative) can be also broken down into further subgroups according to their nature. Hence, these impacts can be positive and negative; random



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and predictable impacts; local and widespread impacts; temporary and permanent impacts, and short- and long-term impacts.

However, environmental impacts should be considered not only as they pertain to road rights-of-way, but also to sites associated with the road project, which include deposit and borrow sites, materials treatment areas, quarries, access roads, labor force housing, workshops, etc. These "off-ROW" areas are often where indirect impacts appear.

6.3 Impact Identification, assessment, and analysis

The scope of the Environmental Impact Assessment activity is to evaluate the temporary and permanent impact of a project on the natural and human environment. In general terms, the methodology of an Environmental Impact Assessment may be well described by the following flow chart.

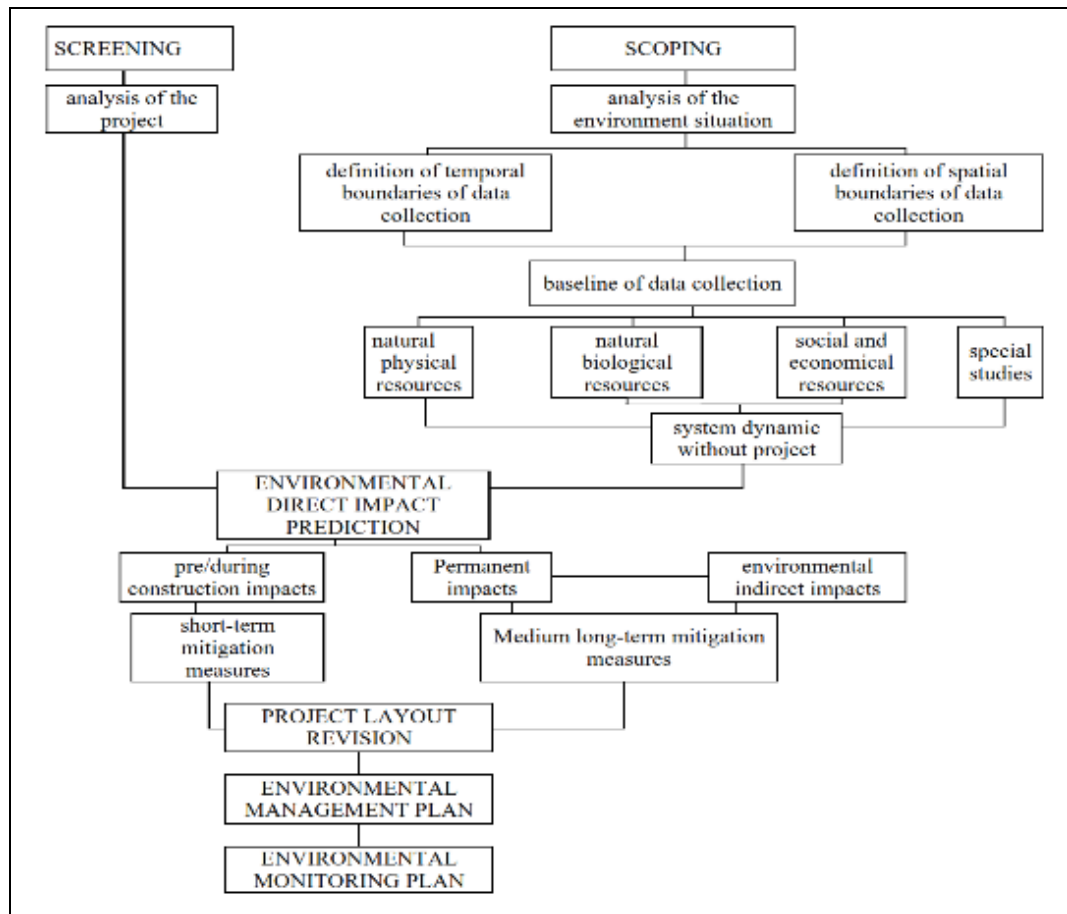


Figure 13: Flow chart of the Environmental Impact Assessment of a project

Additionally, a literature review of published reports, national laws, and policies, the Africa Development Bank Integrated Safeguards System, and other related approved ESIA on road projects in the local area were consulted for having an exhaustive list of possible impacts from the project implementation.



6.3.1 Impact identification

The potential environmental impacts depend on the location of the project and the type and volume of the interventions due to the proposed road project. The project activities such as clearing of vegetation, soil cutting, leveling, felling the trees along the road, construction of culverts & bridges, road construction, rehabilitation, and upgrading activities along the rivers, marsh or swamps areas, setting up of labor camps, installation of construction machinery and other related operations are bound to cause environmental impacts, either positive or negative. The proposed urban roads project has limited adverse environmental and social risks; the magnitude and significance of its impact were assessed based on the following factors:

- Location or extent: The area/volume covered
- Timing: Whether immediate or delayed
- Duration: Short-term, long-term, intermittent or continuous
- Reversibility or irreversibility: Probability of reversibility
- Likelihood: Probability of the impact taking place
- Significance: Whether it is local, regional or global

In order to make the above observation, the magnitude and significance of the predicted impacts on sensitive receptor had been analyzed as a basis on items indicated in the table below:

Table 30: Impact severity analysis

		Sensitivity of Receptor			
		Very Low	Low	Medium	High
		1	2	3	4
Intensity of Impact	Very low 1	1 Negligible	2 Minor	3 Minor	4 Minor
	Low 2	2 Minor	4 Minor	6 Moderate	8 Moderate
	Medium 3	3 Minor	6 Moderate	9 Moderate	12 Major
	High 4	4 Minor	8 Moderate	12 Major	16 Major

6.3.2 Impact Assessment

The characteristics of the foreseeable impacts have been identified considering:

- the actions that may produce impact evaluated in the description of the urban road Project;
- basic environmental data obtained from direct field observations; and
- Information gathered from the available scientific publications and information derived by the study of similar projects.

The matrix table below links the project activities to the environmental and social components, considering the impacts (both positive and negative) generated by the project and related ancillary activities during all the phases of the project that have been proposed. In particular, the proposed matrix contains the aspect whose impact will be treated in this report, giving each aspect considered a different weight in terms of impact. For each phase (during design, construction activities, decommissioning, and operation phases activities), as made in studies on



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other related project cases, the impacts are defined considering the main nine activities which may have some effect on the environment:

- ✓ The design activities
- ✓ The project road
- ✓ The access road
- ✓ The camps site and related facilities
- ✓ The shoulders, embankments, cuttings,
- ✓ The side drains and culverts,
- ✓ The Vehicles & Machines O&M
- ✓ The Quarries, borrow pits and dumping sites,
- ✓ Traffic Construction Machinery
- ✓ The operation activities.

Each cell of the matrix will contain the anticipated relevant value, according to the legend as determined during the Study.



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Table 31: Synthesis of Environment Impact Matrix

Component affected	Project Activity										Decommissioning phase	
	Planning phase	Construction Phase								Operation		Decommissioning phase
	Planning/Design	Urban Road construction	Access Road construction	Camp site	Vehicles & Machines O&M	shoulders, embankments, cuttings,	Quarries, borrow pits, dumping sites	Side drains and culverts	Traffic Construction Machinery	Operation		
Physical Environment												
Soil	4	5	3	4	4	5	5	4		0	3	
Ground water	0	3	2	2	3	3	4	3		0	0	
Surface water	3	4	2	3	3	3	3	3		2	2	
Drainage	4	3	4	4	5	5	5	5		3	0	
Air quality	4	3	3	3	3	3	2	3		3	2	
Noise quality	3	3	3	3	3	4	3	3		2	2	
Water quality	0	2	3	3	2	2	3	3		2	2	
Landscape	4	3	5	4	4	3	3	3	5	0	3	
Biological Environment												
Aquatic/Wetland ecosystem	0	4	5	0	0	5	5	5	0	0	2	
Vegetation	0	4	3	3	4	2	3	2	0	0	0	
Priority forest area	3	4	4	2	0	3	4	2	0	1	0	
Wildlife and in RoW corridor	0	5	5	5	5	5	5	5	5	5	0	
Socio-Economic Environment												



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Component affected	Project Activity										Decommissioning phase
	Planning phase	Construction Phase								Operation	
	Planning/Design	Urban Road construction	Access Road construction	Camp site	Vehicles & Machines O&M	shoulders, embankments, cuttings,	Quarries, borrow pits, dumping sites	Side drains and culverts	Traffic Construction Machinery	Operation	
Property Residence	4	5	3	3	0	2	2	2	0	2	0
Agricultural land	4	4	2	2	0	2	2	2	0	0	0
Disease (Malaria, HIV/AIDS, STDs...)	4	2	0	4	3	0	4	2	4	1	0
VAC, SEA/SH, GBV	4	3	3	2	0	0	4	4	5	3	0
Cultural Heritage sites	2	3	0	0	0	0	0	0	0	0	0
Local services and utilities	3	5	3	4	0	4	4	4	0	0	0
Migrant workers and the local population	2	4	2	3	3	2	3	4	0	0	0
Traffic safety	1	5	5	3	4	4	4	3	3	4	0
Employment Opportunity	A	A	A	B	C	B	B	B	D	E	C
Positive impact	A=Very Important		B=More Important		C=Important		D=Fairly Important		E=Less Important		
No Impact	0		0		0		0		0		



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Component affected	Project Activity										Decommissioning phase	
	Planning phase	Construction Phase								Operation		Decommissioning phase
	Planning/Design	Urban Road construction	Access Road construction	Camp site	Vehicles & Machines O&M	shoulders, embankments, cuttings,	Quarries, borrow pits, dumping sites	Side drains and culverts	Traffic Construction Machinery	Operation		Decommissioning phase
Negative Impact	5=Very Important		4=More Important		3=Important		2=Fairly Important		1=Less Important			



6.4 Environmental and Social Impacts

The Government of Rwanda through Ministerial Order No 001/2019 of 15/04/2019 established the list of projects that must undergo environmental impact assessment, instructions, requirements, and procedures to conduct environmental impact assessment; this list includes construction and repair of international, national, and District roads and repair of large bridges. Therefore, an environmental impact assessment is required before the construction and rehabilitation of such roads. The present project is about the rehabilitation, and upgrading of selected five Byumba urban roads (BUR1, BUR2, BUR3, BUR4, and BUR5) in Gicumbi District, the Northern Province. The project is expected to have different impacts on a large number of the community in Gicumbi District. Those impacts are classified into two categories of positive and negative impacts. Both positive and negative impacts have been studied and wherever possible quantified.

6.4.1 Positive impacts of the proposed project

The positive impacts are expected to occur during the construction, operation, and decommissioning phases of the project. The positive impacts likely to result from the proposed urban roads rehabilitation and upgrading project in Gicumbi District have been identified based on the project description in Chapter 3 and the existing environmental conditions in Chapter 4. The current state of these roads is challenging especially to road users. Rehabilitation of these roads network will thus bring about many benefits. The identified positive impacts for different phases of the project cycle are discussed below.

6.4.1.1 Positive impacts during the construction phase

- **Employment Opportunities**

The proposed project is expected to offer job opportunities for both skilled and unskilled locals in the area. The rehabilitation and upgrading of the urban roads in Gicumbi District will use a labor-intensive approach combined with machinery. During the construction phase, different people will be working as labor both skilled and unskilled. The majority of this labor will be unskilled, from which more people will be sourced from the residents and hence creating employment throughout the project area. Indirect employment will be in the form of suppliers and other forms of sub-contracted works that will be required for the implementation of the project components. In addition, new jobs will be created in the Government for the implementation, monitoring, and evaluation of the project. Women will also have an opportunity to secure employment.

In the post-construction phase, the project will provide social benefits in terms of direct employment by way of better commercial and residential development of the area. Additionally, more people may be indirectly employed in allied activities and trade. In the operation phase of urban roads, more job opportunities will arise in various sectors such as the transport industry especially for the road Byumba-Ngondore which is linking the Gicumbi City and Gatuna cross border. Taken together, job creation will help to reduce the problem of unemployment with an improvement in income for the workers' households and revenue for the country. Apart from additional employment opportunities in farming operations, access to a nearby market would also provide an opportunity for the marketing of farm products and farm inputs creating additional employment in the locality.



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- **Social Interaction**

The local, National, Regional and international manpower will be working together for the project. This interaction will enhance social interaction between people from different places and social levels in Rwanda. In addition, the transport sector will benefit from the transport of materials from the manufacturing site to the construction site. This will provide direct and indirect employment. The expected rehabilitation/upgrading of the urban roads will enhance access to existing social amenities including markets, churches, schools, administrative offices, and a stadium, among others; this stimulates their growth as more people will be using them; ultimately adding to urban development.

- **Boost to Industrial Activities**

During construction, locally made products will be utilized such as cement and gravel. The consumption of these will give a boost to the industrial production of construction materials. During construction, the supply of construction materials, and direct sale of household goods, consumables, and foodstuffs to the workers will improve trade at local and regional levels in Rwanda. In addition, the transport sector will benefit from the transport of materials from the manufacturing site to the construction site. This will provide direct and indirect employment.

- **Potential to Improve Drainage and its Environmental Benefits**

The current drainage structures are mainly absent, inadequate, and/or in disrepair for the selected urban roads in different states. As a result of the project intervention, there will be redesign, upgrading, and rehabilitation of the drainage structures. The improved road drainage system and construction of culverts will reduce erosion problems. On the road embankments, the application of bioengineering measures in high erosion risk zone will reduce possible landslides from heavy rains.

- **Skills Transfer and Training**

Through local labor recruitment, the workers will have an opportunity to learn an array of skills that relate to road rehabilitation and upgrading. The international consultant will associate with the local workforce. In the process of planning and design and also throughout the project implementation period, the local technical manpower will work with international experts. These skills will be very important during regular maintenance that will be carried out during the project operation, generally, that can be done by the local population through Local Community Associations (LCAs) or youth forums. Improved transport will improve interaction with other communities outside the project area which will also provide an opportunity for further learning and cultural exchange.

6.4.1.2 Positive impacts during the decommissioning phase

- **Employment Opportunity**

The decommissioning phase of the project is expected to provide job opportunities for the labors to be employed in different works including demolition and dismantling of the project facilities, and rehabilitation of the abandoned project sites.

- **Income generation opportunity**

Based on the employment opportunity that can be generated by the decommissioning phase, the employed persons will benefit from the income from the undertaken job.



- **Project facilities that can serve as social infrastructure**

Based on the planning arrangements and/or requirements for the installation of the project facilities the campsite can be kept as social infrastructure (Administrative office, health facility, etc.) to serve the project hosting community.

- **Improvement of landscape rehabilitation**

The rehabilitation of the decommissioned project facilities can result in the improvement of the landscape.

6.4.1.3 Positive impacts during the operation phase

The identified positive impact of the project during the operation phase includes the followings:

- **Improved Transport System, Accessibility, and Communication**

It has been noted that the selected urban roads in Gicumbi District are presently in such damaged condition that they need rehabilitation/upgrading to make them all-weather easily motorable for urban residents. The transport investor will be also interested in initiating the public transport system along the road Byumba-Ngondore crossing different rural residential, and commercial centers connected to Byumba City. With the improvement of these urban roads, transport will be improved both in terms of travel time, comfort, safety, and lower costs associated with an increase in public service vehicles.

After the rehabilitation and upgrading of the urban roads, the condition of the road will be improved, hence in the operation phase, accessibility to the various public institutions and markets will be enhanced, in particular, accessibility to churches, educational institutions, and health centers. This will contribute on a long-term basis to the socio-economic development in the project area.

- **Reduction in Length and Travel Time from Origin to Destination**

The proposed urban roads in Gicumbi District intersect with National Road NR 19 and NR 21 at some places. On commissioning, these urban roads will improve connectivity between different places, provides faster access to Gicumbi City resulting in a reduction in vehicle expenses and travel time and facilitate the development of the crossed urban zones of this city.

- **Reduced dust pollution**

The improvement of the selected urban roads in Gicumbi District will reduce dust pollution as the asphalt roads do not produce dust as damages asphalt roads or earth roads. The reduction in dust pollution has also health benefits for the people living nearby the project roads.

- **Increased road safety**

The improvement of the selected urban roads will make traveling easy and safer. In addition, the proposed urban roads rehabilitation and upgrading project is expected to significantly improve vertical and horizontal alignments, improved carriageway width, and provision of the walkway for pedestrians, especially at centers. The road will be designed to reduce traveling time and transportation cost as well as takes into consideration the standard speed to minimize accident risks associated with high speed.



- **Reduction in Green House Gases**

During the operation of rehabilitated urban roads, the vehicles will be running to the smooth wearing course and operate closer to design speed which will help reduce of emission of hydrocarbons and carbon monoxide from the exhaust. Hence the emission reduction of carbon monoxide will decrease the greenhouse gases at regional and global levels which will have a positive impact locally and regionally, emission since engines will not be accelerated as a consequence of poor road conditions.

- **Reduction in Fuel Consumption**

The vehicles provide better fuel performance at the optimum air-to-fuel ratio which is optimum around design speed. The urban roads in Gicumbi District are designed for 50/80 km per hour (maximum) for villages and mountainous sections, and rural & urban sections with rolling terrains respectively which is closer to the design speed of vehicles. This will facilitate in less fuel consumption which will have less burden on the exchequer and will be a direct impact on the country's economy.

- **Induced impacts of the project**

The selected urban roads in Gicumbi District are passing through an urban area with commercial houses, grouped settlements, and small trading centers poorly developed due to poor road conditions. It is expected to have new and improved constructions erected for business purposes.

- **Source of revenue to the Government of Rwanda**

The rehabilitation and upgrading of roads in Gicumbi District is expected to boost economic development through transport and commercial services which are expected to contribute to revenue generation for the Government of Rwanda through taxes paid by new business owners. In addition to this, road repair expenses to the Government will be reduced which has also a positive impact on government revenue.

6.4.2 Negative impacts

The negative impacts of this project have been also identified during the construction, operation, and decommissioning phases.

6.4.2.1 Negative impacts during the construction phase

- **Air pollution**

The impact of road transport on the air environment is a factor in the type of vehicle, fuel used, and capacity. The emission of pollutants by vehicles has worldwide impacts and contributes greatly to the total atmospheric pollution generated by people. The use of passenger cars alone is responsible for 60 percent of carbon monoxide emissions, 60 percent of hydrocarbon emissions, and more than one-third of the nitrogen released into the 75 atmospheres. Pollution by motor vehicles plays a significant role in a serious global problem. The impact severity is moderate (9).

Although in the construction phase, air quality impacts are of short duration, it does not mean that these should not be considered. Consumption of diesel during construction activities will



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be the principal cause of incremental air pollution. Diesel-powered trucks required for the haulage of earth and other construction materials and the running of construction machinery at the construction yards are the major sources of air pollution.

The required construction materials to be transported to the site will increase the traffic volume due to the material haulage and other construction activities during the period of major material transport. The dust emission, especially during dry seasons, will also increase due to intense traffic movement at the site. The air quality due to the movement of trucks will be impacted as the emission due to the transportation of material will be spread into the atmosphere all over the road site vicinity.

- **Noise Levels**

The magnitude of impact during the construction phase will depend upon the types of equipment used, the construction methods employed, and the scheduling of the work. Noise associated with road development affects the environment through which the road passes and has four main sources: a) vehicles; b) friction between vehicles and the road surface; c) driver behavior; and d) construction and maintenance activity.

Vehicle noise comes from the engine, transmission, exhaust, and suspension, and is greatest during acceleration, upgrades, engine braking, rough roads, and stop-and-go traffic conditions. Poor vehicle maintenance is a contributing factor to this noise source. Frictional noise from the contact between tires and pavement contributes significantly to overall traffic noise. The level depends on the type and condition of the tires and pavement. Frictional noise is generally greatest at high speed and during quick braking. Drivers contribute to road noise by using their vehicles' horns, playing loud music, and sudden braking or acceleration. Road construction and maintenance generally require the use of heavy machinery, and although these activities may be intermittent and localized, they nevertheless contribute sustained noise during equipment operation. Note also that the noise level for the construction machinery is also related to the operation model and mechanical condition of the machinery. Therefore, the contractor will have to ensure that the machinery is in good working condition. The impacts severity is major (12)

- **Increased generation of solid waste and spoil soils from borrow and quarry sites**

Volumes of solid wastes will be produced, solid waste materials will be generated from campsites; to the removal of different constructed materials; vegetation clearance of road reserves, demolition works as well as from various packaging materials, throwing an object into the road such as food, bottle, uncovered parked trucks, etc. Significant quantities of rock and soil materials will be generated from earth moving during construction activities, sediment, and sludge from the storm-water drainage system. The excavations of earth from rock in quarrying areas and borrow areas will require cutting of the rock and soils and increase the spoil to be disposed of. Unless properly reclaimed, dumping of construction waste/ manner may cause surface water pollution near the construction sites and breeding sites for mosquitoes. The impact severity is moderate (9).

- **Land use change and loss of vegetation and biodiversity**

The rehabilitation of Gicumbi Urban roads will need an average of 10.05ha of additional land to have 10.5 m right of way, of which 82 % is agricultural land. In addition to this, the land that



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will be acquired for borrow pit, quarrying, and dumping in the project area will bring substantial change in the land use pattern as the road improvement/construction will require additional land.

The change in land use for each road is presented in the table below. The land requirement for the urban road rehabilitation and upgrading will change the land use permanently from agricultural/ built-up land to road corridors. None of the endangered plant or animal species will be affected by the project. The trees which will need to be cut can be easily reproduced and replanted in other spaces after the project is over. The impact severity is major (12)

Table 32: Land acquisition for road widening

Road ID	Road name	Length (Km)	Average existing road width (m)	Proposed rehabilitation Carriageway width (m)	Average additional land for 10.5m RoW (ha)
BUR 1	Byumba-Ngondore	11.7	4	7.0	8.75
BUR 2	Road Cathedral	2.00	5	6.0	1.1
BUR 3	Road Stadium	0.77	6	6.0	0
BUR 4	Access road Miyove	0.72	3	6.0	0.2
BUR 5	Byumba Center to Market	0.34	5	Keep existing	0
Total		15.53			10.05

- **Soil Loss**

The soil loss will be in terms of topsoil erosion from the road corridor, borrow pits, quarries, dumping sites, and storage of material areas. In the areas of the District where the slopes are over 25%, the project may cause risks of high erosion and slope stability, which is in turn relevant to the design of the project and the conduct of operations such as excavation and drilling.

When natural conditions are modified by the construction of a road, it marks the start of a race between the appearance of erosion and the growth of vegetation. Disturbance during construction can upset the often delicate balance between stabilizing factors, such as vegetation, and others that seek to destabilize, such as running water. In some cases, erosion might result in cumulative impacts far beyond the road itself, affecting slopes, streams, rivers, and dams at some distance from the initial impact.

Throughout the road rehabilitation works, heaps of soil could be washed away by rains causing damages downstream, including properties (crops, trees, houses, land, etc.), loss of land productivity, pollution of receiving water bodies, etc. This is likely to happen during the rainy season and is of short-term duration and will be reversible. During the rehabilitation/upgrading of the selected urban road in the Gicumbi district, extra care should be taken while constructing a road crossing mountains topography susceptible to erosion issues.



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During the construction, embankments/slopes along sections of the selected feeder roads might be prone to soil erosion. Such embankments and slopes will need to be stabilized with grasses and engineering measures. This will be done at the same time as the road works to provide immediate protection to newly cut slopes and avoid exacerbating erosion. Grasses on embankments and trees along the rehabilitated roads will be planted for erosion control. The impact severity is major (12)

- **Soil Pollution**

The soil pollution is likely to be caused by the inadequate disposal of waste material on the open ground. The waste likely to fall on the ground may be solid waste/ liquid from labor camps or spillage of oil and grease by construction machinery and equipment, especially during their maintenance. The impacts are of short duration and will be reversible with proper management. Appropriate waste disposal and management system have to be adopted. Construction machinery and project vehicles should be maintained only in service stations and approved areas. Proper care should be taken while locating the above utilities/ facilities to minimize soil pollution.

In this regard, dustbins for the collection of domestic wastes at the camp or construction site should be provided. The collected wastes should be disposed of in the landfill of Gicumbi District. The impact severity is moderate (8)

- **Disruption in Drainage Pattern**

The roads that intersect drainage basins generally modify the natural flow of surface water by concentrating the flow to certain points and increasing the velocity of flow. Depending upon the flow, these changes can contribute to flooding, soil erosion, channel modification, siltation of streams, property damages, conflict over project beneficiaries, etc. These effects are often felt well beyond the immediate vicinity of the road. Proper cross-drainage works on the alignments will be required. Some culverts will also need improvement. Critical areas that need to be considered mostly include steep embankment slopes, and road sections where the drainage crosses the road and discharges water flow into the open lands and agricultural land especially radical terraces. Drainage patterns should well be designed and constructed to channel water from roadsides or upstream the roads to appropriate outlets. The impact severity is moderate (6)

- **Water pollution**

The selected urban roads in Gicumbi district do not cross any important water course (stream& river). Even though it is like that, water pollution impacts cannot be ignored since the storm water from the road drainages is conveyed towards the lowland where there are flowing water courses. This storm water may contain/take away pollutants from spilling construction materials, oils, greases, and paints from the workshop place, and parking yard; thus polluting the receiving water body. Care needs to be taken to provide adequate sanitary facilities and drainage in the temporary colonies of the construction works. The provision of adequate washing and mobile toilet facilities with septic tanks and appropriate refuse collection and disposal systems should be made obligatory to minimize sediment loads. The impact severity is moderate (6)



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- **Increased road embankments' landslides**

One of the selected urban roads Byumba-Ngondore traverses hilly areas with a steep slope. Hence, landslides are likely to occur due to the soil cutting from road embankments. Therefore, particular attention needs to be paid to such areas for appropriate soil cutting techniques or exigency of construction of soil retaining or masonry structures may be applied. Sliding of roads' embankments is expected to increase during construction works in the rainy period, causing road closure, and damage to properties downstream. Therefore, construction work should be done during dry periods or low-intensity rainfall. The impact severity is moderate (9)

- **Increased Water Demand**

The water requirement will be increased during the construction phase for both road construction and workers' needs. Water sources and quality, including surface water, are likely to be impacted due to road construction activities such as setting up of worker's camps, transportation, and storage of construction materials. However, no conflict over water resources since the hydrologic network of the project area is very dense. However, the contractor will be required to take a long distance to collect water for road construction since all roads are not in the vicinity of any watercourse except at the end of Byumba-Ngondore road. The impact severity is moderate (6)

- **Public Occupational Health and Safety risks**

Health risks include disease hazards due to the lack of sanitation facilities (water supply and human waste disposal) for the workers during construction both at the construction site and at the contractor's camp. Improper disposal of waste from the contractor's camp can lead to contamination of both ground and surface water. This could lead to an outbreak of waterborne diseases such as diarrhea, dysentery, typhoid, etc. The solid waste generated in the contractor's camp if not treated properly may cause leaching and environmental pollution. The impact may be of short duration and reversible, but can be of a high magnitude if not well managed.

The project will employ enough labor force for its timely completion. Communicable diseases like tuberculosis; Covid-19, etc. are therefore likely to be disseminated especially during peak demand for manpower. The occupational safety and health issues associated with the construction of the proposed urban roads will include physical hazards and chemical hazards. Chemical hazards will be principally associated with exposure to road construction materials, dust during construction, and exhaust emissions from heavy equipment and motor vehicles. Physical hazards include being exposed to a variety of risks from operating machinery and moving vehicles, exposure to weather elements, noise, work in confined spaces, trenching, falls from machinery or structures, and risk of falling objects, injuries from stepping on or using sharp objects, fires, and accidents by vehicles, motorcycles, and bicycles, etc. There is also a possibility of accidents associated with transporting workers to construction sites. The impact severity is major (12).

- **Temporal road congestion or closure**

Temporal road congestion during its construction is also a possible negative impact as a result of construction works and increased traffic in some sections of the road. Other road sections may even experience total closure for a limited time because of the nature of undertaken works. This would create difficulties for road users as they may need to take longer routes, therefore



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causing more costly and time-consuming travel. The application of traffic management measures and the preparation of alternative roads is expected to minimize road congestion in the project areas. The impact severity is moderate (6).

- **Displacement of PAPs**

The rehabilitation and upgrading of selected urban roads to 6.0 and 7.0 m widths are likely to affect people's assets and displacement. About 436 families comprising 2107 people will be likely affected and among them, 65 families are expected to be displaced. Detailed information for affected and displaced PAPs is presented in a standalone Resettlement Action Plan (RAP) prepared for this project. The compensation and livelihood restoration measures for affected properties and relocated PAPs are envisaged in the RAP document. The impact severity is major (12)

- **Loss of water points**

There is a loss of water points including water valve chambers and 1 water spring that are to be affected by road rehabilitation activities. Therefore, the replacement and/or relocation of existing water points as well as the construction of new water points and relocation of water supply pipes will be envisaged before their damage to satisfy the water supply needs of the local communities in Gicumbi District. The impact severity is minor (4).



Photo 2: Water utilities in the right of way to be affected and lost

- **Road incidents and accidents**

Road incidents and accidents are also the negative impacts that may be experienced by the projects during road construction and operation phases. To cope with these negative impacts, road safety measures are essential and should be adopted both in the construction and operation phases of the road project. Due to improved road conditions, traffic speed is likely to increase and speed limits are also likely to be exceeded, which may lead to a rise in road accidents. The impact severity is major (12)

6.4.2.2 Negative impacts during the operation phase

The negative impacts of the project during the operation phase are identified to be minimal and include the followings.

- **Road incidents and accidents**

Road incidents and accidents are also negative impacts that may be experienced during the operation phase. To cope with this negative impact, road safety measures are essential and should be adopted in the operation phase of the road project.



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Note that some of those measures are to be provided during the construction phase including the installation of the road signs required to enhance road safety for road users. Due to improved road conditions, traffic speed is likely to increase and speed limits are also likely to be exceeded, which may lead to a rise in road accidents. The impact severity is major (12)

The following are examples of the mitigation measures to be adopted respectively to the operation phase:

- Adhere to the speed limits by roads users (vehicles and motorcyclist drivers),
- Respect the indication of roads signs by the drivers,

Inspection of compliance with road safety code to road users by National Police.

- **Encroachments into road reserve**

The rehabilitation and upgrading of the earth road to the asphalt road is expected to attract investors either from the local community or outside of the project area to settle closer to the road for different purposes like the construction of commercial or residential houses or agricultural activities. Therefore, this kind of encroachment may be the source of other negative impacts related to the sustainability of the constructed road or the safety of the people in those houses closer to the road.

- **Interference with the traffic flow**

The rehabilitated and upgraded roads are expected to lead to increased traffic using the roads and this may even lead to traffic jams, especially at junctions.

- **Risks of increased traffic incident**

The rehabilitated and upgraded roads are expected to attract road users mainly motorized vehicles, motorcycles, and bicyclists to move at high speed as a result of good road surface which may lead to traffic accidents involving pedestrians as well.

6.4.2.3 Negative impacts during the decommissioning phase

The negative impacts expected during the decommissioning phase of the project refer to the demolition of the ancillary sites and facilities not expected to remain after road commissioning and operation. The identified negative impacts in this phase include the followings:

- **Occupational Health and safety risks**

Risks associated with the dismantling of the project facilities are susceptible to cause incidents to the involved laborers.

- **Generation of solid wastes**

During the demolition and dismantling of the project facilities, it is expected that solid wastes will be generated at its sites. Demolition of the project will include but not be limited to project camps, laboratory, equipment, and fixtures at the contractor's yard and related infrastructure will result in large quantities of solid waste. The generated solid wastes may thus have negative impacts on the environment aspect contribute to soil, water, and air pollution.



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- **Increased noise and vibration**

The demolition works will lead to the deterioration of the acoustic environment within the project site and the surrounding areas.

- **Landscape degradation**

The decommissioning phase can result in landscape degradation if the rehabilitation of the demolished facilities is not properly done. In this case, those sites can be stagnated by the rainwater in case there was an impermeable layer (cemented ground) thus becoming the origin of water-borne diseases like malaria which can affect the surrounding community.



7. IMPACT MITIGATION MEASURES

7.1 Introduction

Upgrading and Rehabilitation of the selected urban roads in Gicumbi District 15.53 km will have a wide range of impacts on the biophysical environment, health and safety of employees and members of the public, and socio-economic well-being of the local communities and households. It is usually impossible to mitigate all the expected negative environmental and social impacts. Thus, in this chapter, an attempt was made to formulate mitigation measures for the most significant negative environmental and socio-economic impacts.

The aim is to ensure that the most significant negative impacts are avoided or minimized as much as possible while maximizing the positive benefits of the project. The mitigation measures will be presented in the Environmental and Social Management Plan (ESMP) which is intended to assist the proponent in the management of the adverse environmental and social impacts associated with the project life cycle. The following section provides proposed mitigation measures for the anticipated impacts that need to be implemented to avoid or minimize potential adverse impacts. Of these, some involve good engineering practices while others are viewed from socio-economic as well as humanitarian angles. It is important to note that a special focus has been given to the negative impacts that are considered significant and that warrant intervention to reduce the level of impact on the local communities as well as the surrounding environment.

7.2 Mitigation measures of impacts in the construction phase

7.2.1 Air pollution and air emission mitigation

The potential risk of air pollution will be mitigated or minimized by implementing the following measures:

- o Sprinkling of water on dry and dusty surfaces regularly to reduce fugitive dust generation prevent damage to dwellings and avoid nuisance to persons.
- o Special consideration shall be given to sensitive receptors such as schools, public offices, markets, commercial centers, etc.,
- o Dust control measures should be adopted at concrete batching plants, canopying loading points and erecting dust screens around the plant,
- o Provide adequate PPE to staff; comply with personal protective clothing requirements for dusty areas such as dust masks and protective glasses.
- o Enforce onsite speed limit regulations and employ adequate traffic safety risk management, including a code of conduct to truck drivers to avoid impact on the community residing within and nearby the project area, which may contribute to reducing dust levels,
- o Erection of dust screens/barriers around buildings under construction especially in sensitive areas like schools, commercial houses, and workers' camps,
- o Implement dust control measures at the quarry sites and aggregate crushing sites.
- o To mitigate exhaust air emissions, it will be mandatory to procure machines, equipment, and environmentally friendly vehicles,
- o Construction machinery should be well maintained to minimize excessive gaseous emissions,



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- Prohibit plant operators and drivers of construction vehicles from unnecessary revving and idling and limit construction traffic movement and operations to the most necessary activities through adequate planning,
- Sensitize construction drivers and machinery operators to switch off engines when not being used,
- The contractor is required to use equipment and automobiles that have certification of good working conditions from “The National Automobile inspection center” to avoid exhaust fumes since automobiles in good condition will pollute less,
- Control the speed of traffic movement through adequate policing and monitoring. Avoid the burning of materials such as tires, plastic, rubber products, or other materials that create heavy smoke or nuisance odor. Do not burn material that produces toxic gases. Any waste which cannot be composted, reused, or recycled should be disposed of in approved local landfills or buried in well-prepared and well-managed disposal sites.

7.2.2 Noise pollution and excessive vibrations mitigation

During the design phase, the road design has been done to avoid steep grades and sharp corners, especially at sensitive locations to reduce noise resulting from acceleration, braking, gear changes, and the use of engine brakes by heavy trucks. To avoid and/or minimize the potential impacts, the following measures will be adopted:

- Use of new equipment & machinery with silencers,
- Ensuring that equipment and automobiles have certification of good working conditions from “The National Automobile inspection center” to avoid noise.
- Sensitize the drivers to switch off vehicles and machinery that are not being used,
- Ensure that all vehicles and construction machinery are kept in good condition all the time to avoid excessive noise generation,
- Ensure that all workers wear earmuffs and other personal protective gear/equipment when working in noisy sections.
- To reduce night-time disturbance from construction noise, which is unavoidable, the practice of conducting construction activities should be limited between the hours of 06h00 and 19h00.
- Activities that create a lot of noise or irritations, such as vibrations, heavy equipment moving earth, and excavations, shall be restricted to normal working hours (7h00-17h00) to prevent noise for neighbors at night. Equipment normally producing high levels of noise should be suppressed and screened when working within a distance of 200 meters from any settlement, clinic, religious places, or other sensitive noise receptors.

7.2.3 Solid waste minimization and reclamation of borrow and quarry sites

The anticipated impact of solid waste and spoiled soils will be mitigated or minimized by implementing the following measures:

- Collect, segregate, safely transport, and dispose of waste at the final dumping or disposal site specified by the local authority to avoid any adverse impact on the health and well-being of people,
- Provision of waste bins at the project sites to avoid illegal dumping,
- Waste should be segregated at the generation site and collected separately according to their types (hazardous, organic, and inorganic waste),
- Composting of vegetation waste for reuse as a landscaping fertilizer,



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- o Managing sediment and sludge removed from storm drainage systems maintenance activities as hazardous or non-hazardous waste based on an assessment of its characteristics,
- o Management of all removed paint materials suspected or confirmed of containing lead as a hazardous waste,
- o The contractor shall develop a waste management plan to be implemented during the project execution,
- o Sub-contract a licensed waste handling firm to collect solid wastes regularly and disposal in approved dumping sites,
- o Preparation and integration of a separate ESMP for camps, borrow pits, spoils, and quarries into the project rehabilitation phase Clean the area and dump/dispose of the construction spoils at the approved dumping site,
- o The surplus of soils from the RoW and topsoil from borrow/quarry sites should be used to backfill the borrow area.
- o The Contractor shall develop a quarry and borrow site management and rehabilitation management plan to restore/rehabilitate all sites in a satisfactory manner after completion of borrow operations to avoid impacts due to undrained pits that create additional habitats for waterborne disease vectors and possible safety issues for people and livestock (drowning in deep/steep pits),
- o The excavated area must serve as a final depositing area for the placement of overburdened and unused material. The rehabilitation of the ancillary sites should consider the future use of those land (agricultural land, forest land, garden land, etc.).

7.2.4 Land use change and loss of vegetation and biodiversity

The following measures to avoid and minimize the anticipated impact of solid waste and spoiled soils will be adopted. These are:

- o Legislated compensation procedures generally provide only for the owners of the property and make no allowances for tenants, employees, or squatters,
- o Appropriate compensation will be paid to the affected communities with a livelihood restoration program for relocated PAPs,
- o Grasses and tree planting programs after road construction will be implemented in the project areas to replace trees that have been affected,
- o Tree cutting, grass removal, wildlife poaching, or introduction of new species, whether invasive or not, in the area should be avoided or minimized,
- o A proper management system of waste (construction wastes, domestic waste, etc.) should be established to avoid their dumping in the sensitive area where it can lead to loss of biodiversity,
- o Awareness campaigns and enforcement of a worker's code of conduct for the protection of biodiversity,
- o Include vegetation rehabilitation techniques to recover lost plant cover such as reforestation and afforestation,
- o Consider the location of mature trees during route selection for the access road construction and land clearing for quarry and borrow sites,
- o Compensate in cash for the loss of privately-owned mature trees and replanting for the loss of natural vegetation as appropriate,



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- o Minimize clearing and disruption of riparian vegetation. Avoid excessive destruction of trees and other vegetation and minimize clearing of indigenous plant species and replanting of indigenous plant species in disturbed areas.

7.2.5 Water quality and soil contamination minimization

The contractor will construct a workshop for machinery and vehicle maintenance as well as provision sealed areas for the storage of pollutants to avoid any accidental discharge that would pollute water resources. To ensure no or minimum impact on nearby soil and water surface, the contractor shall take into consideration of the following measures:

- o Measures should be taken to ensure proper storage of fuel, oil, and bitumen. Oil-water interceptors or sumps should be constructed to capture the discharge of oils, fats, and other polluting liquids from maintenance workshops, vehicle and equipment washing bays and kitchen drains. Oil and bitumen pollution should be prevented by ensuring its proper storage, handling, and disposal,
- o The Contractor shall also carry out appropriate measures to minimize sediments that increase turbidity and other pollution effects on the nearby surface water sources.
- o Require the contractor to make specific and adequate provisions for the disposal of sanitary and other wastes in such a way as will not result in any form of pollution or hazard to human or animal health,
- o The contractor is to take all reasonable precautions to prevent spillages and leakage of materials with the potential to pollute water resources. The measures should be maintained in an effective condition throughout the life of the base camp.
- o Specifically, prohibit the washing of vehicles and plants in or adjacent to any water sources. All washing is to be carried out at designated areas away from water sources.
- o The contractor is responsible for cleaning up any pollution caused by his activities and the payment of full compensation to those affected.
- o Establish temporary and permanent containment structures for spill-prone areas as applicable
- o Develop and implement a waste management plan
- o Provision of adequate sanitary facilities and drainage in the temporary colonies of the construction workers
- o The provision of adequate washing and mobile toilet facilities with septic tanks and appropriate refuse collection and disposal systems should be made obligatory.
- o Design drainage structure to adequately carry maximum run-off
- o Develop and implement a storm water management plan to employ best practices that slow peak runoff flow, reduce sediment load, and increase infiltration.
- o Regular inspection and maintenance of permanent erosion and runoff control features.

7.2.6 Mitigation measures for increased water demand

To mitigate the negative impact related to the increased water demand that may occur in the project area as a consequence of the project intervention, the following measures are to be adopted by the contractor.

- Equip the project campsite with the water supply line to avoid dependence on the community water tapes,



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- To collect the rainwater from the roof of the campsites building and use it for hygienic activities,
- To ensure that the water supply utilities in the right of way of the project are replaced before its damage,
- Ensure that any accidental damage to the waterline in the household is repaired immediately.

7.2.7 Soil erosion control

- o Ensure that excavation is accompanied by well-engineered drainage and preventative measures may be necessary during closure to construct adequate drainage structures including ditches and other structures to facilitate the movement of surface water and prevent damming,
- o Ensure surface runoff generated on the impervious surface is not channeled directly to steep slopes.
- o Ensure storm water management and drainage around the dumping sites to avoid water washing away the disposed of material,
- o Provide adequate protection against scour and erosion, and give consideration to the onset of the rainy season concerning construction schedules,
- o Provide flow breaks and energy dissipater structures inside drainage channel where there is a steep slope,
- o Construct drainage channels that serve for the safe diversion of storm water away from the embankments and spoil disposal sites,
- o Drainage outfalls should be properly constructed to reduce the erosion from surface runoff and storm water,
- o The particular focus shall be given to vegetation cover on the side slopes of the excavated area to minimize erosion. Any required seeding used shall be of local plant varieties,

Develop and Implement a storm water management plan.

7.2.8 Minimize land sliding of road embankments

The mitigation measure will be:

- o The construction works should be done during dry periods or low-intensity rainfall,
- o The protection of critical road embankments slopes with stone masonry or other engineering measures to stabilize the slopes of the embankment shall be done soon after construction,
- o In addition, the ditches upstream of the slopes with high landslide risks will be constructed to control runoff water causing embankment land sliding.
- o Grasses and tree plantation programs should be combined with engineering measures to control erosion, especially under zones with critical slopes.

7.2.8 Limit vegetation clearing

This should be mitigated as follows:

- o Avoid excessive destruction of trees and other vegetation and minimize clearing of indigenous plant species and replanting of indigenous plant species in disturbed areas,
- o Minimize clearing and disruption of riparian vegetation,



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- o Compensate in cash for the loss of privately-owned mature trees and replanting for the loss of natural vegetation as appropriate,
- o Create awareness to the workers and nearby communities to avoid unnecessary and unplanned cutting of trees,
- o Include vegetation rehabilitation techniques to recover lost plant cover such as reforestation and afforestation.

7.2.9 Public and Occupational Safety and Health Risk Mitigation

- o Develop and enforce a fleet management plan for road construction that includes measures to ensure work zone safety for construction workers and the traveling public.
- o Establishment of work zones to separate pedestrians from vehicular traffic and equipment by routing traffic to alternative roads where possible.
- o Use protective barriers to shield pedestrians from traffic vehicles and regulation of traffic flow by the warning sign,
- o Use of flaggers if possible to direct and ensure the reduction of vehicle high speeds in work zones.
- o Conduct awareness campaigns for workers and the local community about the safety issues related to their activities hence provide frequent training about the use of PPE
- o Ensure safe and good working conditions at the workplace.
- o Hoisting and lifting equipment should be rated and properly maintained, and operators trained in their use,
- o Frequent maintenance of project vehicles and machinery to minimize air emissions.
- o Reduction of engine idling time in construction sites; Use of extenders or other means to direct diesel exhaust away from the operator; Ventilation of indoor areas where vehicles or engines are operated, or use of exhaust extractor hose attachments to divert exhaust outside.
- o Safety Risk assessment will be carried out before the commencement of the project to analyze potential risks. Based on the analysis, preventative and protective measures should be introduced.
- o Isolate or separate the hazard from the people at risk of injury,
- o Engineering controls (Physical changes. E.g.: redesigning machines or methods of work by adding safeguards),
- o Administrative controls (Change the way people work or install signs, rotate jobs, etc.), Personal Protective Equipment-PPE (Protect the workers with PPE through the provision of appropriate personal protective equipment (PPE). However, the emergency procedures and contingencies management plan to be prepared as a stand-alone document will also consider safety risks.
- o The project shall develop and implement an Occupational Health and Safety Management Plan (OHSMP) comprises of monitoring and reporting mechanisms for occupational accidents and diseases, dangerous occurrences, and incidents.
- o The reinforcement of laws on child labor, sexual harassment/prostitution, and gender equity should be done.



7.2.10 Public utility damage prevention

For adequate project execution purposes, bellows are proposed mitigation measures to avoid any adverse impact on public utilities:

- o Collaboration with the project developer, and utility services providers to identify all existing utilities in RoW before project commencement.
- o Planning replacement and/or relocation of existing utilities before their damages before the project commencement. The utilities relocation arrangement will depend on the nature of the contractor for the works.
- o With help of the services provider, the party responsible for the utility relocation will be notified about quantities of utilities to be relocated so that the replacement utilities meet the standard,
- o Sub-contract experienced companies to relocate affected utilities; all of the required measures should be implemented before work commencement.
- o In case unexpected damage happens during construction works, the contractor would notify immediately services providers and take the necessary action as soon as possible.

7.2.11 Road accident mitigation

The following are examples of the mitigation measures to be adopted during the construction phase:

- o Installation and maintenance of speed control and traffic calming devices at pedestrian crossing areas.
- o Installation and maintenance of all signs, signals, markings, and other devices used to regulate traffic, including speed limits, warnings of sharp turns, humps, etc., specifically those related to pedestrian facilities or bikeways.
- o Awareness campaigns to drivers/bicyclists/motorcyclists and pedestrians for road safety,
- o Enforce code of conduct for drivers and operators involved in the project implementation, to adhere to speed limits by project drivers and operators;
- o Prepare an emergency preparedness and response plan and develop a procedure for one-time incident/accident notification in coordination with the local community and local emergency responders to provide timely first aid response in the event of accidents. Any incidents of serious injury and fatality should be immediately notified and reported to RTDA and Africa Development Bank within 48 hours and the root cause analysis within 7 days.
- o Plan and conduct Information Education and Communication (IEC) for schools and village centers across the project area for road safety purposes.
- o Develop and implement a traffic management plan.
- o The contractor is obliged to report site accidents to the consultant and have them recorded in an incident report.

7.2.12 Limit the risks of spreading STDs, HIV/AIDS, Covid-19, and other transmissible diseases

- o Contractor shall sign an MoU with the local health center to provide the following services:



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- o Develop a comprehensive STDS, HIV/ AIDs, and Covid-19 awareness for both workers and the local community.
- o Provision of STDs, and HIV and AIDS prevention measures such as distribution of condoms to workers/local people both male and female.
- o Creation of awareness of STDs, HIV/AIDS, and Covid-19 in worker's camps through training and installation of posters.
- o Promote continuous sectoral, gender-related Information, Education, and Communication (IEC) messages about HIV/AIDS, STDS, Covid-19 infection, protection, counseling, and care.
- o Increase the availability and accessibility of condoms.

Establish a sectoral policy that will safeguard human and civil rights and avoid discrimination against workers and community members who are infected with HIV/AIDS.

7.2.13 Resettlement Action Plan

- o Impacts on massive property loss to be avoided during detailed design via the adoption of a reduced-speed design, reduced right-of-way and land acquisition, etc.
- o The proposed urban roads project in the Gicumbi District design followed existing alignments and seek to minimize the extent (and cost) of land expropriation. This approach resulted in the widening of the road up to the required standard only. As a second example, the adoption of a narrow road reserve can substantially limit options for controlling water flows and soil erosion -with potentially negative effects on the environment. Consideration should also be given to the social and environmental costs of non-displacement of people and business activities.
- o As with prevention, mitigation of land acquisition impacts is achieved primarily by modifying the route or design of a road to minimize and locate the sites in less populated areas where its effects will be limited to nearby properties and land uses.
- o Consultation with affected people and other project-related stakeholders in the resettlement action plan implementation, for mitigating the impacts of land acquisition and resettlement actions to be caused by the project,
- o The client and the district authorities support people to be affected to get the required ownership document for timely compensation payment.
- o The national laws and regulations governing property rights, compensation, and appeal procedures for land expropriation. The government's right to expropriate carries with it a responsibility to ensure that those affected people do not bear an unfair share of the costs of a project which will bring benefits to others. In the simplest terms, this responsibility should be to ensure that the standard of living of all affected persons is restored to the level that is much better and not worse than their previous livelihood before the commencement of the project activities.
- o Legislated compensation procedures generally provide only for the owners of property and make no allowances for tenants, employees, or squatters. Additional arrangements must be defined to ensure that these affected groups are not substantially disadvantaged by land use changes and that they are assisted in relocating and re-establishing their homes and sources of income. These additional arrangements are provided in the updated RAP.



7.2.14 Socio-dispute mitigation

- Ensure proper identification and compensation of all persons who will lose properties.
- Obtain necessary permissions and approvals from the relevant authorities before the use of project sites.
- The contractor will use his best endeavor to maximize local hire of labor, in so far as they are compatible with their skill requirements.
- Enforce the implementation of ESMP for specific project components such as campsites, borrow pit, spoil sites, and quarrying sites.
- Largely involve and ensure a good percentage of the local community members are employees of the project.
- Work cooperatively with the stakeholders and communities along the project area, including with end users of the Works, relevant authorities, and local communities, through the Grievance Redress Committees (GRCs) and meetings at the cell/sector level.
- Protect the health and safety of local communities and users, with particular concern for those who are disabled, elderly, children, or otherwise vulnerable.
- Incorporate a gender perspective and provide an enabling environment where women and men have equal opportunity to participate in, and benefit from, the planning and development of the project work to shape their own lives and contribute to their families, communities, and country hence ensuring that Women are always represented in the GRCs.
- Engage with and listen to affected persons and organizations and be responsive to their concerns, with special regard for vulnerable, disabled, and elderly people.
- Provide an environment that fosters the exchange of information, and feedback to the community about the project implementation,
- Maintain a continuous engagement with the Grievance Redress Mechanism (GRM) and its members through the GRCs.

Work to mediate and resolve as quickly as possible any grievance addressed by any community member against the project.

7.2.15 Climate change mitigation and adaptation measures

Greenhouse gases from human activities are the most significant drivers of observed climate change since the mid-20th century. As greenhouse gas emissions from human activities increase, they build up in the atmosphere and warm the climate, leading to many other changes around the world—in the atmosphere, on land, and in the oceans. Because many of the major greenhouse gases stay in the atmosphere for tens to hundreds of years after being released, their warming effects on the climate persist over a long time and can therefore affect both present and future generations. Major Long-Lived Greenhouse Gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (NO_x), and fluorinated gases including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) among other chemicals.

Sources and emissions of greenhouses gases

- **Carbon dioxide:** is produced or emitted primarily through the burning of fossil fuels (oil, natural gas, and coal), solid wastes, and trees and wood products. Changes in land use also play a role in carbon dioxide emission Deforestation and soil degradation add carbon dioxide to the atmosphere, while forest regrowth takes it out of the atmosphere.



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- **Methane:** Methane emissions result from livestock and agricultural practices and the anaerobic decay of the organic wastes in municipal solid waste landfills.
- **Nitrous oxide:** Emitted during agricultural and industrial activities, as well as during the combustion of fossil fuels and solid wastes.
- **Fluorinated gases:** These gases are emitted from a variety of industrial processes and commercial and household uses and do not occur naturally. Sometimes used as substitutes for ozone-depleting.

Even though road construction projects contribute to inducing climate change, the transport sector is impacted by climate change both positively and negatively. These impacts are dependent on regional variations in the nature and degree of climate change and the nature of local transport infrastructure and systems. Adapting transport systems to the effects of climate in some cases complement mitigation efforts while in others they have a counteracting effect.¹³

From the above consideration, it is expected that vehicle emissions containing greenhouse gases will be generated both during road upgrades and eventual use. Quantities generated will depend on the type, age, and equipment used during construction while operation-phase emissions will depend on traffic volume. These emissions would have a cumulative negative effect on local air quality and global climate change. Therefore, the environmental social impacts assessment (ESIA) report proposes the mitigation and adaptation measures to be undertaken in the project implementation to minimize the project impacts on climate change or being impacted by climate change.

- ✓ Design of storm water drainage structures with appropriate dimensions to avoid and minimize flooding issues of the rehabilitated/upgraded roads,
- ✓ **Use of equipment in good mechanical condition:** The contractor should ensure that all motorized equipment used is in good mechanical condition and regularly serviced to reduce the emissions it generates.
- ✓ **Optimizing works zone traffic management:** Proper traffic management practices will limit GHG emissions due to traffic congestion (i.e. minimal on project road) caused by road construction works.
- ✓ **Managing overloading:** Optimally loaded trucks hauling construction materials will have lower GHG emissions than over-loaded ones.
- ✓ **Use of low roughness:** Fuel consumption of vehicles driving on a road depends, among others, on the roughness of the road surface. Low roughness will therefore reduce GHG.
- ✓ Use of modern bitumen plants that can minimize carbon emissions,
- ✓ **Use of existing material sources:** Maximize use of the material from road widening for backfilling to reduce long-distance transport of material by truck thus reducing gases emissions,
- ✓ **Tree planting along the road:** Another mitigation measure recommended for the operational phase is planting trees along the road, which contribute to carbon sequestration, as well as beautification. Trees and grass planting will be required to be species of local provenance, that will be suitable for the local climate and not susceptible to impacts from vehicle emissions and that require little maintenance. It is highly

¹³ IPCC, 2014. Mitigating climate change



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recommended that RTDA procure professional services for tree planting to ensure that the right species are planted.

- ✓ Proper waste management on the project site and particularly avoiding waste burning would increase greenhouses gases emission.

7.2.17 Labor and child protection measures

The following measures will be enforced on the project site.

- All workers employed on project sites should be at least eighteen years based on the nature of work in a road construction project;
- The contractor should ensure to provide conducive working conditions to the labors (This include providing required personnel protective equipment, providing rest time to labors on work; providing basic facilities like mobile toilet, and potable drinking water on working sites, etc.);
- Any harassment of labors on site is prohibited;
- Any discrimination of labors work is prohibited, and the contractor should give employees equal opportunities at the workplace;
- All labors including casual labor should have a work contract.
- Include signing of the code of conduct and payment of wages/salaries as per Rwanda's labor laws on remuneration.
- Compliance with Rwanda's laws and the AfDB's OS 5 on labor conditions, health, and safety

7.2.16 Cultural resources and Archeological sites mitigation measures

Rwanda has a variety of historic and cultural resources which are the main source of government revenue, this also constitutes a big part of the tourism basement for the nation. Such historical and cultural resources include; Museums sites in different areas of the country, genocide memorial sites, churches, and traditional cultural practices like dances, beaches, etc. Therefore, land use should contribute to the preservation of Rwanda's cultural and built heritage and its diversity. The place falling under this category along Byumba urban roads project is the religious building (Catholic Church) located nearby of the access road to the catholic cathedral. The project shall prepare a Chance Find Procedure as a management plan for guiding archeological artifacts.

7.3 Mitigation measures of impacts in the operation phase

7.3.1 Mitigation measures for roads incident and accidents

Given the likelihood of incidents and accidents during the operation phase of the project due to the improvement of the roads conditions, the following are the measures to be considered during the construction phase of the project:

- To ensure that the roads are constructed considering the safety of the roads users,
- To provide sufficient road signs to warn roads users,
- The local authorities in Gicumbi District to organize awareness campaigns to the local community on roads safety.



7.3.2 Mitigation measures of the encroachment to the road reserve

To avoid the encroachment to the road reserve, the following measures are to be enforced by the local authority in Gicumbi District:

- ✓ Ensure that any new construction in the vicinity of the road is respecting the applicable buffer zone of the road reserve,
- ✓ ensure that any new building construction is having permit respecting the road reserve,
- ✓ enforce the sanction for the non-authorized building elected in the vicinity of the road.
- ✓ Mobilize the farmers to respect one or two meters away from the cut slope to reduce landslide risks,
- ✓ Encourage grasses and tree plantation on the road embankment.

7.3.3. Mitigation measures for interference with the traffic flow

To mitigate the interference of the traffic flow on the roads, the following measures need to be construction phase:

- Ensure that the road signage indicates the priority of the road users according to their directions.
- Ensure that the code of conduct for roads users is regularly monitored by the traffic police.

7.4 Mitigation measures of impacts in the decommissioning phase

7.4.1 Occupational Health and safety risks

- Provide appropriate PPEs to the labors in demolition works,
- Use a lift crane whenever required to dismantle material at an elevated height.

7.4.2 Mitigation measures for solid wastes generation

- Ensure that residual wastes from the demolition of the project facilities are collected for reuse, recycling, and or proper disposal.

7.4.3 Mitigation measures for increase in noise and vibration

The impacts on the acoustic environment will be mitigated as described in the construction phase. Avoid demolition works in the night hours beyond 18h00.

7.4.4 Landscape degradation

- Ensure proper leveling of the areas with the demolished facility,
- Collect and level all hips of soil around the roads and or in the demolished areas,
- Reinstate the area with the demolished facilities according to the future use of that area (agricultural, forest, garden lands, etc.)



8. PROJECT ALTERNATIVES

8.1 General

A comprehensive environmental and social impact assessment requires not only the evaluation of the impacts resulting from the proposed project at a specific location and resulting from the construction process, but also a complete environmental and social impact assessment cycle requires a detailed assessment of possible alternatives as well. During the scoping/feasibility study of the proposed urban roads rehabilitation/upgrading project in Gicumbi District, options were explored, and these options were weighed from all considerations such as cost, environment, ease of implementation, and maximum utilization of available infrastructure.

Alternative routes, realignment of existing routes, and projects and in addition to the "do-nothing" have been considered and the implications of each are described in the sections which follow.

- No project/Without project alternative
- With project alternative
- Construction material and exploitation techniques
- Alternative roads
- Alternative selection
- Project siting
- Design alternative

The alternative analysis aims to arrive at a development option, which maximizes the benefits while minimizing the adverse impacts. An alternative analysis is also a form of mitigation measure. The two alternatives were considered "Without Project Scenario" and "With Project Scenario". In with project scenario, different considerations involved in the project implementation were also discussed. The following sections provide descriptions of the project alternatives and analysis considering the environmental, social, and economic features.

8.2 "Do Nothing"/Without Project Alternative

The "Do nothing"/without project alternative option for the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference of impacts with the existing environmental conditions. This option, however, involves the losses of potential environmental and socio-economic benefits to the local population and the nation as a whole, and quality of life would remain at a low level for many of those who live in the project intervention area.

With this without project alternative, the residents of Gicumbi City will continue to face the constraints they are currently experiencing due to the inefficient transport network and system, and the anticipated economic development aimed at fulfilling the National Strategy for Transformation (NST 1) will remain unattainable; where Gicumbi urban roads rehabilitation and upgrading project will contribute to the reduction of the cost of doing business and facilitate trade, accelerate sustainable urbanization, etc.



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The No Project Option is the least preferred from the socio-economic and environmental perspective due to the following factors:

- The socio-economic status of the Gicumbi District's residents would remain unchanged. Reduced interaction both at local, national, and international levels.
- The local skills would remain under-utilized as no employment opportunities will be created for the local population who would have otherwise been employed by the Gicumbi urban roads rehabilitation/upgrading project.
- Reduced business development due to current bad conditions of selected urban roads in the district.
- Loss of business for contractors and subcontractors at local, National, and International levels depending on the winner to carry out road rehabilitation works.

Therefore, the "Do nothing/ without project" alternative is not preferable to project implementation.

8.3 With Project Alternative

The implementation of the project will contribute to the socio-economic improvement and will have positive impacts on residents' life quality. This alternative will have the following advantage: there will be improved and assured transport facilities for the residents of the urban area of Gicumbi District. This will stimulate the socio-economic development of the area. The proposed urban roads are a major deterrent to urbanization growth in the area, the project scenario will catalyze commercial growth in the different centers and there will be better business opportunities for locals. There will also be savings in the vehicle operation cost (fuel, operation, and maintenance) due to the better condition of selected urban roads.

This option will have also a negative impact on land use, forests/trees, water, and noise and air pollution during the construction and operation phases. About 10.05ha of land is likely to be acquired for road rehabilitation and widening. However, the implementation of the project will take adequate consideration to avoid/minimize and mitigate the anticipated impact through the implementation of the following measures, including proper designs, a tree planting program to replace 1076 trees to be lost, compensation for lost properties, proper management of borrow pits and quarry areas, proper disposal of wastes, stabilization of slopes with vegetation, provision of adequate sanitation facilities, provision with protective equipment to workers, use machinery and truck in good condition during the daytime, regular watering of road sections to ensure the implementation of the project to be environmentally friendly and socially acceptable. In addition, the below alternative construction technologies will also be considered.

8.3.1 Limiting works within the existing carriageway

Limiting the road works within the available carriageway is one of the mitigation measures considered to restrict the project footprint within the project zone of influence. This alternative fits well to the selected urban roads in Gicumbi District which are currently passing through grouped settlements and commercial centers.



8.3.2 Project siting

Different sites to be used in the project implementation will be also identified based on their potential as a source of construction materials (Laterite soil, Sand, Stones, etc.). Therefore, they do not have alternative siting considerations except for exploitation techniques. Other sites (campsites, quarry, crushing and asphalt making, dump sites) will however be sited based on suitability with current policies and laws for environment and biodiversity protection.

8.3.3 Preference for hillside cut

Retaining walls and gabions are structures designed to restrain soil, and control land sliding on roadsides, to a slope that it would not naturally keep to (typically a steep, near vertical, or vertical slope). The scoping study conducted for the urban road in Gicumbi District showed that many locations require masonry retaining walls, especially on fill sides. To minimize the cost of the project roads due to retaining walls it is recommended to shift the alignment to the hillside wherever necessary. Nevertheless, the occurrence of retaining walls can't be avoided.

8.3.4 Construction material and exploitation techniques

The selected Gicumbi urban road project will be rehabilitated and upgraded using locally and internationally accepted materials to achieve public health, safety, security, and environmental aesthetic requirements. Equipment that saves energy and water will be given priority without compromising on cost or availability factors. The road surfaces substructure and road infrastructure will be made using locally sourced materials that meet Standards requirements. Exploitation techniques mainly involve either the use of heavy machinery, labor-intensive methods, or a mix of both through engaging the services of competent contractors. The decision on the methods of construction will be made by the contractor, subject to approval by the supervision consultant.

Labor intensive approach alone will have certain limitations especially the inability to excavate, the inability to fill up road elevation and achieve specified compaction, and slow progress. From a positive perspective, labor-intensive techniques are environmentally friendly compared to the use of heavy machinery. However; using modern heavy machinery has a higher economic return since the speed and quality of construction is highly enhanced and may be favored more than labor-intensive methods for the speedy implementation of the project. Construction equipment and machinery should be incorporated with pollution control devices like dust arrestors/precipitators, emission control, and noise abatement devices.

8.3.5 Preference of local labor over imported labor

Most building works are highly labor-intensive. The use of local labor force over imported labor is important to increase local employment opportunities and ownership of project activities as well as limit the dissemination of communicable diseases. reference of local labor will be prioritized during labor recruitment.



8.4 Analysis/Evaluation of project Alternatives

By analyzing both scenarios, With Project Alternative and “Do Nothing”/Without Project Alternative; the without project Alternative has been rejected, and with Project alternative is adopted.

This “Without Project Alternative” decision is not favorable since the proposed urban roads rehabilitation and upgrading project in Gicumbi District aimed at facilitating economic growth by improving the quality of life of residents of Gicumbi City by creating a cleaner, safer and livable environment. The project is also expected to boost the development and expansion of the urban area of Gicumbi City especially along the road Byumba-Ngondore targeted by the new master plan, thus lowering the transport cost among other benefits. All the mentioned benefits would not be achieved if the selected urban roads in Gicumbi District are not upgraded and rehabilitated.

The “With Project Alternative” adoption decision is based on its socio-economic benefits and the alternative measures that will be developed to avoid, minimize, and mitigate any active and residual environmental and social impacts from the project implementation. Therefore, the benefits from the adopted alternative outweigh the project alternative.



9. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

9.1 General Considerations

The main objective of the ESIA for the Gicumbi urban roads project is to achieve an appropriate balance in environmental and social management during the implementation of the project along the selected road alignment and its immediate surroundings. It is achieved through avoidance, minimization or mitigation of potential impacts associated with the Project, and enhancement of Project benefits. Towards this goal, sound environmental and social management is recommended. To be effective, a sound environmental and social management plan must be utilized adequately considering all anticipated impacts. Also, it shall be fully integrated with the overall project management effort at all levels. This is aimed at providing a high level of quality control, leading to a project which has been properly designed, constructed, and functions efficiently throughout its life.

Appropriate road alignment and design issues need to be addressed as well as specific construction-related activities. The issues like waste management, safety risk management, construction labor, resettlement, and compensation management before the implementation of an environmental management and monitoring plan are to be addressed. An Environmental and Social Management Plan (ESMP) with an estimated budget required to address environmental, social, Health, and safety (ESHS) issues associated with the project implementation has been prepared. However, as during the project implementation; there might be unforeseen impacts that may occur and should be mitigated, this ESMP is subjected to updating.

Most of the project's environmental and social management activities will be carried out during the construction phase since this is when most impacts can be expected to arise. Management will very largely be concerned with controlling impacts that may result from the actions of the Contractor, through enforcement of the construction contract clauses related to the protection of the environment and social and safety risk management as a whole and of the components within it. In this respect, it is important to recognize that successful mitigation of construction impacts can only be achieved if the environmental and social management measures, as set out in the construction contract, are properly enforced and implemented.

The table below summarizes the Environmental and Social Management Plan for identified negative impacts of the project and the proposed mitigation measures to be implemented to avoid or reduce the magnitude of the impacts.



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Table 33: ESMP during Project planning, construction, operation and decommissioning phases

Considering the discussion of the negative impacts of the project in chapter six and the proposed mitigation measures in chapter seven in all phases of the project, the following table summarizes the environmental and social management plan to mitigate those impacts.

Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
PROJECT PLANNING AND DESIGN PHASE					
Selection of Byumba Urban Roads	Conflict over project beneficiaries	Involve all the stakeholders in roads selection (organizing meetings, sites visits with stakeholders)	Planning stage	Districts Authorities, Opinion leaders, Private Sector, Local community	Covered
Road realignment	Loss of properties (land, houses & crops)	Integrate representatives of PAPs in the Project	Feasibility/Scoping study	Consultant, District, RTDA	Covered
		Compensate for lost assets as per the Rwanda Expropriation Law and AfDB involuntary resettlement operational safeguards	Planning stage	Gicumbi District, RTDA	Included in compensation cost (RAP)
Capacity building of District staff	Poor monitoring of roads activities	Training on safeguards and monitoring	Planning & Construction	Gicumbi District, RTDA/SPIU Project staff	3,000,000
PROJECT CONSTRUCTION PHASE					
Earthworks (Roads construction)	Lack of follow-up of ESHS concerns during civil works on project sites	Mobilization of safeguards staff (Environmental, Social specialists; Occupational and Safety officers) to follow and implement various	Construction phase	Contractor	54,000,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
	Loss of beneficiaries' properties (land, trees, crops, houses & other structures)	Compensation for lost properties	Construction phase	Gicumbi District: Local authorities, District Land valuer & Hired a Certified valuer. GRCs members RTDA/SPIU Social Safeguards Specialist, Supervising Firm: Social	Included in compensation cost (RAP)
	Damages to public utilities (water supply line and electricity poles)	Relocation of public utility before its damages	Construction phase	Contractor, Supervising consultant, District authority, Utilities responsible institutions, RTDA Project Engineer)	Contract provisions
	Disruption in the drainage pattern	Proper design of drainage canals Construction of drainage canals as per the designs	Feasibility study phase	Contractor, Supervising consultant	Project cost
		Proper conveyance of excess water from the roads	Construction phase	Contractor, District road Engineer, Supervising consultant Environmentalist, RTDA-Project Engineer,	1,500,000
	Soil erosion causes water quality degradation and property damages	Avoid earthworks during heavy rains (mid-March to mid-May);	Construction works schedule	Contractor, Supervising Firm, District, RTDA Project	
		Disposal of unused stockpiled top soils before rains	Construction phase	Contractor, Supervising consultant (RE & Environmentalist), RTDA-Project Engineer	To be covered in ESMP for ancillary facilities



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
				& Environmentalist	
		Protection of road embankments/ slopes with vegetation to reduce landslides	Construction phase	Contractor and Supervising Consultant Environmentalists, District Agronomist & Environmentalists, RTDA Environmental Specialist	2,500,000
		Install proper road drainage, and silt traps were necessary to reduce silt	Construction phase	Contractors, Supervising Consultant-RE, District Road Engineer, RTDA - Project Engineer	Included in the project cost
	Soil pollution	Maintenance of motorized machinery and equipment in service stations	Construction phase	Contractor,	Included in the project cost
		Cleaning of the site and dispose of the construction spoils at the dumping site approved by the District	Construction phase	Contractor Engineer & Social/Environmental safeguards staff, Supervising Consultant: Resident Engineer and Environmental safeguards Expert, District Engineer and Environmental Officer /RTDA Environmentalist	Included in the above budget for the borrow/quarry management plan
	Water pollution	Provision of sanitary facilities (Mobile toilet,	Construction phase	Contractor Engineer & Environmental &	5,000,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		water, hand washing facilities)		Safeguards Expert, Resident Engineer & Environmental & Safeguards Expert, Supervising Firm, RTDA Environmentalist	
		Provide impermeable area for bitumen storage, oil leakage and bitumen wastes	Construction phase		4,000,000
		- Provision of dustbins for waste collection, - Prevent runoff loaded with sediments and other materials from discharging to water causes. - Construction vehicles are to be washed at designated points and water containing pollutants such as cement, concrete, and fuels are to be discharged as per the environmental regulations.	Construction phase	Contractor	3,000,000
	Increased road embankments' landslides	Construction works should be done during dry periods or low-intensity rainfall	Construction phase	Contractor Engineer, Resident Engineer, District road Engineer RTDA/Project Engineer	



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		Construction of stone masonry/pitching, retaining wall, and gabions on critical road embankment slopes	Construction phase	Contractor Engineer, Resident Engineer District road Engineer RTDA/Project Engineer	Included in the project cost
		Construction of diversion ditches upstream of the slopes with high landslide risks to control runoff water causing embankment sliding	Construction phase	Contractor Engineer, Resident Engineer District road Engineer RTDA/Project Engineer	Included in the project cost
		Planting trees along roads embankment	Construction phase	Contractor and Supervising consultant Environmentalists, District Environment and Forest Officers, RTDA Environmentalist	19,200,000
	Health risks	Developing an Occupation Health and Safety management plan	At the start of the construction phase	Contractor Engineer & Environmental & Safeguards, Supervising consultant: Resident Engineer & Environmental & Safeguards Experts	1,000,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		Provision of protective equipment to workers	Construction phase	Contractor Engineer & Environmental & Safeguards Expert, Resident Engineer & Environmental & Safeguards Expert, Supervising Firm, RTDA/ Environmentalist	15,000,000
		Provision of sanitary facilities (Mobile toilet, water, hand washing facilities)	Construction phase	Contractor Engineer & Environmental & Safeguards Expert, Resident Engineer & Environmental & Safeguards Expert, Supervising Firm, RTDA Safeguards team	Included in the Water pollution Cost above
		Awareness campaigns for the prevention of communicable diseases (HIV/AIDS, Covid-19 etc.) for workers	Construction phase	Contractor & Supervising consultant Environmental and social Safeguards, RTDA-Project Safeguards staffs Environmentalist	4,500,000
		Awareness campaigns for the prevention of communicable diseases (HIV/AIDS, Covid-19 etc.) for the local community	Construction phase	Contractor & Supervising consultant Environmental and social Safeguards, RTDA-Project	1,500,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		<p>Awareness, sensitization and pieces of training to workers on occupational health and safety</p> <p>Undertake regular health checkups for employees</p> <p>Prepare emergency preparedness and response plan</p> <p>Appropriate health and safety measures such as fencing dangerous areas, and placing warning and safety signs.</p> <p>Undertaking annual health and safety audit of machinery and construction materials.</p>		Safeguards staffs Environmentalist	
		Availing of well-equipped First Aid facility	Construction phase	Contractor	2,500,000
		Provision of medical insurance to workers	Construction phase	Contractor, Workers	5,000,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
	Increase of gender based violence cases, prostitution, and use of child labor	Reinforcement of the laws on child labor, sexual harassment/prostitution, and gender equity, child labor, sexual harassment/prostitution, and gender equity	Construction phase	Contractor, District, Supervising Consultant, RTDA, and other stakeholders in the District	1,000,000
		Awareness meetings on GBV and VAC for local community and workers Preparation of gender mainstreaming plan to be implemented throughout the project duration. All employees are to sign a code of conduct against SEA, discrimination, and GBV	Construction phase	Contractor, Supervising consultant, RTDA safeguards staff, District Vice Mayor in Charge of Gender and Family promotion, District Gender Officer, and other Stakeholders in the District	1,000,000
	Other subproject management issues	Discussion meeting to resolve issues raised	Once two weeks during the Construction phase	Supervising Firm Contractors, Local Community, GRCs	2,400,000
	Air pollution due to dust and exhaust fumes	Spray water regularly when constructing roads to reduce the dust Cover stockpiles of sand, and soil during	Construction phase	Contractor's Engineer Supervising firm Engineer District Environmental Officer, RTDA Project Engineer	Included in the project budget



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		transportation. Wet crushing in quarries		& Environmentalist	
		Use equipment and automobiles with certification of good working conditions from the “National Automobile inspection center” to avoid exhaust fumes	Construction phase	Contractor and Supervising consultant-RE	The contractor bidding cost
		Routine maintenance, and repair of trucks and machines by the contractor	Construction phase	Contractor	The project cost
	Noise Pollution	Restriction of activities creating lots of noise or irritations to normal working hours (7h00-18h00) to prevent noise for neighbors at night	Construction phase	Contractor Engineer & Supervising consultant-RE, Safeguards Expert, District	-
		- Use equipment and automobiles with certification of good working conditions from “National Automobile inspection center” to avoid	Construction phase	Contractor and Supervising consultant-RE	Coved above



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		noise - Fit onsite generators with noise mufflers to prevent noise pollution. Obtain relevant noise and vibration permits			
	Loss of flora and fauna habitat	Limiting the construction activity within the RoW to reduce the extent of losing flora and fauna.	Construction phase	Contractor Engineer, Supervising consultant Engineer, District road engineer, RTDA project Engineer	
		Reinforcement of the law on environment protection and conservation	Construction phase	Contractor and Supervising Consultant Environmentalist & District and RTDA Environmentalist	1,000,000
		Tree planting program to replace affected trees	Construction phase	Contractor Environmental & Safeguards Expert, Supervising Firm's Environmental & Safeguards Expert, District Environmental & Forest Officers, RTDA/ Environmentalist	Included in the budget for tree plantation



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		Compensation for lost assets	Construction phase	Contractors Environmental & Social Safeguards Expert; -Environmental & Social Safeguards Expert of the Supervising Firm - District Land valuation & Environmental Officers RTDA/Social safeguards Specialist	Included in the cost for lost assets
	Road congestion /closure	Application of traffic management measures Traffic management plan, employ flag persons to guide traffic during construction, temporal road signs to guide road users	Construction phase	Contractor's Engineer, District Road Engineer, RTDA/Project Engineer, Monitoring Consultant, Rwanda National Police	Included in the project cost
	Disruption of domestic access due to soil cutting, drainage channel construction	Rehabilitate domestic access roads/paths, provision of access slabs	Construction phase	Contractor's Engineer, District Road Engineer, RTDA/Project Engineer, Monitoring Consultant,	Included in the project cost
	Road accidents/incident	Enforce road safety measures on project site	Construction phase	Contractor's Engineer, District Road Engineer, RTDA/Project Engineer, Monitoring Consultant, Rwanda National Police	



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		Prepare and implement the Traffic Management Plan (Use of temporal roads sign, mobilization of flaggers on project sites, use of speed reduction measures)	Construction phase	Contractor's Engineer, Environmentalist and Safety Officer, Supervising Consultant, RTDA/Project Engineer & Environmentalist.	15,000,000
		Community and workers' sensitization on road safety	Construction phase	Contractor's Engineer, Environmentalist, and Safety Officer, Supervising Consultant, RTDA/Project Engineer & Environmentalist.	3,000,000
	Increased water demand	<ul style="list-style-type: none"> - Water supply to the project campsite, - Promotion of rainwater harvesting at the project campsite - Rapid repair of damaged water facility, 	Construction phase	Contractor team	Included in the project site installation and utility relocation budget
	Loss of water points	Relocation and construction of new water points	Construction phase	Contractor's Environmental & Social Safeguards Expert; Environmental & Social Safeguards Expert of the Supervising Firm, District Environmental Officer, RTDA/ Social	400,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
				safeguards Specialist	
	Climate change	<ul style="list-style-type: none"> - Use of equipment in good mechanical condition, - Optimizing works zone traffic management, - Use of existing material sources, - Tree planting along the road 	Construction phase	Contractor's Environmental Expert; Environmental Experts of the Supervising Firm, RTDA Environmental Specialist, District Environmental Officer.	Captured in the project cost,
OPERATION PHASE					
Fast moving vehicles bringing noise and dust	Air pollution causing health risks due to dust and exhaust gas from vehicles	Provision of speed restriction measures (speed limit signs, bumps) near villages and special facilities (schools, health posts, markets)	Operation phase	District Road Engineer	Project cost
	Noise pollution causing health risks due to noise from vehicles	Provision of speed restriction measures (speed limit signs, bumps) near villages and special facilities (schools, health posts, markets)	Operation phase	District Road Engineer	Project cost
		Adhere to speed limits	Operation phase	Roads users, Rwanda National Police	



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
Road safety	Reduced traffic safety due to improved roads, inducing drivers to exceed the speed limits and cause accidents (mostly to pedestrians)	Provide traffic control signage prominently at the entrance and throughout populated village areas prominently at the entrance and populated village areas	Operation phase	Contractor, Supervision consultant and District authority	Covered in the project cost
		Provision of speed bumps in the vicinity of populated areas where needed	Operation phase	Contractor, Supervision consultant and District authority.	Covered in the project cost.
		Wear helmets when driving two wheeler	Operation phase	Road users	
		Community awareness meetings on traffic safety issues	Operation phase	District Authorities, National Police	District and police functioning budget
Heavy rains that cause embankments landslide, bringing debris and clogging the drainage system and roads	Water pollution and Property damages	Regular maintenance of the road drainage system	Operation phase	Local Community Association (LCAs), District Road Engineer	Road maintenance budget
	Landslides of roads embankments	Protection of slopes with vegetation and regular maintenance of the embankments and their upstream part	Operation phase	Local Community Association (LCAs), District Road Engineer	
DECOMMISSIONING PHASE					
Demolition of project facilities	Occupational Health and safety risks	<ul style="list-style-type: none"> - Provide appropriate PPEs to the labors in demolition works, - Use lift crane whenever 	Decommissioning phase	Contractor's Environmental & Social Safeguards Expert; Environmental & Social	5,000,000



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		required to dismantle material in elevated height,		Safeguards Expert of the Supervising Firm	
	Generation of solid wastes	Collect residual wastes for reuse, recycling and or proper disposal.	Decommissioning phase	Contractor's Environmental & Social Safeguards Expert; Environmental & Social Safeguards Expert of the Supervising Firm,	3,000,000
	Increased in noise and vibration	- Consider the mitigation of the construction phase, Avoid demolition works in the night hours beyond 18h00.	Decommissioning phase	Contractor's Environmental & Social Safeguards Expert; Environmental & Social Safeguards Expert of the Supervising Firm,	
	Landscape degradation	<ul style="list-style-type: none"> ✓ Ensure proper leveling of the areas with the demolished facility, ✓ Collect and level all hips of soil around the roads and or in the demolished areas, ✓ Reinstate the area with the demolished facilities according to the future use of that area (agricultural, forest, garden lands, etc.) 	Decommissioning phase	Contractor's Environmental & Social Safeguards Expert; Environmental & Social Safeguards Expert of the Supervising Firm, District Environmental Officer, RTDA/ Environmental and Social Safeguards Specialists	Included in the ESMP budget for project ancillary sites



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Activity	Anticipated Environmental and Social Impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
Total					153,100,000
Contingency (10%)					15,310,000
GRAND TOTAL					168,410,000



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The Contractor will utilize the already identified information on negative impacts and proposed mitigation measures in the table above and update it to develop a Contractor Environmental and Social Management Plan (CESMP). Below an indicative guideline is stated for the preparation of CESMP and specific Management Strategy Implementation Plans (sub-management plans) aligned with this ESIA. These instruments will be prepared by the Contractor to be used as a tool for the contractor to manage any environmental, social, health, and safety (ESHS) risks management anticipated during the construction period and for the proponent to review and supervise the efficiency of the contractor on the management of ESHS risks.

9.2 CESMP and Management Strategy Implementation Plans preparation

In Addition to the above mitigation measures for different impacts from the project activities, the Contractor will prepare the Contractor Environment and Social Management Plan (CESMP) and other key Management Strategy and Implementation Plans (MSIPs) to ensure that all impacts are mitigated at the highest possible level.

The Key Management Strategy and Implementation Plans (MSIPs) to be prepared and operationalized during project implementation including but are not limited to the followings:

- Code of Conduct.
- Occupational Health and Safety (OHS) & Community health management plan.
- Traffic management plan.
- Emergency Procedures and Contingency Plan & Incident Notification procedure.
- Quarry/Borrow/dumping sites Management and Restoration/Rehabilitation plan.
- Blasting management plan, (If it will be applied given that it has been proposed by the scoping study for some rocks found in the RoW of the road Byumba-Ngondore)
- Contractor Campsite Management Plan,
- Wastes Management and Rehabilitation plan.
- Prepare a spills management plan for bitumen and oils/fuel to ensure its safe transport, storage, use and leakage control;
- Stakeholder Engagement plan;
- Gender Action Plan;
- COVID-19 Protocol;
- Contractor's Grievance Redress Mechanism;
- Child Protection Strategy;
- Whistle Blower Policy;
- Chance Find Procedures.

The CESMP to be prepared and the associated management strategy and implementation plans (MSIPs) will go into detail about what needs to be done to properly manage any impacts that might rise during road rehabilitation and upgrading activities. Some MSPs go even beyond the road rehabilitation/upgrading period and focus on the rehabilitation of different sites like quarries, borrow pits, and dumping sites hence the project will be at the end. Note that, the mentioned C-ESMP document will be a living document subject to update whenever required or at a given period to capture any change that might be experienced during the project implementation period by the contractor.



10. ENVIRONMENTAL AND SOCIAL MONITORING PLAN

10.1 General Considerations

The environmental and social monitoring program is a vital tool and process concerning environmental and social management as it provides the basis for rational management decisions regarding impact control. In this project, the environmental and social monitoring plan will help to ensure that the proposed mitigation measures for identified impacts and risks; are being implemented effectively to fix the issues they have been designed for. The monitoring program for the present project will be undertaken to meet the following objectives:

- to check on whether mitigation and benefit enhancement measures have been adopted, and are proving effective in practice,
- to provide a means whereby any impacts which were subject to uncertainty at the time of preparation of the ESIA, or which were unforeseen, can be identified, and to provide a basis for formulating appropriate additional impact control measures, and
- to provide information on the actual nature and extent of key impacts and the effectiveness of mitigation and benefit enhancement measures which, through a feedback mechanism, can improve the planning and execution of future, similar projects.

There are two basic forms of monitoring:

- Compliance monitoring, which checks whether prescribed actions have been carried out, usually through inspection or inquiries.
- Effects monitoring records the consequences of activities on one or more environmental components usually involving physical measurement of selected parameters or the execution of surveys to establish the nature and extent of induced changes.

Compliance monitoring is usually given more emphasis in the case of road projects than effects monitoring. This is because most impact controls take the form of measures incorporated in project designs and contract documents, and the extent to which recommendations on these matters, as set out in the ESIA, are complied with, plays a major part in determining the overall environmental performance of the project. Environmental monitoring during the construction phase will comprise two principal groups of activities:

- Review of the Contractor's plans, method statements, temporary works designs, and arrangements relating to obtaining necessary approvals from the Engineer, to ensure that environmental protection measures specified in the contract documents are adopted and that the Contractor's proposals provide an acceptable level of impact control, and
- Systematic observation on a day-to-day basis of all site activities and the Contractor's offsite facilities including quarry and borrow areas, as a check that the contract requirements relating to environmental matters are being complied with, and that no impacts foreseen and unforeseen are occurring.

These activities will be fully integrated with other construction supervision and monitoring activities carried out by the construction supervision consultant. Primary responsibility for ensuring that an adequate level of environmental and social monitoring is carried out will lie with the Resident Engineer (RE), as part of his duties connected with general site supervision.



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Actual monitoring on a day-to-day basis will be carried out by the site staff from the construction supervision consultant, under the direction of the RE.

The majority of monitoring will comprise visual observations, carried out at the same time as the engineering monitoring activities. Site inspections will take place with emphasis on early identification of any environmental problems and the initiation of suitable remedial action. Where remedial actions have been required on the part of the Contractor, further checks will need to be made to ensure that these are being implemented to the agreed schedule and in the required form. Each part of the site where road rehabilitation activity is taking place needs to be formally inspected from an environmental social management viewpoint regularly.

The RE will decide on the appropriate course of action to be taken in cases where unsatisfactory reports are received from his field staff regarding environmental matters. In the case of relatively minor matters, advice to the Contractor on the need for remedial action may suffice, but in all serious cases, the RE should either recommend an appropriate course of action to the Engineer or should issue a formal instruction to the Contractor to take remedial action, depending on the extent of his delegated powers.

Check monitoring will be carried out on an intermittent basis by the Environmental Specialist. Monthly reports prepared by the RE should contain a brief section referring to environmental and social matters, which summarizes the results of site monitoring, remedial actions which have been initiated, and whether or not the resultant action is having the desired result. The report will also identify any unforeseen environmental and social risks and problems and will recommend suitable additional actions. Progress meetings with the Contractor will also include a review of environmental aspects.

The environmental and social monitoring cost is estimated as 16,588,000 RWF (including contingencies 10%). The most critical parameters to be monitored are listed below and the summary of the Environmental and Social Monitoring Plan is indicated in the table below.

- Behaviors control
- Security control around project sites (Quarries, borrow pits, and campsites)
- Occupational health and safety (OHS) for the labors and communities
- Violence related to the project (GBV, SEA, VAC, SH)
- Road safety and traffic control
- Storm water management,
- Air Quality
- Noise level
- Wastes management
- Flora & Fauna
- Permits, licenses
- RAP implementation
- Gender Mainstreaming
- Grievance Redress
- Accident occurrence and frequency
- Soil conservation and Reforestation



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- Project Capacity building
- Reporting

10.2 Progress reporting

The progress report should be prepared and summarize the results of all monitoring. Reports should emphasize any significant violations of contract provisions by the contractor or any failure to implement requirements of the ESMP and RAP. Any significant incidents of environmental contamination should be summarized, along with actions taken to mitigate these and prevent the reoccurrence.



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Table 34: Environmental and Social Monitoring Program

S/No	Adverse Impact	Parameter to be Monitored	Indicator	Method	Frequency	Responsibility	Cost Estimates
CONSTRUCTION PHASE							
1	Loss of properties (houses, trees, crops) and relocation of affected households	Compensation for lost assets/ RAP implementation and monitoring	Lists of PAPs & their affected assets, Lists of paid PAPs	Site visits for meeting with PAPs and cross-checking at the Banks.	Continuous	District authorities, RTDA	2,000,000
2	Grievances raised by affected families	Complaints raised by PAPs	Number of complaints recorded	Meetings, site visits	As and when required	Grievance redress committees, District	1,080,000
4	Soil Pollution	Soil Chemical properties,	Soil nutrient loads	Soil sampling and laboratory analysis	As and when required	Monitoring consultant, District, RTDA	500,000
5	Water pollution	Baseline Water chemical properties to be monitored	<ul style="list-style-type: none"> - Storage and disposal and management of bitumen, oil leakages, - Wates management, - Erosion control on project sites (Campsite, borrow pits, dumping sites, 	Site visit and water parameter analysis.	Rain period	Contractor, Monitoring consultant, District, RTDA	500,000



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6	Air pollution	Number of watering on site to prevent dust pollution, - Life conditions of project vehicles as old vehicle can emit much gases.	- Number of complaints related to noise pollution, - Technical control certificate for project trucks	Site visits and technical control of project vehicles			250,000
7	Noise pollution	Working hours for machines and engines that produce noise on sites.	- Number of complaints related to noise pollution, - Technical control certificate for project trucks	Record of complaints	Construction phase	Contractor, Monitoring consultant, District, RTDA	250,000
5	Loss of trees	Tree species along roads and other identified areas	Number/area of planted trees by the contractor	Field observations	Twice a year	District, Monitoring Consultant/ RTDA Environmental	1,500,000
6	Safety hazards	safety at the site	Incidences, accidents, diseases,	Review and evaluation of incidences, accidents register, disease records,	Continuous	Gicumbi District, Consultant and RTDA	2,000,000
		Accidents frequency	Number of accidents per month	Review of police records on roads accidents	Continuous	National Police, District, Monitoring Consultant, RTDA	2,000,000
7	Low capacity of contractor labors to comply with ESHS requirement	Capacity building of contractor labors in ESHS maters	training reports, number of trained staff	Training of contractor labors in ESHS maters	Twice a Year	Monitoring consultant, District, RTDA	2,000,000



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8	Solid and liquid wastes generation	Disposal of solid and liquid wastes	Availability of wastes bins on project sites	Inspection on wastes management	Continuous	Monitoring consultant, District, RTDA	1,000,000
9	Any form of violence (GBV, SEA, VAC)	Project appreciation by the community	Community wetness in local meeting (Inteko z'abaturatione)	Participation in the community meeting	Continuous	Contractor, Monitoring consultant, District, RTDA	1,500,000
OPERATIONAL PHASE							
1	Roads incident and accidents	Occurrence of the incident on the new roads	Number of incidents	Accident record	Operation phase	Rwanda National Police	Police budget
2	Encroachment to the road reserve	Construction in the road reserve	Construction without permit	Inspection	Operation phase	District authority	District budget
3	Interference with the traffic flow	Occurrence of traffic jam in new roads	Time taken to travel in the project roads & Regulating the traffic flow in the		Operation phase	Rwanda National Police	Police budget
DECOMMISSIONING PHASE							
1	OHS risks	Work plan, labor and equipment mobilization for decommissioning phase	Required material and PPEs mobilized	Works approval before commencement	Decommissioning phase	Monitoring consultant	Monitoring consultant budget
2	Generation of solid wastes	Disposal of solid from decommissioning activities sites	End use of solid wastes from project sites	Site inspection	Decommissioning phase	Contractor, Monitoring consultant, District, RTDA	500,000
3	Increased in noise and vibration	Work plan and methodology		Project monitoring activity	Decommissioning phase	Monitoring consultant & Local authority	Monitoring consultant budget



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Total						15,080,000
Contingency (10%)						1,508,000
Grand Total						16,588,000



10.3 General costs for ESMP implementation and monitoring

This study on environmental and social impact assessment for Gicumbi urban roads (15.53km) rehabilitation and upgrading project has identified negative impacts likely to occur through the planning, construction, decommissioning, and operation phases. To ensure that those negative impacts are avoided where possible, minimized, and compensated; the study proposed different mitigation measures to be undertaken during the project implementation. Considering that proposing the mitigation measures alone does not provide a guarantee that the project will be free from those negative impacts, the monitoring of the project ESMP implementation is a must. To address this challenge, the ESIA has estimated the budget required to implement the proposed mitigation measures as well as the budget for its monitoring.

The following table summarizes the total budget to be spent in mitigating the project's negative impacts:

Table 35:General cost for ESMP implementation and monitoring

No	Key activity	Aim of the activity	Estimated budget (Rwf)	Source of budget
1	Stakeholder Consultation	Engaging stakeholders in the project implementation.	-	RTDA, Gicumbi District budgets
2	Resettlement Action Plan (RAP) implementation	Compensating the properties to be affected	1,571,077,945	MINECOFIN
3	ESMP implementation	Mitigating negative impacts	168,410,000	Project cost
4	ESMP monitoring	Ensure implementation of proposed mitigation measures.	16,588,000	RTDA
	Total		1,756,075,945	

From the above table, the total budget expected to be spent in mitigating the negative environmental and social impacts is **1,756,075,945Rwf**.



11. DISPUTES AND GRIEVANCES REDRESS MECHANISMS

Considering that during the implementation of the project, disputes or grievances are likely to arise based on the fact that any party having interest or can be affected by the intervention of Byumba urban roads project in Gicumbi District; can express an official statement of a complaint or a strong feeling that it has been treated unfairly.

During the implementation process of the project, from its planning to decommissioning phases; disputes or grievances may arise from the concerned parties. Those parties include those who have an interest or are to be affected by the project intervention, thus hampering the smooth implementation of the project. To avoid this to happen, this project has to adopt dispute resolution or the grievance redress mechanism to settle those complaints that may arise. Considering the nature of the project, and its implementation arrangements, disputes, and grievances may arise between the following parties:

- Dispute between the project and/or the contractor and the local community,
- Dispute between the contractor and its workforce,
- Dispute between the contractor and the client.

The following sections, describe and explain the mechanisms of the project to handle all those complaints.

11.1 Dispute between the contractor and the client

The dispute that may arise between the contractor and the client are to be handled based on the provisions of the contract that will be signed by the two parties. However, those mechanisms may mainly include one or two of the following mostly used by RTDA in contract management.

11.1.1 Amicable settlement mechanism

By this mechanism, the parties in disputes shall seek to resolve the dispute amicably by mutual consultation.

11.1.2 Adjudication or arbitration mechanism

By this mechanism, the parties in disputes shall seek the accredited independent third party that will review the case and by considering the claim of each party, provide an enforceable decision to be followed.

11.1.3 Litigation mechanism

By this mechanism, the parties in disputes shall take the dispute to court. The mechanism to be applied in case of disputes should be agreed upon in the contract to be signed by the two parties.

11.2 Dispute between the contractor and labors

For the dispute that would arise between the contractor and his labors during the project implementation. The mechanism to be followed to settle those disputes would vary from internal arrangements which will include the code of conduct, the grievance redress mechanism for workers where a grievance redress committee of workers where a representative of each group of workers and the project manager from the contractor can assess the complaint and propose the way forwards. This committee will be also assisted by the labor inspector at the



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District level. In addition to the internal mechanism, these disputes shall be also settled based on court procedures. In any case, given that the contractor will be bound to adhere to the national laws including labor law, in handling the complaints of the labor, the labor law should be consulted.

11.3 Dispute of the community on the project

Grievance redress mechanisms will be required to ensure that project-affected people (PAPs) can raise complaints or concerns, without cost, and with the assurance of timely and satisfactory feedback, and resolution of the issue. The procedures also ensure that the entitlements are effectively transferred to the intended beneficiaries. All stakeholders will be informed of the intention to implement the grievance mechanism, and the procedure will be communicated before the start of civil works. In Gicumbi district, 3 grievance redress committees (GRCs) were formed and are set at the cell level. It is intended that the members of these committees will be trained on grievances recording, reporting, monitoring, and handling before the commencement of civil works.

The Grievance redress mechanism is one of the strategies that are put in place to monitor and resolve complaints that may arise during or after the Project implementation by the affected people. The Urban roads development project will employ local people through contractors. Casual labor will come from the local community and complaints may arise within the site either related to (late payment, illegal contract termination, extra working hours) or offense by the contractors, the Urban roads project will guide the formation of workers' grievance redress committees (WGRC). Gicumbi district and RTDA will ensure the functioning of these grievance redress committees both for the community and workers levels.

The grievance redress mechanism should involve an inappropriate level of management and address concerns promptly, using an understandable and transparent process that provides feedback to those concerned, without any retribution.



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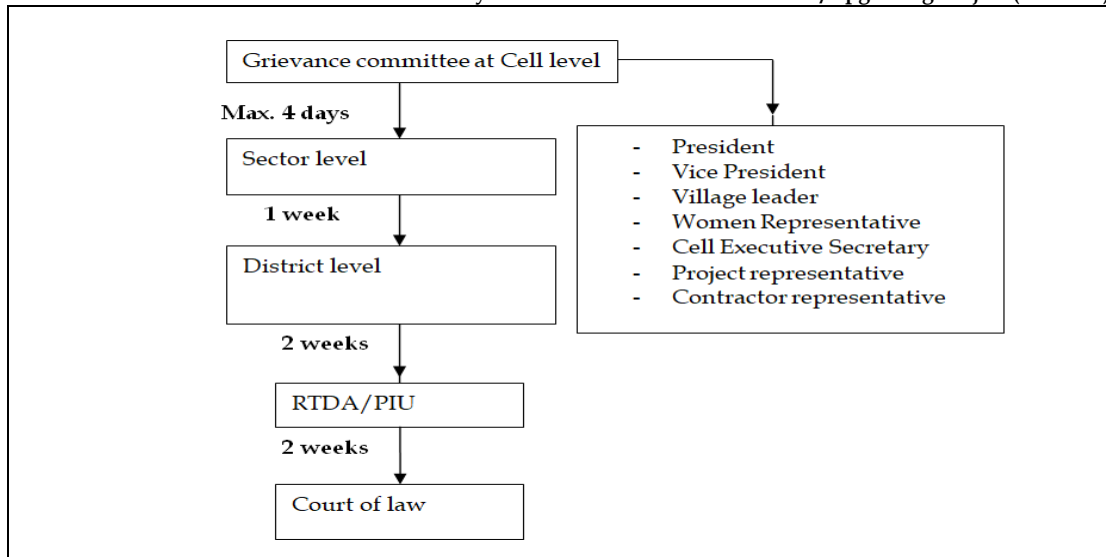


Figure 14: The Grievance redresses Mechanism Structure

11.3.1 Community Grievance Redress Committee

The Grievance Redress Mechanism (GRM) ensures that complaints are received, reviewed, and addressed by the elected Grievance redress committee. The Grievance redress committees (GRCs) were formed during the consultation meeting with the local community together with local authorities. The formed committees are based at the cell level and are made up of the community and local authorities representatives. The members include the President, vice president, women representative, representative of village leaders at the cell level, and the executive secretary of the Cell. In addition to these members, the contractor, consultant, and RTDA safeguards team will be also members of the committees once civil works will be started.

All grievances concerning the non-fulfillment of contracts, levels of compensation, or seizure of assets without compensation shall be addressed to the subproject GRC and resolved in coordination with the District Administration.

In practice, grievances and disputes that are most likely during the implementation of a resettlement program are the following:

- Misidentification of assets or mistakes in valuing them;
- Disputes over plot limits, either between the affected person and the Project or between two neighbors;
- Dispute over the ownership of a given asset (two individuals claim to be the owner of the same asset);
- Disagreement over the valuation of a plot or other asset;
- Successions, divorces, and other family issues, resulting in disputes between heirs and other family members, over ownership or ownership shares for a given asset;
- Disagreement over resettlement measures, for instance on the location of the resettlement site, on the type or standing of the proposed housing, or over the characteristics of the resettlement plot;



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- Disputed ownership of a business (for instance where the owner and the operator are different persons), which gives rise to conflicts over the compensation sharing arrangements.
- Dispute over offsite impacts (for instance, runoff water from the road causing downstream damages).

11.3.2 Grievance resolution approach

It is encouraged to resolve the issues at Cell and Sector levels, as they are so close to the affected communities, aware of and involved in the whole process. The unsolved grievance at the cell level can be referred to the sector and the District committee. The relevant local administration will then attempt to resolve the problem (through dialogue and negotiation) within 30 days of the complaint being lodged. If the grievance is not resolved in this way, the dissatisfied party can refer the matter to the competent court. Local courts should be used. If not resolved, then the high court or court of appeal of Rwanda remains an avenue for voicing and resolving these complaints.

RTDA will follow up with the aggrieved PAP at each level to ensure that the grievances are resolved. Each sector will identify one PAP to work with RTDA, the Contractor, supervising firm, and the local leaders to ensure that the grievances are attended to in time. The channels of receiving complaints include the presentation of complaints via face-to-face meetings, written complaints, telephones, email communication, and third party (e.g., farmers' organizations, Church, private sector, etc.).

11.3.3 Grievance Logbook

The GRC (Grievance Redress Committee) will ensure that each complaint has an individual reference number and is appropriately tracked, and recorded actions are completed. The log will contain the record of the person responsible for an individual complaint, and records dates as shown in the table below in the local language as it is filled by the grievance redress committees at the cell level:



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Table 36: Community complaints recording form

IFISHI YO KWAKIRIRAHO IBIBAZO MU GIHE HASHYIRWA MU BIKORWA UMUSHINGA WA IMIHANDA YO MUMUJYI WA BYUMBA

COMPLAINT FORM TO BE USED DURING URBAN ROADS

N ^o	Amazina/Names	Itariki cyakiriweho/dates on which the complaint was received	Uburyo cyatanze/ means on which complaint was received	Aho ikibazo cyakiririwe/ place where the complaint was received	Ubwoko bw' ikibazo/ type of complains: Ubusabe, request Impungenge, concern Ikirego: court case	Incamake y' ikibazo/ summary of complaint raised	Icyiciro / category: - Kwimurwa/ displacement - Rwiyezeza - mirimo/ contractor	Icyakozwe/ how complaint was addressed	Igihe cyakorewe/ date on which complaint was raised	Aho bigeze+ iminsi 30/ progress beyond 30+	Aho bigeze+ iminsi 60 progress beyond 60+	Aho bigeze + iminsi 90 progress beyond 90+
1												
2												



11.3.4 Monitoring Complaints

The District Project team will be responsible for:

- Providing the sub-project GRC reports on a bi-weekly basis detailing the number and status of complaints;
- Any outstanding issues to be addressed; and
- Monthly reports, including analysis of the type of complaints, levels of complaints, actions to reduce complaints, and initiator of such action. Transport and communication incentives of the grievance redress committee are estimated at Frw **1,080,000** as described in the table below. The budget was included in the RAP budget hence it has not been made part of the ESMP budget.

Table 37: Estimate transport and communication of grievance redress committee

Unit price per meeting	Number of meetings per month	Duration/ per months	# GRC set up in Gicumbi	Members per 1 grievance committee	Total amount to be paid
3,000	2	15	3	4	1,080,000

11.3.5 Monitoring and Evaluation

A monitoring and evaluation (M&E) program is required to be developed to provide feedback to project management which will help to keep the programs on schedule and successful. The complaints from the community may include grievances concerning payment of compensation for the affected properties either in the right of way or outside, as environmental, health, and safety issues emanating from the project activities. Therefore, monitoring provides both a working system for the effective implementation of the RAP and ESMP by the project managers and an information channel for the PAPs to assess how their needs and concerns are being met.

The arrangements for monitoring the resettlement and compensation activities, and implementation of the proposed mitigation measures will fit the overall monitoring program of the entire proposed Resettlement Action Plan (RAP) and ESIA/ESMP for Gicumbi Urban roads development project, which will fall under the overall responsibility of the hired independent supervising firm, RTDA, and District authorities. The RTDA management will have responsibility for ensuring that monitoring is undertaken at the appropriate time and in an effective way.

Periodic evaluations will be made to ensure that the system is achieving the expected results in terms of handling timely, properly, effectively, and efficiently the issues that arise from the project implementation. Several objectively verifiable indicators shall be used to monitor the impacts of the compensation and resettlement activities. These indicators will be targeted at quantitatively and qualitatively measuring the physical and socio-economic status of the PAPs, to determine and guide improvement in their environmental and social well-being.



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Suggested monitoring indicators are outlined below and include (and are not limited to):

- Number and place of public consultation meetings held with PAPs and local authorities in the preparation of or during RAP implementation;
- Number of PAPs effectively compensated and aggregated amount disbursed compensation (actual versus planned);
- Number of complaints: (total received, total justified; total non-justified).

This should include the subject matter for all complaints; an explanation for non-justified complaints (total resolved at various levels including the type of agreement reached; total referred to the legal system/ Courts of Law, including clarification on who initiated (local leaders, PAP or RTDA), the referral and the subject matter.



12. CONCLUSION AND RECOMMENDATIONS

The rehabilitation and upgrading of selected five Byumba urban roads project in Gicumbi district is the best alternative adopted by this ESIA study; based on positive socio-economic benefits that will be accrued by the local community as a result of its implementation. However, the project implementation has also some negative environmental and social impacts, but most of them are reversible and are within manageable limits. The present ESIA study has therefore proposed different mitigation measures for the residual environmental and social impacts of the mentioned project. Therefore, it is also recommended that the implementation of this project should be in line with the effective mitigation measures developed by the ESIA study as well as those to be developed for the management of the project ancillary facilities not covered in this study.

The reconnaissance survey conducted on the selected roads to be rehabilitated showed that two of them named Byumba-Ngondore and access to Cathedral are in critical condition due to the physical and natural obstacles observed there. The obstacles include the utilities mainly the water supply pipe in the centerline and electrical poles on the access road to Cathedral, the steeper slope of the hills which will involve much cutting with the possibility of causing landslides, and the rock which may require the use of blasting for Byumba-Ngondore road widening.

With the anticipated negative environmental, social, health, and safety impacts from roads rehabilitation and upgrading works; the contractor will be also required to prepare the Contractor Environmental and Social Management Plan (C-ESMP) with different Management Strategies Implementation Plan (MSIPs) detailing the actions to be taken by the contractor to implement the proposed mitigation measures. The key MSIPs to be prepared by the contractor include the following:

- Code of Conduct for all workers
- Occupational Health and Safety (OHS) & Community health management plan.
- The traffic management plan to enforce road safety.
- Emergency Procedures and Contingency Plan & Incident Notification procedure.
- Quarry/Borrow/dumping sites Management and Restoration/Rehabilitation plan.
- Blasting management plan (If rock blasting will be needed as proposed by the scoping study)
- Contractor Camp Management Plan
- Wastes Management and Rehabilitation plan
- Prepare a spills management plan for bitumen and oils/fuel to ensure its safe transport, storage, use, and leakage control.

The environmental and social mitigation measures as stipulated in ESMP should be monitored during the implementation of Byumba Urban roads project. To ensure the effective implementation of the proposed mitigation measures, the following recommendations have been also formulated:

- RTDA and Gicumbi District authorities should make a joint effort and collaboration during the project implementation to ensure that a high momentum level of all stakeholders' engagement and information sharing,



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- The project implementation should respond to the expectation of the local authorities and community to achieve its objectives without adversely affecting them, The contractor has to prepare different Management Strategy and Implementation Plans (MSIPs) list above associated with detailed requirements for the effective implementation of Environmental and Social Management Plan (ESMP), or any other management plan that would appear necessary during the construction phase; so that the project implementation is environmental and social sound,
- The contractor should ensure that the staffs and labors involved in the implementation of environmental and social mitigation measures have the necessary knowledge, skills, and ethic to do so,
- The contractor once on board after identifying sites for project ancillary facilities (borrow pits, dumping sites, crusher sites, Campsites, etc.) will be required to prepare a separate ESIA study and ESMP for those sites before its exploitation,
- The availability of supervising consultant experts in matters of environmental and social should be ensured on-site to interact with the contractor's safeguards staff whenever needed for a smooth implementation of the project under environmental and social safeguarding requirements,
- Tree planting along the Byumba-Ngondore road should be planned as an environmental enhancement measure to replace the lost trees as well as to avoid the landslides likely to occur on the section of this road at its end towards the National road (NR-3) to Gatuna border with Uganda Country.

Given the ESIA/ESMP findings, it is concluded that the project will bring benefits to the people of the area. The identified negative impacts can be mitigated with the proposed Environmental and Social Management Plans. However, for the successful implementation of planned development activities, the timely implementation of the proposed mitigation measures is required. Finally, the application of the recommended measures is valuable for the project to be implemented in an environmentally friendly, socially acceptable, and economically feasible manner.



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14. ANNEXES

Annex 1: Attendance list and the minute of the consultation meeting with local authorities



Adobe Acrobat
Document

Annex 2: Attendance list and the minute of consultation meetings with the local community



Adobe Acrobat
Document



Acrobat Document

Annex 3: List of projects to undergo EIA



Acrobat Document

Annex 4: Questionnaire for socio-economic survey



Appendix 1: QUESTIONNAIRE FOR SOCIO-ECONOMIC SURVEY OF HOUSEHOLDS

SOCIO-ECONOMIC SURVEY

Questionnaire No__

Name of village_____

Name of cell_____

Name of the interviewer _____

Code of the interviewer_____

Date of the interview___/___/_____

INTRODUCTION

1. H/H COMPOSITION

1.1. We would like to make the list of both the present and the absent members of your household. By household we mean the people living under the same roof and running the same household

N	1. Relationship with the head of the household	2. Sex	3. Age (number of years)	5. Marital status	6. Educational level (from the age of 5)	7. Employment status (aged 5 and above)	8. If employed in the public sector	9. Social group
	Head	1. Male	1. r of	1. Married		1. Employed	1. 1st degree of disability	
	Spouse	2. Female	2. com	2. Single	1. Non literate	2. Employed in public sector	2. 2nd degree of disability	
	Daughter		3. plete	3. Widow	2. Elementary	3. Employed in private sector	3. 3rd degree of disability	
	Son		4. year	4. Divorced	3. Incomplete secondary	4. Student, pupil	4. Disabled since childhood	
	Mother		5. s)	5. Not applicable	4. Secondary	5. Housewife	5. Full orphan,	
	Father				5. Secondary vocational	6. Unemployed	6. semi-orphan.	
	Sister				6. Incomplete higher	7. Military servant	7. Single mother/father	
	Brother				7. Higher (bachelors' or master's degree)	8. Not applicable	8. Lonely pensioner	
	Grandmother				8. Postgraduate	9. Not	9. None of	
	Grandfather							
	Daughter-in-law							
	Son-in-law							
	Grandson/grand daughter							
	Mother-in-law (husband's mother)							
	Father-in-law (husband's father)							
	Mother-in-law (wife's mother)							
	Father-in-law							



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(wife's father)
Other

applicable

al farm
7. Other

abovementi
oned

1	Relationship with the head of the household	Sex	Age	Maratal status	Education level	Emplyme nt status	If employed	Social category
2								
3								
4								
5								
6								
7								
8								
9								
10								

A. HOUSING CONDITIONS

A1. What kind of a house does your family live in?

Housing conditions	
1. In a cottage/ rural house	
2. Other (please specify) _____	

A2. What is your house made from?

1. Wood	
2. Clay	
3. Cement	
4. Other (please specify) _____	

A3. Please indicate whether it is own or rented

Owned

Rented

Owned by friends/relatives

Squatter/informal settlement

Other, please specify _____-

A4. What conveniences are there in your house, and what's their condition?

Convenience	Functions	Functions with interruptions	Doesn't function	Doesn't exist
1. Grid electricity				
2. Solar energy (local supply)				



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3. Mobile phone				
4. Private toilet				
5. Other_____				

A5. Please indicate the energy source used for lighting, cooking, heating. (Tick the source and provide the estimated monthly costs)

	Lighting		Cooking	
	Tick <input type="checkbox"/>	Estimated monthly cost (Rw Franc)	Tick <input type="checkbox"/>	Estimated monthly cost (Rw Franc)
Electricity				
Gas				
Wood				
Candle				
Charcoal				
Battery				
Solar energy				
Petrol				

A6. Overall, how would you evaluate your housing conditions?

1. Very good
2. Good
3. Satisfactory
4. Bad
5. Very bad
6. Don't know/No answer

A7. Which infrastructure do you have in your cell?

Convenience	Functions	Functions with interruptions	Doesn't function	Doesn't exist
1. Water supply				
2. Public toilet				
3. Market				
4. Road				
5. Other_____				



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A8. Which public services do you have in your cell?

	Name	Time spent to get there (walking)		
		Less than 30 minutes	30 minutes to 1 hour	More than 1 hour
1.Church/ Mosque				
2. Primary school				
3. Secondary school				
4.Clinic/health centre				
5. Area of cultural significance				
6. Other, please specify				

A.9what is your main source of water?

Source	Tick one
1. Well	
2. Spring	
3. Piped supply	
4. Public water point	
5. River	
6. Rainwater	
7. Buy water	
8. Other (please specify)_____	

A10. How many of each type of livestock does your family own?

Type	Number
Cattle	
Sheep	
Goats	
Chickens	
Ducks	
Other (please specify)	

B. EDUCATION

B1. Did any of your household members attend an educational institution (1. kindergarten, 2.primary school, 3.secondary, 4. higher educational institution, 5.technical school, others specify.) during the past 12 months?

Yes 2. No (Pass on to C1)



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B2. How many members of your HH who attended the following kind of an institution? / do they attend? /Up to 6 members/	No one	1	2	3	4	5	6
Kindergarten							
Primary school							
Secondary school							
Higher educational institution							
Technical school							
Other (please specify) _____							

C. HEALTH and HEALTH CARE

C1. Did any members of your household suffer from the following disease/maladies in the past six months (Yes/N0).If yes please tell us how many of the household members were affected by each?

Disease/ Malady	Number of household members affected
TB	
Malaria	
Skin Rash	
Diarrhea	
Bilharizia	
Respiratory infection	
Gastroenteritis	
Others (specify).....	

C2. Was there any case during the past 12 months when you or any of your household members medical help but didn't get it?

Yes

No (**Pass on to C3**)

C3.If yes, what were the reasons for not getting medical help? (INTERVIEWER: Please circle not more than two).

High official payment rates for treatment.

High non-official payment rates for treatment.

Distrust towards medical services.

Distance

No health insurance

Other (please specify) _____

Don't know

D. NUTRITION

D1. How often does your family eat per day?

Once	
------	--



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Twice	
Three times	

D2. How often does your family eat...

	Per year	Per month	Per week	Per day
Meat				
Fruit/vegetables				
Dairy				
Eggs				

D3. Do you feel the amount your family has to eat is...

More than enough	
Enough	
Sometimes not enough	
Frequently not enough	

E. OCCUPATION AND OTHER INCOME SOURCES OF HOUSEHOLDS

E1. Which are the main sources of income of your family? Tick the answer from the list provided. /INTERVIEWER: provide Card D1 accepting maximum three answers based on ranking/

- Permanent waged employment
- Short term employment
- Income from own business
- Income from rent
- Self-employment income (not including farming)
- Income from agriculture
- Remittances from family members, relatives living/working abroad
- Income from offspring living in Rwanda
- Support from other relatives living in Rwanda
- Pensions/allowances
- Income from sale of items of private property
- Money Borrowing
- Other(Please specify) _____

THANK YOU VERY MUCH FOR YOUR PARTICIPATION IN THIS SURVEY!