

THE GOVERNMENT OF RWANDA

Energy Utility Corporation Limited (EUCL)

**Rwanda Electricity Sector Strengthening Project
Project number (P150643)**

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

September, 2015

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iv. Glossary of Terms

Cumulative impacts/effects: The total effects on the same aspect of the environment resulting from a number of activities or projects.

Developer/Proponent/Sponsor: the entity – person/ company/agency – proposing to develop/implement/install a new project/sub- project or expand an existing project under the RESSP.

Direct impacts: An effect on the environment brought about directly by the RESSP subprojects.

Disclosure: Information availability to all stakeholders at all stages of the development of subprojects.

Environment: physical, biological and social components and processes that define our surroundings.

Environmental impact assessment (EIA): A comprehensive analysis of the project and its effects (positive and negative) on the environment and a description of the mitigative actions that will be carried out in order to avoid or minimize these effects.

Environmental Monitoring Plan: The process of examining a sub project on a regular basis to ensure that it is in compliance with an Environmental Management Plan (EMP), or the Government of Rwanda (GoR) Environmental Impact Assessment (EIA) certification of approval conditions and / or environmental prescriptions.

Impact: A positive or negative effect that a project has on an aspect of the environment.

Indirect impact: A positive or negative effect that a project indirectly has on an aspect of the environment.

Involuntary resettlement: The forceful loss of land resources that requires individuals, families and / or groups to move and resettle elsewhere.

Lead Agency: The agency with primary responsibility for the protection of the environment. For instance, the lead agency for environment matters in Rwanda is the Rwanda Environment Management Authority (REMA).

Mitigation measures: The actions identified in an EIA to negate or minimize the negative environmental impact that a project may have on the environment.

Subproject: a set of planned activities designed to achieve specific objectives within a given area and timeframe.

Project Brief: The initial submitted document to RDB to initiate the process that will lead to the issuance of the EIS certificate of approval.

Scoping: The initial stage in the environmental assessment that determines the likely major environmental parameters, which will be affected, and the aspects of the project that lead to these effects.

Screening: An initial step when a project is being considered for environmental assessment. The screening is the determination of the level of assessment that will be conducted. In the case of GoR, screening will place project into one of three environmental categories (I, II or III).

Significance: Importance.

Significant effect: An important impact on the aspect of the environment.

Stakeholder: Any person or group that has an interest in the project, and the environmental effects that the project may bring about.

v. Acronyms and Abbreviations

CAS:	Country Assistance Strategy
CFL:	Compact Fluorescent Lamps
EDCL:	Energy Development Corporation Limited
EUCL	Energy Utility Corporation Limited
EDPRS:	Economic Development and Poverty Reduction Strategy
EIA:	Environmental impact assessment
EARP	Electricity Access Roll out Programme
EMP:	Environmental Management Plan
EPC:	Engineer, Procure, Construct
ESMF:	Environment and Social Management Framework
ESMP:	Environmental and social management plan
ESWG:	Energy Sector Working Group
GDP:	Gross Domestic Product
GEF:	Global Environment Facility
GoR:	Government of Rwanda
HFO:	Heavy Fuel Oil
HIV/AIDS:	Human Immuno Deficiency Virus
IBs:	Incandescent Bulbs
IDP's:	Internally Displaced Persons
ISDS:	Safeguards Data Sheet
LV:	Low Voltage
MINAGRI:	Ministry of Agriculture, Livestock and Forest
MININFRA:	Ministry of Infrastructure
MINIRENA :	Ministry of Natural Resources
NGO's:	Non-Governmental
OP:	Operational Policy
PV:	Photo Voltaic
MV:	Medium Voltage
EARP:	Electricity Access Roll out Programme
NEDA:	National Energy Development Agency"
NEP:	National Policy on Environment Organizations Procedures
PACD:	Plan of Action to Combat Desertification
PCD:	Project Concept Document
PCU:	Project Coordination Unit
PMU:	Project Management Unit
PRSP:	Poverty Reduction Strategy Paper
RAPs:	Resettlement Action Plans
RDB:	Rwanda Development Board
REG:	Rwanda Energy Group
RESSP	Rwanda Electricity Sector Strengthening Project
REMA:	Rwanda Environment Management Authority
ROW:	Right of Way
RPF:	Resettlement Policy Framework
SED :	Sustainable Energy Development

STIs:	Sexually Transmitted Infections
T&D:	Transmission and Distribution
UN:	United Nations
UNCED:	United Nations Conference on Environment and Development
UNCOD:	United Nations Conference on Desertification
UNEP:	United Nations Environment Programme
UNFCCC:	United Nations Framework Convention on Climate Change
WB:	World Bank

0. EXECUTIVE SUMMARY

0.1 Background

The Government of Rwanda (GoR) through the Ministry for Infrastructure (MININFRA) has proposed for funding under the World Bank IDA, the Rwanda Electricity Sector Strengthening Project (RESSP) which is in line with the Economic Development and Poverty Reduction Strategy EDPRS II for the energy sector. The RESSP will allow the Government of Rwanda to achieve and expand upon results from Electricity Access Rollout Programme EARP which continues to construct the backbone of the power supply system to rural areas and will align generation capacity and demand to achieve an efficient tariff. EARP is being implemented within the framework of a Sector Wide Approach (SWAp) to encompass all donors active in the sector under one common sector investment program.

0.2 Project description

Rwanda Electricity Sector Strengthening Project (RESSP) has been designed to address two major challenges faced by the energy sector in Rwanda:

- i Electricity Sector Capacity Strengthening with an aim to improve the performance of the electricity sector institutions;
- ii Increased Access to Electricity

The programme has three main components as following:

- **Component A (Electricity Sector Capacity Strengthening) which has three subcomponents**
 1. Integrated Business Management Information System
 2. Revenue Protection
 3. Strengthening technical management capacity of key function in the Electricity Utilities Corporation Limited (EUCL)
- **Component B (Increased Access to Electricity Services) which contains**
 1. Strengthening the distribution network around Kigali Area
 2. Grid Extension to New Load Centers
- **Component C (Technical Assistance and Project Implementation Support)**
 1. Technical Assistance and Project Implementation Support
 2. Project Implementation Support

The total project cost is estimated at US\$ 95 million. The project will be entirely financed by IDA. The lending instrument is the Investment Project Financing (IPF).

The donors including EU, AfDB and BTC will provide parallel funding of approximately US\$ 320 million that will support the sector reform and the access roll-out.

This ESMF report brings forward environmental and social impacts/enhancements, mitigation measures to be undertaken and the institutional responsibilities for implementing the proposed Rwanda Electricity Sector Strengthening Project including anticipated subproject sites. The report also guides the monitoring of EMP and capacity building to ensure that responsibilities are carried

out effectively. The ESMF also guides environmental and social impact assessment studies for individual subproject.

This report has been prepared in line with the relevant Bank safeguard policies on social and environmental management and has further taken into account Rwanda government policies, legal and institutional framework related to environmental and social assessment.

0.3 Objectives of the Environmental and Social Management Framework

The Environmental and Social Management Framework (ESMF) seeks to institute a consistent and effective environmental and social screening process for application in all RESSP. The specific objectives of the ESMF are:

- 0 To ensure that all sub-projects are screened for potential adverse environmental and social impacts and appropriate mitigation and monitoring measures, including cost estimates, are identified and implemented;
- 1 To guide the environmental and social screening process as outlined in this Framework, including the implementation and monitoring of mitigation measures of all sub-projects as necessary.

0.4 Environmental and Social Requirements

The GoR by its national laws and the World Bank's Operational and Procedural Policies, specifically OP 4.01 requires the government to prepare an Environment and Social Management Framework (ESMF), which establishes a mechanism to determine and assess future potential environmental and social impacts of the Ministry for Infrastructure planned investments/activities under the proposed RESSP.

The ESMF then sets out screening, mitigation, monitoring and institutional measures to be taken during design, implementation and operation of these activities to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels.

An ESMF is required to guide RESSP activities within existing Government Policy regulations for environment and social process and the Bank's operational policies. This ESMF will be a living document that will be subject to periodic review to update policies, legal and institutional framework and address specific concerns raised by stakeholders. It will compliment the environmental and social assessment studies provided for the programme.

OP 4.01 further requires that the ESMF report must be disclosed as a separate and stand alone by the Government of Rwanda and the World Bank as a condition for Bank Appraisal of the RESSP. The disclosure of ESMF document should be both in locations where it can be accessed by the general public and local communities using the media, and at the Infoshop of the World Bank. The date for disclosure must precede the date for appraisal of the programme.

In keeping with this requirement and the further detail set out the draft report will firstly be made publicly available to project-affected groups and local NGOs in Rwanda by placing a public notice in a national newspaper and making the report available at the offices of relevant government ministries and REMA. This measure will also satisfy the Organic Law requirement that environmental and social

assessment reports are disclosed and be subjected to review by the public. Following revisions, the ESMF will be officially submitted to the World Bank, and made public before appraisal by the World Bank board.

0.5 Safeguard Screening Procedures

The proposed programme has been rated Category B under the World Bank Policy on Environmental Assessment (OP4.01), requiring a partial Environmental Assessment (EA). The ESMF is expected to help in the screening, cover anticipated impacts and to recommend mitigation measures. The screening and review process will determine whether a particular subproject will trigger a safeguard policy, and what mitigation measures will need to be put in place. The screening and review process will also ensure that subprojects that may have potentially significant impacts will require more detailed study and the need for subproject specific EA and/or EMP.

The process of preparing this ESMF of RESSP was based on an update of the ESMF prepared for the EARP and entailed detailed desktop literature review coupled with consultation and engagement of appropriate stakeholders.

0.6 Environmental and Social Impacts

Positive Impacts

The positive impacts are numerous and wide-ranging. The benefits of the project for domestic supply and use in small-scale businesses and in access to electric power for schools and public services are evident. In the construction phase there will be temporary employment opportunities for local contractors and those who will be employed or supply services and provisions for workers and to contractors. Within the respective project areas there will be opportunities for petty trading and small business service provision along the power line routes and where there are sub-station rehabilitation components.

Significant social benefit will come through employment generation and safer more efficient operation of key services, through provision of electricity access to the villages along the transmission and distribution lines served by the project. Potential beneficiary enterprises affected by and contributing to regional socio-economic transformation will be small industries like saw mills and joineries, grain mills and other agricultural processing businesses which need electricity.

The long-term direct positive impact is therefore in access to reliable electricity supplies, which will lead to better provision and easier management of goods and services, and enable new facilities for processing and storage. There will be better availability and supply of safe and clean water (which needs pumping); data management with computers is made possible and communication facilities like Internet can be made available, as also charging for mobile phones; also, electric lighting adds to security at night and enables extended opportunities for work and study.

As a consequence the quality of life and extent of economic opportunity will be changed for the better. Social and environmental costs, not least in noise and air pollution, associated with existing generator usage will be reduced and there may be a more limited requirement for firewood cutting and collection.

Adverse impact

Transmission and distribution network systems extension can be expected to have minor direct and indirect impacts on villages and hamlets where the proposed transmission lines pass, both positive and even negative if mitigation measures and compensation is not undertaken effectively.

The following adverse impacts have been identified as likely to arise from the implementation of the RESSP especially when implementing major activities in component B and C of the project and for which this ESMF report seeks to address:

Environmental Impacts

- Land degradation and soil erosion related to clearing the project areas for construction related works towards installation of towers, cabins, Right of Way (RoW), etc.
- Vegetation in the project area due to clearing to create distribution path, construct substations, install towers or create Right of Way.
- Ecological issues should the network cut across sensitive ecosystems
- Impact on fauna, e.g. birds (Bird strikes on T-lines)
- Impacts on soil and water from machinery fuel and lubricants contamination from accidental spills or unsound disposal or handling
- Contamination of soil and water resources from poor disposal of CFLs which contain mercury.
- Borrow pit related impacts including becoming breeding grounds for disease vector, hazards that could drown animals and people, and ecological destruction if borrow pits are located in sensitive environments

Social and cultural Impacts

- Loss of land or property/buildings to provide path for Right of Way (ROW), distribution line or for construction of LV sub stations (cabins).
- Crop destruction in the project area due to clearing to create distribution path, construct substations, install towers or create Right of Way.
- There may also be minor effects on agriculture, if there would be a restriction on land use in the right of way to the areas where transmission lines pass, and, in any involuntary resettlement requirement.
- Dust related impacts during construction
- Aesthetics and visual related impacts
- Damage and loss of physical cultural properties
- Workers Health and Safety related impacts due to potential construction, operations and maintenance
- Social and cultural interaction impacts between the contractor's workers and local populations.
- Noise impacts during construction from the machinery and from the sub stations during operation phase
- Dust impacts, vegetation destruction, loss of crops in areas where access roads will be built for the project.

- Establishment of construction camps for the workers likely to cause vegetation and crop destruction as well as camp construction relate impacts.

The impacts are considered to be limited to the specific project areas, minimal and minor in scale and in terms of magnitude and should be adequately mitigated through the preparation of appropriate EMPs and RAPs whenever required.

0.7 Reporting and Performance Review Requirements

The EUCL's Social and Environmental safeguard Experts prepare quarterly environmental and social monitoring reports. These are submitted to the World Bank's supervision unit for review. The reports are shared with MININFRA and other relevant government agencies such as REMA.

0.8 Capacity Building and Training

Effective implementation of the Environmental and Social Management Framework will require that adequate capacity enhancement within institutions and other stakeholders be undertaken. From the Environmental audit conducted for the EARP it was noted that EARP coordination Environmental and Social Specialists and other key actors have received adequate training prior to programme implementation which include project screening, impact identification and analysis, environmental and social assessment procedures and requirements. Moreover this team designed a Strategic Environmental and Social Assessment report. However, The EUCL shall enter into a Project Implementing Support Agreement (PISA) with EDCL to enable the former to engage the EARP-PCU services, in this regard the Safeguards aspects

The RESSP will fund the training of EUCL and EDCL staff and the main objective of the training is to support the newly created agencies (especially the EUCL and EDCL) to develop capacity and in the medium term to have in-house capacity to mainstream safeguard activities with specific skills in integrating environmental and social considerations early in the design concepts such as the design of transmission lines and substations and during surveys and project supervision.

For effective implementation of the programme, district/local level environmental officers are trained and called for their full involvement in project implementation whereby supervision and monitoring of environmental safeguards requirements in subproject construction and operations are among the duties.

It is also expected that environmental and social considerations will be taken into account in the contracts between RESSP and contractors. The contract should include a clause on training requirements and other necessary support services to implement the mitigating measures. It is therefore expected that workers at site be trained in sound environmental and health and safety practices when implementing EARP subproject activities.

0.9 Report Structure

Chapter one reviews the EARP context in EDPRS II and provides a rationale for the existence of the document and introduces the Rwanda Electricity Sector Strengthening Project. Chapter two describes the project and its components. Chapter three presents the methods used in undertaking and developing framework while chapter four provides national environmental and social baseline

conditions. Chapter five presents national and international policy, legal and institutional framework. Chapter six reviews the relevant World Bank environmental and social safeguards policies.

Chapter seven reviews the potential positive and adverse social and environmental impacts from RESSP subproject activities. This is followed by proposed mitigation and enhancement measures and environmental and social monitoring plan which are discussed in chapter eight. Chapter nine highlights the project coordination and implementation agreements, approvals and reporting. Capacity building, training and technical assistance procedures as well as the budget for EMP implementation are presented in Chapter ten.

1.0 INTRODUCTION

The Government of Rwanda (GoR) through the Ministry of Infrastructure initiated through Rwanda Energy Group (REG) and its subsidiary the Energy Utility Corporation Limited (EUCL), the Electricity Sector Strengthening Project which will contribute to Economic Development and Poverty Reduction Strategy (EDPRS) I and II targets and shall be supported from different donors including World Bank as the main donor. This project complements the on-going EARP which will continue to lead on grid electrification in urban areas and rural settlement.

In compliance with Environmental Organic Law N^o4/2005 and the World Bank's Safeguards Policies, the GoR, represented by the Ministry of Infrastructure has prepared the Environmental and Social Management Framework (ESMF) document for the Rwanda Electricity Sector Strengthening Project (RESSP).

The aim of establishing the ESMF is to set up a mechanism in the determination and assessment future potential environmental and social impacts of the RESSP, and thus set out mitigation, monitoring and institutional measures to be taken during implementation and operations of the proposed investments/activities and to eliminate their adverse environmental and social impacts, offset them, or reduce them to acceptable levels.

The GoR is also further required to disclose this document in-country as a separate and stand alone document so that it is accessible by the general public, local communities, potential project affected people, local Joint Action Development Forum (JADF) and other stakeholders. The document must also be available at the Infoshop of the World Bank and the date for disclosure must precede the date for appraisal of subprojects.

Rwanda Development Board is responsible for the screening, review and clearance of planned investment subprojects prior to implementation. The use of this ESMF by EUCL) would be the instrument through which the RESSP subprojects environmental and social impacts are identified, assessed, evaluated and have appropriate mitigation, management and monitoring measures, designed and incorporated within the sub project itself. The World Bank assesses if the latter have been complied with its safeguard requirements.

1.1 Objectives

The objectives of the ESMF are:

- To establish clear procedures and methodologies for environmental and social planning, review, approval and implementation of subprojects to be financed under the project;
- To assess the potential environmental and social impacts of envisaged subprojects
- To propose mitigation measures which will effectively address identified negative impacts and support green connections
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures for managing and monitoring environmental and social concerns related to subprojects;
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF; and

- To establish the project funding required to implement the ESMF requirements.

2.0 PROJECT DESCRIPTION AND COMPONENTS

Rwanda Electricity Sector Strengthening Project (RESSP) is proposed to have three components: Component - A, electricity sector capacity, Component-B, increased access to electricity services and Component-C (Technical Assistance and Project Implementation Support).

2.2 Project Components

The RESSP three components are as follow:

2.2.1 Component A: Electricity Sector Capacity Strengthening

the project will support EUCL to establish a comprehensive Integrated Business Management Information Systems (IBMIS)MIS to ensure efficient, transparent, and accountable processes covering network operations and maintenance (O&M); commercial functions; and management of corporate resources. The primary activities will include the design, supply, installation, and operationalization (including staff training) of an integrated management information system with several modules covering commercial, network operation, and corporate functions. The integrated Business Management Information Systems will have the following subcomponents:

Sub-component A-1: Integrated Business Management Information Systems

The proposed project will support development of an integrated business MIS that will cover core business functions, including network operations and maintenance, commercial functions, and management of corporate resources. The integrated Management Information System (MIS) will include a new Commercial Management System (CMS), an Incident Recording and Management System (IRMS), and an Enterprise Resource Planning (ERP) system.

- **Commercial Management System (CMS)**

This CMS will finance the design, procurement and implementation of a new commercial management system in order to provide support to the utility's business functions related to revenue and customer management. The objective is to improve customer service and at the same time strengthen business performance, especially reduction in commercial losses. The CMS will include aspects related to customer database, billing, and commercial processes and procedures.

- **Integrated Distribution Management System (IDMS)**

The IDMS will include several **system** modules: (i) a geographic information system (GIS); (ii) an outage management system, including incident recording; (iii) distribution systems operations and maintenance; and (iv) distribution supervisory control and data acquisition (SCADA). The IDMS will improve electricity supply reliability, operating efficiency, and outage management to assure increased customer satisfaction.

- **Enterprise Resource Planning (ERP) System**

The RESSP will cover core corporate functions including human resources, finance, procurement, and asset management. The objective is to support the utility to better plan and manage all of its resources for increased efficiency and accountability.

Sub-component A-2: Revenue Protection Program

This sub-component will finance: (i) the creation of a Metering Control Centre (MCC) and investments in infrastructure needed for its operations; (ii) incorporation of state-of-the-art Meter Data Management software and training of staff of the MCC in its proper use to ensure systematic use of the information provided by the metering system so that corrective field action can be undertaken as needed; and (iii) supply and installation of advanced metering infrastructure (AMI) for the targeted 1,500 large customers. The AMI will include an integrated system of smart meters, communications networks, and data management systems to enable two-way communication between the MCC and the targeted customers.

The main objective of the Revenue Protection Programme (RPP) is to sustainably protect EUCL's revenues from electricity sales to large and medium customers who are currently less than 3 percent of the total customer base, but represent around 50 percent of total sales. Implementation of the RPP will ensure that the billing for these "high value" customers is systematic and accurate according to their full metered consumption. The RPP will protect utility revenues by providing accurate, reliable, and timely billing information, thus promoting greater billing transparency and reduced consumption disputes, while also identifying network theft, which will contribute to significant reduction/control of commercial losses. Deployment of the AMI, including smart meters together with the proposed IDMS, will not only contribute to EUCL's operations efficiency and customer service quality, but also provide a platform for further distribution grid modernization as the utility develops and deploys more functions related to "smart grid" functionality.

Sub-component A-3: Strengthening of Technical Capacity of key functions in EUCL

This subcomponent will support the strengthening of the technical capacity in key functions of the EUCL namely, operations, commercial services, finance, and corporate services. The TA support shall include but not be limited to: (i) coaching, mentoring, and enhancing the capacity of EUCL staff in areas of their technical expertise; (ii) assisting EUCL to develop and document functional processes and operational procedures; (iii) assisting EUCL to implement the MIS system and the RPP (components A-1 and A-2); (iv) assisting EUCL to collect and keep data records to be used as baseline data in performance targets setting; and (v) together with EUCL staff and assisted by a strategy execution consultant, preparing and implementing a corporate strategic plan and developing an all-inclusive performance based dashboard

2.2.2 Component B: Increased Access to Electricity Services

The Increased Access to Electricity Services will support connection of new consumers all over Rwanda and network reinforcements, where required, to ensure that network expansion does not compromise the quality of supply; and strengthening of the Kigali 15KV distribution network to provide sufficient capacity to meet increased demand arising out of increased economic activities.

Sub-Component B-1: Strengthening the distribution network around Kigali Area

The subcomponent will finance (i) the rehabilitation of key 15KV medium voltage switching stations in the Kigali electricity distribution network to enhance safety; (ii) upgrading of the Kigali network to increase loading capacity thereby improving supply reliability and reduced technical losses; and (iii) installation of equipment that will facilitate monitoring and control of the network from the National Control Centre (NCC) to reduce unscheduled downtime. These improvements will enhance overall network operations efficiency.

Sub-Component B-2: Electricity Access

This subcomponent is aimed at continued support of the ongoing EARP and will finance activities to connect new consumers all over Rwanda through the purchase of equipment for grid extensions, reinforcements, consumer connections, and installation services, including upstream system reinforcements, where required, to ensure that network expansion does not result in the deterioration of the quality of supply. The project will support investments that will result in the connection of about 47,000 new customers to the national electricity grid.

2.2.3 Component C: Technical Assistance and Project Implementation Support

The Technical Assistance and Project Implementation Support component will include the Technical Assistance (TA) and Electricity Sector Strengthening Project Implementation Support. The TA will support Feasibility and Diagnostic Studies required to have in place the requisite plans, bankable projects, and management capacity to foster improved sector expansion and efficient operations

Sub-component C-1: Feasibility and Diagnostic Studies

This sub-component will support studies to address sector performance improvements in the medium to long term, especially those related to grid supply and reliability as well as options for sector development. For the former, assessments will include (but not be limited to) identification of investments required to (i) increase electricity distribution network reliability, and (ii) reduce network down time and operations costs through network automation. In addition, the assessments will include distribution network protection studies (fault calculations and protection grading) that will be required to enable the proposed network automation. For the latter, studies will support required feasibility studies and just-in-time policy advisory notes that are required to inform decision making regarding emerging sector issues. This subcomponent will also finance TA activities to develop strategies, including strengthening the functions of investment planning covering aspects such as feasibility studies and projects due diligence.

Sub-component C-2: Project Implementation Support

This subcomponent will support the Project Coordination Unit (PCU), including project management, procurement, financial management, safeguards, and monitoring and evaluation (M&E) staff, as well as the Sector Working Group (SWG) secretariat, and capacity building and operating costs. Execution, design, and supervision consultants to assist with project implementation and sector coordination will also be supported as necessary.

Project components and related cost are summarized in Table 1.

Table 1 Project component and cost

Component	Subcomponent	Cost US\$ million equivalent	
A. Electricity Sector Capacity Strengthening	1. Integrated Business Management Information Systems	10.0	20.0
	2. Revenue Protection	5.0	
	3. Strengthening of Technical and Management (STM) capacity of key functions in the EUCL	5.0	
B. Increased Access to Electricity Services	1. Strengthening the distribution network around Kigali Area	15	50.0
	2. Grid Extension to New Load Centres	35	
C. Technical Assistance and Project Implementation Support	1. Feasibility and Diagnostic Studies	5.0	10.0
	2. Project Implementation Support	5.0	

2.3. Project cost and Financing

The total project cost is estimated at US\$ 95 million. The project will be entirely financed by IDA. The lending instrument is the Investment Project Financing (IPF).

Table 2: IDA Financing

Project Components	Project Cost (US\$ Millions)	IDA Financing	% Financing
1. Sector Performance Management Improvement	20	20	100
2. Increased Access to Electricity Services	50	50	100
3. Technical Assistance and Project Implementation Support	10	10	100
Total cost	95	95	95
Total Project Costs	95.0	95.0	100
Front-End Fees	0.0	0.0	0.0
Total Financing Required	95.0	95.0	100

Other donors will provide parallel funding of approximately US\$ 320 million that will support the sector reform and the access roll-out

Table 3: Parallel funding of the electricity sector reform

DP (For ongoing and pipeline support)	Funds available (USD-millions)
WB (pipeline)	45.50
AfDB (Ongoing)	41.0
EU (pipeline)	155
BADEA (Ongoing)	11.0
Saudi funds (Ongoing)	10.0
Kingdom of Belgium	37.74
AFD (Pipeline)	22.0
Total	322.64

The implementation arrangements for the Project were discussed as summarized in the paragraphs below and detailed in chapter 5.

3.0 METHODOLOGY AND CONSULTATION

The study was conducted by the consultant using the following approach and methodology;

3.1. Literature review

Review on the existing baseline information and literature material was undertaken and helped in gaining a further and deeper understanding of the project. Among the documents that were reviewed in order to familiarize and deeply understand the programme included:

- World Bank Project Concept Note and Integrated Data Sheet
- RESSP sub project preparation brief-Status and Next steps
- RESSP Preparation Country document
- PID Electricity Access Scale Up
- National policies and legal and institution framework
- World Bank Operational Policies and Procedures

The consultant also undertook detailed review and analysis of the international conventions related to this project and other relevant documents.

3.2 Field Visits

The consultant made visits to the potential RESSP sub projects areas in order to familiarize with the issues on the ground and appreciate the concerns. There was limited consultation during the study to engage the project affected persons and intended beneficiaries owing to time constraints and the magnitude of sub-projects.

3.3 Interactive Discussions

Stakeholder engagement and consultation with regard to project was conducted to enable capture of the views and thoughts of different players. Various discussions were held with EUCL, REMA as well as local government and other stakeholders such as Rwanda Natural Resources Authority. These discussions were insightful in understanding the issues and are the basis for most of the measures contained in this ESMF. The issues raised and concerns expressed including possible mechanisms of addressing these issues and concerns are appended in annex 5 of this document. The stakeholders 'consultation was significant to the preparation of this ESMF and partly formed the basis for the determination of potential project impacts and viable mitigation measures. After location selection of a subproject community level environmental screening will be an integral part of the subproject planning.

Thus consultation will be a continuous process by which opinion from public will be sought on matters affecting them. Public consultation is a continuous process aimed at engaging the stakeholders' effort throughout the planning, design, consultation and operation. Once RESSP sub project locations have been identified, Environmental Impact Assessments (EIAs) and /or Environmental Management Plan (EMPs) will be prepared as required by National legislation and World Bank guidelines and further public and stakeholder's consultations with targeted beneficiaries will be undertaken. The opinions and suggestions of the stakeholders would assist in taking appropriate decisions for effective environmental

management of the sub project. It would help facilitate and streamline decision making whilst fostering an atmosphere of understanding among PAPs.

3.4 Preparation of ESMF

This involved:

- Collation of baseline data on the environmental conditions of the project area;
- Identification of potential positive and negative environmental and social impacts;
- Identification of environmental and social mitigation measures;
- Proposal of screening tools to be used while screening subproject proposals; and
- Formulation of environmental and social monitoring plans.

4.0. ENVIRONMENTAL AND SOCIAL BASELINE DATA

This section describes the overall baseline conditions of Rwanda in terms of social and bio-physical environment.

4.1. Location and Size

Rwanda is a small mountainous landlocked country, located in Central Africa, at latitude 2 00 S and longitude 30 00 E, bordered to its South by Burundi , Tanzania to its East, , Uganda to its North and the Democratic Republic of Congo (DRC) to its West. Rwanda has a total surface area of 26, 338 sq. km of which the total land area is 24, 948 sq. km and 1, 390 sq. km is surface water.

Rwanda is often referred to as the country of a “thousand hills” (mille collines) , because of its numerous highly dissected hills, often with flat peaks and convex slopes mainly in Northern and Western part, separated by relatively narrow valleys, with the lowest altitude of around 900 m at Bugarama and the highest altitude at Mount Karisimbi 4,519 m. The average altitude is 1,250 m above sea level.

Rwanda can be divided into six topographical regions which are:

- From North-West to South -West are the narrow Congo Nile Ridge, which slopes sharply to Lake Kivu
- The Volcanic Virunga Mountains, whose highest peak, Mount Karisimbi, towers over the high North-Western lava plains.
- The steep North-South rise of the Congo – Nile Basins divide, whose width averages 25 km.
- The ridge of the Congo – Nile Basins divide, with an average elevation of 2750 m above sea level.
- The central plateau East of the mountains, which are covered by rolling hills.
- The savannas and swamps of the Eastern and South Eastern border areas which cover one-tenth of the nations land area and include the Akagera National Park.
- Most of Rwanda is at least 900m above sea level; the central plains have an average elevation of 1932m, while South-Eastern Rwanda has a desert like terrain.

4.2. Physical Environment

4.2.1. Climate

Rwanda enjoys a tropical temperate climate due to its high altitude. The average annual temperature ranges between 16°C and 20°C, without significant variations. Rainfall is abundant although it has some irregularities. Winds are generally around 1-3 m/s.

In the high regions of the Congo-Nile ridge, average temperatures ranges between 15 and 17°C and the rainfall is abundant. The volcanic region has much lower temperatures that can go below 0°C in some places. In areas with intermediary altitude, average temperatures vary between 19 and 21°C and the average rainfall is around 1000 mm /year. Rainfall is less irregular, and sometimes causes periods of drought. In the lowlands (East and Southeast), temperatures are higher and the extreme can go beyond 30°C in February and July-August. The absolute

temperature of 32.8°C was recorded in the Southeast by Karama-Plateau station on the 4th of September 1980.

Thermic constraints are more considerable there than in the remaining part of the country. Rainfall is less abundant in that region (700 to 970 mm/year). Weather in Rwandan is determined by the rainfall patterns. Thus, the climate of the country is characterized by an alternation of four seasons of which two are wet and the other two are dry. However, one can notice that rainfall is generally well distributed through out the year, despite some irregularities. Eastern and South-Eastern regions (Umutara, Kibungo, Bugesera, Mayaga) are more affected by prolonged droughts while the northern and western regions (Musanze, Rubavu, Nyamagabe and Gicumbi) experience abundant rainfall that usually causes erosion, flooding, and landslides.

The quantity of total annual rainfall varies between 800mm in the North-East of Rwanda (Eastern Umutara) and 1600 mm in the natural forest of Nyungwe and in the high lands of the North-West (Kinigi). The decrease in rainfall is observed in the region of Bugesera (900 mm) and in the Western part of Rubavu district (1200 mm). The increase of rainfall is observed in some regions like Kibungo (Gahororo, 1200 mm); in the South-West (Mibirizi, 1450 mm) and in the natural forest of Gishwati (1350 mm).

The region that is characterized by the highest rainfalls (over the average isohyets of 1200 mm) is located in the western half of the country, from Byumba to Kibeho and from Kinigi to Mibirizi including the region bordering Lake Kivu.

4.2.2. Relief

The Rwandan relief is hilly and mountainous with an altitude varying between 900 m and 4507 m. The components of that relief are:

Congo-Nil Ridge over laying Lake Kivu with an altitude between 2500 m and 3000 m. It is dominated in the North-West by the volcanic ranges consisting of five volcanic massifs of which the highest is Karisimbi with 4507 m. The central plateau presents a relief of hills with an altitude ranging between 1500 m and 2000 m. The lowlands of the East are dominated by a depression characterized by hills with more or less round top and 1000 to 1500 m in altitude. The lowlands of the South-West in Bugarama plain with an altitude of 900 m are part of the tectonic depression of the African Rift Valley.

4.2.3. Catchment and Hydrology

Rwanda has a relatively big quantity of water: rivers, lakes and marshes and occupy a surface area of 211000 ha or about 8% of the national territory (lakes: 128000 ha, rivers: 7260 ha and marshes: 77000 ha).

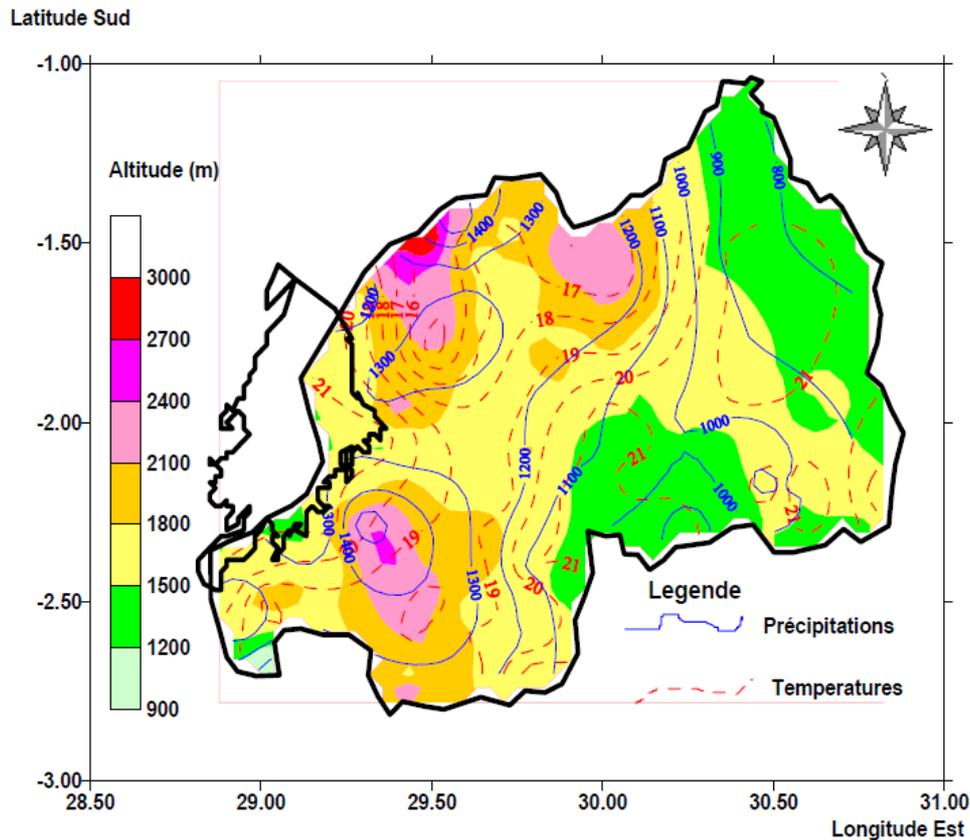


Figure 1: Relief and climate

Source: Data collected at National Meteorological Service

4.2.4. Surface water

Rwanda has a dense hydrographical network of $\pm 2 \text{ km/km}^2$ (length of the superficial flow network by km^2 of surface). The country is divided into two hydrographical basins with a separating line called Congo-Nile Ridge, moving from the North to the South and \pm perpendicular to the volcanic chain, making natural obstacles exchange between the catchments basins of the Northern Kivu and the Southwest of Uganda and those of Rwanda.

In the West of that line there is the Congolese basin (33% of the surface of the national territory) that drains 10% of water resources of the country. It comprises rivers Sebeya, Koko, Rusizi, Rubyiro, as affluents of Lake Kivu (around 1000 Km^2 on the Rwandan side, 490 m of maximum depth), Ruhwa and many other small rivers (around 127 rivers).

In the East of the Congo Nile Ridge there is the Nile basin which covers 67% of the National territory and drains 90% of Rwandan waters by two main rivers namely Nyabarongo and Akagera. The latter is the main affluent of Lake Victoria with an average outflow of $256 \text{ m}^3/\text{s}$ at Rusumo station and thus considered as the source of the Nile. The basin of the Nile in Rwanda comprises a lot of small lakes (Burera, Ruhondo, Cyohoha South, Mugesera, Muhazi, Rwampanga, Mihindi, Mirayi and many others). Those lakes are not very deep (5 to 7 m of depth) except for Lake Burera and Ruhondo which are 65 to 173 m deep.

4.2.5. Groundwater

The outflow of the ground renewable water resource is estimated at 66 m³/s. Out of this, the 22,000 known sources contribute an output of 9 m³/s. In general, little information is available on ground water resources.

4.2.6. Lakes

Rwanda has some 28 lakes of significant size. Six among the largest are entirely within the national territory: Ruhondo, Muhazi, Mugesera, Ihema, Rwanyakizinga and Burera. Three others, Rweru, Cyohoha and Kivu, are shared with neighboring countries. The largest and most spectacular is Lake Kivu, so large as to seem almost like a sea to the landlocked inhabitants.

Lake Kivu lies at 1,460m above sea level and is 90 km long (north-south) and 49 km wide (east-west). From an average depth of 240 m, it plunges to a maximum depth of 490 m. Lake Kivu has a rough, jagged coast and contains numerous islands, including Nkombo and Iwawa. Lake Kivu lies on the border with Congo in Western Rwanda at the foot of the Virunga Volcanoes. Kivu's shores are densely populated and the principal town on the Rwandan side is Rubavu. Although it is supplied with fish, the lake is poor in fauna but rich in volcanic substance.

Great volumes of dissolved methane gases ((~60 km³ STP) that may be developed as energy sources exist in its deep waters. Lake Kivu drains to the south into Lake Tanganyika by the swiftly descending Ruzizi River.

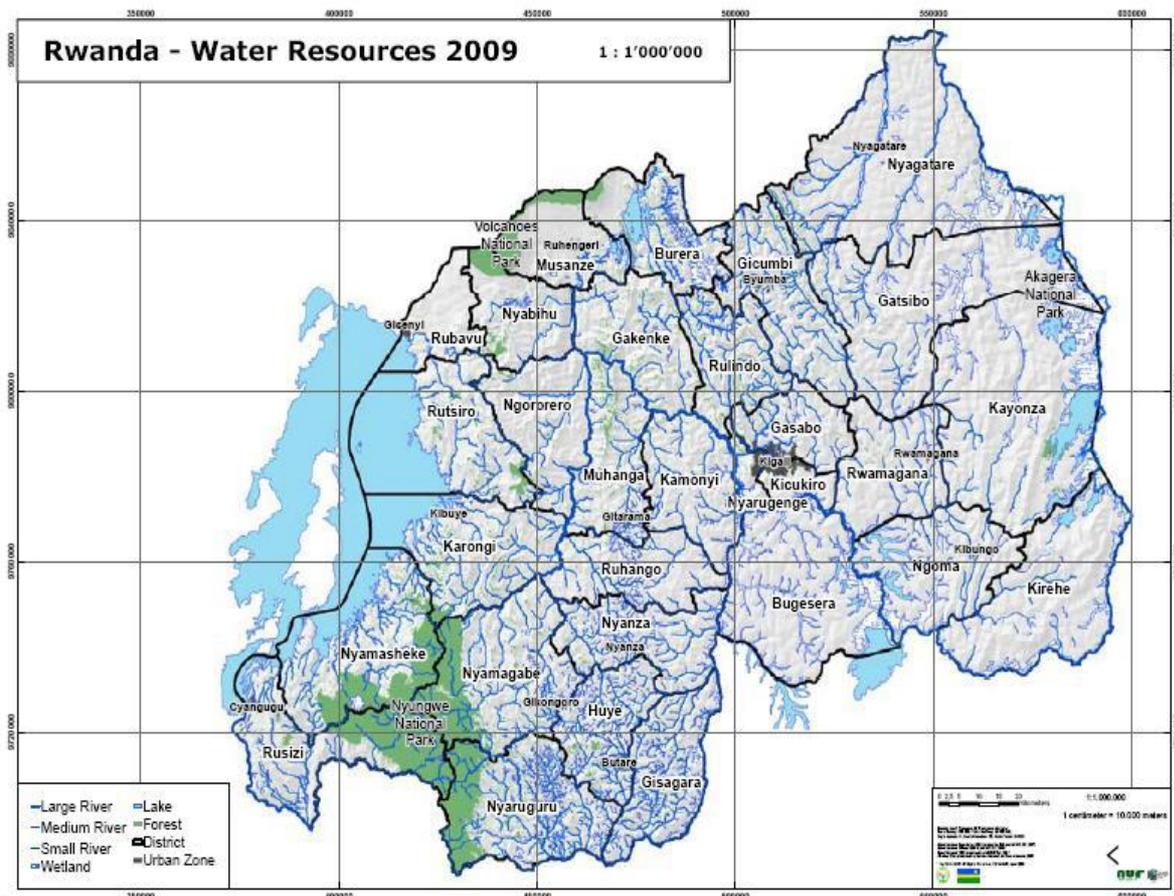


Figure 2: Rwanda water resources

Source: RNRA

4.2.7. Quality of water

In Rwanda the quality of water is generally good with a pH ranging between 6 and 7.5. Surface water often carries sediments and in mining and volcanic regions, the water can contain arsenic, lead, mercury, fluoride, iodide and other toxic metalloids and heavy metals. The physio-chemical pollution of water is not frequent due to the small level of industrialization and use of agricultural chemical inputs. The microbiological pollution is often observed and it comes from various domestic wastes and debris carried by rain water towards the natural environment. The pollution of water courses and lakes by the water hyacinth and other harmful aquatic plants is a phenomenon that is very recent and alarming in Rwanda.

4.2.8. Wetlands

Wetlands cover a total area of 164,000 ha or about 6% of the territory. The wetlands include a variety of ecosystems, ranging from large, permanently flooded swampy peat-lands to smaller, seasonally flooded wetlands with a more mineral soil. The main swamps are Akanyaru (30,000 ha) on the border with Burundi, Mugesera Rugwero in the southeast, Kagera swamps along the Tanzania border in the east, Nyabarongo (10,000 ha) and the Rugezi wetlands (5,000 ha) in the north.

The wetlands serve as troughs for sediment particles and play an important role in the national water balances by acting as a buffer, thus reducing the maximal flow rates during the rainy season and maintaining a relatively high flow rate during the dry season.

Currently, an estimated 94,000 ha have been brought under agriculture, the large majority of this being spontaneous agriculture with maize, sweet potatoes and beans. In addition, the wetlands are used for a variety of traditional activities including the collection of leaves to make handicrafts, extensive grazing and making of bricks. Wetlands also provide a spawning habitat for fish, and are of great significance for biodiversity conservation. The wetlands are composed of marshes, lakes, rivers and brooks representing around 14.9% of the national territory of which 6.3% consist of marshes and 8.6% of lakes, water courses and pools of permanent or seasonal fresh water.

In the highlands of the North-West, there are: lakes Burera and Ruhondo as well as the marshes of Rugezi. In the Central and the East of the country, wide marshes are those of Nyabarongo, Akanyaru and Akagera rivers. Many cuvette lakes connect with rivers and most of them are located in the Akagera National Park. From the Southeast to the North-West, there are lakes like Cyohoha in the South, Mugesera, Rweru, Sake, Cyambwe, Ihema, Milindi, Rwanyakizinga, Kivumba, etc.

Given the importance that the Government of Rwanda attaches to wetlands, in 2003 Rwanda ratified the Ramsar Convention or convention on wetlands and has already registered on the Ramsar list the site of Rugezi and identified other potential sites that will be registered in the future, like the complex of Mugesera-Rweru, Kamiranzuvu marshes and the wet zones of the Akagera National Park. In addition, an action plan for the implementation of the Ramsar Convention was developed in June 2004. The wetlands ensure several functions and provide numerous services to people. For instance they ensure control of floods and the recharge of underground waters. They play the role of alleviating the erosive force of water and thus facilitate the deposit of sediments in suspension that could block water courses downstream.



Figure 3: Wetlands in Rwanda

Source: Audit team

4.2.9. Degradation of water resources

The degradation of water resources is characterized by:

- Frequent flooding and their effects on health, infrastructures, economy, land and aquatic ecosystems.
- The problems linked to water pollution (toxic products, water hyacinth, etc.);
- Erosion of drainage basins, sedimentation of water courses and silting up of lakes;
- Over exploitation of lakes and water reserves.

4.3. Geology and soils

4.3.1. Soils

According to the Geological Map of Rwanda, the regional geology consists of pelitic rocks and Quartz-Phyllites (Cyurugeyu Superformation), Granites to Granite-Gneisses, Quarzites and Mica-Schists, Amphibolites and Mylonites (Huye Complex) as well as Quartz-Phyllites and Meta-Volcanics (Nyungwe Formation). The greater part of the geological structure is occupied by such lithological varieties of Rocks. Rwanda shows well developed drainage pattern that belongs to dendritic and trellis types. Metamorphic rocks form the major part of the rock mass and some magmatic rocks are also present. Major rock types observed in the area are granitic gneiss, quartzite, schists and amphibolites.

The dominant soils are the result of alteration of the granite and the gneiss. Disruption of drainage due to tectonic movements of the Pleistocene caused the formation of alluvial valleys. They consist of alluvium and colluvium in the basin as result of the erosion. They have generally colluvial and alluvial

in the valleys around the rivers. The soils of the top of the mountains are products of granite and gneiss and have resisted erosion.

Soils derived from schistose, sandstone and quartzite formations found in the Congo-Nile Ridge and Soils derived from old volcanic materials found in the plateau of the south west of the country.

Over the RESSP subproject area, most of the valley slopes extending from river banks to the top of the ridges are cleared for cultivation of various crops of a seasonal nature. As a result, soil cover is well exposed for potential erosion. A few patches of new forest plantations of eucalyptus and pines can also be seen on the valley slopes.

4.3.2. Use of soils

The exploitation of land employs around 70% of the active population. Land resources are thus limited and coveted resulting in overexploitation and inappropriate use of lands with disastrous consequences on land resources and on environment in general.

In mountainous area, steep slope lands are deforested and used for staple crops under high rainfall precipitation, with often accelerated land degradation through water erosion, poorer soil fertility, increased floods and landslides, and overall, food insecurity and poverty. Appropriate land uses combined with soil and water conservation measures then become a must; in some sites, active erosion mainly caused landslide hazards which increase sediments in rivers. Other than that, erosion has also formed gully bodies through the slopes of mountainous area.

Land use activities including infrastructure development may increase the potential of occurrence of landslides and erosion in various ways, which include destabilization of rock masses by cuts in slopes, improper stockpiling of materials, destruction of vegetative cover during site clearing and uncontrolled surface run-off during storms may increase the erosion rate. River banks are composed of alluvial and proluvial loose-fragmental soils. Thus, the activities may increase erosion and landslides rates at various points along the banks of rivers and in some lateral ravines.

Intensive cultivation occurs along the steep slopes predominant in the area without proper soil conservation techniques hence accelerating soil erosion. However, it is worth mentioning that terracing as a measure for soil erosion control is practiced in some parts of the project area.

Extensive deforestation to meet energy demands has further reduced the soils 'ability to withstand the scouring effects of rain in the upland watersheds has had serious downstream implications. When viewed against that background, therefore, it is easy to appreciate that the project would have negligible incremental impact on the rates and overall patterns of erosion.

Nevertheless, erosion is of relevance to slope stability, which is in turn relevant to the design of the project and the conduct of operations such as excavation and borrowing. The specific measures will be taken to address these considerations.

4.3.4. Highland soils

The highland soils are particularly prone to erosion and landslides especially regions of the Congo-Nile ridge, valleys and lowlands (peat lands) as well as highland meadows. Soils of foothills of the Congo-Nile Ridge and of other transition regions between the central plateau and highlands are fertile but, due to deforestation and inappropriate agricultural practices, they are vulnerable to erosion.

4.3.5. Soils of the central plateau

The central plateau covers the regions of South and South-East. The soil types are hill Ferro soils and valley histosols. The slopes of hills are exposed to erosion notably in the case of clay-sandy or gravelly soils.

4.3.6. Soils of the lowlands

They cover the Eastern and South-eastern regions and are Ferro soils with savannah vegetation. Similar to the region of Bugesera, the river-lake complex along Nyabarongo and Akanyaru rivers underwent serious leaching. In addition, the geological structure of soils in those regions allows rain waters to infiltrate deeply into soils, and that can partly explain the lack of runoff waters and shallow brooks.

4.3.7. Soils of valleys

These are soils of histosol and peat soil types that constitute potential agricultural and energy wealth (case of intermountain basins of Kamiranzovu and Rugezi). In the wide water surfaces of eastern regions like Umutara and Bugesera, as well as the Rusizi region (Bugarama), the valleys are of vertisol and alluvial types are fertile. The slope slight as they may be, are threatened by erosion due to the weak permeability of soils.

The exploitation of peat for fuel production purposes would require a preliminary development plan for swampy areas. In fact, any extraction of peat is associated with drainage and exudation, two factors likely to impact negatively on the crucial role of wet ecosystems and swamps in regulating the hydrology. Moreover, the exploitation of mines and quarries spoils the landscape and more often constitutes a source of soil erosion, water pollution and pose a danger to human health. A good number of queries are not rehabilitated and always left open.

4.4. Biological Environment

Rwanda is covered with diverse ecosystems that include mountains, ombrophile forests, gallery forests, savannahs, wet and aquatic zones, wood and agro ecosystems. All these ecosystems have a rich flora and fauna.

4.4.1. Protected areas

The fauna and the flora can be better preserved and protected thanks to the establishment of a system made of protected areas like national parks and forest reserves to which the best management is applied. However, through time and due to human activities, these conservation areas have been reduced considerably.

4.4.1.1. Forests

Rwanda's remaining natural forests, the Nyungwe Forest, the Gishwati Forest and the Mukara Forest, are highland forests around the volcanoes, have a high degree of biological diversity and rare animal species, such as mountain gorillas, Ruwenzori colobus monkeys and golden chimpanzees.

It is estimated that there are 2150 plant species to be found in Rwanda, with around 700 species of these acknowledged to have medicinal value. Towards the east of the country lies the Akagera National Park, the Mutara game reserve forests galleries and wooded savannahs.

Population pressures have already drastically reduced the land area of the natural forests of Rwanda from about 30% to presently fewer than 10% in less than a century. The deforestation of Rwanda's remaining forests is also the result of high fuel wood consumption. Heavily populated and cultivated areas adjacent to the natural forest, as well as the recent wars, have resulted in massive deforestation and loss of genetic diversity within Rwanda's natural forest.

Clearance for farming and pasture land has also contributed to the reduction in forest cover, as well as harvesting for fuel wood and timber for housing and small scale mining. Production of export crops is also a factor in forest destruction: half the forests around the volcanoes in the North were cleared for pyrethrum plantations in the 1960's, and areas around the Nyungwe were cleared for tea plantations.

Preliminary estimates indicate that the protected areas and forest reserves were seriously damaged as a result of recent wars. From an estimated pre-1994 total surface area of 417,000 ha, it is thought that they have been reduced to approximately 226,000 ha. Specifically, the Akagera National Park was reduced to less than one-third of its original size when the Umutara prefecture was created in 1996 for the resettlement of returning refugees. The Gishwati Forest has all but disappeared (from a pre-war estimate of 37,000 ha, only about 2,000 ha now remain).

4.4.1.2. National Parks/Forest Reserves at a Glance

The national parks in Rwanda are:

- Volcanoes National Park
- Akagera National Park
- Nyungwe National Park
- Gishwati-Mukura National Park

These areas are exclusively reserved for the protection of flora and fauna, eco-tourism, biodiversity conservation, and for geological formations of scientific and aesthetic value.

The geographical distribution of those parks on the national territory is a guarantee of the conservation of biological diversity representative of the fauna and flora of the country.

Volcanoes National Park

Spanning on a 160 Km² area in the Northern part of Rwanda, Volcanoes national park is the oldest national park in Africa, created in 1925. It was initially a small area around Karisimbi, Mikeno and Visoke volcanoes which was gazetted to protect the Mountain gorillas which were facing the threat of extinction as a result of poaching. In 1929, the park was extended into Rwanda and the then Belgian Congo and was named Albert national park managed and run by the Belgian Colonial Authorities. During early 1960s, the park was divided as Rwanda and Congo gained their independence and by the end of that decade, the park was almost half of its original size (340 Km² to 160 Km²).

Volcanoes National Park is home to Mountain Gorilla (*Gorilla beringei beringei*); golden monkeys (*Cercopithecus mitis kandti*), Spotted Hyena (*Crocuta crocuta*), buffaloes (*Syncerus caffer*), elephants, black-fronted duiker (*Cephalophus niger*), and bushbuck (*Tragelaphus*

scriptus). The park also harbors 178 bird species including at least 29 endemics to Rwenzori mountains and the Virungas. The VNP also host 245 species of plants of which 17 are predominant, including 13 orchid internationally protected, 115 species of mammals, 27 species of reptiles and amphibians and 33 species of arthropods. Some of these species are endemic while others are internationally protected.

Nyungwe National Park

Located in the South West corner of Rwanda, Nyungwe National Park is an untouched natural rainforest that is filled with exciting biodiversity. Nyungwe National Park was established in 2004 and covers an area of approximately 1000 km² of rainforest, bamboo, grassland, swamps, and bogs. The nearest town is Rusizi, 54 km to the west. Mount Bigugu is located within the park borders. Nyungwe is surely one of the world's most beautiful and pristine mountain rainforests. It's believed to be one of Africa's oldest forests, staying green even through the Ice Age, which explains its diversity. The Nyungwe forest has a wide diversity of animal species, making it a priority for conservation in Africa. The forest is situated in a region in which several large-scale biogeographical zones meet and the variety of terrestrial biomes provides a great span of microhabitats for many different species of plants and animals.

The park contains 13 different primate species (25% of Africa's total) with habituated chimpanzees and 12 other primates species (including a 400-strong troop of habituated Ruwenzori Black & White Colobus), 85 mammal species, 275 species of birds of which 26 are endemic in the Albertin Rift and 3 are on the red list of the IUCN (*Bradypterus graueri*, *Crypto spiza shelleyi* and *Apidis argentea*), 32 amphibian and 38 reptile species and 1068 plant species of which 140 species of orchids, 260 species of ligneous and herbaceous plants, 24 species of trees. Many of these animals are restricted-range species that are only found in the Albertine Rift montane forests ecoregion in Africa. In fact, the number of endemic species found here is greater than in any other forest in the Albertine Rift Mountains that has been surveyed. The forest, which reaches its maximum altitude of 3000 metres above sea level, is of particular interest for the presence of colonies of chimpanzees (*Pantroglodytes - Blumenbach, 1775*) and Angola colobus (*Colobus angolensis - Sclater 1860*).

Akagera National Park

The savannah in the North Eastern Rwanda is used as the Akagera National Park; it covers 900km² situated between 1300-1825 m of altitude. This park was created in 1934 to protect animals in three ecoregions: savannah, mountain and swamp. Conserving biodiversity in this ecosystem has been challenging due to increasing pressures, potential loss of habitat and species or lack of up-to-date data, etc.

This park has a set of compounds that define its high importancy, the Akagera major components are: Forest fringed lakes, papyrus swamps, savannah plains and rolling highlands.

Akagera has exceptional levels of biodiversity, partly due to its position at the confluence of different vegetation zones. The extensive systems of freshwater lakes and associated papyrus swamps form the largest protected wetland in central Africa. Its biodiversity has a double origin; both native and introduced species make the Akagera fauna and flora diversity. The wildlife in the Akagera National Park comprises 90 species of mammals of which 47 species of big mammals,

530 bird species, 35 fish species, 9 species of amphibians and 23 species of reptiles. Four animal species are protected by the CITES (Convention on International Trade of Endangered Species) namely *Loxodonta Africana*, *Sincerus caffer*, *Panthera leo* and *Tragelaphus oryx*. The flora of the Akagera National Park is diverse and 6 species of orchids are recorded. The ANP is dominated by the grass savannah and different species of acacia trees; the most found in the forest savannah.

Introduced 'Masai' giraffe, black rhino, elephant, buffalo, zebra and duikers are major herbivorous of the Akagera National Park. Whereas for the large predators only leopard (*Panthera pardus*) and hyaena (*Crocuta crocuta*) can still be found in the park. Although lion once occurred throughout Akagera, the population has been wiped out mostly through poisonings by cattle herders seeking to protect their livestock. A reduction in the prey-base due to heavy poaching would also have contributed to their demise. Smaller predators are still well represented with healthy populations of several mongoose species, viverrid species, serval (*Leptailurus serval*) and side-striped jackal (*Canis adustus*).

Gishwati-Mukura National Park

Presently, Gishwati-Mukura forest reserve is known for a wide range of fauna, including four species of primates: the eastern chimpanzee, the golden monkey, the blue monkey, and the l'hoest's monkey (also known as mountain monkey); more than a dozen species of East African chimpanzees; mammals such as red river hog, the black-fronted duiker, the southern tree hyrax, among others. Conservationists have also reported seeing the black and white colobus, another species of primates. The forest reserve also boasts about 60 species of trees, including indigenous hardwoods and bamboo. Gishwati and Mukura natural forests were originally earmarked as forest conservation zones in 1933. According to the draft law of October 15, 2014, the Gishwati-Mukura National Park will cover a total surface area of 3,427.46 hectares with Gishwati forest (1,439.72 hectares) and Mukura forest (1,987.74 hectares). The government has also dedicated an area covering 992.48 hectares to a subsequent buffer zone to deter human encroachment. Over the past decades, the Gishwati-Mukura area was nearly depleted largely due to resettlement, livestock farming and smallholder farms in the aftermath of the 1994 Genocide against the Tutsi.

Relic forests and gallery forests

The Gishwati forest that covered 21.000 ha before 1981, consisted of only 600 ha in 2002. *The natural forest of Mukura* that stretches on 3.000 ha in 1960 covered only 800 ha in 2002. Regarding tree species and altitude, it is similar to that of Gishwati (2000~3000 m). *Relict forests and savannahs in the East* are located around the Akagera Park and have a variety of endemic and rare species whose majority is used in traditional medicine. *Gallery forests* accommodate an important biodiversity with endemic and rare species. That is for instance the case of the *Blighia unijugata*, *Grewia forbese*, *Rhus vulgaris*, *Pterygota mildbraedii* and *Ficus sp.*

In general, for a period of about 40 years, the surface area of the natural forests of Rwanda underwent a decrease of about 65% between 1960 and 2002. The search for arable lands, extensive farming, illegal felling of forests for firewood, production of wood for charcoal and poles for building in urban areas, as well as a land mismanagement have drastically contributed to the reduction of the surface area of forests.

4.4.2. Biodiversity of wetlands

The ecosystems of the Rwandan wetlands inhabit a rich biological diversity in terms of vegetation and animal species (more than 104 plant species have been identified), except for Lake Kivu, Bulera and Ruhondo that have some limnologic problems.

The Lake Kivu contains a very poor aquatic flora and the density of the phytoplankton is relatively low due to the lack of mixture of layers with a biozone limited at 60 m to 70 m (the nutrients are found at the bottom of the lake). The ichthyologic fauna is also poor with 31 fish species due to the volcanic origin of the lake.

Most lakes of the Akagera National Park are very rich in biodiversity with phytoplankton, fish species and ornithological fauna. The flora is dominated by the Cyperus, Phragmites, Phinix, etc. The Water Hyacinth (*Eichornia crassipes*) is present and has started spreading covering more important surfaces of the lakes, thus posing a threat to their biological diversity. Some lakes like Cyambwe, Rwampanga and Rweru are particularly rich in hippopotamuses and crocodiles. One can also find many other lakes such as Nasho, lakes of Gisaka and Bugesera that contain phytoplankton that is very rich in biodiversity and flora that is mainly dominated by papyrus with *Cyperus papyrus* mixed with *Miscandium violaceum* and *Nymphaea nouchallii*. All these lakes are associated with gallery forests onshore or on small islands.

Concerning the Northern lakes (Bulera and Ruhondo), the aquatic flora and fauna are poor due to the physico-chemical situation unfavourable to their development and the isolation of the two lakes. The concentration of the plankton is less important in Lake Bulera than in Ruhondo. They have 48 species grouped in 4 families (chlorophyceous, Cyanophyceous, pyrophytes and bacillariophyceous). Lake Muhazi is land locked, isolated, and its ichthyologic fauna is very limited. One can find three endemic species and other nine introduced from outside. The lake is very rich in phytoplankton.

The macroflora of the marshes is mostly composed of wide spaces of papyrus with some zones of *Miscanthidium*. The low layer is covered with *Cyclosorus stratus*. The fauna of big rivers and associated marshes comprises ungulates, carnivores, primates, rodents, lagomorphous, insectivorous and birds.

4.4.3 Biodiversity in agricultural systems

Demographic pressure and intensive agricultural practices in combination with diversified agro-pastoral practices; deforestation, bush fires and urbanization have disrupted the ecosystem functions. These changes caused secondary formation consisting essentially of graminaceous plants, numerous seasonal or perennial species alternating with crops.

Agricultural arable land presently covers around 52% of the total surface area of the country and is permanently cultivated (RNRA 2012). The time between two growing seasons is the only period of respite. These areas have various crops that play an essential role in the national economy. These crops are usually grouped in two categories: subsistence and cash crops.

Some of the food crops include; sorghum, beans (*Phaseolus vulgaris*), eleusine (*Eleusine corocana*), Colocases (*Colocasia antignorum*), maize (*Zea mays*), rice (*Oryza sativa*), wheat

(*Triticum sp*), barley (*Hordeum vulgare*), peas (*Pisumsativum*), soja bean (*Soja hispada*), peanut (*Arachis hypogea*), sweet potato (*Ipomea durcis*), potato, cassava (*manihot esculanta*) and banana (*Musa*).

The importance of each crop varies according to regions. Some crops, like bananas, potatoes, different varieties of wheat, sorghums and beans are subject to high commercial trade. Potatoes, beans, cassava and bananas are present everywhere for the daily diet of the people. The cash crops are very few. They are limited to coffee, tea and pyrethrum.

4.4.4. Pastoral zones

In Rwanda, the essential part of animal husbandry is limited to the family and a small number of animals per household. As agriculture occupies the biggest portion of land, the cows graze in paddock, some parts of marginal lands and limited pasturelands mainly Gishwati national reserve and Umutara. This obliges farmers to adopt the semi-permanent farming and grow fodder crops such as *Tripsacum laxum*, *Setaria spp*, *Desmodeum spp*, *Pennisetum purpureum*, *Mucuna pruriensis*, *Cajanus cajan*, *Calliandra calothyrsis*, *Leucaena diverifolia*, *Sesbania sesban*, etc. However, we can notice the development of ranching in Umutara and Gishwati. Other pastoral land is very limited and distributed all over the country.

These areas are prone to bush fires, trampling and sometimes overgrazing. The latter is the main cause of reduction of the biological diversity as it exterminates the most precious species along with pyrophyle species with small bromatologic value such as *Eragrostis spp*, *Sporobolus spp* and *Digitaria spp*.

4.4.5. Woodlands

Tree planting in Rwanda was limited to some plants around households such as *Ficus thoningii*, *Euphorbia tirucalli*, *Erythrina abyssinica*, *Vernonia amygdalena*, *Dracaena afromontana*, etc., but the cultivation of woody perennials for timber, energy generation or other services was not part of the customs. That resulted in a massive exploitation that quickly proved its limits.

The first forest plantations were created in 1920 and 1948 and only consisted of *Eucalyptus*. Later on, other species were introduced. These were namely *Pinus spp*, *Callistris spp*, *Grevillea robusta*, *Cedrella spp*, *Cupressus*. The Arboretum of Ruhande (RAB Station) has 206 species among which 146 feuillus, 56 resinous and a species of bamboo. Those species proved to be dangerous for the biological patrimony because they used to drain and acidify places that are already acid, what caused the reduction or even the extermination of the undergrowth. Thus planting those species would lead to erosion. The covered surface area was estimated at 256,300 hectares in 1998. Despite efforts of diversifying tree species, we estimate that 99% of trees consisted of *Eucalyptus spp*.

4.5. Socio-economic Environment

4.5.1. Population and Demographic Characteristics

The 2012 census shows that the population of Rwanda has reached 10.5 million with a density of 416 inhabitants per km², which makes it the highest population density in Africa (RoR_MINECOFIN, 2012). In spite of this, the 2012 census shows that the annual population growth slowed from 3.2% in 2002 to 2.6% in 2011. Moreover, it shows that the population below 40 years of age living in rural areas has declined from 90% in 2002 to 83% in 2011 (RoR_MINECOFIN, 2012; see also Rwanda Statistical Yearbook, 2014).

Table 4: Evolution of Population Census (Rwanda statistical yearbook 2014)

Indicators	1978	1991	2002	2012
Population				
Total population (both sex)	4,831,527	7,157,551	8,128,553	10,515,973
Males	2,363,177	3,488,612	3,879,448	5,064,868
Females	2,468,350	3,668,939	4,249,105	5,451,105
Population density	183	272	321	416

Source: Rwanda Statistical Yearbook, 2014

The slowdown of annual population growth is the results of a number factors including the decline in the fertility rate from 6.00 in 2006 to 4.6 in 2011, increase number of use of married women using modern contraceptive methods for family planning, etc. (see table 3 below). The social indicators related to health have improved with life expectancy of 64.4 years in 2012 compared to 51.2 in 2002 (Rwanda statistical yearbook, 2014), and infant mortality of 107 per 1000 live births compared to 27 in 2000 (see table 3 below). The HIV/AIDS prevalence rate has declined from 13.7% in 2000 to 3% in 2012. Malaria has also considerably declined due to effective preventive measures including distribution of mosquito nets to the population at a rate of 82.70% in 2012 compared to 18.20% in 2006 (see Rwanda statistical yearbook 2014; RoR_MINECOFIN, 2012). As illustrated in the tables below so many other indicators show that health and socio-demographic conditions have generally improved in the recent years. The table 3 below gives details about health and demographic incidence of malaria and HIV.

Table 5: DHS Indicators from 1992 to 2012 (see Rwanda statistical yearbook, 2014)

Indicators	1992 (DHS-I)	2000 (DHS-II)	2005/06 (DHS-III)	2007/08 (IDHS)	2010/11 (DHS-IV)
Fertility					
Total fertility Rate (TFR)	6.20	5.80	6.00	5.50	4.60
Median age at first birth	-	-	22.00	22.30	22.40
Teenage fertility	11.00	7.00	4.10	5.70	6.10
Family planning					
The use of Modern Contraceptive Methods among Currently Married Women	13.00	4.00	10.00	27.00	45.10
Unmet need for family planning	-	17.70	37.90	-	18.90
Child Health					
Vaccination	86.00	76.00	75.00	80.40	90.10
Infant mortality rate (per 1,000 live births)	85.00	107.00	86.00	62.00	27.00
Child mortality rate	151.00	196.00	152.00	103.00	76.00
Underweight	29.00	24.00	23.00	-	11.00
Maternal health					
Maternal mortality rate (per 100,000)	-	1071.00	750.00	-	476.00
Assistance during delivery	25.00	26.00	28.00	45.20	69.00
Adolescent birth rate (% total live birth)	-	-	4.20	-	4.10
Antenatal care coverage (at least one visit)		92.50	94.40		98.00
Antenatal care coverage (at four visit)	-	10.40	13.30	-	35.40
Malaria					
Prevalence rate in children	-	-	-	-	1.40
Prevalence rate in women	-	-	-	-	0.70
Ownership Mosquito nets	-	-	18.20	59.10	82.70
HIV Prevalence rate	-	13.7	3.00	-	3.00

Source: Rwanda Statistical Yearbook, 2014

4.5.2. Literacy and Education Evolution

Socioeconomic conditions of Rwandan population have generally improved. The education and literacy for instance have considerably improved such a way that MDGs and EDPRS1 have been reached. The adult literacy increased from 52.40% in 2000 to 69.70% in 2011 and that of the youth reached 83.70%. Figures show that the access to primary and secondary schools is at a great level. The proportion of population that ever attended school has increased from 78.90% to 80.20% and the total number of net primary enrollment has reached 91.7%. In primary education, only 0.31% of increase was counted in student enrollment. In secondary education, the enrollment has doubled with 20.9% in 2011 compared to 10.2% in 2000 (see details in table 4 below).

Table 3: EICV Literacy and Education Indicators from PRSP1 to EDPRS1

EICV Indicators			
Indicators	2000/01	2005/06	2010/11
Literacy and Education			
Adult Literacy	52.40	65.30	69.70
Youth Literacy	-	76.90	83.70
% of individuals (6+ years) that have ever attended school	-	78.70	83.20
Gross Primary School Enrolment		100	148.4
%Girls in total enrolment		49.6	54.4
Net Primary Enrolment		73.3	91.7
Pupil/teacher ratio in primary schools		73.1	62.1
Gross Secondary School Enrolment		10.2	20.9
Higher Education: % girls in total enrolment	-	-	2.6

Source: Rwanda Statistical Yearbook, 2014

4.5.3 Economic Development Evolution

Despite the efforts in declining the on-farm activities by increasing off-farm income generating activities, the Gross Domestic Product of Rwanda is still dominated by the agricultural sector (RoR_MINECOFIN, 2012). The lowest Gross Domestic Product (GDP) per capita is estimated at 644 USD approximately equivalent to 463,700 FRW (see Rwanda Statistical Yearbook, 2014). The real growth of the GDP has increased from 6, 5% in 2006 to 8.2% in 2012 due to substantial improvement of varied socioeconomic activities. For instance, during the EDPRS 1, services sector grew at an average rate of 10 % per year, and the industrial sector grew at an average of 9.8% per year and contributed 20% of total growth, while the agriculture sector contributed 32.7% of GDP and 28% of total growth with an average of 5.4% (Ibid.). In the effort to reduce poverty and food insecurity countrywide, the government of Rwanda supported agriculture sector by using fertilizers and improved seeds, particularly maize, voluble beans, soya beans, wheat, rice, etc. For instance, from 2006 to 2011, use of fertilizers tripled in tonnage terms, and the share of marketed agricultural output increased from 21.5% to 26.9%. At the same time, the number of off-farm jobs increased by 50-60% (see RoR_MINECOFIN, 2012; see also Rwanda Statistical Yearbook, 2014).

Table 4: Economic Development Achievements

Priority area	Indicator	Baseline 2006	Target 2012	Actual 2011/12
Growth and poverty reduction	Real GDP growth (% annual)	6.5	8.1	8.2 (2008-12)
	Export growth (% annual)	10	15	25.1(2008-12)
	National investment (% of GDP)	16.3	24.4	22.5
	Share of population living in poverty (%)	57	46	44.9
	Share of population living in extreme poverty (%)	37	24	24.1
	Poverty incidence among people living in female-headed households (%)	60	48	47.0
	Employment in agriculture (% reporting as main occupation)	80	70	71.6
	Number of new jobs created	-	140,000	177,362
	Gini coefficient	0.52	0.49	0.49
Widen and strengthen the Financial Sector	Private Sector credit (% of GDP)	10	13.9	14.5
	Financial depth (broad money/GDP)	20	22.5	21.3
	% of currently working persons aged 16+ with usual work status of wage non-farm	10.90	-	16.90
	% of HHs with at least one savings account	18.90	-	39.40
Raise agricultural productivity and ensure food security	% of HHs with any plot affected by land consolidation		-	26.90
	Share of marketed agricultural output	21.50	-	26.90
	% of crop-producing HH purchasing fertilizer	18.00	-	38.00
	% of agricultural land protected against soil erosion	40	90	92.0
	Area under irrigation (hectares)	15,000	24,000	24,131
	Use of mineral fertilizer (MT)	14,000	47,600	46,000
	Livestock in intensive systems (%)	16	55	60
Land and Environment	Forestry coverage (%)	20	22.7	24.5
	Land titles issued	8,000	7 million	4.2 million
	Area of land protected to maintain biological diversity (%)	8	9.6	10.1
Build Infrastructure	Households with access to electricity (number of households)	70,000	270,000	308,326
	Electricity generation (off/on grid, MW)	45	120	110
	Classified national road network in good condition (%)	11	63	68
	ICT penetration rate (%)	26	40	44
Increase access to safe drinking water and sanitation	Access to safe drinking water (% of population)	64	83	74
	Access to hygienic sanitation	38	63	74.5
Strengthen governance, security and the rule of law	Share of population expressing satisfaction/confidence in decentralized governance (%)	85	100	68

Source: NISR_MINECOFIN, 2012 ; see also Rwanda Statistical Yearbook, 2014

4.5.4. Achievements and Challenges post EDPRS1

In spite of considerable growth in service, industrial and agricultural sectors during EDPRS1, Rwanda is facing a number of challenges. For instance, extreme poverty remains high and persistent in rural areas with 48.7% compared to 22.1% in urban areas, and female are the most affected in both areas (see EICV3 report); environmental degradation due to limited arable land in a densely populated country with 83% of rural population dependent on subsistence agriculture (RoR_MINECOFIN, 2012; Rwanda Statistical Yearbook, 2014).

4.5.5. Industry and Mining

The industrial sector of Rwanda is modest and recent: 78% of industrial companies were created between 1964 and 1987. In 2013, the contribution of the industry sector to the GDP was of 15% of which the major part was from the agro industry and the rest from small and medium size of companies which produce consumption goods in replacement of importation by using simple technologies. The mining has contributed only 2% of the GDP in 2013, (Statistic Yearbook, 2014).

One of the major problems is related to the location of industrial units as some of them are installed near residence houses, others in valleys (wetlands). These installations are sometimes sources of pollution because of their wastes, liquid (waste waters) or gaseous (dust, smoke, smell), and noise.

The mining policy covers not only mineral extraction, processing and export, but also quarrying, production of construction materials and extraction and processing of semi-precious stones. The mining sub-sector has registered some key achievements. It is one of the major sources of income to the country with revenue from minerals exportation. However, the exploitation of mines and quarries is often a source of water pollution due to contamination linked with the absence of wastewater purification, modern practices of exploitation and soil erosion.

4.5.6. Human settlements

The Rwandan settlement pattern has been scattered since time immemorial. It has for long been characterized by the traditional use of land associated with the ancestral lifestyle but which does not correspond any more to the present environmental and economic constraints. It is in that perspective that the present policy of the Government of Rwanda regarding settlement consists of encouraging a clustered habitat commonly known as «IMIDUGUDU».

In most urban areas, Rwanda has not yet developed city master plans. There are only plans of different towns of which some have expired and need updating. Urban centers developed spontaneously without taking environmental aspects into consideration.

Sanitary facilities are insufficient and sometimes inadequate in city centers. In suburban zones known as spontaneous quarters, solid wastes are piled in disorder, drinking water is rare, and rain water draining gutters are insufficient. Thus diseases are frequent in those areas, the degradation of environment is more pronounced and living conditions are poor.

City development should normally be based on urban planning documents like the “Urban management master plan (SDAU)”. Presently, only two centers have got that kind of document and the SDAU of Kigali and Rwamagana are under development. The policy of city development which is under finalization is aimed at supporting districts in their efforts to quickly get urban planning documents integrating environmental aspects.

4.5.7. Physical Cultural Resources

Rwanda’s physical cultural resource, seen from a general perspective, is rich and diversified. But it has, for long, been regarded as being a sector of minor importance, and, because of such consideration, failed to play its basic role of developing the nation.

However, there is no doubt physical cultural resource is one of the main pillars for sustainable development.

Rwanda's physical cultural heritage is rich and diversified; it contains:

- Sacred hills, forests and trees with legendary history;
- traditional huts and royal palace;
- churches and other colonial buildings;
- caves and rocks with bas-reliefs marking the legendary or historical events that have occurred on the site;
- thermal springs and wells used for ritual purposes;
- genocide memorial sites;
- designated burial sites which are located in different sectors

Protection and preservation of national cultural heritage consolidate national unity, social cohesion, cultural freedom and recognition of community identity.

Therefore, Government of Rwanda and its partners have the obligation to preserve and perpetuate this physical cultural heritage for present and future generations because, on the one hand, it brings in a lot of money as do agriculture, industry, gold or oil and, on the other, it maintains harmony and social balance between peoples. This implies, the project will undertake the Chance Finds Procedures in addressing possible encounters of any archaeological resources during project implementation.

4.5.8. Agriculture

The agriculture production system is based on small family exploitations whose production is consumed by the owners at more than 80 %. The systems of crops are complex, based on the diversification of productions and the association of crops. Seven main crops, namely banana, bean, sweet potato, cassava, sorghum and potatoes, of which the first five are present in 90 % of production units and constitute the common basis for all the regions of Rwanda.

Great investments in modern agriculture and research-based agriculture using fertilizers and improved seeds on consolidated lands, pumping irrigation on hillsides, etc., have allowed great productions of maize, soya beans, voluble beans, wheat, Irish potatoes and rice. This achievement results in MINAGRI's decision of putting in place specialized centers for policy implementation and research such as RADA, RARDA, RSSP, RAB, etc.

The recent survey has proved that the agriculture is the most important sector of the Rwandan economy and contributes considerably to poverty reduction. For instance, from 2011 to 2013 the total production of vegetables increased by 9% and their exports while fruits production increased by 18%. Their exports counted an increase from 15.4 ('000 Tons) in 2012 which generated 5,013,260 USD to 31.9 ('000 Tons) which generated 9,494,442 USD (see Rwanda Statistical Yearbook, 2014).

However, the extensive agriculture practiced by the majority of Rwandan population contributes to the degradation of environment. Moreover, the agricultural intensification at the level of projects was often realized without taking into account environmental drawbacks accrued from inputs like (mineral fertilizers, pesticides, herbicides and used techniques).

4.5.9. Animal husbandry

The pastures consisted mainly of family fallows and marginal lands considered as inappropriate to agriculture such as the undergrowth. The limited subsisting pastoral areas were badly used because farmers did not master the management of pastures. That was showed by the overgrazing and overexploitation caused by trampling, degradation and disappearance of vegetation cover. The MINAGRI policy of keeping cattle in shed known as “zero grazing” program has significantly limited environmental degradation and crops damage, which was also a source conflicts between neighbors.

Moreover, the demographic pressure has progressively led to the semi intensification or intensification of fodder resources used to feed animals. Hence, animal husbandry, essentially made of cattle, was progressively transformed. This resulted in considerable increase of milk production from 257,450 in 2008 to 628,266 tons in 2013 and beef meat production increased from 24,889 to 29,807 tons in 2013 (see Rwanda Statistical Yearbook, 2014).

Animal husbandry has also contributed to poverty reduction through a RARDA-MINAGRI program called “*One Cow per Every Poor household in Rwanda*”. This program has decreased the number of malnourished children countrywide and has considerably contributed to poor household food security.

4.5.1.1 Characteristics of Poverty

As we have seen earlier, the per capita income has significantly increased from 220 USD in 2000 to 664 USD in 2013. Based on the results of the in-country consultations with local communities, local and central governments and civil society members, during the preparation of this ESMF, the following characteristics of poverty were derived:

Who are the Poor?

- Rural households.
- Female headed households, other households with less than two adult-members, elderly and handicapped persons.
- Large households.
- Returning refugees from different countries and from DR Congo in particular.
- The historically marginalized communities.

Why are the poor?

Rural Households

- Low agricultural productivity, declining soil fertility and environmental degradation.
- Lack of access to land, land fragmentation, insecurity of land tenure.
- Poor agricultural extension services, lack of access to and knowledge of the use of improved inputs.
- Climatic hazards combined with geography
- Lack of modern technology to confront serious constraints to agricultural development.
- Lack of access to markets, absence of rural commercial activity and alternative income earning opportunities.
- Social and economic isolation due to high transport costs and insecurity.
- HIV/AIDS incidence, impacting negatively on productivity.
- Lack of access to low cost capital or micro-credit or micro-grants.

- Lack of access to affordable and sustainable household energy sources.

Female-headed households

- Shortage of household labor.
- Declining soil fertility
- Many women have to take care of husbands and sons in prison, dependant parents, orphans, handicapped husbands and children, returning refugees, and other dependents.
- Low education attainment, poor access to land, paid employment and credit
- Poor social services, e.g. water, health, education etc.

Urban Poor

- Rapid increase in urban population.
- No employment opportunities particularly among poorly educated young people.
- Poor basic social services and infrastructure.
- Lack of housing.
- Lack of land.
- High food prices due to low agricultural productivity, high transport costs and restrictions on petty trade.

4.6 Kigali City baseline information

Kigali City is the capital located in the heart of Rwanda and built on the hills and valleys. With some slopes of up to 50% and two rain seasons, the land is vulnerable to erosion and flooding. There are 25 watersheds within the city limits and valleys are fertile. Agriculture occupies the largest proportion of the land (60.5%), with built-up areas covering about 15%.

Since 2002, the City of Kigali has made a concerted effort to institute urban planning for sustainable development, guided by seven key initiatives: Millennium Development Goals (MDGs), Rwanda's Vision 2020, the Economic Development and Poverty Reduction Strategy (EDPRS I and II), the National Strategy for Climate Change and Low Carbon Development (NSCCLCD), the Integrated Household Living Conditions Survey (EICV), the City of Kigali Development Plan (CKDP) and the Kigali Conceptual Master Plan (KCMP).

Kigali City is home to 10.8% of Rwanda's total population and is one of the fastest-growing cities due to a high rate and high level of positive net migration. Between 1962 and 2012, its administrative boundaries grew from about 3 sq. km to 730 sq. km and its population increased from some 6,000 to more than one million people. The average male-to-female ratio is 106 to 100, and 73 per cent of its total population is under the age of 30.

Kigali generates 50 % of the country's Gross Domestic Product (GDP). It aims to become a middle-income economy by 2020 and to reduce poverty from 14.8% to below 10% within the next 5 years.

Land, Settlements and Infrastructure

Wetlands, water bodies, forests, steep hills and other natural constraints cover 50.3 % of the land area. By the mid-2000s, about 19 % of the city was built on high risk zone. In 2012, 83 % of the population lived in informal housing with limited access to facilities and poor living conditions. Since 2005, the City of Kigali has been curbing the spread of unplanned housing, relocating people into clustered settlements and improving living standards.

Granitic and meta-sedimentary rocks underlie the City of Kigali; these include schists, sandstones and siltstones. Lateritic soils, rich in iron and aluminium, dominate the city's hillside surfaces while alluvial soils (fertile soil deposited in river valleys) and organic soils are found in the lowlands and wetlands. Inappropriate development on Kigali's hilly slopes has caused extensive soil erosion in some areas.

Buildings on steep slopes, seasonal rainfall, inadequate drainage and construction in food prone zones have made parts of Kigali highly susceptible to flooding. The impacts of a changing climate could exacerbate the risks. Disaster management is becoming decentralised to help prevent such hazards.

Fifty-six per cent of households have electricity for lighting compared to the national average of 12%, while charcoal is surpassing wood as the primary source of cooking fuel, serving 51 per cent of households. Modernising energy provision will help reduce respiratory disease, deforestation and contributing to anticipate, mitigate and help to adapt on Climate change.

Land use of Kigali is forest covers an area of only about 77 sq. km (10.6 %). Urban development and farming activities, including zero-grazing and commercial dairy and subsistence farming systems, have left only small, scattered patches of forest and other areas of natural vegetation. Tree-planting schemes have reforested some areas, which are dominated by Eucalyptus plantations for agro-forestry purposes. The loss and degradation of these natural habitats has contributed to the loss of biodiversity.

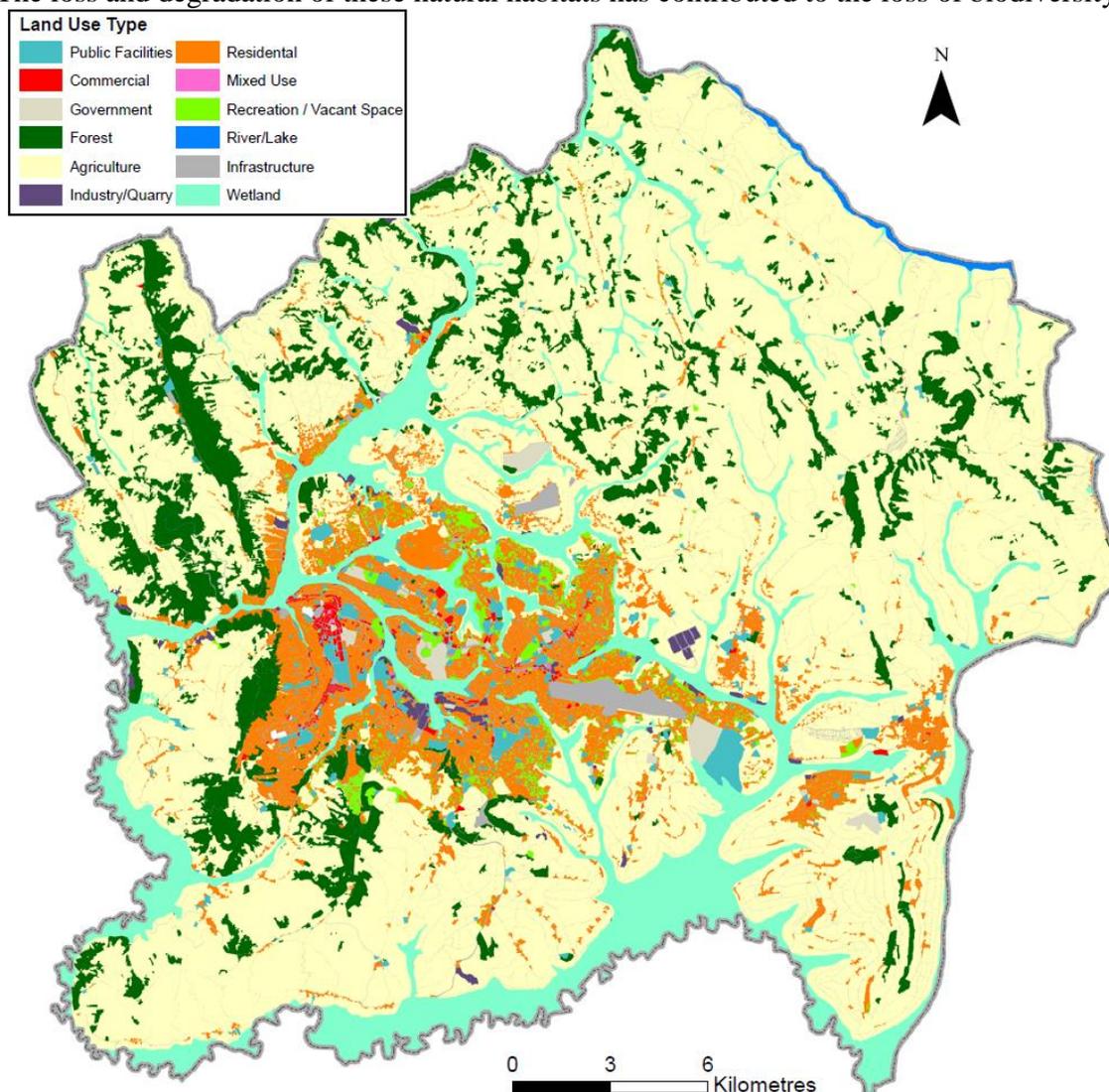


Figure 4: Kigali land use, 2014

5.0 POLICIES, LEGAL AND INSTITUTIONAL FRAMEWORK

This chapter of the report describes the institutional, legal and policy framework for environmental and social requirements in Rwanda, the relevant World Bank safeguard operational policies applicable to the project as well as the international laws and conventions that bear relevance to the implementation of this project.

5.1. International Legal Framework

Rwanda has ratified and signed a number of international conventions and protocols on or related to environment and has taken further steps to confirm his commitment in the area of environmental and natural resources management. Rwanda is an active participant in major international multilateral conventions relating to environmental governance, most notably the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), the Convention to Combat Desertification and Drought (UNCDD) and the international policy framework such as the MDG.

Table 6: International conventions and protocols

Conventions and Treaties	Date of signature	Approved by law and date signed/ratified by GoR
International convention on biological diversity and its habitat signed in RIO DE JANEIRO in BRAZIL	June 5 th , 1992	Presidential Order N ^o 017/01 of March 18 th , 1995
United Nations framework convention on climate change signed in RIO DE JANEIRO in BRAZIL	June 5 th , 1992	Presidential Order N ^o 021/01 of May 30 th , 1995
STOCKHOLM convention on persistent organic pollutants	May 22 nd , 2001	Presidential Order No 78/01 of July 8 th , 2002
BASEL convention on the control of trans-boundary movements of hazardous wastes and their disposal	May 22 nd , 1989	Presidential Order No 29/01 of August 24 th , 2003
ROTTERDAM international convention on the establishment of international procedures agreed by states on commercial transactions of agricultural pesticides and other poisonous products	September 11 th , 1998	Presidential Order No 28/01 of August 24 th , 2003
MONTREAL international convention on substances that deplete the ozone layer	1997	Presidential Order No 30/01 of August 24 th , 2003
CARTAGENA protocol on biosafety to the convention of biological biodiversity signed in NAIROBI and NEW YORK	Nairobi May 15 th to 26 th , 2000 and New York from June 5 th , 2000 to June 4 th , 2001	Law No38/2003 of December 29 th , 2003
KYOTO protocol to the framework convention on climate change	March 6 th , 1998	Law No 36/2003 of December 29 th , 2003
RAMSAR international convention on wetlands of international importance, especially as waterfowl habitats	February 2 nd , 1971	Law No 37/2003 of December 29 th , 2003
BONN convention on conservation of migratory species of wild animals	June 23 rd , 1979	Law No 35/2003 of December 29 th , 2003
Washington agreement on international trade in endangered	March 3 rd , 1973	Presidential Order No 211

species of wild flora and fauna		of June 25 th , 1980
African Agreement on the Nature Conservation and Natural Resources	15/09/1968	20/05/1975

5.2 Description of World Bank environmental and social safeguards policies and triggers

This ESMF has been designed so that all investments under the RESSP will comply with the relevant laws of Rwanda and the Environmental and Social Safeguard Policies of the World Bank. In this chapter, the Bank's safeguards policies and their applicability are discussed. The World Bank Safeguard Policies are;

1. Environmental Assessment (OP4.01, BP 4.01, GP 4.01)
2. Natural Habitats (OP 4.04, BP 4.04, GP 4.04)
3. Forestry (OP 4.36, GP 4.36)
4. Pest Management (OP 4.09)
5. Cultural Property (OPN 11.03)
6. Indigenous Peoples (OD 4.20)
7. Involuntary Resettlement (OP/BP 4.12)
8. Safety of Dams (OP 4.37, BP 4.37)
9. Projects on International Waters (OP 7.50, BP 7.50, GP 7.50)
10. Projects in Disputed Areas (OP 7.60, BP 7.60, GP 7.60)

In preparing this ESMF, a consideration of the type of future investments planned vis-à-vis the baseline data presented in Chapter 4 and the requirements of the Bank Safeguard policies, has led to the determination that only the following Bank policies are triggered.

1. Environmental Assessment (OP4.01, BP 4.01, GP 4.01)
2. Involuntary Resettlement (OP/BP 4.12)
3. Physical Cultural Resources (OP/BP 4.11)

Notwithstanding, since the exact location of the investments is not known at the time of preparation of the RESSP, other bank policies may apply and not all policies selected above may apply simultaneously.

A complete description of the bank safeguards and their triggers for applicability can be used as part of the Environmental and Social Management process presented in chapter 7 of this ESMF.

5.2.1 Environmental Assessment (OP4.01, BP 4.01, GP 4.01)

This policy requires Environmental Assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making. The EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed investments under the RESSP. The EA process takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property) and transboundary and global environmental aspects.

The environmental and social impacts of the RESSP will come from the proposed investment activities under Components a) and b). However, since the exact location of these investments will not be identified before bank appraisal of the project, the EA process calls for the GoR to prepare an Environmental and Social Management Framework (ESMF).

This report which will establish a mechanism to determine and assess future potential environmental and social impacts during implementation of RESSP activities, and then to set out mitigation, monitoring and institutional measures to be taken during operations of these activities, to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels.

Operational Policy 4.01 further requires that the ESMF report must be disclosed as a separate and stand alone document by the Government of Rwanda and the World Bank as a condition for bank appraisal. The disclosure should be both in Rwanda where it can be accessed by the general public and local communities and at the Infoshop of the World Bank and the date for disclosure must precede the date for appraisal of the program.

The policy further calls for the RESSP as a whole to be environmentally screened to determine the extent and type of the EA process.

The World Bank system assigns a project to one of three project categories, as defined below:

Category “A” Projects

An EIA is always required for projects that are in this category. Impacts are expected to be ‘adverse, sensitive, irreversible and diverse with attributes such as pollutant discharges large enough to cause degradation of air, water, or soil; large-scale physical disturbance of the site or surroundings; extraction, consumption or conversion of substantial amounts of forests and other natural resources; measurable modification of hydrological cycles; use of hazardous materials in more than incidental quantities; and involuntary displacement of people and other significant social disturbances.

Category “B” Projects

Although an EIA is not always required, some environmental analysis is necessary. Category B projects have impacts that are ‘less significant, not as sensitive, numerous, major or diverse. Few, if any, impacts are irreversible, and remedial measures can be more easily designed.’ Typical projects include rehabilitation, maintenance, or upgrades, rather than new construction.

Category “C” Projects

No EIA or other analysis is required. Category C projects result in negligible or minimal direct disturbance of the physical environment. Typical projects include education, family planning, health, and human resource development.

The RESSP has thus been screened and assigned an EA Category B. This category of projects is defined as follows.

Category B projects are likely to have potential adverse environmental impacts on human populations or environmentally important areas – including wetlands, forests, grasslands, and other natural habitats – and are less adverse than those of category A projects. These impacts are site specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. The EA process for category B projects examines the potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

Therefore, this ESMF sets out to establish the EA process to be undertaken for implementation of project activities in the proposed RESSP when they are being identified and implemented.

This process requires that RESSP and its implementing partners screen their activities to identify their potential adverse impacts and thereby determine the corresponding mitigation measures to incorporate into their planned activities.

5.2.2. Operational Policy 4.12: Involuntary Resettlement

This policy covers direct economic and social impacts that both result from Bank-assisted investment projects, and are caused by (a) the involuntary taking of land resulting in (i) relocation or loss of shelter; (ii) loss of assets or access to assets, or (iii) loss of income sources or means of livelihood, whether or not the affected persons must move to another location; or (b) the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons. For project activities that impact people and livelihoods in this way, RESSP will have to comply with the requirements of the disclosed RPF to comply with this policy.

This policy is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts.

The policy promotes participation of displaced people in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement.

The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to project appraisal of proposed projects. The objective of this policy to avoid where feasible, or minimize, exploring all viable alternative project designs, to avoid resettlement.

This policy covers direct economic and social impacts that both result from Bank-assisted investment projects, and are caused by the involuntary taking of land resulting in relocation or loss of shelter, lost of assets or access to assets, or loss of income sources or means of livelihood. This applies whether or not the affected persons must move to another location; or the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.

The policy requires the displaced persons and their communities, and any host communities receiving them, are provided timely and relevant information, consulted on resettlement options, and offered opportunities to participate in planning, implementing, and monitoring resettlement. Appropriate and accessible grievance mechanisms are established for these groups. In new resettlement sites or host communities, infrastructure and public services are provided as necessary to improve, restore, or maintain accessibility and levels of service for the displaced persons and host communities. Alternative or similar resources are provided to compensate for the loss of access to community resources (such as fishing areas, grazing areas, fuel, or fodder).

5.2.3 Operation policy 4.11: Physical Cultural Properties

This policy addresses physical cultural resources, which are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance.

Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices.

The policy aims to ensure that Physical Cultural Resources (PCR) are identified and protected in World Bank financed projects, and national laws governing the protection of physical, cultural property are complied with. The policy is implemented as an element of the Environmental Assessment. The component a "Grid rollout" implies the construction of the transmission and distribution lines and substation sites may be acquired from sites with physical cultural resources hence OP 4.11 may be triggered.

Physical Cultural properties which may be affected are normally not fully known during project preparation, but some transmission lines, substation and access road works may be located in the influence area of some sites. Graves for instance, could be located along transmission lines project sites. Construction and rehabilitation operations may require borrow pit excavations or some limited movements of earth. Such activities may have potential impacts on previously unidentified physical cultural resources through chance finds of an archaeological nature. This policy requires that whenever physical cultural resources are encountered an investigation and inventory of cultural resources potentially affected need to be carried out. Mitigation measures need to be included where there are adverse impacts on physical cultural resources.

Though the level of impacts on PCRs cannot be ascertained with certainty, the project may impact on some PCRs and an Annex 4 addressing Chance Find Procedures has been prepared to cater for possible trigger of this safeguard policy in the proposed project. The environmental and social screening tool will include the identification of chance finds. The project will be reviewed for potential impact on physical cultural property and clear procedures will be required for identification, protection of cultural property from theft, and treatment of discovered artefacts will be included in standard bidding documents. While not damaging cultural property, sub-project preparation may identify and include assistance for preservation of historic or archaeological sites.

Table 7: Summary of World Bank Safeguards Policies

Safeguard policy	Description
OP 4.01 Environmental Assessment	EA to be conducted for all projects that fall into either World Bank Category A or Category B. These categories are equivalent to Government of Rwanda's Schedule 1 and 2 projects.
OP 4.36 Forestry	The Bank's lending operations in the forest sector are conditional on government commitment to undertake sustainable management and conservation-oriented forestry. In forestry areas of high ecological value, the Bank finances only preservation and light, non-extractive use of forest areas.
OP 4.04 natural Habitat	The conservation of natural habitat is essential for long-term sustainable development. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resources management to ensure opportunities for environmentally sustainable development. The Bank does not support projects that involve the significant conservation or degradation of critical natural habitats.
OP 4.09 Pest Management	In Bank- Financing operations, pest populations are normally controlled through IPM approaches, such as biological control, cultural practices, and the development and use of crop varieties resistant or tolerant to the pest. The Bank may Finance the purchase of pesticides when their use is justified under an IPM approach.
OP/BP/GP 4.12 Involuntary Resettlement	People who have to be removed or who lose their livelihood as a result of the project must be resettled, compensated for all of their losses and they must be provided with a situation that is at least as good as the one from which they came.
OP 4.20 Indigenous Peoples	This policy covers local indigenous people or distinct groups who are marginalized in society and who could be adversely affected by the project. The Bank does not support projects that negatively affect these peoples.
OP 4.11 Cultural Property	Bank supports the preservation of cultural properties which includes sites with archeological, paleontological, historical, religious or unique natural values. It seeks to avoid impacts on such sites.
Op 4.37 Dam Safety	Bank financed new dams must be designed and built under the supervision of competent professionals. Dams over 15 metres in height are of concern particularly if there is a large flood handling requirement or the dam is in a zone of high seismicity and /or where foundations and other design features are complex.
OP BP 7.0 International Waterways	If a project has the potential to negatively affect the quality or Quantity of water of a waterway shared with other nations the Bank will insist that a negotiated agreement be established between the two or more nations involved. Irrigation , drainage, water and sewage, industrial and similar projects that involve the use or potential pollution of international waterways (rivers, canals, lakes or similar bodies of water)
OP 7.60 Disputed areas	Projects in disputed areas could affect relations between the country within which the project is being developed and neighboring countries. Disputes would be dealt with at the earliest opportunity.

Table 8: RESSP Activities Triggering World Bank Safeguard Policies

Policy	RESSP	Discussion
Environmental Assessment (OP 4.01, BP4.01, GP 4.01)	Yes	The project component will trigger EA safeguards. The construction of the distribution networks and the disposal of the CFLs is all likely to pose an adverse impact on the biophysical environment.
Involuntary Resettlement (OP4.12, BP 4.12)	Yes	<p>OP 4.12 is to be complied with where involuntary resettlement may take place.</p> <p>The types of projects which are likely to trigger the involuntary resettlement safeguards include:</p> <p>Category B projects such as those that result in restricted access to land. The safeguards require that involuntary resettlement should be avoided through exploration all viable alternative projects designs where feasible, or similarly minimized. Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits.</p> <p>Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.</p>
OP 4.11 Physical Cultural Properties	yes	<p>The component B may implicate on the safeguard. Activities such as construction of transmission lines, substation and access road.</p> <p>The policy is triggered in case cultural artifacts are unexpectedly found during implementation of works. The policy requires for an investigation, inventory and mitigation measures to be put in place for cultural resources potentially affected.</p> <p>ESMF has provided Chance Finds Procedures for management of Cultural resources in the project.</p>

5.3. National Legal, Regulatory and Policy Framework

5.3.1 Constitution of Rwanda

The constitution states that all citizens have the right of equal access to public service in accordance with their competence and abilities. In the Constitution of the Republic of Rwanda of June 4th, 2003 as amended to date, article 49 states that every citizen is entitled to a healthy and satisfying environment. The law determines the modalities for protecting, safeguarding and promoting the environment. Different policies and laws from the constitution, the Vision 2020, the PRSP and EDPRS and the National Decentralization Policy (the “Decentralization”) take into account environmental aspects and are in accordance with international policy framework mentioned in earlier section (5.1)

The laws and regulations of Rwanda and their pertaining policies were reviewed to identify those relevant to the proposed development. These are Environmental Organic Law; The law governing Land; Energy Law; Law governing electricity; Forest law and Wetland Law.

5.3.2. Environmental Organic Law N° 04/2005

The law sets out the general legal framework for environment protection and management in Rwanda. The law determines the modalities of protecting, conserving and promoting the environment. Chapter IV of the Organic Law Article 67 clearly calls for the need to subject projects to mandatory Environmental Impact Assessment (EIA). Article 65 further specifies that every project shall be subjected to EIA prior to its commencement. Strategic Environmental Assessment (SEA) shall be subjected for programs, plans and policies (PPP) before obtaining authorization for implementation. It thus implies that environmental assessment would have a broader scope than the project-based EIA and provides a legal provision for a SEA instrument. Specific details of projects referred to in this Article are spelt out by the order of the Minister in charge of environment (**Laws N° 003/2008** and **N°004/2008** of August 15th, 2008). EIA shall be carried out at the expense of the promoter.

Article 70 states that the Ministerial order establishes the list of projects for which the public administration shall not warrant any authorization without an EIA describing direct and indirect consequences of the project to the environment.

5.3.2. Organic Law governing land in Rwanda N° 03/2013

Article 3 of this law stipulates that land is part of the public domain of all Rwandans; ancestors, present and future generations. With exceptions of the rights given to people, the state has supreme powers to manage all the national land. This is done in the public interest aimed at sustainable, economic development and social welfare, in accordance with procedures provided for by law. In that regard, it is the state that guarantees the right to own and use the land. The state also has rights to expropriation due to public interest, settlement and general land management through procedures provided by law and after appropriate compensation.

Article 4 requires that any person or association with legal personality has the right over the land and to freely exploit it as provided for by this organic law in Articles 5 and 6. Any discrimination either based on sex or origin in matters relating to ownership or possession of rights over the land is prohibited. The wife and the husband have equal rights over the land.

Under Article 7, the rights over the land acquired from custom and the rights acquired from written law are equally protected. According to the law, all owners of land acquired from custom (persons who inherited the land from their parents), those who acquired it from competent authorities or those who acquired it through any other means recognized by national custom whether purchase, gift or exchange have rights over the land.

Land ownership is divided into the following categories: individual owned lands and State lands (whether urban or rural). Individual land is comprised of land acquired through custom, written law, acquisition from competent authorities, purchase, gift, exchange and sharing (Article 11).

Land in Rwanda is categorized into two categories: individual Land and public land (Articles 12 and 13). The later is subdivided into two categories: the state land in the public domain and the state land in the private domain. State land in the public domain includes national land reserves for environment conservation; land over which administration building are erected, state roads, and land containing lakes, rivers, stream and springs. State land in the private domain includes swamps that may be productive in terms of agriculture, vacant land with no owner, land purchased by the state, donations, land acquired through expropriation and land occupied by state-owned forests.

5.3.3. Law Governing Electricity N° 21/2011

Rwanda's draft Electricity law was enacted into law in June 2011 and gazetted in July 2011. The law on electricity governs the activities of electricity power production, transmission, distribution and trading both within and outside the national territory of Rwanda.

The primary objectives of the law are:

- Liberalization and Regulation of electricity sector;
- Harmonious development of power supply for all population categories and for all the country's economic and social development sectors in the framework of laws in force.
- Setting up economic conditions enabling electric power sector investments.
- Respect for the conditions of fair and loyal competition and for the rights of users and operators

The Electricity law gives the Ministry in charge of electricity the rights to provide concession Agreements to firms and provides the legal basis for the Rwanda Utility Agency (RURA) to approve and grant licence holders. Article 7 and 8 state that any activity of production, transmission, distribution, and trading of electric power within and outside the national territory of the Republic of Rwanda shall be subject to a license issued by RURA and the latter shall ensure, prior to the issuance of a license, that the concerned individual or institution shall respect the rights of users and environment protection.

The law specifies that the electricity market of Rwanda shall be a single market base on free and open third party access to the transmission and distribution networks based upon the principles of regulated access to ensure a transparent and non-discriminatory market place.

The Electricity law authorizes the insurance of an International Trade Licence for the import and export of electric power across the borders of Rwanda and for the supply and sale to eligible customers in conformance with sector policies and other laws in force.

5.3.3. Expropriation Law N°18/2007

The law determines the modalities and the procedures relating to expropriation in the public interest. It states that only the Government shall carry out expropriation. Expropriation as provided for in this law shall be carried out only in the public interest and with prior and just compensation. Every project, at any level, which intends to carry out acts of expropriation in the public interest, shall provide funds for inventory of assets of the person to be expropriated and for just compensation on its budget.

Article 3 stipulates that expropriation can only be carried out by Government and only in the public interest and with prior fair and just compensation. Underground or surface activity may be carried out with a public interest aim, on land belonging to a person. No landowner is permitted to oppose such activity. In the event that the activity causes any loss to the landowner, he shall receive fair and just compensation for it.

Article 12 stipulates that the relevant Land Commission, after receiving the request for expropriation, shall examine the basis of that project proposal. In case it approves the basis of the project proposal, the relevant Land Commission shall request, in writing, the District authorities concerned to convene a consultative meeting of the population where the land is located, at least within a period of thirty (30) days after receipt of the application for expropriation, and indicating the date, time and the venue where the meeting is to be held. The relevant Land Commission shall take a decision within a period of at least fifteen (15) days after the consultative meeting with the population.

Article 17 stipulates that a person or representatives to be expropriated shall be informed in the presence of representatives of the local administrative entities of the beginning of the process of the land survey and the inventory of the properties thereon. The owner of the land is not allowed to carry out any activities after the land survey and the inventory of the properties. In case the beneficiary carries out any activities, they shall not be valued in the process of expropriation. In case the owner of the activity who was informed through procedures provided by this law does not appear, a report shall be made and signed by the representatives of the local administrative entities as well as those who conducted the survey and the inventory.

Article 18 stipulates that the person who owns land intended for public interest shall provide evidence of ownership of the land and certificate of acknowledgment of the members of his/her family. The evidence shall specify in which conditions the land was acquired and shall include a document or statement of local administrative entities indicating rights of the expropriated person on the land; a document of witnesses; or a Court certificate. The person who occupied reserved land after the publication of relevant laws shall not be entitled to any compensation.

According to Article 21, the properties to be valued for just compensation due to expropriation include land and activities that were carried out on the land including different crops, forests, any buildings or any other activity aimed at efficient use of land or its productivity. The value of land and the activities thereon that belong to the person expropriated shall be calculated considering their size, nature and location and considering the prevailing market prices.

Article 23 provides that through agreement between the person to expropriate and the one to be expropriated, the just and fair compensation may be monetary or an alternative land and a building equivalent to the determination of just monetary compensation. In order for the expropriation to be implemented, the just compensation shall be awarded to the expropriated person before he or she relocates.

Article 24 stipulates that the timeframe for compensation shall not exceed one hundred and twenty (120) days from the day of approval of the compensation. Subsequent to receiving just compensation, the expropriated person has a period that does not exceed ninety (90) days, in order to relocate or to cultivate and harvest crops within that period. Forceful relocation is permitted where a person receives an award and refuses to relocate. Competent authorities shall supervise such relocation. In case the expropriator does not pay the agreed just compensation on time as provided by Article 24, he or she shall pay an annual interest on delays of 5% in addition to the just compensation agreed or awarded to the expropriated person. Such a period shall not exceed two (2) years.

According to Article 25, compensation payment transactions shall be made through banks or any financial institution recognised by law and of his or her own choice in the country. In case of compensation, rights on the property as a family or as a legally married spouse shall be applied and the money shall be deposited on a joint account and any withdraw shall be done with consent of account owners.

5.3.4. Vision 2020 and EDPRS 2

Vision 2020 ensures social and economic transformation while addressing environmental and natural resource management. Environment protection and management rank among the main pillars of vision 2020. To this effect, every individual including the corporate world should make efforts in ventures that will bring sound development aimed at improving Rwanda's per capital GDP.

In the EDPRS 2, infrastructure and energy sector plays a crucial role. Although national development is desired, any such development should be done in a sustainable manner as provided for in Rwanda's Environmental Policy. The Strategy highlights the environment priorities as major issues and has made efforts to focus on the environment and all key sectors that have at least one environmental indicator among their key performance indicators.

By 2020, the Government intends to have built a nation where pressure on natural resources mainly lands, water, biomass; biodiversity will have reasonably been decreased and the pollution process and environmental degradation reversed. As such, it acknowledges the interdependencies and complementarities between different policies and developments.

Table 9: Relevant policies for RESSP subprojects

Policy	Relevant institution/Date of adoption	Key areas
National environmental policy	MINIRENA, REMA, NOVEMBER 2003	The overall objective is the improvement of people's wellbeing, the judicious utilisation of natural resources and the protection and rational management of ecosystems for sustainable and fair development. Sets out specific objectives as well as fundamental principles for improved management of environment, both at the central and local level, in accordance with the country's current policy of decentralisation and good governance. Integrates environment aspects in all development policies, programmes and planning for all works, activities and projects at national, district and local levels with good public participation assuming an informed population.
National energy policy and strategy	MININFRA, REG 2011	Creates conditions for the provision of sufficient, safe, reliable, efficient, cost-effective and environmentally appropriate energy services to households and to all economic sectors on a sustainable basis. The objectives are to support national development through: a) Ensuring the availability of sufficient, reliable and affordable energy supplies for all Rwandans; b) Promoting the rational and efficient use of energy; c) Establishing environmentally sound and sustainable systems of energy production, procurement, transportation, distribution and end-use.
National land policy, February, 2004	MINIRENA, RNRA, 2004	Puts emphasis on appropriate land administration systems as a key element of land tenure security by providing the possibility of registering and transferring land and also the possibility of investment in land. Highlights key principles of appropriate land use and land management.
National Forest policy	MINIRENA, RNRA, 2010	Established Provincial Forest Commission to promote and oversee forestry activities, which meet, on a sustainable basis, the population's needs for wood and other forest products and services. The main targets are forest cover to comprise at least 30 % of the national territory and to have at least 85 % of farmland under agro-forestry by 2020.
Ministerial instructions implementing the law on forestry	MINIRENA, RNRA, 2010	Puts emphasis on instructions ensuring the proper management and protection of forest resources. It highlights 14 key guiding instructions including: Promotion of afforestation and forest protection programs, roadsides trees plantation, trees plantation on lake and rivers banks as well as wetlands, establishment of villages' forest, establishment of schools' forest, promotion of agro forestry systems, forest resources harvesting guidelines (for government/community forest, district forest and private forest), non replacement of forest by any other activity, forest resources transport authorization guidelines and it provides also penalties for any abuse of forest related policies and law.
National policy of decentralization	MINALOC, 2006	Recreated Districts, sectors and cells to include environmental and land officers within the District organigram to help with planning and coordination of environmental and land management activities at District level.

5.4. Project Institutional and Implementation Arrangements

The sector oversight and management is primary responsibilities of three institutions are the Ministry of Infrastructure (MININFRA), the Rwanda Utilities Regulatory Authority (RURA) and The Rwanda Energy Group (REG).

5.4.1. Ministry of Infrastructure

The main institutions in electricity supply for Rwanda is the Ministry of Infrastructures (MININFRA). MININFRA is responsible for policy development, advisory and monitoring. It is responsible for setting overall policy and strategy of the energy sector, and for coordinating the developments of the electricity sub-sector. MININFRA ensures the infrastructures developments that protect fragile ecosystems where development projects may destroy natural habitat are being implemented. Besides organizing human settlement, MININFRA has the mandate for town planning, public infrastructure and transport; the management of water supply as well as actions to encourage water harvesting in the settlement and housing sector. It also ensures the proper use, management and rehabilitation of all public infrastructures and other related.

5.4.2 Rwanda Utilities Regulatory Authority

Rwanda Utilities Regulatory Authority (RURA) is a national institution established by the Law N°39/2001 of 13/09/2001 for the Regulation of Certain Public Utilities including energy sector.

RURA has a legal personality and autonomy in the management of its finances, assets and employees and has its own official seal and Regulates;

RURA has a legal personality and autonomy in the management of its finances, assets and employees and has its own official seal and Regulates;

The public utilities regulated by RURA are Energy, Telecommunications, Water and Sanitation, and Transport.

The Legal Mandate under Energy

1. Ensure energy service provision throughout the country is meeting the demand;
2. To ensure that licensees have adequate means to finance their activities;
3. To promote the interest of users and potential users of services through effective competition;
4. Ensure Consumer protection;
5. Facilitate and encourage private sector participation in investments by setting up conditions enabling electric power investments;
6. Ensure compliance by public utilities with the laws;

5.4.3. Rwanda Energy Group (REG)

The Rwanda Energy Group Limited (REG Limited) and its two subsidiaries; The Energy Utility Corporation Limited (EUCL) and The Energy Development Corporation Limited (EDCL) entrusted with energy development and utility service delivery. The Rwanda Energy Group Limited was incorporated to expand, maintain and operate the energy infrastructure in the country through its two subsidiaries the Energy Utility Corporation Limited (EUCL) which is the implementing entity and the Energy Development Corporation Limited (EDCL).

It has to ensure focused attention to enhancing efficiency in utility operations on one hand and ensure more timely and cost efficient implementation of development projects on the other. Moreover, the REG holding structure provides the overall coordination and ensures effective development of energy and investment plans. REG ensures the effective implementation of Government policies, monitoring the execution of strategic plans; improvement of service delivery and effective project execution by the subsidiaries. It also plays a coordination role to ensure the smooth interrelationships of the two subsidiaries.

The REG holding company plays an interfacing role between government policies enforcement and subsidiary companies' sustainable management. REG's key role is to ensure timely execution of the actions under the National Strategic Plan by the subsidiary companies while at the same time ensuring that the government provides appropriate economic resources to each subsidiary.

Energy Development Corporation Limited

The Energy Development Corporation Limited (EDCL) was incorporated to have devoted attention to increasing investment in development of new energy generation projects in a timely and cost efficient manner to expand supply in line with EDPRS and other national targets. It has also to develop appropriate transmission infrastructure to evacuate new plants and deliver energy to relevant distribution nodes. Planning and execution of energy access projects to meet the national access targets is at its central point of attention. This ring-fenced approach to development is designed to enhance accountability of development resources with the various stakeholders while at the same time opening space for increased private sector participation.

The Energy Utility Corporation Limited

The Energy Utility Corporation Limited (EUCL) is the implementing entity of the RESSP. It was incorporated to have devoted attention in providing energy utility services in the Country through operations and maintenance of existing generation plants, transmission and distribution network and retail of electricity to end-users. The EUCL has to ensure the following as part of ensuring the proper running and development of the energy sector and related initiatives:

- Optimized generation capacity and economic plant dispatch to meet short and long-term energy supply requirements,
- Enhanced operational efficiency (progressive system loss reduction, billing and collection efficiency, network reliability and high quality of service),
- Improved customer service, and
- Network growth and increased connections within the footprint of electrified areas thereby making an effective contribution to the EDPRS targets.

The Company has four main processes feeding into the core business; Policies planning, Marketing planning and development, Distribution planning and development within already electrified areas and Operation & Maintenance of Power Plants and Transmission & Distribution Networks owned by the Utility. The utility will also play a key role in the execution of Power Purchase/Power Sales Agreements with IPPS and other regional utilities for import and export.

5.4.4. Rwanda Housing Authority

Rwanda Housing Authority agency under the ministry of infrastructure, legally established in order to organize the construction industry as a whole and by doing so to spur Economic Development and Poverty Reduction which guide Rwanda's medium-term development. Rwanda Housing Authority has to ensure the implementation the National Housing, Urbanization, construction and Government Assets management policies through coordination, conception, development, monitoring and evaluation of actions and programs set out in its mission.

Its specific objective is to ensure adequate institutional, legal and regulatory framework (including capacity building), increase the volume of infrastructure and equipment, ensure quality of services, minimize and stabilize costs, increase accessibility, ensure continuity/durability, and ensure safety in housing infrastructure for its user/beneficiaries. Majors of its functions which are regulate the housing, legislation, construction, urban development industries and management of government assets both fixed and non fixed assets and also to develop a reliable database that encompass land use/management ,housing and construction.

The Rwanda Housing Authority developed Urban Planning Code and Rwanda Building that provides urban planning principles that include criteria of defining urban centers, basic public infrastructures, objectives and requirements of site development and land subdivision, plot restructuring and re-plotting, plot development parameters based on zoning principles, categorization of urban land use, neighborhood design principles, traffic circulation principles, etc. These guide the setting of electricity networks in order to ensure the effective use of energy resources available in Rwanda and sustainably use available resources urban and rural areas electrification.

5.4.5. Ministry of Natural Resources

Ministry of Natural Resources (MINIRENA) is responsible for addressing issues of policy, in particular through Ministerial orders and/or orders that set out laws and procedures for the administration, planning and allocation of land. It governs the implementation and application of organic law and land use master plan. It puts in place mechanism for the sustainable management of natural resources in conformity with the national priorities set by the national development pillars (Vision 2020, EDPRS II, MDGs).

5.4.6. Rwanda Natural Resources Authority (RNRA)

RNRA is an authority that leads the management of promotion of natural resources which is composed of land, water, forests, mines and geology departments. It is entrusted with supervision, monitoring and to ensure the implementation of issues relating to the promotion and protection of natural resources in programs and activities of all national institutions. It is particularly responsible for the enforcement of all national laws and international conventions/treaties ratifies Rwanda on matters related to the conservation of natural resources. Its mandate also goes to the government technical advisory in different matters related to natural resources sustainable use and ensuring good collaborations with stakeholders in natural resources at all levels. It plays also a valuable role in natural resources inventories, registration and records keeping for their proper uses and planning.

5.4.7. Rwanda Environmental Management Authority (REMA)

REMA is non-sectorial institution mandated to facilitate coordination and oversight of the implementation of national environmental policy and the subsequent legislation. REMA has a key role to play towards the achievement of the national goal of sustainable development as set in out in the National Development Vision 2020. The alarming rate of environmental destruction as a result of population pressure, serious erosion, pressure on natural resources, massive deforestation, pollution in its various forms etc. necessitated the Government, to form REMA to coordinate, supervise and regulate environmental management for sustainable development in Rwanda. With regards to the management of the bio-physical environment throughout Rwanda, the overall responsibility now lies with the Rwanda Environment Management Authority. In November 2003, the Government of Rwanda approved the law establishing the Rwanda Environment Management Authority (REMA).

REMA is also tasked to coordinate different environmental protection activities undertaken by environmental promotion agencies; to promote the integration of environmental issues in development policies, projects, plans and programmes; to coordinate implementation of Government policies and ensure the integration of environmental issues in national planning among concerned departments and institutions within the Government; to advise the Government with regard to the legislation and other measures relating to environmental management or implementation of conventions, treaties and international agreements relevant to the field of environment as and when necessary; to make proposals to the Government in the field of environmental policies and strategies.

5.4.8. Rwanda Development Board

Rwanda Development Board (RDB) is a one stop institution bringing together several government bodies focused at promoting investment in Rwanda. The authority is charged with administering the ESIA process and works with other institutions in the process. RDB has created a department of EIA responsible for reviewing all projects EIA before approval; a duty that was previously undertaken by REMA. With regard to Environmental safeguards, RDB plays the following roles:

- Review Project Briefs so as to advise on Terms of Reference, Provide information or advice to developers and EIA Experts when consulted during EIA process,
- Review EIA reports and provide comments to the developers
- Organizing public hearings,
- Issue certificate of approval

5.4.9. Ministry of Local Government (MINALOC)

Under the framework of decentralization, MINALOC oversees the implementation of the decentralization process as well as relevant community and social protection programmes. This Ministry is also responsible for environment governance and therefore for mobilizing the public to participate in the management and protection of natural resources. The National Decentralization Policy adopted in May 2000 holds local populations responsible for managing resources, including natural resources.

Districts are responsible for protection of public infrastructures and the environment. Similarly, cities, towns, and villages are responsible for land and environmental management, urban

planning, road maintenance and energy and water resources management. MINALOC is over-seeing various community development related programme in the districts. MINALOC is engaged in ensuring the development of rural areas through the implementation of settlement policies and ensuring their access on basic infrastructures through advocacy and collaboration with various stakeholders in different sectors including the energy sector.

5.4.10. Local government

The Republic of Rwanda is divided into 4 provinces plus Kigali City, (Eastern, Western, North and Southern Provinces) which are further divided into districts (there are 30 districts), which are further divided into Sectors and the Sectors are divided into cells. The cells are subdivided into villages commonly known as “*Imidugudu*” and are the smallest administrative bodies and the closest to the local communities. The District is an autonomous administrative structure with a legal status and financial autonomy.

The District advisory council is responsible for the enforcement of the laws of Rwanda, promotion of governance based on democracy, preparation of regulations governing the District, implementation of Government decisions, adoption of the development action plan of the district and the district budget and fixing the maximum amount to release from the District’s funds, the follow up of activities of the Executive Committee, coordination of activities of the sectors, approval of grants, bequest and credits that the District may receive, inter alia.

In collaboration with the District Executive Committee, the Mayor of the District is in charge of day-to-day administration of the District. The Mayor signs minutes, regulations, notices, contracts and all agreements involving the District. The Mayor of the District is the representative of the State at the District Level.

5.5 Project Implementation Arrangements

EUCL is proposed to be the Project Implementing Entity and will be responsible for the implementation of the RESSP activities. In order to provide leadership, coordination and effectively implement Components A-1 (Management Information Systems); Component A-2 (Revenue Protection Program); Component A-3-1 (Strengthening the technical capacity of key functions in EUCL); Component A-3-2 (Corporate Strategic Plan and Culture Change) and Component B-1 (Strengthening of the distribution network around in the Kigali city area), EUCL shall establish project implementation arrangements as detailed below. Component B-2 will continue to be managed by EARP-PCU housed in EDCL.

- A. Project Manager:** EUCL will appoint a Project Manager who will report directly to the Managing Director of EUCL. The Project Manager will have the overall responsibility of:
- i. The project implementation management and coordination;
 - ii. Project reporting covering progress of implementation and project's outcomes with regard to Components A and B-1; and
 - iii. Provide reports and information to the SWG and the EARP-PCU

The Project Manager shall be supported by EUCL technical specialists (Departmental Project Implementation Teams, - DPITs) as shall be nominated by the respective directors of the beneficiary/user departments.

- B. Project Steering Committee (PSC):** EUCL shall establish a Project Steering Committee (PSC) which will be chaired by the Managing Director of EUCL. The membership of PSC shall comprise the directors, managers and heads of units responsible for Corporate Services Finance, Commercial, Operations, IT, the Project Manager, the EARP-PCU Project Coordinator and such other staff as the Managing Director will determine to be necessary.

The equivalent technical specialists procured under the Business Support Services Firm (BSSF) shall also be members of PSC. The mandate of the PSC shall be to provide leadership, guidance and oversight during the project implementation. The PSC shall also have the responsibility of approving:

- i The operational procedures and functional processes prepared by the DPITs; and
- ii Project technical designs submitted by the DPITs

The PSC shall meet at least monthly to review the progress of implementation of the various activities.

- C. Departmental Project Implementation Teams (DPITs)** EUCL shall establish Departmental Project Implementation Teams (DPITs) in the relevant departments with functions covered in the scope of the project, including operations, customer service, IT, and corporate resources. Each DPIT shall be led by the respective head of department/section and shall include dedicated staff from the department with skills and experience in the operations of the department. The technical specialists procured under BSSF shall be members of their respective DPIT. The DPIT shall be responsible for performing the following roles, among others:

- i. Preparing, reviewing and documenting the operational procedures and functional processes related to their functions to be supported by the MIS for approval by the PSC;
- ii. Preparing functional and technical designs as inputs to the bidding process;
- iii. Acting as counterparts to the consultants and contractors during the implementation of the various project activities

The Project Manager shall have the overall responsibility of coordinating and managing the DPITs.

D. EARP Project Coordination Unit

The EARP-PCU, which has been rated satisfactory for the ongoing Bank portfolio, shall provide project implementation support services to the EUCL with regard to the project procurement, financial management, social and environmental aspects, M&E, contracts management, and overall project reporting to the SWG and IDA. Noting the institutional autonomy of the EDCL and EUCL, both companies shall enter into a Project Implementation Support Agreement (PISA) which shall detail the roles and functions of the EARP-PCU implementation support to EUCL. The EARP-PCU, headed by a Project Coordinator, will have the following responsibilities:

- i. management of the financial, procurement and safeguards functions;
- ii. facilitating coordination with the EUCL as well as among all relevant institutions and development partners; and
- iii. providing reports and information to the SWG and financiers, including the project monitoring and evaluation.

The PCU shall be staffed with various specialists who will cover the key functions required for project implementation related to contracts management, procurement, financial management, environmental and social safeguards and M&E. The PCU professional and support staff shall be financed under the project and will work primarily only on the project. The PCU staff, where required, will be supported/ reinforced with short term experts, on an advisory basis.

E. Other activities, related to feasibility studies and assessments will be led by either the heads of departments or technical specialists in the respective departments of the Ministry and the REG/ EUCL to ensure oversight and ownership by the user/beneficiary departments and skills transfer but reporting to EUCL and the EARP-PCU.

Energy Sector Working Group

The Sector Wide Group (SWG) will be supported by a full time SWG Secretariat comprising of the SWG Coordinator, Economist, External Links and Donor Coordinator, and an M&E Specialist.

Technical Assistance to the EARP-PCU and the EUCL

Technical assistance to EARP-PCU and EUCL will support project execution, design, and supervision to assist the entities in project implementation, sector management and coordination including just in time advisory services, diagnostic and feasibility studies.

6.0 DETERMINATION OF POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

6.1. Beneficial social and environmental impacts

Development interventions will have both positive and negative impacts except the component of technical assistance, which are expected to have exclusively the beneficial impacts. The significance of these impacts would vary depending on the individual sub project, its size and location.

6.1.1. Potential positive social impacts

The RESSP will bring various social benefits. Employment opportunities will be offered to skilled and non-skilled workers during construction and operation phases and other employment opportunities benefiting from electricity connection. Income generating activities are expected to be created hence contributing to poverty reduction and increasing revenues and sustaining social and economic development with women at the centre. In the long term, RESSP subprojects will improve the quality of life including education, health and security.

With the additional substations and transmission lines, there will be increased capacity and reliability of power supply. This additional capacity will have a positive impact by being able to meet the ever rising power demand across the entire country.

With the development of ICT networks including the layout of the optical-fiber ground wire, the beneficiaries are expected to benefit from broadband telecommunications, mobile telephone networks and digital television centres which will increase access to information especially in key sectors of development such as Agriculture, Health Care systems and Education.

Affordable electricity will reduce the rate of fuel use and will lead to the emergence and maintenance of businesses and services for rural communities.

6.1.2. Potential positive biophysical impacts

The RESSP is expected to increase access to electricity and to promote energy efficiency frameworks and substitution of fossil fuels and to offset carbon emissions hence ensuring a sustainable development. Therefore, the implementation of the programme will reduce pressure on biomass use and reduce the emission of greenhouse gases, which would have otherwise been generated for power generation of similar capacity. Furthermore, the RESSP will lower the cost of economic infrastructure such as communication, transportation and distribution networks, financial institutions and markets and thus boosting development processes. The quality of life of the beneficiaries in the project area will be improved hence reducing the exploitation of natural resources. The programme is also expected to reduce the cost of fuel and the pressure on forests as energy source.

6.2. Determination of potential environmental and social negative impacts

This section highlights the potential adverse social and environmental impacts that could occur when the various different activities in the RESSP components are implemented. Substation construction activities, transmission and distribution network systems extension activities can be expected to have positive direct and/or indirect impacts whereby the proposed transmission lines pass and negative impacts if mitigation measures and compensation is not undertaken effectively.

The adverse environmental concerns likely to occur when implementing RESSP activities are clustered into the sector specific issues such as ecological impacts and land degradation while adverse social impacts concern land acquisition, damage of assets, health and safety. However, the broad categories include into localized and cumulative as described below:

Most of the developments or subprojects planned under the RESSP will vary from medium to small in scale. Consequently the significance of the direct negative environmental impacts is likely to be relatively small and localized. All the activities planned under RESSP have the potential to alleviate some of the root causes of deforestation in Rwanda in those areas where electrical power supply is restored on a predictable and more reliable basis, by reducing the demand for fuel wood and charcoal as the main source of energy. Therefore, this will have a cumulative positive impact on the conservation of forest ecosystems and their function as a natural habitat. The RESSP will pose no major or significant risks to biodiversity, natural habitats and wetlands as it will not fund activities in protected areas, national parks or wetlands. However, some of subprojects in various phases may entail negative environmental impacts that are outlined in the following paragraphs:

6.2.1. Design and planning phase

During planning and design phase, activities include site selection, land acquisition, planning for civil, mechanical, engineering and electrical specifications, equipment and machineries to be procured, material storage and waste disposal measures.

Dispute and possible conflict over the land identified can arise owing to forced eviction, resettlement, loss of crops, trees and housing, absence of compensation and lack of dialogue with the Project Affected People (PAP). Poor selection of project site for the plant can cause conflict over environmental degradation including the destruction of sensitive ecosystems and or protected areas. Inadequate and poor designs and plans including storage of equipment and machinery and waste disposal can possibly cause environmental degradation. In particular, unsafe storage of creosote treated poles is source of obnoxious odours for workers and general public. Polychlorobiphenils (PCBs) from transformers and capacitors at substations can cause soil and water pollution if used.

6.2.2. Construction phase

Construction activities for poles, towers and substations include site earthworks which involve site preparation, clearing, stripping, grading, soil removal, backfilling, compacting, use of construction material sourcing areas (quarry and borrow pits), disposal of surplus, landscaping, shoring as required and final site clean up.

Some workers will leave their families and relocate to construction camp sites. New interactions between local community and workers are likely to take place. These interactions are likely to pose public health related issues such as HIV/Aids, communicable and sexually transmitted diseases (STDs).

The activities are likely to cause some social impacts such as noise pollution from construction machines and vehicles, accidents and hazards for both workers and general public from erection of steel structures, welding, metal grinding and cutting and concrete work. Injuries can result from trips and falls and other physical and mechanical hazards.

Particulate matter pollution is also likely to occur during site clearance, excavation and spreading of topsoil during construction and exposure to diseases from building materials can affect site workers and general public.

The excavation and construction activities may also affect physical cultural properties by displacement, damage or loss of structure from RoW and substation location site.

Generation of solid waste such as packaging materials, plastics, scrap metal and timber remains and dumping around the site and in construction camps can pose threat to environment and public health.

Negative impacts on soil and water can also be generated from machinery fuel and lubricants contamination from accidental spills or unsound disposal or handling. In particular, transformers can experience a leak arising from a fault, poor handling and vandalism. These leaks may result in potential contamination of surface and groundwater as well as soil.

Potential environmental impacts also include clearing of indigenous vegetation and disturbance to biodiversity and disruption of ecosystem functions. Excavation works for site preparation, access roads, construction of substations and poles installation are likely to cause loss of soil cover. Construction materials sourcing areas that include quarry and borrow pits sites are also likely to cause soil disturbance and soil erosion.

The activities are also likely to create additional demand for water in addition to the existing demand. Water will be mostly used in the mixing of concrete wetting surfaces or cleaning completed structures. It will also be used in the washrooms at the construction and camping site and also during the running period of the project.

6.2.3. Operation phase

During operation phase, activities include maintenance of infrastructure such as transmission and distribution lines and substations. Maintenance of RoW requires vegetation clearing.

Potential social adverse impacts include risk of electrocution, injury for workers and general public and risk of accidents to life property.

Disposal of used creosote treated wooden poles can be a source of water and soil pollution and can affect biodiversity.

6.2.4. Decommissioning

Activities include dismantling of infrastructure of transmission lines and in substations, removal of storage facilities. During decommissioning, contamination of ground and surface water resources through unsound disposal of used CFLs which are hazardous to the soil and ground resources especially if disposed indiscriminately. Dismantling of substation is likely to cause noise and generate dust impacts and waste debris from equipments including oil spills.

6.2.5. Cumulative Impacts

The sum of impacts from implementation of many subprojects in an area may result in cumulative impacts on natural resources. Cumulative impacts are those that may result from individual small-scale activities with minimal impacts but which over time can combine to have a significant impact. Cumulative impacts can also be defined as impacts that potentially develop from the combined impacts of more than one subproject. Examples include:

- Land cover change due to the cleaning of some land cover patterns for infrastructure setting which may lead to the biodiversity community changes, microclimate changes and ecosystem services depletion.
- Attraction of immigrant populations to communities that have improved energy infrastructures. High influxes of people will result into depletion of natural resources, pollution of public waters and degradation of soils.
- Migration of animal species may have adverse environmental impacts including biodiversity loss, ecological interactions disturbance leading ecological disequilibrium, etc.

6.3. Environmental and social management plan

The purpose of the Environmental and Social Management Plan (EMP) is to provide guidance during the implementation of RESSP regarding the institutional responsibilities and cost estimates for effective environmental and social management.

The Environmental Management Plan outlined in the following sections consists of a set of measures for: a) screening (i.e. determination of potential adverse environmental and social impacts), b) mitigation, c) monitoring and d) institutional arrangements to be undertaken during planning, design, procurement, construction and post-construction stages of the activities to be financed in the RESSP, to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The EMP includes the actions needed to implement these measures.

6.3.1. Environmental and Social Screening Process

The section below illustrates the steps involved during environmental and social screening process leading to the review and approval of RESSP activities. The screening process intends to:

- Determine potential impacts of selected subprojects as to whether they are likely to cause negative environmental and social impacts;
- Determine appropriate mitigation measures for activities with adverse impacts;
- Incorporate mitigation measures into project design;
- Review and approve project proposals,
- Monitor environmental and social parameters during project implementation.

The classification of each subproject under the appropriate environmental category will be based on the provisions of the World Bank Operational Policy on Environmental Assessment (OP4.01). The environmental and social screening of each proposed sub-project will result in its classification in one of the three categories (A, B or C), depending on the type, location, sensitivity and scale of the subproject and the nature and the magnitude of its potential environmental and social impact.

- **Category A:** Any project which is likely to have significant adverse environmental and social impacts that are sensitive, diverse or unprecedented.

The impacts under this category affect broader area than the sites or facilities subject to physical works. This category is equivalent to **Impact Level 3 (IL3)** in Rwanda's General Guidelines for EIA (2006). No category A subprojects will be eligible for financing under EASP in Rwanda.

- **Category B:** Any project which is likely to have potential adverse environmental and social impacts, which are less adverse than those of category A projects, on human populations or environmentally important areas including wetlands, forests, grasslands and any other natural habitat. The impacts are usually site specific, few or none of them are irreversible, and most of them are mitigated more readily than impacts from category A subprojects. This category is equivalent to **Impact Level 2 (IL2)** in Rwanda's General Guidelines for EIA (2006).

- **Category C:** Any project which is likely to have minimal or no adverse environmental and social impacts. Beyond screening no further EA action is required. This category is equivalent to **Impact Level 1 (IL1)** in Rwanda's General Guidelines for EIA (2006).

The extent of environmental work that might be required for sub-projects prior to implementation will depend on the outcome of the screening process described below:

Step 1: Screening of Project Activities and Sites

The initial environmental and social screening will be carried out through the use of the Project Screening Criteria Form (PSCF) used by RDB. This form will be completed by the District Environmental Officer (DEO) assisted by sector specific committees as found necessary for the purposes of identifying the potential environmental and social impacts, determining their significance, assigning the appropriate environmental category, proposing appropriate environmental and social impact mitigation measures, and carrying out Environmental Impact Assessments (EIAs) if necessary.

The environmental screening procedure can lead to one of the following decisions:

- Elimination of category A subprojects from the subproject approval process.
- For subprojects classified as category B, it will be required that the appropriate level of environmental and social impact assessment be carried out, and Environmental Management Plan be prepared.
- For subprojects classified as category C, no further environmental and social assessment will be required.
- For pollution control plans, feasibility studies, and engineering designs for RESSP components, the studies and designs don't cause any direct social or environmental impacts, either positive or negative. However, future implementation of such plans with other sources of funds could generate potential Category B, or maybe even Category A impacts. For this reason, any feasibility studies and engineering designs financed under RESSP will follow the recommendation of OP 4.01, in addition to any determinations under Rwanda environmental legislation, as if future investments would be financed by the World Bank. This will ensure that World Bank safeguard policies standards will be applied to all activities supported by RESSP.

In addition, in case subprojects trigger World Bank Operational Policies on Involuntary Resettlement (OP 4.12) and or Physical Cultural Properties (OP 4.11), the following measures are required.

- The project will not finance any activities that involve the significant conversion or degradation of critical natural habitat according to the definitions in OP 4.04.
- The project will also prepare and implement a plan for construction supervision and quality assurance, an instrumentation plan, an operation and maintenance plan, and an emergency preparedness plan.
- In case the project may result in involuntary resettlement, then the resettlement procedures shall be instituted through the preparation of a site specific Resettlement Action Plan (RAP) as provided for in the Resettlement Policy Framework (RPF).
- In case some cultural resources shall be affected by the project, then the chance finding procedures shall apply and required authorization collected before resuming any construction work.

Step 2: Re-categorize activities according to expected Environmental and Social impact

The assignment of the appropriate environmental category will be based on the provisions of the World Bank Operational Policy on Environmental Assessment (OP 4.01). Rwanda's EIA guidelines are consistent with the Environmental and Social Impact screening categories contained in OP 4.01. With regard to subprojects to be financed under RESSP, it is likely that most will be categorized as B (IL2). Some subprojects categorized as B (IL2) will require EIAs that need to be approved by both RDB and the World Bank, through normal procedures, prior to the commencement of activities. Some projects might be categorized as C (IL1) if the environmental and social screening results indicate that the projects will have no or minimal environmental and social impacts and therefore do not require additional environmental work. Thus, if the screening

form has only "No" entries, the project will not require further environmental work, and the District Environmental Officer (DEO) will recommend approval of the project to RDB and implementation can proceed.

All implementers will have to pay particular attention to projects such as construction in fragile ecosystems within declared conservation areas, effluent discharges and the rehabilitation and expansion of existing schemes.

Based on the recommendation arising from the screening process, the following environmental work can be carried out:

Use of Environmental and Social Check List (ESCL) for subprojects assigned as Category B (IL2): The District Environmental Officer (DEO) would fill out the ESCL.

This document will then be scrutinized and amended by qualified personnel based on the requirements of the subproject being assessed. An Environmental Management Plan (EMP) will be prepared to (i) identify the set of responses to potentially adverse impacts; (ii) determine requirements for ensuring that those responses are made effectively and in a timely manner; and (iii) describe the means for meeting those requirements.

Where the screening process identifies the need for land acquisition, qualified consultants would prepare a Resettlement Action Plan (RAP) in accordance with WB OP 4.12 and the Involuntary Resettlement Policy Framework (IRPF).

Step 3: Preparation of the appropriate level of ESIA and ESMPs

The safeguard tools such as Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plans (ESMP) will be prepared and implemented based on guidance from the ESMF and REMA environmental impact assessment guidelines, 2006.

Environmental Impact Study phase is the investigative stage of the ESIA process for which the developer (EUCL) hires certified ESIA experts or use environmental and social safeguards team. This phase begins by EUCL selecting expert(s) among a list of certified ESIA practitioners in Rwanda or international consultant.

The ESIA and EMPs will be prepared by environmental and social safeguard team or the selected certified local EIA practitioners or international consultant.

The EUCL and the selected national and/or international ESIA shall work together throughout the Environmental Impact Statement phase to develop adequate measures to identify, offset and mitigate negative impacts and enhance positive ones.

Step 4: Review and Approval of the Screening Activity

RDB will review the environmental and social screening results as well as the environmental checklists that were completed in the course of project preparation to ensure that all environmental and social impacts have been identified and successfully addressed.

If the screening form has any "Yes" entries, or unjustified "No" entries, the application would need to adequately explain and demonstrate that the issues raised have been addressed appropriately.

If RDB finds that the submitted design is not consistent with the requirements of the environmental screening form or the environmental checklist, then the project implementer would be requested to re-design the project (e.g. make additional modifications and/or choose other sites). Any proposed projects that do not comply with the requirements of Rwanda and the World Bank Safeguards policies will not be cleared for implementation.

If RDB is satisfied that the designs/project proposals are environmentally and socially compliant, they will be submitted to the Local Government (LG) at the Village levels for disclosure. The project documentation must be accompanied by the completed environmental and social screening forms, and where applicable, the RAP.

If the application is seen to satisfactorily address all environmental and social issues, RDB will then clear the project and recommend its approval while informing the focal point ministry subsequently, RDB will recommend the project to the District Council for approval. For projects which require construction/rehabilitation works, the District Council will give a conditional approval for detailed planning, construction and operation of the investment. These conditions may include, for example, such measures as public involvement, siting or routing restrictions, construction and operation practices, restoration of disturbed areas, the complete implementation of a resettlement action plan and/or, construction supervision to ensure the approval conditions are being followed (*See Environmental Guidelines for Contractors in Annex-3*).

Step 5 - Public Consultation and Disclosure

In line with transparency principles, the public will be consulted on the proposed subprojects. Public consultations will be held as part of the environmental and social screening process. The purpose of these consultations is to allow for the identification of the main issues and how the concerns of all parties should be taken into account in deciding whether or not to issue a permit for the sub-project.

For category B (IL2) subprojects, during the EA process, project affected groups and local Non Governmental Organizations (NGOs) will be consulted about the project's environmental aspects and their views are taken into account. Such consultations should be initiated as early as possible in the subproject elaboration stage. In addition, project implementers consult with such groups throughout project implementation as necessary to discuss the status of implementation of the EMP and identify and address any pending EA related issues that may affect them.

The final EIA reports for category B subprojects will be disclosed to the public by presenting the findings and recommendations to the village assembly and disclosing the document at the offices of the concerned districts. NGO's and other civil society organizations in the village and the district will be informed of the meeting, and copies of the EIA report will be made available before the meeting, in a language that is understood by the recipients.

Once a draft EIA is ready, REG must (a) circulate it for written comments from the various agencies and government agencies (b) notify the public of the place and time for its review and (c) solicit oral or written comments from those affected. RDB will decide whether or not the EIA review is to be conducted through public hearing.

Beneficiaries under RESSP sub projects or any affected interested party, have the right to appeal. If dissatisfied with the decision reached at any stage in the EIA process, the affected party has the right to bring their concerns to REG, and also of appeal to the Minister responsible for Environment.

Step 6 - Environmental Monitoring and Follow-up

The purpose of environmental monitoring is to check the effectiveness and relevance of the implementation of the proposed mitigation measures. Monitoring will be done by District Environmental Officers together with trained personnel at the lower LG levels based on the scale and complexity of the sub-project. It shall be carried out in accordance with the procedures and at the intervals prescribed in the Project Implementation Plan (including Maintenance Schedules where appropriate). The District Environmental Officer working with the relevant sector heads at high and lower LG levels will monitor the implementation of environmental mitigations measures based on contractors' plans for investments. Oversight monitoring by REMA will be carried out on an annual basis.

Monitoring will be carried in accordance with the Environmental Management Plan (EMP) prepared for each sub-project, which shall include the monitoring indicators for the project. Environmental Indicators may include but need not be limited to the following:

- Loss of Vegetation
- Land Degradation
- Land and water pollution
- Biodiversity loss
- Legislative Compliance

6.3.2. Environmental Impacts Mitigation

For the purposes of this Environmental Management Plan (EMP), the activities in the RESSP that are likely to have adverse impacts are mainly expected to arise from the RESSP components activities.

Mitigation measures involve avoiding of impact altogether, minimizing the impact, rectifying the impact and gradual elimination of impact over time. Depending on the nature, these measures will be implemented by communities the support will be in form of financial and human resource efforts.

Mitigation measures are twofold: physical and socio-economic. Physical measures relate to issues of project siting, re-vegetation and preventive measures like bush clearing, erosion, sedimentation and pollution control and good construction practices, waste management, and application of Environmental Guidelines for Contractors. Socio-economic measures will include education and awareness, hygiene and sanitation training, rules and regulations and institutional support (including skills training).

Table 10 provides the generic Environmental and Social Management Plan (EMP) and gives a link between the impacts of project activities and the mitigation measures put in place to minimize these impacts and enhance the positive impacts during different project phases.

Table 10: Generic Environmental and Social Management Plan

1. Planning and design phase

Project components/ Activities	Negative Impacts	Mitigation Measures	Responsibility	Cost Estimates(USD)
Land Acquisition and assets loss	Dispute and possible conflict over the land identified can arise owing to forced eviction, and absence of compensation and dialogue with the PAPs.	Ensure that the land identified for the project is acquired as per the requirements of the Government of Rwanda and World Bank guidelines in relation to land acquisition, resettlement and compensation Involve and meaningfully engage the PAPs, general public including administration, and local/traditional leaders in the transparent acquisition of the land Utilize the RPF document available and develop RAP to be used in acquisition of the land.	EUCL EARP-PCU, Contractors	Included in the contract
Site Selection	Poor selection of project site for the substation sites, ROW transmission and distribution lines and be an environmental degradation threat that include the destruction of sensitive ecosystems such as wetlands or protected areas	Avoid construction sites in or near sensitive ecosystems Do not select land that contravenes the regulations of the Government of Rwanda in relation to natural resources and sensitive ecosystems Where there is no alternative for ROW in wetland ecosystems, ensure that existing water flow regimes and irrigation channels is maintained and/or re-established where they are disrupted due to works being carried out.	EUCL EARP-PCU, Contractors	Included in the contract
Plan Designs	Poor designs of plans, inadequate equipment and machinery specification Inadequate and poor designs and plans including equipments and machinery can possibly cause environmental degradation.	Ensure during planning and design to incorporate environmental sound design concepts as appropriate All designs, equipment and machineries to be procured should include instructions on their environmental specifications and requirements All instructions or planning for civil, mechanical, engineering and electrical specifications including technical specifications must have stringent environmental obligations in accordance with the World Bank guidelines, international or local guidelines whichever emerges as stringent in terms of environmental and social requirements.		
	Poor planning of worksite waste management posing threat to environment and public health	Preliminary environmental and social assessment studies that include environmental impact assessment, planned mitigation measures, compensation measures as well as monitoring and follow up programs	Contractors	Included in the contract

		<p>Involvement of local authorities and Public hearing to allow participation and issuing of recommendations</p> <p>Include in the contract documents environmental guidelines/the emergency response plan and procedures and organization structure for such situations</p> <p>Organise professional training for health and safety</p>		
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2. Construction phase

Project components/ Activities	Negative Impacts	Mitigation Measures	Responsible	Cost Estimates(USD)
Construction of new access roads to substations and transmission lines, use of borrow pits	<p>Loss of vegetation and potential soil erosion, siltation</p> <p>Fugitive dust may be emitted from construction works and stock piles of materials including machinery as well as from truck traffic. This could cause health related impacts to the communities around and workers in the project site</p> <p>Stockpile and construction waste, increased water use, generation of wastewater</p> <p>Noise pollution from construction machines and vehicles,</p> <p>Accidents and hazards for both workers and general public from erection of steel structures, welding, metal grinding and cutting and concrete work. Injuries can result from trips and falls and other physical and mechanical hazards.</p> <p>Loss of livelihoods such as crop fields and housing</p>	<p>Environmental guidelines as stipulated in the contract specifically:</p> <p>Implement soil erosion control measures such as protecting stockpiles through the use of silt fencing. Reduced slope angles should be used to minimize soil erosion during construction or to avoid surface run off and preventing siltation</p> <p>Additional plantation and embankment using removed top soil is recommended near sensitive locations</p> <p>Conversion of access roads to new routes and roads</p> <p>The dirt roads and exposed construction areas should be moisturized during the dry season to prevent or minimise the fugitive dust emissions.</p> <p>Storage areas should be located outside of the habitation area</p> <p>Environmental and compliance monitoring by environmental officers</p> <p>Workers in the project site must be equipped with the necessary and required Personal Protective Equipment (PPE) prescribed by the construction industry</p>	<p>EUCL</p> <p>Construction Contractors, EARP-PCU</p>	<p>Included in contract</p>
Construction of sub-	Loss of vegetation and	All vessels (drums, containers, bags, etc.) containing oil/fuel/surfacing	EUCL	Included in

stations and transmission lines	land for crops, soil erosion Use and disposal of creosote and storage of treated poles and a threat to the environment and public health	materials and other hazardous Chemicals shall be bonded in order to contain spillage. All waste containers, litter and any other waste generated during the construction shall be collected and disposed off at designated disposal sites in Line with applicable government waste management regulations. Borrow areas (if any) should avoid agricultural areas; borrow areas should be reworked to blend into the surroundings. Re-vegetation should be performed using local plants. All slopes and working surfaces should be returned to a stable condition Storage areas for creosote treated poles should be located outside of the construction camp sites and residential area	Construction Contractors,	contract
Noise	Noise and Vibrations from Equipment Operation Noise from construction activity may be significant.	Substation and transmission lines construction works will be carried out during daylight hours. If power outages are required, it may be necessary to carry out some works at night or weekends. In such cases, the local population will be informed sufficiently in advance through local media All workers in the project site must be equipped with the necessary and required Personal Protective Equipment (PPE) prescribed by the construction industry but not limited to facilities to protect against noise impacts, safety helmets, boots, dust masks, gloves, overall, goggles etc. Reduce vehicle speeds (stick to recommended speeds) in populated areas For workers noise levels shall be kept below 80 dB (A), wherever possible. In case of exceeding this value, hearing protections must be provided to workers and warning signs must be installed Notify nearby residents and businesses at least 24 hours in advance if particularly noisy activities are anticipated	EUCL Construction Contractors,	Included in the contract
Health and safety	Accidents at work place during construction from operating of machineries and equipment by workers	Development of an HSE Policy for the construction phase, in advance of construction activities Development of an HSE Management Plan for the construction phase (shall include Waste Management Plan), in advance of construction activities Installation of an HSE Management System (HSEMS) during the construction phase Implementation of health and safety workshops for construction workers Hire only experienced workers for specific jobs, such as working at heights, handling large equipment and machinery, handling hazardous material, which required highly specialized training. Train workers accordingly in regard to working at heights, electrical safety, vehicular	EUCL Construction Contractor	Included in construction costs

		<p>safety, handling of hazardous materials, PPE, use of first aid and rescue techniques, emergency response, poisonous snakes etc. Provide first aid kits and fire extinguishers at all Project sites Forbid alcohol and other drugs at construction sites Limit occupational exposure to EMF by use of shielding materials, and train workers accordingly</p> <p>All workers entering the construction site must be equipped with PPE including goggles, factory boots, overalls, gloves, dust masks, among others. The PPE should be those that meeting the international standards of PPE.</p>		
	Community Health and Safety	<p>Ensure that traffic is not interfered by construction through proper traffic management Notification of the public on upcoming construction, in advance of construction period Public education and outreach efforts to provide information about hazard awareness, upcoming construction activities, safety measures, reporting unsafe conditions and environmental impacts, in advance of construction period Inform population along public roads in advance in case of transporting heavy equipment Provide adequate security measures to prevent accidents and injury (e.g. keeping speed limits on public roads, grounding objects) Provide adequate security to prevent public access to the substations, work sites, hazardous materials and waste</p>		
Traffic	Risks from Traffic Disruption congestion and or Road Accidents	<p>Collaborate with local communities on education about traffic and pedestrian safety, in advance of construction period</p>	Construction Contractors, RESSP Project Coordination Unit	Included in contract
Dust and Air Emission	Air Emissions and Ambient Air Quality)	<p>Reduction of speed and limited movement of vehicles Use dust-suppressing water on unpaved roads, e.g. spraying of water with watering trucks in advance of transportation activities Cover truck beds with tarps during material transport Use dust-suppressing water spray during civil works, where necessary Store and handle material appropriately to limit dust (e.g. protect cement with tarpaulins) Use equipment with dust suction devices in enclosed spaces during civil works, where necessary</p>	EUCL Construction Contractors,	Included in contract
cultural heritage demolition, cemeteries	Establishment of distribution lines can	<p>Consultation should be undertaken with local authorities and communities to ensure that potential genocide memorial sites are</p>	EUCL should make contacts	Included in the project cost

	lead to unearthing genocide sites hence cause cultural strife.	avoided. Accidental unearthing of such sites should be culturally handled in accordance with the cultural sites and requirements. Funds for conducting necessary rituals and ceremonies related to beliefs must be set aside. Avoid sitting infrastructure where people will be disturbed and where resettlement could be an issue.	with local authorities and engage good collaborations.	
Excavation and construction may cause the damage and loss of cultural properties	Destruction of physical cultural property such as graves, Chance found Archaeological Property among others	All necessary and adequate care shall be taken to minimize impact on cultural properties which includes cultural sites and remains, places of worship including temples, mosques, churches and shrines, etc., graveyards, monuments and any other important structures as identified during design and all properties / sites / remains notified. No work shall spillover to these properties, premises and precincts. The Contractor will be responsible for familiarizing themselves with the “Chance Finds Procedures” in case culturally valuable materials are uncovered during excavation or any project activities, including: <ul style="list-style-type: none"> • Stop work immediately following the discovery of any materials with possible archeological, historical, paleontological, or other cultural value, announce findings to project manager and notify relevant authorities; • Protect artifacts as well as possible using plastic covers, and implement measures to stabilize the area, if necessary, to properly protect artifacts; • Prevent and penalize any unauthorized access to the artifacts; and • Restart construction works only upon the authorization of the relevant authorities. The PCR Chance Finds Procedures have been prepared to remedy such issues;	EUCL ,Construction contractor Local authorities and the Ministry in charge of culture	Included in the project cost
Destruction of existing infrastructures	Impact on existing infrastructures (water pipelines, existing power lines, telecommunications lines, fiber optic,.....)	Destruction of the existing infrastructures should be avoided In case of transmission line or other infrastructures is damaged, the project will repair the damages and remove it in other appropriate site	EUCL Construction Contractors,	Included in contract
Soil and Water pollution	Harmful and dangerous material and	Regular maintenance of all vehicles and machines at regular service stations, if possible Maintenance and re-fueling of the construction equipment only on sealed and enclosed areas	EUCL Construction Contractors,	Included in contract

		<p>Store all liquid materials (e.g. fuel, engine oil, etc.) and lubricants in locked tanks and on sealed and roofed areas</p> <p>Store construction material as bags of cement etc. in containers in order to avoid rinsing out</p> <p>Provide proper sanitation facilities</p> <p>Design bunds around and oil collecting system beneath transformers to prevent contamination of soil and groundwater</p> <p>Remove contaminated soil if spills occur and handle as hazardous waste</p> <p>Collect contaminated spill materials and manage as hazardous waste</p>		
Risks from Waste		<p>Construction contractor will have to clarify with local authorities, where different kind of wastes may be disposed of</p> <p>Development of Waste Management Plan within the HSE Management Plan considering following principles: (i) waste management hierarchy of avoidance-minimization-reuse-treatment-disposal; (ii) segregation of waste; (iii) minimization of construction waste by good technical planning; (iv) training of staff</p> <p>Implementation of a Waste Management System</p> <p>Train workers in handling and disposal of recyclable, sanitary, solid, liquid and hazardous waste</p> <p>Segregate hazardous waste and store in suitable drums or containers in secure facilities (fitted with roofs, concreting, bunds etc.), and clearly identify hazardous waste</p> <p>Dispose of oil-contaminated soil in adequate storage facilities</p> <p>Store scrap metal (iron, steel, copper, etc.) onsite for later recycling including material already stored onsite</p>	<p>EUCL</p> <p>Construction Contractors,</p>	<p>Included in contract</p>
Social Impacts		<p>Prioritize employment of local people for construction works (skilled and unskilled workers)</p> <p>Improve recruitment of women for construction works</p> <p>Health awareness workshops for workers by a specialized NGO</p> <p>Develop and implement a Grievance Redress Mechanism</p>	<p>EUCL</p> <p>Construction Contractors,</p>	<p>Included in contract</p>

3. Operation phase

Components/ Activities	Negative Impacts	Mitigation Measures	Responsible Inst	Cost Estimates(USD)
Operation of maintenance of substation	Employee and Public Health and Safety	<p>Develop a Health and Safety Management Plan (HSMP) and implement an Health and Safety Management System (HSMS) for operation and maintenance of substation</p> <p>Erect fire walls between or at new transformers foreseen in switchyard of s/s YTPC to prevent spreading of fire in case of an accident</p>	EUCL	Development of an ESMP for the operational phase (to be set up by EARP), is recommended
Electric and magnetic fields	Electric and magnetic fields	<p>Substations international standards.</p> <p>At substations the strength of the electric and magnetic field will be measured when in operation and zones with high fields will be marked with possible restrictions for allowed working hours</p> <p>However, gained from the experience with similar projects, no risk for workers will come up within a MV/LV substation designed state-of-the art</p>	EUCL	Maintenance cost
Solid waste	Little if any solid waste will be generated which includes conductor and tree cuttings	<p>All left over conductor cuttings to be disposed appropriately or be returned to the store for proper disposal</p> <p>Proper budgeting of materials to reduce wastage</p> <p>practice 3 Rs of waste management: reduce, reuse, recycle of materials</p> <p>Properly Manage storage, transfer, and disposal of transformer oils according to industry standards</p>	EUCL	Maintenance cost

Decommissioning

Components/ Activities	Negative Impacts	Mitigation Measures	Responsible Inst	Cost Estimates(USD)
transformers, cables	Waste Debris from Equipments and Machines when substation is dismantled	Ensure all the machines and equipment are disposed in the right places, Explore available recycling opportunities	EUCL	Included in decommissioning cost
CFLs Poor disposal of used CFLs and exchanged IBs	Likely to lead to ground and surface water contamination. CFLs contain mercury a hazardous heavy metal (substance) that is harmful to aquatic resources, soil resources and human population. Soil contamination is a likely adverse impact if the CFLs are dumped in an open dumping site without mitigation measures and controls. Soil contamination could impact on agriculture.	Ensure that all the IBs collected in exchange for the CFLs are stored securely in a appropriate warehouse until a disposal plan is prepared. Develop a waste disposal plan for the disposal of the CFL lamps. Identify a suitable store for keeping all the IBs	EUCL	Included in decommissioning cost
Health and safety	Accidents during decommissioning including oil spills	Apply the accidents reduction /mitigation impacts specified in the construction phase of the project	EUCL	Included in decommissioning cost

6.4 Environmental and Social Monitoring Plan

This section sets out requirements for the monitoring of the environmental and social impacts of the RESSP subprojects. Monitoring of environmental and social indicators will be mainstreamed into the overall monitoring and evaluation system for the project. In addition, monitoring of the implementation of this ESMF will be carried out by REMA and EUCL Environmental and Social Safeguards Specialists.

The objective of monitoring is twofold;

1. to alert project authorities (i.e. EUCL primarily) by providing timely information about the success or otherwise of the environmental management process outlined in this ESMF in such a manner that changes can be made as required to ensure continuous improvement to RESSP environmental management process (even beyond the project's life).
2. to make a final evaluation in order to determine whether the mitigation measures incorporated in the technical designs and the EMP have been successful in such a way that the pre-project environmental and social condition has been restored, improved upon or is worst than before and to determine what further mitigation measures may be required.

6.4.1 Monitoring of environmental and social indicators

The goals of monitoring are to measure the success rate of the project, determine whether interventions have resulted in dealing with negative impacts, whether further interventions are needed or monitoring is to be extended in some areas. Monitoring indicators will be very much dependent on specific project contexts.

6.4.1.1 Monitoring of participation process

The following are indicators for monitoring of the participation process involved in the project activities.

Number and percentage of affected households consulted during the planning stage;

- Levels of decision-making of affected people;
- Level of understanding of project impacts and mitigation;
- Effectiveness of local authorities to make decisions;
- Frequency and quality of public meetings;
- Degree of involvement of women or disadvantaged groups in discussions.

Monitoring of implementation of mitigation plans lists the recommended indicators for monitoring the implementation of mitigation plans.

6.4.1.2 Evaluation of Results

The evaluation of results of environmental and social mitigation can be carried out by comparing baseline data collected in the planning phases with targets and post-project situations.

A number of indicators would be used in order to determine the status of affected people and their environment (land being used compared to before, how many clean water sources than before, etc). In order to assess whether these goals are met, the EARP-PCU Environmental and Social safeguard Specialist with technical support of the two environmental and social experts to be hired by EUCL will indicate in the EMP, parameters to be monitored, institute monitoring milestones and provide resources necessary to carry out the monitoring activities.

The following are some pertinent parameters and verifiable indicators/questions to be used to measure the ESMF process, mitigation plans and performance;

- Has the environmental and social safeguards specialist?
- Have the EMP's and Final Designs been cleared by the RDB?
- Have the Civil Works Contractors got considerable legal muscle to enforce the EMP?
- At what rate are the civil works been monitored by EUCL and by the REMA?
- How many violations of the contractors/transporters have been recorded and at what rate are they occurring.
- How many RAPs have been fully executed before PAPs are physically displaced?
- How many recorded grievance cases have been settled within one year?

6.4.2. Monitoring of ESMF implementation

In addition to the Project Reports and ESIA studies required under the Organic Law, an Annual Audit on ESMF Implementation will be prepared by the EUCL, and delivered to RDB. In addition, each large project that has been subject to an ESIA study (or RAP etc.) will also be required to produce a social and environmental audit report, for delivery to REMA.

Table 11: Environmental and Social Monitoring Plan
1. Monitoring during design and planning phase

Activity / Impact	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)		When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
			Method	Indicator		
Land acquisition and assets loss	Utilize the RPF document available and develop Resettlement Action Plan	Location of RESSP substation, ROW for transmission and distribution lines and access roads	Inspection of implementation of RAP Compensation of all PAPs	All compensation processes implemented	Before construction begin and throughout construction activities	EUCL social and environmental safeguard specialists EARP-PCU social safeguard specialists Concerned district authorities
	Implementation of RAP					
Site selection	Do not select sites that contravenes the regulations of the Government of Rwanda in relation to natural resources and sensitive ecosystems	Location of RESSP substation, transmission and distribution lines	Inspection of selected sites	EIA, EMP approval certificate	During selection of construction sites and transmission line routes	EUCL design and planning directorate Environmental safeguard specialists Design consultant
	Undertake detailed EIA study or Environmental Management Plan on selected site					
Designs of plans, equipment and machinery	Ensure during planning and design to incorporate environmental sound design concepts as appropriate All designs, equipment and machineries to be procured should include instructions on their environmental specifications and requirements.	Designs plans and machinery, equipment specification	Checking the design and plans and electrical equipment to be used	Designs plans and electrical equipment which include environmental	Before Construction works begin	EUCL social and environmental safeguard specialists

specification	All instructions or planning for civil, mechanical, engineering and electrical specifications including technical specifications must have stringent environmental obligations in accordance with the World Bank guidelines, international or local guidelines whichever emerges as stringent in terms of environmental and social requirements.			and social safeguards specifications	Before Tender is advertised and Tender Documents dispatched to selected bidders	EARP – PCU Environmental Safeguards Specialists
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2. Monitoring during construction phase

Activity / Impact	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)		When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
			Method	Indicator		
Soil and Water Pollution (Part 1)	Regular maintenance of all vehicles and machines at regular service stations, if possible	Construction sites at RESSP substation, transmission and distribution lines	Inspection of maintenance records	All vehicles and machines adequately maintained	Regularly during construction	EUCL social and environmental safeguard specialists EARP-PCU Environmental safeguards specialists Supervision consultant
	Maintenance and re-fueling of the construction equipment only on sealed and enclosed areas		Visual inspection of maintenance and re-fueling areas	No unsuitable areas used for maintenance and re-fueling		
	Store all liquid materials (e.g. fuel, engine oil, etc.) and lubricants in locked tanks and on sealed and roofed areas		Visual inspection	All materials adequately stored		
	Store construction material as bags of cement etc. in containers in order to avoid rinsing out			Adequate number of sanitation facilities separately for men and women; and in proper condition		
	Provide proper sanitation facilities with hand-washing facilities in adequate number, separately for men and women		Inspection of training records	All workers trained accordingly		
	Train workers in appropriate sanitation practices		Visual inspection	All transformers fitted with bunds and oil collecting system		
	Design bunds around and oil collecting system beneath transformers to prevent contamination of soil and groundwater			Inspection of training records		
	Train transporters and workers in spill prevention and control especially in handling of oil / fuel					
Soil and Water Pollution (Part 2)	Provide proper equipment (as drip pans) and implement procedures to handle transformer oil	Construction sites at RESSP substation, transmission and distribution lines	Inspection of equipment	Equipment provided	Regularly during construction	EUCL social and environmental safeguard specialists
	Provide spill-control materials to drivers and workers, in order to clean up spills, if necessary					

Activity / Impact	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)		When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
			Method	Indicator		
	Report and respond to spills promptly and train workers in how to report		Inspection of spill reports, and training records	Number of spill reports All workers trained accordingly		EARP-PCU Environmental safeguards specialists Supervision consultant
	Remove contaminated soil if spills occur and handle as hazardous waste		Inspection of spill reports and storage areas	All contaminated materials adequately stored		
	Collect contaminated spill materials and manage as hazardous waste					
Waste Management (Part 1)	Construction Contractor will have to clarify with local authorities, where different kind of wastes may be disposed of	Construction sites at RESSP substation, transmission and distribution lines	Control of written agreement	Written agreement provided	In advance of construction works	EUCL social safeguard specialists Supervision consultant
	Development of Waste Management Plan within the HSE Management Plan		Control of Waste Management Plan	Waste Management Plan developed		
	Implementation of a Waste Management System		Control of Waste Management System	Waste Management System implemented	Regularly during construction	
	Train workers in handling and disposal of recyclable, sanitary, solid, liquid and hazardous waste		Inspection of training records	All workers trained accordingly		
Waste Management (Part 2)	Segregate hazardous waste and store in suitable drums or containers in secure facilities (fitted with roofs, concreting, bunds etc.), and clearly identify hazardous waste	Construction sites at RESSP substation, transmission and distribution lines	Visual control of storage areas at substation	All hazardous materials and scrap metal stored in appropriate storage areas	Regularly during construction	EUCL social safeguard specialists
	Store used oil in suitable tanks and at proper areas at substation site including storage of already existing oil onsite					EARP-PCU environmental safeguard specialists
	Store scrap metal (iron, steel, copper, etc.) onsite for later recycling including material already stored onsite					External expert
Employee Health and Safety (Part 1)	Development of an HSE Policy for the construction phase, in advance of construction activities	Construction sites at RESSP substation, transmission and distribution lines	Inspection of relevant documents	HSE Policy developed	In advance of construction works	EUCL social and environmental safeguard
	Development of an HSE Management Plan for			HSE Management		

Activity / Impact	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)		When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
			Method	Indicator		
	the construction in advance of construction activities			Plan developed	Regularly during construction	specialists EARP-PCU environmental safeguard specialists External expert
	Installation of an HSE Management System (HSEMS) during the construction phase			HSE Management System implemented		
	Make sure that all workers have a health insurance		Inspection of workers' health documents	All workers have health insurance		
	Provide proper sanitation facilities in adequate number		Visual inspection	Adequate number of sanitation facilities and in proper condition		
	Provision of HIV /AIDS protection equipment for workers		Interviews	Protection equipment provided		
	Implementation of health and safety workshops for construction workers		Inspection of workshop records	Workshops implemented		
	Installation of warning signs "Danger of Electrocutation" at towers, substations etc.		Visual inspection	Warning signs installed		
	Provide workers with appropriate protective equipment (PPE) (dust, noise, thick gloves against snake bites etc.)		Inspection of accident records	All workers provided with PPE		
	Provide first aid kits and fire extinguishers at all Project sites and in all vehicles		Interviews Visual inspection	First aid kits and fire extinguishers provided		
Employee Health and Safety (Part 2)	Train workers in regard to working at heights, electrical safety, vehicular safety, handling of hazardous materials, PPE, use of first aid and rescue techniques, emergency response, poisonous snakes etc.	Construction sites at RESSP substation, transmission and distribution lines	Inspection of training records	All workers trained accordingly	Regularly during construction	EUCL social and environmental safeguard specialists EARP-PCU environmental and social safeguard specialists
	Forbid alcohol and other drugs at construction sites		Inspection of incident records	No workers found under influence of alcohol or other drugs		
	Assure transfer of injured workers to hospitals in the case of serious accidents		Inspection of accident records	Workers transferred to hospital in case of serious accidents		

Activity / Impact	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)		When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
			Method	Indicator		
	Identify area emergency responders, hospitals, and clinics, and provide advance notice of Project activities	Area emergency responders	Interviews	Area emergency responders informed about Project activities	In advance of construction works	Supervision consultant
	Implement programs for medical screening, health and safety monitoring, and reporting	Construction sites at RESSP substation, transmission and distribution lines	Inspection of records	H&S programs implemented	Regularly during construction	
	Limit occupational exposure to EMF by use of shielding materials, and train workers accordingly		Interviews	Shielding materials in place		
	Record all accidents and incidents		Inspection of training records	All workers trained accordingly		
			Inspection of records	Recording implemented		
Public Health and Safety (Part 1)	Ensure that traffic is not interfered by construction through proper traffic management	Residents living near RESSP subproject construction activities	Inspection of complaints	No complaints from residents	Regularly during construction	EUCL social and environmental safeguards specialists
	Notification of the public on upcoming construction		Interviews	Public informed about upcoming construction	In advance of construction	
Public Health and Safety (Part 2)	Public education and outreach efforts to provide information about hazard awareness, upcoming construction activities, safety measures, reporting unsafe conditions and environmental impacts, in advance of construction period	Residents living near RESSP subproject construction activities	Interviews	Public accordingly informed	In advance of construction	EUCL social and environmental safeguards specialists
	Inform population along public roads in advance in case of transporting heavy equipment	Residents along public roads	Inspection of complaints and accident records	No complaints	Regularly during construction	
	Provide adequate security measures to prevent accidents and injury (e.g. keeping speed limits on public roads, grounding objects)	Residents living near RESSP subproject construction activities		No complaints from residents; no accidents	Regularly during construction	
	Provide adequate security to prevent public access to the substations, work sites, hazardous materials and waste	Residents living near RESSP construction activities	Visual inspection Inspection of records	Security measures implemented		

Activity / Impact	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)		When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
			Method	Indicator		
				No incident records		
Noise (Part 1)	Reduce vehicle speeds in populated areas	Residents living near RESSP subproject construction activities	Inspection of complaints	No complaints from residents	Regularly during construction	EUCL social and environmental safeguards specialists EARP-PCU social and environmental safeguards specialists
	Allow truck movements only during daylight, but not between 7 pm and 6 am					
	Utilization of low sound power mechanical equipment like bulldozer, air compressor, concrete pumps, excavator, concrete mixer etc. whenever possible	Residents living near RESSP subproject construction activities	Visual inspection	Low sound equipment used		
	Regular maintenance and service of building machinery and other during construction works		Inspection of complaints	No complaints from residents		
Noise (Part 2)	Shut down or throttling down of noisy machinery to a minimum	Construction site	Inspection of complaints	No complaints from residents	Regularly during construction	EUCL social and environmental safeguards specialists EARP-PCU social and environmental safeguards specialists
	For workers noise levels shall be kept below 80 dB (A), wherever possible. In case of exceeding this value, hearing protections must be provided to workers and warning signs must be installed					
	Notify nearby residents and businesses at least 24 hours in advance if particularly noisy activities are anticipated	Residents living near RESSP substation	Instrumental measurement in case of complaints	Residents informed in advance		
	Conduct noise-generating activities during normal work hours during the day	Construction sites at RESSP substation	Interviews	No complaints from residents		
Air Quality (Part 1)	Reduction of speed and limited movement of vehicles	Construction sites at RESSP substation	Inspection of complaints	No complaints from residents	Regularly during construction	EUCL EARP-PCU environmental safeguard specialists Supervision
	Maintain vehicles and construction machinery properly, as recommended by suppliers					
	Use dust-suppressing water on unpaved roads, e.g. spraying of water with watering trucks in advance of transportation activity	Unpaved roads used for transport	Inspection of complaints	No complaints from residents		
	Cover truck beds with tarps during material	Construction sites at				

Activity / Impact	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)		When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
			Method	Indicator		
	transport Use dust-suppressing water spray during civil works, where necessary	substation and transmission lines				consultant
Air Quality (Part 2)	Use equipment with dust suction devices in enclosed spaces during civil works, where necessary	Construction sites at substation and transmission lines	Visual inspection	Dust suction devices used where necessary	Regularly during construction	EUCL EARP-PCU environmental safeguard specialists Supervision consultant
	Store and handle material appropriately to limit dust (e.g. protect cement with tarpaulins)			Appropriate storage		
	Avoid unnecessary idling of construction machines and vehicles			No unnecessary idling		
	Burning of rubbish onsite must be strictly forbidden			No rubbish burned		
Social Impacts (Part 1)	Prioritize employment of local people for construction works	Construction sites at RESSP substation, transmission and construction lines	Visual inspection	Percentage of local people employed	Regularly during construction	EUCL EARP-PCU Supervision consultant
	Improve recruitment of women for construction works			Percentage of women employed		
	Facilitate other economic opportunities for local communities	Residents living near substation	Interviews	Other economic opportunities established		
	Health awareness workshops for workers by contractor	Construction sites	Inspection of workshop records	All workers participated		
Social Impacts (Part 2)	Develop and implement a Grievance Redress Mechanism	Construction sites at RESSP substation, transmission and distribution lines	Inspection of grievances	Percentage of grievances adequately treated	Regularly during construction	EUCL EARP-PCU Supervision consultant
	Announce start and duration of works through media and signs to the public in advance of construction period	Residents living near substation	Interviews	Public informed about construction works	In advance of construction	
Traffic Managem	Use of existing access roads to construction site	Residents living near substation	Inspection of complaints	No complaints from residents	Regularly during construction	EUCL EARP-PCU

Activity / Impact	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)		When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
			Method	Indicator		
ent (Part 1)	Keep to speed limits in public roads	Construction sites at RESSP substation, transmission lines	Inspection of complaints Visual inspection	No complaints from residents Speed limits, inspection requirements, operating rules established	Regularly during construction Regularly during construction	Supervision consultant
	Establish rights-of-way, speed limits onsite, vehicle inspection requirements, operating rules and procedures before commencement of construction					
Traffic Management (Part 2)	Maintain vehicles regularly and use manufacturer approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure	Construction sites at RESSP substation Local communities	Inspection of maintenance records	Vehicles regularly maintained and approved parts used	Regularly during construction In advance of construction	EUCL social and environmental safeguards specialists EARP-PCU social and environmental safeguards specialists
	Minimize transport distances by using locally sourced materials, if possible		Visual inspection	Locally sourced material used, if possible		
	Collaborate with local communities and authorities to improve signage, visibility and overall safety of roads, particularly along stretches located near schools or other locations where children may be present		Visual inspection Interviews	Improvement of overall safety of roads started		
	Collaborate with local communities on education about traffic and pedestrian safety	Local communities Emergency responders	Interviews	Education program about traffic and pedestrian safety established	In advance of construction	
	Coordination with emergency responders			Coordination established		

2. Monitoring during Operation and Maintenance

Activity / Impact	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)		When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
			Method	Indicator		
Employee Health and Safety	Develop Health and Safety Management Plan (HSMP) and implement HSMS for operation and maintenance of substations	RESSP substation	Visual inspection	HSMP developed and HSMS implemented	Operation and maintainance	EUCL EARP-PCU Environmental and social safeguards team
	Erect fire walls between transformers foreseen in switchyard of EARP substation to prevent spreading of fire in case of an accident			Fire walls erected		
Disposal of CFLs Pollution of land (soil), river and other natural water sources.	Develop a waste disposal plan for disposal of the CFLs	Disposal area	Visual inspection	Availability of effective Waste disposal plan for CFL	Operation and maintainance	EUCL EARP-PCU Environmental and social safeguards specialists REMA

6.4.3. Monitoring Roles and Responsibilities

Rwanda Energy Group, EUCL and EDCL

The EMP will address with specific details how the environmental and social impacts and their designed mitigation measures are to be monitored during implementation (construction/rehabilitation works) and operation (including maintenance stages. No assignment of its monitoring responsibilities by EUCL to other parties, contractors, agents should absolve it, EUCL with the technical support of EARP-PCU of their responsibility to successfully manage, mitigate or monitor any adverse impacts caused by their activities under this project. The main roles and responsibilities of EUCL and EARP-PCU for monitoring impacts of their activities and their corresponding mitigation measures will be as follows; EUCL assisted by EARP-PCU environmental and social safeguards specialist team will monitor the implementation of the approved EMP and technical designs.

Environmental and Social Safeguards Specialists

The EUCL Environmental and Social Safeguards Specialists will monitor and evaluate the environmental and social impacts at all project sites, regularly and as frequently as required and will maintain suitable records to be made available to the REMA. The social and environmental safeguards specialists will also be responsible for monitoring impacts and mitigation measures resulting from the actions of their contractors, transporters, suppliers and all third parties in the course of their duties under this project.

Therefore, wherever environmental and social impacts are or can be attributed to Rwanda Electricity Sector Strengthening Project activities, the appropriate mitigation measures will apply consistent with this ESMF and their EMP, and the EA would be responsible for monitoring and evaluating the same. The EA will prepare and submit periodic monitoring reports to EUCL and the REMA.

Rwanda Environment Management Authority

REMA will play the leading oversight role of monitoring the RESSP activities.

The RDB will carry out this role by ensuring that the environmental and social management plans (ESMPs) contained in the cleared design package is being implemented as specified therein. REMA will monitor the reports on a regular basis, perhaps quarterly. They will rely on a bottom up feedback system to them from the ground by going through the monitoring reports prepared by the EUCL's Environmental and Social specialist as well as consultants in cases where they will be used in preparing of the ESMP. REMA will also make regular site visits to inspect and verify for themselves the nature and extent of the impacts and the success or lack off, of the mitigation measures.

REMA will prepare brief consolidated periodic monitoring reports for submission to the World Bank.

For the RESSP Component

- The EUCL environmental and social experts and the existing EARP-PCU Environment and Social Safeguards Specialists and using external qualified environmental consultants will screen the design (using all drawings, specifications for workmanship and materials, screening checklist and review forms in section 8.2), for the rehabilitation and new works, at the substations and along the existing and proposed extension transmission and distribution grids, that all planning, building and environmental laws and requirements are complied with, and to identify any adverse potential and social environmental impacts of the designs.

EUCL social and environmental experts and EARP-PCU environmental and social specialists will work with the team of EUCL engineers to ensure that any adverse environmental impacts identified will be mitigated in the designs, before they are finalized. Some mitigation measures would be adjustments to the technical drawings, while others may require incorporation/adjustment of clauses to contract conditions or specifications for goods and workmanship. The EUCL engineers will also be provided with adequate training in environmental best practice aspects and management procedures related to design of sub stations and transmission/distribution lines, effective mitigation and monitoring measures and reporting.

Where land acquisition that leads to resettlement is expected, such as at the substations or possible expansion of the transmission grid, the Social Safeguards Specialist will use the separately prepared and disclosed Resettlement Policy Framework for this programme, to guide and manage external consultants to prepare on behalf of EUCL, the appropriate Resettlement Action Plans (RAPs), one for each affected site.

The EUCL Environmental and Social Specialists and the EARP-PCU social and environmental specialists using external qualified consultants will prepare an Environmental Management Plan (EMP) to accompany the final designs (including complete set of contract documents) which will include details of all mitigation measures, including RAPs, where required, to be sent to Rwanda Development Board (RDB) and the World Bank for review and clearance.

Only after clearance of the EMP and the Final Designs from RDB can tenders be launched to select contractors to carry-out the works. RDB may require certain revisions to the EMP, final designs and RAPs before granting its clearance. Additionally, for sites affected by resettlement, activities that lead to impacts on affected people requiring them to be physically resettled will not commence until the RAPs are fully implemented.

The RAPs will be reviewed for compliance with the disclosed RPF.

Any part of the ESMP and Final Design that does not comply with the requirements of the Environmental Organic Law of Rwanda and the requirements of the World Bank Safeguards policies will not be cleared by RDB.

The environmental Safeguards Specialists will monitor as stated in the cleared EMP, during construction and installation, the activities of the contractors to ensure that the works are being carried out as stated in the approved designs.

The Social Safeguards Specialist will also monitor implementation of the RAPs.

EUCL's Environmental and Social Safeguards Specialists will work closely with EUCL engineers to ensure all adverse impacts are anticipated, identified and considered in the design and planning phase of the RESSP subproject.

Consultants with guidance from EUCL environmental and social specialists will prepare EIA, ESMP and RAP for Rwanda Development Board (RDB) approval



RDB will review all aspect of the design to ensure all identified impacts are adequately mitigated. RDB and World Bank will issue approval of the ESMF for the programme and EIA/ESMP for the subproject once they are ensured of compliance with all applicable Rwanda regulation and World Bank Safeguards.

Figure 5: Summary of Key roles in the Environmental and Social Review process

7.0 RESSP SUBPROJECT PREPARATION ARRANGEMENT

7.1 Rwanda Electricity Sector Strengthening Subproject Preparation, Approval and Reporting

This section of the ESMF describes the process for ensuring that environmental and social concerns are adequately addressed through the institutional arrangements and procedures used by the project for managing the identification, preparation, approval and implementation of subprojects. This section sets out the reporting systems and responsibilities of the institutions in implementing the ESMF including the details to be addressed by the ESMF and the specific steps to be undertaken to ensure adherence to the ESMF.

7.2. RESSP Subproject

RESSP Subprojects activities will each need to be reviewed for potential environmental and social impacts. The project is expected to produce net benefits. However certain project activities may have environmental and social impacts that will require mitigation. For this reason, this project has been rated as Category B under the World Bank Policy on Environmental Assessment (OP 4.01), requiring Environmental Assessment. The subprojects are categorized among the projects which have to undergo EIA process before their implementation.

7.2.1 Subproject Screening and Screening Checklist

Subprojects and activities that fall under components A and B will each need to be reviewed for potential environmental and social impacts. The project is expected to produce net benefits however; certain project activities may have environmental and social impacts that will require mitigation. For this reason, this project has been rated as Category B under the World Bank Policy on Environmental Assessment (OP 4.01), requiring Environmental Assessment. Using the screening and review process for subproject identification presented here, will, therefore help determine which of the safeguard policies are triggered and what measures will need to be taken to address the potential adverse impacts.

The screening will further ensure that subprojects that may have potential adverse impacts are studied in greater detail including need for subproject specific EIA.

As part of the identification of sub-projects, the project proponent will prepare a simple screening checklist. The screening checklist will be prepared by the project proponent. As part of the identification of sub-projects, the project proponent will prepare a simple screening checklist. The screening checklist will be prepared by the project proponent.

The screening checklist will lead to the preparation an EIA or EMP Report for review by Rwanda Development Board (RDB). Project reports will be prepared by independent consultants as registered by REMA, who will be paid by the project implementing agency or when possible the study may be done by existing EARP social and environmental safeguards team. The EARP's environment and social specialist will offer guidance in the preparation of the screening forms and project reports.

7.2.2 Screening Checklist Review Form

Based on this application, the proposal will be reviewed and selection for the next stage of evaluation undertaken. At this selection stage, a first level of environmental screening takes place on the basis of the screening checklist completed by the proponent.

The screening checklist will be reviewed using the Review Form, to be completed either by the district officer in charge of environment or the EARP's Environmental safeguards Specialist. Where there are social impacts indicated, the form will have to be reviewed in addition by EARP's Social Safeguards Specialist. The form prompts the reviewer to verify the information provided by the proponent, and confirm the best course of action. The reviewer must consider the nature and location of the project and the anticipated impacts, and based on his/her judgment, confirm or propose the best course of action.

8.0. CAPACITY BUILDING, TRAINING PLAN AND TECHNICAL ASSISTANCE

Effective implementation of the Environmental and Social Management Framework for RESSP will require technical capacity in the human resource base of implementing institutions as well as logistical facilitation. Implementers need to understand inherent social and environmental issues and values and be able to clearly identify indicators of these.

The RESSP will be implemented by EUCL. The existing EARP-PCU has the necessary capacity for the project coordination, fiduciary, and safeguards management aspects and has been rated satisfactory for the ongoing Bank-supported portfolio under its mandate. The EUCL shall enter into a Project Implementing Support Agreement (PISA) with EDCL to enable the former to engage the EARP-PCU services, in this regard the Safeguards aspects. The social and environmental experts to be hired in RESSP and the existing EARP-PCU social and environmental safeguards team will ensure compliance with environmental and social safeguards issues during the implementation of RESSP subproject activities, public awareness, particularly among construction contractors and their works about the importance of undertaking development work while safeguarding the environment both biophysical and social environment.

The RESSP will fund the capacity building of EUCL and EDCL staff. The main objective of the training is to support the newly created entities to develop capacity and in the medium term to have in-house capacity to mainstream safeguard activities and to upgrade skills and carry regular outreach about the utility benefits of compliance. This will help to improve the effectiveness of stakeholders at various levels in the management of environmental and social impacts during planning, implementation and operation of RESSP subproject, and this is good for continued implementation and sustainability of project activities.

As regards the institutional capacity building of EUCL and EDCL and the district environmental and social officers as the key stakeholders of RESSP implementation at local level are necessary in different aspects of the implementation of the ESMF, including interpretation and implementation of environmental impact management guidelines and the World Bank safeguard policies.

8.1 ESMF implementation budget

The breakdown of estimated costs for implementing the ESMF for RESSP is provided in Table 12. This includes costs to continue capacity building of existing EARP-PCU as outlined below.

Table 12: Estimated Capacity Building Budget

ESMF _RESSP

RESSP	Group to be trained	Activity	Budget US\$				Total US\$
			Year 1	Year 2	Year 3	Year 4	
Different components of RESSP	District level Training (District Environment and social Officers)	Detailed training on use implementation and management of ESMF and associated tools (EA, Screening checklists) EA Process, Impact identification and mitigation, reporting and monitoring, using the screening checklist Implementation of RAP	25,000	25,000	25,000	25,000	100,000
	National Level (EUCL, EDCL, a unit responsible for RESSP within the ministry in charge of energy”, MININFRA	Training on fundamentals of ESMF, application and use, EA Process, Impact identification and mitigation, reporting and monitoring, using the screening checklist,	40,000	40,000	40,000	40,000	160,000
	Training for National Engineering Contractors	Training on environmental best practice aspects and inclusion during the engineering and design stages as well as during the construction phase of the project	25,000	25,000	25,000	25,000	100,000
TOTAL							360,000

***The cost for the training include cost of preparation of training materials, delivering the training, cost for venue booking, stationery and other training related materials.**

ESMF_RESSP

8.2 ESMF Implementation Budget for Rwanda Electricity Sector Strengthening Project

The estimated total cost of RESSP is an initial IDA grant of US\$ 95 Million. The total estimated cost for mainstreaming environmental and social concerns over an indicative period of 4 is approximately US\$ 9.5 million or 10% of the total project cost. The cost also includes training and capacity building costs, cost for engaging consultants to undertake the preparations of EMP/EIA. The figure of 9.5 million USD also includes the cost for mitigation and monitoring measures as will be specified in each EMP.

Under EUCL a functioning safeguards framework and mitigation procedures will be established. Each activity is expected to have only minor adverse impacts but the sheer volume of activities spread across the country that need safeguard assessments and follow-up of mitigation measures will pose a challenge for the project management team and require considerably increased safeguards capacity on a permanent basis.

It is expected to have an Environmental Expert and a Social Expert, funded by the RESSP, whose focus will be primarily to advise on safeguard related issues, develop and implement safeguard instruments as well as enforce safeguard compliance in RESSP activities.

8.2.1. Mainstreaming Costs

Costs related to the required mitigation measures for RESSP subprojects are not set out in the budgets presented here. These will be assessed and internalized as part of the overall subproject cost.

For the smaller RESSP subprojects, it is extremely difficult to estimate the proportion of the subproject cost that can be expected to be devoted to mitigation and monitoring measures. However, they should be expected to cost between 2% and 5% of the total project cost.

8.2.2. Cost of Training

The cost related to training and capacity building and monitoring including sensitization is estimated to be approximately **360,000 USD** spread out through the project period.

As indicated in the introduction, training of staff from EUCL and EDCL is expected to support the newly created entities to develop capacity and in the medium term to have in-house capacity to mainstream safeguard activities. The Environmental and social officers at the district level will be taken through training course during the RESSP implementation. Refresher training and sensitization sessions will be planned through the project life to ensure the continued implementation and sustainability of project activities.

8.2.3. Compensation/Resettlement Costs

The costs that will be incurred in relation to compensating the PAPs for loss of land, crops, vegetations etc has also not been factored in this section because of the difficulty in determining or providing a reasonable estimate.

8.3 Public consultation

According to REMA's Guidelines for EIA and the World Bank's relevant policies, public consultations are an integral component of the environmental and social screening process, EIA, RAP requirements, and the guidelines identify the following principal elements:

- Developers are required to conduct public consultation during the preparation of Project Briefs, EIAs, RAPs as well as implementation of the environmental and social screening process outlined in this ESMF
- EIA and RAP documents are made available for public review and comments. Documents to which the public has access include:
 - Project Briefs, EIA terms of reference, draft and final EIA and RAP reports, and decisions of the appropriate authorities regarding project approval.
 - Certificates approving projects will be publish.

Public consultations are critical in preparing an effective proposal for the construction and rehabilitation of the project activities. The first step is to hold public consultations with the local communities and all other interested and affected parties, during the screening process and in the course of preparing the EIA and RAP.

These consultations should identify key issues and determine how the concerns of all parties will be addressed in response to the terms of reference for the EIA, RAP which might be carried out for construction and rehabilitation proposals.

The public will be allowed to access information in Rwanda during screening, EA preparation as well as final EA reports before project appraisal and disclosure will also take place in the World Bank's INFO-Shop before project appraisal.

Instruments for Use during Consultations

The REMA Guidelines, 2006 for EIA and EA provides details concerning the public consultation methods in Rwanda. Such methods include press conferences, information notices, interviews, questionnaires, community meetings, and public hearings. The guidelines for public consultation include, among others, a requirement that major elements of the consultation program should be timed to coincide with significant planning and decision-making activities in the project cycle. In terms of Rwanda's EIA process, and World Bank policy standards, public consultation should be undertaken during (i) the preparation of the EIA and RAP terms of reference; (ii) the carrying out of an EIA and RAP; (iii) government review of an EIA and RAP reports; and (iv) the preparation of environmental and social terms and conditions of approval. Consultations will be carried out by communities as part of the environmental and social screening process of sub-projects, and the results will be communicated in an understandable language to potentially affected persons and beneficiaries.

Annexes

Annex 1: Screening checklist

RESSP Project: Select relevant project

Sub-project name [type here]

Location [type here]

Estimated cost (USD) [type here]

TYPE OF PROJECT OR ACTIVITY

Sub Project Type

Construction of Sub-station

Design and installation of a transmission and distribution network

Disposal of CFLs

Rehabilitation of networks

Other

Please give more details: [type here]

For all projects, an Environmental and Management Plan (EMP) will be required. In addition, the following studies may be required:

Yes No

Will this project affect Indigenous People? If yes, an Indigenous People's Plan will be required

Will the project require land for its development, and therefore displace individuals, families or businesses from land that is currently occupied, or restrict people's access to crops, pasture, fisheries or forests, even, whether on a permanent or temporary basis. If yes, a Resettlement Action Plan will be required

The project is not expected to trigger OP 4.04 (habitats) nor OP 4.36 (forests) and any subprojects that would do so, would be screened out.

Will the Project:

Yes No

Require large volumes of construction materials (e.g. gravel, stone, water, timber, firewood)?

Use water during or after construction, which will reduce the local availability of groundwater and surface water?

Lead to soil degradation, soil erosion in the area?

Create waste that could adversely affect local soils, vegetation, rivers and streams or groundwater

Create pools of water that provide breeding grounds for disease vectors (for example malaria or bilharzia)?

Involve significant excavations, demolition, movement of earth, flooding, or other environmental changes?

Affect historically-important or culturally-important site nearby?

Require land for its development, and therefore displace individuals, families or businesses from land that is currently occupied, or restrict people's access to crops, pasture, fisheries, forests or cultural resources, whether on a permanent or temporary basis?

Result in human health or safety risks during construction or later? Involve
 inward migration of people from outside the area for employment or other purposes?

Result in conflict or disputes among communities?

	Yes	No
Affect indigenous people, or be located in an area occupied by indigenous people?		

Result in a significant change/loss in livelihood of individuals? Adversely
 affect the livelihoods and /or the rights of women?

If you have answered Yes to any of the above, please describe the measures that the project will take to avoid or mitigate environmental and social impacts [type here]

What measures will the project take to [type here] ensure that it is technically and financially sustainable?

CONCLUSION

Which course of action do you recommend?

EMP RAP

There are no environmental or social risks

Type here

If a RAP is required, will the project Displace or restrict access for less than 200 individuals, or if over 200, are losses for all individuals less than 10% of their assets?

If Yes, prepare an abbreviation RAP

If No, prepare a full RAP

Full details of resettlement requirements are provided in the accompanying Resettlement policy Framework. Completed by: [type here]

Name: [type here]

Position/: [type here]

Date: [type here]

Format 2.0

SCREENING CHECKLIST REVIEW FORM

Based on the location and the type of project, please explain whether the Proponent’s responses are satisfactory.

Yes No

Their description of the compliance of the project with relevant planning Documents

If ‘No’, please explain: [type here]

Their responses to the questions on environmental and social impacts please explain: [type here] If ‘No’

Their proposed mitigation measures

If ‘No’ please explain: [type here]

Their proposed measures to ensure sustainability please explain: [type here] If ‘No’,

REVIEWER’S CONCLUSION

Which course of action do you recommend?

ESMP; RAP

There are no environmental or social risks

[Type here]

If a RAP is required, will the project displace or restrict access for less than 200 Individuals, or if over 200, are losses for all individuals less than 10% of their assets?

If Yes, prepare a RAP

If No, prepare a full RAP

Full details of resettlement requirements are provided in the accompanying Resettlement Policy Framework.

If this differs from the Proponent's recommended course of action, please explain:

[type here]

Preparation of a project Report, based on field appraisal by RDB environmental and social Officers, is required to investigate further, specifically to investigate:

[type here]

Reject

Review form completed by: [type here]

Name: [type here]

Position / Community: [type here]

Date: [type here]

The reviewer of the screening checklist has an option to determine whether a more detailed Project Report, based on a field appraisal, is required. A Project Report will require the EARP environmental and soil specialists to briefly visit the proposed project site, interview the project proponents, and assess the project's impacts in view of their knowledge concerning environmental and social risks and concerns in the area.

Project Reports are normally prepared as a means of informing RDB of the proposed development such that after review of the report, RDB advises on the need or otherwise for a full ESIA. The ESIA regulations allow for approval of proposed projects at the Project Report Stage and have been effectively used by RDB to grant Environmental Licenses to small projects without requiring a full ESIA.

Table 8 : The RDB Process for Approving Project Reports

Steps	Action	Actor	Time requirement
One	Submission of PR to RDB. RDB receives PR, issues a receipt and acknowledgement.	EUCL	To be undertaken by EUCL environmental and social specialists
Two	RDB mails PR to Lead Agencies	RDB	7 days assuming all requirements are fulfilled
Three	Lead agencies review PR and issue comments	Lead Agencies	21 days (minimum) after receipt of PR from RDB.
Four	Review of PR by RDB	RDB	30 days after receipt of PR.
Five	Communication of findings from RDB review	RDB	45 days after receipt of PR.

Typical outcomes of review of Project Reports from RDB are likely to be as shown in Table 9 below. These are as follows:

Project is approved. Where RDB and Lead Agencies ascertain that a project report has disclosed adequate mitigation for identified impacts, the project is approved by RDB upon which, conditions attached to grant of an Environmental License are issued. Once these are fulfilled, an Environmental License is also issued subject to conditions which will be specific to the scheme in question. Among these is the requirement that the scheme design should not be altered without approval by RDB. As well, an audit report is required of each project after the first year of completion.

Project Report discloses potential for major irreversible adverse impacts. In this case, RDB may not approve the project.

Table 9: Possible Outcomes of RDB Review of Project Reports

Outcome	Recommendation	Important precautions
Project found to have no significant Social and Environmental Impacts or Project report discloses sufficient mitigation measures	An Environmental License will be issued by the Authority	Project report must disclose adequate mitigation measures and show proof of comprehensive consultations within the area of influence.
Significant adverse social and environmental impacts found or Project Report fails to disclose adequate mitigation measures.	A full cycle ESIA will be required by RDB	As above
A proponent is dissatisfied with the outcome of the RDB review.		

Format 3.0 Project Report FormPROJECT REPORT FORM

EARP	Select relevant project
Sub-project name	[type here]
Estimated cost (USD)	[type here]
What are the project objectives and Activities	[type here]
Reason for field appraisal, based on Issues in screening checklist	
	[type here]
Approximate size of the project in land area	[type here]
Approximately size of the project in terms of affected individuals	[type here] of
How was the site of the sub-project chosen?	[type here]
Does the project comply with the most [type here] Relevant planning document, for example the Development Plan?	
Will the project:	
	Yes No
Require large volumes of construction materials e.g. gravel, water, timber, firewood)?	stones,
If 'Yes', give details: [type here]	
Use water during construction, which will reduce the availability of ground water and surface water?	local
If 'Yes', give details: [type here]	
Lead to soil degradation, soil erosion or soil salinity in the	area?
If 'Yes' give details: [type here]	

Create waste that could adversely affect local soils,
and streams or groundwater?

vegetation, rivers

If 'Yes', give details: [type here]

Create pools of water that provide breeding grounds for
vectors (for example malaria or bilharzia)?

diseases

If 'Yes', give details: [type here]

Involve significant excavations, demolition, movement of
other environmental changes?

earth, flooding, or

If 'Yes', give details: [type here]

Affect historically-important or culturally-important site

nearby?

If 'Yes', give details: [type here]

Require land for its development, and therefore displace individuals, families or businesses from
land that is currently occupied, or restrict people's access to crops, pasture, fisheries, forests or
cultural resources, whether on a permanent or temporary basis?

If 'Yes', give details: [type here]

Result in human health or safety risks during construction or

later?

If 'Yes', give details: [type here]

Involve inward migration of people from outside the area
or other purposes?

for employment

If 'Yes', give details: [type here]

Result in conflict or disputes among communities?

If 'Yes', give details: [type here]

Affect indigenous people, or be located in an area occupied by indigenous people?

If 'Yes', [type here]

Result in a significant change/loss in livelihood of individuals?

If 'Yes', give details: [type here]

Adversely affect the livelihoods and /or the rights of women?

If 'Yes', give details: [type here]

MITIGATION MEASURES

If you have answered Yes to any of the above, please propose adequate mitigation measures.

[type here]

ALTERNATIVES

Is it possible to achieve the objectives above in a different way, with fewer environmental and social impacts? If yes, describe these alternatives, and state why they have been rejected.

[type here]

OTHER OBSERVATIONS

Please describe any other observations, especially any related to the reason for the field appraisal.

type here

CONCLUSION

Approval:

There are no environmental or social risks Independent preparation of a Detailed Plan is Required:

ESMP

IPP

RAP

If a RAP is required, will the project displace or restrict access for less than 200 individuals, or if over 200, are losses for all individuals less than 10% of their assets?

If Yes, prepare a abbreviated RAP

If No, prepare a full RAP

Full details of resettlement requirements are provided in the accompanying Resettlement Policy Framework.

Reject

Review form completed by [type here names of all contributors to the appraisal] Name: [type here]

Position/ community: [type here]

Date: [type here]

In the eventuality that a Project cannot be approved by RDB on the basis of a Project Report, the proponent will be advised to undertake full cycle ESIA leading to development of a fully fledged Environmental and Social Impact Assessment Study Report.

Scoping Report

Firstly, on advice from RDB, the proponent will prepare a Scoping Report specifying the project's area of influence, the thematic scope and depth of assessments required, the composition of the required EIA team, and the probable budget required to mount the EIA Study.

ESIA Study

Upon review and approval of the Scoping Report, RDB will advise that an ESIA Study be undertaken. The ESIA Study will entail a systematic investigation of all impact areas as identified in the scoping report, taking care to document the current baseline environment, resource exploitation patterns and ecological pressure points. It is mandatory for the ESIA study to undertake public consultation with all stakeholders in the project's area of influence. The ESIA Team should note and understand all stakeholder interests so as to cater for them in the ESMP. All accruing information will be written into a Draft ESIA Report prepared in the same format as the project Report and submitted to RDB for review. Upon review of this report, it will be subjected to public review.

Public Review of the ESIA Report

This will entail exposure of all the ESIA documents at strategic points within the project's area of influence so as to allow all stakeholders to read and understand how they stand to be affected by the project. The public review has to be advertised twice in local dailies that are widely read in Rwanda, and are often supplemented by public hearings organized by REMA where the project is explained to local stakeholders. Upon expiry of the public review period, the ESIA team will organize the written comments either into an additional chapter or a volume to the ESIA report. This chapter will clearly explain how each of the comments and concerns have been addressed and resolved. This will be issued under the same conditions as is the case of the project report.

A. Suggested Format for EA Studies

The environmental impact assessment study report will incorporate, but not be limited to, the following information:

- (a) the proposed location of the project;

- (b) a concise description of the national legislative and regulatory framework, baseline information, and any other relevant information related to the project;
- (c) the objectives of the project;
- (d) the technology, procedures and processes to be used in the implementation of the project;
- (e) the materials to be used in the construction and implementation of the project;
- (f) the products, by-products and waste generated by the project;
- (g) a description of the potentially affected environment;
- (h) the environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long term effects anticipated;
- (i) alternative technologies and processes available and reasons for preferring the chosen technology and processes;
- (j) analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design and technologies;
- (k) an environmental management plan proposing measures for eliminating, minimizing or mitigating adverse impacts on the environment; including the cost, time frame and responsibility to implement the measures;
- (l) provision of an action plan for the prevention and management of foreseeable accidents and hazardous activities in the cause of carrying out activities or major industrial and other development projects;
- (m) the measures to prevent health hazards and to ensure security in the working environment for the employees and for the management of emergencies;
- (n) an identification of gaps in knowledge and uncertainties which were encountered in compiling the information;
- (o) an economic and social analysis of the project;
- (p) an indication of whether the environment of any other state is likely to be affected and the available alternatives and mitigating measures; and (q) any other matters as REMA may require.

B. Technical guidelines for environmental assessment and impact mitigation

1. Baseline studies

Baseline studies are the first stage in the EIA process. The goal of collecting baseline data is to determine the value of natural and human environments (high to low value) to be affected by project activities. With this pre-project baseline information, it will then be possible to identify and measure impacts of future project activities and preparation of a monitoring plan. Much of the baseline information may be contained in the project brief. However, during the baseline study any gaps should be identified and filed.

The baseline study will make use of a number of standard methods, including surveys, field visits and review of existing literature. Baseline studies for EASP may consist of the following main elements, depending on the type and scale of the specific project.

- Description of terrestrial vegetation, including important or rare species, account of human interventions such as clearing, cutting wood fuel and grass fuel and the agro-ecosystem
- Description of fauna and habitats, including important or rare species, interaction with human population and hunting practices.
- Description of the aquatic ecosystem, including physical and chemical features, sediments, river flow characteristics, zooplankton, macro-invertebrates, fish species and fish migration, fishing practices, aquatic plants, water hyacinths and wetland vegetation
- Identification of conservation status of project area in relation to natural environment and biodiversity issues on an international, national and regional/ local basis
- Demography: sample population and house hold surveys to provide information on number of households and affected people; population profile, birth and mortality rates, ethnic composition
- Cultural Heritage: account of history and mitigations, settlement patterns, household composition, religious practices and survey of any archaeological finds or cultural heritage sites
- Gender Issues: household composition, division of labour, women's position in society
- Resource Use: agricultural production, land holdings, cropping system, livestock, fishing, use of forests, water sources and energy use (particularly wood fuel)
- Economic activities: characteristics of the household economy, trading centres, account of skills and description of the standard of living
- Health and education: health and education facilities, major diseases, sanitation, education levels and literacy levels
- Infrastructure and Service: Roads, waterways and other forms of transportation, community water supply, electricity and sewage systems
- Visual and aesthetic aspects: local perceptions of landscape and cultural; importance and tourism potential of site
- Stakeholder: District and local authorities, local groups related to project, national and international NGOS operating in the project area, International Donor programmes as well as public perception of the project

All baseline data should be examined according to designated Direct and Indirect Impact Zone of the project, Direct Impact Zone refers to any area that is subjected to physical disturbances caused by project activities. Indirect Impact Zone refers to any other influences or charges caused by project activities on adjacent areas or surrounding communities.

2 Analysis of Impacts

The methods used for assessing project impacts and arriving at recommendations and conclusions is based on a three-step procedure of making assessment of impacts, conclusions and recommendations more objective, easier to understand and possible to trace back if desired. The core of the procedure is to combine the ‘value’ of the affected environment and the ‘magnitude of impacts’ to arrive at an ‘overall impact assessment.’

Step 1

Firstly baseline conditions, both environmental and social, are described in detail and a value, on a scale from ‘low value’ to high value’, is assigned to the impact zones and the characteristics thereof. This value is related to international, national or local guidelines, standards and evaluations. In the case of the human environment, people, cultures and health cannot be ranked in such a manner and, unlike the varying values of the biophysical environments, should be all classified as having a ‘high value’.

Low	medium	High
◆		

Step 2

The second step is to describe and evaluate the magnitude of potential impacts. The impacts are measured in terms of their extent in time and space, the vulnerability of the environments affected, the probability that impacts will occur and the reversibility of impacts. The magnitude of impacts is evaluated on a scale from ‘high negative’ to ‘high positive’. In addition, distinction between the construction (i) and operational (ii) phases of the project. The example below is for terrestrial vegetation such that possible disruption during construction would cause some negative impacts but after construction there would be little or no negative impacts.

Phase	Magnitude of impact on Terrestrial vegetation.				
	Negative High	Medium	Little/no	medium	High
i	--◆--				
ii	--◆--				

The third and final step is combining the “value” (step) and “the magnitude of impacts” (step 2) to obtain the “overall impact assessment:” (step 3). This assessment evaluated the importance of an impact on a scale from “very large negative” to “very large positive”. For instance, an area of ‘high value’ affected by a ‘High negative impact’ results in an overall impact assessment of very large

negative impact’, while an area of ‘low value’ affected by a ‘high negative impact;’ may give an overall assessment of ‘small negative impact’. It is then possible to illustrate how different mitigation measures can reduce, offset or even eliminated negative impacts or how interventions can enhance benefits. An example is given below of the overall impact assessment:

	Overall Impact Assessment	
Study	Without mitigation	With mitigation
Terrestrial Vegetation	Medium Negative. (--)	Little or no impact (-/0)

As a result of this procedure, positive and negative impacts are ranked in a relatively objective manner. An additional benefit of this approach is that the overall impact assessment also generates a priority list for mitigation and monitoring activities as well as priority of measures to optimise potential project benefits.

2 . Analysis of Alternatives

The analysis of alternatives for EARP subprojects should seek to compare various alternative options that may be available for any project, and thus determine which represents the most desirable in view of environmental and social factors. The process should therefore include an analysis and discussion of a range of alternatives to the proposed project that could feasibly meet the basis GoR and Bank environmental and social standards. The analysis and discussion should include an evaluation of the merits of each alternative with respect to the following:

- Nature of the alternative sites/locations of the EARP subprojects
- Feasibility of the alternative
- The trade-offs of advantaged and disadvantages of each alternative
- Cost effectiveness, including associated environmental costs and benefits of each alternative
- Technology and engineering design
- Interference and/or harmony with the surroundings and future plans
- Construction practices for each alternative
- Operations, including associated demands for energy and other inputs by the various alternatives
- Risk associated with the alternative e, including potential risks to human health
- Existence of important cultural and sensitive ecological systems and habitats in the proposed projects area
- Presence of endangered, rare and/ or threatened species that may be at risk if the project is implemented
- Conformation to existing policies, Plans, laws, regulation, etc.
- The “No Project” alternative

During alternative analysis, the environmental losses and gains associated with the various alternatives are compared to provide a balanced and full picture for energy development. A recommendation and indication of the preferred alternative and why it was chosen shall normally be given in the discussion of alternatives. If the preferred alternative is not the one with the least

impacts, the discussion shall normally indicate why it was chosen. The environmental and social analysis associated with alternative analysis is an important aid to the decision-making process.

Where it may not be possible to qualify or attach monetary value to a certain set of environmental impacts for purposes of comparing the various alternatives, other approaches may be adopted for placing value on such environmental impacts and thus permitting a decision to be made on the alternative to be implemented. This may involve holding meetings, seminars and /or round table discussions involving stakeholders, and /or ranking the alternatives using various important weighting techniques adopted on a project-by- project basis.

4. Impact Mitigation Guidelines

The purpose of impact mitigation is to look for alternative and better ways of implementing the proposed project or associated activities so that the negative impacts are eliminated or minimized, while benefits are enhanced. Impact mitigation requires that the full extent of the anticipated environmental problems be understood. In the following sections key environmental issues are outlined as guidelines for assessing impacts and formulating mitigation measures.

Avoidance of Areas of High Biodiversity

The important guidelines in relation to the development of EARP or any project of this kind is the avoidance of sensitive and high biodiversity sites as locations for projects. This would relate to hydropower and diesel generator schemes since PV systems would be preferable in such areas as National Parks. This includes avoidance of National Parks and other areas with a high biodiversity or conservation value. Avoidance of these areas concerns not only project impacts but also the anticipated population influx and human development that may remain after project completion

Soil Degradation and Erosion

Soil degradation and erosion due to construction activities and potential increases in agricultural activities in EARP subproject areas. This may be primarily in the case of hydropower project but population increases can be expected in area where electricity is made available given the advantages of electricity and the relatively few rural areas that are presently supplied. Increased demand for food could result in shorter fallow periods, use of areas prone to erosion and other negative impacts that degrade the soil and caused erosion.

Impact on Vegetation

Charting potential and actual changes in the biological environment will form an important part of assessing and monitoring of impacts. Many EARP subprojects will involve some clearing activities and potential population influx into new areas. Measures to control negative impacts may include demarcating areas, limiting project activities away from sensitive areas and conducting environmental awareness programs. The latter would be imperative when projects are located near National Parks or other areas of important biodiversity. After project construction, revegetation programs and reforestation programs may be undertaken and should be funded by the project developer as part of the overall mitigation plan.

In addition to the above, a number of social-economic impacts could occur and these need to be addressed in a similar manner.

5. Identifying Opportunities from Position Impacts

The ESIA study should address positive impacts that may arise from the electrification. It should also explore opportunities for environmental enhancement. The involvement of local communities is essential in developmental enhancement. The involvement of local communities is essential in developing ways to enhance positive impacts.

6. Environmental management Plan

Goals and Objectives

An environmental Management Plan (EMP) should clearly define all environmental requirements for the successful integration of measures to eliminate, offset or reduce the expected impacts as identified in the EIA. The EMP forms the link between the impacts and mitigation measures presented in the EIA and the implementation of a range of management activities. The EMP should outline the mitigation measures, Monitoring activities and institutional arrangements to be followed during the pre-construction, construction, operation and decommissioning (if applicable) phases to avoid or control impacts as well as indicating the scheduling, budgets and responsibilities for the recommended mitigation and monitoring activities.

ESIA studies for EARP should identify a variety of impacts that a particular projects is likely to have on the natural and human environments, Timely and efficient implementation of mitigation measures and monitoring activities should be recommended in the ESIA in order to endure the environmental and social sustainability of the project, which is the overall objective for the EMP.

Stakeholders

A large number of stakeholders or partners are likely to be involved in the ESIA consultation and project planning of RESSP. These could include the RDB, MININFRA, District Authorities, Local Councils, REMA, NGOs and the local population. The involvement of these groups should be maintained during the implementation of mitigation measures and monitoring. Certain mitigation and monitoring activities, in terms of project design, construction methods and project operation are clearly the responsibility of the developer. However, other stakeholders could be heavily involved in the implementation of the EMP, particularly in the mitigation and monitoring activities relating to such issues as conservation areas, agricultural intensification and social development strategies. It is especially important to involve relevant stakeholders in these types of ‘development’ activities in order for the benefits to be maintained in the long term. The project developer has the financial responsibility for the EMP. However, particular activities may be the responsibility of other stakeholders who will also participate in the implementation.

A table outlining mitigation measures, responsible party, involved other parties and cost will need to be presented as part of an EMP.

Mitigation Measures

Mitigation measures, depending on the scale and type of project, may divide into two levels; level I will include measures that are required by World Bank and REMA guidelines as conditions for approval of a project by RDB. Level II will include measures that are highly recommended although not considered of such importance that they should be set as conditions for project implementation. Although not conditions for development these mitigation measures could still have major positive effects.

An approximate cost should also be presented with each main mitigation measure. Budgeting must be further detailed during the refinement of the plan by those responsible for implementation of the EMP. In order to implement the recommended mitigation measures effectively and in a timely manner it is considered important that adequate organizational and managerial bodies are in place.

Capacity building is an important element in any project that has long term objectives. In case of RESSP , efforts to maintain the environment and improve social conditions will be greatly enhanced by improving the capacity of local and district organizations to deal with new situation. Regular meetings and workshops will be needed to discuss ongoing concerns and improve understanding.

The local authorities will also be involved in a number of activities that will require training and capacity building in areas such as social development programmes and conservation awareness.

Annex 2: Projects which require an Environmental Impact Report (REMA GUIDELINES)

FIRST SCHEDULE

PROJECT CATEGORY		DESCRIPTION
1	Infrastructure Projects.	
	a) Road and highway projects, bridges and tunnels.	Includes construction and rehabilitation of all these categories of infrastructure.
	b) Airports, airstrip, heliport.	
	c) Landing sites or boat marinas on lakeshores.	
	d) Railway line and tramways.	
	e) Dams, reservoirs or other installations for storing water on a long-term basis.	
	f) Pipelines, sewers and underground electricity or communications infrastructure.	
	g) Solid waste management (collection, transportation and disposal) facilities.	Including landfills, transfer stations, incinerators, recycling facilities and waste processing/ treatment/destruction plants.
	h) Liquid waste management facilities.	Including industrial wastewater and sewage treatment plants.
	i) Car depots, car washing bays garages, facilities for storage of scrap metal and scrap vehicles.	
	j) Water treatment, supply and distribution infrastructure.	
	k) Telecommunications infrastructure	Including masts, base stations and optical cable networks.
2	Land use and built development projects.	
	a) Urban development projects including commercial buildings, residential, or conference halls that sit more than one hundred (100) people.	
	b) Business parks, modern markets, international markets, free trade zones.	
	c) Hotel, holiday village or tourist and recreation developments.	
	d) Theme parks.	
	e) Recreation and sporting facilities/activities.	Including permanent racing tracks, cable cars and campsites.
	f) Golf courses.	
	g) Industrial estates/ parks.	
	h) Defense facilities.	Defense developments may require EIA depending on their type/effect, proposed site and land area to be occupied.
	i) Stadiums of capacity of more than 1000 people.	
	j) Construction of schools	
	k) Construction of hospitals and healthcare facilities.	

	PROJECT CATEGORY	DESCRIPTION
3	Developments on lakeshores, riverbanks, rivers, lakes and wetlands.	
a)	Reclamation of land from wetlands.	
b)	New resorts, beach or beach enhancement.	
c)	Dredging/ mining on lake bottoms and riverbeds.	
d)	Ports	
4	Extractive industry.	
a)	Hard rock quarry.	Including restoration of disused quarries.
b)	Soft rock quarry.	
c)	Murram (gravel) quarries.	
d)	Sand quarries.	
e)	Clay quarries.	
f)	Drilling for petroleum and natural gas.	EIA is required for each contact production contact area.
g)	Commercial mining on more than one half (0.5) hectares.	
h)	Groundwater abstraction wells and artificial recharge schemes.	
i)	Mineral processing industries.	Including cement processing plants, rock processing plants, ready-mix concrete plants, concrete block/brick plants, tarmac production plants and lime kilns.
j)	Salt extraction schemes.	
5	Agricultural projects.	
a)	Reclamation and drainage of swampland of more than 5 hectares.	
b)	Irrigation projects on land exceeding 5 hectares.	
c)	Commercial livestock projects.	Including commercial rearing of poultry, pigs, rabbits, beef cattle, dairy cattle, ostriches and crocodiles (and any other animals which can create an ecological imbalance if they escaped into the wild).
d)	Aquaculture projects (farms and hatcheries) rearing aquatic plants or animals on more than 5 hectares.	
e)	Commercial fishing.	
f)	Greenhouses and protected crops.	
g)	Crop and animal farming activities on more than 50 hectares that use fertilizers and chemicals to increase production.	
h)	Agricultural activities that use hybrid seeds.	

i)	Agricultural activities that use of pesticides.	
j)	Farming of non-indigenous crops and animals.	

6	Energy projects.		
	a)	Crude oil refining facilities.	
	b)	Industrial briquetting of organic residues.	
	c)	Thermal power stations for electricity generation.	
	d)	Hydroelectric power dams.	
	e)	Commercial renewable power plants (wind farms, solar, geothermal).	Including installation and harnessing of wind, sun and geothermal for commercial energy generation.
	f)	Nuclear energy facilities.	Including storage, reprocessing and disposal of radioactive waste.
	g)	Storage depots, petrol stations and transportation networks of gasses, fossil fuels and petroleum and petrochemicals.	Including petroleum or petrochemical storage depots, resale stations, surface and underground storage of combustible gases and petroleum, pipelines for transportation of gas, steam or hot water.
	h)	Commercial steam, hot water and ice plants.	
	i)	Electricity transmission lines.	Transmission of high voltage electrical energy by overhead cables.
7	Industrial developments and operations.		
	a)	Construction of industries facilities	
	b)	Industrial smelting of iron and steel.	
	c)	Manufacture of asbestos cement and other products containing asbestos.	Including clutch plates, brake linings, insulation materials etc.
	d)	Manufacture, recycling and storage of chemicals.	Including organic/inorganic chemicals, plastics, fertilizers, pesticides, paints, vanishes, pharmaceuticals, soaps and detergents, explosives and any other related products.

	e)	Processing of metals.	<p>Including:</p> <p>i) Roasting, palletising and sintering of ores.</p> <p>ii) Iron and steel works including foundries, forge, smithery, drawing plant and rolling mill, not being works falling within (i) above.</p> <p>iii) Pressing, drawing and stamping of large castings.</p> <p>iv) Installations for production (including smelting, refining, drawing and rolling) of non-ferrous metals including precious metals (e.g. gold, silver mercury).</p> <p>v) Installations for surface treatment and coating of metals and plastics using electrolytic or chemical processes.</p> <p>vi) Boiler making or manufacture of reservoirs, tanks and other sheet-metal containers.</p> <p>vii) Boat-making facilities.</p> <p>viii) Manufacture or assembling motor vehicles or their engines.</p> <p>ix) Installations or manufacture or repair of aircraft.</p> <p>x) Installations for the application of fused metal coats (e.g. zinc plating).</p>
8		Glass and ceramics	
	a)	The manufacture of glass and fiberglass.	
	b)	The manufacture of ceramic products by burning, in particular roofing tiles, bricks, refractory bricks, floor tiles, stoneware or porcelain.	
9		Food processing.	
	a)	Manufacture of vegetable or animal fat.	
	b)	Packing or canning of animal or vegetable products.	
	c)	Manufacture of dairy products.	
	d)	Beer brewing.	
	e)	Bottling of beverages.	
	f)	Baking and confectionery.	
	g)	Animal slaughter houses and abattoirs.	
	h)	Manufacture of industrial starch.	
	i)	Fish meal or fish-oil industry.	
	j)	Sugar processing.	
	k)	Commercial production of livestock feeds.	
	l)	Commercial grain storage and milling.	
	m)	Coffee processing plants	

10	Textile, leather, wood and paper industries.	
	a) Manufacture of fibreboard and plywood.	
	b) Manufacture of pulp and paper.	
	c) Fiber drying factories.	
	d) Cellulose processing and production facilities.	
	e) Tannery and leather industries.	
	f) Timber treatment & processing facilities.	
11	Rubber industry.	
	a) Manufacture, treatment and recycling of rubber products.	
12	Forestry.	
	a) Planting commercial forest plantations on more than 5 hectares.	
	b) Harvesting more than 2 hectares of forest cover at once.	
	c) Planting non-indigenous trees.	
	d) Making more than half a tonne of charcoal.	
	e) Activities carried out in national parks or around national parks.	
	f) Commercial mining on more than 0.5 hectares.	

Annex 3: Suggested Format for a Simple EMP

The ESMF emphasizes that an environmental management plan (EMP) should fit the needs of a subproject and be easy to use. The basic elements of an EMP are:

- A description of the subproject activity;
- A description of potential environmental impacts;
- A description of planned mitigation measures;
- An indication of institutional/individual responsibility for implementing mitigation measures (including enforcement and coordination);
- A program for monitoring the environmental effects of the subproject both positive and negative (including supervision);
- A time frame or schedule; and
- A cost estimate and source of funds.

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Responsibility (including enforcement and coordination)	Monitoring Requirements (including supervision)	Time Frame or Schedule	Cost Estimate
[type here]	[type here]	[type here]	[type here]	[type here]	[type here]	[type here]
[type here]	[type here]	[type here]	[type here]	[type here]	[type here]	[type here]
[type here]	[type here]	[type here]	[type here]	[type here]	[type here]	[type here]

The above matrix should be filled out for each subproject that will have the need for a separate EMP (the screening process using the screening checklist should determine this).

EMP contents usually are:

- **Description of adverse impacts:** The anticipated impacts are identified and summarized.
- **Description of Mitigation Measure:** Each measure is described with reference to the effects it is intended to deal with. As needed, detailed plans, designs, equipment description, and operating procedures are described.
- **Description of monitoring program:** Monitoring provides information on the occurrence of impacts. It helps identify how well mitigation measures are working, and where better mitigation may be needed. The monitoring program should identify what information will be collected, how, where and how often. It should also indicate at what level of effect there will be a need for further mitigation. How environmental impacts are monitored is discussed below.
- **Responsibilities:** The people and organizations that will carry out the mitigation and monitoring activities are defined, as well as to whom they report and are responsible. There may be a need to train people to carry out these responsibilities, and to provide them with equipment and supplies.

- **Implementation Schedule:** The timing, frequency and duration of mitigation measure and monitoring are specified in an implementation schedule, and linked to the overall sub project schedule.
- **Cost Estimates and Source of Funds:** These are specified for investment for the mitigation and monitoring activities as the project is implemented. Funds to implement the EMP will predominantly come from RESSP.
- **Monitoring methods:** Methods for monitoring the implementation of mitigation measures or environmental and social impacts should be as simple as possible, consistent with collecting useful information, so that EUCL can apply them. For instance, they could just be regular observations of the project activities or sites during construction and then when in use. Are plant/equipment being maintained and damages repaired, does a water source look muddier/cloudier different than it should, if so, why and where is the potential source of contamination. Most observations of inappropriate behavior or adverse impacts should lead to common sense solutions. In some case, e.g. high emission of green house gases or loss/death of flora and fauna, there may be need to require investigation by a technically qualified person.

Annex 4 : Chance Find Procedures

Chance find procedures will be used as follows:

- Stop the construction activities in the area of the chance find
- Secure the site to prevent any damage or loss of removable objects.
- Notify the supervisory Engineer who in turn will notify the responsible local authorities (at the district level) and the Ministry of Culture and Sport (within 24 hours or less);
- The local authorities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archeologists of the Directorate of Museums (within 24 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
- Decisions on how to handle the finding shall be taken by the Ministry of Culture and Sport. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;
- Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the Ministry of Culture and Sport;
- Construction work could resume only after permission is given from the responsible local authorities and the Ministry of Culture and Sport concerning safeguard of the heritage;
- These procedures must be referred to as standard provisions in transmission lines and substations construction contracts, when applicable. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered are observed;
- Construction work will resume only after authorization is given by the responsible local authorities and the Ministry of Culture and Sport concerning the safeguard of the heritage; and
- Relevant findings will be recorded in World Bank Implementation Supervision Reports, and Implementation Completion Reports will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.

Annex 5: Itinerary of Stakeholder Consultations and visited sites

Dates	Consulted person/ Position	Venue	Observation / Points raised	Suggestions by stakeholders and how they are taken into account by the project (proposed action in this ESMF)
Gisagara District				
May 1,2015	District Infrastructure and environmental officers	District Headquarter' offices	<p>Considerable delays in compensation payments; Some cases of expropriation are also pending; Delays are generally due to errors not because of lack of funds but due to errors in account numbers;</p> <p>There is no problem with assets valuation. Access to electricity is expanded throughout the district but connectivity to households is very low, but the process is on a good track.</p>	<p>Local authorities should work hand in hand with SACCOs (bank) in order to avoid errors in accounts numbers.</p> <p>Compensation payments should be done before the commencement of project works <i>The project will conduct a RAP and will diligently compensate the people affected by the project.</i></p>
May 1,2015	Community including PAPs	Duwane, Rwanza and Save centres	<p>The poles are installed along the road and no need for compensation</p> <p>People residing along local main roads have access to electricity; the majority is connected with local government support but there is a number of those who cannot afford the service.</p> <p>Those who are able to afford the electricity costs in remote rural areas claim that REG targets public institutions only and ignore <i>imidugudu</i> in which they reside.</p>	<p>The incapacity to afford the costs of electric power for household lighting and other services is due to poverty. Therefore, poverty reduction strategies have to be strengthened. <i>The project will advocate for electricity be extended to settlement areas in remote areas (imidugudu)</i></p>
Nyanza District				
May 2, 2015	Gasoro local community	Butara Centre Butara Cell	<p>Assistance to PAPs in connecting their households. Highlights lots of positive socioeconomic impact of access to electricity in rural areas; Some delays of compensation due to the availability of annual budget</p>	<p>Expand access to electricity in remote areas, particularly trade centers and <i>imidugudu</i> <i>The project will advocate for electricity be extended to settlement areas (imidugudu)</i></p>
Muhanga District				
May 2, 2015	Shyogwe local community	Shyogwe Kinini Centres	<p>The beneficial impact of the electricity Adverse impact of the subproject</p>	-

Huye District				
May 28, 2015	Mayor District Environmental officer	District Headquarter, Offices	Assistance to PAPs in connecting their households. Highlights lots of positive socioeconomic impact of access to electricity in rural areas; Some delays of compensation due to the availability of annual budget	Expand access to electricity in remote areas, particularly trade centers and imidugudu <i>The project will advocate for electricity be extended to settlement areas (imidugudu)</i>
May 8, 2015	Ngoma and Karama local communities	Karama and Matyazo Centres	People are generally happy praise the government for having connected their villages and trade centres. There are some cases of laws/regulations infringement while connecting electricity	<i>The project will avoid electric cables over homes (M kv) as per EUCL guidelines on power transmissions lines</i>
Nyamagabe District				
May 28, 2015	Vice Mayor (Economic affairs)	District Headquarters, office	The geographical aspect of the region doesn't smooth electricity connectivity; The process of compensation is slow but this is not a district fault. Compensation payment is REG responsibility, which means that delay issues should be addressed to REG not to the district. Gender is neglected in many aspects including the responsibility of managing money from compensation or taking a decision on household properties. Less than 5% of one's land is not compensated, i.e. a piece of land where an electric pole is implanted.	<i>The project will encourage gender equality in households' resources management</i>
May 28, 2015	REG/EDCL technicians in Nyamagabe)	EDCL/Nyamagabe station office	Safety and health measures during construction works	-
May 27, 2015	Rukarara I and II officials	Rukarara I and II station	Losses have been calculated since March 2014, but since then people wait for compensation payments. However, there is a number of those who have been compensated including the owner of the land where the Rukarara station II was built. Land acquisition along the road is not considered in expropriation and compensation process.	Advocacy for compensation payment <i>Land acquisitions under the ROW as well as crops/trees destroyed are considered for compensation and the project will conduct a RAP and will diligently compensate the people affected by the project.</i>
May 27, 2015	Uwinkingi Sector staff in charge of land	Uwinkingi Sector office	Compensation payment is a challenge because local authorities don't have an answer to it. They have to wait for budget People residing close to the sector premises are connected	Advocacy for compensation payment

			and praise the project performance. Electricity distribution and connectivity to other households is expected soon on condition that they join planned sites for imidugudu.	
May 27, 2015	Local community	Uwinkingi Centre	People claim not only their compensation but also to have access to electricity in their villages.	Compensation payment should be paid beforehand <i>The project will conduct a RAP and will diligently compensate the people affected by the project.</i> <i>The project will advocate for electricity be extended to settlement areas (imidugudu)</i>
Ruhango District				
May 28, 2015	District Environmental/social officer District infrastructure officer	District Headquarters, Office	Some regulations are not implemented. i.e. the distance from the main roads to where poles are supposed to be planted is violated. Private project implementers violate laws most often and cut down public forests without compensation. When EDCL/EARP collaborates in advance, even compensation payment is quick and laws and regulations are followed.	EDCL/EARP should actively involve local authorities in preparation and implementation of electricity projects. <i>Land acquisitions under the ROW as well as crops/trees destroyed are considered for compensation. The project will conduct a RAP and will diligently compensate the people affected by the project.</i>
May 28, 2015	Local community	Ruhango Centre	Impact of EARP subproject	Local government involvement during subproject planning. <i>As key stakeholders in resettlement and compensation process, local government officers will be consulted during different sub projects stages</i>
Gakenke District				
May 29, 2015	Janja substation staff		Neighbouring population to Janja substation has been compensated but they complain about confusing and unclear boundaries between their land and expropriated land. Local staff was not able to explain that phenomenon.	The Boundaries of the substation are not clearly demarcated. It is a sine qua none condition in order to avoid conflict escalation <i>The project will conduct public consultations during environmental and social studies and reports will be disclosed to the public</i>
May 29, 2015	Local community	Mugunga, Kabiganda Centres	People living close to the station complain about lack of electricity access and connectivity while they are close to Janja sub station	They requested to be connected to electricity <i>The project will advocate for electricity be extended to settlement areas (imidugudu)</i>

			Delays of compensation for lost crops during construction activities	
Rulindo District				
June 1, 2015	New Rulindo substation surrounding community	Rebero Village, Kayenzi Cell, Bushoki sector	Compensation process. In case of wrong bank accounts and inadequate identification of beneficiary, the compensation process takes too long	Some PAPs requested some facilitation in providing the bank account in order to get their compensation package <i>The project will conduct a RAP and will diligently compensate the people affected by the project. The Project and District staff will facilitate administration process for payment of compensations to the PAPs</i>
Kirehe District				
June 2, 2015	District officials (urban planning in charge of and expropriation District environmental officer	District headquarter/offices	Compensation of losses is an issue since the payments process is long. After having collected the signed lists of beneficiaries on which the damaged assets and owed amount is mentioned, the lists are sent to Ngoma Branch , then continue the journey to Kigali EDCL/EARP headquarter and then follow the payment the same channel downwards. The process is too long.	District officers suggested the decentralization of not only the funds for compensation and expropriation but also to be given the EIA report and involve its officers in the planning and implementation of EARP subprojects <i>The project will conduct public consultations during environmental and social studies and reports will be disclosed to the public.</i>
June 2, 2015	Nyarubuye Sector officials (executive secretary and staff in charge of social affairs)	Executive secretary's office	Compensation is an issue. In a project where the district is directly involved, compensation is immediate, but when EARP takes the initiative alone without involving the district, compensations delay and people are discontented. In order to be compensated, property title is a condition, which means that those who lease and tenant don't have to claim when their assets are damaged	Find a way of handling the problem of tenants and leases compensation when their crops are damaged <i>Land acquisitions under the ROW as well as crops/trees destroyed are considered for compensation and the project will conduct a RAP and will diligently compensate the people affected by the project.</i> <i>District officers are key stakeholders in the preparation of EIA and RAP reports and will be fully involved in the expropriation process</i>
June 2, 2015	Mareba local community	Mareba cell centre	They are happy with EARP program. But their worry is about lack of guarantee in case the power cut and back damages their electronic machines or burns their houses. They don't know	Assure people that any damaged asset due to technical failure would be refunded

			who would be responsible of damages	
Rusizi District				
June 5, 2015	Gishoma-CIMERWA	Gishoma Centre	Compensation process and Grievance Redress Mechanism They received their compensation payments	-
Bugesera District				
June 8, 2015	District Coordinator of one stop centre District environmental officer	District Headquarters/ offices	People are generally enthusiastic when they have access to power in their area. Very few claim compensation for loss crop or used land, but the majority don't require any compensation	-
June 8, 2015	Community in Karumuna Centre	Karumuna Centre	In this area, people are generally ready to pay any costs provided that they have access to electricity. They don't need any compensation; their concern is only to have access power.	-
June 8, 2015	A Welder	Karumuna Centre	Two main concerns in this area: (i) frequent power cuts (ii) Insufficient power due to a weak power convertor in Karumuna	Minimize power cuts in order to facilitate the development of rural income generating activities and small industries

Public institution consulted (MINIRENA, REMA, RNRA, RURA, RSB, EDCL/EARP) and Property valuers				
June 15, 2015	Environmental Protection Specialist /MINIRENA	MINIRENA head office	Instrument of wetland protection Adverse impact of EARP subprojects on wetland and forest	<i>Natural habitats such as wetlands and forests are not expected to be impacted by the project and EIA studies for sub-projects will be conducted to prevent potential impacts to such critical ecosystems.</i>
June 12, 2015 June 13, 2015	Forestry protection officer/RNRA Monitoring and Evaluation Specialist	RNRA head office	Instrument of forest protection The way of minimizing adverse environmental and social impacts such as minimize tree cuttings Consultation between EARP and RNRA before clearing state and district forest	They highlighted the need for involvement of RNRA and district before commencement of state and district tree cutting <i>Natural habitats such as wetlands and forests are not expected to be impacted by the project and EIA studies for sub-projects will be conducted to prevent potential impacts to such critical ecosystems. In case of tree cutting under the ROW, district officers will be involved in the process</i>
June 13, 2015	Land valuer	Property valuer	Property valuation process	The replacement cost method should be used for

		office in Kigali		structures and house Market value is used for crops and trees <i>The project will conduct a RAP following international standards and will diligently compensate the people affected by the project.</i>
June 15, 2015	Director ER and PC/REMA	REMA head office	Complaint of local schools about bad smells from creosote-treated poles. No significant environmental impact of transmission lines in sensitive ecosystems such as wetlands	Determine the extent of potential solid and liquid waste generation, including hazardous wastes such as creosote, and appropriate material/waste storage facilities Regular monitoring to ensure health and safety for the general public in areas of operation <i>The project will prepare and implement an Environmental Management Plan following international standards and national guidelines</i>
June 16, 2015	Director of Energy regulation /RURA	RURA head office	Affordability of the electricity services Instruments in electricity regulation (laws, guidelines)	To facilitate the vulnerable group (poor) to afford the electricity services <i>The project will advocate for electricity be extended to settlement areas (imidugudu)</i>
June 17, 2015	Metrology Division Manager /RSB	RSB head office	Quality of transmission lines, substation construction materials used at EARP	-
June 17, 2015	Head commercial cycle performance/EDCL	EDCL head office	Cost of electricity and current connection and production capacity of Rwanda, Affordability	-
June 18, 2015	EARP Coordinator	EDCL/EARP head office	The structure and responsibility of EARP coordination Expropriation and compensation procedures	-
June 18, 2015	Director of construction and contract management	EDCL/EARP head office	ROW for LV, MV Monitoring of construction activities	-
June 15, 2015	Director of general services	EDCL/EARP head office	Construction of transmission line and affected assets	-
June 15, 2015	Monitoring and evaluation specialist	EDCL/EARP head office	Background of EARP	-

June 15, 2015	EARP/ GIS supervision	EDCL/EARP Kiyovu Office	Provision of different maps and localization of the transmission lines	-
June 15, 2015	EARP/planning engineer	EDCL/EARP Kiyovu Office	Background and the planning of EARP subproject	-
June 18, 2015	EARP environmental safeguard specialists	EDCL/EARP head office	Implementation of the proposed EMP and monitoring	The environmental safeguard specialists should be actively involved in subproject planning Monitoring of the implementation of EMP is necessary for contractors <i>The project will prepare and implement an Environmental Management Plan following international standards and national guidelines. The role of Environmental specialists will be detailed in the report.</i>
June 18, 2015	EARP Social safeguard specialist	EDCL/EARP head office	Process of conducting RAP and Grievance Redress Committee	The social safeguard specialist should be actively involved in subproject planning. Social safeguard specialist is overloaded because his in charge of handling all social aspect in all EARP subprojects. EARP should increase the number of social safeguards to deal with monitoring of the implementation of EMP and RAP <i>The project will prepare and implement an Resettlement Action Plan following international standards and national guidelines. The role of Social specialists will be detailed in the report.</i>
June 19, 2015	EARP/ in charge of Remera electrical equipments and creosote treated poles storage site	Remera store for transmission line construction materials	Solid waste management Bad smells from creosote treated poles	The EARP management is aware and is searching the new storage sites <i>The project will prepare and implement an Environmental Management Plan following international standards and national guidelines.</i>