REPUBLIC OF RWANDA

MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES

RWANDA FEEDER ROADS DEVELOPMENT PROJECT

FINAL REPORT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT & ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN FOR INDICATIVE FEEDER ROADS

NYAGATARE DISTRICT

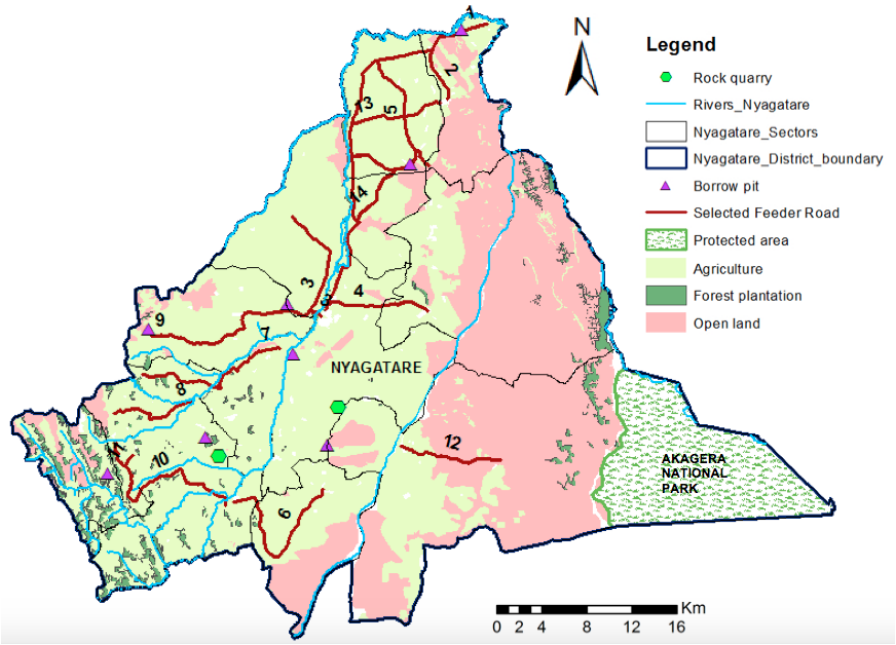
Intercontinental Consultants and Technocrats Pvt. Ltd. (INDIA)
In Association With
ALN Consultants Ltd (RWANDA), as Sub-Consultant

December, 2016

0 EXECUTIVE SUMMARY

The Government of Rwanda and Development Partners are intensifying their support not only to agriculture but also to feeder roads infrastructure development to reduce post-harvest loss and the high transport price in the project areas. In this regards, the Government of Rwanda launched the Rwanda Feeder Roads Development Project (FRDP) to develop agricultural marketing roads. This project got funds from IDA to rehabilitate, upgrade and maintain 500 km of indicative feeder roads in Rwamagana, Gisagara, Karongi and Nyamasheke Districts. The Government of Rwanda also applied for additional funding for the rehabilitation of 1,200 km of feeder roads in other six districts, namely Gatsibo, Nyagatare, Gakenke, Nyaruguru, Rutsiro and Nyabihu Districts.

The District of Nyagatare is one of the 7 Districts that make the Eastern province covering a surface area of 1,929.5 sq.km, with a population of 465,855 inhabitants[1] and road network in poor condition. The Feeder Roads Development Project prepared the feasibility report for 184.19 km feeder roads in the District of Nyagatare. The major activities associated with the indicative feeder roads include rehabilitation/upgrading of carriageway pavement with a standardised width, bridges and drainage work as well as maintenance of rehabilitated infrastructures. The map showing different feeder roads and sensitive receptors are presented below.



[1]Rwanda 4th Population and Housing Census, 2012 (NISR)

The average carriageway width of the indicative feeder roads ranges from 4.5 to 8.0 m and will be upgraded to 6m. The project plans to construct 121 culverts and bridges with a total length of 2,261 m and 108.68 km of drains. The requirements of construction material have been identified along with the quarry and borrow area sites. Eight borrow areas and 2 quarry areas were identified.

The rehabilitation of the feeder roads requires the preparation of an Environmental and Social Impact Assessment/ Environmental and Social Management Plan (ESIA/ESMP) to ensure that the planned activities are environmentally and socially implemented in full compliance with Rwanda's and the World Bank's environmental and social policies and regulations. In this regards, MINAGRI/SPIU FRDP hired Intercontinental Consultants and Technocrats Pvt. Ltd. (ICT) in association with ALN Ltd to conduct an Environmental and Social Impacts Assessment (ESIA) study in indicative feeder roads of Nyagatare, Gatsibo, Nyaruguru, Gakenke, Nyabihu and Rutsiro Districts. This report focuses on the main findings from Nyagatare District.

The main objective of the assignment wasto assist the FRDP of the Ministry of Agriculture and Animal Resources (MINAGRI), in conducting the Environmental and Social Impact Assessment (ESIA) and corresponding Environmental and Social Management Plans (ESMP) for indicative feeder roads in Nyagatare District.

The methodology adopted for the preparation of this report includes the review of feasibility reports and detailed designs,national and international regulations related to environmental and social safeguards, district reports and field observations and measurements as well as discussions with project's experts/ personnel. Public consultation meetings were also conducted to explain the project and determine the beneficiaries' opinions and concerns on the environmental impacts of the rehabilitation of feeder roads in the District.

The assessment done indicated that the project area is generally characterised by lowly inclined hills and flat lands separated by valleys in the North, East, West and South East and high mountains in the South West and with a very limited hydrographic network. The plant diversity in the project area is characteristic of lowland vegetation and dominated by crops, Acacia species spotted in different places. The grass savannah is dominated by *Themeda triandra* and *Hyparrhenia sp*.

The site also accommodates a huge variety of birds such as birds of prey.The total number of people within RoW reaches 2,598 people including 1,273 men and 1,325 women, grouped in 590 families.

The findings of the ESIA study revealed that the feeder roads project in Nyagatare has both positive and negative impacts. The positive impacts include employment opportunity, skill transfer, enhanced economy in rural areas, increase in social and industrial activity, improved transport system, saving in travel time, reduction in accidents, better drainage system, reduction in fuel consumption and green house gases. Potential negative impacts include loss of 84.19 ha of land, 263 trees, 128 houses and other structures (like water points); increase in erosion rates, soil pollution due to spill of oil, grease and other chemical/ material on road, disruption of natural drainage, water pollution due to construction in water front structures or disposal of waste; increase in water demand and water use conflict, risk to health due to poor waste disposal and outside labour; increase in noise and air pollution in the vicinity of construction sites, increased road congestion, encroachment into the nature reserves.

The above adverse impacts are low to medium and can be mitigated. Adopting a proper waste management system at the site, designing and constructing properly the drainage pattern, provision of sanitary facilities, construction of checkdams/ silt trap structures before discharging roadside runoff into water bodies, using motorized equipements in good working conditions during daytime, regular spray of water during road construction, application of traffic management measures or preparing alternative roads in case of road closure, provision of protective equipments to workers, organizing awaireness campaigns for the prevention of communicable diseases, compensation for affected assets, etc. are suggested measures to mitigate the potential adverse project impacts. The monitoring plan was set up to ensure the negative impacts are attenuated. The contractor and supervising firm will respectively implement the project and follow up its compliance with environmental and social safeguards under the direct supervision of MINAGRI/FRDP and Nyagatare District. RDB will approve the report while REMA will oversee the project implementation and conduct environmental audit during the project implementation. Other stakeholders include MININFRA/RTDA, MINIRENA/RNRA, MINALOC, RSB and World Bank.

Different stakeholders (local authorities, Community People and Road Users and Cooperative and church leaders) were consulted to explain the project and give them the

opportunity to express their views and concerns. All consulted stakeholders are in favour of the project but requested for the compensation of their properties likely to be affected.

The bills of quantities (BoQ) prepared for the environmental and social management along with monitoring plans are estimated at **Frw 538,810,000** which is 5.3**%** of the project cost, including 507,020,000Frw for ESMP and 31,790,000Frw for environmental and social monitoring plans.

The Government of Rwanda will disclose this ESIA/ESMP reportand will authorize the World Bank to disclose it electronically through its InfoShop.

In view of the ESIA/ESMP findings, it could be 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.

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ABBREVIATIONS

AIDS	:	Acquired Immune Deficiency Syndrome
amsl	:	Above Mean Sea Level
BP	:	Bank Procedure
CBD	:	Convention on Biological Diversity
DPR	:	Detailed Project Report
DPs	:	Displaced Persons
EA	:	Environmental Assessment
EDPRS	:	Economic Development and Poverty Reduction Strategy
EIA	:	Environmental Impact Assessment
EMP	:	Environmental Management Plans
ESIA	:	Environmental and Social Impact Assessment
ESMP	:	Environmental and Social Management Plan
FS	:	Feasibility Studies
GDP	:	Gross Domestic Product
GOR	:	Government of Rwanda
HIV	:	Human Immune Deficiency Virous
IDA	:	International Development Association
IL	:	Impact Level
IWRM	:	Integrated Water resources Management
LCV	:	Light Commercial Vehicle
LHS	:	Left Hand Side
MDG	:	Millennium Development Goals
MINAGRI	:	Ministry of Agriculture and Animal Resources
MINALOC	:	Ministry of Local Government
MINIRENA	:	Ministry of Natural Resources
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
OP	:	Operation Policy
PAPs	:	Project Affected Persons
PCRMP	:	Physical Cultural Resources Management Plan
POL	:	Petrolium, Oils and Lubricants
PM	:	Patriculate Matter
QA	:	Quality Assurance
RAP	:	Resettlement Action Plan

RCC	:	Reinforced Cement Concrete
RDB	:	Rwanda Development Board
REMA	:	Rwanda Environmental Management Authority
RFP	:	Request for Proposal
RFRDP	:	Rwanda Feeder Roads Development Project
RLDSF	:	Rwanda Local Government Development Support Fund
RHS	:	Right Hand Side
RMF	:	Road Maintenance Fund
RNRA	:	Rwanda National Resources Authority
RSB	:	Rwanda Standards Board
RTDA	:	Road Transport Development Agency
SPM	:	Suspended Particulat Matter
Sq. mi	:	Square Mile
STD	:	Sexually Transmitted Disease
ToR	:	Terms of Reference
ROW	:	Right of way
TP	:	Transport Policy
WB	:	World Bank
WHO	:	World Health Organization

CURRENCY EQUIVALENTS (AUGUST 2016)

Currency Unit	=	Rwandan Franc (RWF)
1 EUR	=	RWF 909
1 US$	=	RWF 801

1 INTRODUCTION

1.1 BACKGROUND OF THE PROJECT

Rwanda, the world's 149th largest country, has an area of 26,338 square kilometres (10,169 sq mi). Rwanda has four provinces (East, West, North and South) and Kigali City. Nyagatare District is one of the seven Districts that makes the Eastern Province. The District has 14 Sectors, which are Gatunda, Karama, Karangazi, Katabagemu, Kiyombe, Matimba, Mimuli, Mukama, Musheli, Nyagatare, Rukomo, Rwempasha, Rwimiyaga and Tabagwe. NyagatareDistrict is located at about 160 km from the Capital Kigali and can be approached via National Roads RN-3 and RN-5. **Figure 1** indicates the location of Nyagatare District in Rwanda.

Figure 1 : Location of Nyagatare District in Rwanda

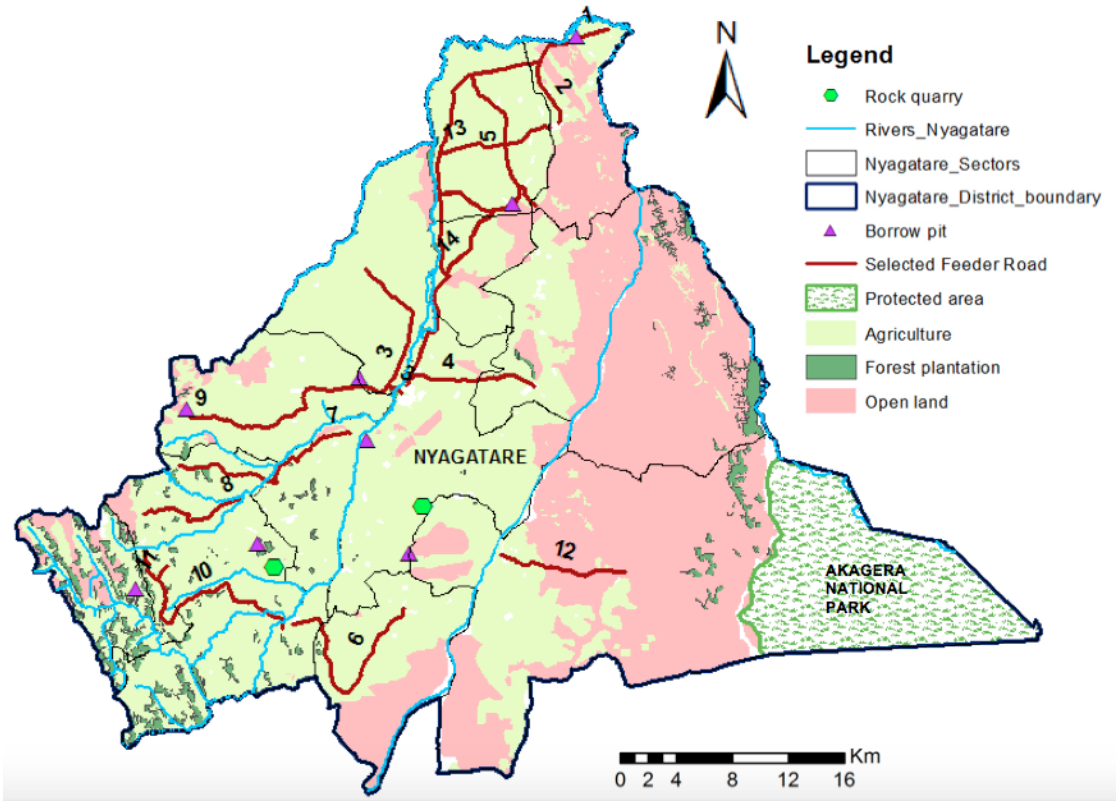
The District covers a surface area of 1,929.5 sq.km, with a population of 465,855 inhabitants[2]. It is the largest and second most populated district in Rwanda.

The population density accounts for 241 inhab/sq.km, ranking the District seventh from bottom country-wide; the density is 42% lower than the national average(415 inhab/sq.km) and 12% lower than the Eastern Province average (274 inhab/sq.km). The population growth is expected to decrease, from 2.37% in 2013 down to 1.89% in 2032. The district is prevalently rural, the urban population accounted only for 10% of the total District population in 2012. The District constructed more than 919 km of road network (Nyagatare District, 2013) some of the roads are in poor condition. This is constraining the trade and movement of good and people from different corners of the District.

The Government of Rwanda, through the Ministry of Agriculture and Animal Resources (MINAGRI), has launched the Rwanda Feeder Roads Development Project (FRDP) in order to reduce post-harvest loss and the high transport price in the project areas by developing agricultural marketing roads.The FRDP has initially received funding from IDA of the World Bank to rehabilitate, upgrade and maintain 500 km of indicative feeder roads in four Districts, namely Rwamagana, Gisagara, Karongi and Nyamasheke. Under the same project, the Government of Rwanda applied for additional financing for the rehabilitation of 1200 km of feeder roads in other six Districts, Nyagatare inclusive.The total road network in the project area is estimated at 184.19 km which are in poor condition. The implementation of FRDP will improve the consumer access to safe and affordable food and enhance producers' access to markets, especially in areas with high agricultural potential through improvement of feeder roads.

M/s Intercontinental Consultants and Technocrats Pvt Ltd, in association with ALN Consultants Ltd (*as sub-consultant*), was contracted by MINAGRI / FRDP to provide the consultancy services in conducting the Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) for indicative feeder roads in six Districts, namely Gatsibo, Nyagatare, Nyaruguru, Gakenke, Nyabihu and Rutsiro.The present report only concerns Nyagatare District and **Figure 2** presents the indicative feeder roads in Nyagatare District.

[2]Rwanda 4th Population and Housing Census, 2012 (NISR)



Source: Consultant (June, 2016)

Figure 2 : Map showing the indicative feeder roads in Nyagatare District, borrow pits and quarry areas.

1.2 OBJECTIVE

The **main objective** of the assignment is to assess the Environmental and social Impacts of the rehabilitation of indicative feeder roads in Nyagatare District for the account of Rwanda Feeder Road Development Project (FRDP).

The **specific objectives** are:

- To assess the potential positive and negative environmental and social impacts of the feeder roads rehabilitation projects in Nyagatare District,
- To propose environmental and social management measures to mitigate the negative impactsand enhance positive impacts;
- to provide guidance and means for monitoring the implementation of environmental and social management measures;

- To produce reports in the format and level so that these are meeting EIA guidelines, policies and regulation of Government of Rwanda (GoR) and the operation policies and safeguards measures of the World Bank (WB).

1.3 SCOPE OF SERVICES

The scope of services of the present consultancy is implemented in an environmentally and socially sustainable manner and compliance with Rwanda's and the World Bank's environmental and social policies and regulations. The scope of work is issued along with Request for Proposal (RFP). However, keeping in view World Bank Operation Policy (OP), the tentative scope of work has been drawn for the study and according approach and methodology have been drawn. The scope of services in brief for the present studyis as follows:

- Development of baseline status for various environmental and social attributes on Physical Environment; Ecological Environment; Physical Cultural Resources and Socio-economic profile;
- Organizing public consultation meetings with various stakeholders
- Assessment of potential positive and negative environmental and social impacts of proposed feeder roads;
- Proposing Environmental and social mitigation measures and management plans to effectively address the negative impacts;
- Prepare the ESIA/ ESMP report for review and approval by FRDP, RDB and the World Bank;
- Prepare post project monitoring programs, institutional arrangement to implement the environmental and social plans and cost involved.

The project will improve the existing infrastructure in rural areas, which will boost the connectivity and transfer of goods and people from one place to another in less time. The improved feeder roads will contribute towards the GDP of the project area and the country in general. The project will also pave the way for systematic improvement and continued investment in Nyagatare District.

1.4 APPROACH AND METHODOLOGY

In formulating this approach and methodology, care has been taken for the requirements of the ToR and accordingly given full consideration to the objectives, purpose and the scope of the study. The review of project reports (feasibility reports and detailed designs, project appraisal documents, etc), national and international regulations related to environmental and social safeguards, district reports; visits for field observations and measurements; consultations with various stakeholders (local authorities, local communities, farmers'organizations, church leaders, private sector federation, etc) as well as discussions with project's experts/ personnel are tools and methodologies used to collect needed information. A questionnaire was prepared and administered to affected families within the right of way (RoW) to assess their socio-economic conditions. The sample size of 70 families, ie 2 people for every 5km, was used to collect needed information.

Based on site assessment findings, the Consultant identified potential impacts, both positive and negative, prepared Environmental and Social Management and Monitoring Plans as well as estimated costs before producing the ESIA/ESMP report. This report will be submitted for review and approval by FRDP, RDB and the World Bank.

The study was conducted in such a manner and procedure that it fulfils the requirements of Government of Rwanda and the World Bank's environmental and social appraisal procedures.

2 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

2.1 NATIONAL RELEVANT POLICIES AND STRATEGIES[3]

This chapter describes the relevant policies and strategies, legal instruments, institutional arrangement and international framework applicable to rehabilitation and /or construction of feeder road in different districts of Rwanda. It summarizes the National Laws and describes the procedure for obtaining environmental permits to allow project implementation. The awareness of environmental and social issues started as early as in 1920. Thereafter were created respectively Albert Park (1925), the National Forest of Nyungwe as a reserved forest (1933) and Akagera National Park (1935). The environmental friendly initiatives were also supported by vast campaigns for soil conservation from 1947. In 1977 action program of environmental nature were launched such as: human settlement (1977), stockbreeding (1978), soil protection and conservation (1980), water supply in rural areas (1981), erosion control (1982) and reforestation (1983). However, it is only in 2003 that an elaborate National Evironment Policy was established by the Government of Rwanda.

2.1.1 National Environment Policy

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

- to enable the country to strike a dynamic balance between population and resources 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 natural environment.

This policy therefore seeks to integrate environmental sustainability principles into all development processes, programmes 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, risk of losses, are prior anticipated, identified, analysed and integrated into the project design and implementation.

[3] National Environmental Policy (November 2003)

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 environment policy also advocates to ensure compliance with environment in all transport and communications activities which includes the following:

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

2.1.2 National Transport Policy

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 achievement of the objectives of EDPRS-II and Vision 2020[4].

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;

[4]The transport policy is inspired by planning tools such as EDPRS-II, National Investment Strategy, and the medium term expenditure framework. The policy enables the establishment of viable transport sector for economic development in Rwanda. It is also addressing the present and future shortcomings. The vision 2020 advocates the internal trade and mobility with access to market through road network particularly in rural area. The transport policy also matches with the millennium development goals of economic growth and reduction in poverty.

e) Improving the ability and quality of local road infrastructure, thereby enabling the rural community to market its crops;
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.

2.1.3 Road Maintenance Strategy

The Road Maintenance Strategy of May 2008 emphasises routine maintenance as a more cost-effective tool of 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 lays emphasis 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.

2.1.4 National Land Policy

National land policy was adopted in February 2004. This policy provides register and transfer of land and possibility of investments in land. It also highlights key principle 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, economical, cultural, 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.

2.1.5 Integrated Water Management Policy

The Integrated Water Managemet Policy aims for sustainable management of water. This policy is relevant as some of the activities such as bridges, culverts and road construction will be undertaken in marshlands or buffer zones of rivers and/or marshlands. The policy also highlights management of water on both demand and supply side. Policy also integrates the other policies on forests, wetland, agriculture and land.

2.1.6 National Development Strategy[5]

The Vision 2020 document has developed National Development Strategy in year 2000 wherein it is realized that Rwanda shall have a reliable and safe transport network of feeder roads. Hence feeder roads will continue to be extended and improved. Land use management, urban and transport Infrastructure development are considered as important pillar among 6 pillars of vision 2020 and protection of environment and sustainable natural resource management is one of the crosscutting areas of the vision.

The other important planning tools are: the second Economic Development and Poverty Reduction Strategy (EDPRS-II), the National Investment Strategy, Millennium Development Goals (MDGs) and the Medium Term Expenditure Framework. The vision document advocates to the development of economic infrastructure of the country and transport infrastructure in particular. The Government of Rwanda (GoR) developed National Strategies and Action plans for the following:

- National Biodiversity Strategy and Action Plan (NBSAP) 2003,
- National Plan of Action (NAPA) for climate change adaptation (2006/7), and
- National Action Plan (NAP) for combating desertification.

These strategies and action plans reflect national priorities for Environmental Natural Resources (ENR) sector that are online with the Rwanda's second phase Economic Development and Poverty Reduction Strategy (EDPRS-II) as a medium-term framework for achieving the country's long term development aspirations as embodied in Rwanda Vision 2020 and the Millennium Development Goals (MDG) priorities.

[5]Rwanda Vision 2020; Republic Of Rwanda; Ministry Of Finance and Economic Planning (2000).

2.1.7 National Wetlands Conservation Program

The program aims at engaging various government ministries in wetland conservation and ensure 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.

2.2 LEGAL INSTRUMENTS

The main national legislations that provide for and guide Environmental and Social Impact Assessment (ESIA) for road infrastructure, and the provisions, thereof, include the following: National Constitution of June 2003 obliges the Government of Rwanda - current and future – together with the population, to carefully harness environmental resources in order to ensure sustainability and inter-generational equity. The degree of relevance of these legislative instruments varies with the activity and area, because environmental consequences of development tend to be area and theme specific.

2.2.1 Important Environmental Legislations

The legal instruments that are more relevant to the present project are:

i. The Constitution of the Republic of Rwanda, June 2003 promulgated in 2015: In particular, articles 29, 30, 49, 62, 88, 90, 93, 108, 118, 190, 191 and 201, make various provisions for environmental management; from guaranteeing rights to a healthy environment for every citizen.
ii. Organic Law No. 04/2005 determining the modalities for the protection, conservation and promotion of environment in Rwanda.
iii. Law No. 55/2011 of 14/12/2011 governing roads in Rwanda;
iv. Law No. 32/2015 of 11/06/2015 relating to Expropriation in the Public Interest in Rwanda;
v. Law No. 62/2008 of 10/09/2008 regulating the use, conservation, protection and management of water resources;
vi. Ministerial OrdersNo. 003/2008 and No. 004/2008 of August 2008 respectively relating to the requirements and procedure for environmental impact assessment and the list of works, activities and projects that have to undertake an environment impact assessment;

vii. Ministerial Orders No. 005/2008 and No. 007/2008 of August 2008 respectively establishing modalities of inspecting companies or activities that pollute the environment and list of protected animals and plant species;

viii. Ministerial Instruction No. 02/UPPR/09 with respect to excavations and restoration of public infrastructure by Communications and Infrastructure Service Providers (CISPs) operating in Rwanda, April 21, 2009.

ix. General Guidelines and Procedures for Environmental Impact Assessment of November 2006, prepared by Rwanda Environment Management Authority (REMA).

x. Sector Guidelines for Environmental Impact Assessment (EIA) for Road Development Project (August, 2009);

2.2.2 Environmental Impact Assessment Legislation in Rwanda

The Rwandan legislation governing EIA concerns also the construction or rehabilitation of national roads, district roads and repair of large bridges.Some of the roads in Nyagatare District will cross wetlands, and the Environmental Organic Law determines that:

(Article 17): The use, management of water and its resources shall not in any way use unfair methods of exploitation that may lead to natural disasters such as floods or drought. Any acts concerned with water resources like watering plants, the use of swamps and wetlands and others, shall always be subject to prior environmental impact assessment.

(Article 83): It is prohibited to dump in wetlands:1° waste water, except after treatment in accordance with instructions that govern it; 2° any hazardous waste before its treatment. Any activity that may damage the quality of water is prohibited.

Chapter IV of Rwanda Environmental Organic Law is dedicated to EIA in its articles 67 to 70 as cited below:

(Article 67): Every project shall be subjected to Environmental Impact Assessment/Environmental Management Plan, before obtaining authorization for its implementation. This applies to programmes and policies that may affect the environment. An order of the Minister having environment in his/ her attributions shall determine the list of projects mentioned in this organic law.

(Article 68): The environmental impact assessment shall at least indicate the following:

- a brief description of the project and its variants;
- a study of direct or indirect projected effects on a place;
- analysis relating to the initial state of a place;
- measures envisaged to reduce, prevent or compensate for the damage;
- reasons based on in selecting such a place;
- an explanation of the methods that will be used in monitoring and evaluating the state of the environment before, during the activities of the project, but particularly after completion of the project;
- an estimation of the cost of the measures recommended to prevent, reduce or compensate for the negative effects the project may cause on the environment as well as the measures for examining and controlling the status of the environment.

An order of the Minister having environment in his or her attributions shall specify the details of the provisions of this article.

(Article 69): The Environmental Impact Assessment shall be examined and approved by the Rwanda Environment Management Authority or any other person given a written authorization by the Authority. The promoter pays a levy reduced from the operating cost of his or her project excluding the working capital. This tax is determined by the law establishing the National Fund for the Environment. The EIA shall be carried out at the expense of the promoter.

Note: REMA used to have the legal authority/ responsibility of overseeing the conduct of Environmental Impact Assessment (EIA) under Article 69 of the Environmental Organic Law, but since the establishment of the Rwanda Development Board (RDB) in September 2008, the responsibility of overseeing the conduct of EIAs was given to RDB under Article 3 of the Organic Law No. 53/2008 of 02/09/2008 establishing RDB and determining its responsibilities, organisation and functioning. Article 3 point 11 of the said law states that RDB should facilitate and help investors to meet environmental standards in the execution of their projects.

(Article 70): An order of the Minister having environment in his or her attributions establishes and revises the list of planned works, activities and projects, and of which the public administration shall not warrant the certificate, approve or authorize without an environmental impact assessment of the project.

The EIA shall describe direct and indirect consequences on the environment. The list of works, activities and projects that have to undertake an Environmental Impact Assessment has also been published under the Ministerial Order No. 004/2008.

2.2.3 Environmental Impact Assessment Guidelines in Rwanda

Rwanda Environment Management Authority (REMA) has established a number of EIA guidelines, ranging from general EIA guidelines to sector specific guidelines in order to ease the EIA process in Rwanda. The following areEIA guidelines presently available:

1. General EIA guidelines
2. EIA guidelines for environmental auditing
3. EIA guidelines for roads development projects
4. EIA guidelines for water resources management
5. EIA guidelines for wetlands management
6. EIA guidelines for waste management
7. EIA guidelines for housing industry

i. General EIA guidelines

These guidelines were developed by REMA in August 2009 in order to assist projects developers, contractors and EIA practitioners.

An EIA process in Rwanda includes 5 steps: (i) project application and registration, (ii) screening, scoping and terms of reference, (iii) EIA study and report, (iv) submission of an EIA report and finally (v) decision making. **Figure 3** summaries the EIA procedure in Rwanda including timeline in each stage.

Screening enables categorisation 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 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.

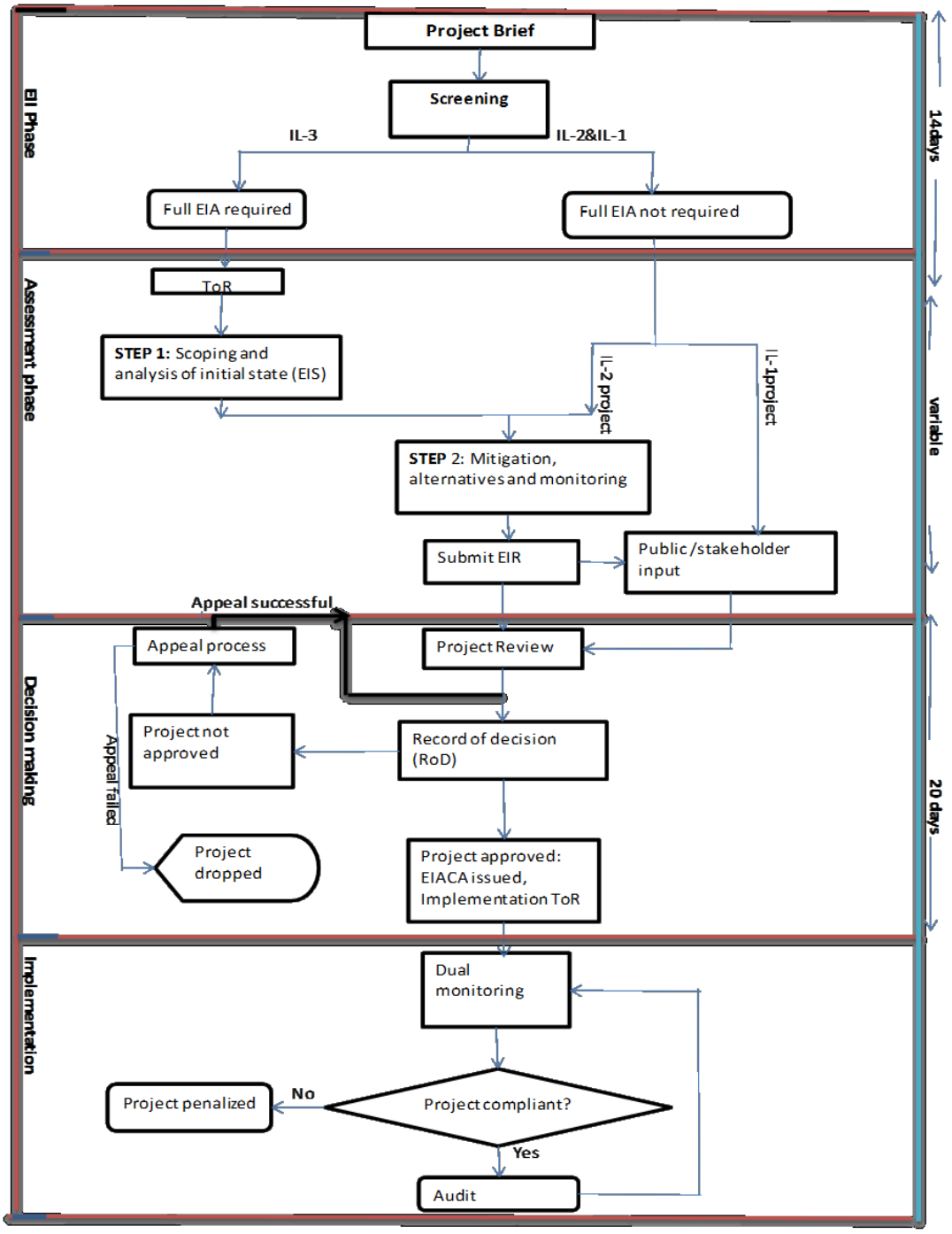


Figure 3: EIA Procedure in Rwanda[6]

[6]General Guidelines and Procedures for Environmental Impact Assessment

Ministerial order No. 004/2008 of 15/08/2008 establishes the list of works; activities and projects that have to undertake an EIA. They are classified into infrastructure, Agriculture and Animal Husbandry, works in park and in its buffer zones and mine extraction. According to that law, the proposed feeder road rehabilitation project falls in category 3 (IL3) of infrastructure where full EIA is required.

ii. EIA guidelines for roads development projects

These guidelines were developed by REMA in August 2009 in order to assist road developers, contractors, EIA practitioners and planners in the road sector, providing a tool that guides the EIA process so that EIA in the road sector is satisfactory and cost-effective. To ensure this, these guidelines:

- provide basic information to be collected on biophysical, social, cultural and economic parameters relevant for roads development, in each phase of the road development project cycle;
- advise on the methodology for collecting and analyzing data;
- provide a generic framework for logically documenting and presenting the EIA results (general report outline);
- provide basic guide on how to execute EIA activities including conducting public hearings for multi-stakeholder projects like roads development.

iii. EIA guidelines for water resources management

These guidelines were developed by REMA in March 2009; one of its objectives being to enable environmentally adequate management of all development project activities that may negatively impact water resources.

iv. EIA guidelines for wetlands management

These guidelines were also developed by REMA in March 2009; with the main purpose of enabling environmentally adequate management of all development project activities that may negatively impact wetlands.

2.2.4 International Environmental Related Conventions signed by Rwanda

Besides the law and regulation on ESIA at national level, Rwanda has approved and signed several international conventions which are in one or another way related to environmental management of feeder roads development projects:

- Convention on Biological Diversity aiming at conserving biodiversity, using it sustainably and fairly and equitably sharing benefits arising from genetic resources;
- The CARTAGENA protocol on Biosafety, which is a supplement to the Convention of Biodiversity 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 n° 38/2003 of 29 December 2003;
- The KYOTO Protocol to the Framework Convention on Climate Change adopted at KYOTO on March 6, 1998 as authorised to be ratified by Law n° 36/ 2003 of 29 December 2003;
- The RAMSAR International Convention of February 2, 1971 on Wetlands of International importance, especially as waterfowl habitats as authorised to be ratified by Law n° 37/2003 of 29 December 2003;
- The STOCKHOLM Convention on persistent organic pollutants, signed in STOCKHOLM on 22 May 2001, has been approved by Presidential Order n° 78/01 of 8 July 2002;
- CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora): This is an international treaty aiming to prevent species from becoming endangered or extinct because of international trade. Any trade in protected plant and animal species should be sustainable, based on sound biological understanding and principles.

This shows the commitment of Rwanda to fulfil all the requirements at international level in terms of environmental protection toward sustainable development.

2.3 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 summarised in **Table 1** below.

Table 1: Key Institutions in ESIA implementation and major stakeholders in feeder roads development in Rwanda

Institution / Agency	**Key interests and responsibilities for feeder 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 public hearing during the ESIA process and conducts the project environmental audit during project implementation.
2. Rwanda Development Board (RDB)	In order to facilitate the investors, RDB has been given the responsibility of reviewing the ESIA reports, providing environmental compliance certificates to development projects
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 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. Ministry of Agriculture and Animal Resources (MINAGRI) through FRDP	Formulating policies andinitiating public investments for the agriculture sector in the country. Together with its stakeholders, MINAGRI is implementing feeder roads through FRDP for supporting the farmers in improving their access to markets, therefore improving the agriculture value-chain. MINAGRI also oversees the compensation process, approves the list of PAPs and proceeds to their payments and conducts regular crosschecking visits to PAPs and banks to ensure PAPs were paid and properly use the compensation.
5. Ministry of Infrastructures (MININFRA)	Formulating policies and laws for roads development in the country. It is also responsible for national roads, highways and bridges and oversees feeder roads 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); initiating public investment in transport services. It provides technical support to the Districts in the development of feeder roads.
7. Ministry of Natural Resources (MINIRENA)	Formulating policies and regulations for land administration and land use planning; environmental protection and natural resources utilization, including expropriation. In feeder roads development, a major responsibility is to allow the exploitation of borrow pits and quarries for the required construction materials.
8. Ministry of Local Government (MINALOC).	Formulating national policies and laws on decentralisation and local governance – Supervising District authorities which are responsible for feeder roads development.
9. Districts	Districts are responsible for planning and execution of feeder roads construction, rehabilitation and maintenance projects. For the purpose of PAPs expropriation by FRDP where necessary, Nyagatare District will be the "*Expropriator*" as per the Expropriation Law.
10. Rwanda Natural Resources Authority (RNRA)	Land registration and land use planning throughout the country. Compensation and resettlement will depend on legal ownership.
11. Rwanda National Police (RNP)	The National police have statutory responsibility for law enforcement including ensuring that road traffic laws are observed; and therefore all roads are constructed in conform to appropriate legislations. They also have to provide security to road construction facilities.
12. World Bank	- Provision of loans and grants financing for road construction - Clearance of ESIA/ESMP report, - Technical assistance in the implementation of project activities;

13 Contractor	- Preparing and implementing the site specific ESMP during construction phase, including employing an environmental and social safeguards expert for the proper ESMP implementation.
14. Supervising Firm	- Supervising the proper implementation of site specific ESMP

2.4 WORLD BANK SAFEGUARD POLICIES

In order to avoid adverse negative environmental and social impacts of a proposed road for improvement, no road contract tender should be launched before a road specific ESIA and RAP based is preparedon 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.

The World Bank Operational Policy 4.01 requires that the Environmental and Social Assessment report must be a standalone document to meet the bank appraisal procedures for the project. The disclosure should be in Rwanda where it can be accessed by both the general public and local communities. In accordance with the World Bank Safeguard operational policies and procedures the proposed Rwanda Feeder Road Development Project has been classified as Environmental Assessment (EA) risk category A equivalent to Category 3 under the Rwanda's EIA Guidelines. The EA categories are summarized on **Table 2**.

Table 2: Categorization of Projects Subjected to EIA (World Bank, 1999)

Category A	Category B	Category C	Category FI
The project is likely to have significant adverse impacts that may be sensitive, irreversible, diverse, comprehensive, broad or precedent setting. These impacts generally result from a	Although an EIA is not always required, some Environmental analysis is necessary. The projects have impacts that are 'less significant, not as sensitive, numerous, major or diverse. Few if	The projects result in negligible or minimal direct disturbance of the physical Environment.	It involves investment of Bank funds through a financial intermediary

major component of the project and affect the area as a whole or an entire sector. **A full environmental assessment is required**	any of the impacts are irreversible and mitigation measures can easily be designed. **Typical projects include rehabilitation, maintenance, or upgrades, rather than new construction**	Typical projects include education, family planning, health, and human resource development **No EIA or other analysis is required**.	

The project triggers the following safeguard policies:

i. **Environmental Assessment – Operational Policies (OP) and Bank Procedures (BP) (OP/BP 4.01**) require environmental assessment of projects proposed that are deemed to have potential adverse impacts upon the environment to help ensure that they are environmentally sound and sustainable.Environmental Assessment is one of the 10 environmental, social, and legal Safeguard Policies of the World Bank. World Bank Environment and Social Safeguard Policy aims at improving decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted. Operational Policy 4.01 further requires that the ESIA/ESMP report must be disclosed as a separate and standalone document by the GoR and the World Bank as a condition for Bank appraisal of this project. Potential adverse environmental and social impacts include: noise, dust, soil and water erosion, and health and safety. Mitigation measures to address these impacts have been recommended in the ESMP as part of this ESIA. The measures built on Rwanda's EIA Guidelines for Roads, World Bank Group General Environmental Health and Safety Guidelines and international good practices. An Environmental and Social Management Framework (ESMF), was prepared, consulted upon, and disclosed prior to appraisal to guide the preparation of the ESIA for those subprojects yet to be identified and/or finalized. An ESIA/ ESMP will be prepared for finalized alignment of roads.

ii. **Natural Habitats (OP/BP 4.04) -** This policy aims at the conservation of natural habitats, like other measures that protect and enhance the environment. Natural Habitats are land and water areas where the ecosystems' biological communities are formed largely by native plant and animal species, and human activity has not essentially modified the areas primary ecological functions.

The policy is essential for long term sustainable development. The Bank therefore supports the protection, maintenance, and rehabilitation of natural habitats. The Natural Habitats policy is triggered by the project because the project area possess one natural habitat, *Acacia kirkii* gallery forest and some of the indicative feeder roads pass along or nearthe forest. This forest may have ecological value, and provide shelters to populations of primates, birds, insects and to flora, especially Acacia kirkii, which is threatened of extinction. The ESMF and ESIA will include mitigation measures to address the potential impacts.

iii. **Physical Cultural Resources (OP/BP 4.11) -** The Bank operational policy on safeguarding cultural properties aims at protecting cultural assets and knowledge of communities in bank financed project areas. Safeguarding cultural property policy requires the determination of what is known about the cultural aspects of the proposedproject site.

The policy calls for consultation involving all parties including scientific institutions and NGOs as part of this process. The policy defines cultural property as sites having archaeological, paleontological, historical, religious and unique natural value. These sites, when stumbled upon, require that the authorities are informed and the site is demarcated and protected. There are no graves or other physical cultural resources likely to be affected by the project activities in the influence area except chance finds during construction. The Contractor's construction ESMP will include detailed procedures on chance finds. In case a physical cultural resource is found, the civil works in that particular location will stop until the revised and updated ESIA (including a PCRMP acceptable to the Association) and final RAP have been submitted to the Bank, cleared, and disclosed and compensation paid.

iv. Involuntary Resettlement (OP/BP 4.12) - This policy covers direct economic and social impacts that both result from Bank-assisted investment projects, and are caused by; involuntary taking of land resulting in relocation or loss of shelter; loss of assets or access to assets, or loss of income sources or means of livelihood, whether or not the affected persons must move to another location.

The objective of this policy is to avoid where feasible, or minimize the resettlement, exploring all viable alternative project designs. The proposed project settings may induce land acquisition.

A resettlement action plan has been prepared as a separate document to mitigate against effects of displacement.The project setting may induce land acquisition. The Resettlement Policy Framework (RPF) was prepared, consulted upon, and disclosed prior to appraisal. RAPs are prepared for subprojects already identified. A comparison between Rwanda laws and World Bank Policy is presented in Ta**b**le 3.

Table 3: Comparative Analysis between World Bank OP 4.12 and Rwanda Legislations

Principles	Rwanda Legislations	World Bank's involuntary Resettlement (OP 4.12)	Recommendations to fill the gaps
Valuation	Valuation is covered by the Expropriation Law and the Law establishing and organizing the real property valuation profession in Rwanda and stipulates that the affected person receive fair and just compensation. However a ministerial order gives the value of land and crops	OP 4.12 prefers Replacement cost method of valuation of assets that helps determine the amount sufficient to replace lost assets and cover transaction costs. In applying this method of valuation, depreciation of structures and assets should not be taken into account If the residual of the asset being taken is not economically viable, compensation and other resettlement assistance are provided as if the entire asset had been taken.	Adopt replacement cost method of valuation
Compensation	Article 27 of the expropriation law No 32/2015 of 11/06/2015 entitles the landholder to compensation for the value of the land and activities incorporated on that land on the basis of size, nature location considering the prevailing market value.	OP 4.12 gives preference to land based resettlement strategies for displaced persons whose livelihoods are land-based as compared to monetary compensation	Adopt OP 4.12 mode of compensation by giving preference to land based resettlement as opposed to monetary compensation
Participation and consultation	The Rwandan law on Expropriation simply stipulates that affected peoples be fully informed of	WB OP 4.12 requires that persons to be displaced should be actively be consulted and should have opportunity to participate in planning and design of resettlement	Adopt OP 4.12 methods of participation

Principles	Rwanda Legislations	World Bank's involuntary Resettlement (OP 4.12)	Recommendations to fill the gaps
	expropriation issues. The law also conflicts the very purpose of consultation and involvement by prohibit any opposition to the expropriation program if considered to be under the pretext of self-centered justification which might not be the case	programs	
Timeframe	Rwanda expropriation law stipulates a timeframe upon when the property to be expropriated must be handed over which is 90 days after compensation has been paid.	OP4.12 requires that displacement must not occur before necessary measures for resettlement are in place, i.e., measures over and above simple compensation. Measures pertaining to provision of economic rehabilitation however can and often do occur post displacement. WB OP 4.12 provides for a timeframe (cut-off date) upon which interested parties are entitled to respond	A cut- off date should be applied. OP 4.12 states that, Where the borrower has offered to pay compensation to an affected person in accordance with an approved resettlement plan, but the offer has been rejected, the taking of land and related assets may only proceed if the borrower has deposited funds equal to the offered amount plus 10 percent in a secure form of escrow or other interest-bearing deposit acceptable to the Bank, and has provided a means satisfactory to the Bank for resolving the dispute

Principles	Rwanda Legislations	World Bank's involuntary Resettlement (OP 4.12)	Recommendations to fill the gaps
			concerning said offer of compensation in a timely and equitable manner.
Overall strategy	Section 2 of the expropriation law on procedures, provides for the process to show how the sub projects fits into the land master plan of the area in question	Under the OP 4.12 , it's not necessary to prove that the project fits within the overall land master plan	Adopt Rwanda Expropriation Law
Eligibility	Article 26 of the law No 32/2015 of 11/06/2015 requires the person who owns land intended for expropriation to provide evidence of ownership or rights on that land and presents a certificate to that effect	OP 4.12 criteria for eligibility include even those who do not have formal legal rights to land at the time the census begins but have a claim to such land or assets--provided that such claims are recognized under the laws of the country or become recognized through a process identified in the resettlement plan and also those who have no recognizable legal right or claim to the land they are occupying	OP 4.12 will be more appropriate for determining eligibility due to the fact that many of those who farm the lands don't own it, although they may have depended on farming on such lands for their livelihood, and as such, should be assisted to at least maintain their pre-project level of welfare. (especially for assets)
	Expropriation law is silent on provision of alternative land and resettlement of those to the pre-displaced status	OP 4.12 requires and prefers resettlement of displaced persons.	Use World Bank OP 4.12 During the upgrading of the feeder road, some resettlement will be required
Required Measures	Expropriation law does not provide for alternatives when	OP 4.12 requires displaced persons to be consulted on, offered choices among, and	Use World Bank OP 4.12

Principles	Rwanda Legislations	World Bank's involuntary Resettlement (OP 4.12)	Recommendations to fill the gaps
	undertaking compensation	provided with technically and economically feasible resettlement alternatives	
Grievance redress mechanisms	The new Expropriation Law of 2015 creates the Resettlement and Grievance redress committee and provides complaints procedures for individuals dissatisfied with the proposed project or the value of their compensation and process for expressing dissatisfaction and for seeking redress.	OP 4.12 requires PAPs be informed of the compensation exercise and establishes Grievance Redress Mechanisms	Adopt Rwanda Expropriation Law which establishes the GRM formed by District (sector/cell) authority, PAP representatives and Project

v. Forests (OP 4.36)

The objective of this policy is to assist borrowers to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development and protect the vital local and global environment services and values of forests.

This policy applies to:

- Projects that have or may have impacts on the health and quality of forests;
- Projects that affect the rights and welfare of people and their level of dependence upon or interaction with forests; and
- Projects that aim to bring about changes in the management, protection, or utilization of natural forests or plantations, where they are publicly, privately, or communally owned.

The bank supports sustainable and conservation oriented forests. Where forest restoration and plantation developments are necessary to meet these objectives, the bank assist borrowers with forest restoration activities that maintain or enhance biodiversity and ecosystem functionality. The bank also assist borrowers with the establishment and sustainable management of environmentally appropriate, socially beneficial, and economically viable forest plantations to help meet growing demands for forest goods and services

There are no forests likely to be affected by the project activities, but there might be individual trees like Acacia, Euphorbia to be cut. The Project plans to plant trees for the protection of rehabilitated roads and replacement of lost trees Indigenous tree species such as Acacia will be used for planting.

3 PROJECT DESCRIPTION

3.1 PROJECT LOCATION

Nyagatare District is situated in the Eastern Province of the Country. The district borders with Uganda in the North, Tanzania in the East, Gatsibo District in the South and Gicumbi District in the West. The distance between Kigali and Nyagatare is about 160 Km on National Road 3 and National Road 5. It is approachable by road in three hours. The population of Nyagatare District is 465,855 people and spread over an area of 1,929.5 km^2. It has a population density of 241 person/km^2 (country density is 415 person/km^2) and rankssecondfrom bottom for population density among the Districts[7] of Rwanda.

Nyagatare District is made of 14 Sectors, among which the following 13 Sectors are concerned with the present feeder roads project: Gatunda, Karama, Karangazi, Katabagemu, Matimba, Mimuli, Mukama, Musheli, Nyagatare, Rukomo, Rwempasha, Rwimiyaga and Tabagwe as shown in **Figure 4** below. Kiyombe Sector is not crossed by any of the indicative feeder roads.

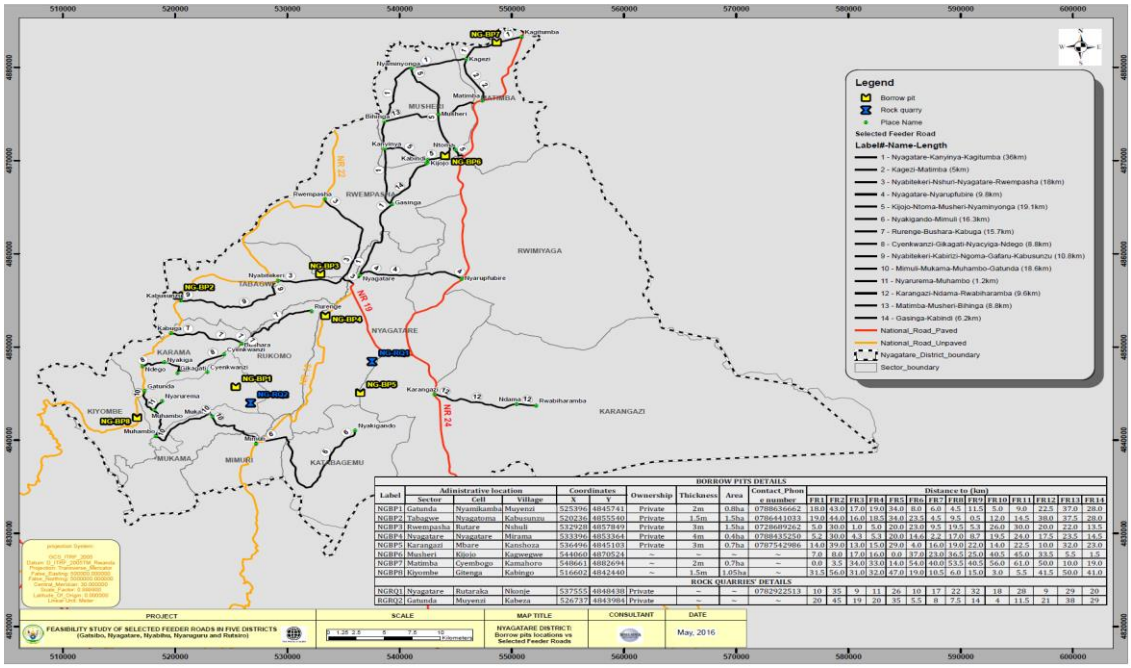


Figure 4: Administrative Map showing indicative feeder roads and borrow and quarry areas in different Sectors of Nyagatare District

Source: *Feasibility study, June 2016*

[7] Population and Housing Census 2012, National Institute of Statistics of Rwanda

The roads in Nyagatare are mostly in short hills terrain, low lands as well as in wetlands. The hills are populated with scattered settlements often located on the small holdings of individual households. However, the government has launched an initiative, which encourages the scattered settlers to live in small townships established at indicative central locations for a population living in a defined rural neighbourhood.

The hills are covered with farms and small grazing lands andthe marshlands are located in valleys between the hills. The farms are usually on the foot of the hills adjacent to the marshland.

The project area of influence covers the existing RoW, areas required for roads widening of indicative roads, proposed borrow pits, quarry and disposal sites in all Sectors of the Nyagatare District, except Kiyombe Sector.

3.2 OBJECTIVES OF THE PROJECT

The main objective of the project is to improve transport infrastructure with a view to support project area's social economic development. The project development will facilitate the economic growth, the improved transportation of goods and services. Specifically, the major purpose of the proposed upgrading project is to construct feeder road network in Nyagatare District in order to meet the following objectives:

- To promote socio economic development of the project area by linking it with other district and cities; and
- To increase agricultural productivity and marketing capacities, by lowering the transport costs and losses of farm input and output. In particular, improved feeder networks will enhance the commercial surpluses of rural households and their access to services, reducing poverty and isolation.

3.3 ROADS STATUS

Nyagatare District mainly consists of a rural area with a poorly developed road network. The condition of indicative feeder roads varies from very poor to fair. Some roads are very bad with pot holes and without side drains. Other roads pass through thick vegetation.In various areas, roadsides are cultivated or already cleared.

Side drains may require stone pitching and check dams to control erosion. The roads traversing swampy areas require construction of culverts, often small in size, following the existing natural water course.

The basic infrastructure in the rural areas has to be improved to facilitate the co-relation between the rural sectors and the urban centers, especially with regards to trade and transfer of agricultural products.The roads crossing marshlands may have to be raised and the side slopes may have to be flatter and involve widening, but this will not require relocating large population.

3.4 PROJECT DETAILS

The project details are reproduced from the feasibility study. The project components include rehabilitation of right of way, culverts, bridges and cross drainage works. The affected areas of feeder road rehabilitation are limited to RoW, plus the widening areas, borrow and quarry areas. The existing Right of Way (RoW) will be followed with 2.5-4m widening. Due to slopes settlements are placed along side of the road. Cultivation and plantations are extended closer to feeder roads. The main food crops produced in the district are Maize, Rice, Beans, Cassava and Soya beans. The land slopes less than 35 degrees are cultivated leaving very little room for native flora species. These feeder roads are discussed in subsequent sections.

3.4.1 Brief Description on Feeder Roads

The Ministry of Agriculture and Animal Resources (MINAGRI) has prepared a feasibility report for 184.19 km feeder roads in the district of Nyagatare. Based on technical, economical, financial, social and environmental factors, the feeder roads have been assigned the priority. The above length is covered in 14 priority section of feeder roads. A brief description of these roads is presented below;

1. Nyagatare-Kanyinya-Kagitumba (NGFR1)

The alignment starts at the end point of NR19 in Nyagatare town. From there the road traverses to north direction towards Uganda border. The alignments passes adjacent to the east banks of Umuvumba River. The terrain classification of this road is predominantly plain to rolling. At km 25+300, the alignment takes turn towards east direction and ends at NR24 with the ending chainage of 36+312.

The section from km 33+300 to km 36+312 have continuous scattered built-up section. There are some major stream crossings at km 4+500, 9+200 and 22+000.

2. Kagezi-Matimba (NGFR2)

The road begins from the junction of NR 24 at Matimba, which is about 9km south of Kagitumba.From there the road traverses towards northwest through built-up section of about 800m. The alignment does not have any major stream crossing. The alignment ends at junction with NGFR1.The total length of the alignment is about 5km.

3. Nyabitekeri- Nshuri-Nyagatare- Rwempasha (NGFR3)

The road begins from junction of NR 22 at Nyabitekeri Centre which is about 9km south of Kagitumba. From there it traverses towards northwest through buit-up section of about 8km wet of Nyagatare town. The alignment traverses in east direction towards Nyagatare town.

After km 5+500, the alignment changes its direction towards northeast. From there the road passes on the side of a marshland and it crosses several irrigation canals.The alignment changes its direction towards northwest at km 12+200 and reaches Rwempasha Centre at km 16+700 where the alignment ends. NGFR3 also includes a spur alignment connecting NR19 to the main alignment of NGFR3.It starts from NR19 and crosses the Umuvumba River at km 0+500 and ends with the chainage km 1+233. A narrow Bailey Bridge across Umuvumba River is found in good condition.

4. Nyagatare- Nyarupfubire (NGFR4)

NGFR4 begins in Nyagatare town at km 0+350 of NGFR1. The alignment proceeds towards east direction in the built-up section of Nyagatare. The stretch from 0+000 to 0+800 was recently graveled with lined ditches on both sides. From 0+800, the alignment passes through paddy fields. The alignment ends on NR 24. It does not have any major stream crossing. The total length of the alignment is 9.8km.

5. Kijojo- Ntoma- Musheli- Nyamiyonga (NGFR5)

The road starts from NGFR1 at station 15+350 and proceeds to east direction. The alignment meets NGFR4 junction at km 4+600 and further proceeds towards east and reaches the spur road alignment of the same at km 7+350. From there the alignment traverses towards north and reaches Musheri at km 10+600. From Musheri, the alignment traverses towards north and end at NGFR1 junction.

The spur alignment is the small section of 2.2km connecting NR24 to the main alignment of NGFR5. This road does not have any major catchment area as it traverses through highland.

6. Nyakigando- Mimuli (NGFR6)

The road starts from Mimuli on NR19, which is about 20km south of Nyagatare town. The alignment proceeds towards east direction until km 2+000 and then changes its direction towards southeast.

From there the alignment follows ridgeline of the hill. After reaching km 8+300, it runs towards northeast and reaches Nyakigando at km 16+268.

7. Rurenge- Bushara- Kabuga (NGFR7)

The road starts from the District Road DR 57 junction whichis about 5km southwest to Nyagatare town. The alignment traverses towards southwest and runs along south side of Umuvumba River tributary. The alignment passes through agricultural fields and at 8+700, it crosses a major stream with Bailey bridge and then turns towards west and ends at Kabuga on NR 22. The total length of the alignment is about 15.7km.

8. Cyenkwanzi- Gikagati- Nyacyiga- Ndego (NGFR8)

The road starts from the marshlands and end on NR22 at km 8+766km. From the start the alignment heads towards southwest abd reaches Cyenkwanzi and Gikagati built-up section at km 2+400 and km 4+000. Further, it passes through thick vegetation section for about 2km. From Gikagati built-up section, it heds towards west and reaches NR22 at km 8+766.

There are no major catchment areas in this alignment as it follows ridge alignment.

9. Nyabitekeri- Kabirizi- Ngoma- Gafaru- Kabusunzu (NGFR9)

This roads starts from Kabusunzu of Tabagwe Sector on NR22. The alignment heads towards northeast direction and reaches Kabirizi built-up section at km 4+300. It further follows in the northeast direction until km 9+400 and takes a sharp turn towrds north and reaches narrow wooden log structure at km 10+150. This structure is not motorable due to narrow width. From here the alignment climbs towards north and reaches NR22 at Nyabitekeri.

10. Mimuli- Mukama- Muhambo- Gatunda (NGFR10)

NGFR10 starts from NR22 near Gatunda. The alignment heads towards south and reaches Muhambo centre at 6+500. From there the alignment changes its direction towards northeast by following a ridgeline of a hill. At km12+000, the alignment takes sharp turn towards southeast. The section from km 13+000 to km 15+000 is not motorable due to narrow/ missing culverts across streams.

There are two major concrete narrow bridges at km 16+500 and km 18+200. The alignment ends at NR19 junction near Mimuli.

11. Nyarurema- Muhambo (NGFR11)

The road starts from the junction of NGFR10 at km 2+600 and traverses towards northwest. NGFR is a short road of 1.23km long connecting to NGFR10 to the built-up section of Nyarurema. The alignment follows a ridgeline and does not have any major existing culvert

12. Karangazi- Ndama- Rwabiharamba (NGFR12)

NRFR12 starts from NR24 junction. The start point is about 16km south of Nyagatare. The alignment traverses towards east from the National Roads junction and climbs the steep gradient up to km 1+200. From there the alignment passes through the agricultural fields. Livestock and cattle farming are the major activities in the surrounding area of this feeder road. Open fields in this road are the main source of feeding for the cattle in this region. The alignment ends at chainage 9+588 and has the junction with a graveled road. There are no existing culverts along this road and also it does not have any major catchments for drainage structures.

13. Matimba- Musheli- Bihinga (NGFR13)

NGFR13 starts from Matimba at National road junction NR24.

The alignment traverses towards east direction through the Matimba built-up section. The road section from start at km 0+000 to km 3+800 is recently graveled and is in good riding condition. Section from NGFR13 junction to end point with NGFR1 is non motorable due deep storm water cuts in the Centre of the road. The alignment cross the only one major stream at km 5+900.

14. Gasinga- Kabindi (NGFR 14)

NRFR14 starts from NRFR5 junction at km 4+600 near Kabindi village. The alignment heads towards southwest and reaches the end point on NGFR1 near Gasinga village. The total length of the alignment is 6.26km. The alignment does not have any exiting culverts and also does not have any major catchments for the drainage structures.

The table below provides details on the total length of each of the feeder roads, existing carriageway, number of bridges and culverts to be built, length and width of these bridges, cross drainages, paved or all-weather roads, etc.

Table 4: Details on indicative roads and structures to be built

Road ID	Road Name	Length (km)	Average Carriage way Width (m)	Paved road (m)	Length of Built up (km)	Length of Low lying area (m)	Length of drain (km)		Culverts + bridges		
							Left	Right	Number	Length (m)	Diame ter (m)
FR1	Nyagatare – Kanyinya - Kagitumba	36.31	6.3	6	7.74	0	1.18	1.68	42	322	1
FR2	Kagezi - Matimba	5.01	7.7	6	2.86	0	9.00	4.50	4	84	1
FR3	Nyabitekeri-Nshuri-Nyagatare-Rwempasha	18.07	6.0	6	3.42	0.70	8.57	5.7	36	147	1
FR4	Nyagatare-Nyarupfubire	9.80	6.1	6	0.20	0.53	1.0	1.0	4	133	1
FR5	Kijojo-Ntoma-Musheli-Nyamiyonga	19.20	5.7	6	1.58	0	2.10	2.10	0	280	1
FR6	Nyakigando-Mimuli	16.20	6.0	6	12.15	0	12.8	10.10	9	217	1
FR7	Rurenge-Bushara-Kabuga	15.73	5.1	6	6.96	0.40	7.00	5.0	2	224	1
FR8	Cyenkwanzi-	8.80	5.3	6	5.49	0	5.84	3.74	0	119	1

	Gikagati-Nyacyiga-Ndego										
FR9	Nyabitekeri-Kabirizi-Ngoma-Gafaru-Kabusunzu	10.80	5.0	6	7.30	0	1.60	0.80	5	161	1
FR10	Mimuli-Mukama-Muhambo-Gatunda	18.40	6.5	6	6.92	3.10	3.88	10.46	18	189	1
FR11	Nyarurema-Muhambo	1.21	7.0	6	1.01	0	0	0	0	21	1
FR12	Karangazi-Ndama-Rwabiharamba	9.60	8.0	6	2.05	0	2.50	2.30	1	147	1
FR13	Matimba-Musheli-Bihinga	8.80	4.5	6	1.55	0.70	3.60	2.20	0	119	1
FR14	Gasinga-Kabindi	6.20	4.8	6	0.75	0	0	0	0	98	1
Total/ average		**184.13**		**6**	**59.98**	**5.43**	**59.1**	**49.58**	**121**	**2261**	1

Source: Feasibility Study report, June 2016

3.4.2 Present Traffic Survey

The present traffic in the district is estimated in the feasibility study of the project. These projections are mostly linked to the demographic growth and the improvement of socioeconomic conditions during the last 10 years. The same growth pattern has been taken for the projection of traffic during next 10 years (2022). **Table 5** presents the current and projected traffic.

Table 5: Summary of Traffic Count Survey Results on Feeder Roads in Nyagatare District

Feeder Road ID	Road Name	Road Length (km)	Motorized Traffic (Vehicles per day)			Non Motorized Traffic	
			Motocycle	Light Vehicles < 3.5 Tons	Heavy Vehicles > 3.5 Tons	Bicycle	Pedestrian
1	Nyagatare- Kanyinya-Kagitumba	36.31	175	2	2	268	450
2	Kagezi- Matimba	5.01	431	18	37	867	697
3	Nyabitekeri- Nshuli-Nyagatare-Rwempasha	18.07	466	36	22	381	429
4	Nyagatare- Nyarupfubire	9.80	372	27	9	347	360
5	Kijojo- Ntoma- Musheli-Nyamiyonga	19.20	153	4	5	125	150
6	Nyakigando- Mimuli	16.20	161	16	13	383	1153
7	Rurenge- Bushara- Kabuga	15.73	125	40	17	855	2249
8	Cyenkwanzi- Gikagati-Nyakiga- Ndego	8.80	103	6	4	277	1311
9	Nyabitekeri- Kibirizi- Ngoma-Gafaru- Kabusunzu	10.80	91	1	2	224	556
10	Mimuli- Mukama- Muhambo-Gatunda	18.40	85	9	10	199	249
11	Nyarurema- Muhambo	1.21	118	2	4	355	795
13	Karangazi- Ndama-Rwabiharamba	9.60	361	17	7	341	881
14	Matimba- Musheli-Bihinga	8.80	202	5	1	185	845
14	Gasinga - Kabindi	6.26	91	**1**	**2**	224	506

Source: Feasibility Study report, June 2016

The above summary highlights the typical traffic pattern of rural roads, 50% of which is in bad or very bad condition.

Motorcycles account for two thirds of motorized traffic, whereas light and heavy vehicles are a minor share. Another typical feature of this type of traffic is the ratio bicycles / motorized vehicles - bicycles are in greater number as compared to motorized vehicles, because of the undulating - mountainous terrain of Nyagatare District.

Table 6 presents the shares of motorized vehicles, motorcycles account for 90% of all motorized vehicles; the remaining 10% are mostly cars, pickups and, small or medium trucks with a payload up to 3.5 and 7 tons respectively.

The ratio bicycles / motorized vehicles, calculated on the total of the surveyed traffic highlights the prevalence of bicycles accounting for 151% of motorized vehicles.

Table 6: Structure of the Surveyed Traffic

Vehicle Category	**Percentage of all motorized vehicles**
Motorcycles	90%
Light vehicles	6%
Heavy vehicles	4%
Total motorized traffic	100%
Ratio bicycles/motorized vehicles	151%

3.4.3 Feeder Road Design Standards

Generally the study of rehabilitation intends to improve the condition of the district network that can:

- Ensure an average commercial speed of 40 km/h,
- Reduce routine and periodic maintenance cost, and
- Reduce vehicle operating costs and contribute to economic growth.

The existing horizontal alignments have been maintained and few corrections made near the existing bridges or when the road cross some villages. Minor realignments are however inevitable on the existing horizontal alignment at isolated sections where the radius fall short of the design requirements. The vertical alignment follows the existing natural ground in general with exceptions in the sections where the water cross the roadway especially near the existing bridges. In those limited sections the consultant proposes to construct small embankments to raise the vertical profile elevation. The cross section consist of one carriageway with width between 6 and 7 m , no shoulder and two side drain , one on each side of the carriageway. The proposed project aims to widen the dual carriageway for 6-7 m. **Table 7** summaries the geometric Design Standards adopted for the project.

Table 7: Proposed Design Standards for Rwanda's Rural Roads

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

The following are designs of the proposed roads, drainage and culvert/ bridge

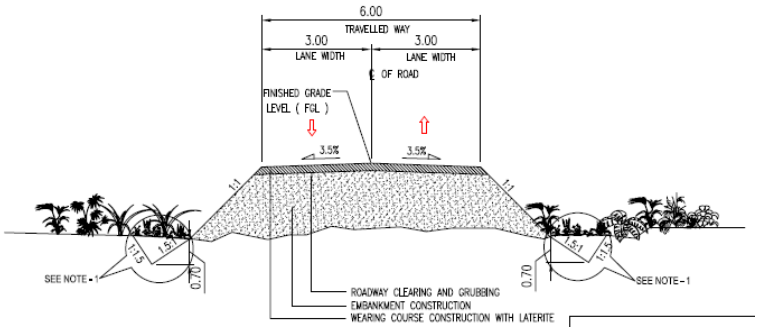


Figure 5: Design of the road section

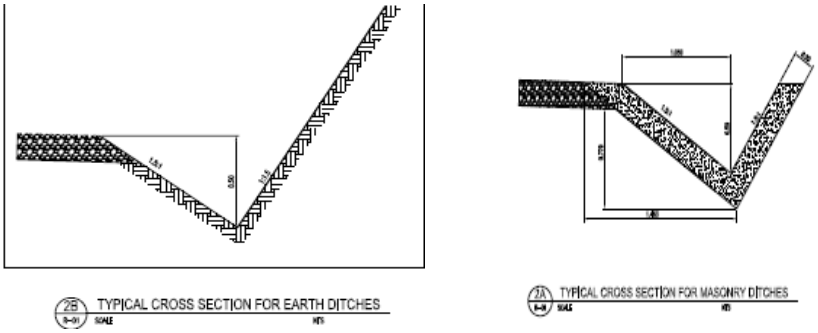


Figure 6: Design of the cross section for earth and masonry ditches

3.5 ANALYSIS OF ALTERNATIVES

During the feasibility stage of the proposed feeder road rehabilitation/reconstruction project, options were explored and these options were weighed from all considerations such as cost, environment, and ease of implementation and maximum utilization of available infrastructure. The aim of alternative analysis is to arrive at a development option, which maximizes the benefits while minimizing the adverse impacts. Alternative analysis is also a form of mitigation measures. The two alternatives were considered "Without Project Scenario" and "With Project Scenario". More alternatives are presented along with management plan.

3.5.1 Without Project Alternative

The No Project option in respect to 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 with the existing environmental conditions. This option will however, involve several losses on socioeconomic condition both to the local population and the nation as a whole. The local farmers will continue to face the constraints they are currently experiencing due to inefficient transport network and system and the anticipated economic development aimed at fulfilling the Vision 2020 will remain unattainable. The No Project Option is the least preferred from the socio-economic and partly environmental perspective due to the following factors:

- The socio economic status of the Nyagatare District's residents would remain unchanged. Reduced interaction both at local and national levels;
- The local skills would remain under-utilized as no employment opportunities will be created for local population who would have otherwise worked at the project area;
- Reduced business development due to current bad condition of the feeder road project;
- The current erosion rate in the feeder road due to lack of drainage system will remain.

No project scenario case will also avoid social impacts due to the implementation of the project.

3.5.2 With Project Alternative

The implementation of the project will contribute to socio-economic improvement and will have positive impacts on residents' life quality. The With Project Alternative have the following advantages: there will be improved and assured transport facilities to the residents of the District. This will stimulate socio-economic development of the area. The proposed feeder roads are a major deterrent for commercial growth in the area, the project scenario will catalyse commercial growth in the different centres 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 better feeder road condition.

This alternative will have negative impact on land use, forests/trees, water, noise and air pollution during construction and operation phases.About 84.19 ha of land are likely to be acquired for road widening and communities properties (houses, trees, crops, etc) affected.Edaphic- climatic based designs, the tree planting program for replacing lost trees, 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 equipments to workers, use machinery and truck in good condition during daytime, regular watering of road sections under construction are alternative technologies to mitigate adverse impacts of roads on environment.

3.5.3 Limiting works within the existing carriageway

Changing road alignments where the indicative roads pass through grouped settlementsand trading centers is one of the mitigation measures to minimize the number of households to be relocated. The same applies to road section passing close to the Muvumba gallery forest.

3.5.4 Sourcing of construction materials and location of borrow pits

Road construction materials can be obtained from close or far away the RoW. Out of 8 borrow pits (BP) and 2 quarry sites identified, only 2 borrow areas are within the RoW of 2 indicative roads. The remaining 6 BPs and 2 stone quarries are outside the RoW. BPs within or close to the RoW can be preferred over BPs and quarries away from the road to minimize transport costs and create local employment.

3.5.5 Preference of local labour over imported labour

Most building works are highly labour-intensive in nature. The use of local labour force over imported labour is important to increase local employment opportunities and ownership of project activities as well as limit the dissemination of communicable diseases. The awaireness compaign on communicable diseases prevention for workers should be prioritized.

3.6 QUANTITY OF MATERIAL FOR CONSTRUCTION

The new Road Act[8], which requires upgrading some feeder roads to six meter width, may involve widening the existing road formation by two to three meters. This may necessitate expropriation of some farm lands and relocating households. Bidding process shall not be launched for a particular road section until every person affected by the works on that section has been relocated and/or properly compensated according to Bank policies.

Feasibility report has estimated thequantities of construction material road wiseand reproduced in **Table 8**. These have been further utilized in assessing the environmental and social impact due to development of each road.

Table 8: Quantity of Construction Material

S.No	Description	Unit	Quantity
1	**Preliminary Works**		
1.1	Re-reveling	m^2	1,120,090
1.2	Fill material	m^3	0
2	**Earthworks**		
2.1	Excavation in rock and earth; Removal of heap of rocks, embankment from borrow pits and purge marshy soils	m^3	220,805
3	**Roadway**		
3.1	Wearing Course	m^3	152,537
3.2	Caping Layer	m^3	0
4	**Bridge, Culverts& Drainage**		
4.1	Supply and install Culvert Ø 100cm (reinforced)	M	2,261
4.2	Reinforced concrete proportioned at 350kg/m3 for all works	m^3	1,058
4.3	Stone masonry works for culverts head	m^3	23,953

[8]Law No. 55/2011 of 14/12/2011 governing roads in Rwanda

3.7 CONSTRUCTION SCHEDULE

The construction schedule of feeder roads depends on the methodology adopted for construction. In general the time period will also depend on the resources put in place by the contractor. The 184.19km feeder roads may take 24 to 36 months, including design tendering and construction. A Typical Construction Schedule is shown in **Table 9.**

Table 9: Typical Construction Schedule

Activity	Duration in Month											
	1-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24
Detail design of feeder roads, Tender documents and BOQ												
Notice inviting Tender, Tender process evaluation & award												
Preliminary works clearing, compensation etc.												
Construction of Bridges, Culverts and Roads etc.												
Testing and Commissioning Monitoring and Evaluation												

3.8 COST OF THE PROJECT

The cost of the interventions to improve the feeder roads has been reproduced from the feasibility report. The total cost for construction to improve of 184.19 km of feeder roads in Nyagatare District amounts to US$ 12.221 million; the average cost per km being US$ 66,375. The overall cost including construction, supervision and VAT amounts US$ 15.143 million.

4 ENVIRONMENTAL AND SOCIAL BASELINE DATA

4.1 GENERAL

The objective of Environmental Impact Assessment (EIA) is to ascertain the baseline environmental conditions and then assess the impacts as a result of the proposed feeder road project during various phases of the project cycle. Identification of environmental parameters, data collection and impact predictions are the core of Environmental Impact Assessment (EIA) process. A scoping matrix has been formulated to identify the attributes likely to be affected due to proposed project and presented in **Table 10**. In order to review and update the environmental aspects, the data has been collected, compiled and analysed for the following:

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

Based on environmental scoping matrix and project setting the attributes likely to be affected are identified for baseline data generation. Data on geology, soils, air, noise, ecology, sociology are presented in this chapter and has been collected from various sources. Majority of data have been collected from field visits and desk research. Formal and informal discussions held with the local people, project affected people and local government/non-government organisations, together with published reports, have provided very useful information for the preparation of this report. Information on project facilities, size, magnitude and cost of the construction activities, geology and soils of the project sites have been taken from the draft feasibility study of April 2016.

The concept is to assess the extent that the construction and operation of the proposed feeder roads project is likely to have impact on above environmental attributes. A baseline environmental condition comprises the features present within the proposed ROW as well as a strip of 5 m on either side of the existing road. This area is referred to as study area/project area in the report.

It includes environmental features such as forest areas, ecological sensitive areas, water bodies (rivers, marshy and ponds), and places of historical importance, tourism etc. The scope of this chapter is limited to only those issues, which are of concern in the environmental impact assessment. The land use of the project area is agriculture, built up, and plantation.The major purposes of describing the environmental settings of the study area are:

- Understanding the need of the project and 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 10: 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/ soil loss - Pollution by construction spoils,grease/oil spills and domestic waste disposal - Use of land for labor colonies and solid waste disposal	- Soil characteristics - Rainfall - Physiographic / Slopes - Construction materials / spoils - Number of employees during construction peak period
B. WATER ENVIRONMENT		
Design Phase	- Erosion of soil/roads	- Drainage Pattern - Rainfall
Construction Phase	- Water Quality Impacts due to disposal of wastes from labor colonies and construction sites - Water and energy supply - Waste water treatment and disposal from labour camps.	- Rainfall / Storms - Water courses/Drainage - Water quality - Waste water treatment
Operation Phase	Run off Drainage Problems	
C. AIR ENVIRONMENT		
Construction Phase	- Impacts due to emissions generated by construction machinery - Fugitive emissions from various sources.	- Ambient air quality at different locations

Operation Phase	- Exhaust emission due to road operation	- Ambient air quality
D. NOISE ENVIRONMENT		
Construction Phase	- Impacts due to construction machinery - Vehicle noise	- Ambient noise quality at different locations
Operation Phase	- Noise due to road operation	- Ambient noise quality at different locations
E. ECOLOGICAL ENVIRONMENT		
Construction Phase	- Loss of Forest/Trees - Migration of Fauna	- Forest Area/ Tree Numbers - Faunal Species
F. PHYSICAL AND CULTURAL RESOURCES		
Construction Phase	- Relocation of Infrastructure - Impact on Cultural Resources	- Status of Infrastructure - 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
	- Potential for 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 formation width of 10 m or 5 m on either side from centre line of the existing road as well as proposed carriageway. The project influence area has been defined as 15 m on either side (Arial distance) from boundary of road for collection of secondary data, including impacts due to ancillary sites like borrow areas, quarry, and material storage and disposal areas. The location of feeder roads is shown in chapter 3 on project description.

4.3 LAND ENVIRONMENT

The roads are located throughout Nyagatare District. The altitude of these roads is between 1,300-1,600 m amsl. The **Figure 7** illustrates the altitude of the project area compared to the rest of the country. The parameters involved in land environment includephysiography, geology and soils and land use pattern. These are discussed in the following paragraphs.

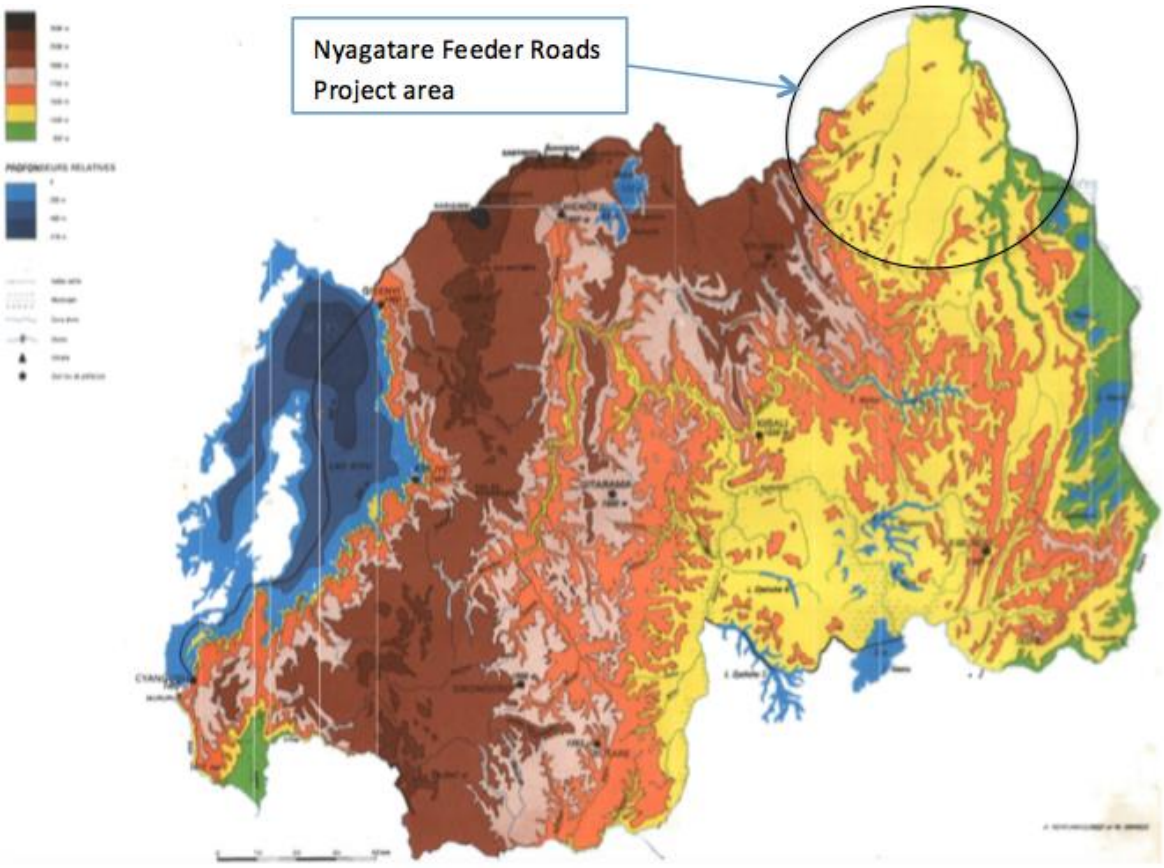


Figure 7: Map showing the altitude of the feeder roads project area in Nyagatare District

4.3.1 Physiography and Land Use of Nyagatare District

Nyagatare District, where the Feeder Roads rehabilitation project area is located, is characterised generally by lowly inclined hills and flat lands separated by valleys in North, East, West and South East while the South West is characterized by high mountains in administrative Sectors of Kiyombe, Mukama, Karama and Gatunda.

The District is located in the granite low valley whose average altitude is 1,515m asl spread on the plateau and the savannah of the Eastern part of the country. This kind of topographical layout constitutes an important potentiality for modern and mechanized agricultural farming.

4.3.2 Geology and Soils

In General, Rwanda has a complex geological history which presents itself in varied topographic profiles from the mountainous Northwest to the glassland of Akagera in the East.

The oldest rocks of Rwanda are the Paleoroterozoic migmatites, gneisses and mica schists overlain by the Mesoproterozoic Kibaran Belt. The folded and metamorphosed sediments of the Kibaran Belt are primarily schists and quartzites introduced by granites and cover most of Rwanda, including Nyagatare District.

Nyagatare District is characterised by an abundance of humus bearing soils and ferralisols. The later are the ones that transform into laterite from the deterioration of the shales and phyllites and accumulation of the collisions in the dry valleys. The granite soils has a texture with little red clay especially in the South-West part of the District.

The soils of Nyagatare District contain huge quantities of granite, industrially exploited for the production of construction materials. They also contain other usual construction materials such as stones, gravel, sand, and clay. A number of eight (8) borrow pits and two (2) rock quarries have been identified by the feasibility study, and they will be used as a source of materials for the construction of feeder roads in Nyagatare District.

4.4 WATER ENVIRONMENT

Water environment consists of water resources such as streams, lakes, estuaries, water use, and quality. Understanding the water quality is essential in preparation of EIA to identify critical issues with a view 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 above purposes in the project area.

Rwanda is divided into two major drainage basins: the Nile to the East covering 67 per cent and delivering 90 per cent of the national waters and the Congo to the West which covers 33 % and handles the remaining 10% of national waters.The country's hydrological network includes numerous lakes and rivers and its associated wetlands. A recent inventory of marshlands in Rwanda conducted in 2008 identified 860 marshlands, covering a total surface of 278,536 ha, which corresponds to 10.6% of the country surface, 101 lakes covering 149,487 ha, and 861 rivers totalling 6,462 km in length (REMA, 2008).

The hydrographic network in Nyagatare is located in Nile Basin and is very limited. Apart from Muvumba Riverthat cuts across the District, Akagera and Umuyanja rivers making the border with Tanzania and Uganda respectively, there are no other big consistent

rivers that can be exploited by the population of Nyagatare.

The few and small streams in the district are Nyiragahaya, Kayihenda, Karuruma, Nyagasharara and Kaborogota. These are erratic and intermittent. The weak river network constitutes a serious handicap to responding to the needs of water for people and animals.

The proposed feeder roads will be passing through or by side of number of water bodies presented in**Table 11** below.

Table 11: Water Bodies along Nyagatare Indicative Feeder Roads

Feeder road No.	Feeder Road Name	Water Body	Cross drainage at Chainage	Status/ Remark
1	Nyagatare-Kanyinya-Kagitumba	Muvumba River	4+800	The road runs parallel to Muvumba River (on the right side of the road)
		Muvumba wetland	5+900	Muvumba river and the associated wetland is home to endangered species of *Acacia kirkii*. It's also home to diverse bird species and primate (monkeys)
		Bihinga wetland	15+700	
2	Kagezi- Matimba	No water body		
3	Nyabitekeri- Nshuri Nyagatare-Rwempasha	Muvumba River Muvumba wetland	8+000 7+000	The road crosses Muvumba on a bailey bridge. The road runs parallel to Muvumba wetland
4	Nyagatare-Nyarupfubire	No water body		
5	Kijojo-Ntoma-Musheri-Nyamiyonga	No water body		
6	Nyakigando-Mimuli	Karungeri	8+500	

		Karungeri	12+100	
7	Rurenge-Bushara-Kabuga	Muvumba River	7+500	Road crosses Muvumba River
8	Cyenkwanzi-Gikagati-Nyacyiga-Ndego	River	7+700	
9	Nyabitekeri-Kabirizi-Ngoma-Gafaru-Kabusunzu	Mirambi wetland Mitungisa wetland	2+900 9+300	
10	Mimuli-Mukama-Muhambo-Gatunda	Urugunga wetland	4+500	Dominant vegetation made of *Saccharum officinale* (Sugar cane) and *Zea mays* (Maize) cultivations
11	Nyarurema-Muhambo	No water body		
12	Karangazi-Ndama-Rwabiharamba	No water body		
13	Matimba- Musheri-Bihinga	No water body		
14	Gasinga-Kabindi	No water body		

Source: Consultants Field Surveys, May 2016

4.5 ECOLOGICAL ENVIRONMENT

Nyagatare District is characterized by low hills of the eastern lowlands and grassy plains, whose the overage altitude is 1,515m. The district has a higher temperature compared to the other parts of the country. It also receives lower precipitations which sometimes lead to droughts. The soil of this area is characterized by the tightness of the humifere layer of the soil brought about by the grassy savanna and by the vertisols that are rich in nutrients mineral elements but lacking organic substances. Few of the rivers found there are erratic and intermittent. Muvumba River and Akagera National Park are the main natural ecosystems found in the Nyagatare. The district also counts for more than 30 marshlands.

4.5.1 Plants diversity

Plant diversity of Nyagatare District is characteristic of lowland vegetation. Apart from crops dominated by large scale rice cultivations in the wetlands and bean, maize and banana on hills, dominant natural vegetation is made of Acacia species spotted in different places. The grass savannah is dominated by *Themeda triandra* and *Hyparrhenia sp*. In the South-Eastrern part of the District is located the Akagera National Park which is a savannah forest. This park hosts a high diversity of plants, among which many threatened species can be found including *Blighia unijugata* (Umuturamugina)*, Osyris lanceolata* (Kabaruka)*, Afrocanthium lactescens* (Umukondokondo) and *Zanthoxylum chalybeum* (Intareyirungu).

Along the project's roads, ruderal species can be found in various places, with some exotic plant species including timber trees such as *Grevillea robusta* (Gereveriya) and *Eucalyptus sp* (Inturusu), shrubs like *Senna spectabilis* (Gasiya) and fruit trees like *Mangifera indica* (Imyembe) and *Persea americana* (Avoka). Along Muvumba River banks, the river shelters a relict gallery forest constituted mainly of *Acacia kirkii* (Umunyaryera/Umukinga). The *Acacia kirkii* tree is critically endangered species, and does not occur anywhere else in the Great Lakes Region. The species is in balance with its environment, tolerates the frequent flooding, and maintains a humid microclimate all year round thus enabling many undergrowth species to survive. It provides habitat for many bird, amphibian and also mammal species.

No endangered plant species within the right of way of the indicative feeder roads in Nyagatare were recorded. Acacia spp and other indigenous plant species such as Euphorbia, Ficus, etc will be used for planting along the road sides to replace those affected and protect the roads.

Trees within Immediate Corridor of Impact (COI): The total number of 31 dominant plant species were inventoried along feeder roads project's area in Nyagatare District (**Table 12**). Trees are most dominant (45%), followed by herbs (35%) and shrubs (20%).

Table 12: Dominant plant species along the Feeder Roads

No	Plant species	Vernacular name	Morphological forms
1	*Acacia kirkii*	Umukinga	Tree
2	*Acacia polyacantha*	Umugu	Tree
3	*Acacia sieberiana*	Umunyinya	Tree

4	*Acanthus pubescens*	Igitovu	Shrub
5	*Achyranthes aspera*	Umuhurura	Herb
6	*Albizia gummifera*	Umusebeya	Tree
7	*Blumea brevipes*	Igitabitabi	Herb
8	*Carica papaya*	Ipapayi	Tree
9	*Casuarina equisetifolia*	Filaho	Tree
10	*Erythrina abyssinica*	Umuko/Umurinzi	Tree
11	*Eucalyptus sp*	Inturusu	Tree
12	*Euphorbia tirucalli*	Umuyenzi	Tree
13	*Gomphocarpus physocarpus*	Gasaho	Herb
14	*Grevillea robusta*	Gereveriya	Tree
15	*Hygrophylla auriculata*	Gangabukari	Herb
16	*Indigofera errecta*	Umusororo	Shrub
17	*Kyllinga errecta*	Uruvuya	Herb
18	*Lantana camara*	Umuhengeri	Shrub
19	*Leonotis nepetifolia*	Igicumucumu	Herb
20	*Mangifera indica*	Umwembe	Tree
21	*Mikania cordata*	Urugozi	Herb
22	*Mimosa pigra*	Umugeyo	Shrub
23	*Ocimum suave*	Umwenya	Herb
24	*Oryza sativa*	Umuceri	Herb
25	*Pennisetm purpureum*	Urubingo	Herb
26	*Persea americana*	Avoka	Tree
27	*Polygonum setulosum*	Igorogonzo	Herb
28	*Psidium guajava*	Ipera	Tree
29	*Senna spectabilis*	Gasiya	Shrub
30	*Tetradenia riparia*	Umuravumba	Shrub
31	*Vernonia amygdalina*	Umubirizi	Shrub

Two hundred and sixty tree individuals (263) (with at least 30 cm of girth size, which is the upper limit of semi-mature trees) have been identified in the proposed ROW of feeder roads (**Table 13**)**.**

Table 13: Trees Along Feeder Roads Within the Right of Way

Road No.	Feeder Road	Length in Km and Number of Trees (no)						Total (No)
		0-3	3-6	6-9	9-12	12-15	15-18	
4	Nyarupfubire-Nyagatare	5	2					**7**
5	Nyamiyonga-Musheri-Ntoma-Kijojo	8			3			**11**
6	Mimuli-Nyakigando	7	10					**17**

7	Rurenge-Bushara-Kabuga	36	112	24		12		**184**
9	Nyabitekeri-Kabirizi-Ngoma-Gafaru-Kabusunzu		5					**5**
10	Gatunda-Muhambo-Mukama-Mimuli		5					**5**
12	Karangazi-Ndama-Rwabiharamba	16						**16**
13	Matimba-Musheri-Bihinga		11	7				**18**
14	Gasinga - Kabindi							
Total		**72**	**145**	**31**	**3**	**12**	**0**	**263**

Source: Field Surveys May 2016

The number of trees by girth size are detailed in table 17. Most trees are in the girth class of G1 (37%), followed by G3 (35%).

Table 14: Girth Wise Details of trees

Road No.	Feeder Road	Girth Class							Total
		G1	G2	G3	G4	G5	G6	G7	
4	Nyarupfubire-Nyagatare	1	1	4			1		**7**
5	Nyamiyonga-Musheri-Ntoma-Kijojo		3	8					**11**
6	Mimuli-Nyakigando	6		5	3	3			**17**
7	Rurenge-Bushara-Kabuga	78	29	56	9	9	1	2	**184**
9	Nyabitekeri-Kabirizi-Ngoma-Gafaru-Kabusunzu			3		2			**5**
10	Gatunda-Muhambo-Mukama-Mimuli			4		1			**5**
12	Karangazi-Ndama-Rwabiharamba	1		9	1	4		1	**16**
13	Matimba-Musheri-Bihinga	11	1	3	3				**18**
14	Gasinga - Kabindi								
TOTAL		**97**	**34**	**92**	**16**	**19**	**2**	**3**	**263**
G1:30-60cm; G2:61-90cm; G3:91-120cm; G4:121-150cm; G5: 151-180; G6: 181-210; G7: >210									

4.5.2 Mammals and hepertofauna

The District of Nyagatare covers the northern part of Akagera National Park where is found a vast number of wildlife including elephants, buffaloes, lions, leopards, hyenas, giraffes, zebras, baboons... Over twelve species of antelopes are also found the park, such as impalas, duikers, oribi, waterbucks, bushbucks, elands, topi…Hippos and crocodiles are also common in the lakes and rivers. Common snake species are found in lakes and savanna, such as *Vipera aspic* (Impiri), *Naja nigricollis* (Inshira) and *Philotanus irregularis* (Insharwatsi-Ingongo). The amphibians are also represented, but they are poorly identified due to lack of inventory studies in this field.

The indicative feeder roads are far from Akagera national park. The closest road to the park (FR12) ends at about 30 Km away from the park. No wild animals from the Park will therefore be affected. On the other hand, the FR1 starts at about 300 m from Muvumba gallery forest, a 170 ha natural habitat accommodating a good number of primates and birds. Though the FR1 is not traversing the forest and no wild animals are crossing the FR1, the construction is likely to lead to wildlife disturbance (noise, lights, pollution, etc) in the road section close to the gallery forest. Reptiles (mostly snakes) and different insects species are the fauna species identified wthin the road reserve and none of them is endangered.

4.5.3 Avifauna

Nyagatare District accommodates a huge variety of birds such as birds of prey, guinea-fowl, partridges, heroes and so forth. Most of them are located in the Akagera National Park, which also hosts some endangered bird species such as Shoebill (Munwarukweto), Southern Ground-hornbill (Ikigungumuka), Lappet-faced Vulture (Inkongoro) and White-headed Vulture (Inkongoro). However, none of those bird species were recorded within the road reserve.

4.5.4 Fish Species

Main fish species in Nyagatare District are those produced in tank based aquaculture. They mainly include Nile Tilapia (Oreochromis niloticus) found in Cyabayaga dam. Other species like African catfish (Clarias gariepinus) is also common in water courses like Muvumba river.

4.6 SOCIO-ECONOMIC ENVIRONMENT

4.6.1 Demographics

Nyagatare District is part of the Eastern Province. The District has a population of 465,855 inhabitants[9] and extends over an area of 1,929.5 sq. km. The population density accounting for 241 inhab/sq.km ranks the District second from bottom countrywide;this density is 42% lower than the national average (415 inhab/sq.km) and 12% lower than the Eastern Province average (274 inhab/sq.km). The population growth 2002-2012 has been 6.2%, significantly higher than the national average (2.6%) for the same period. The District is prevalently rural, the urban population accounting for 10% of total District.

The population is unevenly distributed over the District area; the most densely populated areais the Sector of Rukomo(585 inhab/sq. km)while the least densely populated Sector is Karangazi(104 inhab/sq. km)in the south-western part of the District. The highest and lowest population number was recorded in Rwimiyaga and Kiyombe sectors respectively. Karangazi, Rwimiyaga and Nyagatare are the most populated Sectors with over than 50,000 residents each. They represent 12.3%, 12.3% and 11.2% of the total District population respectively. Kiyombe and Rwempasha are the least populated sectors with 17,152 and 20,512 people respectively. The population of Nyagatare is predominantly female (51.0%). In each sector of Nyagatare District, females are more than 50% of the total population, except Nyagatare, Rwempasha and Rwimiyaga.

The average household size in Nyagatare district (4.4 persons/hh) is slightly above the national average household size (4.3 persons/hh). The mean demographic data of Nyagatare District are highlighted in **Table 15** below.

Table15: Nyagatare District demographic profile

District Sectors	Both Sexes	Male	Female	% Female	Urban Population	Rural Population	Area (Km2)	Density inhabitants per Km2	House hold Size
Nyagatare District	**465,855**	**228,325**	**237,530**	**51.0**	**47,480**	**418,375**	**1929.5**	**241**	**4.4**
Gatunda	27,776	**13,345**	**14,431**	**52.0**	0	27,776	52.1	533	4.2
Karama	26,994	12,794	14,200	52.6	0	26,994	53.6	502	4.3
Karangazi	57,444	28,690	28,754	50.1	3,020	54,424	564.1	104	4.7

[9]Rwanda 4th Population and Housing Census, 2012 (NISR)

Katabagemu	34,033	16,452	17,581	51.7	0	34,033	98.0	347	4.5
Kiyombe	17,152	8,074	9,078	52.9	0	17,152	69.1	248	4.4
Matimba	23,704	11,732	11,972	50.5	5,943	17,761	78.7	299	4.4
Mimuri	27,211	12,999	14,212	52.2	4,878	22,333	47.7	570	4.0
Mukama	21,679	10,432	11,247	51.9	0	21,679	64.3	337	4.3
Musheri	32,204	15,768	16,436	51.0	0	32,204	95.8	334	4.8
Nyagatare	52,107	26,144	25,963	49.8	14,320	37,787	164.6	317	4.2
Rukomo	34,218	16,603	17,615	51.5	3,875	30,343	58.5	585	4.2
Rwempasha	20,512	10,369	10,143	49.4	1,545	18,967	167.7	122	4.8
Rwimiyaga	57,527	28,804	28,723	49.9	12,490	45,037	309.0	186	4.5
Tabagwe	33,294	16,119	17,175	51.6	1,409	31,885	106.3	312	4.6

Source: Fourth Population and Housing Census 2012. NISR 2014, and Consultant elaboration.

4.6.2 Gender and childcontext

a) Demographic data

As per the results of the 4th population and housing Census (2012), the females outnumber males by 9,205 in Nyagatare District. The total District population is 465,855 residents of which 52.0% are females. In each sector of Nyagatare District, females are more than 50% of the total population, except Nyagatare (49.8%), Rwempasha (49.4 %) and Rwimiyaga (49.9%).

The majority of the population of Nyagatare is young with 84.4% of the population aged less than 40 years old. Elderly people (above 65 years old) make up only 1.8%. About 42.4% of the resident population of Nyagatare are females aged less than 40 years old. The females aged 65 years and above represent 1.4% of the total population.The population aged below 14 years old is 205,039 people, representing 44.0% of the total district population. This category is predominantly female; 103,087 are women, corresponding to 50.3% of the population below 14 years old or 22.1% of the total district population.

b) Gender based violence and child labour /abuse situation

Gender-based violence (GBV) is a universal reality existing in all societies. The assessment done by the Rwanda Gender Monitoring Office (GMO) identifies four major forms of GBV including:

- ✓ Economic violence (denial of economic rights to property, succession, employment or other economic benefits);
- ✓ Physical violence (ie the intentional use of physical force with the potential to cause harm);
- ✓ Sexual violence (act of forcing another individual, through violence, threats, deception, cultural expectation, weapons or economic circumstances, to engage in sexual behavior against her or his will); and
- ✓ Psychological violence: trauma to the victim caused by acts, threats of acts or coercive tactics; these threats are often related to sexual or physical violence).

Though there are limited data on GBV, it is not a big problem in Rwanda. The Country has achieved impressive results in the fight against GBV, including a GBV hostile legaland policy framework that supportsprevention and response to GBV, and provides an opportunity for further advancements. The National Policy against Gender-Based Violence and its strategic plan, theLaw No 59/2008 of 10/09/2008 on prevention and punishment of gender based violence, Law No 22/1999 of 12th November 1999 to supplement Book one of the Civil Codeand to institute Part Five regarding Matrimonial Regimes, Liberalities and Successions, Law No 13/2009 of 27th May 2009 regulating Labor in Rwanda, Law N° 32/2016 of 28/08/2016 governing persons and family among others were put in place and awaireness campaigns on GBV prevention done. All those legal provisionsprevent and punish GBV Crimes in all of its forms, sexual harassment in the workplace inclusive, provide for equal inheritance rights between women and men, girls and boys and provide for equal opportunities and equal pay for women and men.

c) Child labour and women trafficking

As per the 4th Population and Housing Census of 2012, the children (below 17 years old) constitute 50.9% of the resident population of Nyagatare district, with females slightly outnumbering males. The female children represent 50.2% of the total children population in the District.The children share is higher in Musheri (54.2%) and Rwimiyaga (53.1%) and smaller inKiyombe sector (48.9%) and Nyagatare sector (49%).

Though there are no data for both Rwanda and Nyagatare District, the child labour or abuse situation in the District is not alarming. Legal mechanisms were put place to prevent child labour/ abuse in the country. The most noticeable regulations include the Law 54/2011 of 14/12/2011 relating to the rights and protection of the child and Law No

13/2009 of 27/05/2009 regulating labour in Rwanda, in addition to the Constitution of the Republic of Rwanda of 2003 revised in 2015.

Concerning women and child trafficking, this type of crime is likely still unknown in Rwanda, and there is no related provision in the Penal Code.

4.6.3 Population on the right of way

The feeder roads in Nyagatare District pass through scattered settlements, grouped settlements (villages) and trading centers. In general about 2.5 to 4 m average width will be required for widening of roads to have right of way of 10.5 m. The widening will have impact on houses, agricultural land and other infrastructure facilities. The following are the socio-economic characteristics of the RoW.

a) Families within the right of way

The survey of the people likely to be affected by road widening works revealed that 590 families are living or have properties within the RoW for all indicative feeder roads. The total number of people within RoW reaches 2,598 people including 1,273 men and 1,325 women.

b) Size of the surveyed Household

The information concerning size of the households was collected and results are summarized in Table below.

Table 16: Size of the surveyed Households

S/N	Family size	Number of Respondents	Percentage (%)
1	Small (2-4)	21	30
2	Medium (4-6)	42	60
3	Large (Above 6)	7	10
	Total	**70**	**100**

Source: Field survey and Analysis, July, 2016

The results from the survey revealed thatthe majority of families within the RoW (60%) are of medium size (4-6 people per household) while large families are represented by 10%. About 30% and 10% of the surveyed families have small size and large size, meaning between 2-4 and above 6 persons per family respectively.

c) Marital status of respondents

The marital status of the surveyed families is an important parameter to know the views of different categories of people about the project. The table below showed the marital status of the respondents.

Table 17: Marital Status of Respondents in the Household Surveyed

S/N	Marital status	Number of respondents	Percentage (%)
1	Married	61	87.1
2	Single	3	4.3
3	Widow	5	7.2
4	Divorced	1	1.4
	Total	**70**	**100**

Source: *Field survey and Analysis, July 2016*

The majority of families (87.1%) within the RoWare married while widow, single and divorced families are represented by 7.2%, 4.3% and 1.4% respectively.

d) Vulnerability of people within the right of way

The vulnerability and social group for individuals in the community is for a paramount importance because it gives the idea of level of vulnerability. The following **Table** gives the detail on vulnerability within the right of way.

The majority of the project affected population (75.7%) are in normal conditions and persons representing 8.6% are orphans; persons living with disability are 4.3%; women headed households are represented by 4.3% while7.1% represent elderly persons (ie people above 65 years).

Table 18: Vulnerability assessment in the RoW

S/N	***Social group***	***Frequency***	***%***
1	Living with disability	3	4.3
2	Orphans	6	8.6
3	Women headed household	3	4.3
4	Aged people	5	7.1
5	People in normal conditions	53	75.7

	Total	**70**	**100**

***Source**: Field survey and Analysis, July 2016*

e) Education of Respondents

The level of education among the population within the RoW is very low as revealed by the data analysis reported in Table below. Among the respondents, 25.7% are illiterate; primary (elementary level) education represents 58.6% and 7.1% have incomplete secondary level. The proportion representing those who completed the secondary vocational represents 8.6%. The main reason is the poverty of families that could not afford school fees and materials required for the education of their children. However, due to the government policy, elementary education is free of charge, therefore every parents has an obligation to send his children to school.

Table 19: Level of Education of respondents

S/N	Level of education	Frequency (No)	Percentage (%)
1	Illiterate	18	25.7
2	Primary	41	58.6
3	Incomplete Secondary	5	7.1
4	Secondary	0	0
5	Secondary vocational	6	8.6
6	Incomplete Higher	0	0
7	Higher (Bachelors Degree)	0	0
8	Postgraduate	0	0
	Total	**70**	**100**

***Source**: Field survey and Analysis, July 2016*

4.6.4 Socio-economic Conditions

Concerning the households economic condition and making reference to poverty and extreme poverty lines, set out at Rwf 159,375 and Rwf 105,064 respectively, Nyagatare district is ranked 20th position country-wide by percentage of extreme-poor and poor population categories. In the previous survey EICV3 2010-11 Nyagatare was ranked 9th; the worsening of economic conditions is attributed to the frequent droughts that have affected the agriculture and livestock.

About 56% of the population in Nyagatare District is identified as non-poor, 24.6% as poor (excluding extreme-poor) and 19.5% as extreme-poor on total population by District. Compared with other 6 districts of Eastern Province, Nyagatare district comes 6th (out of seven) for proportion of non-poor.

Referring to the sector's contribution to household income, the EICV3 results show that at the national level, agriculture contributes the largest share of a household's income (46%), followed by wage income (25%), business income (i.e. self-employment), transfers, and rents. The smallest contributors to household income in Nyagatare District are private and public transfers, with 8.3% and 4.4% respectively.

a) Agriculture

The mean size of land cultivated per household in Nyagatare District is 0.77 ha. Consequently, Nyagatare district is also among the seven Districts that have a high percentage of cultivating households (66%) that cultivate between 0.75 and 0.9 ha of land. The proportion of households cultivating under 0.3 ha land by district represents 29% in Nyagatare District, ranking it 25th among all Districts in terms of the percentage of households with under 0.3 ha of land.

Various crops are grown in Nyagatare District. Those include maize which occupies the first place with an average of 35% of crop share which is above the national average (18%), followed by bush beans (13%) equivalent to the national share crop and banana with 13% of crop share which is below the national average (18%). Cassava comes fourth with 11% of crop share and therefore, being above the national average (9%). Other crops include sorghum, rice, vegetables (mainly tomatoes and ognion), sweet potatoes, soyabean and groundnuts.The following table illustrates the proportion of the key crop production in 2015 A and B Seasons in Nyagatare District.

Table 20: Crop production in Nyagatare District

District Sectors	Production (Tons)					
	Maize	**Bean**	**Cassava**	**Soyabean**	**Rice**	**Total**
Gatunda	2000	1500	1200	0.0	816.0	5516
Karama	2400	7000	1740	187	0.0	11327
Karangazi	13647.6	6920	6000	86.4	0.0	26654
Katabagemu	11,204.0	2561.6	660	178	0.0	14603.6
Matimba	8,700.0	2400	600	520	0.0	12220
Mimuri	4,095.0	3249	0.0	592	0.0	7936
Mukama	3,375.0	2300	380.0	150	0.0	6205
Musheri	7,978.5	3300	1100	0.0	0.0	12378.5

Nyagatare	9,320.0	2200	480	16	3,190.0	15206
Rukomo	5,920.0	3525	740	58.5	3,600.0	13843.5
Rwempasha	3,380.0	1330	600	43.5	12,955.3	18308.7
Rwimiyaga	27,712.0	8296.5	7000	294	0.0	43302.5
Tabagwe	3,730.0	3114	1100	7	2,800.0	10751.0
Nyagatare District	**103,462.1**	**48,146.1**	**21,600**	**2,132.4**	**23,361.3**	**198,701.8**

Source: Feasibility study of indicative feeder roads in 5 Districts by Sheladia, June, 2016

The Nyagatare District statistics show that the traded staple crops (banana, maize, cassava and beans) account for 35% of the production whereas the cash crops (paddy rice and soya beans) are almost totally traded (Nyagatare, 2013). The main crop in Nyagatare District is Maize with 103,462Tons of agricultural production in season A and B 2015. Other crops include bean, banana and rice.The table below depicts the proportion of the crop production marketed in 2015 A and B Seasons.

Table 21: Marketed crop production in Nyagatare District for 2015 A and B Seasons

Source*: Feasibility study of indicative feeder roads in 5 Districts by Sheladia, June, 2016*

District Sectors	**Sold production (Tons)**						
	Maize	**Bean**	**Cassava**	**Soyabean**	**Rice**	**Total**	**%**
Gatunda	1,400	1,200	1,080	0.0	816.0	4,496	82
Karama	1,680	5,600	1,566	177.7	0.0	9,023.7	80
Karangazi	9,553.3	5,536	5,400	82.1	0.0	20,571.4	77
Katabagemu	7,842.3	2,049.3	594	169.1	0.0	10,655.2	73
Matimba	6,090	1,920	540	494	0.0	9,044	74
Mimuri	2,866.5	2,599.2	0.0	562.4	0.0	6,028.1	76
Mukama	2,362.5	1,840	342.0	142.5	0.0	4,687	76
Musheri	5,585	2,640	990.0	0.0	0.0	9,215	74
Nyagatare	6,524	1,760	432	15.2	3,190.0	11,921.2	78
Rukomo	4,144	2,820	666	55.6	3,600.0	11,285.6	82
Rwempasha	2,366	1,064	540	41.3	12,955.3	16,966.5	93
Rwimiyaga	19,398.4	6,637.2	6,300	279.3	0.0	32,614.9	75
Tabagwe	2,611	2,491.2	990	6.7	2,800.0	8,898.9	83
Nyagatare District	**72,423.5**	**38,516.9**	**19,440**	**2,025.7**	**23,361.3**	**155,767.3**	**78**

The table shows that 78% of the total production for key crops are marketed. Maize (70%) and beans (80%) are the key crops sold, representing 71.2 % of the total marketed produce in the district of Nyagatare.

Commercialization of crop production overall, as measured by the share of harvest sold (including households selling zero crops), is 27% in Nyagatare District. It is 20.9% atnational level and about 20% in all other provinces outside Kigali City.

In addition to crops, livestock is another important source of income and food for agricultural households. The livestock population of Nyagatare District includes cattle (198,613), followed by goats (181,637), chicken (108,026), rabbits (19,427), sheep (17,902) and pigs (6,357). There are 12 Milk Collection Centers in 8 Sectors with a total capacity of 71,000 liters.

b) Access to basic infrastructures

Located in semi-arid zone, Nyagatare district faces with few water sources and accessibility. The majority of households in Nyagatare District use surface water (rivers or valley dam water) and public standpipes. Only 42.3% of the District population access to clean water (EICV 2011).

The district has improved tremendously in education sector. According to EICV3, the net enrolment in primary school is at the rate of 87.1 % and 70% in secondary schools. The overall enrolment rate in primary school is however slightly lower compared to the national average of 91%.

There are 20 health centers, two health posts, one prison dispensary and one district hospital in Nyagatare District (Nyagatare District, 2013). They all have access to water, internet and electricity. With regards to the distance covered in order to reach health facilities, EICV3 indicated that the mean walking distance to a health centre in Nyagatare District is the same as the national level (60 minutes) and 48.3% of households walk for under one hour to reach a health centre.

The current market infrastructure in Nyagatare offers two main types of structures: modern markets and selling points. Nyagatare District has five (5) modern markets for goods (Rukomo, Mimuri, Rwimiyaga, Matimba and Nyakiganda), seven (7) commercial centers (Kagitumba, Rwimiyaga, Matimba, Rukomo, Karama, Mimuri and Nyakiganda) and eight (8) modern markets for cattle (Ryabega, Mbare, Karangazi, Nyendo, Rwimiyaga, Nshuri, Rutare and Nyakiganda). The District also has one selling point.

Energy sector is also another important sector in economic transformation of the District.The overall distribution of electricity in Nyagatare district is 23.4% which is above the national level of 10.8%. Out of 105,686 resident households in Nyagatare District, 24,704 households (23.4%) are electrified and 73,756 households use improved cooking stoves. About 412 families use biogas as energy source. Four percent use cooking gas.

The Consultant made an inventory of basic infrastructures along the indicative feeder roads in Nyagatare District. The Table below presents the number of schools, health centers, churches, markets and public offices by road.

Table 22: Number of schools, health centers, churches and public offices by road

Road ID	Road Name	Basic Infrastructures			
		Health Center	School	public office	Church
FR1	Nyagatare – Kanyinya - Kagitumba	1	3	4	2
FR2	Kagezi - Matimba			1	1
FR3	Nyabitekeri-Nshuri-Nyagatare- Rwempasha	1	2	2	4
FR4	Nyagatare- Nyarupfubire		2	2	3
FR5	Kijojo- Ntoma- Musheli- Nyamiyonga	1	2	2	2
FR6	Nyakigando- Mimuli	3	5	3	2
FR7	Rurenge- Bushara- Kabuga	0	2	4	5
FR8	Cyenkwanzi- Gikagati- Nyacyiga- Ndego	2	1	3	0
FR9	Nyabitekeri- Kabirizi- Ngoma- Gafaru- Kabusunzu	1	1	1	2
FR10	Mimuli- Mukama- Muhambo- Gatunda	3	4	6	2
FR11	Nyarurema- Muhambo	1	0	0	0
FR12	Karangazi- Ndama- Rwabiharamba	1	1	2	1
FR13	Matimba- Musheli- Bihinga	1	1	1	3
FR14	Gasinga- Kabindi	1	1	1	
Total		**16**	**25**	**32**	**27**

Source: Survey by the Consultant, October, 2016

About 50% of indicative feeder roads are in bad or very bad condition (Sheladia, 2016). The indicative feeder roads are mostly used by pedestrians (56%) and bicycles (27%) while motocycles are used by 16% of the road users. However, motocycles related accident due to bad road condition, distraction and inattention is the most frequent in the area and pedestrians are the most vulnerable road users.

c) Distances to basic services

From the viewpoint of the basic services, Nyagatare district ranks lower than the national average. Walking distance to basic services can be considered as an indicator of both provision and coverage of such services and the remoteness of households' dwellings. Referring to the mean walking distance to primary school by District, it shows that Nyagatare is classified among eleven Districts with a mean walking distance to a primary school within the interval of 28 to 33 minutes.

The mean walking distance to primary school in Nyagatare District is 34.43 minutes. About 35% of households are still between 30 and 59 minutes of a primary school. This

walking distance to a primary school in Nyagatare District is higher than the mean distance in rural areas, and higher than the national level. The mean walking distance to a primary school is 28.6 minutes in rural areas, 19.4 minutes in urban areas and 27.2 minutes at national level.

The mean walking distance to a health centre in Nyagatare district is the same as the national level (60 minutes) and 44.3% of households walk for under an hour to reach a health centre. The mean walking distance to a health centre is 35 minutes in urban areas and 64.4 minutes in rural areas, while it is one hour country-wide.

d) Social services and prevention of communicable diseases

Predominant communicable diseases in Nyagatare District include Malaria, HIV/AIDS, Tuberculosis, epidemics and other transmittable diseases. Social services were put in place for their prevention.

The rate of malaria within Nyagatare District is around 6%. Treated mosquito nets are distributed free of charge to pregnant women attending antenatale care (ANC) and to children under 5 years through mass campaigns countrywide and campaign for malaria prevention and treatment. The malaria treatmentdrugs wereintroduced in all health facilities,community health workers (CHW) in all Districts and in private pharmacies. Training of CHWs on malaria prevention and treatment and mass awaireness campaigns for malaria prevention are regularly conducted.

The HIV/AIDS prevalence in Nyagatare district averages 1.9% and this is below the national level of 3%. The number of health facilities offering HIV/AIDS services has increased to 98% for Voluntary Canceling and Testing (VCT), 97% for Prevention of Mother to Child Transmission (PMTCT); while 93% of health facilities provide full package including antiretroviral treatment (ART). All health centers within the project site offer HIV/AIDS services.

e) Employment opportunities

With reference to employment, the overall employment rate is 85% of the resident population aged 16 years and above in Nyagatare district; the unemployment rate is0.2% and the economic inactivity rate is 15%. Nyagatare District is ranked 16th among all districts by employment rate. The national average employment rate is 84%, the unemployment rate is 0.9% and the economic inactivity rate is 15%.

With reference to usual main job in Nyagatare district, most people aged 16 years and above in Nyagatare have independent farmer as their main job (66.5%). The second most frequent main job is wage farm (13.2%), followed by wage nonfarm (10%). Only 7.2% are independent nonfarmers (i.e. businesses).

The survey done within the RoW by the Consultant indicates that agriculture employs 51.5%, followed by wage income (public servant, mason, etc) with 24.3% and business income (trading, etc) with 15.7%.

4.6.5 Resettlement implications of the Project

The indicative feeder roads in Nyagatare District pass through scattered settlements, villages and trading centers (towns). The widening will have impact on houses, agriculture land and other infrastructure facilities. About 128 houses on the indicative feeder roads are likely to be affected if the 10.5 m RoW is considered. Most of them are concentrated on roads passing through grouped settlements. About 84.19 ha of land, mostly agricultural land, community assets, crops and trees on the land are potential properties to get affected due to widening of feeder roads in the District. The Subproject RAP for affected assets is being prepared and compensation for affected assets will be done before the start of civil works.

5 PUBLIC CONSULTATIONS AND PARTICIPATION

Public participation and community consultation has been taken up as an integral part of social assessment process of the project. 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 the participation in the decision making process. 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. It was also organized to determine their thoughts, opinions and feedback on the impact of the rehabilitation of feeder roads in the District.

Two public consultation meetings, one at the screening stage and the second at the draft report presentatation stage. The 1st public consultation meeting concerned various stakeholders, namely local authorities, private sector, farmers organizations, churches and local communities. The 2nd meeting brought together district officers (road engineers, environmental and social protection officers), representatives of the district private sector, farmers cooperatives, church leaders). The 2nd meeting was held on 31/08/2016.

The public consultation was carried out in different areas. The approach of zoning was used to group close roads in one zone. A total number of 6 zones have been identified and a public consultation was held in each zone. **Table 23** provides details of Zones and the way roads have been grouped in the zones.

Table 23: Zones of Public Consultation Meetings

S/N	Zone	Roads covered	Date of Public Consultation	Number of participants
1	Ndama	F12	30/07/2016	96
2	Gatunda	FR6, FR10, FR11	27/08/2016	169
3	Ndego	FR8	30/07/2016	48
4	Karama	FR9, F8, FR7, FR4, FR3	27/08/2016	208
5	Gasinga	FR1, FR14	30/07/2016	60
6	Musheli	FR1, FR2, FR5, FR13	27/08/2016	59
TOTAL				640

Source: Consultant's Survey and field visit, July 2016

5.1 Stakeholders

Involving stakeholders through participatory direct or indirect consultations is central to completion of the ESIA/ESMP. The main groups of stakeholders met are:

- Local authorities;
- Churches and cooperative leaders
- Private sector,
- Community People and Road Users'

5.2 Public Participation – Methods and Process

During the consultative process, beside the local authorities and ordinary population (mainly PAPs), other social organizations were also invited to attend the communication meetings. These are church leaders, local cooperative leaders and private sector. The public consultation for ESIA andPre-RAP, was conducted at the same time.

During consultation meetings with the communities, efforts were made to reach as many people as possible. For this purpose, the strategy of reaching people in community works known as "UMUGANDA[10]" was exploited. For this purpose, public consultation was carried out with two different groups and different areas. The approach of road zoning was also used to group close roads in one zone.

All stakeholders met were explained about the project (background, objectives, expected upcoming activities, social and environmental impacts) as well as project expectations from the beneficiaries for its success. The participants were encouraged to (i) be open and raise their concerns and claims. The Lists of stakeholders contacted are reported in Table 24, 25, 26 and Annexure 7.

5.3 Findings from Public Consultation Meeting

The data obtained from public consultation and views as well as concerns from different stakeholders are presented below. The people who participated in the public consultation, their signed attendance sheets are available in Annexure 7 and photographs are put at the end of this Section.

[10] Umuganda : Is a traditional practice, through which citizens living in the same Village, Cell, Sector with local authorities meet in public work. This is carried out every last Saturday of the month.

5.3.1 Consultation with district authorities

As earlier indicated, the District will play a critical role in the project. Thus, during the field visits, District Authorities have been consulted for the purpose of raising awareness about the project and getting their views/ perception on the project. A meeting with District authorities was held on 12th /05/2016 at the District headquarters. **Table 24** shows details on the consulted authorities.

Table 24: Authorities Consulted in Nyagatare District

S/N	Names	Function	Contact
1	MUSABYEMARIYA Domitille	Vice Mayor in charge of Social Affairs	0788823774
2	TURATSINZE Caleb	Director of one Stop Center	0788638752
3	MURINZI John	District Infrastructure engineer	0788816244
6	SONGA Joseph	Executive Secretary Rwenanga Cell	0787858118

Source: Consultant's Survey, July 2016

The salient feature of the meeting is presented below:

i) Views from the Vice Mayor / Social Affairs of Nyagatare District

The Vice Mayor in charge of Social Affairs of Nyagatare District fully supports and appreciates the "Feeder Road Project". She argued that *"the rehabilitation of these feeder roads is synonym to development"* There are much benefits expected form the project such as facilitating transport for agricultural production to the market. However, she pointed out that, though the project brings positive impact to the people, it might also generate negative impact; thus she urged the teamto minimise the negative impact, by developing mitigation measures, including expropriation before the project implementation. She further, insisted on the strict application of the laws, procedures and principles governing expropriation for public interests. She concluded that the project should be people centred.

ii) Views from the Director of One Stop Center of Nyagatare District

The One Stop Center of Nyagatare District fully supports the "Feeder Road Project". In his remarks during the meeting session, he stated that " *It is with pleasure to have this kind of project in our District"* He argued that *"the rehabilitation of these feeder roads will certainly bring positive impact to the people".*

The benefits expected are Improved conditions of transporting goods and people; (ii) Opening up of the hinterland and improved access to basic socioeconomic infrastructure; (iii) Creation of direct and indirect employment during the road construction, operation and maintenance phases; (iv) Reduced risk of landslides and erosion thanks to the reinforcement and monitoring of embankments; (vii) Added value of land as a result of improved accessibility; and Improved security around schools along the road.She finally urged the people to well come the project, and for the PAPs that they should not worry, as laws are there to protect them.

iii) Views from the Executive Secretaries of Cell

In line with the Director of one stop Center, the Executive Secretary of Rwenanga Cell acknowledges the huge benefits that they expect from the rehabilitation the feeder Roads in Nyagatare District. They urged the participants to welcome the project as it brings benefits to them. People should participate in the implantation and the protection of these socio economic infrastructures. People's participation has to be observed in the rehabilitation, as they will the first to given jobs. They reminded the participants the compensation law and practices.

5.3.2 Consultation with Cooperative Leaders

During the public consultation leaders of cooperatives have been consulted with the aim of raising their awareness about the project and getting their views about the project as opinion leaders. The meeting with cooperative leaders and members was held on 28th May 2016. **Table 25** shows details about cooperative leaders consulted.

Table 25: Details about consulted cooperative leaders

S/N	Name of the Leader	Cooperative	Contact
1	IRYARUREMESHA Bony Steven	KOKOWINYA[11]	0788616431
2	UWIMANA Grace	KABOKU[12]	0788679231
3	NDIZEYE James	KRMC[13]	0788525780
4	KAYIGEMA Didace	KRMC	0785023261

Source: Consultant's Survey, May 2016

[11] Koperative yo Kongera Umusaruro W'ibigori mu Karere ka Nyagatare (KOKOWINYA)
[12] Koperative y'Abahinzi Borozi bo mukibaya cy'Umuvumba
[13] Karangazi Rapid Motocycle Cooperative (KRMC)

The salient feature of their views, is that they all appreciate and welcome the project, as it will facilitate them to channel their production to the market. Easy access to the market will certainly boost the value of their products. However, they all raised the concern of the land in case the widening of the road requires land acquisition. They suggested that the project should avail a fair compensation to their, and payment has to be done before the transfer of their land.

5.3.3 Consultation with Church Leaders

During the public consultation, church leaders (**Table 26**) have been consulted, for the purpose of colleting their view and concerns about the project. Being opinion leaders, they are key stakeholders of the project their views are relevant due to their influential role in the society.They all appreciate the project and argue that infrastructures in general and roads specifically, are the engine of development. Thus, the rehabilitation of these feeder roads will bring development to the population. However, their prime concerns are related to the compensation, procedures that are followed, etc. They finally recommended that laws governing expropriation should be strictly observed during the project implementation, especially during the valuation and compensation payment.

Table 26: Details about consulted church leaders

S/N	Name of the Leader	Church	Contact
1	RWABUHUNGU Telesphore	ADEPR	0788646065
2	TWAHIRWA ERIDADI	AEBR	0783222344

Source: Consultant's Survey, July 2016

5.3.4 Consultative Meetings with community

The meeting was held after the Community works "Umuganda" on 27th of July, 2016. Approximately 640 people attended the public consultation meetings, including 20% of women.The main objective of the public consultations was to gather information on their concerns, perceptions, reactions and fears of the livelihood changes to be brought about as a result/consequence of rehabilitation of feeder roads in Nyagatare District.

After the presentation, the community was given opportunity to give their views, comments and queries.

Different community problems were addressed during the meeting in which the local participants expressed repeatedly their main concerns as follows:

- Road safety issues, especially motocycles related accidents;
- Compensation of affected assets
- Lack of jobs and income generating activities
- Very poor road conditions in some villages;
- Lack of sidewalk;
- Narrow local roads..

Any comments or questions raised by stakeholders were responded to by the Consultant and recorded. Employment opportunities in jobs associated with the rehabilitation of feeder roads was a theme brought up in the meetings. The consultant explained that positive and negative impacts of the project on people and the environment will be analysed such as air pollution, dust, influx of people, employment, traffic, road safety, the consultant team highlights that the project will follow government policies in protecting the population.

All the participants confirmed that they appreciate the feeder Road Rehabilitation Project. The project received high degree of acceptability in that rehabilitation of the road will boost local economy due to increased usage of the road hence more exposure and increased benefits as more people would be passing through the road and in a way increase trading opportunities.

During public consultation following points have emerged as their recommendations:

- The PAPs and other stakeholders consulted are in favor of the project.
- The project Affected People will prefer cash compensation for houses likely to be affected,
- The PAPs who are involved in business have given their choice near the market or cell / sector resettlement scheme;
- Farmers have also indicated cash compensation for crops and trees;
- Most of the PAPs are looking some form of incentive for themselves from the projects such as regular/ temporary jobs.

These recommendations shall be assessed against laws and procedures governing compensation and expropriation in the context of feeder roads in Rwanda.

The signed attendance list of people participatingin public consultation is presented in Annexure 7 and photos are presented below.

Figure 9: A Photographic View of Public Consultation

6 ENVIRONMENTAL AND SOCIAL IMPACTS

6.1 ENVIRONMENTAL IMPACTS

In pursuance of the global goals of nature conservation and protection of environment to which Rwanda is committed, the Government of Rwanda has initiated plans, schemes and actions to implement various legislations. The Organic Law of 2005 determining the modalities for protection, conservation and promotion of environment in Rwanda and the Ministerial Order of 2008 determining the requirements and procedures for conducting EIA are the most important legislation for environmental assessments in Rwanda. The Guidelines and procedures for EIA 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 prior to their implementation.

The present project is about reconstruction and modification/ expansion of feeder roads in Nyagatare District, the Eastern Province. Hence an EIA is required before construction of the project. The project is expected to impact a large number of people, therefore its social impacts have been more emphasized in the present report, making it an Environmental and Social Impact Assessment (ESIA).

With rapid strides in economic development, the need for rationalizing the development is imperative. In the process of development, there has been intensive use of natural resources; very often leading to ecological imbalance. In construction projects like this, involving wide ranging construction activity, conservation of flora and fauna is an important aspect of eco-development. The impacts of the project could be positive or negative. Both types of impacts have been studied and wherever possible, have been quantified. The potential impacts have been assessed in this chapter from the proposed development on environmental baseline conditions (refer to**Chapter 4**), while recommendations for environmental management and enhancement measures have been enumerated in **Chapter 7.** Both negative and positive impacts are categorized as direct or indirect.

6.2 IMPACT IDENTIFICATION

The potential environmental impacts depend on the location of the project and type and volume of the interventions due to proposed development.

The project activities such as levelling, cutting, clearing of vegetation, felling the trees along the road, construction of culverts & bridges on rivers or swamps, setting up of labour camps, installation of construction machinery and other related operations are bound to cause environmental impacts, either positive or negative. The impact to environment due to road project, can be minimized or avoided, if appropriate management measures are adopted during design, construction and operation phases. The identification of potential impacts is based on field inspection of existing road with due consideration of direct, indirect, cumulative, positive or negative and secondary impacts on environmental attributes. The impacts are presented for both positive and negative in nature for different phases of project cycle in the following sections.

6.3 POSITIVE IMPACTS

The positive impacts likely to result from the proposed project have been identified based on project description in Chapter 3 and the existing environmental conditions in Chapter 4. The current state of the road is challenging especially to the road users. Rehabilitation of Nyagatare feeder road network will thus bring about many benefits. The identified positive impacts for different phases of the project cycle are discussed in the following sections.

6.3.1 Impact during Planning and Design phase

i) Employment opportunities

During the planning and design period, new jobs will be created for the skilled and unskilled manpower in the community to conduct topographical and geological investigations. A majority of unskilled labour will be sourced from the local residents. Indirect employment will be in the form of suppliers and other forms of sub-contracted works that will be required for planning and design of project components. Women and youth will also have an opportunity to secure employment.

ii) Skills transfer

The international consultant will associate with local partners. In the process of planning and design, the local technical manpower will work with the international experts. This process of working together will transfer design and planning tools, computer design software and other useful guideline which are used in similar topographical conditions in the world.

iii) Training

The international consultant will provide training to local counterparts for acquiring new skills likely to be necessary for the planning and design activities. This training and trained manpower will go a long way in meeting the requirements of the country in the transport sector in general and the roads development in particular.

6.3.2 Impacts during Construction Phase

i) Employment Opportunities

The construction of feeder roads will use a labour-intensive approach. During the construction phase, it is estimated that about 500 people will be working as labour both skilled and unskilled. The majority of this labour will be unskilled, from which more than 400people will be sourced from the local residents and hence creating employment throughout the District. Indirect employment will be in the form of suppliers and other forms of sub-contracted works that will be required for the construction of project components.In addition new jobs will be created in the Government forthe implementation, monitoring and evaluation of the project. Women will also have an opportunity to secure employment.

ii) Enhancement of Rural Economy

As the construction works are spread throughout the District in rural areas, people in these areas will get an opportunity to work for the project. This will increase their income, therefore supporting the rural economy. Those who are involved in trade will have opportunities to supply construction materials for the project or the other items required for the work force working at site.

iii) Social Interaction

The National and International; local and regional manpower will be working together for the project. This interaction will enhance social interaction between the people from different places and social levels.

iv) Boost to Industrial Activities

During construction,locally made product will be utilized such as cement and gravels. The consumption of these will give boost to industrial production of construction materials. During construction, supply of construction materials, 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 transport of materials from manufacturing site to construction site. This will provide direct and indirect employment.

v) Induced impacts of the project

Due to road construction activities, small businesses will be created/ enhanced. The selling of construction materials such as sand and stones will be developed in the project site. Other small businesses like mobile restaurants and pubs will be run to meet workers' food needs at work.

6.3.3 Impacts during Project Operation

i) Improved Transport System, Accessibility and Communication

As a consequence to the poor road condition, investors in the transport industry have no incentive, hence the public transport system is underdeveloped and unreliable with only some buses plying the road at designated times in some sections of the road. Residents, therefore, have to use mostly the motocycles or seek other means of transport from unauthorized vehicles such as pick-ups and trucks. With the improvement of the road, transport will be improved both in terms of travel time, comfort, safety and lower costs associated with an increase in public service vehicles. During operation, accessibility to the various public institutions and markets will be enhanced, in particular, accessibility to health centersand educational institutions. After rehabilitation and reconstruction of feeder road network, the condition of the road will improve and transportation of commodities to and from the project areas will become easy. This will contribute on long term basis for the socio-economic development of the project area. The improved road safety and reduction in road accidents as opposed to the current situation in which, accidents are quite rampant due to the rutty, rugged nature of the road, dust, ditches, mud and pools of water in rainy season etc. The feeder roads development will lead better and wider connection of the project area with the rest of the country, enhancing Nyagatare District development in particular, and the whole country in general.

ii) Employment Opportunities

In the post construction phase the project will provide social benefits in terms of direct employment by way of better commercial and industrial development of the area.Additionally, more people may be indirectly employed in allied activities and trade. In the operation phase of the feeder roads project, more job opportunities will arise in various sectors such as the transport industry, the tourism sector, commerce and trade of agriculture products.

Taken together, job creation will help to reduce the problem of unemployment with improvement in income for the workers' household and revenue for the country. Apart from additional employment opportunities in farming operations, access to nearby market, would also provide opportunity for marketing of farm products and farm inputs creating additional employment in the locality.

iii) Enhancement of Rural Economy (Agriculture and Trade)

The road will provide a stimulus growth to Nyagatare District as well as improving trade with the other nearby Districts through faster transportation of agriculture products. The performance of this sector is likely to experience the greatest gain upon improvement of the road since majority of the population derive their livelihood from agriculture. The agriculture is expected to be the greatest beneficiary of the project. The poor road network was repeatedly cited as one of the major hindrances to the growth of the agriculture sector that accounts for 80 percent of employment in Rwanda. Road condition has led to low incomes for farmers and the subsequent inability of the District to increase the sector as required.

After rehabilitation and upgrading of the road, there is greater potential for the establishment of agro-processing plants to process the huge supply of fruits, banana and other crops. In the fieldwork survey it was noted that a lot of agriculture products are sold in the cities of Nyagatare, Kayonza and Kigali. Currently local farmers face a problem of market because of higher transportation costs. In addition, some of the agricultural goods like vegetables from the locality were of lower quality due to the longer transport time to markets. In the areas of Gikobwa, many agriculture lands are not really exploited because of lack of market.The market potential will be augmented by upgrading and rehabilitating access roads to city, thereby increasing incomes in agribusiness sector and raising the socio-economic status of local households. With the anticipated efficient, reliable and cheap transport, the following are likely to be achieved.

- Quick and easy transport of perishable farm produce such as vegetables and fruits to markets and livestock too on less price;
- Cheaper and available farm inputs and ease in provision of services to farmers;
- Easy access to bigger and better markets such as Kigali and in surrounding Districts;
- Improved marketing of agricultural products, thus higher prices.

It is likely that the farmers of most agricultural products in the area will improve depending on the commodity and the season.

All the above impacts on this dominant sector will have indirect positive impacts on other sectors, especially trade and commerce, transportation, health and nutrition and education.

iv) Reduction in Length and Travel Time from Origin to Destination

The proposed feeder roads intersect with National Road 5 at number of places. On commissioning, the feeder roads, will improve connectivity between different places, provides faster access to Kigali resulting in reduction in vehicle expenses and travel time and facilitate the development of a new economic corridor.

v) Potential to Improve Drainage and its Environmental Benefits

The current drainage structures are mainly inadequate and / or in disrepair. Often the structures cannot accommodate high flows associated with flash floods in the wet seasons. In addition, soil depositions, debris and solid waste have also clogged several drainage structures where routine maintenance activity is inactive. The project will redesign, upgrade and reconstruct all these structures. The improved road drainage system and reconstruction of bridges will reduce erosion rate. On the roads embankments, the application of bioengineering measures in high erosion risk zone will reduce possible landslides from heavy rains.

vi) Skills Transfer and Training

Through local labour recruitment, the workers will have an opportunity to learn an array of skills that relate to road rehabilitation and reconstruction. These skills will be very important during regular maintenance that will be carried out during the project operation, and generally done by the local population. Improved transport will improve interaction with other communities outside the project area, that will also provide an opportunity for further learning and cultural exchange.

vii) Enhanced Social Interaction

The infrastructures for social services developed in the area are schools, health centres, water and energy. The expected rehabilitation/ upgrading of the feeder road will enhance access to existing social amenities and stimulate their growth as more people will be using them; ultimately adding to agricultural development. With the construction of feeder roads, the main artery for social interaction amongst towns and villages along the route shall be strengthened. The general quality of life along the route will be enhanced, spurring the District's development.

viii) Road Safety

The improvement of feeder roads will make travelling easy and safer, because the accidents are quite rampant due to therutty, rugged nature of the feeder roads for the current situation. From the public consultations, most of road accidents are caused by motocycles. Improved feeder roads will attract investments in public transport, therefore reducing the number of people using motocycles, thus improving road safety.

ix) Reduction in Green House Gases

During operation of improved feeder roads, the vehicles will operate closer to design speed which will help reduction of emission of hydrocarbons and carbon-monoxide from exhaust. Hence the emission reduction of carbon monoxide will decrease the green house gases at regional and global levels which will have positive impact locally and regionally.

x) Reduction in Fuel Consumption

The vehicles provide better fuel performance at optimum air to fuel ratio which is optimum around design speed. Nyagatare landscape being mostly a rolling terrain, the feeder roads are designed for 60/40 km per hour (maximum/minimum)[14] which is closer to design speed of vehicles. This will facilitate in less fuel consumption which will have less burden on exchequer and will be direct impact on country's economy.

xi) Induced impacts of the project

The indicative feeder roads are passing through 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. This will acquire agricultural land and convert it into urban settings.

6.4 NEGATIVE IMPACTS

Leopold matrix has been used to show possible interaction between developmental activities and a set of environmental characteristics. On top on X-axis, project cycle activities are considered while on Y-axis, Valued Ecosystem Components (VEC) are taken to identify the impacts, through interaction method. The boxes are marked with possible impact during different phases of project cycles. Impacts on environmental component due to project activities are summarized in **Table 27** and discussed in subsequent sections.

[14] Feasibility Study report

Table 27: Impact Matrix for Potential Environmental Impacts

Component Affected	Project Activity								
	Planning Phase	Construction Phase							Operation Phase
	Land Acquisition	Site clearance	Removing trees and vegetation	Contractor camps	Vehicles & Machines operation and maintenance	Quarries	Construction/ modification of Roads	Construction Machinery	Operation
Soil	Loss of Agricultural land	Loss of crops, trees and other vegetation	Erosion and loss of top soil	Contamination from wastes	Contamination by fuel and lubricants; Compaction of soil	Increase in erosion, siltation and slope instability	Soil pollution	Pollution due to spills	Soil contamination due to surface runoff
Ground Water			Increased evaporation	Water extraction for drinking and other purposes	Water extraction for cleaning		Exploitation of water for construction		Maintenance of trees /shrubs
Surface water	Loss of water body	Change in water quality and siltation	Siltation Torrent runoff	Pollution from sanitary & other wastes	Contamination by fuel & lubricants	Water logging and mosquito breeding	Change in water quality and reduction of Ground Water recharge	Pollution due to spill into water bodies	Degradation due to spills & road runoff
Drainage		Change in natural drainage pattern	Change in natural drainage pattern	Change in drainage pattern due to disposal of solid wastes on soils	Change in natural drainage pattern due to spills	Change in drainage pattern	Interference with natural drainage and water logging		Cleaning & maintenance

Component Affected	**Project Activity**								
	Planning Phase	**Construction Phase**							**Operation Phase**
	Land Acquisition	**Site clearance**	**Removing trees and vegetation**	**Contractor camps**	**Vehicles & Machines operation and maintenance**	**Quarries**	**Construction/ modification of Roads**	**Construction Machinery**	**Operation**
Air Quality		Increase in SPM	Reduced buffering of air pollution, change in climatic conditions	Pollution due to fuel burning	Dust & air pollution	Dust pollution	Dust pollution	SPM, SO_2	Increase in SPM, SO_2 and NO_X
Noise Quality		Increase in Noise level	Reduced buffering of Noise		Increase in Noise level	Vibration from blasting operations	Vibrators, mixing plant noise etc.	Increase in Noise	Increase in noise levels due to increased traffic.
Flora & Fauna		Loss of crops, trees and migration of wild life	Loss of crops, trees and disturbance to wild life	Cutting of trees for fuel burning		Loss of trees, crops and disturbance to wild life	Disturbance of Wildlife		Collision with Wildlife
Socio-economic	Rehabilitation and Resettlement	Loss of Livelihood	Loss of forest and fruit trees	Transmission of Disease					
	Occupational health and safety	Possible child labour, gender	Possible child labour, gender	Prostitution at the camp					

Component Affected	**Project Activity**								
	Planning Phase	**Construction Phase**							**Operation Phase**
	Land Acquisition	**Site clearance**	**Removing trees and vegetation**	**Contractor camps**	**Vehicles & Machines operation and maintenance**	**Quarries**	**Construction/ modification of Roads**	**Construction Machinery**	**Operation**
		based violence, gender unequity	based violence, gender unequity						

6.4.1 Impact during Planning Phase

i) Change of Land Use Pattern

The development in the study area will definitely bring substantial change in the land use pattern as the road improvement/ construction will require additional land from private and government. It is estimated that on an average 10.5 m widening will require **84.19** ha land for the feeder roads improvement. The analysis of data has also indicated that about 80% land on road side is under agriculture. Hence around 67.4ha will be under agriculture. The land use change is presented in **Table 28.** This land requirement for the road construction will change the land use permanently from agricultural/ built up land into right of way (ROW). Though 84.19ha will be required for widening the feeder road, only6.24 ha will be permanently and irreversibly lost for the paved roads.

Table 28: Land Use Change

Feeder road No	Description	Average existing road width (m)*	Required road width (m)*	Required right of way (RoW) width (m)*	Average additional width for the road (m)	Average additional width for the RoW (m)	Length (km)*	Additional area required for the roads (ha)	Additional area required for the ROW (ha)
FR1	Nyagatare- Kanyinya- Kagitumba	6.30	6	10.5	-	4.20	36.31	0.00	15.25
FR2	Kagezi- Matimba	7.70	6	10.5	-	2.80	5.01	0.00	1.40
FR3	Nyabitekeri- Nshuri- Nyagatare-Rwempasha	6.00	6	10.5	-	4.50	18.07	0.00	8.13
FR4	Nyagatare-Nyarupfubire	5.70	6	10.5	0.30	4.80	9.80	0.29	4.70
FR5	Kijojo- Ntoma-Musheri-Nyamiyonga	5.60	6	10.5	0.40	4.90	19.20	0.77	9.41
FR6	Nyakigando- Mimuli	6.00	6	10.5	-	4.50	16.20	0.00	7.29
FR7	Rurenge- Bushara-Kabuga	5.10	6	10.5	0.90	5.40	15.73	1.42	8.49
FR8	Cyenkwanzi-Gikagati- Nyacyiga-Ndego	5.30	6	10.5	0.70	5.20	8.80	0.62	4.58
FR9	Nyabitekeri-Kabirizi- Ngoma-Gafaru-Kabusunzu	5.00	6	10.5	1.00	5.50	10.80	1.08	5.94
FR10	Mimuli- Mukama-Muhambo-Gatunda	6.50	6	10.5	-	4.00	18.40	0.00	7.36
FR11	Nyarurema-Muhambo	7.00	6	10.5	-	3.50	1.21	0.00	0.42
FR12	Karangazi- Ndama-Rwabiharamba	8.00	6	10.5	-	2.50	9.60	0.00	2.40
FR13	Matimba- Musheri-Bihinga	4.50	6	10.5	1.50	6.00	8.80	1.32	5.28

FR14	Gasinga- Kabindi	4.80	6	10.5	1.20	5.70	6.20	0.74	3.53
	Total				**0.34**	**4.57**	**184.13**	**6.24**	**84.19**

Source: Consultant's computation and (*) Feasibility report

6.4.2 Impact during Construction Phase

i) Change of Land Use due to Borrow/ Quarry Areasand road widening

About 180,000 m^3 of earth work is likely to be involved in up-gradation/ widening of feeder roads from excavation in rock and earth from borrow areas for wearing course and capping layer. Out of this, about 150,000 m^3 will be from borrow areas. The excavations of earth from rock in mining areas and borrow areas will require cutting of the rock and soils. If a depth of 4 m is taken for quarry/ mining, the land required will be 0.64 ha and for average depth of 2 m for borrow areas, the land required will be about 7.63 ha. The total borrow and quarry area required for will be about **11 ha**.

The stone quarries and borrow areas have been identified in the vicinity of the proposed roads to reducetransport costs. Eight (8) burrow pits and 2 stone quarries were identified as potential sites for construction materials.The following table illustrates the proposed borrow pits and stone quarries in Nyagatare District feeder roads.

Table 29: Borrow pits and stone quarries in Nyagatare District feeder roads

Label	Feeder Roads ID	Administrative location			Thick-ness (m)	Area (Ha)
		Sector	Cell	Village		
	Burrow pits details					
NGBP1	FR6, FR7, FR8, FR10, FR11	Gatunda	Nyamikamba	Muyenzi	2	1
NGBP2	FR7,FR8, FR9	Tabagwe	Nyagatoma	Kabusunzu	1.5	2
NGBP3	FR1, FR7, FR3, FR4, FR9	Rwempasha	Rutare	Nshuli	3	2
NGBP4	FR1, FR4, FR3, FR14, FR7, FR9	Nyagatare	Nyagatare	Mirama	4	0.5
NGBP5	FR6, FR12,	Karangazi	Mbare	Kanshoza	3	1
NGBP6	FR1, FR2, FR5, FR13, FR14	Musheli	Kijojo	Kagwegwe	2	0.5
NGBP7	FR1, FR2,FR13	Matimba	Cyembogo	Kamahoro	2	1
NGBP8	FR8, FR10, FR11	Kiyombe	Gitenga	Kabingo	2	1
	Stone quarry details					
NGRQ1	FR1, FR3, FR6, FR12, FR2, FR4, FR5, FR13, FR14	Nyagatare	Rutaraka	Nkonje		
NGRQ2	FR6, FR7, FR8, FR10, FR9, FR11	Gatunda	Muyenzi	Kabeza		

***Source**: Feasibility study of indicative feeder roads in 5 Districts by Sheladia, June, 2016*

The excavated borrow pitsand stones quarries are required to be restored and reclaimed in a satisfactory manner on completion of burrow and quarry operations.Excavation of earth from borrow areas and stones from quarry areas may lead to undrained pits that create additional habitats for water borne disease vectors and possible safety issues for people and livestock (drowning in deep/steep pits). It may also lead to loss of topsoil and soil erosion problem during rains; affecting otherwise productive farm land and degrading the aesthetic views of the landcape.Most of the above impacts are of short duration and could be managed by the management plans. The proper management of borrow and quarry areas will be implemented during construction phase.This impact is a temporary and reversible change in land use pattern.

The pits reclaimation should be done in a way it leaves the site in a safe, stable, and non-polluting condition with no remaining plant, soils or stones unnecessary for post-operational use,prevents the establishment of stagnant waterand supports vegetationgrowth over the long-term.After excavations, the surplus of excavated soils from roads, topsoil from land acquired for road widening as well as topsoil from borrow areas will be spread over the borrow pits to fill them. The organic materials will also be applied to improve the soil fertilityof the rehabilitated borrow areas, especially those under croplands, before handing them over to their respective owners and used for crop production. Trees or grasses will be planted after rehabilitation of borrow pits located in forest land or abandoned land. With regards to stone quarry sites, theirclosure and restauration should be done throughreshaping the quarry pits, backfilling the pits using topsoils from within or outside the site and revegetating the areas. The use of indigenous trees species will be encouraged.

About 6.24 ha of area will be stripped for cleaning of road surface for the project work. Excavated earth material estimated at 500,000 m3 will be reused in the road construction or will be used to fill the low laying areas or fill borrow pits/ quarry areas, hence its disposal is not likely to have impact on the environment. However, this soil material should never be disposed of into the wetlands. The acquired land for road widening will be permanently lost since it will be an integral part of the carriageway. This impact is permanent and irreversible. Compensatory measures will be planned for.

ii) Soil Loss

The soil loss will be in terms of top soil erosion from the right of way, borrow pits, quarries, and storage of material areas. In the areas of the District where the slopes are over 25%, the project may cause high risks oferosion and slope stability, which is in turn relevant to the design of the project and the conduct of operations such as excavation and drilling. The soil erosion is likely to take place due to up-gradation and widening of project roads. Throughout the road rehabilitation works, heaps of soils 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 rainy season and is of short term duration and will be reversible.

The construction works during the great wet season (mid-March to mid-May) are likely to be stopped to prevent or minimize soil erosion. Any area that has topsoil and vegetation removed need to have measures in place prior to the rainy season to avoid erosion and siltation of wetlands and streams. In addition, heaps of soils can be properly disposed of before the coming of heavy rains and dumped into the borrow/ quarry areas for their backfilling. Around 9,356 m^3 of the topsoil from all areas shall be stripped to a specified depth of 150 mm and preserved properly. This topsoil will be 50.81 m^3 per km. The stored topsoil will be utilized for the restoration of borrow areas, top dressing of the road embankments.

During the construction, embankments/slopes along sections of the indicative road FR3 might be prone to the soil erosion. Such embankments and slopes will need to be stabilized with grasses as soon as the construction is over. The construction of diversion ditches can also used to control runoff water upstream the steep slopes.

iii) Soil Pollution

The soil pollution will be dueto improper disposal of waste material on the open ground. The waste likely to fall on the ground may be solid waste/ liquid waste from labour campsor spillage of oil and grease by construction machinery and equipments, especially during their maintenance. The impacts are of short duration and will be reversible with a proper management.

Appropriate waste disposal methods 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 so as to minimize the soil pollution. A proper waste management system should be established.
In this regards, dustbins for collection of domestic wastes at the camp or construction site should be provided. The collected wastes should be disposed of in landfills approved by the District.

Construction materials will be required for the construction of road pavement, bridges and culverts, road side drains etc. About 10-15% of the construction material is left behind by the contractor as construction waste/ spoils. The material required for construction is summarized in **Table 8** and reproduced in **Table 30** which may need disposal.

Table 30: Construction Spoils Need Disposal after Construction

S.No	Material	Construction Material (m^3)	Construction Spoils (m^3)
1	Concrete	1,698	170
2	Stone Masonry	23,953	2,395
3	Stone Riprap	1,789	179

Source: Consultant's computation based on feasibility report

Dumping of construction waste/ spoil in haphazard manner may cause surface and ground water pollution near the construction sites and breeding site for mosquitoes, hence, it is proposed to clean the area and dump/dispose the construction spoils at the dumping site specified by the local authority to avoid any adverse impact on health and well-being of people.

iv) 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, properties 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. There is a number of major bridges, causeways and many culverts that will also need improvement. Critical points that need to be considered mostly include wetlands or water courses receiving the drainage, steep embankment slopes, road section where the drainage crosses the road, etc. Drainage pattern should well be designed and constructed to channel safely water from road sides to appropriate outlets.

v) Water Pollution

Surface water bodies such as lake, rivers, seasonal streams and wetlands are located along the road. Soil erosion from borrow areas, loose soil from road, runoff from road, and tree felling may increase sediment load in the water bodies ultimately impacting the water quality of the surface water. Contamination of water bodies may also come from spilling of construction materials, oils and greases and paint during transportation and at the equipment yards. But the quantity of such spills will be negligible.

Construction of bridges/ culverts may also create water pollution and increase turbidity during construction phase. The short-term increase in runoff laden with sediment and nutrients may also occur due to the removal of trees, vegetative cover and top soil. The suspended sediments and the associated pollutants may get washed into these water bodies, leading to change in water quality. Care however needs to be taken to provide adequate sanitary facilities and drainage in the temporary colonies of the construction workers. Provision of adequate washing and mobile toilet facilities with septic tanks and appropriate refuse collection and disposal system should be made obligatory. The construction of checkdams or silt trap structures before discharging runoff water from roads into receiving water bodies (lake, stream, etc) to minimize sediments loads.

vi) Increased Water Demand and water use conflict

The water requirement will be increased during construction phase. About 500 people are estimated during peak period. The peak demand is estimated at about 35 KL/day. In addition, water will be required for construction purpose all along the feeder roads.

This will lead to increased water demand and reduced water availability in an area with very few permanent watercourses. Considering the level of water scarcity in the area, there is a possibility that project activities will affect the current domestic and agricultural consumption of the mentioned resource. This could spark conflict of resource between the locals and the project. This impact will be pronounced during dry periods.Identifying new water sources from outside the project area, hence not conflicting with the already existing water sources within the project areas and avoiding misuse of supplied water will be required to safeguard the nearby water environment.

vii) Health and safety

Health risks include disease hazards due to lack of sanitation facilities (water supply and human waste disposal) to the workers during construction both at construction site and at

contractor's camp. Unscientific disposal of waste from contractor's camp can lead to contamination of both ground and surface water. This could lead to outbreak of water borne disease such as diarrhoea, dysentery, typhoid etc. The solid waste generated in contractor's camp if not treated properly may cause leaching and environmental pollution. Communicable diseases like tuberculosis, malaria, etc are likely to be propagated especially during peak demand for manpower.

Various accidents at the sites (injuries caused by handling of construction equipments, spills and leakage of hazardous materials, injuries from stepping on or using sharp objects, fires, accidents by vehicles, motocycles and bicycles, etc) are likely to increase due to rise in traffic and manpower. Due to increased employment opportunities at the site, child labour, prostitutions or sexual offences, gender imbalance are likely to occur. The impact will be of short duration and reversible, but can be of a high magnitude if not well managed.

Management measures including proper sanitation, waste disposal facilities, awaireness campaigns for the prevention of HIV/AIDS, sexually transmitted diseases and other communicable diseases, sensitization for health insurance will be needed. Provision of protective equipments to workers (helmets, boots, masks, etc) will also obligatory. The laws on child labour, sexual harassment/ prostitutions and gender equity should be reinforced.

Due to the proximity of the project area with the Muvumba river and gallery forest, hosting wild animals and snakes, some accidents by wild animals might occur during construction works. The following are measures proposed to prevent or respond to any accident by wild animals.

- Work closely with Park Department of RDB and use information from the park department to find out what wildlife lives in the area;
- Wear protective clothing such as long pants, tall hiking boots, long sleeves, and gloves;
- Availing first aids equipements at the site;

viii) Air Pollution

The impact of road transport on air environment is a factor of type of vehicle, fuel used and its capacity. The consultant has taken emission factor to estimate the pollution potential on air environment during construction and operation phases.

It is also assumed that the quarry and burrow sites will be closer to the road under construction to save on fuel and emission load on environment. During calculation density of soil and rock is taken as 1800 kg/m^3 and 2400 kg/m^3 respectively.

The vehicle emission factors are summarized in **Table 31.** Although, in the construction phase, air quality impacts are of short duration, but it does not mean that these should not be considered. Consumption of diesel during construction activities will be the principal cause of incremental air pollution. Diesel powered trucks required for the haulage of earth and other construction material and running of construction machinery at the construction yards are the major sources of air pollution.

Table 31: Vehicles Emission Factors

Vehicle Type	Emission Factor (gm/km)				
	CO	HC	NOx	CO2	PM
Moped	0.81	0.5	0,29	20.1	0.01
Motor cycle	3.12	0.78	0.23	22.42	0.01
Passenger Car (Diesel)	0.06	0.08	0.28	148.8	0.015
Passenger Car (Petrol)	0.84	0.12	0.09	172.9	0.002
LCV	3.66	1.35	2.12	401.2	0.47
Trucks	6.0	0.37	9.30	762.4	1.24
Bus	3.2	-	11.0	-	-

Source: Emission Factor in Developing Countries (India) for vehicle Manufactured after 2000.

The construction materials required for the project are about 30,000 m^3 of rock, 170,000 m^3 of earth and 5,000 m^3 of other construction materials. These have to be transported to site and 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 increased due to intense traffic movement at the site. The air quality due to the movement of trucks will be impacted.

The likely impact on air environment is presented in **Table 32.** The pollutants emitted during construction period of 12 months are estimated at 19.43 tons other than carbon-dioxide**.**

The emission due to transportation of material will be spread into the atmosphere all over the road site vicinity. Due to high windturbulence in the atmosphere, rainfall, wide spread area and dispersion; the increase in ambient quality of any pollutant is estimated to be less than 1 µg/m^3 which is insignificant.

Table 32: Emission during Construction (12 months)

S/No	Pollutant	Unit	Value Due to Transportation of				Total (Tons)
			Earth	Rock	Other Material	Passenger	
1	CO	Tons	3.60	2.16	0.60	0.02	6.38
2	HC	Tons	0.22	0.13	0.04	0.03	0.42
3	NOx	Tons	5.58	3.35	0.93	0.10	9.96
4	CO2	Tons	457.44	274.46	76.24	54.31	862.46
5	PM	Tons	0.74	0.45	0.12	0.01	1.32

Source: Consultant's computation based on emission factors

In order to provide an estimate of emissions of air pollutants at the construction yard, fuel consumption rates for major construction machinery were estimated. The data on fuel utilization rates of the units expected to be in operation during the road construction are provided in **Table 33**. During the period of maximum construction activity the fuel consumption at the construction yard is expected to be about 135 litre of diesel per hour.

Table 33: Fuel Consumption Rates for Construction Machinery

S. No.	Machines	Fuel Consumption (litre/h)
1	Cement Concrete Mixer	7
2	Generator	30
3	Bulldozer	20
4	Graders	12
5	Rollers	20
6	Excavators	20
7	Dumpers & Tippers	18
8	Water Tanker	8

Source: Based on Manufacturers Information

To reduce the effects of dust and exhaust fumes emission, it is proposed that the following measures are implemented:

- The contractor is required to use equipment and automobiles that have certification of good working conditions from "National Automobile inspection centre" to avoid exhaust fumes since automobiles in good condition will pollute less.
- FRDP project coordination on site and District will ensure that contractors will be doing routine maintenance, repair of trucks and machines. This would reduce on the exhaust fumes from the machines.
- The Contractor will spray water regularly when clearing land and compacting roads to reduce the dust.

ix) Noise Levels

The magnitude of impact during the construction phase will depend upon the types of the equipment used, the construction methods employed and the scheduling of the work. Noise associated with road development affects the environment through which 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, on upgrades, during engine braking, on rough roads, and in 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 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, by 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. Construction activities are expected to produce noise levels in the range of 80-85 dB(A) at 15 m distance, which will decrease with increase in distance. Noise due to construction machinery is predicted as presented in **Table 34.** The noise levels will be with a limit of 55-65 dB(A) at a distance of 100-125 m from construction site.The expected noise levels due to operation of construction machinery at site are summarized in **Table 35**. The noise levels will decrease with distance.

Table 34: Noise Due to Construction Machinery

S. No.	Machine	Operation	Noise In dB(A)
1.	Dump Truck	Haul	83

2.	Compactor	Fill	81
3.	Dozer	Fill	85
4.	Excavation by Shovel	Cut	87
5.	Excavation by Caterpillar	Cut	87

Source: Consultant's own survey from other projects

Table 35: Noise Levels During Construction, dB (A)

Source	**Dump Truck**	**Compactor**	**Dozer**	**Excavation by Shovel**	**Excavation by caterpillar**
Noise Level dB(A)	83	81	85	87	87
Source Distance (m)	15	15	15	15	15
Noise Levels at Distance (m) from source					
20	78.5	76.5	80.5	82.5	82.5
25	76.1	74.1	78.1	80.1	80.1
30	74.0	72.0	76.0	78.0	78.0
35	72.1	70.1	74.1	76.1	76.1
40	70.5	68.5	72.5	74.5	74.5
45	69.0	67.0	71.0	73.0	73.0
50	67.5	65.5	69.5	71.5	71.5
55	66.2	64.2	68.2	70.2	70.2
60	65.0	63.0	67.0	69.0	69.0
75	61.5	59.5	63.5	65.5	65.5
100	56.5	54.5	58.5	60.5	60.5
125	54.6	52.6	56.6	58.6	58.6
150	53.0	51.0	55.0	57.0	57.0
175	51.7	49.7	53.7	55.7	55.7
200	50.5	48.5	52.5	54.5	54.5
225	49.5	47.5	51.5	53.5	53.5
250	48.6	46.6	50.6	52.6	52.6

Source: Consultant Measured at Source and Computed at Distances

The following can be suggested to minimize the effects of such activities:

- Activities that create lots of noise or irritations, such as; vibrations, heavy equipment moving earth, excavations, shall be restricted to normal working hours (7h00-17h00) to prevent noise for neighbours at night ;

- The contractor is required to use equipment and automobiles that have certification of good working conditions from "National Automobile inspection centre" to avoid noise.

x) Loss of biodiversity

Field surveys in Nyagatare District revealed that a total number of 263 plants (of more than 30cm of girth size) fall within the ROW during construction of the project and are likely to be affected. Different types of vegetation plants, crops inclusive, will also be affected. This will lead to loss of habitat for birds, some reptiles (snakes and frogs). The tree planting programme after road construction in the project areas is planned to replace species that are likely to be affected. The use of drought tolerant trees species resistant to termites in the region is compulsory for the success of the programme. Acacia spp, Senna spectabilis, Grevillea, etc are some the species that can be used in the region. Awaireness campaigns for the protection of biodiversity, posting signposts especially in the protected zone will also be needed.

xi) Encroachment into the Nature Reserves and Wildlife

The Akagera National Park and gallery forest with *Acacia kirkii* (Imikinga) are the protected areas located in Nyagatare District. Akagera National Park is located far from the project area. Hence, there will be no impact of the project's activities to this park. The main impact is expected to occur at the level of Muvumba River and the associated gallery forest with *Acacia kirkii* as well as Nyagatare, Mirambi, Mitungisa and Urugunga wetlands bordering the feeder roads number 1, 3, 9 and 10. The FR1 starts at about 300 m from the gallery forest but there is no critical areas where the road crosses the forest or collisions with wildlife could occur. The wetlands crossed by FR3, 9 and 10 were all converted into agriculture.

Therefore, the existing law on the conservation of protected areas, Muvumba gallery forest inclusive, should be reinforced. The tree cutting, wild animal poaching or waste dumping within the protected area should be avoided. A safe drainage system should also be set to control wetlands floodings by roadside runoff water.

xii) Road congestion or closure

Some road sections might be congested during construction as a result of construction works. Some other road sections may even experience total closure for a limited time because of the nature of undertaken works.

This will create difficulties for the road users as they may need to take longer routes, therefore causing more costly and time consuming travels.

The application of traffic management measures and the preparation of alternative roads in case of road closure will minimize the road congestion in the project areas. The road closure or congestion may also cause inaccessibility to water by cattle as some of the roads are passing through pastures. The pathways for cattle should be planned for to avoid depriving cows of water.

xiii) Wildlife and domestic animals accidents and passes

The Muvumba gallery forest accommodates a good number of primates, birds and other wildlife. The road construction, especially FR1, is likely to lead to traffic disturbance of wild animals. One FR1 section at the start of the road is at about 300 m from the gallery forest. The cutting of trees for firewood might also lead to destruction of nests and birds' habitats.

Some sections of the FR 1, FR2, FR3, FR4, FR5, FR12, FR13 and FR14 cross rangelands without water supply facilities. Most the cattle in the roads' upstream pastures are crossing the roads searching for water in the lowlands. The roads activities within those areas might cause animals collisions.

Limiting and enforcing the vehicle speed near/along the forest and pasture sections to maximum 20 km/hr, avoiding to blow horns near the forest and in pasture sections, organizing awareness campaigns for drivers and workers on the protection of wildlife and safety of animals, creating passes for cattle, posting warning roads signs, awareness campaigns to drivers/ bicyclists/ motorcyclists and pedestrians for pedestrians safety, etc are some of the mitigation measures.

xiv) Displacement of PAPs

The rehabilitation and upgrading of indicative feeders to 10.5 m width of road corridor is likely to affect people's assets and displacement. About 590 families formed of 2598 people are living or having properties within the 10.5 m road corridor. The road widening is likely to cause the relocation of 128 houses and acquire 84.19 ha of land, including 6.24 ha likely to be permanently lost for road carriageway. The land acquired for road widening is presented in Table 27 while details on PAPs will be presented in a standalone Resettlement Action Plan (RAP) for Nyagatare feeder roads, currently under preparation.

The compensation for affected communities accompagnied with a livelihood restoration program for relocated PAPs are among the mitigation measures.

xv) Loss of water points

In the project area, there are some water points (4 water taps, 10 water valve chambers) that are likely to be affected by road construction activities, causing temporary inaccessibility and lack of drinking water to users. The replacement and/or relocation of water pipes, existing water points as well as construction of new water points, whenever needed, will be required to satisfy the water needs of the affected communities.

6.4.3 Impact during Operation Phase

i) Air Pollution

The extent of air pollution will depend upon i) the rate of vehicular emission and ii) the prevailing meteorological conditions. The traffic data for the year 2016are available in Chapter 3 (Refer **Table 5**). The emission factors for vehicles have been used to estimate the ground level concentration near the feeder roads. The available litterature has been used to predict the carbon monoxide and nitrogen oxides.There are assumptions that the increase in pollutants concentration will not be significant in the nex ten years. Air quality is likely to improve in the initial years after commissioning because of saving of fuel in the vehicular traffic riding on smooth and improved roads with much less interruption. But dust emissions are likely to increase during dry periods.

ii) Noise Levels

During the operation phase of the road, movement of heavy and light vehicles is expected to give rise to higher ambient noise levels. In order to quantify the project induced noise impacts with respect to existing noise levels, noise monitoring was carried out. It was observed that during the day time the noise levels at all the monitoring locations vary between 42 to 65 dB(A). Assessment of noise impacts due to the project have been carried out using Highway Noise Model based on the guidelines suggested by Federal Highway Administration (FHWA). The details of the model and the model commutations are described below:

Where:

L(eq) (hi)	:	Equivalent noise level at hour (h) for the vehicle type (i);
L(OE,i)	:	Reference mean energy level for (i^{th}) type of vehicle;
N(i)	:	Number of vehicles of (i^{th}) class passing in time T,1 hour;
S(i)	:	Average speed for vehicle (i^{th}) class;
T	:	Time Duration for which L(eq) is desired (T= 1 hr);
D	:	Perpendicular distance(m) from the center line of traffic lane to observer;
α	:	Absorption characteristic factor;
δs	:	Shielding factor.

The vehicular noise emission levels vary significantly with speed. It therefore becomes necessary that speed dependency of the noise emissions for different categories of vehicles should be taken into account. In view of the above, speed related noise levels are considered for prediction. The maximum speed assumed for the present scenario is 40 km/hr. **Table 36** shows noise emitted by different vehicle types. The computed results are summarized in **Table 37.** The results have indicated a maximum increase in noise level to the tune of 10 dB(A) being highest 65 dB(A) on the feeder roads specially in urban area near markets which is moderate. Otherwise in rural area it will be around 45 dB(A) during peak hours.

Table 36: Noise Emitted by Different Vehicle Types in dB(A)

Speed (Kmph)	Vehicle Type			
	Cars	**Trucks**	**Buses**	**2-Wheelars**
40	65.0	81.0	81.0	68.0

Table 36: Projected Noise Level on Feeder Road with Maximum Vehicles

Description	Feeder Road, dB(A)
Existing Maximum (dBA)	50
Total Projected (2026) dB(A)	60
Total Noise Exposure, dB (A)	60
Increase (dBA):	10
Impact :	None

Source: Consultant's computation from field survey

iii) Water Pollution

The sediments from the road drainage system may negatively affect the receiving water bodies; this could be dealt with by incorporating check dams within the drainage system to retain the sediments and a regular maintainance of the system.

iv) Road safety

The road safety measures are essential both in construction and operation phases. The mitigation measures include:

- Adhere to speed limits (Low speed limits should rigorously be enforced);
- Wear helmet while driving two wheeler;
- Display signage on road indicating the problem;
- Awaireness campaigns to drivers/ bicyclists/ motorcyclists and pedestrians for pedestrians safety.

v) Induced impacts of the project

Due to improved road accessibility in the area, the encroachment to Muvumba gallery forest for forage, firewood is likely to happen, thus accentuating deforestation in the area. The hunting/ poaching of wildlife is also likely to occur but limited due to the enforcement of the existing law on protected areas. The reinforcement of the law on protected areas, collaboration between institutions and awaireness campaigns for wildlife protection will be required to mitigate the induced adverse impacts.

6.5 IMPACTS ANALYSIS

Checklist is the list of environmental parameters or impact indicators, which the environmentalist is encouraged to consider when summarizing the potential impacts. A typical checklist identifying the anticipated environmental impacts due to the project activities are shown in **Table 29**. The impacts have been categorized and analyzed in the following manner:

i) Nature (positive/negative, direct/indirect);
ii) Magnitude (high, moderate, low);
iii) Extent/location (area/volume covered, distribution);
iv) Timing (during construction or operation, immediate; or delayed);

v) Duration (short term/long term, intermittent/continuous);

vi) Reversibility/irreversibility;

vii) Likelihood (probability, uncertainty); and

viii) Significance (local, regional, global)

Table 38: Impacts Analysis of feeder roads works

S. No.	Activity	Potential Impact	Nature	Magnitude	Extent/ Location	Timing/ Phase	Duration	Reversible /Irreversible	Likelihood	Significance
i)	Planning and Design of Roads	Skill Transfer & Training	Positive Direct	Low	Medium	Pre-Construction	Long Term		Probability	Regional
ii)	Site Acquisition for road construction	Change in land use/ Loss of Land	Negative Direct	Medium	Small Area/ Large Distribution	Pre-Construction	Long Term	Irreversible	Probability	Regional
iii)	Disposal of waste material, construction spoils, spill of oil and grease from construction machinery.	Soil Pollution	Negative Direct	Low	Small area/ Large Distribution	Construction	Short Term	Reversible	Probability	Local
iv)	Exposed surface due to widening of ROW, borrow pits, quarries site construction of bridges	Soil Loss/ Erosion on ROW	Negative Direct	Low	Large Distribution	Construction/ Operation	Long Term	Reversible	Probability	Local
		Soil Loss from Borrow/Quarry Areas	Negative Direct	Low	Large Distribution	Construction	Short Term	Reversible	Probability	Local
v)	Movement of Vehicles on adjoining productive land	Loss of soil fertility	Negative Direct	Low	Small area/ Large Distribution	Construction	Short Term	Reversible	Probability	Local
vi)	Construction of road, borrow areas and quarry sites	Change in Natural Drainage Pattern	Negative Direct	Low	Small area/ Large Distribution	Construction	Short Term	Reversible	Probability	Local

S. No.	Activity	Potential Impact	Nature	Magnitude	Extent/ Location	Timing/ Phase	Duration	Reversible /Irreversible	Likelihood	Significance
vii)	Runoff from roads, quarry site and borrow areas; construction of bridges and abutments on river and streams	Water Pollution	Negative Direct	Low	Small Distribution	Construction	Short Term	Reversible	Probability	Local
viii)	Disposal of waste	Health Risk due to WasteDisposal	Negative Direct	Low	Low	Construction	Short Term	Reversible	Probability	Local
ix)	Use of water in Construction and drinking	Increased Water Demands	Negative Direct	Low	low	Construction	Short Term	Reversible	Probability	Local
x)	Movement of vehicles for construction works and then use of road	Air Quality	Negative Direct	Low	low	Construction/ Operation	Long Term	Reversible	Probability	Regional
		Increase in Green House Gases	Negative Direct	Low	low	Construction/ Operation	Long Term	Reversible	Probability	Regional
		Fuel Consumption	Negative Direct/ Indirect	Low	low	Construction/ Operation	Long Term	Irreversible	Probability	Regional
		Noise Levels	Negative Indirect	Low	low/ less area	Construction/ Operation	Long Term	Reversible	Probability	Regional
xi)	Acquisition of land for road widening	Loss of Tress	Negative Direct	Low	Moderate/ large area	Pre-Construction	Short Term	Reversible	Probability	Regional
xii)	Widening of Road, construction of	Encroachment into water bodies/	Negative Direct	Low	low/ less area	Construction	Short Term	Irreversible	Probability	Local

S. No.	Activity	Potential Impact	Nature	Magnitude	Extent/ Location	Timing/ Phase	Duration	Reversible /Irreversible	Likelihood	Significance
	bridges and culvers	marshy land								
xiii)	Widening of Road,	Loss of Physical Cultural Resources	No Impact							
xiv)	Widening of Road,	Re location of Physical Structure	Negative Direct	Low	Less area	Construction	Short Term	Reversible	Probability	Local
xv)	Construction and operation of road	Employment Opportunities	Positive Direct	Medium	Large Distribution	Construction/ Operation	Long Term		Probability	Regional
		Enhancement of Rural Economy	Positive Direct	Medium	Large Distribution /Permanent	Construction/ Operation	Long Term		Probability	Regional
xvi)	Operation of road	Reduction in length and travel time	Positive Direct	Medium	Permanent	Operation	Long Term		Probability	Regional
		Enhanced Social Interaction	Positive Direct	Medium	Permanent	Construction/ Operation	Long Term		Probability	Regional
xvii)	Construction of roads, bridges and culverts and Operation of road	Skill Transfer and Training	Positive Direct	Medium	Permanent	Construction/ Operation	Long Term		Probability	Regional
xviii)	Side cutting for road widening	Land Slides	Negative	Low	Temporary	Construction	Short Term	Reversible	Probability	Local
xix)	Construction Activities	Workers Safety	Negative	Low	Temporary	Construction	Short Term	Reversible	Probability	Local
xx)	Employment of outside labour	Health Safety (Transmission of STD, HIV/AIDA	Negative	Low	Temporary/ Permanent	Construction	Short Term	Reversible	Probability	Local

The roads rehabilitation works is likely to have social impacts including land acquisition of 84.19 ha, relocation of 128 houses and 590 affected households. These social impacts are considered Medium because none of the project affected households (PAH) will leave his plot due to project activities. The PAHs likely to be relocated will continue living within the same plots but will move at some distances from the RoW within the same plot. In addition, the loss of land due to road works will not render the remaining area unusable and PAPs losing their assets will be compensated for. Not only the borrow pits will be rehabilitated using surplus from RoW and topsoils from both borrow area but also the soil fertility will be restored through organic materials application soon after the murram extraction.

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN, MITIGATION AND ENHANCEMENT MEASURES

7.1 MANAGEMENT PLANS

Conservation, protection and preservation of environment have always been a primary consideration in Rwanda ethos, culture and traditions. In order to meet people's requirement in transportation sector, up-gradation / modification/ construction of feeder roads are planned which affects the ecology and the environment of project area. The impact due to project on different attributes of environment are discussed and presented in Chapter 6. Management of Environment by provision of necessary safeguards in planning of the project itself can lead to reduction of adverse impacts due to project. This chapter spells out the set of measures to be undertaken during project construction and operation to reduce or mitigate or bring down the adverse environmental impacts to acceptable levels based on the proposed Environmental Management Plan. Mitigation measures are actions that are intended to avoid, alleviate or reduce environmental impacts on the environment.These measures include generic and site-specific measures based on the results of the impact assessment and measures/guidelines for roads set by the Rwandan Government and the World Bank's Safeguard Policies, including the WB General Environmental Health and Safety Guidelines.

The most reliable way to ensure that the plan will be integrated into the overall project planning and implementation is to establish the plan as a component of the project. This will ensure that it receives funding and supervision along with the other investment components. For optimal integration of ESMP into the project, there should be investment links for:

- Funding,
- Management and Training, and
- Monitoring.

The purpose of the first link is to ensure that proposed actions are adequately financed. The second link helps in embedding training, technical assistance, staffing and other institutional strengthening items in the mitigation measures to implement the overall management plan. The third link provides a critical path for implementation and enables sponsors and the funding agency to evaluate the success of mitigation measures as part of project supervision, and as a means to improve future projects.

For every issue discussed for above measures, the implementing agency as well as staffing, equipment, phasing and budgeting have been presented as far as possible. All required funds will be channelled through the executing agency.

The mitigation measures are set forth to maximise positive impacts and minimise negative impacts as a result of the proposed feeder roads. The following general mitigation measures will be applied:

- Cut material shall be temporarily stored along the road side to prevent eroding into the streams and it will be reused in the road levelling activities.
- Stabilization of road sides quarry and borrow areas by replanting the trees to minimize erosion;
- Rehabilitation works are recommended to be implemented during the dry season;
- Excavated areas should be restored immediately after excavation to limit the exposure of loose soils, thus minimizing soil erosion;
- Land clearing should be limited to only those areas necessary for the road rehabilitation and upgrading of the project;
- Installation of silt catch basin/ trap and oil and grease interceptor to avoid water pollution;
- Cross drainage works at regular interval in flood prone areas with adequate size to meet flood requirements specially minor bridges;
- Provision of water supply and sanitation facilities in construction camps; Provision of covered trucks from top carrying earth to avoid air dust pollution;
- Disposal of solid waste generated from construction activities as construction spoils and domestic solid waste from house activities; and
- Tree plantation on side of feeder roads specially on steep landscapes to reduce erosion and accidental risks, etc.

7.2 PROPOSED MITIGATION MEASURES IN DIFFERENT PROJECT PHASES

Based on project description Chapter 3, Environmental Baseline Data Chapter 4 and Environmental Impacts Chapter 6, it is proposed to prepare the environmental management plans to mitigate or reduce negative impacts. Based on impacts, environmental management plan has been prepared by adopting mitigation measures for negative impacts and are presented for different phases in **Table 39.**

Table 39: ESMP during Project planning, construction and operation Phases

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
PROJECT PLANNING AND DESIGN					
Selection of feeder roads	Conflict over project beneficiaries	Involve all the stakeholders in roads selection (organizing meeting, sites visits with benefiaries)	Planning stage	Districts Authorities (Mayor or his representative), Opinion leaders, Local community, MINAGRI/ FRDP Coordinator or his reprsentative	1,000,000
Selection of borrow/quarry areas	Conflict over project beneficiaries	Consultation with affected communities	Feasibility study stage	District road Engineer & Environmental Officer, MINAGRI/FRDP Engineer and Environmental Specialist Contractor	1,000,000
	Loss of properties (crops, trees, houses, etc)	Compensate for lost assets as per the Rwanda Expropriation Law and WB policy on Involuntary Resettlement	Feasibility study stage	Contractor District road Engineer & land officer MINAGRI/FRDP Environmental Specialist	5,000,000
		Minimize the number of borrow pits by increasing the free haul distance in BOQ;	Feasibility study stage	Contractor	0
Road realignment	Loss of properties (land, houses & crops)	Involve all the stakeholders in roadsselection	Planning stage	District road engineer Contractor	0

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		Integrate representatives of PAPs in the Project	Planning stage	District road Engineer Contractor MINAGRI/FRDP social safeguards specialist	0
		Compensatefor lost assets as per the Rwanda Expropriation Law and WB policy on Involuntary Resettlement	Planning stage	- District - MINAGRI/FRDP	Included in compensation cost above
Subproject design			Feasibility study stage	MINAGRI/FRDP road Engineer Contractor	0
PROJECT CONSTRUCTION PHASE					
Borrow pits/quarry sites exploitation	- Loss of topsoil and soil erosion affecting productive farm land and landscape aesthetics; - Stagnant water in undrained borrow pits/quarry areas creating habitat for water borne disease vectors and possible safety issues for people and livestock	Establishing a detailed borrow pit / quarry management plan	Construction Phase	- Contractor Environmental & Social Safeguards Expert; - Environmental & Social Safeguards Expert of the Supervising Firm - District Environmental Officer - - MINAGRI/ FRDP Environmental Specialist	2,500,000
		Proper implementation of the borrow pit / stone quarry management plan			
		Reshaping, transport and spreading over topsoils in the pits on 9 ha for rehabilitation	Construction Phase	- Contractors Engineer and Environmental & Social Safeguards Expert; -Resident Engineer & Environmental & Social	16,500,000

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
				Safeguards Expert of the Supervising Firm	
		Application of organic materials	Construction Phase	Contractors Environmental & Social Safeguards Expert; -Environmental & Social Safeguards Expert of the Supervising Firm - District Environmental Officer, -District Agronomist - MINAGRI/ FRDP Environmental Specialist	1,800,000
		Planting of trees and grasses and maintenance for 1.5 years	Construction Phase	- Contractors Environmental & Social Safeguards Expert; -Environmental & Social Safeguards Expert of the Supervising Firm -District Environmental Officer - District Agronomist - MINAGRI/ FRDP Environmental Specialist	19,250,000
	Safety risks at the borrow/quarry sites (accidents,	Design borrow pits/ quarry sites safety measures	Construction phase	Contractor's Engineer and Environmental & Social Safeguards Expert; -Environmental & Social Safeguards Expert of the Supervising Firm	0
		Posting of safety signposts and guards at the site	Construction phase	Contractor's Engineer and Environmental & Social	5,000,000

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
				Safeguards Expert; -Environmental & Social Safeguards Expert of the Supervising Firm	
Earthworks (Road construction and Camp site installation)	Loss of beneficiaries' properties (trees, crops, houses & other structures)	Compensation for lost properties	Construction phase	- Contractors Environmental & Social Safeguards Expert; -Environmental & Social Safeguards Expert of the Supervising Firm- District Environmental OfficerDistrict Agronomist - MINAGRI/ FRDP Social safeguards Specialist	200,000,000
	Soil erosion causing water quality degradation and property damages	Avoid earthworks during heavy rains (mid-March to mid-May);	Construction works schedule	Contractor District Road Engineer MINAGRI/FRDP Engineer	0
		Disposal of unused stockpiled topsoils before rains	Construction phase	Contractor Engineer & Social/ Environmental safeguards Expert Resident Engineer and Social/ Environmental safeguards Expert, Supervising Firm District Engineer and Environmental Officer MINAGRI/FRDP Environmentalist	20,000,000
		Protection of road embankments/ slopes with vegetation to reduce	Construction phase	- Contractors Environmental & Social Safeguards Expert; -Environmental & Social	4,000,000

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		landslides		Safeguards Expert of the Supervising Firm- District Environmental OfficerDistrict Agronomist - MINAGRI/ FRDP Environmental Specialist	
		Install proper road drainage and check dams, silt traps where necessary to reduce silts	Construction phase	Contractor	50,000,000
	Soil pollution	Maintenance of motorized machinery and equipments in service stations	Construction phase	Contractor	10,000,000
		Provision of dustbins for waste collection	Construction phase	Contractor	3,000,000
		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 Expert -Resident Engineer and Social/ Environmental safeguards Expert, Supervising Firm -District Engineer and Environmental Officer -MINAGRI/FRDP Environmentalist	Included in the above budget for borrow/quarry management plan
	Disruption in drainage pattern	Ensure the proper design of drainage canals	Construction phase	Contractor District road Engineer FRDP Engineer	0
		Construction of drainage	Construction phase	Contractor	0

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		canals as per the designs		District road Engineer FRDP Engineer	
	Water pollution	Provision of sanitary facilities to workers (mobile toilets, water, sewage disposal facilities like septic tank, soak pit, etc)	Construction phase	- Contractor Engineer & Environmental & Safeguards Expert - Resident Engineer & Environmental & Safeguards Expert, Supervising Firm - District Environmental Officer - MINAGRI/FRDP Environmentalist	11,000,000
		Construction of checkdams or silt trap structures to minimize sediments loads before discharging roadside runoff into receiving water body	Construction phase	- Contractor Engineer - Resident Engineer - District road Engineer - MINAGRI/FRDP Engineer	Included in the budget for checkams & silt traps structures above
	Wildlife accidents & passes	Avoiding poaching, Limiting the vehicle speed, Avoiding to blow horns in the forest section, Awaireness campaigns for drivers and workers on the protection of wildlife, Posting animal safety signposts,	Construction phase	• Contractor • Supervising Firm • MINAGRI/FRDP • RDB • District authority	500,000
	Domestic animals' accidents & passes	Establishing animal passes Limiting the vehicle speed, Avoiding to blow horns in	Construction phase	• Contractor • Supervising Firm • MINAGRI/FRDP	5,000,000

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		the pasture section, Awareness campaigns for drivers and workers on human – Cattle safety, Posting animal safety signposts, Awareness campaigns to drivers/ bicyclists/ motorcyclists and pedestrians for pedestrians safety		• District	
	Increased water demand and water use conflict	Identify new water sources from outside the project area and avoid water misuse	Construction phase	Contractor Engineer District road Engineer MINAGRI/FRDP Engineer	0
	Health and safety	Developing a health and safety management plan	At the start of the construction phase	Contractor Engineer & Environmental & Safeguards Expert -Resident Engineer & Environmental & Safeguards Expert, Supervising Firm	2,300,000
		Provision of sanitary facilities (toilet, water, etc)	Construction phase	-Contractor Engineer & Environmental & Safeguards Expert -Resident Engineer & Environmental & Safeguards Expert, Supervising Firm -District Environmental Officer -MINAGRI/FRDP	Included in Water pollution Cost above

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
				Environmentalist	
		Awaireness campains for the prevention of communicable diseases, STDs, etc	Construction phase	- Contractor Environmental & Safeguards Expert; - Supervising firm Environmental & Safeguards Expert; - District Health Centers staff - MINAGRI/FRDP Environmentalist	200,000
		Use a field guide and information from the park department to find out what wildlife lives in the area	Construction phase	- Contractor Environmental & Safeguards Expert; - Supervising firm Environmental & Safeguards Expert; -RDB field Guide	200,000
		Avoid to fetch water from the Dam and lake by workers.	Construction phase	-Contractor Environmental & Safeguards Expert -Environmental & Safeguards Expert, Supervising Firm -District authorities (Sector, Cells authorities)	0
		Provision of protective equipments and clothing	Construction phase	-Contractor Engineer & Environmental & Safeguards Expert -Resident Engineer & Environmental & Safeguards Expert, Supervising Firm -District Environmental Officer -MINAGRI/FRDP Environmentalist	5,000,000

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		Availing well equipped First Aid facility	Construction phase	Contractor	7,000,000
		Provision/ensuring medical insurance to workers	Construction phase	- Workers - Contractor	0
	Increase of Gender based violence cases, prostitutions and use of child labour	Reinforcement of the laws on child labour, sexual harassment/ prostitutions and gender equity	Construction phase	- Contractor Environmental & social safeguards Expert - Supervising firm Environmental & social safeguards Expert - District Environmental Officer - District Social protection officer - District Road Engineer -MINAGRI/FRDP Environmentalist & social safeguards specialist	0
		Awaireness meetings on GBV, child labour, prostitutions preventions	Construction phase	- Contractor Environmental & social safeguards Expert - Supervising firm Environmental & social safeguards Expert - District Social protection officer -MINAGRI/FRDP Social safeguards specialist	1,000,000
		Awaireness programs on child protection through close collaboration with	Construction phase	- MINAGRI/FRDP Social safeguards Specialist,	2,000,000

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
		existing Child protection Committees within the community and capacity building for those committees		- District Social protection officer	
	Other subproject management issues	Discussion meetings to resolve issues raised	Once two weeks during the Construction phase	- Supervising Firm - Contractors - Community	0
	Air pollution due to dust and exhaust fumes	Spray water regularly when constructing roads to reduce the dust	Construction phase	Contractor's Engineer Supervising firm Engineer District Environmental Officer MINAGRI/FRDP Environmentalist	92,060,000
		Use equipments and automobiles with certification of good working conditions from "National Automobile inspection centre" to avoid exhaust fumes	Construction phase	Contractor Environmentalist & social safeguards Expert Supervising Firm Environmentalist & social safeguards Expert District Environmental Officer MINAGRI/FRDP Environmentalist	0
		Routine maintenance, repair of trucks and machines by the contractor	Construction phase	Contractor	15,000,000
	Noise Pollution	Restriction of activities creating lots of noise or irritations to normal working hours (7h00-17h00) to prevent noise for neighbours at night	Construction phase	- Contractor Engineer & Environmental & Safeguards Expert - Environmental & Safeguards Expert, Supervising Firm - District Environmental Officer	0

Activity	Adverse impacts	Mitigation measures	Implementation schedule	Responsibility	Estimated cost (Frw)
				- District Road Engineer MINAGRI/FRDP Environmentalist&Engineer	
		Use equipments and automobiles with certification of good working conditions from "National Automobile inspection centre" to avoid noise	Construction phase	- Contractor Engineer & Environmental & Safeguards Expert - Environmental & Safeguards Expert, Supervising Firm - District Environmental Officer - District Road Engineer MINAGRI/FRDP Environmentalist &Engineer	0
	Loss of flora and fauna habitat	Awaireness campaigns for the protection of biodiversity, Posting signposts especially in the protected zone	Construction phase	- Contractor Environmental & Safeguards Expert - Supervising Firm's Environmental & Safeguards Expert, - District authorities - MINAGRI/FRDP Environmentalis	10,000,000
		Compensation for lost assets	Construction phase	- Contractors Environmental & Social Safeguards Expert; -Environmental & Social Safeguards Expert of the Supervising Firm - District Environmental Officer - MINAGRI/ FRDP Social	Included in the cost for lost assets above

				safeguards Specialist	
	Road congestion /closure	Application of traffic management measures	Construction phase	- Contractor's Engineer - District Road Engineer - MINAGRI/FRDP Engineer	0
		Preparation of alternative roads in case of roads closure	Construction phase	- Contractor's Engineer - District Road Engineer - MINAGRI/FRDP Engineer	7,500,000
	Encroachment into nature reserve and poaching risks	Enforcement of law on protected areas	Construction phase	- Contractors Environmental & Social Safeguards Expert; -Environmental & Social Safeguards Expert of the Supervising Firm- District Environmental Officer - MINAGRI/ FRDP Social safeguards Specialist - RDB field guide	0
		Chance finds procedures	Construction phase	- Contractors Environmental & Social Safeguards Expert; -Environmental & Social Safeguards Expert of the Supervising Firm- District Environmental Officer - MINAGRI/ FRDP Social safeguards Specialist	2,500,000
	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	10,150,000

				- MINAGRI/ FRDP Social safeguards Specialist	
	Non compliance with safeguards in camps site	Implementing the recent WB guidelines regarding worker camps	Construction phase	Environmental & Social Safeguards Expert of the Supervising Firm - District Environmental Officer - MINAGRI/ FRDP Social safeguards Specialist	0
PROJECT 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	0
	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	0
		Adhere to speed limits	Operation phase	Roads users	0
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	Operation phase	District Road Engineer	10,000,000
		Provision of speed bumps in the vicinity of populated	Operation phase	District Road Engineer	5,000,000

		areas like villages, schools, markets, health posts, etc.			
		Wear helmets when driving two wheeler	Operation phase	Road users	0
		Community awareness meetings on traffic safety issues	Operation phase	District Authorities National Police	10,000,000
Heavy rains bringing debris and clogging the drainage system	Water pollution and Property damages	Regular maintenance of the road drainage system		Local Community Association (LCAs) District Road Engineer	10,000,000
TOTAL					**545,460,000**

The total cost for the ESMP implementation from planning to operational phase is estimated to 545,460,000 Frw. This cost also includes the estimated compensation cost but excludes the cost of environmental and social safeguards experts for both contractors and supervising firms.

7.3 SPECIFIC ISSUES WITH ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

i) Soils Erosion due to Land Clearing

Since the proposed feeder roads will be reconstructed on existing ROW, the land likely to be acquired is agriculturalland. The entire stretches of the alignments are subjected to erosion of varied degree. This area shall be treated through environmental measures. Mitigation measures include careful planning and timing of cut-and fill operations and re-vegetation, proper management of borrow pits/ quarry areas, adequate management of surplus soil from the road, maintenance of drainage pattern, etc. In general, construction works shall be stopped during monsoon season. Cost involved to prevent erosion has been included in the actual construction cost.

ii) Quarries and Crushers

It is appropriate to give consideration to the environmental implications in selection of quarry sources since poorly run operations create dust problems, contribute to noise pollution, ignore safety of their employees, or cause the loss of natural resources. To ensure adequate mitigation of potential adverse impacts, only licensed quarrying operations are to be used for material sources. Efforts should be made to use material commonly found along the roadway as construction material.

iii) Borrow Pits sites

Borrowareas will be located outside the RoW. They shall preferably be indicative from high land and/or waste land, though locations of the borrow areas are negotiated between contractor and landowners. The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Supervising Engineer, is required before the final acceptance and payment under the terms of the contract. All the borrow and quarry areas will be properly dressed maintaining drainage to outwards. The surplus soils from the RoW and topsoils from borrow/quarry sites should be used to backfill the borrow/quarry area. Topsoil from the opening of borrow/quarry pits from agriculture land shall be saved and reused in re-vegetating the pits to the satisfaction of the Engineer/land owner. Additional borrow pits will not be opened without the restoration of those areas no longer in use.

iv) Water Quality

The proposed project will not alter the existing water quality on a permanent basis, but during the construction phase, extent of surface runoff and silt load may increase giving rise to a negative impact on receiving natural bodies especially the marshy, streams, and rivers. The water will be consumed/ utilized and not likely to pose serious water pollution problems. However, additional water supply provision needs to be made in water supply system.

To prevent the water pollution from the construction site, the following measures will be taken:

- Silt fencing through checkdam construction to prevent sediments from the construction site into the nearby water resources;
- Sedimentation chamber to remove the sediments from road side runoff to avoid entry in nearby water courses;
- Oil interceptor for the removal of oil and grease from point sources during construction as well as during operation.

v) Cross Drainage

Adequate sizes of drainage structures at regular intervals in flood-prone areas and at crossing points (e.g. intermittent streams) are essential. Adequately sized drainage channels to accommodate 25-year flood in the case of culverts and minor bridges and 50-year floods in the case of major bridges may be established for design purpose. Downstream slopes will be stabilized with concrete, or walls to avoid erosion.

Water Supply and Sanitation: Water supply will be needed both for the labour camp and for construction activities. In addition, public health facilities, such as sanitation and toilets will be required in contractor's camp. Water supply provision may be made at 70 litres of water per person per day for such locations. Water should be treated well before use and should be brought up to drinking water standards. It is recommended that water should be treated by conventional water treatment process like sedimentation, filtration and chlorination so as to render it safe for drinking and other purposes. This will help in reduction of water borne diseases among the labour force. Collection and safe disposal of human wastes are among the most critical problems of environmental health. Individual sewerage disposal system by way of septic tank could be adopted for sewage from contractor's Labour Camp.

The capacities for septic tanks serving individual dwellings are indicated in **Table 340**. It will be the responsibility of the contractor to provide proper water supply and sanitation facilities.

Table 40: Capacity of Septic Tanks for Individual Dwellings

S/No.	Max persons served	Liquid capacity of tank (liters)	Recommended dimensions (m)			
			Width	Length	Liquid depth	Total depth
1	8	5,000	1.22	2.60	1.37	1.68
2	10	5,900	1.22	3.05	1.37	1.68

vi) Air Quality

During construction period, the impact on air quality is mainly due to the material movement. The latter affects air quality over a large area, though, not in significant levels. There is an increase in the dust levels all along the haul roads, the borrow areas and dumping areas. The emissions from the construction machinery are the source of ambient air pollution during the actual construction. Continuous use of generators, bulldozers, rollers, crane, trucks etc. give rise to the ambient levels. The mitigation measures are as follows:

- In order to curb the increased fugitive dust emissions in the area due to vehicular movement and raw material transport, provisions should be made for sprinkling of water on the haul roads in the area. Sprinkling of water should be carried out at least once a day on a regular basis during the entire construction period. Special attention should be given to all the haul roads passing through residential areas in the region. Daily inspection at haul roads and at construction site should be carried out to ensure removal of construction debris to the landfill sites.
- It should be ensured that the dust emissions from the quarries do not exceed the standard.
- Covered trucks shall be used for transportation of materials prone to fugitive dust emissions. Additionally materials which may collect on the horizontal surfaces of these trucks during loading should be removed before transportation.
- Idling of delivery trucks or other equipments should not be permitted when not in active use.

- The emission levels from diesel vehicles being used should be checked on monthly basis and brought to the required levels of emission standards.
- Proper care should be taken for storage of furnace oil, diesel, petrol etc.
- Work schedule and the operation time of construction machinery should be suitably modified to exercise a control on ambient air quality standards.
- To ensure the efficacy of the mitigation measures suggested, air quality monitoring shall be carried out as per environmental monitoring plan;.
- As soon as the construction activity is over the surplus earth should be utilized to fill up the low lying areas, if any.
- The ambient air quality levels in future years will increase due to increase in traffic. The mitigation measures are suggested as under:
- It should be made compulsory by government authorities for all vehicles to adhere to the engine maintenance schedule and standards to reduce the air pollution due to vehicular emissions.
- Planting of trees all along the road can reduce 30% of the concentration of pollutants at ground levels. It is therefore recommended that the area available along the project road should be used to develop green belt.

vii) Noise Quality

Noise is also important for the construction and operational phases. During the construction phase, there would be an increase in ambient noise levels due to construction machinery operation and movement of construction vehicles. Following mitigation measures may be adopted:

- Construction yard shall be established at least 200 m away from any residential area. This will allow the noise to attenuate.
- Special acoustic enclosures should be provided for individual noise generating equipments. Enclosures may be provided by way of noise shields, which can be either brick masonry structure or any other physical barrier which is effective in adequate attenuation of noise levels. A 3 m structure made up of brick and mud with internal plastering and of non-reflecting surface will be very effective in this regard.

- Noise measurement should be conducted during construction to assess the prevailing noise levels. Earplugs should be provided to those workers who will be working very close to noise generating construction machinery.
- The exposure of workers to high noise levels especially, near the construction site needs to be minimized during construction period. This could be achieved by: Job rotation, Protective devices, Noise barriers. Stationery construction equipment should not be located near human habitation in particular schools, hospitals and institutions.
- Noise levels from loading and unloading can be reduced by usage of various types of cranes and by placing materials on sand or on the beds of sandy bags.
- Use of noisy construction equipment should not be permitted during night hours near residential areas or sensitive areas.

viii) Sensitive receptors

The sensitive receptors along Nyagatare feeder roads include wetlands, Muvumba gallery forest (protected natural habitat), houses and communities likely to be affected, land acquired, etc. The Subproject is likely to affect 590 families, counting 2598 persons and cause the relocation of 128 houses. Details on affected people (PAPs), land acquisition, affected properties, houses inclusive will be presented in a standalone Resettlement Action Plan (RAP) under preparation. The information on other sensitive receptors (national parks, gallery forest and wetlands) and how close or far these receptors are to the RoW is presented in Annex 9. The mitigation measures for the protection of the park and identified physical cultural resources were discussed above.

ix) Tree Plantation in the RoW

It isrecommended that the felling of 263 trees along the alignment should be carried out carefully to meet required safety standards of accommodating alignment widening and upgrading the conditions of adjacent areas. No fire should be used for cleaning operations as it may cause fire hazards. it is also propose to elaborate a reforestation compensatory approach to re-establish the vegetation structure cleared by reintroducing indigenous species as much as possible, adapted to the dry area conditions, and, thus, to positively contribute to biodiversity conservation. Plantation of trees is also desirable as it attenuates the noise and air and adds to the aesthetics. The objective of the tree plantation programme should be to develop natural areas in which ecological functions could be maintained on sustainable basis.

It is proposed to triple the number of trees likely to be removed. Thus, approximately 800 number of seedlingsshall be planted. Key recommended tree species for planting include *Accacia spp, Grevillea robusta, Senna spectabilis*, fruit trees like *Persea americana, Mangifera indica* as well as other indigenous species. All trees species proposed for the District are drought tolerant and resist to termites.

x) Human Health and Safety

The Project will have no significant impact on disease transmission or other health factors. Positive health impacts will include improved access to health care facilities and quicker response time in emergency situations. No additional mitigation actions related to health are warranted. Mitigation related to potential safety impacts will include improved road standards, and improved signage. The construction camps will be fenced off using chain-link fencing to prevent unauthorised entry. Chain link is commercially available in rolls and can be raised on site along the perimeter of the construction camps, vehicle-parking areas and any other areas where temporary enclosure is required. The chain-link fencing will ensure that visual continuity is intact.

The road safety measures are essential both in construction and operation phases. The mitigation measures include:

- Adhere to speed limits;
- Wear helmet while driving two wheeler; and
- Display signage on road indicating the problem
- Awaireness campaigns to drivers/ bicyclists/ motorcyclists and pedestrians for pedestrians safety

Efforts need to be made to employ local labour to avoid the transmission of sexually transmitted diseases (STD), HIV/AIDS**.** In addition, the manpower shall be tested and treated for these disorders before employment to avoid further risk to fellow workers.

xi) Hill/ Mountain Side Environmental Conservation

The hilly landscape in the project area, slope erosion by runoff is serious risk to any investment in the roads development sector. The Government and private land owners already have soil conservation measures in place.

But with the widening of road some disturbances are likely to take place. This may create landslides. Hence following measures are recommended:

- Cutting road side hills should be minimum,
- Focus on implementing a comprehensive soil erosion control practices all along the road in hilly landscape in order to fight against erosion;
- The erosion control measures currently being implemented include constructing anti-erosion structures (bench terraces and drainage system) along the steep slopes;
- The outfall of the drainage shall also be looked into while designing the drainage.
- The valley side of the road shall also be protected by environmental enhancement measures such as plantation of trees, rip-rapping and grass soling.

xii) River and Marshland Protection

The feeder roads are crossing at number of places through marshland and river zone. These are likely to be effected due to water pollution and physical disturbances during construction. Following measures may be adopted for protection of these resources:

- The minor and major bridges shall be constructed to accommodate the 25 and 50 years floods; otherwise it will accelerated sedimentation and clogging of the marshland during the rainy season
- During construction the work of foundations may be separated from the stream flow by creating the construction enclosure;
- The all side of embankment should be protected by stone pitching, grass soling or riprap methods to avoid erosion as soon as construction work is over.

xiii) Fuel Provisions in Contractors Camp

The contractor shall provide the cooking gas in the contractor camp to reduce pressure on the cutting of trees from the area. However, it will be appropriate to employ local labour on site. This will also decrease the fuel requirements in the camps.

7.3.1 Restoration of Facilities

The facilities available on road side and/or right of way are reported in chapter 4. The electrical pole and water tanks need to be shifted out of RoW.

However efforts shall be made during construction that these civic facilities such as water supply and sanitation, electricity supply should remain in operation.

In addition, safe passage shall be provided by creating appropriate diversions to schools, churches, mosques, health centres and memorial sites. It will be appropriate if people can be deputed to help in crossing at these sites.

7.3.2 Design Considerations during Detailed Engineering

The incorporation of environmental considerations from the stage of design, avoids a number of environmental impacts. Hence it is proposed to include the following in the project designs:

i) The embankments, road layout shall match with the landscape of the area especially at embankments, bridges sites, near water bodies, villages, memorials, etc.

ii) The mergers of feeder roads with other feeder road and/or with national roads shall be as per technical requirements. The designs should take into consideration of possibility of accidents, turn around, slopes, etc.

iii) The minor and major bridges on rivers / or streams shall be designed to accommodate 25 and 50 years flood respectively.

iv) The transport policy advocates cross drainage works at every 250 m. The outfall of these cross drainage should be connected to natural drainage system for final disposal of storm water to stream.

v) There are sites where feeder roads are having less width and impact is likely on both sides, design should locate the facility from central line of the road.

vi) The site for contractors camp, quarry and borrow pits shall be identified well in advance to avoid major impacts. These sites shall be at least 200 m from settlement, away from water bodies and closer to the feeder roads.

vii) The roads design should ensure adequate drainage and sufficient hydraulic connectivity to maintain natural water flow and conditions of wetlands

7.3.3 Environmental and Social Management Issues in Tender Document

In order to have environmental and social compliance and also physical cultural resources, it is proposed to include the following in the tender document:

- Contractor shall establish the machinery yard and labour camp on location/ place approved by FRDP; the contractor have to make his own arrangements for water supply, sanitation, solid waste management, health check up, canteen, fuel and light;
- Contractor shall use approved quarry and borrow pits for construction material and close these as soon as work is over; the exposed surface likely to be eroded may be brought in the notice of resident engineer;
- The machinery and vehicles shall meet international noise and emission standards; the oil and grease spill shall be collected for safe disposal to avoid water and soil pollution;
- The sites and work place should not pollute the water sources, protect trees forests, ecology and physical cultural resources; relocate the civic facilities and provide guidance for diversions if any;
- The environmental management plans / items shall be conducted as specified in the Bill of Quantities;
- The site monitoring shall be conducted as specified in the bill of quantities along with required frequency, the results of monitoring shall be keep for record and shall be submitted to FRDP in quarterly report;
- The PCR Management shall also be included in the document along with the conditions such as 'chance find' and authority to be informed such as Genocide Commission;
- The contractor shall extend the facilities to his employees as indicated in section 6.6.

7.4 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN IMPLEMENTATION

Institutional strengthening will be undertaken to achieve the goals of the project including sound environmental management.This ESMP will be implemented by the several institutions mentioned below who are directly or indirectly involved in the project under the following sub-headings:

- Organization and Staffing;
- Implementation and budget
- Environmental Training;
- Monitoring and Reporting; and

- Record-keeping.

7.4.1 Organization and Staffing

World Bank

The **World Bank** is the financier of the project including monitoring and evaluation of the implementation of the EMP within the budget of Rwanda Feeder Road Development Project (FRDP). The main role of the Bank is to provide support and ensure that compliance is achieved as per the requirements of the ESMP.

MINAGRI

Ministry of Agriculture and Animal Resources (MINAGRI) through the FRDP is the lead agency in the implementation of this EMP and the project. The role of the FRDP is to implement mitigation measures, building the capacity of other actors in SPIU, and in environmental management. The SPIU co-ordinator will be the focal point for training in FRDP and will liaise with the ministry of agriculture and animal resources for technical support. The capacity building activities should be through hands-on experience approach. The project should establish one capacity building road which will act as the field school. The role of MINAGRI will be to ensure that the roads, bridges and drainages are constructed according to the specifications of international technical and safety standards.

MININFRA

The Ministry of Infrastructure (MININFRA) through RTDA will provide technical support and oversee the project implementation.

RDB and REMA

RDB will issue an ESIA certificate of approval, authorizing FRDP to start civil works while REMA will oversee the Project compliance with national environmental regulations.

District

The project will be implemented by the District.It will closely work with MINAGRI/FRDP to follow up the civil works and compliance with environmental and social safeguards.

Contractor

The Contractor shall prepare a Construction ESMP (CESMP) based on this ESMP and final road alignments and design prior to the commencement of civil works.

The CESMP will be submitted by the Contractor to the Supervision Consultant and MINAGRI for review and approval. No civil works shall commence until a CESMP has been approved by MINAGRI. The Contractor shall hire an Environmental Specialist and Social Development Specialist to implement the CESMP.

Supervision Consultant/Firm

A Supervision Firm/Consultant shall be hired to supervise the implementation of the CESMP by the Contractor.

7.4.2 Implementation and budget

MINAGRI has the required capacity to implement the environmental and social management plans and monitoring programs in Nyagatare District. The District also has in its core staff the environmental and social safeguard officers (District Environmental Officer and District Social Protection Officer). In addition, the Supervision firm will add to the capacity to manage the processes in the plan.

In case required, expert opinion should be sought from government agencies or consultants. Moreover the contracting firms that will be constructing the feeder roads will also use their capacity for environmental and social protection. The ESIA has made provisions for training and the individual capacity may be enhanced through specialized module in the required field.

MINAGRI will designate one of its officers to act as Environmental and Social Safety Officer (EO), to formally address environmental and social issues on a routine basis, who will have an oversight of environmental aspects of the construction contracts, including the enforcement of all monitoring provisions, the locations of construction and labour camps, etc. Before the commencement of construction, the designated EO will receive training in the environmental and social issues associated with road construction and maintenance projects. The designated EO will further organise the training.

The main duties of the designated EO will include:

- Review of bids to ensure their adherence to the environmental and social specifications and the requirements of the Environmental and Social Management Plan (ESMP);

- Collection and dissemination of relevant environmental documents including amendments to environmental protection acts issued by REMA;
- Co-ordination with government departments on environmental and social issues and obtaining the necessary clearances from the regulatory authorities;
- Monitoring the environmental aspects during construction to ensure that the environmental requirements of the contract and the mitigation measures proposed in the ESMP are implemented;
- Supervising contractors and preparation of environmental and social input to the quarterly progress report.

The project will closely work with RDB, REMA, MININFRA/RTDA and District staff to ensure the adequate implementation and monitoring of safeguards. The cost for the implementation and monitoring the ESMP proposed for Nyagatare feeder roads project is presented below.

Table 41: Bills of Quantities and Cost Estimates for Environmental and Social Management Plan

S/No	Activity	Unit	Quantity	Frequency	Rate	Total (RWF)
A	**Project Planning and design Phase**					
1	Meetings/ site visits for beneficiaries' involvement in selection of feeder roads	Number	14	Once per road before works	LS	1,000,000
2	Consultations with affected communities	Number	14	Once per road before works	LS	1,000,000
3	Compensation of assets to be lost during the selection of borrow/quarry areas and roads realignment	Assets		Once	LS	5,000,000
SUBTOTAL A						**7,000,000**
B	**Project Construction Phase**					
4	Employing Environmental & Social & Health and Safety Experts for Contractors & Supervising firms	Number	8	Six Lots, one contractor's expert per lot and One Expert from the Supervising firm for 2 lots lots for 12 months	1000,000/month/pers	96,000,000
5	Developing detailed borrow pits/ quarry management plans	report	1	Once after confirmation of the borrow/quarry area selection	LS	2,500,000
6	Developing a health and safety management plan	report	1	Before the start of civil works	LS	2,300,000
7	Reshaping, transport and spreading over topsoils in the pits	ha	11	Once at the completion of excavations	1,500,000	16,500,000
8	Application of organic materials	Tons	45	Once at the completion	40,000	1,800,000

S/No	Activity	Unit	Quantity	Frequency	Rate	Total (RWF)
				of excavations		
9	Tree and grass plantation in borrow/quarry areas and maintenance for 1.5 years	Number of trees	7,700	Up to Three Years	2,500	19,250,000
10	Posting of safety sign posts	Number	100	Once and as required	100,000	10,000,000
11	Disposal of unused stockpiled topsoils before rains	m^3	180,000	depending on available materials	LS	20,000,000
12	Protection of roads embankment with vegetation	km	20	as required	200,000	4,000,000
13	Construction of drainage systems, checkdams and silt traps	km	10	where required	LS	50,000,000
14	Maintenance of motorized machinery & equipements in service stations	Number	50	regularily	LS	10,000,000
15	Solid Waste container for collection	Number	30	Once every 10 km, at least 2 for each road	100,000	3,000,000
16	Provision of sanitary facilities to workers	number of workers	maximum 500		LS	5,000,000
17	Sewage disposal during construction (Septic Tank & Soak pit) + Emptying	Number	30	One every 10 km, at least 2 for each road	200,000	6,000,000
18	Awaireness campaigns for preventing communicable diseases	Meeting	2/ road	Monthly	LS	500,000
19	Awaireness meetings on GBV, child labour, prostitutions preventions	Meeting	2/road	on term basis	LS	1,000,000
20	Assessment of wildlife in the area				LS	200,000
21	Creation of Cattle passes				LS	5,000,000

S/No	Activity	Unit	Quantity	Frequency	Rate	Total (RWF)
22	Provision of protective equipments and clothing	number of workers	maximum 500	Continuous	LS	5,000,000
23	Provision of first aid facilities	Number	14	One per road	LS	10,000,000
24	Water sprayer/ Watering for dust suppression	km	184.12	As and When Required	500,000	92,060,000
25	Routine maintenance, repair of trucks and machines	Number	50	As required	LS	15,000,000
26	Construction of alternative roads in case of roads closure			When required	LS	7,500,000
27	Chance and find procedures			As required	LS	2,500,000
28	Awaireness programs on child protection through close collaboration with existing Child protection Committees within the community and capacity building for those committees	Number	60	Continuous	LS	2,000,000
29	Construction of water points					
a)	Valve Chamber (60x60x75 cm)	Numbers	17	Once	500,000	8,500,000
b)	Replacement of Water Taps	Numbers	8	Once	100,000	800,000
c)	Replacement of Valve	Numbers	17	Once	50,000	850,000
	Sub-Total B					**395,260,000**
C	**Project Operation Phase**					
30	Capacity building of district staff & local communities	Number	50	Twice a year	LS	20,000,000
31	Provision of traffic control signage prominently at the entrance &		Where	Once	LS	10,000,000

S/No	Activity	Unit	Quantity	Frequency	Rate	Total (RWF)
	throughout populated areas		required			
32	Provision of speed bumps in the vicinity of populated areas		Where required	Once	LS	5,000,000
33	Awaireness meetings on traffic safety issues	Number	at least 10	At least two meetings per road	LS	10,000,000
34	Tree Plantation on Road Side for Enhancement Measure	Number	5,500	Plantation & Up to 3 years Management	2,500	13,750,000
	Sub-Total C					**58,750,000**
	Total (A+B+C)					**461,010,000**
	Contingencies (10% of A+B+C)					**46,101,000**
	TOTAL					**507,020,000**

The total cost for implementation of the ESMP is 507,020,000 Frw, compensation cost exclusive. The compensation cost will be detailed and a standalone site RAP currently under preparation.

7.4.3 Environmental and Social Training

The training program will cover measurement techniques in the field, tools for the prediction of pollutants, reforestation methods and procedures, conservation of water bodies including marshlands, etc. Immediate short-term training will be required for the Project in-charge and designated Environmental Officer to raise the level of environmental awareness. The training institutions, the institutions of high learning in Rwanda (universities) and the World Bank's Economic Development Institute (Environment and Natural Resources Division), conducts regular training and access to their resources may be sought. The need for additional and specialised training will be examined and appropriate training will be undertaken as required. Training of personnel to be deployed on the proposed project during construction and operation, with regard to environmental requirements should be the integral part of the planning. The project authority should be asked to submit a detailed programme for training of personnel and implementation with regard to the environmental requirements. Apart from the training, such programme should include guidelines for safety, methods of disaster prevention, action required in case of emergency, fire protection, environmental risk analysis etc. Capacity to quantitatively monitor water sediments or turbidity (by suitable portable test equipment) and noise is always advantageous, but monitoring will primarily involve ensuring that actions taken are in accordance with contract and specification clauses, and specified mitigation measures. Some awareness training will be provided to the contractor personnel to ensure that this occurs effectively. The provision of training has been made in cost estimates for environmental training (Refer to Chapter 8).

7.4.4 Monitoring and Reporting Procedures

The baseline data should be collected before the project begins. This will help in monitoring and controlling environmental impacts caused by the development of the project. The project in-charge and designated EO will visually assess contractor's practices and, if high pollutant levels are suspected, will direct the contractor to Rwanda Standards Board (RSB) or other laboratories to verify measurements on a routine basis. Photographic records will be established to provide useful environmental monitoring tools. A full record will be kept as part of normal contract monitoring. All applicable regulations need to be enforced by the Project Incharge and designated EO. Under the Environment Organic Law (2005) water quality discharge standards, air pollution emission standards and noise standards have been established. It is a legal obligation of the Contractor that any discharges from the work sites meet these standards.

Steps will be taken by the Project Incharge and designated EO to ensure that regular monitoring of water quality parameters such as pH, suspended solids, turbidity, Magnesium, oil and grease be carried out as provided in the contract. Regular monitoring of noise and dust will also be carried out as provided in the environmental monitoring program. The monitoring of accident frequency as compared to baseline will also be done,

Throughout the construction period of feeder roads'activities, the Contractor and the Supervising firm will both provide the monthly progress reportonthe subproject compliance withenvironmental and social safeguards. The report will be submitted to the MINAGRI/SPIU FRDP for review and approval.The Project Enironmental Officer will prepare periodic environmental and social consolidated reports (three month progress report) on the monitoring progress of the feeder roads project inthe district. These reports should be forwarded to REMA and World Bank for information.The Project in collaboration with REMA will be required to conduct an environmental audit every 2 years or whenever needed.

7.4.5 Record Keeping

Monitoring form should be devised for documentation, analysis and record of parameter. The form should focus attention on environmental issues and provide feedback for the future stages of the work. Mitigation and enhancement measures adopted in final design will be explicitly under the bill of quantities (BOQ) so that performance and completion is readily documented. Daily project diaries would record environmental problems (spills, dust, noise, etc.) as well as safety incidents and will be retained as part of accepted modern contract management and summarized in Quarterly Environmental Reports.

7.4.6 Implementation Schedule

The most important aspects of the implementation are the appointment of the Environmental Officer to oversee the implementation of the environmental mitigation measures incorporated in the design and contract specifications. Development and delivery of an environmental training program for indicative staff and Project coordinators responsible for overseeing the construction contracts can commence immediately thereafter. This will be an ongoing process. Contracts will be awarded over a period of time stretching over many months. Schedule for Implementation of Environmental and social Management Plan (ESMP) is given in **Table 42.**

Table 42: Schedule for Implementation of ESMP

S. No.	Activity	Frequency and/or Implementation Date
1	Appoint Environmental Officer	Date to be determined
2	Initiate First Training Program	Date to be determined
3	Ongoing Training	As required
4	Check Monitoring	Quarterly
5	Prepare Environmental Reports	Quarterly
6	Construction Supervision	During Construction
7	Roadside Environment Safety and Non-Motorised Transport Policy Development	Long-Term
8	Development of Compensatory Habitats Policy	Long-Term
9	Set up an Environmental Unit	Long-Term

Source: Consultant Proposal

7.5 CONSTRUCTION MANAGEMENT GUIDELINES

In order to avoid major environmental issue, it will be appropriate to follow construction management guidelines:

- Access roads should not be constructed near water bodies. If at all it is necessary to construct them, then a buffer strip should be provided to prevent water pollution.
- In order to avoid congestion of road during construction, traffic shall be diverted to other roads with sign boards and information.
- Water Supply, sewerage and drainage lines likely to be affected need to be diverted suitably without affecting the supply system.
- People working/living near feeder roads should be made aware about possibility of high noise, hazards and other information in the Right of Way.
- There may be damage to surface and sub-surface drainage and also rotting and mixing of top soil. To avoid this, it is essential to retain original surface contours as far as possible and minimize the earth work involved.

- As far as possible, care should be taken to compact all loose soil before end of work every day and avoid work during rainy season. This will help control erosion of soil.
- Care must be exercised not to spill fuel by keeping vehicle/equipment in a well maintained condition. Special attention should be given to oil seals of equipment/vehicle involved. Maintenance should be done in automobile service stations and other approved service areas. In case of accidental oil spills, proper clean-up should be conducted by skilled technicians.
- It is necessary to check the noise generated during construction. The equipment and vehicles should be in good working condition to allow for minimum generation of noise.
- The occupational noise levels during 8-hour work shift should not exceed 85 dB(A). The public exposure should be limited to 55 dB(A) during day time(6AM - 9PM) and 45 dB(A) during night time (9PM - 6AM).
- Use of electrical equipment should be preferred over pneumatic ones in order to minimize noise generation,

First aid: At every workplace, a readily available first aid unit including an adequate supply of sterilized dressing material and appliances will be provided. Workplaces remote and far away from regular hospital will have indoor health units with one bed for every 250 workers. Suitable transport will be provided to facilitate taking of injured or ill person (s) to the nearest applicable hospital.

Setting up of Construction site: The contractor may follow the guidelines to identify the location of the construction equipment site.

1. A minimum of 1 km away from any major settlement or village,
2. A minimum of 300 m away from major surface water course or body,
3. On non-agricultural lands, as far as possible, and
4. Safety measures to Workers during construction.

Risk from Operations: The implementing agency is required to comply with all the precautions as required for the safety of the workmen.

The contractor will supply all necessary safety appliances such as safety goggles, helmets, masks, etc., to the workers and staff. The contractor has to comply with all

regulation regarding safe scaffolding, ladders, working platforms, gangway, excavation, and trenches.

Workers Camps: All temporary accommodation must be constructed and maintained in such a fashion that uncontaminated water is available for drinking, cooking and washing; Adequate washing and bathing places shall be provided, and kept in clean and drained condition; Construction camps people shall be adequately provided with health care; drains and ditches should be treated with bleaching power on a regular basis.

Shelter at Workplace: At every workplace, shelter place shall be provided free of cost, for meals and for rest, and separately for use of women labourers. The height of shelter shall not be less than 3 m from floor level to lowest part of the roof. Sheds shall be kept clean and the space provided shall be on the basis of at least 0.5 sq. m per head.

Canteen Facilities: A cooked food canteen on a moderate scale shall be provided for the benefit of workers wherever it is considered necessary. The contractor shall conform generally to sanitary requirements of local medical, health and municipal authorities and at all times adopt such precautions as may be necessary to prevent soil pollution of the site.

Day Creche Facilities: At every construction site, provision of a day creche shall be worked out so as to enable women to leave behind their children while working.

8 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

8.1 ENVIRONMENTAL AND SOCIAL MONITORING

Environmental and social monitoring programme is a vital process of any environmental management. This helps in signalling the potential problems resulting from the proposed project and will allow for prompt implementation of effective corrective measures. The environmental monitoring will be required during construction and operational phases. The following parameters shall be monitored:

- Water Quality,
- Air Quality,
- Noise levels, and
- Soil conservation,
- Accident frequency
- Socio-economic Conditions; and
- Reforestation.

A matrix has been developed for monitoring of impacts to facilitate the monitoring frame work which includes the following:

- Parameters to be monitored,
- Indicators,
- Method used for verification,
- Frequency of monitoring,
- Responsibility, and
- Costs involved.

Table 43 summarizes the above monitoring program. The bills of quantities (BoQ) have been prepared for environmental and social management plans along with costs involved are presented in **Table 41.**

8.2 TOTAL ENVIRONMENTAL AND SOCIAL MONITORING COSTS

The environmental and social management and monitoring costs is estimated as **RWF 31,790,000** (including contingencies 10%) as detailed below.

Table 43: Environmental and Social Monitoring Program

Adverse Impact	Parameter to be Monitored	Indicator	Method	Frequency	Responsibility	Cost Estimates (RWF)
Loss of properties (houses, trees, crops, etc)	Compensation for lost assets	Lists of PAPs & their affected assets, Lists of paid PAPs	Site visits for meeting with PAPs and crosschecking at the Banks	Continous	District authorities, MINAGRI/FRDP Social safeguards Specialist	1,000,000
Grievances raised by affected families	Complaints raised by PAPs	Number of complaints recorded	Meetings, site visits	As and when required	Grievance redress committees, District	0
Water Pollution	Water quality (DO, Ca,Mg, TSS, Turbidity, Coli form Count)	Nutrient and sediments loads	Bi-annually during wet seasons	Once every wet season	FRDP	3,000,000
Soil Pollution	Soil Chemical properties,	Soil nutrient loads	Soil sampling and laboratory analysis	As and when required	FRDP	1,500,000
Loss of trees	Tree species along roads and other identified areas	Number / area of planted trees	Field observations	Once in a month for 3 years	FRDP Environmentalist District PAPs	7,200,000
Safety hazards	health safety at the site	Incidences, accidents, diseases,	Review and evaluation of incidences, accidents register, diseases records,	continuous	MINAGRI/ FRDP District	4,700,000
	Accidents frequency	Nbr of accidents per month	Review of police records on roads accidents	Continuous	National Police District MINAGRI/FRDP	1,500,000
Low capacity of beneficiaries	Capacity/skills in	training reports,	Training of District	Twice a Year	MINAGRI/FRDP MINALOC	10,000,000

in the implementation of safeguards	environmental and social management	number of trained staff	Environmental Officers and other officers involved in environmental and social management		Districts	
Total						**28,900,000**
Contingency (10%)						**2,890,000**
Grand Total						**31,790,000**

8.3 GRIEVANCE REDRESS MECHANISMS

The grievance redress committee, composed of representatives from the participating District, MINAGRI/FRDP, Contractor and Supervising firm as well as affected comminities willbe created at the Subproject level to supervise the safeguards compliance throughout the project implementation period and resolve related issues/ conflicts. This committee will ensure that all affected people are fully informed of the process for expressing dissatisfaction and for seeking redress, and will issue warnings about the consequences of failure to lodge their complaints in time. Sub-comittees will also be created at the road level and will be Sector based. These sub-comittees will work under the coordination of the Subproject Committee.

It is encouraged to resolve the issues at Cell, Sector or District levels, as they are aware of and involved in the whole process. 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.

MINAGRI/RFRDP will follow up the aggrieved PAP at each level to ensure that the grievances are resolved. Each sector should identify one PAP to work with MINAGRI/FRDP and the local leaders to ensure that the grievances are attended to in time.

9 DISCLOSURE OF ENVIRONMENTAL SAFEGUARDS INSTRUMENTS

The Ministry of Agriculture and Animal Resources will disclose this ESIA/ESMP report by making copies available at its head office and in District / Sectors/ Cell project is situated. The copies shall also be made available to the local government's agencies (REMA, RDB, etc), the Environmental and Social Group and other stakeholders. The Government of Rwanda will also authorize the World Bank to disclose this ESIA/ESMP electronically through its InfoShop.

10 CONCLUSION AND RECOMMENDATIONS

10.1 CONCLUSION

Based on Project Description (Chapter-3)**,** Environmental Baseline Data (Chapter-4), Environmental Impacts (Chapter-5) and Environmental Mitigation Measures (Chapter-6), the following conclusions are drawn:

i) The feeder roads are mostly in hilly terrain in the district of Nyagatare. A feasibility study was done for a total of 184.12 km of feeder roads, and anenvironmental and social impact assessment study was conducted to establish en environmental and social management plan.

ii) The project area is about 160 km from Kigali and may be reached by road via National Road 3 and National Road 5. The integration of these roads with National Roads will help in economic development of the region. One of the important aims of rehabilitating Nyagatare district feeder Roads is to provide access to the rural areas and to improve quality of life of local community. This will enable to fulfil the goal of vision 2020, EDPRS II and other development programs to a large extends. Apart of this aim, the feeder road will help improve social and cultural environment and development of other sectors like agriculture, commerce and trade. Hence the proposed feeder road rehabilitation will play an important role in economical growth and reduction of the poverty. Educational, cultural and health centres will have an easy access thus making improved living standards and quality life of the people.

iii) The cost of the interventions to improve the feeder roads has been reproduced from the feasibility report. The total cost of construction to improve of 184.19km of feeder roads amount to US$ 12.221 million, the average cost per km amounts to US$ 66,375. The planned activities include rehabilitation / maintenance of drainage, bridges and carriageway. The environmental and social management plansand monitoting costs are estimated to RWF 538,810,000(including 10% Contingencies) which is 4.3% of project costs. The estimates do not include those items which are part of project intervention such as cross drainage works.

iv) It is estimated that 263 trees are likely to be cut for expansion of feeder roads. It is proposed to plant a little more than trees cut; hence 300 trees will be planted at

suitable locations along the feeder roads. In addition about 5,500 trees will be planted on marginal lands in the surroundings of the rehabilitated feeder roads as an environmental enhancement measure and also to protect the valley side erosion. In addition, the borrow area and quarry sites will also be vegetated to prevent erosion. About 7.63 ha of tree plantation will be done at these sites.

v) The major positive achievements of feeder road project are:
   - The road network in the District with national road linking with Kigali and other Districts, mainly Gatsibo, Kayonza and Gicumbi.
   - Development of social and cultural environment of not only influence area but also the surrounding Districts.
   - Development will stimulate ancillary projects in agriculture and allied areas which will improve economical status of the local population;
   - More employment of people during construction and operation phases;
   - Less travel time to schools, health centre and markets.
   - Development of potential socio-economic centres, enhancement of rural economy and improved transport system,
   - Skill Transfer and Training,
   - Potential to improve drainage, road safety and reduction in green house gases.

vi) The project is planning appropriate drainage pattern which will reduce the erosion rate in the different catchments. The underground utilities such as water pipeline, valve chambers etc. are likely to be relocated. Income generation of the rural population will be greatly enhanced through creating new avenues like trade commerce and other small agro processing industries.

vii) The environmental and social mitigation measures as stipulated in ESMP shall be monitored during implementation of the feeder road project. In order to perform monitoring of ESMP the construction company shall monitor the plans in the supervision of the experienced monitoring laboratory or Company.

viii) The noise and air quality of the project area is within the permissible limits. With the increase in traffic the maximum increase in noise level anticipated in the project area will be about 10 dB(A) as estimated based on field measurements. The change in air quality will be insignificant.

The overall impact on air and noise quality during construction is limited to site and of short duration and can be mitigated.

ix) The labour camps shall be established away from the forests and wetlands to avoid the problem of water pollution.

x) The environmental monitoring will be required before the start of the construction and during the construction and operation phases. The following parameters need to be monitored: Water Quality, Air Quality, Noise quality, and Soils. The parameters will be as specified in monitoring program in chapter 8.

xi) During public consultation, few recommendation were drawn are :i) Involve local communities in all stages of project planning and development, ii) Permanent communication between project initiators and local authorities, iii) All people whose properties have been affected by the project have to be compensated for loss of house, land, crops and trees, iv) Grievance redress and monitoring register have to be set-up and the process be publicized in the affected areas v) During construction, first priority should be given to local people for employment of skilled and unskilled manpower.

10.2 Recommendations

In view of above it could be concluded that project will bring benefit to the people of the area. The negative impacts are within the manageable limits and can be mitigated with the proposed management plans and hence project may be implemented.

ANNEXURES

Annexure 1 : Study Team

S. No.	Name of the Expert	Specialization
1	Prof Jean Bosco M GASHAGAZA	Environmentalist / Team Leader
2	Mr. Samuel NSHUTIYAYESU	Ecologist / Natural Resources Management Specialist
3	Eng. Naila UMUBYEYI	Water Resources Management Specialist
4	Dr. Balinda RUTEBUKA	Sociology Specialist

Annexure 2: Tolerance Limits for Discharged of Domestic Wastewater

S. No.	Parameter	Limits Treated	Methods of Test
1	TDS mg/l	<1500	ISO 6107-2:1989
2	TSS mg/l	<50	ISO 11923:1997
3	ph	5-9	ISO 10523:1994
4	Nitrates mg/l	20	ISO 5663:1984, ISO 6778:1984, ISO7890-3:1988
	Nitrites mg/l	2	ISO 6777:1984
	Total Nitrogen	30	ISO 11905
5	Total phosphorus mg/l	5	ISO 6878:2004
6	Temperature variation of Treated water compare to ambient Temperature of water ^{0}c	<3	Thermometer
7	BOD_5 mg/l	< 50	ISO 5815-2:2003
8	COD mg/l	< 250	ISO 6060:1989
9	Faecal Coli forms mg/l	400	ISO 4831:2006
10	Oil and grease mg/l	<10	ISO 9377-2:2000
11	Chlorine mg/l	<2	ISO 7393
12	Sulphate mg/l	500	ISO 22743
13	Color Pt-Co	200	ISO 7887

Annexure 3: Permissible Limits for Industrial Waste Water Discharge

S. No.	Parameter	Permissible Limit	Test Method
1.	Temperature increase ^{0}C	<3	Thermometer
2.	Total suspended solids mg/l	50.0	ISO .11923:1997
3.	Total Dissolved Solids mg/l	2000.0	ISO 7868:1985
4.	Oil and *grease*mg/l	10 0	ISO 9377-2:2000
5.	BOD_5 mg/l (20 ^{0}C)	50.0	ISO 5815-2:2003
6.	COD mg/l	250 0	ISO 6060:1989
7.	Faecal Coli forms MPN/I00ml	400	ISO 4831:2006
8.	Ammonia (as **N)** mg/l	20.0	ISO 6778:1984
9.	Arsenic mg/l	0.01	ISO 11969 1996
10.	Benzene mg/l	0.1	ISO 11423-2:1997
11.	Cadmium mg/l	0.01	ISO 5961:1994
12.	Hexavalent Chromium mg/l	0.05	ISO 23913:2006
13.	Copper **mg/l**	3.0	ISO 8288:1986
14.	Cyanide **mg/l**	0.1	ISO 6703-1:1984
15.	Iron **mg/i**	3.5	ISO 6332:1988
16.	Lead mg/l	0.1	ISO 8288:1986
17.	**Mercury** mg/l	0.0002	ISO 5666:1999
18.	Nickel mg/l	3.0	ISO 8288:1986
19.	Phenol mg/l	0.2	ISO 8165-1:1992
20.	Sulphide mg/l	1.0	ISO 13358:1997
21.	Zinc mg/l	5.0	ISO 8288:1986
22.	pH	5-9	ISO 10523:1994

Annexure 4: Ambiant Air Quality Tolerance Limits

S/No.	Pollutant	Time weighted average	Land Use Area			Test Methods
			Industrial Area	**Residential Rural & other Area**	**Controlled area**	**ISO 4221-1980**
1	**Sulphur oxides(SOx);**	Annual Average*	80µg/m3	60µg/m3	15 µg/m3	-
		24 hours**	125 µg/m3	80µg/m3	30µg/m3	
2	**Oxides of Nitrogen (NOx)**	Annual Average*	80µg/m3	60ug/m3	15µg/m3	-
		8 hours				
3	**Suspended particulate matter(SPM)**	Annual Average	360µg/m3	140µg/m3	70µg/m3	ISO 9835:1993
		24 Hours	500µg/m3	200µg/m3	100µg/m3	
4	**Respirable particulate matter(<10um)(RPM)**	Annual Average	70µg/m3	50µg/m3	50µg/m3	ISO 9835;1993
		24 Hours	150µg/Nm3	100µg/Nm3	75µg/Nm3	
5	**MP2.6**	Annual Average	35µg/m3	-	-	ISO 9835;1993
		24 Hours	75µg/m3			
6	**Carbon monocide(CO)/ Carbon dioxide(CO_2)**	8hours**	5.0mg/m3	2.0mg/m3	1.0mg/m3	ISO 4224:2000

Annexure 5: Noise Exposure Limits

Area Code	Category Area	Limits in dB (A) Maximum	
		Day time 06:00 – 21:00	***Night time*** 21:00 – 06:00
A	Industrial Area	75.0	70.0
B	Commercial Area	65.0	55.0
C	Residential Area	55.0	45.0
D	Silence Zone	50.0	40.0

Source: Rwanda Standards Board **RS 236:2014**

Annexure 6: Sample Site Visits Photographs

Annexure 7: List of Participants in Public Consultation Meetings

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Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: Nyagatare | GATUNDA Date: 27/8/2014

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
16	Hategekimana Innocent	Gyagaju	FR11	0788342709	Enseignant	
17	Mukanzeli Sofesina	Nyagatare	FR11	-	Umuhinzi	
18	Nyiransengimana Peruvina	Nyagatare	FR10	-	Umuhinzi	
19	Nyiranyenyo Elise	Nyagatare	FR10	-	Umuhinzi	
20	Nyirabahizi Du Berth	Nyagatare	FR10	-	Umuhinzi	
21	Mukantabaro Esperance	Nyagatare	FR10	-	Umuhinzi	
22	Mujawimana Esperance	Nyagatare	FR10	0787088263	Umuhinzi	
23	Mukandayisenga Beatrice	Nyagatare	FR10	0789923531	Umuhinzi	
24	Muhawenimana Rose	Nyagatare	FR11	-	Umuhinzi	
25	Uwimana Donatile	Nyagatare	FR11	-	Umuhinzi	
26	Mukankusi Ferest	Nyagatare	FR11		Umuhinzi	
27	Habimana Fred	Nyagatare	FR10	0783906541	Umuhinzi	
28	Mukamwiza Ana Henri	Nyagatare	FR10		Umuhinzi	
29	Bizinde Jean	Karushuga	FR10	0783294702	Umuhinzi	
30	Muhawenimana Jea	Nyagatare	FR10	-	Umuhinzi	

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ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
01	BIRAGUMA Thomas	NYANGARA	FR10	0783095382	UMUREZI	
02.	KAYIRANGA Epiphane	"	FR10	0783516187	UMUHINZI	
03.	BUHIGIRO Gratien	"	FR10	07 —	UMUHINZI	
04.	NSABIMANA François	"	FR10	0783897826	"	
05	NYIRANEZA Claudine	"	FR10	0783266044	"	
06	BUTARE Augustin	"	FR10	0783820917	"	
07	KANYARUZINI Célestin	"	FR10	0782663636	Enseignant	
08	MUGWENDELI Alphonsine	"	FR10	0783136593	Enseignante	
09.	MUSA MUGENGE	"	FR10	0788664288	UMUHINZI	
10	MUTAWEMANA Hervé	"	FR10	0782923536	UMUHINZI	
11.	NYIRABUHINJA Pélagie	"	FR10	0 —	UMUHINZI	
12.	MUGASO François	"	FR10	078[illegible]8[illegible]	"	
13.	NTEZIMANA Probper	"	FR10	0783655499	"	
14	CANGENYENKA Donatien	"	FR10	0788660127	"	
15	MUGABE Jean Baptiste	"	FR10	0782094228	"	

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Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / GATUNDA Date: 6 & 7/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	NYIRASANGWA Alphonsine	NYANGARA	FR10	0786997263	cultivateur	
2.	HAGENIMANA Albert	NYANGARA	FR10	0786164853	Cultivateur	
3.	GYUBAHIRO Eric	NYANGARA	FR10		Student	
4.	BYUMUHOZE Baptiste	NYANGARA	FR10	0788263255	cultivateur	
5.	SIBOMANA Athanase	NYANGARA	FR10	-	Student	
6.	NSABIMANA J. Claude	NYANGARA	FR10	-	Student	
7.	NKUNDUWE Remy	NYANGARA	FR10	-	Student	
8	KUMBUKA Gerard	NYANGARA	FR10	-	Student	
9.	IYAMUREMYE Jovens	NYANGARA	FR10	0784038720	cultivateur	

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District: NYAGATARE / GATUNDA Date: 27/8/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	MURWANYI Isaie	NYANGARA	FR10	0788572968	Headteacher	[signature]
2	HITIMANA Simon	NYANGARA	FR10	0788617686	cultivateur	[signature]
3	BABWIUNGA Vincent	NYANGARA	FR10	0786539109	Cultivateur	[signature]
4	HAGEKIMANA Sylvère	NYANGARA	FR11	0788647277	Cultivateur	[signature]
5	MUGABIRE Tanière	NYANGARA	FR11	0784300647	SEDO of Cell	[signature]
6	BISANGWA Venuste	NYARUREMA	FR11	0788761495	Headteacher	[signature]
7	NKIRIYEHE Emmanuel	NYANGARA	FR11	0787858132	E/S Cell	[signature]
8	MUKAMAKUZA Therese	NYANGARA	FR11	-	Cultivateur	[signature]
9	TUMWIHRWE Christine	NYANGARA	FR11	0789465547	cultivateur	[signature]
10	BYARAKABITE Ildephonse	NYANGARA	FR11	0785245229	cultivateur	[signature]
11	NTIBAMBURWA Louis	NYANGARA	FR11		Cultivateur	[signature]
12	HAKIZIMANA Emmanuel	Kabeza	FR10	0784886942	E/Secr.	[signature]
13	KAREGEYA Ernest	NYANGARA	FR10	-	cultivateur	[signature]
14	NYIRABARAME Susane	NYANGARA	FR10	-	cultivateur	[signature]
15	HABYARIMANA Jonathan	NYANGARA	FR10	0785028322	cultivateur	[signature]

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ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
01	MUGABO Jonathan	NYANGARA	FR10	0786632926	UMUHINZI	
02	CYOMUGISHA Louise	"	FR10	0787537854	"	
03	RUHIGIRA Fred	"	FR10	0787537753	"	
04	BAGUMA Jean Damascène	"	FR10	0787219981	"	
05	RYUMUGABE Jean Pierre	"	FR10	0782290314	"	
06	NSENGIYUMVA Léonard	"	FR10	0783182110	Enseignant	
07	KUBWIMANA Christine	"	FR10	0786790105	UMUHINZI	
08	NDAGIJIMANA Jean Damascène	"	FR10	0783268180	"	
09	Kamanzi FRED	"	FR10	0787309960	Macro Comptable	
10	NYIRANGERAGEZE Seraphine	"	FR10	—	UMUHINZI	
11	TWAGIRAYEZU Gervais	"	FR10	0784059368	"	
12	BIZIMANA François	"	FR10	—	"	
13	MUNGUYIKO Abraham	"	FR10	—	"	
14	KAMUGISHA Efraole	"	FR10	—	"	
15	MUSABYIMANA Sativa	"	FR10	—	"	

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ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	TUZISABIMANA Cyrille	NYAKARA	FR10	0783108170	Teacher	
2.	KAMUHANDA Evariste	NYANGARA	FR10	-	Cultivateur	
3.	KABUTURA Sylvestre	NYANGARA	FR10	0784239407	cultivateur	
4	MBONIMPA Jean	NYANGARA	FR10	-	Cultivateur	
5	SEBUFIRA Daniel	NYANGARA	FR10	-	cultivateur	
6.	HAVUGIMANA S Baptiste	NYANGARA	FR10	-	Cultivateur	
7	MARONGA Felicien	NYANGARA	FR10	-	Cultivateur	
8	MUTAGIRENDA Sylvère	NYANGARA	FR10	-	Cultivateur	
9.	KAMANZI Benoit	NYANGARA	FR10	-	Cultivateur	
10	KAGANGU Juvenal	NYANGARA	FR10	-	Cultivateur	
11	NIKUZIGIZE Focas	NYANGARA	FR10	-	Cultivateur	
12	MUKAMUSHIZI Sylvina	NYANGARA	FR10	-	Cultivateur	
13.	MUKESHIMANA Denyse	NYANGARA	FR10	-	Cultivateur	
14.	UMUTESI Jeannette	NYANGARA	FR10	-	Cultivateur	
15	INGABIRE Pierre	KAGINA	FR10	-	Cultivateur	

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ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	MUKAMUREMI Vestine	NYANGARA	FR10	0783033887	Farmer	
2	NDISHUNGA Jmv	NYANGARA	FR10	0788457147	Teacher	
3	MWIZERWA William	NYANGARA	FR10	0788557228	Teacher	
4	MUBAHUNGA Emmanuel	NYANGARA	FR10	07 —	Farmer	
5	NSENGUMUREMYI Didas	NYANGARA	FR10	0782993816	Mélanicien	
6	NDUWAYEZU Jean Damascene	NYANGARA	FR10	0784927787	Farmer,	
7	INGABIRAMA Eugène	NYANGARA	FR10	0786621061	Menuisier	
8	MUKAGATARE Espérance	"	FR10	0788898537	Farmer	
9	UWIMANA Odile	"	FR10	0782340883	Farmer	
10	NTIRENGANYA Hamidou	"	FR10	0781319107	Farmer	
11	UZAMUSHAKA Mariam	"	FR10	07 —	Farmer	
12	NSENGIYUMVA J. D'Amour	"	FR10	0727024491	Trader	
13	NYIRANEZA Charlotte	"	FR10	07 —	Farmer	
14	UWIRAGIYE Florence	"	FR10	0782154643	Student	
15	MUKUNDWA Anitha	"	FR10	0722481670	Student	

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ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	Munyeregwe Joseph	Nyangare	FR10	0786829828	Umuhinzi	[signature]
2	Gatera Cerdo	Nyangare	FR10	0783058374	Umuhinzi	[signature]
3	Ndayambaje Erick	Nyangare	FR10	0783152789	Umurezi	[signature]
4	Bizimana Franc	Mihambo	FR10	078 -	Umuhinzi	[signature]
5	Rwabitoi fundure	Nyangare	FR10	-	Umuhinzi	[signature]
6	NZIKOBANYANKA Isaac	"	FR10	0785661604	Umurezi	[signature]
7	Ntengiyumva Prince	Nyangare	FR10	0784310196	Umuhinzi	[signature]
8	Nkurunziza Simon	Nyangare	FR10	-	Umuhinzi	[signature]
9	Bashakira J.B	Nyangare	FR10	0784622265	Umuhinzi	[signature]
10	Barikamwe Evariste	Nyangare	FR10	~~0788872534~~	Umuhinzi	[signature]
11	Munyagatorama Anisia	Nyangare	FR10	0788192538	Umuhinzi	[signature]
12	R Habakurama R	Nyangare	FR10	0788656760	Umuhinzi	[signature]
13	Munabandi Elias	Nyangare	FR10	-	Umuhinzi	[signature]
14	Nsanzimana J claude	Nyangare	FR10		Umuhinzi	[signature]
15	Nzigiye Roland	Nyangare	FR10	0786961781	Umuhinzi	[signature]

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ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
31	Hakizimana J.B	Nyagatare	FR10	0786280598	Umuhinzi	
32	Murekatete Damien	Nyagatare	FR10	0783344579	Umuhinzi	
33	Habinshuti Gil	Nyagatare	FR10	0783236257	Umuhinzi	
34	Mwendabari Kanyoti	Nyagatare	FR10	—	Umuhinzi	
35	Habimana Anita	Nyagatare	FR10	0788896467	Umuhinzi	
36	Bizimungu William	Nyagatare	FR10	0783015799	Umuhinzi	
37	Ntibazikiko Gerdi	Nyagatare	FR10	0781136190	Umuhinzi	
38	Mbonankira Isec	Nyagatare	FR10	078 —	Umuhinzi	
39	Rukumurenzi J.M	Nyagatare	FR10	0781811792	Umuhinzi	
40	Ndacyayisenga Zeller	Nyagatare	FR10	0784302305	Umuhinzi	
41	Nzabonimpa Jelina	Nyagatare	FR10		Umuhinzi	
42	Uzayisenga Jafeth	Nyagatare	FR10	0781618284	Umuhinzi	
43	Mutabazi Fostin	Nyagatare	FR10	—	Umuhinzi	
44	Nshutiyabeto Patric	Nyagatare	FR10	—	Umuhinzi	
45	Hitimana Alexander	Nyagatare	FR10	0789354521	Umuhinzi	

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Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

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ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
	HABIMANA Idephonse	Kijojo	FR1	0788823409	HINZI	
	HABYARIMANA Emanuel	Kijojo	FR1	0784588671	HINZI	
	BAHIZI Eliyabo	Kijojo	FR1	0789558162	HINZI	
	MANISHIMWE Adolphe	NTOMA	FR5	0782732183	HINZI	
	HATEGEKIMANA Felesien	NTOMA	FR5	0	HINZI	
	RUKAYABO Felesien	Kijojo	FR1	0786628283	HINZI	
	NSANZIMANA Elie	Kijojo	FR1	0784273299	HINZI	
	NZABANDORA Isai	Kijojo	FR1	0784619381	HINZI	
	HABAGUHIRWA Anuza	Kijojo	FR1	0782822483	HINZI	
	BUSARE John	NTOMA	FR5	0784596439	HINZI	
	MANKUENA John	NTOMA	FR5	0783568631	HINZI	
	NIYONSENGA Samuel	NTOMA	FR5	0	HINZI	
	MANGANJE Fabien	NTOMA	FR5	0785117666	HINZI	
	RUKERATABARO André	NTOMA	FR5	0788911234	HINZI	
	NYANDWI Louis	NTOMA	FR5	0784887527	HINZI	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

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ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	Ndayambaje Jean Baptiste	Kijojo	FR1	0788232049	Umuhinzi	[signature]
2	HABIMENSHI Thadeo	Kijojo	FR1	0783906701	Umuhinzi	[signature]
3	Habineza Jean Claude	Kijojo	FR1	0789944380	Umuhinzi	[signature]
4	SINTABAKIRA Faustin	Kijojo	FR1	0784335797	Umuhinzi	[signature]
5	HAKIZIMANA Celestin	Kijojo	FR1	0784955770	Umuhinzi	[signature]
6	NSABIMANA Celestin	Kijojo	FR1	0781952664	Umuhinzi	[signature]
7	HABIYAKARE François	Kijojo	FR1	-	Umuhinzi	[signature]
8	Hakimana Donath	Kijojo	FR1	0781997330	Umuhinzi	[signature]
9	Habiyambere Jean Baptiste	Kijojo	FR1	0789472438	Umuhinzi	[signature]
10	Nandwahafi Isai	Kijojo	FR1	0782090691	Umuhinzi	[signature]
11	NSABIMANA Eliderphonse	Kijojo	FR1	0785281361	Umuhinzi	[signature]
12	Habimana Joseph	Kijojo	FR1	0739491495	Umuhinzi	[signature]
13	Ntamutumadua J. Damascene	Kijojo	FR1	-	Umuhinzi	[signature]
14	Bizimana Anastas	Kijojo	FR1	0782056215	Umuhinzi	[signature]
15	Ndayisaba Elarde	Kijojo	FR1	0783555539	Umuhinzi	[signature]

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: Nyagatare /Mimuri Sector Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
31	SABITI Jean Baptiste	Nyoma	FR5	078	Umuhinzi	[signature]
32	MUNYANEZA Cyprien	Nyoma	FR5	078136600	" "	[signature]
33	Kusiima Célestin	Nyoma	FR5	0782922284	" "	Kuwf
34	SAMVURA Simion	" "	FR5		" "	[signature]
35	MUNYENTWARI Vincent	" "	FR5	0787599125	" "	[signature]
36	NZABANITA Théogene	" "	FR5		" "	[signature]
37	NSEKARIJE Célestin	" "	FR5		" "	[signature]
38	NGIRABAKUNZI Théogene	" "	FR5		" "	[signature]
39	NIYONSABA J Paul	" "	FR5	0781282124	" "	[signature]
40	NTAWIREMA Gerard	" "	FR5		" "	[signature]
41	HAREERIMANA Adidas	" "	FR5		" "	[signature]
42	DUSABE John	" "	FR5	0727496439	" "	[signature]
43	KWIBANGAVA Charlotti	" "	FR5		" "	[signature]
44	NGAYABOSHYA Leon	" "	FR5	0787508196	" "	[signature]

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: Nyagatare / MUKAGERI Cell Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
16	HAKUZIYAREMYE Ezekiel	NTOMA	FR5	0783516878	Umujyanama	
17	HAKIZIMANA J. Bosco	NTOMA	FR5	0786532510	Umukinzi	
18	NDABAMENYE J. de la paix	" "	FR5	078	" "	
19	Akimana J. D'amour	" "	FR5	0784232894	" "	
20	Habumugisha Felicien	" "	FR5		" "	
21	IGENUKWAYO J. Bosco	" "	FR5	0783664595	" "	
22	Rwanika Sylvestre	" "	FR5		" "	
23	NTAKIYIMANA Leonard	" "	FR5		" "	
24	AYINKAMIYE Madalina	" "	FR5			
25	MUNYANEZA J. de la paix	" "	FR5	0783525234	" "	
26	NDAHAYO REVIS	" "	FR5	0783650417	" "	
27	NZAROSA Jackson	" "	FR5	0784840307	" "	
28	MUNYAZESA Théogene	" "	FR5		" "	
29	NSHIMIYIMANA Zekalie	" "	FR5		" "	
30	MUNYENKWAYA J. Damascene	" "	FR5	0783244925	" "	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: Nyagatare/Musheri Sector Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	BIMÉNYIMANA Martin	Ntoma	FR5	0783037038	Umuhinzi	
2	NDAYISABA Fabien	Ntoma	FR5	0788827399	" "	
3	KURABUSENGE Theoneste	Ntoma	FR5	0784384048	" "	
4	NKIKABWINSHI Célestin	Ntoma	FR5	0783400047	" "	
5	NTEZIYAREMYE Théoneste	Ntoma	FR5	0785295685	" "	
6	NIZEYIMANA Cyprien	Ntoma	FR5	0782412474	" "	
7	MBONANKIRA J Bosco	Ntoma	FR5	0788205598	" "	
8	HABINEZA Eliezel	Ntoma	FR5	0787503329	" "	
9	MPORANYABAHIZI Bernard	Ntoma	FR5	0785443417	" "	
10	SAFARI Silas	Ntoma	FR5	0787826942	" "	
11	BAZIRAMWABO Fidel	Ntoma	FR5		" "	
12	NSANZUMUHIRE JMV	Ntoma	FR5	0789003955	" "	
13	HASHAKIMANA Frodoard	Ntoma	FR5	0783425388	" "	
14	MPAGAZEHE Emmanuel	Ntoma	FR5		" "	
15	NSANZIMANA Sylvie	Ntoma	FR5		" "	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE/MUSHERI Sector Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
	MANIRAKIZA CYPRIEN	NTOMA	FR5	0782665408	HINZI	
	MAYIZIENTE DEGRIA	NTOMA	FR5	.	HINZI	
	TUYISHIME JACKOBE	NTOMA	FR5	0786233133	HINZI	
	MANIRAKIZA JABORO	NTOMA	FR5	0787347848	HINZI	
	NDIZIHIWE JABANUR	NTOMA	FR5	0783997361	HINZI	
	SEBAGEZA EMMANUEL	NTOMA	FR5	.	HINZI	
	CYATEGENGE MOSA	NTOMA	FR5	0786[illegible]	HINZI	
	BEBISHIMBO EGUSITE	NTOMA	FR5	078 5254288	HINZI	
	NTEZIYAREMYE JABOSIE	NTOMA	FR5	0734286316	HINZI	
	HABIMANA BEZIRE	NTOMA	FR5	.	HINZI	
	AYINKAMIYE MADARINA	NTOMA	FR5	.	HINZI	
	HAKIZIMANA VESENTI	NTOMA	FR5		HINZI	
	NZABONIKORA FERESIYANE	NTOMA	FR5	0783032037	HINZI	
	HABUMUKEMYE ERIYA	NTOMA	FR5	0786880380	HINZI	
	SIWOMANA DANYIKI	NTOMA	FR5	0781134511	HINZI	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / NGARAMA [illegible] Date: 27/8/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	TUYAMBAZIMANA FOLORIYE	NTOMA	FR5	0786465937	HINZI	
2	MBUZAMAMENERO SERUKIYA	NTOMA	FR5	-	"	
3	TEGAYOMBI EMANUELI	NTOMA	FR5	0783045773	"	
4	MUSENEZA ~~POSIYANI~~ MARTINI	NTOMA	FR5	0786535683	"	
5	HAGENIMANA DONOSIYANI	NTOMA	FR5	0783395809	"	
6	MUHAMIRA PIYERI	NTOMA	FR5	-	"	
7	NSENGIYUMVA SAMUELI	NTOMA	FR5	-	"	
8	HABARUREMA PIYERI	NTOMA	FR5	07838573260	"	
9	HAKIZIMANA DAVIDI	NTOMA	FR5	0736148482	"	
10	HAFASHIMANA NOSENTI	NTOMA	FR5	078665639 5	"	
11	MBAGUMANA KERODE	NTOMA	FR5	078361608 4	"	
12	AHISHAKIYE REWOMARUBI	NTOMA	FR5	-	"	
13	BUSHAMBIMANA BOSIKO	NTOMA	FR5	07823233	"	
14	NSEKARIJE JOZEFU	NTOMA	FR5	-	"	
15	KANYAMUGO EZEKIELI	NTOMA	FR5	0786464887	"	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / MUSHERI FEEDER Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
01	NDUWAYEZU OMARI	NTOMA	FR5	0783496352	TEKENISIC	
02	SINZINKAYO KASIANI	NTOMA	FR5	0786656341	HINZI	
03	RWANGANO PIERRE	NTOMA	FR5	0788571335	TEKENIEN	
04	HARERIMANA ZENO	NTOMA	FR5	0787593604	HINZI	
05	MUNYARUKIKO MARC	NTOMA	FR5	0787753342	HINZI	
06	BAMAHATE FAUSTIN	NTOMA	FR5	0786490827	HINZI	
07	MUSABYIMANA Celestin	NTOMA	FR5	0783761945	HINZI	
08	NSABIMANA J. Bosco	NTOMA	FR5	078	HINZI	
09	CYIZA EVARISTE	NTOMA	FR5	078	HINZI	
10	KAZUBWENGE Alphedi	NTOMA	FR5	0783517399	HINZI	
11	NYIRAMAJYAMBERE Alp	NTOMA	FR5	0783793522	HINZI	
12	NIYOMUKIZA EVARISTE	NTOMA	FR5		HINZI	
13	MUNYABUHORO Sylvestre	NTOMA	FR5	0789247274	HINZI	
14	NDAYAMBAJE J. Damascene	NTOMA	FR5		HINZI	
15	NKUNDABERA BONAVENTURE	NTOMA	FR5	0787604911	HINZI	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE/NGIHERI Sector Date: 27/8/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	BIZIMUNGU SHALIRI	NTOMA	FR5	0783391044	HINZI	
2	BARENGAYABO DANIYERI	NTOMA	FR5	0727431403	HINZI	
3	Habarimana Jean Bosco	Ntoma	FR5	0785684332	Hinzi	
4	NYIRIMBONEZA JOZEFU	NTOMA	FR5	-	NZI	
5	MUKANOHELI VIJOLETA	NTOMA	FR5	-	NZI	
6	MUYEHE MOSENTI	NTOMA	FR5	0783488213l	NZI	
7	NIZEYIMANA REGISI	NTOMA	FR5	078	NZI	
8	UWINEZA JORDANI	NTOMA	FR5	-	NZI	
9	KIMANGANA SHABANI	NTOMA	FR5	-	NZI	
10	MANIRAKIZA KOLOBE	NTOMA	FR5	078646331	NZI	
11	IBAHIBERESE FORTUNE	NTOMA	FR5	0784223220	NZI	
12	HITIMANA NTWALI	NTOMA	FR5	0736870 6603	NZI	
13	SEBURAMA DAMASENI	NTOMA	FR5	078895062l	NZI	
14	BIKORIMANA SELESITINI	NTOMA	FR5	0785117723	NZI	
15	KURABUSENGE MOSENTI	NTOMA	FR5	0785654327	NZI	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE/MIMERI Sector Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	BIGENIMANA JEROME	KIJOJO	FR1	0784545202	UBUHINZI	
2	UWAYENEZA - KORODINA	NTOMA	FR5	0788980627	UBUHINZI	
3	TWIZEYIMANA DIYOJENI	NTOMA	FR5	0784884804	UBUHINZI	
4	SEMINEGA FRANSI	KIJOJO	FR1	0783878814	UBUHINZI	
5	NDIZURENDE JABOSIKO	KIJOJO	FR1	0789702453	UBUHINZI	
6	UWIRINGIYIMANA VESTINA	NTOMA.	FR5	078695985	UBUHINZI	
7	NYIRANGAMBO EMARIE	NTOMA	FR5		UBUHINZI	
8	TWIZERIMANA VESTINA	NTOMA	FR5	0782332556	UBUHINZI	
9	HAGENIMANA ANATHASIA	NTOMA	FR5	0783319596	UBUHINZI	
10	IGIRANEZE SUZANA	NTOMA	FR5	0785796540	UBUHINZI	
11	NYRANDUYAMBAJE [illegible]	NTOMA	FR5	0784005596	UBUHINZI	
12	BAGIRUWA JANDIDIYE	NTOMA	FR5	0788912467	UBUHINZI	
13	YABABACIYE JATIVA	NTOMA	FR5	0783399863	UBUHINZI	
14	MUTABANIRA KAAIGI	NTOMA	FR5	-	UBUHINZI	
15	NTEGEREJIMANA ZENA	NTOMA	FR5	.	UBUHINZI	
16	Segatarama Viane	Kiaia	FR1	078	Umuhinzi	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / MUSHERI Sector Date: 27/8/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	NIZEYIMANA Jean Pierre	NTOMA	FR5	0782922223 0783175520	HINZI	[signature]
2	TURIKUBWIMANA FOSITE	NTOMA	FR5	0787874781	"	[signature]
3	GASHEREBUKA VISENTI	NTOMA	FR5	0786614795	KINYOZI	[signature]
4	MUNYABUGANGE FOSITE	NTOMA	FR5	0787323223	"	[signature]
5	MASHIZE JEROME	NTOMA	FR5	0785596372	"	[signature]
6	KAZUNGUTSI SERESITINI	NTOMA	FR5	-	"	[signature]
7	SAGINDEGE AMULANI	NTOMA	FR5	-	"	[signature]
8	NTIBASHOGWA SERESITINI	NTOMA	FR5	-	"	[signature]
9	HAAYISABA EVARISITE	NTOMA	FR5	-	"	[signature]
10	KAYUMBA SAYIDI	NTOMA	FR5	0786256534	"	[signature]
11	HABARUREMA J Claude	NTOMA	FR5	0782559359	"	[signature]
12	MWISETSI ALUFONSI	NTOMA	FR5	0783749348	"	[signature]
13	BIZIMUNGU ELIKEFONSI	NTOMA	FR5	0785392075	"	[signature]
14	HAKIZIMANA PASIKARI	NTOMA	FR5	-	"	[signature]
15	HAKORIMANA IBOSIKO	NTOMA	FR5	07828814 8	"	[signature]

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE/KARAMA SECTOR Date: 28/8/016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
16	BIKINGI Faustine	gikundamvura	R7	⟵ "	"	[signature]
17	KAREKEZI kwANYARARA	" "	R7	⟵ "	"	[signature]
18	NIZEYUMUREMYI Fabrice	gikundamvura	R7	⟵ "	UMUHINZI	[signature]
19	INEZA Veronika	gikundamvura	R7	0788900034	" "	[signature]
20	MUKAMBANZINEZA Dative	gikundamvura	R7	⟵ "	" "	[signature]
21	MUKAKABANO Alphonsine	BUSHARA	R7	0724382656	"	[signature]
22	NYIRAMBARUSHIMANA Bernadette	BUSHARA	R7		"	[signature]
23	AYINKAMIYE FORORIAN	BUSHARA	R7		UMUHINZI	
24	UWIMANA HIRARIYA	BUSHARA	R7	[illegible]		[signature]
25	MUGISHA SIRAJYE	BUSHARA	R7	0782240100		[signature]

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / KARAMA SECTOR Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
16	UKURIKIYIMANA J Baptiste	Gikundamvura	R7	0728564152	Ushinzwe umutekano	
17	HABIMANA Pastor	"	R7	0785470472	Umuhinzi	
18	MUHAWINKA Alexandre	Gikundamvura	R7	0788378863	Umuhinzi	
19	MUSINGE Vestine	"	R7	-	Umuhinzi	
20	MUGENZI Theodore	Gikundamvura	R7	-	Umuhinzi	
21	MUHOZA Simone	"	R7	0788744633	Umuhinzi	
22	MUNYAKAZI Sylvestre	"	R7	-	Umuhinzi	
23	SINDIKUBWABO Stephano	Gikundamvura	R7	0788333121	Umuhinzi	
24	MANIRAKIZA Eric	"	R7	0788468453	Umuhinzi	
25	SEBIKAMBA Joseph	"	R7	0783359528	Umuhinzi	
26	NYIRAMANA Devotha	Gikundamvura	R7	-	Umuhinzi	
27	NYIRANDAGIJIMANA Regine	"	R7	-	Umuhinzi	
28	BASEKE Christine	"	R7	0728408884	Umuhinzi	
29	NIYONSABA Clementine	"	R7	-	Umuhinzi	
30	NIKUZE Angelique	Gikundamvura	R7	0782509639	Umuhinzi	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE KARAMA SECTOR Date: 27/07/2015

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1.	HABIMANA Jean	GIKUNDAMVURA	FR7	-	HINZI	
2.	ABIMANA Martin	"	FR7	0787408199	"	
3.	HAKIZIMANA Etienne	"	FR7	0788660233	"	
4.	MUTETERI Léonie	"	FR7	0725156996	"	
5.	NZAYUGANYIZE Justin	GIKUNDAMVURA	FR7	-	"	
6.	HABIMANA Emmanuel	"	FR7	0783659273		
7.	KARIMA J. Damascène	"	FR7	-	HINZI	
8.	NKURUNZIZA Evariste	"	FR7	0785684230	HINZI	
9.	KWIHANGANA Ellidefonde	"	FR7	0783469489	HINZI	
10.	NTIMANA J. Népo	"	FR7	0723629550	"	
11	NTAWUKENAYENDA Gaétan	"	FR7	0783413961	"	
12.	TUGIRIMANA J. Bosco	"	FR7	0723288397	"	
13.	TWAHIRWA Joseph	"	FR7	0788419862	"	OW.
14.	HAKORIMANA Frédéric	"	FR7	0788591944	"	
15.	NDAYAMBAJE Ildephonse	"	FR7	0785248116	"	

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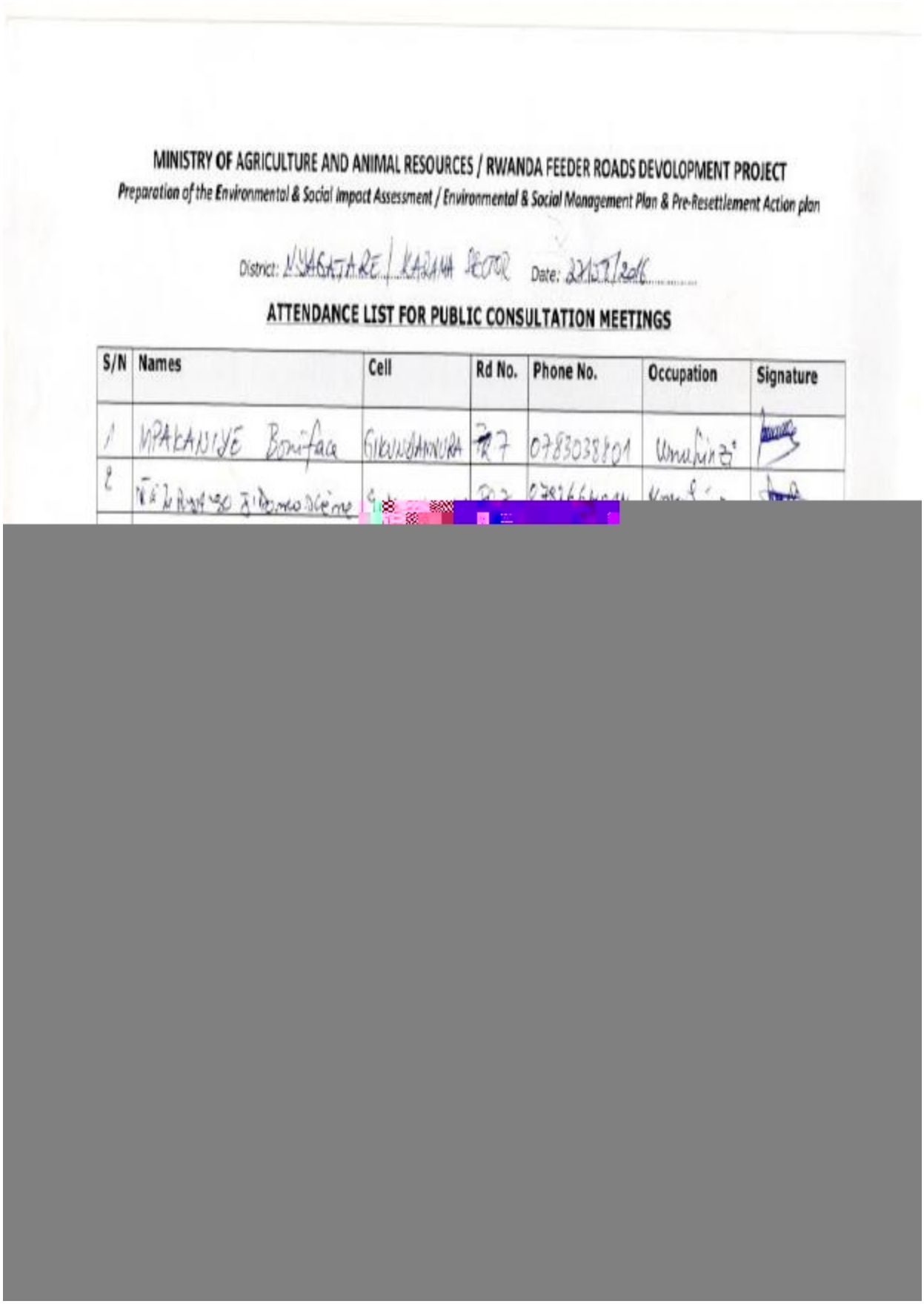

MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / KATUNA SECTOR Date: 22/07/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	NIYAKAMIYE Boniface	GIKUNDAMVURA	R7	0783038801	Umuhinzi	
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE, KARAMA SECTOR Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1.	MUKANDAYISENGA ANGELIQUE	GIKUNDAMVURA	R7		UMUHINZI	[signature]
2.	MUKANDAYISENGA Françoise	GIKUNDAMVURA	R7		"	[signature]
3.	MUKAMANA Béatrice	GIKUNDAMVURA	R7		"	[signature]
4.	KABATESI M. Denise	GIKUNDAMVURA	R7		UMUHINZI	[signature]
5.	MUKARUDIYA ANGELIQUE	- " -	R7		"	[signature]
6.	UWIMANA Emilienne	- " -	R7		"	[signature]
7.	ICYIZANYE Christine	- " -	R7		"	[signature]
8.	MUKARUSANGA Jinipa	- " -	R7		UMUHINZI	[signature]
9.	ZARAMBAHAYE Alfred	- " -	R7			[signature]
10.	NYAMBERE ANGELIQUE	GIKUNDAMVURA	R7		" "	[signature]
11.	NTIRENGANYA J'd'Amour	- " -	R7		UMUHINZI	[signature]
12.	MUNYABARENZI Cyprien	- " -	R7	0783586678	" "	[signature]
13.	UWIHOREYE Stephanie	- " -	R7		UMUHINZI	[signature]
14.	MUHAYIMANA Thérèse	- " -	R7		" "	[signature]
15.	NYAMBERE ANGELIQUE	- " -	R7		" "	[signature]

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE/KARAMA SECTOR Date: 27/07/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	BITAKARAMIRE Diogène	GIKUNDAMIRA	R7	0789465788	MINZI	
2	NYIRAKOMEZA Clémentine	GIKUNDAMIRA	R7	" "		
3	NIZEYIMANA Salim	" "	R7	" "	UMUMANZI	
4	MUBIRU Evariste	" "	R7	0788975497		
5	HAFASHIMANA BOSCO	" "	R7	0728581008		
6	YANKURIJE Olive	" "	R7	" "		
7	BARAKAMFITIYE Innocente	" "	R7	" "		
8	NIKUZE Chantal	" "	R7	UMUMANZI		
9	MUTUYIMANA TUYISHIME	" "	R7	" "	" "	
10	NGENDAHAYO Emmanuel	" "	R7	0783268208	UMUMANZI	
11	RUSHIGAJIKI THEOGENE	GIKUNDAMIRA	R7	0783379455	" "	
12	NZITABAKUZE Alphonsine	" "	R7		UMUMANZI	
13	MUSABYIMANA Olive	" "	R7		" "	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / KARAMA SECTOR Date: 27-3-2025

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
16	Vabcai Diyonizi	Gikundamvura	FR7		Ubuhinzi	
17	Ntakontagezi Domien	Gikundamvura	FR7		Ubuhinzi	
18	Mukamisoman Dativa	Gikundamvura	FR7		Ubuhinzi	
19	Beratsautie Jimode	Gikundamvura	FR7		Ubuhinzi	
20	Mukamisoe Mariya Goreti	Gikundamvura	FR7	0785038620	Ref w'umudugudu Ubuhinzi	
21	Nkundiyimana Jaglore	Gikundamvura	FR7	0782492637	Ubuhinzi	
22	Nkurikiyumukiza Sonia	Gikundamvura	FR7		Ubuhinzi	
23	Kanimumukama Gordance	Gikundamvura	FR7		Ubuhinzi	
24	Ngayaburira Josiline	Gikundamvura	FR7		Ubuhinzi	
25	KARODI ILDEPHONSE	Gikundamvura	FR7	0787719079	Ubuhinzi	
26	Munyaneza Alice	Gikundamvura	FR7		Ubuhinzi	
27	NDAHIRO Dionyse	Gikundamvura	FR7		Ubuhinzi	
28	NTIRIVAMUNDA Valens	Gikundamvura	FR7		Ubuhinzi	
29					Ubuhinzi	
30						

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / KARAMA SECTOR Date: 26/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
16	KABERA Marceline	Gikundamvura	FR7	0785038637	Chef umudugudu Umuhinzi	[illegible]
17	BANTEGEYE Clementine	Gikundamvura	FR7		Umuhinzi	[illegible]
18	NYAMVURA Eugenie	Gikundamvura	FR7		Umuhinzi	[illegible]
19	MUHUTUKAZI Berna	Gikundamvura	FR7		Umuhinzi	[illegible]
20	BANZIRABOSE Reoleadia	Gikundamvura	FR7		Umuhinzi	[illegible]
21	Niyodusenga Vratine	Gikundamvura	FR7		Umuhinzi	[illegible]
22	Musabyimana Vestin	Gikundamvura	FR7		Umuhinzi	[illegible]
23	Nyirabagande Avilla	Gikundamvura	FR7		Umuhinzi	[illegible]
24	Musabyimana Odith	Gikundamvura	FR7		Umuhinzi	[illegible]
25	UWIRAGIYE Janette	Gikundamvura	FR7		Umuhinzi	[illegible]
26	Nyirafaranga Cariseria	Gikundamvura	FR7		[illegible] itorambere	[illegible]
27	Nsanzineza J. Bosco	Gikundamvura	FR7		Umukozi	[illegible]
28	Bavugayabo Claudine	Gikundamvura	FR7		Umuhinzi	[illegible]
29						
30						

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / KARAMA Date: 29/8/016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	NKERABIGWI pascal	gikundamvura	FR7	0783088644	Hchairman	
2	BIMENYIMANA Isidore	" " "	FR7	0785116672	polisng	
3	MUKANTABANA Angelique	" " "	FR7		CNF	
4	HABAMAHORO JB	" "	FR7	0726678427	"	
5	MPANGUHE Faustin	" "	FR7	-	" "	
6	HITIMANA Alexis	" "	FR7	0787475767	"	
7	BIZIMUNGU Alphonse	" "	FR7	0783905806	Porising	
8	URABARANGA gaspot	" "	FR7	0782506693		
9	NKUNDAKOZERA Anastasia	" "	FR7	-		
10	BAZUBAGIRA Stephanie	" "	FR7	-	Umuhinzi	
11	ZANINKA	" "	FR7	0725693539	"	
12	MUKANGANGO Jeanette	" "	FR7	-	"	
13	NYANGAWINDEMERA	" "	FR7	-	"	
14	DUSHIMIRIMANA Jonathan	" "	FR7		"	
15	KANTARAMA Emacillé	" "	FR7	" "	"	

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / KARAMA SECTOR Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
31.	MUKARUBASWAMA Espérance	GIKUNDAMVURA	FR7	-	HINZI	
32.	UWIZEMARIYA Béatrice	"	FR7	-	HINZI	
33.	IYAMUREMYE A. Damien	"	FR7	0725125767	HINZI	
34.	HATEGEKIMANA Gaspard	"	FR7	0728761796 0729922663	"	
35.	HAKIZIMANA Claude	"	FR7	0788408884	"	
36.	RUBAMBURA Augustin	"	FR7	0728476552	"	
37.	HAKORIMANA Emmanuel	"	FR7	0728132171	"	
38.	NSENGIYUMVA Faustin	"	FR7	0786591400	"	
39.	BIHOYIKI Chantale	GIKUNDAMVURA	FR7	-	"	
40	MUKUNDWIMANA Costasie	GIKUNDAMVURA	FR7	0783616388	"	
41	MUNYENSANGASAYI Di	RUSHARA	FR7	0788664013		
42	KAMANA KAROOE	RUSHARA	FR7		"	
43	TUMUKIRIHBE RAJYABU	RUSHARA	FR7		" UMUHINZI	
44	MPARIKWABEASHI ASUMA	RUSHARA	FR7	0783693867	"	
45	NTAKOBATAGIRA DIVINA	RUSHARA	FR7			

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Intercontinental Consultants and Technocrats Pvt Ltd (India)
ALN Consultants Ltd (Rwanda)

MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE KARAMA SECTOR Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
16	TURYASINGURA Faustin	GIKUNDAMVURA	FR7	—	Umuhinzi	[signature]
17	NTAMBARA	GIKUNDAMVURA	FR7	—	UMUHINZI	[signature]
18	HAKIZIMANA Eugène	GIKUNDAMVURA	FR7	—	UMUHINZI	[signature]
19	KARIMUNDA Etienne	GIKUNDAMVURA	FR7	—	UMUHINZI	[signature]
20	SEBATWARE Félicien	GIKUNDAMVURA	FR7	0784405786	UMUHINZI	[signature]
21	SEZARI NIYOMURAYEYI	GIKUNDAMVURA	FR7	—	UMUHINZI	[signature]
22	UWAMARIYA Feresita	GIKUNDAMVURA	FR7	0782922644	UMUHINZI	[signature]
23	HABUMUREMYI J. BATISITA	BUSHARA	FR7	0786961544	UMUHINZI	[signature]
24	NSANZUMUHIRE STANISLAS	BUSHARA	FR7		UMUHINZI	[signature]
25	KAHIMBA Jean	BUSHARA	FR7	0789970969	UMUHINZI	[signature]
26	BUSHABIZIANA J. Bo	BUSHARA	FR7	0787548602	UMUHINZI	[signature]
27	MANIRABORA DIYANE	BUSHARA	FR7		UMUHINZI	[signature]
28	UWAMAHORO JAKERINA	BUSHARA	FR7		UMUHINZI	[signature]
29	KARUGWIZA PRIMITIVA	BUSHARA	FR7		UMUHINZI	[signature]
30	UYIRANDIKU BUVUMA PETERO	BUSHARA	FR7		UMUHINZI	[signature]

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: Nyagatare/KARAMA SECTOR Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
16	Uwimana Theoneste	Gikundamvura	R7	0783038284	Umuhinzi	
17	Uzabakiriho Matiyas	Gikundamvura	R7	—	Umuhinzi	
18	Ndayimana Leonard	Gikundamvura	R7	0786062882	Umuhinzi	
19	NGIRABATWARE Selevilien	BUSHARA	R7	078	Umuhinzi	
20	Murekambanze Vincent	Bushara	R7		" "	
21	KARIMUNDA Theoneste	Bushara	R7	0789777132	Umuhinzi	
22	RUTIHANGA ABUDU	BUSHARA	R7		UBUHINZI	
23	HAKIZIMANA Emmanuel	BUSHARA	R7		UBUHINZI	
24	HABIMANA J.B.	BUSHARA	R7		UMUHINZI	
25	MASONYUMUGABE ZAKARIA	BUSHARA	R7	-	UMUHINZI	
26	Banyangiriye Eugenie	Rurembo	R7	0722056398	Umuhinzi	
27	MUKARUGANYAMAKIRISITU	BUSHARA	R7	0727216168	Umuhinzi	
28	MUKAMURIGO Theodeta	BUSHARA	R7	-	UMUHINZI	
29	KABENDERA SHINANI	BUSHARA	R7	0788737284	UMUHINZI	
30	NSABIMANA OSENI	Rugazi	R7	—	Umuhinzi	

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Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE/KARAMA SECTOR Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1.	Mukeshimana J. Baptiste	Gikundamvura	FR7	0783038735	Chef w'umudugudu	
2.	Ndabaramiye Isidori	Gikundamvura	FR7	—	Umuturage	
3.	Habakurama Vincent	Gikundamvura	FR7	—	Umuturage	
4.	Mbabazende Chrestori	Gikundamvura	FR7	0781113272	Umuturage	
5.	Ngarakigintwari Evariste	Gikundamvura	FR7	0785798553	Umuturage	
6.	Nzamurambaho Frederika	Gikundamvura	FR7	0782481383	Umuturage	
7.	Dusengimana Emmanuel	Gikundamvura	FR7	—	Umuturage	
8.	Tindimutima Anastazija	Gikundamvura	FR7	—	Umuturage	
9.	Bizimungu Evariste	Gikundamvura	FR7	—	Umuturage	
10	Kayalije Agustin	Gikundamvura	FR7	0784886915	Umuturage	
11	Nyirambarushimana Jantre	Gikundamvura	FR7	—	Umuturage	
12.	Musabyimana Therezija	Gikundamvura	FR7	—	Umuturage	
13	Zigirimbuti J. Pierre	Gikundamvura	FR7	—	Umuturage	
14	Kanyabugande Faustin	Gikundamvura	FR7	0788920166	Umuturage	
15	Musabyimana Demetrija	Gikundamvura	FR7	—	Umuturage	

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Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE KARAMA FR7 Date: 26/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	HATEGEKIMANA Cyprien	Gikundamvura	FR7	0783650004	[illegible]	[signature]
2	NSENGA Mafuwe	Gikundamvura	FR7	0783413965	Umuhinzi	[signature]
3	UWAYENEZA J. Damascene	Gikundamvura	FR7	0781142705	Umuhinzi	[signature]
4	SEZIBERA Fidel Joseph	Gikundamvura	FR7	0783140331	Umuhinzi	[signature]
5	NDORIMANA J. Claud	Gikundamvura	FR7		Umuhinzi	[signature]
6	HABIMANA J. Claude	Gikundamvura	FR7		Umuhinzi	[signature]
7	UWERUMAHA Mario	Gikundamvura	FR7		Umuhinzi	[signature]
8	NDAGIJIMANA Deogene	Gikundamvura	FR7		Umuhinzi	[signature]
9	NGEZAHOGUHORA Etienne	Gikundamvura	FR7		Umuhinzi	[signature]
10	HITIMANA Anaphose	Gikundamvura	FR7		Umuhinzi	[signature]
11	DUKUZUMUREMYI Wellars	Gikundamvura	FR7		Umuhinzi	[signature]
12	HABANABAKIZE	Gikundamvura	FR7	0726564422	Umuhinzi	[signature]
13	UAGENIMANA	Gikundamvura	FR7		Umuhinzi	[signature]
14	SIBOMANA Gaudan	Gikundamvura	FR7		Umuhinzi	[signature]
15	NYIRANGENDAHIMANA Drusilla	Gikundamvura	FR7		Umubyeyi	[signature]

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

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District: NYAGATARE / KARAMA SECTOR Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1.	NDAGNIMANA Theoneste	BUSHARA	FR8	0782822725	UMUHINZI	
2.	BARIYANGA Onesphore	BUSHARA	FR8	078720116	UMUHINZI	
3.	RUTAHWIRE J. bosco	BUSHARA	FR8	0783351609	UMUHINZI	
4	MANIRAHGUHA	BUSHORA	FR8	0789754590	umuhinzi	
5	NYAMUZIGA J. BOSCO	BUSHARA	FR8		HINZI	
6	NIYIRAGIRA Elias	BUSHARA	FR8		HINZI	
7	KAMARI Jean-Bosco	BUSHARA	FR8	0723053908	UMUHINZI	
8.	Ntombora Fulgence	BUSHARA	FR8		Umuhinzi	
9	HABimana Jonathan	BUSHARA	FR8		Umuhinzi	
10	BITEGETSIMANA BERA	BUSHARA	FR8	0786954900	ISANGANO	
11	uwamariya milken	BUSHARA	FR8	0728261859	UMUHINZI	
12	Bizimungu J. Baptiste	Bushara	FR8	—	Umuhinzi	
13	MUGABO Johnson	Bushara	FR8	—	Umuhinzi	
14.	ATWAYIRE Etienne	BUSHARA	FR8	0788804110	umuhinzi	
15.	Habyarimana Fabien	Bushara	FR8	07851645	Umuhinzi	

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Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: Nyagatare / KARAMA Sector Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	NISHAKIYE YASINI	BUSHARA	FR8	0783038811	UMUHINZI	[signature]
2	TWIRINGIYIMANA J DAMASCEN	BUSHARA	FR8	0727172655	UMUHINZI	[signature]
3	NTIRIVAMUNDA VENSA	BUSHARA	FR8		UMUHINZI	[signature]
4	TWARICYI J ndoramurwa	BUSHARA	FR8	0723022486	UMUHINZI	[signature]
5	NDERERIMANA FARANSUWA	BUSHARA	FR8	0722418697	UMUHINZI	[signature]
6	GAHUTU EVARISITI	BUSHARA	FR8	0782613165	UMUHINZI	[signature]
7	MUNYANKORE VENUSITI	BUSHARA	FR8		UMUHINZI	[signature]
8	NTARWANDA ERIAS	BUSHARA	FR8		UMUHINZI	[signature]
9	GASHUMBA JOZEFU	BUSHARA	FR8	0781618378	UMUHINZI	[signature]
10	NYIRABARANGARIISE YOZAFINA	BUSHARA	FR8	0787155340	UMUHINZI	[signature]
11	MUSABYEMARIYA GODEREVA	BUSHARA	FR8		UMUHINZI	[signature]
12	NYIRAUBAHIRIWE SERUGRIYA	BUSHARA	FR8		UMUHINZI	[signature]
13	ICYIMANIZANYESARAFINA	BUSHARA	FR8	0725810808	UMUHINZI	[signature]
14	MANIRIHO ASUMANI	BUSHARA	FR8		UMUHINZI	[signature]
15	BIZACYIRA EMANUWELI	BUSHARA	FR8	0788473820	UMUHINZI	[signature]

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: NYAGATARE / KARAMA SECTOR Date: 27/8/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
	BATARINGAYA BIRYIJA	BUSHARA	FR8		HINZI	[signature]
	HABAKUBAHO DAVID	"	FR8		HINZI	[signature]
	BIKWIYIMANA Thomas	"	FR8		HINZI	[signature]
	GATABAZI Felicien	"	FR8		HINZI	[signature]
	TWIZERIMANA J. BAPTISTE	"	FR8		HINZI	[signature]
	NTAKEZA YONAS	"	FR8		HINZI	[signature]
	MUNYARUKUMBUZI Aloys	"	FR8		HINZI	[signature]
	TUYISHIMIRE JB	"	FR8		HINZI	[signature]
	HITIMANA J. Claude	"	FR8		HINZI	[signature]
	NTAGWABIRA J.P	"	FR8		HINZI	[signature]
	KABUSHESHE	"	FR8		HINZI	[signature]
	JUMWINE	"	FR8		HINZI	[signature]
	MUKANKUSI Laurence	"	FR8		HINZI	[signature]
	MUKABARDI Gaudence	"	FR8		HINZI	[signature]
	MUKANDENGO Rose	"	FR8		HINZI	[signature]
	NIYONSABA VINCENT	"		0788810841	HINZI	[signature]

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MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

Preparation of the Environmental & Social Impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: Nyagatare /KARAMA Sector Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	MUKAMBUGI KAZIYA	BUSHARA	FR8	0782322707	UMUHINZI	
2	MANUGAMBONYIMANA JOSEPH	BUSHARA	FR8	0782322702	UMUHINZI	
3	MUTEYEZU FRASINA	BUSHARA	FR8	078590119	UMUHINZI	
4	BEYAKAZA JOSEPHIN	BUSHARA	FR8	.	UMUHINZI	
5	HAGENIMANA Eugene	BUSHARA	FR8	0789048761	Macon	
6	MUKABUNYANGE NATALIYA	BUSHARA	FR8	0787604347	UMUHINZI	
7	MUKANTABINDWA DEREPHIN	BUSHARA	FR8	-	UMUHINZI	
8	Habamungemyi Juvenal	Bushara	FR8	0782229045	umuhinzi	
9	Hiliariro Samuel	BUSHara	FR8	0725511766	UMUHINZI	
10.	Ntawbara fulgence	BUSHAra	FR8		UMUHINZI	
11	KAMPALI Jean Bosco	BUSHARA	FR8	0723053908	UMUHINZI	
12	NTIYAMIRA BONIFASI	BUSHARA	FR8	078340513	UMUHINZI	
13	NGENDAHIMANA SIRIDIYO	BUSHARA	FR8	0785800122	UMUHINZI	
14	MIHANDA DIOJENE	BUSHARA	FR8	0786535720	UMUHINZI	
15	Uwimana Ildephonse	BUSHARA	FR8	0785252359	UmuHinzi	

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Preparation of the Environmental & Social impact Assessment / Environmental & Social Management Plan & Pre-Resettlement Action plan

District: Nyagatare / KARAMA SECTOR Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	Ndayisenga Educard	BUSHARA	FR8	0784719856	umuhinzi	[signature]
2	Kasyambera Sibasi	BUSHARA	FR8	0788718521	umuhinzi	[signature]
3	Mawukisasagwa Roza	BUSHARA	FR8	0785820291	umuhinzi	[signature]
4	Habiriwapa Enoqmi	BUSHARA	FR8	0786280178	umuhinzi	[signature]
5	Nyiransabimana Regina	BUSHARA	FR8	—	umuhinzi	[signature]
6	Nyirabize Siama Sarah	BUSHARA	FR8	—	umuhinzi	[signature]
7	Kasekeri Serasitini	BUSHARA	FR8	—	umuhinzi	[signature]
8	Kabinabura Solomoni	BUSHARA	FR8	—	umuhinzi	[signature]
9	Ntamwemezi Emanuel	BUSHARA	FR8	—	umuhinzi	[signature]
10	Nzabanda Filimoni	BUSHARA	FR8	0784685964	umuhinzi	[signature]
11	Ntunziki Yiana Sodatiq	BUSHARA	FR8	—	umuhinzi	[signature]
12	Mukuta Solomoni	BUSHARA	FR8	—	umuhinzi	[signature]
13	Muhayimana Jomalik	BUSHARA	FR8	—	umuhinzi	[signature]
14	Kalabua Falasiba	BUSHARA	FR8	0788867310	umuhinzi	[signature]
15	Sebara Sodaliye	BUSHARA	FR8	0788038146	umuhinzi	[signature]

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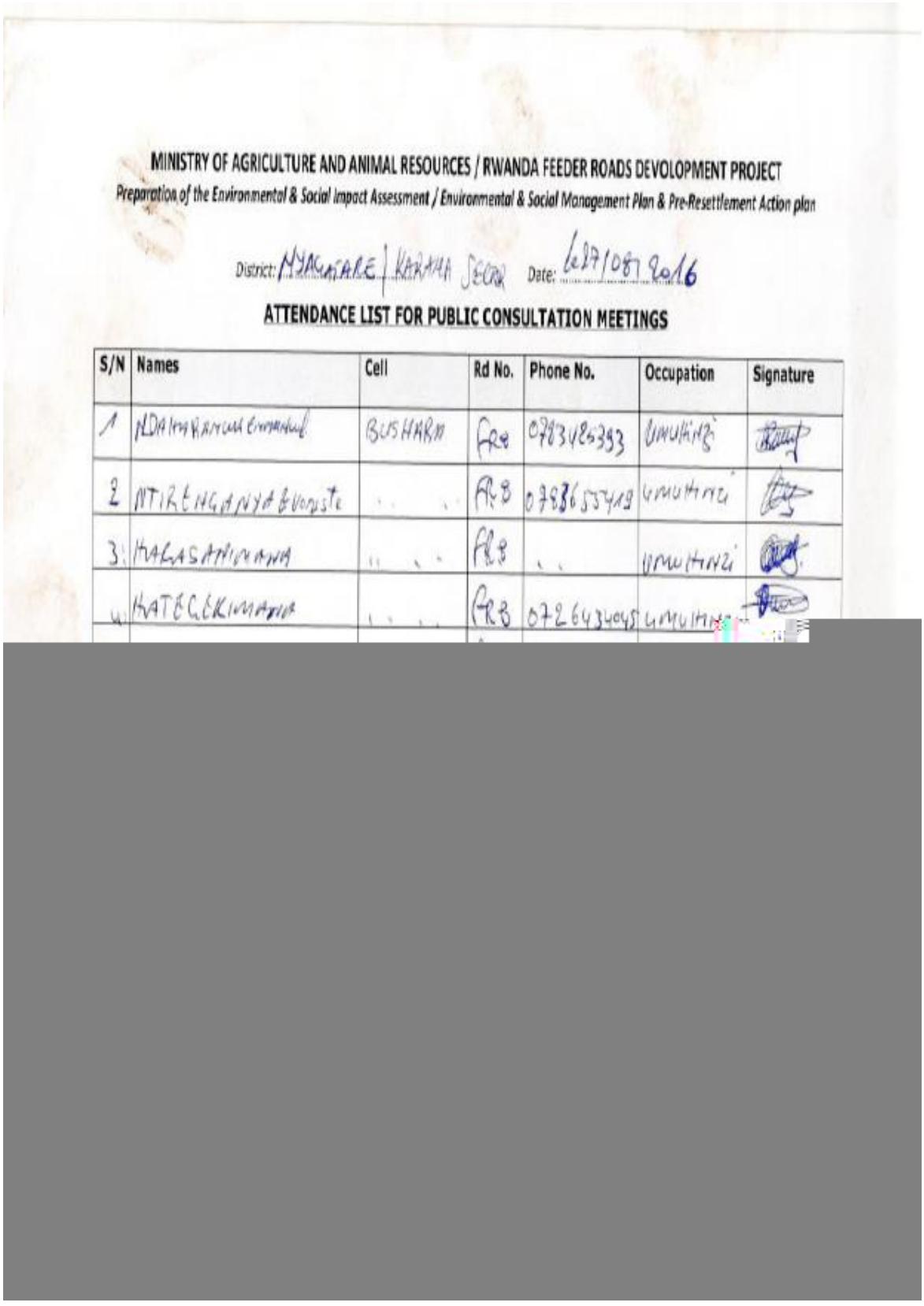

MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES / RWANDA FEEDER ROADS DEVOLOPMENT PROJECT

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District: NYAGATARE / KARAMA SECTOR Date: 27/08/2016

ATTENDANCE LIST FOR PUBLIC CONSULTATION MEETINGS

S/N	Names	Cell	Rd No.	Phone No.	Occupation	Signature
1	NDAYISHIMIYE Emmanuel	BUSHARA	RR8	0783486393	UMUHINZI	
2	NTIRENGANYA Evariste	"	RR8	0788655419	UMUHINZI	
3	HAGASANIMANA	"	RR8	"	UMUHINZI	
4	HATEGEKIMANA	"	RR8	0726434045	UMUHINZI	

Annex 8: Interim checklist - Review of E&S Implementation in T&I Bank-financed Works Contracts

Project Name	
Project Number	
Country	
Contract Name	
Contract Duration and completion date	
Implementing Agency	
Review Date	

No	Measure	Current Status (Please elaborate rather than a "Yes/No"- approach)
Contractual Arrangements on site		
1	Is there a full-time Employer's Representative (ER) on site at all times? If not frequency of visits?	
2	Years of experience of the ER?	
3	Name of Supervision Consulting Firm (SC)	
4	Does SC TOR require oversight over ESMP, RAP, HIV/AIDS awareness implementation?	
5.	If yes, to the above, does the SC contract provide sufficient resources?	
6.	If yes, to the above, does the works contract provide sufficient resources to implement all activities? Are they provisional sums or budgeted activities?	
7	Name of SC Team Leader The Resident Engineer - RE)	
8	Years of experience of RE	
9	Does the Employer have an Environmental Unit – if yes, how many full-time technical staff are employed?	
10	Does the Employer have an Social Unit – if yes, how many full-time technical staff are employed	
Contract Reports and Instruments		
11	Does the Bank receive Monthly Progress Reports from the RE on schedule?	
12	ESMP in place, and cleared, being implemented and documented in the	

	MPRs? Provide dates of submission and clearance and any sequencing of works to accommodate clearance process.	
13	Is the ESMP an integral part of the contractors contract with clear activities and costs?	
14	RAP or ARAP, if required, completed and RAP or ARAP completion Report cleared? Provide dates of submission and clearance and any sequencing of works to accommodate clearance process.	
15	Is there any additional expropriation which will require a RAP amendment?	
16	Contractor's Health and Safety Management Plan in place and approved by ER, and implementation documented in the MPR?	
17	Any Citizen engagement activities under implementation?	
18	Any Gender-based activities and/or data collection in place	
19	Contractor's Traffic Management Plan in place, cleared by RE, and being implemented?	
20	HIV/AIDS Awareness/STI mitigation measures in place?	
21	Who is HIV/AIDS service provider? Are they registered with the National Aids Commission?	
Site arrangements		
22	Grievance Redress System in place?	
23	Contractor/Cs/ER combined Meetings with affected communities undertaken and how regularly?	
24	Number of contractor's staff provided with site accommodation.	
25	Distance of contractor's base camp vis-à-vis towns, villages, centers of population and environmentally sensitive areas.	
26	Percentage of staff recruited from the Project Impact Area vs. brought from outside.	
27	Condition of site accommodation and amenities provided.	

28	Do out-of-area workers receive any allowances additional to their salary/wages? If so, please describe.	
29	Wages paid to casual and permanent works and their compliance with local labor laws.	
30	Compliance with local working hours and site safety laws for contractor's workers.	
31	Are Contractor's staff wearing issued personal protection equipment?	
32	Emergency contact numbers for Contractor/ ER shown in conspicuous place?	

Annex 9: Sensitive receptors along the RoW of indicative feeder roads in Nyagatare

Roads ID	Road name	Length (Km)	Sensitive receptors						
			Natural habitat	Wetland	HHs likely to be affected	Houses likely to be affected	Total land to be acquired for 10.5m RoW (Ha)	Total land to be acquired for 6.0 m paved road	Remarks
FR1	Nyagatare – Kanyinya - Kagitumba	36.31	Muvumba gallery forest	Muvumba	8		15.25	0.00	The forest is at 50m to the RoW and the road runs parallel to the forest and the wetland currently converted into agriculture. the road is also very far from the Park
FR2	Kagezi - Matimba	5.01			10	3	1.40	0.00	No wetland crossed and the road is also very far from the Park
FR3	Nyabitekeri-Nshuri-Nyagatare-Rwempasha	18.07	Muvumba gallery forest	Muvumba	43	3	8.13	0.00	The road crosses Muvumba marshland on approximately 100 m before it runs parallel to the wetland
FR4	Nyagatare-Nyarupfubire	9.80			28	2	4.70	0.29	No wetland & forest crossed. The road is very far from the Park
FR5	Kijojo-Ntoma-Musheli-Nyamiyonga	19.20			82	12	9.41	0.77	No wetland & forest crossed. The road is very far from the Park
FR6	Nyakigando-Mimuli	16.20			120	20	7.29	0.00	The road crosses Karungeri river and its wetland converted into agriculture
FR7	Rurenge-Bushara-Kabuga	15.73		Muvumba	77	30	8.49	1.42	The road crosses Muvumba river and its wetland converted into agriculture
FR8	Cyenkwanzi-Gikagati-Nyacyiga-Ndego	8.80			93	21	4.58	0.62	No wetland & forest crossed. The road is very far from the Park

FR9	Nyabitekeri-Kabirizi-Ngoma-Gafaru-Kabusunzu	10.80		Mirambi & Mitungisa	79	12	5.94	1.08	The road crosses Mirambi & Mitungisa wetlands converted into agriculture
FR10	Mimuli-Mukama-Muhambo-Gatunda	18.40		Urugunga	6	11	7.36	0.00	The road crosses Urugunga wetland converted into agriculture (maize, sugarcane)
FR11	Nyarurema-Muhambo	1.21			0		0.42	0.00	No wetland & forest crossed. The road is very far from the Park
FR12	Karangazi-Ndama-Rwabiharamba	9.60			0	2	2.40	0.00	No wetland & forest crossed. The road is very far from the Park
FR13	Matimba-Musheli-Bihinga	8.80			32	3	5.28	1.32	No wetland & forest crossed. The road is very far from the Park
FR14	Gasinga-Kabindi	6.20			12		3.53	0.74	No wetland & forest crossed. The road is very far from the Park
Total		**184.12**			**590**	**128**	**84.19**	**6.24**	

HH: Household
BP: Borrow pit

NB: (i) Apart from BP6 and BP7 located from within the RoW of FR5 and FR1 respectively, other BPs are located at a distance of at least 0.5 km from the indicative roads. Quarry sites are also located at minimum distance of 4 km from the road.

(ii) Some sections of FR1, FR3, FR4, FR5, FR12, FR13 and FR14 cross areas used for livestock production (pastures).