ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR THE CONSTRUCTION OF MEDIUM VOLTAGE LINES IN KARONGI AND RUTSIRO DISTRICTS.

Submitted:

By

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February 2020

EXECUTIVE SUMMARY

The Government of Rwanda through the Energy Development Corporation Limited (EDCL) has secured a budget for construction of a Medium Voltage line in Karongi and Rutsiro Districts to supply power to 10 sectors.

This Environmental and Social Management Plan (ESMP) is prepared in relation to the above project to comply with national legislation and international environmental and social safeguards policies related to energy projects.

The ESMP was prepared by Mr. KABANDA Philbert, a Registered EIA Lead Expert (RAPEP/EA/021/2018) under the Rwanda Association of Professional Environmental Practitioners (RAPEP) and a Certified Property Valuer (RC/IRPV/169/2018) under the Institute of Real Properties Valuers of Rwanda (IRPV) with vast experience in similar projects.

The aims and objectives of ESMP is to inform the process of decision-making by identifying the potentially significant environmental effects and risks of development projects on a short term and to promote sustainable development by ensuring that development projects do not undermine critical resource and ecological functions or the wellbeing, lifestyle and livelihood of the communities and people who depend on them.

The ESMP evaluated the project in view of the potential impacts (both negative and positive) related to the construction of the Medium Voltage Lines in Karongi and Rutsiro Districts. The ESMP has been prepared on the basis of field surveys, site visits and desk studies including; review of key documents relevant to the environmental legislative and policy frameworks for Rwanda, identification of potential adverse impacts and recommendation of an Environmental and Management and Monitoring Plan.

Special attention has been given to the management of site installation, vegetation clearing, affected people and properties compensation, site clearing, impacts on the vegetation, soil, ground and surface water, air quality, human nuisance, dust generation increase, flora and fauna, wastes generation and cultural heritage.

In addition, this ESMP indicates, the positive impacts of the project that are encouraging and dwell mainly on socio-economic improvements, electricity supply, employment, wealth creation, affordability of construction materials and affordability of medical insurance and education for the employed workers.

Negative impacts include crops and trees losses, soil pollution, disruption of natural drainage, water pollution due to construction in waterfront structures, construction spoil disposal and waste disposal; increase in water demands, increase in noise, air pollution in the vicinity of construction corridor.

Furthermore, the ESMP proposes the measures to mitigate the identified negative impacts and enhance the positive ones which proposed. An environmental and social monitoring plan indicating the mitigation measures, procedure to be followed, the responsible parties to implement these measures and likely cost of implementing each of these mitigation measures have all been included in this plan.

The ESMP concludes that the negative impacts caused by the construction of the Medium voltage lines are limited to the Right of Way (RoW) where the activities are planned and can be mitigated, minimized or managed.

The ESMP further recommends that the environmental and social monitoring is implemented, and a qualified environmentalist is tasked to ensure compliance of the ESMP implementation.

Further, the ESMP provides recommendation in relation to compensation process and timing, inventory of properties, to recruiting an environmental and social specialist to monitor the ESMP implementation, various training, awareness, tool box meetings and sensitization programme, excavated soil management, noise generated by the project activities, waste management, incidents recording, GRM records and establishment of a Grievance Redress Mechanism committee, gender related requirements and child abuse or exploitation.

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LIST OF ABBREVIATIONS

AP:	Angle Point
BP:	Bank Policy
CAE:	Child Abuse and Exploitation
CBD:	Central Business District
CEC:	Century Engineering Contractors
Dba:	Decibel
EDCL:	Energy Development Corporation Limited
EACCCP:	EAC Climate Change Policy
EIA:	Environmental Impact Assessment
EDPRS:	Economic Development and Poverty Reduction Strategy
ESMP:	Environmental and Social Management Plan
EPC:	Engineering, Procurement and Construction
EA:	Environmental Assessment
ECOSAN:	Ecological Sanitation
GBV:	Gender Based Violence
GRC:	Grievance Redress Committee
IRPV:	Institute of Real Properties Valuers
kV:	Kilo-Volt
MININFRA:	Ministry of Infrastructure
OP:	Operational Policy
PAP:	Project Affected People
STD:	Sexually Transmitted Diseases
RwF:	Rwanda Franc
RAP:	Resettlement Action Plan
RAPEP:	Rwanda Association of Professional Environmental Practitioners
REMA:	Rwanda Environmental Management Authority
RDB:	Rwanda Development Board
RBS:	Rwanda Bureaus of Standards
RPF:	Resettlement Policy Framework
RoW:	Right-of-Way

SDG: Sustainable Development Goals

USD: United States Dollar

ToR: Terms of Reference

WASAC: Water and Sanitation Corporation

CHAP I: INTRODUCTION

1.1 General introduction

In Rwanda like in many other countries reducing the burden of environmental impacts is necessary if development is to become sustainable. As resources become limited, environmental impacts are becoming more complex, and as a result, ESMP is of ever increasing importance as a tool for development decision-making and projects implementation.

In practice, ESMP is applied primarily to prevent or minimize the adverse effects of major development projects. It is also used as a planning tool to promote sustainable development by integrating environmental considerations into a wide range of proposed actions. Most notably, the use of policies and plans to focus on the highest levels of decision making and take care of the environment in considering development alternatives and options.

More limited forms of ESMP can be used to ensure that smaller scale projects, conform to appropriate environmental and social standards or site and design criteria.

The aims and objectives of ESMP can be divided into two categories.

- The immediate aim (short term) of an ESMP is to inform the process of decision-making by identifying the potentially significant environmental effects and risks of projects development and implementation.
- The ultimate aim (long term) of an ESMP is to promote sustainable development by ensuring that development projects do not undermine critical resource and ecological functions or the wellbeing, lifestyle and livelihood of the communities and people who depend on them.

Rwanda like any other global player and a signatory of a number of International environmental treaties and protocols has embarked on actions to protect, preserve and improve the quality of the environment and ensure sustainable resources utilization. The protection and safeguarding of environment has become an important concern in Rwanda. Key environmental challenges concern; deforestation, soil erosion, misuse of wetlands and poor liquid and solid waste management associated with negative impacts on human and biodiversity thus a hindrance to sustainable development of the country.

This trend of events has led to the reform of environmental policies, legal and institutional framework aimed at safeguarding the environment, an indication of government concerns to awaken the minds of the public to the dangers of environmental degradation. This will promote and enhance the wellbeing of the present and future generations.

Realizing the magnitude of the problem, the Government of Rwanda has got on reforming strong environmental policies, legal and institutional instruments to safeguard the present and future generation to ensure sustainable development basing on Vision 2020.

1.2 Contractor presentation

The contractor is Century Engineering Contractors Limited (CEC Ltd) and is a subsidiary of EPC Africa Group which is based in Kigali. CEC Ltd is specialized in High Voltage Transmission Lines Construction and rendering technical services to the energy and infrastructure sectors in Africa. The Group focuses in engineering, procurement, Construction, power generation, transmission and distribution.

The Company combined Vision and Mission are to build affordable Energy and Tele-Communication infrastructures to all corners of the Livable Environment on the African Continent.

CEC Ltd has vast experience in the following core activities: Construction Project Management, Compliance & Quality control, Project Supervision, Turnkey project, Conceptual and preliminary design, leading in health, safety and environmental performance, Delivering on our promises & client vision and Systems re-engineering review and audit.

1.3 Environmental and Social Expert presentation

The Environmental and Social Expert, Mr. KABANDA Philbert a is Registered EIA Lead Expert (RAPEP/EA/021/2018) under the Rwanda Association of Professional Environmental Practitioners (RAPEP) and a Certified Property Valuer (RC/IRPV/169/2018) under the Institute of Rear Properties Valuers of Rwanda (IRPV). He has a bachelor's degree in Civil Engineering and Environmental Technology and a Master's degree in Environmental Planning and Management with more than 16 years of experience in various sectors. Recent similar assignments include Environmental and Social, health and Safety Assessment for electrification projects, irrigation projects, Urban development plants, roads, buildings, energy, agriculture, mining, hydropower, Environmental Audit for mining projects, hydropower plants construction and irrigation projects.

1.4 Objective of the study

1.4.1 General Objective

The ESMP was conducted in order to examine, analyse and assess the proposed Medium voltage lines construction so that the lines construction is implemented in an environmentally sound and sustainable manner. The immediate aim of ESMP is to inform the process of decision making by identifying the potentially significant environmental effects and risks of development projects. The ultimate (long term) aim of ESMP is to promote sustainable development by ensuring that development projects do not undermine critical resource and ecological functions or the wellbeing, lifestyle and livelihood of the communities and people who depend on them.

The general objective of this study is to carry out a comprehensive ESMP study for the construction of medium voltage lines in Karongi and Rutsiro districts project that will guide environmental, social compliance process during construction and operation phases.

1.4.2 Specific objectives

The specific objectives of the study are the following:

1. Establish baseline conditions in the project area and surrounding environments and assess how these conditions would be altered by the proposed medium voltage lines;
2. To detect the effects of the project on the neighboring environment such as the water bodies, the soil, the people, the infrastructure, the fauna, the flora and the atmosphere;
3. To propose mitigation measures and alternatives measures where it is noticed that adverse effect may occur;
4. To set up an Environmental and Social Management and Monitoring Plan that will govern all activities of the project for the better protection of the environment.

1.5 Approach and methodology

In general, the ESMP was prepared by first reviewing of all existing information on the project area including its surroundings, review of existing project documents, review of the relevant policies, laws and regulations of Rwanda. Upon reviewing the existing information on this project area, a detailed analysis of the area was carried out through site visits, interviews with current workers and local authority. The aim of the site visit was to assess the surrounding environment (physical and human) of the proposed medium voltage lines.

After collecting the data from the site visits, an analysis done to assess activities under the medium voltage lines direct, indirect and cumulative impacts. These impacts were then weighed on their significance based on whether they are direct or indirect, their frequency, whether they were

reversible or irreversible, time of occurrence, among others. It is those impact activities that were considered in establishing mitigation measures and eventually the environmental and social management and monitoring plan.

1.6 Responsibility

The Environmental Assessment Practitioner is to provide the technical expertise on:

i. Environmental baseline conditions,
ii. Identification of potential impacts of the project,
iii. Impacts mitigation and management options and legal framework.
iv. Development of the ESMP with the content below:
    - Introduction and background
    - Project description
    - Institutional and legal framework
    - Institutional framework for the implementation& Monitoring of ESMP
    - Review of the baseline conditions
    - Describe the project impacts and its mitigation measures:
    - Environmental impacts
    - Social impacts
    - Training plan
    - Mitigation measures, Management and monitoring plan.
    - Estimated cost of ESMP implementation
    - Roles and responsibilities of each institution

CHAP II: INSTITUTIONAL, LEGISLATIVE AND POLICY FRAMEWORKS

The ESMP considers the national policies, laws and guidelines and World Bank Operational policies related to Environmental and Social Safeguards consideration which are the main tools to assist in implementing the ESMP and monitoring parameters to ensure the distribution lines are constructed in compliance with the mentioned laws, policies and guidelines.

2.1 Institutional Framework

The institution to which this project will have to consult and relate to include:

i. Rwanda Environmental Management Authority (REMA)
ii. Rwanda development Board (RDB)
iii. Rwanda Bureaus of Standards (RBS)
iv. Ministry of Infrastructure (MININFRA)
v. Karongi and Rutsiro Districts

2.2 Legislative Framework

Amongst the laws that will have a bearing to the medium voltage lines include:

i. Constitution of the Republic of Rwanda, 2003
ii. The environmental Law, 2018.
iii. Law relating to expropriation in the public interest, 2015
iv. Organic Law determining the modalities of protection, conservation and promotion of environment in Rwanda, 2005
v. Law governing land in Rwanda, 2013
vi. Law on mining and quarry operations, 2014
vii. Law governing the preservation of air quality and prevention of air pollution in Rwanda, 2016
viii. Ministerial Order determining the length of land on shores of lakes and rivers transferred to public property, 2010
ix. Law governing biodiversity in Rwanda, 2013
x. Law governing urban planning and building in Rwanda, 2012
xi. Law relating to the prohibition of manufacturing, importation, use and sale of polythene bags in Rwanda, 2008
xii. The Labour Law, 2009
xiii. Ministerial order relating to the requirements and procedure for environmental impact Assessment (EIA), 2008

xiv. Ministerial Order establishing the list of projects that must undergo environmental impact assessment, instructions, requirements and procedures to conduct environmental impact assessment, 2019.

xv. Rwanda building control regulations, 2012

xvi. Ministerial order establishing modalities of inspecting companies or activities that pollute the environment, 2008

2.3 Policy Framework

i. Rwanda Environmental Policy, 2003

ii. National Land Policy, 2004

iii. Rwanda Biodiversity Policy, 2011

iv. National Water Supply Policy, 2016

v. National Employment Policy, 2007

vi. National Energy Policy and Strategy, 2011

vii. National E-Waste Management Policy for Rwanda, 2016

viii. National Policy & Strategy for Water Supply and Sanitation Services, 2010

ix. National Sanitation Policy December, 2016

x. National Water Supply Policy, 2016

xi. Vision 2020

xii. Economic Development and Poverty Reduction Strategy (EDPRS), 2013 – 2018

xiii. National Strategy for Transformation 2017 – 2024

xiv. National Employment Policy, 2007

2.4 International Legislative Framework

Rwanda is a signatory to a number of conventions on sustainable development and is member of various bilateral and multilateral organizations amongst those that have an impact to this project include:

i. Our common future or Brundtland report to the World Commission on Environment and Development, 1987

ii. United Nations Framework Convention on Climate Change, 1992 Sustainable Development Goals (MDGs), 2017

iii. Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1998

iv. EAC Climate Change Policy (EACCCP), 2010

2.5 World Bank Environmental and Social Framework (ESF)

Environmental and Social Standard	Yes	No	Objective	Relevance
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	[X]	[ ]	ESS1 sets out the Borrower's responsibilities for assessing, managing and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through Investment Project Financing	The Project triggers this policy because although there is justification for the proposed distribution lines, there are also environmental and social risks and impacts associated with the construction and operation and maintenance of the distribution lines. ESS1 requires an Environmental Assessment (EA) of projects proposed for WB financing to ensure that they are environmentally sound and sustainable, and thus to improve decision making. It is in this regard that an EIA was undertaken by the Proponent and this ESMP helps to establish a detailed Environmental and Social Management Plan that will provide guidelines for environmental stewardship of the construction and operational phases of the Project.
ESS 2: Labour and Working Conditions	[X]	[ ]	ESS2 recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth.	The Project triggers this policy because the implementation of the proposed project will utilize people in the day to day working on to the projects and this persons need to be treated according the Labour law where the work conditions must meet the required standards.
ESS 3: Resource Efficiency and Pollution Prevention and	[X]	[ ]	ESS3 recognizes that economic activity and urbanization often generate pollution to	The activities of the Project will trigger this policy as the proposed medium voltage lines will require the use various resources which need to be used efficiently while at the same

Environmental and Social Standard	Yes	No	Objective	Relevance
Management			air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels	time preventing the pollution of their sources amongst others. The resources include air, water, vegetation and land.
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	[X]	[ ]	ESS5 recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. Project-related land acquisition1 or restrictions on land use may cause physical displacement (relocation, loss of residential land or loss of shelter), economic displacement (loss of land, assets or access to assets, leading to loss of income sources or other means of livelihood),3 or both.	The activities of the Project will trigger this policy as the medium voltage lines construction re will be located in areas where people are conducting mostly farming activities, livestock and residence. However, due to the nature of the project, there shall be no involuntary resettlement.
ESS 6:Biodiversity Conservation and Sustainable	[ ]	[X]	ESS6 recognizes that protecting and conserving biodiversity and sustainably	Not triggered

Environmental and Social Standard	Yes	No	Objective	Relevance
Management of Living Natural Resources			managing living natural resources are fundamental to sustainable development.	
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	[ ]	[X]	ESS7 applies to a distinct social and cultural group	Not triggered
ESS 8: Cultural Heritage	[ ]	[X]	ESS8 recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present and future	Not triggered
ESS 9: Financial Intermediaries	[ ]	[X]	ESS9 recognizes that strong domestic capital and financial markets and access to finance are important for economic development, growth and poverty reduction.	Not triggered
ESS 10: Stakeholder Engagement and	[X]	[ ]	ESS10 recognizes the importance of open and transparent engagement between	The activities of the Project will trigger this policy as the medium voltage lines will be implemented where people are located and they will be involved. Various consultation

Environmental and Social Standard	Yes	No	Objective	Relevance
Information Disclosure			the Borrower and project stakeholders as an essential element of good international practice.	meetings will be held with Project Affected persons, the Districts and Sectors officials and other relevant staff of the key implementing partners

CHAP III. PROJECT AND AREA DESCRIPTION AND BASELINE CONDITIONS

3.1 Project site location and description

The proposed medium voltages right of way shall pass through two districts of Karongi in Gitesi, Rugabano, Mutuntu, Twumba and Rwankuba sectors and Rutsiro in Nyabirasi, Kivumu, Murunda, Mukura and Ruhango sectors.

The entire line shall cover a total distance of about 90 kilometers. The line does not pass through any protected ecosystem (forest, wetland), any cultural heritage and any other protected patrimonies.

3.2 Baseline conditions

3.2.1 Physical environment

Location

The project is located in in Karongi and Rutsiro districts and is strategically located on residential areas of the Western Province. The proposed medium voltages right of way shall pass through two districts of Karongi in Gitesi, Rugabano, Mutuntu, Twumba and Rwankuba sectors and Rutsiro in Nyabirasi, Kivumu, Murunda, Mukura and Ruhango sectors.

Climate

The Project areas enjoys the temperate climate due to its altitude. However, Rwanda's average temperature varies according its topography. Low temperatures are observed in the regions of high altitude with average temperatures ranging between 15° and 17°. In some part of the volcanic region, temperatures can go below 0°C. The rain patterns are characterized by four seasons, a short rainy season from September to November and a longer season between March and May. Between these seasons are two dry periods, a short one between December and February and a long one from June to August. Rains ranges from about 900mm in the east and Southeast to 1500 mm in the north and the northwest volcanic highland areas (SEA,2013).

Hydrography

The hydrography of the project area is marked by the presence of the Congo Basin and lake Kivu. The Congo Basin represents 15% of the total areas of Rwanda, while lake Kivu is one of the largest in Africa with an area of 2.650km2, located between Rwanda and Congo. In Rubavu, District, River Sebeya is one of the major rivers emptying into lake Kivu, and in view of the altitude, allows for the generation of hydroelectric power. River Pfunda, a tributary of Sebeya, stagnates in the low-lying areas over a distance of about 15km. The region has known a series of tectonic movements and has

an important network of geological fractures resulting in a number of thermal water points on the ground surface like Mashyuza near the limestone quarry (SEA,2013).

Relief

The topography of the project area and the surrounding consists of high mountains, plain of Bugarama and Valley. According Fichtner, the project areas is a hilly region with peaks up about 2000m.It belongs to the western foothills of the Congo Nile and is heavily dissected by short valley between with very steep slope and sharp peak.

Geology and soil

The geological formations may be classified under lithological group, which differs in terms of the mineralogical composition and facies. The geological formations from oldest to the most recent are as follows:

(i) Precambrian rocks represented by various formations, the Butare complex made up of metasediments, gneiss and granite, the Gikoro, Pindura, Cyohoha and Rugezi groups.

(ii) The tertiary cover represented by volcanic rocks of mainly alkaline and basalt composition over large areas covering the Precambrian rocks and

(iii) Intrusive rocks in the form of undifferentiated pegmatic or isolated granite.

The Western Province has a rich shallow soil from volcanic rocks and lava decompositions. The North-West has deep-soils, but these are poor, very often acidic, sandy-clay and high eroded. Torrential rain and the relief exacerbate soil erosion. The type of soil outclassing most of parts of western zone is basalt, generally permeable and rich in iron. The soil is less acid, with an average quantity of clay (Karyokinesis). At some points of the Kivu Lake shore, one can find a soil of phyllodes origin, the clay and sand with quartz crystals and other types of soil which can easily rot.

Land Use and Settlement

The housing in the Western Province of Rwanda is characterized by four different types: the well-developed urban area, urban areas in settlements, villages (imidugudu) in rural areas and houses scattered in rural areas.

For the project area in the peri-urban areas, most of the houses are built in earth brick and timber and roofed in iron sheet in some areas like Karongi and Rutsiro districts. Concerning urban area in settlement, the houses are built also in earth brick and timber and finally, you find a huge area the scattered houses.

Air quality

Considering that no industry and intense vehicle traffic are present, it is possible to anticipate a good air quality, mainly affected by dust during wind and smoke during seasonal burning of agricultural fields.

Energy

The main sources of energy used for cooking are: firewood and charcoal. Charcoal is the energy source most used in cooking in urban areas. This use is among the direct causes of environmental degradation in the country resulting in disorderly exploitation of forests. For lighting, energy sources used are REG electricity, lamp oil, lanterns, candles and wood. This kind of energy is found in Karongi and Rutsiro districts.

3.2.2 Natural environment

Land use

The project is located in a densely populated area which has modified natural ecosystem. Human settlement, diversified agro-pastoral practices, consumption of forest products, bush fires and urbanization have caused the disappearance of that climatic formation. These changes caused secondary plant formations consisting essentially of grasses, numerous seasonal or perennial species alternating with crops. Note that the North-eastern section of the line includes a section where it runs above a banana plantation. Overall, none of the areas crossed are in natural condition.

Flora and Fauna

The project area of Karongi and Rutsiro districts harbours very diverse flora due to a considerable geo diversity and a climatic gradient. There project area is close to Mukura forest and Gishwati national park. There are in the project area the owl-faced monkey, the mountain monkey and the Chimpanzee. The area is one of the top birding area.

In Western Province, there are an important ecological heritage with a multitude of species, prominent among which are: the Dombeya Gortzeneri (umukore),Entandrophragma excersum (umuyove),Prodocarpus(umufu),Catrapa grandiflora(umushwati),Sumphaniaglobulifera(umushishi),Alanginus(umurava),lancolata(umulanga),Polycias fulia(umwungo) and the Eucalyptus.On the other hand,the project area is very poor in wildlife.As a result of forest degradation, wildlife has gradually disappeared,giving way to certain reptiles,amphibiansand birds.

Sensitive Ecosystems

The sensitive ecosystems in the project area are the Mukura forest, Gishwati national park and Lake Kivu but the medium voltage right of way shall not affect any iof these protected areas.

3.2.3 Socio-economic environment

Population and demography

The project area population is predominantly rural. The population is mostly young and live mainly in the rural areas but tending to move to urban areas of the surrounding cities of Rubavu and Karongi.

Employment and income generation

In the project area the unemployment rate is higher in urban areas than in rural areas. Unemployment rate among females is higher than males and gender disparities are remarkable in labour force participation. Poverty rates are still very high and the cause of poverty has often been linked to high population growth and declining soil fertility in a largely agrarian based economy. The principle economic activity is agriculture and livestock.

Infrastructure

The project area is located near the National road from Rubavu to Karongi district along Kivu Lake. The types of roads found in the project area are of tarmac, cobbled and unpaved standards.

Cultural Heritage and Tourism

The project area has many cultural sites including Mukura forest, Lake Kivu and Gishwati national Park.

Vulnerable groups

There are several vulnerable groups in the project area. Women can be considered as one of these groups, especially women-headed households because of their social status in the community as well as their economic situation. Women-headed households are frequent in the area. Most of them are

widows from the genocide, the war or natural deaths due to diseases. This ESMP further recommends that women, vulnerable groups and youth should be given priority during recruitment and GBV and CAE policies rigorously implemented.

3.3 Project Activities and works

Mainly, this project consists of the construction of medium voltage lines in Rutsiro and Karongi District covering a total length of about 90 kms.

3.3.1 Electrical lines

The project shall consist of the construction of medium voltage lines by taking into consideration environmental and social issues to avoid minimize or mitigate the negatives impacts that may take place during construction and operation phase of the project.

3.3.2 Line route

As mentioned earlier, the line shall connect from various tapping point and was selected basing on the consideration to avoid dense housing to minimize the expropriation costs and avoid passing through wetlands. The line route shall affect

3.3.3 Poles

The proposed poles of the medium voltage lines shall be of the type of wooden poles. They shall be used at various spacing basing on the angle points or location as well as their foundation and height as per the attached drawing of the poles.

3.3.4 Right of Way (RoW)

The proposed right-of-way (RoW) for the medium voltage lines is 12 meters as per EDCL standards equivalent to 6 metres on either side of the medium voltage line. Only crops and trees shall be affected. It shall be possible to continue growing low crops and banana plantations in the RoW, but very high palm, eucalyptus plantations and forest shall not be allowed.

CHAP IV: IDENTIFICATION, ANALYSIS AND MITIGATION OF THE ANTICIPATED IMPACTS

4.1 Potential impacts.

This chapter outlines the potential negative and positive impacts that will be associated with the project. An impact is any change to the existing condition of the environment caused by human activity or an external influence. Impacts therefore may be positive (beneficial) or negative (adverse). They may also be direct or indirect, long-term or short-term, and extensive or local in effect. The weight of each impact is described in terms of the following significance factors:

- **Type:** biological, physical, social, economic, etc.
- **Nature:** Direct, indirect, cumulative, synergetic
- **Magnitude:** Impacts can vary in terms of their consequences
- **Extent:** localized, regional, transboundary, global
- **Timing**: Maybe felt immediately or may not be evident for sometime
- **Duration:** the impacts may range from short term to permanent impacts
- **Uncertainty:** impacts can vary in both likelihoods and consequences of occurrence
- **Reversibility:** some impacts maybe reversible or can be rehabilitated upon decommissioning of the project while others maybe irreversible**.**

Some impact mitigations measures have already been addressed in the proactive design and other mitigations can only be guaranteed through active, responsible management, helped by following the guidelines in the project ESMP. The impacts will be related to activities to be carried out during construction phase of the project. For the operation phase the major the issues are the key impacts include energy consumption, atmospheric emissions and noise. Closure and decommissioning phase impacts of the project are also highlighted. The impacts of the project during each its life cycle stages (construction, operation and decommissioning) can be categorized into: impacts on the biophysical environment impacts and socio-economic impacts.

4.2 Impact Identification and Analysis

4.2.1 Sources of Impacts

The possible impacts associated with this project mainly emanate from site activities, products, by-products and outputs. These are related to the following:

a) Contractor/staff activities at the site.
b) Vegetation clearing
c) Soil erosion

d) Noise from the construction and operation of the medium voltage lines
e) Air Emissions from vehicles traffic and excavation activities
f) Effluent discharge from the toilets.
g) Solid waste from operational activities.
h) Diseases spread
i) Fire hazards
j) Gender Based Violence
k) Visual and landscape impacts from the project structure.

4.2.2 Analysis of the Impacts:

The methodology which has been adopted to evaluate the significance of the impacts is the semi-qualitative one. The technique used to undertake the analysis covered the following aspects: level of the impacts, the magnitude, and significance of the impact where each type of impact categories of insignificant, minor, moderate, severe and critical need to be defined precisely. Thus the impacts were reviewed based on four critical factors which were considered when assessing the significance of impacts, these were:

a) Relationship of the impacts to temporal scales;
b) Relationship of the impacts to spatial scales;
c) The severity/benefits from the impacts; and
d) The likelihood of the impacts occurring.

4.3 Positive Impacts.

The positive impacts are beneficial and will thus not require any mitigation. These are mainly supported by the fact that the location of the site is secured. Most of the clients need a secured place for them to focus well on their work. It's however the management and monitoring plan which shall ensure their sustainability. These include but not limited to the following:

1) Access to electricity
2) Creation of employment opportunities
3) Increased business opportunities.
4) Revenue to Government and the District
5) Improved Infrastructure
6) On job trainings

4.4 Adverse/Negative Impacts

The negative impacts can be divided into those that will directly come from the constructional and operational activities and those that will be due to socio-economic issues or decommissioning.

CHAPTER FIVE: IMPACTS MITIGATION AND MONITORING

5.1 Introduction:

This chapter highlights the necessary mitigation measures that will be adopted to prevent or minimize significant negative environmental and social impacts associated with the activities the project during its construction, operation and decommissioning phases. Some impact mitigation has already been addressed in the proactive design and other mitigations and Environmental Impact Assessment can only be guaranteed through active, responsible management, helped by following the guidelines in the project ESMP.

5.2 Mitigation for the anticipated Negative Impacts.

5.2.1 Impacts on vegetation clearing and fauna

The vegetation within the construction corridor is directly affected by removing plants, cutting down shrubs and felling trees. Plants growing on areas set aside for storing building materials will also be affected. Access to poles sites by vehicles and equipment will cause more destruction of vegetation. The avifauna is going to be affected to minor extent as the RoW shall be chosen through trees are not habitat to birds where possible.

These impacts shall be minimized and mitigated as follows:

- Avoid as much as possible the cut of large trees which serve as habitat cover for birds,
- Compensation shall be paid for felled trees to the owner
- Determinate necessary storage area on a site that does not require clearing;
- Measures for landscape are equally available
- All woody vegetation cleared on the RoW is made available to villagers for use as construction materials or firewood,
- Bush clearing should be avoided where possible and/ or minimized especially during poles construction and access
- No hunting shall be allowed by the workers or residents as prohibited by national regulations.
- During stringing people shall be informed and proper communication equipment and techniques used.
- At the decommissioning phase, the right of way shall be rehabilitated to almost its initial state before project implementation.

5.2.2 Land use and tenure

During the construction phase of the medium voltage lines, there will have serious impact on land use and land tenure. This is one of the critical negative impacts of this project because of the sensitivity of the issue, and the lack of available replacement land to mitigate this impact. A majority of the proposed line route is located in rural area and shall therefore potentially affect cultivated land, trees and forestry resources.

The medium voltage lines construction will not affect land:

- These medium voltage lines with poles will not require any permanent acquisition of land as their owner will continue to use their lands.
- Line construction. This will require access for heavy machinery that will damage cultivated land. During the construction phase, human activities will be disturbed;
- The right of way. The electric medium voltage lines will require a right of way of 12 meters (6 meters on either side of the line). Houses located in this area will not be affected. Similarly, trees planted on that route will need to be cut and shall not be replanted after construction phase. Other crops will be destroyed during the construction phase but can be re-established afterward the construction phase.

As mitigation measures related to negative impacts due to land use and tenure the following measures and requirements have to be given a priority and adopted prior to project commencement:

(i) Compensation. affected properties shall be composted according to the legislation in place in Rwanda:
   - Identification of all the Persons Affected by the Project (PAP) with a participatory census.
   - In order to have access permission to private land, the Contractor assisted by local authorities shall carry out awareness and sensitization meetings on a regular basis.
   - Ensure affected properties are estimated at market price,
   - The compensation of affected people and properties should be completed prior to commencement of all works,
   - Engagement of the PAPs about compensation measures.
   - Permission of the farmers to cultivate in the RoW after the construction with the limit of not planting trees but with full permission to cultivate short crops like: beans, potatoes, maize, vegetables, etc.

(ii) For cultural resources, the line route has been selected to avoid cultural heritage such as genocide memorial. Should there be any other significant resource on the line route identified during the census, it will require an engagement with the local population and authorities about the best appropriate measure.

5.2.3 Extraction and use of building materials

Good and efficient use of the natural resources will be the key to reduced impacts on the use of the extracted raw materials. This will be achieved through:

- The contractor will source building materials such as sand, ballast and hard core from registered quarry and sand mining firms.
- The contractor will only order for what will be required through accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities.
- The contractor will ensure that wastage, damage or loss (through run-off, wind, etc.) of materials at the construction site is kept minimal, as these would lead to additional demand for and extraction or purchase materials.
- The contractor shall consider reuse of building materials and use of recycled building materials. This will lead to reduction in the amount of raw materials extracted from natural resources as well as reducing impacts at the extraction site.

5.2.4 Minimize the effects of noise emitted from the project activities.

Significance of noise impacts depends on whether the project would increase noise levels above the existing ambient levels by introducing new sources of noise. Other construction site noises may be difficult to control. However, these are expected to be temporal and limited to the construction period. Preferred noise levels in residential areas as per IFC Occupational, Health and Safety Guidelines that is 55 dB (A) from 7h – 22h day time and 45 dB (A) at night time should be observed. in order to reduce negative impacts on surroundings.

Noise impacts would be considered significant if the project would result in the following:

- Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels.
- A substantial permanent increase in ambient noise levels (more than five dBA) in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

- Although blasting is not planned to be used, any blasting shall not be allowed without permission from the district authorities and EDCL and any social, economic and environmental consequence or damage shall be borne/ paid by the contractor.

The contractor shall put in place several measures that will mitigate noise pollution arising during the construction phase of the medium voltage lines. The following noise-suppression techniques will be employed to minimize the impact of temporary construction noise at the project site.

- Construction works should be done during the day when people are away and also the outside environment is also noisy. This should be restricted between 7.00 am and 6.00pm.
- Install portable barriers to shield compressors and other small stationary equipment where necessary.
- Use quiet equipment (i.e. equipment designed with noise control elements).
- Co-ordinate with relevant agencies regarding all construction activities in the residential areas.
- Limit pick-up trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible.
- Heavy machinery and vehicles to be used by the project will be in good condition and emitting low noise levels.

5.2.5 Air quality:

Controlling dust is useful in minimizing nuisance conditions. It is recommended that a standard set of feasible dust control measures be implemented for all construction activities. Emissions of other contaminants (NOx, CO_2, SOx, and diesel related PMB10) that would occur in the exhaust from heavy equipment and trucks are also included. The contractor is committed to implementing measures that shall reduce air quality impacts associated with construction. All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction.

Dust emissions will be controlled by the following measures:

- Watering all active excavated and construction areas as and when necessary to lay dust.
- Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Pave, apply water when necessary, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction site.
- Burning of wastes shall be avoided on site.

5.2.6 Exhaust emission:

The exhaust emissions impacts will be greater in areas where the materials are sourced and at the construction site as a result of frequent gunning of vehicle engines, frequent vehicle turning and slow vehicle movement in the loading and offloading areas. These emissions have the potential to compromise the local air quality and contribute to global warming, acid rain, and local health problems and thus needs to be minimized.

In order to control exhaust emissions, the following measures shall be implemented during construction period:

- Proper planning of transportation of materials to ensure `that vehicle fills are increased in order to reduce the number of trips done or the number of vehicles on the road.
- Equipment shall be properly tuned and maintained.
- All trucks and vehicles shall have a valid Vehicle Inspection Certificate.

5.2.7 Oil spills.

It is important to note that oil/grease spills can occur at construction or camp sites and in most areas that make use of petroleum products for running of equipment and machinery. Such products contain detrimental elements to the environment. They contain such heavy metals as mercury, lead, and sulphur among others. Though this may not be common a major threat, it is wise to control and observe the little that could occur especially during maintenance of the involved equipment and machinery (generator).

Some of the proposed mitigation measures include:

- All machinery must be keenly observed not to leak oils on the ground. This can be affected through regular maintenance of the machinery.
- Maintenance must be carried out in a designated area (protected service bays) and where oils are completely restrained from reaching the ground. Such areas should be covered to avoid storm from carrying away oils into the soil or water systems.
- All oil products and materials should be stored at well designated stores. They should be handled appropriately to avoid spills and leaks.
- Oil spill kits will be kept on site and all oils and fuels will be removed from the site for proper reuse/recycling or disposal as appropriate.

5.2.8 Minimization of water use

As noted the project will use water from the WASAC supply which supplies water countrywide thus there will be need to make sure that conservation measures are put in place to ensure maximum resource utilization.

This can be done by amongst others having the following measures:

- Pressure on the water supply will be reduced at maximum, all rainwater shall be harvested in underground storage tanks where possible like camp site and site offices and be used for cleaning or gardening activities;
- The project will optimize the quantity of water used for different needs i.e. ensure conservative use of water during construction to avoid wastage,
- The contractor shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water usage.
- Any water leaks through damaged pipes and faulty taps will be fixed promptly by qualified staff and the cost shall be borne by the Contractor.

5.2.9 Solid waste generation.

The project is expected to generate enormous amounts of solid waste during its construction phase. The bulk of the solid waste generated during the operation of the project will consist of paper, plastic, glass, metal, textile, wood and organic wastes. Such wastes can be injurious to the environment through blockage of drainage systems, choking of water bodies downstream and negative impacts on animal and human. Some of these waste materials especially the plastic/polythene which is not biodegradable may cause long-term injurious effects to the environment.

Even the biodegradable ones such as organic wastes may be injurious to the environment because as they decompose, they produce methane gas, a powerful greenhouse gas known to contribute to global warming. The following mitigation measures will be implemented:

- Put in place proper house-keeping and implement wastes management hierarchy (avoid, reduce, reuse and recycle)

5.2.10 Gender Based Violence and Child Abuse/Exploitation

Given the big number of workers during the construction of the medium voltage lines, there likely violence based on gender and child abuse within the project area. The following measures will address (GBV) and Child Abuse and Exploitation (CAE) issues:

- GBV and CAE awareness meeting shall be organized prior to commencement of the works and once in a month to all workers.
- Defaulters shall be informally and formally warned and strict sanctions (loss of employment, reported to competent authorities) shall be applied to defaulters
- A GBV and CAE committee composed of the project manager, the contractor's environmental and social specialist, the human resources of the contractor and women representative at the sector level.

Grievances on site: given the size of the project, there likely grievances and complaints from workers and neighbouring communities and if not solved may lead to conflicts and increase social problems. The following measures will be implemented:

A Grievance Redress Committee shall be formed and composed by local authorities at each sector and composed of sector community development officer, affected people, women and youth representative and constructor's environmental and social specialist.

5.2.11 Impacts on gender and vulnerable people

Negative gender impacts would arise from discrimination in hiring construction workers if preference is given to men who are perceived to be stronger and more resilient lines construction could also result into constrained access to homes, gardens, water sources, places of worship and schools, especially for women, children, elderly and disabled people. Temporary bridges improvised to abate this impact are often inadequate and unsafe for use by vulnerable people. The following measures will be applied to address this:

- Ensure positive discrimination in job allocation to lines construction workers whereby women and vulnerable people are given priority and to tasks they would do best, based on their potential.
- Where access to private property or public resources/ places is severed, the contractor should provide safe temporary access that is both gender-friendly and usable by disabled persons. In this regard, temporary culverts instead of wood planks would be more appropriate.
- Workplace environment including tools and fixtures should be gender-friendly.

5.2.12 Soil erosion

Due to the kind of project activities, there is a high risk of soil erosion. The following measures are proposed:

- Revegetation shall be done during and at the decommissioning phase

- Areas highly prone to erosion shall be identified and protected during construction,
- Excavated soil shall not be exposed for a long time especially during rainy seasons
- Backfilling should be applied after excavation to reduce soil erosion

5.2.13 Casual labour payment

To avoid any complaint and delay on payment of casual labour, the client shall ensure the contractors has paid the casual labour their full payment and on time prior to approval of the last invoices. The contractor and the subcontractor shall comply with the national labour law.

5.2.14 Impacts on existing infrastructures

The contractor shall ensure by all means avoid to destroy existing infrastructures (water pipelines, electrical cables, public lighting, road and fibber optic). The contractor shall contact the infrastructure owner whenever there is a risk of damaging the infrastructures.

5.2.15 Impacts due to human excreta

To avoid any impacts on the environment and human health, Ecosan Toilets shall be provided on-site and regularly maintained. Since the project activities are not static, these mobile Ecosan toilets are more convenient.

CHAP VI: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

6.1 General Introduction

The client and contractor of the proposed project acknowledges the fact that the proposed project activities will have some impacts on the biophysical environment, and socio economic wellbeing of the local residents. Thus, the main focus will be on reducing the negative impacts and maximizing the positive impacts associated with the project activities through a programme of continuous improvement.

The main aim of ESMP is to protect and enhance the existing environment of the project area. The purpose of this ESMP is to establish actions required to prevent, mitigate, and control possible negative impacts of the project on the environment, and to analyze steps that could be taken with regard to it.

In this regard the Expert developed an ESMP to aid the proponent in managing significant environmental impacts associated with the project. The ESMP outlines a plan of action to be instituted by the project to ensure that environmental quality is maintained and improved throughout the life of the project through a program of continuous improvement.

This project bears the potential for a number of negative impacts on the environment. However, if proper environmental and social management procedures are in place and adhered to then there would be very minimal negative impact of concern emanating from it.

The ESMP addresses all the anticipated impacts of the project, locations of impacts, mitigation measures, cost, responsible person/institution and monitoring measures. Plans are essential and shall be undertaken in various phases of the project cycle

6.2 Responsibilities for ESMP implementation

6.2.1 Role of the Contractor

Implementation: CEC Ltd will implement and ensure that the mitigation measures in the ESMP are to be followed during construction of the medium voltage lines. The contractor will undertake regular monitoring of all the activities occurring at the project site to ensure compliance with to the ESMP. Contractor will have an environmental, and social as part of the team specifically responsible for the implementation and reporting on the proposed mitigation measures in the ESMP. The contractor in conjunction with sector authorities shall be responsible for organising meeting and sensitization and awareness programmes on GBV, CAE, HIV Aids and STD prior and during project implementation.

6.2.2. Role of the Supervisor

The role of the supervision mission shall be to determine if the contractor carries out the project activities in conformity with environmental and social safeguards specialist, the supervision of the implementation of the mitigation plan, supervision of the monitoring plan, review the reports submitted by the contractor, regularly reports on any non-compliance in relation to the ESMP, national laws and international standards, to recommend appropriate risk management strategies to the contractor, in charge of overall management of the project in relation to environmental and social safeguards specialist and to identify problems as they arise during the project implementation in relation to environmental and social safeguards specialist for compliance. Regular and monthly reporting on ESMP implementation to the client.

6.2.3 Role of the Client

EDCL shall be the overall project coordination at national level and funds allocation for the project of the medium voltage lines construction project. EDCL shall also be responsible for overseeing the ESMP implementation through their Environmental and Social Safeguards specialists under the project management department. Inspection on site to ensure ESMP compliance

6.2.4 Role of MININFRA

The Ministry of Infrastructures which is the ministry in charge of energy sector will be the project executing Ministry with the key role of developing and maintaining sustainable power generation and distribution facilities. It has also a big role in coordinating the key stakeholders involved with lines construction and in general develop policies and guidelines and laws related to energy generation and distribution.

6.2.5 Role of REMA:

General Monitoring and inspection visits. As the lead agency responsible for the protection of the environment in Rwanda, REMA will undertake environmental audits to ensure that the project proponent enforces the ESMP and other environmental regulations. REMA will also conduct monitoring visits to verify if there are any emerging environmental issues arising from the projects activities that were not anticipated by the ESMP.

6.2.6 Role of RDB:

RDB is responsible for environmental certification. In the initial planning stages RDB officials visited the project site to gather the information that led to the elaboration of the ToR's. Upon submission of the ESIA to RDB the report was reviewed according to the requirements of ToR's.

RDB approved the ESIA report and awarded an environmental certification that authorizes the proponent to progress to the construction phase of the project and certification also lays out the condition that will have to be met by the project implementation by the contractor.

6.2.7 Role of Local Authorities.

During the construction of the medium voltage lines, local authorities will be in position to undertake visits to assess compliance with the ESMP through a district environmental officer. The local authorities will also ensure that the development is in line with the proposed country development plan, the District's master plan and the goals of the district development Plans.

They will also have the role of approving the necessary construction permits and approve valuation forms and ensuring that documentation in regard to the development are all in order. The district shall have a key in assisting the contractors through census, public consultation in relation to assets inventory of affected assets and properties.

6. 3 Environmental and Social Management and Monitoring Plan

This environmental and social management and monitoring plan is made as part of the whole ESMP for the construction of the medium voltage lines. It is intended to ensure that all the environmental and social management issues outlined in the ESMP are addressed through a comprehensive and proper environmental and social management and monitoring programme.

This environmental and social management and monitoring plan aims at:

- Defining the mitigation monitoring and execution requirements associated with the construction of the medium voltage lines,
- Defining the process to be used to identify and execute mitigation actions related to the medium voltage lines construction,
- Ensuring that the mitigation measures proposed in the ESMP are incorporated in the medium voltage lines construction specifications and duly implemented.
- Ensuring that any other impacts that may arise can be identified and appropriate mitigation measures are taken.
- Establishing roles and responsibilities and implementing procedures for effective execution of the mitigation process.
- Finally cost estimations of what the mitigation measures shall require.

The Environmental and Social Management and Monitoring Plan for the construction of the medium voltage lines in Rutsiro and Karongi districts are given according to the proposed mitigation measures mentioned in previous chapter.

Table 1: The Management and Monitoring Plan for the construction camp site, storage and offices

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Storage of materials including hazardous materials	The contractor to ensure the storage of materials are located in the designated stores and separated from other non-hazardous materials. Where necessary, provide impervious floors.	Separate storage with impervious floor	Weekly	Contractor's environmentalist	Before construction of the camp site, offices and storage	Provided in the contract budget
Storage materials are exposed and accessible by unauthorized people and workers	The storage area is well designated, demarcated and fenced. The access of unauthorized people should be controlled and warning sign installed.	Storage demarcated and fenced	Weekly	Contractor's environmentalist	Before construction of the camp site, offices and storage	Provided in the contract budget

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Poor camp site, offices and storage rehabilitation at the end of construction	The site shall be vegetated, reseeded, at almost at its natural state and all waste removed from the site	Trees and grasses planted.	During and after construction works	Contractor's environmentalist	At the end of the construction works.	Contract budget

Table 2: The Management and Monitoring Plan for Environmental Training and Awareness

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Environmental, social requirements noncompliance due to lack of knowledge and awareness	Training, awareness programme and tool box meetings on environmental, social management shall be organized regularly for the workers, site foreman, equipment operators and truck drivers.	Reports of training, awareness programme and tool box meetings	Monthly	Contractor's environmentalist	During the construction works.	Provided in the contract budget

Table 3: The Management and Monitoring Plan for impacts due to vegetation clearing monitoring

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Impacts related vegetation clearing, removing of trees. People will have their properties destroyed	Compensation shall be paid for felled trees to the owner. Determinate necessary storage area on a site that does not require clearing; Avoid as much as possible the cut of large trees Measures for landscape are equally available All woody vegetation cleared on the RoW is made available to villagers for use as construction materials or firewood	Proof of compensation Landscaping plan available Wood wastes are availed to initial owners	Weekly	Contractor's environmentalist	During the construction works.	Provided in the contract budget

Table 5: The Management and Monitoring Plan for impacts on land use and tenure

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Crops and assets are affected or destroyed	Identification of all the Persons Affected by the Project (PAP) with a participatory census and inventory of affected assets carried out and compensation paid prior to commencement of the construction works.	Proof of compensation	Weekly	Contractor's environmentalist	Before commencement of the construction works.	To be determined after valuation is completed.
	Ensure affected properties are estimated at market price, Engagement of the PAPs about compensation measures and support for their reinstallation; Permission of the farmers to cultivate in the RoW after the construction with the limit of not planting trees but with full permission to cultivate	Compensation report provided prior to commencement of works Farmers cultivate the compensated plots	Weekly	Contractor's environmentalist	Before commencement and during the construction works.	No cost applied

Table 6: The Management and Monitoring Plan for impacts due to extraction and use of building materials

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Impacts to natural resources due to the extraction and use of raw construction materials related to unauthorized extraction and dumping, excessive wastes	The contractor will source building materials such as sand, ballast and hard core from registered quarry and sand mining firms. The contractor will only order for what will be required through accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities. .	District License for quarry and sand mining No excessive materials on site Excessive wastes reused	Weekly	Contractors environmentalist	During the construction works.	No budget

	The contractor will ensure that wastage, damage or loss (through run-off, wind, etc.) of materials at the construction site is kept minimal, as these would lead to additional demand for and extraction or purchase materials. The contractor shall consider reuse of building materials and use of recycled building materials. This will lead to reduction in the amount of raw materials extracted from natural resources as well as reducing impacts at the extraction site					

Table 7: The Management and Monitoring Plan for erosion control

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Impacts due to noise emitted from line construction	Construction works should be done during the day when people are away and also the outside environment is also noisy. This should be restricted between 7.00 am and 6.00pm. Use quiet equipment (i.e. equipment designed with noise control elements).	Complaints from residents Portable barriers installed	Weekly	Contractor's environmentalist	During the construction works.	No budget
	Co-ordinate with relevant agencies regarding all construction activities in the residential areas. Limit pick-up trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible. Heavy machinery and vehicles to be used by the project will be in good condition and emitting low noise levels.	Vehicles inspection Certificates				No budget

Table 8: The Management and Monitoring Plan for impacts on air quality

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Dust pollution due to excavation works affecting the quality of air	Watering all active excavated and construction areas as and when necessary to lay dust. Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard. Pave, apply water when necessary, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction site.	Hauling covers available for all trucks Number of watering times in dry season	Weekly	Contractor's environmentalist	During the construction works.	Provided in the contract budget

Air pollution from exhaust fumes from trucks and other equipment	Proper planning of transportation of materials to ensure `that vehicle fills are increased in order to reduce the number of trips done or the number of vehicles on the road. Equipment shall be properly tuned and maintained. All trucks and vehicles shall have a valid Vehicle Inspection Certificate.	Number of maintenance of trucks and equipment Vehicle inspection certificate available	Weekly			

Table 9: The Management and Monitoring Plan for soil pollution

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Impact of soil pollution due oil spills	All machinery must be keenly observed not to leak oils on the ground. This can be affected through regular maintenance of the machinery. Maintenance must be carried out in a designated area (protected service bays) and where oils are completely restrained from reaching the ground. Such areas should be covered to avoid storm from carrying away oils into the soil or water systems. All oil products and materials should be stored at well designated stores. They should be handled appropriately to avoid spills and leaks. Oil spill kits will be kept on site and all oils and fuels will be removed from the site for proper reuse/recycling or disposal as appropriate.	Vehicle inspection certificates available Designated maintenance area provided Store for oil with impervious floor constructed	Weekly	Contractor	During the construction works.	Provided in the contract budget

Table 10: The Management and Monitoring Plan for impacts on water use

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Impacts due to excessive water usage from the national utility	Pressure on the water supply will be reduced at maximum, all rainwater shall be harvested in underground storage tanks where possible like camp site and site offices and be used for cleaning or gardening activities; The project will optimize the quantity of water used for different needs i.e. ensure conservative use of water during construction to avoid wastage, The contractor shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water usage. Any water leaks through damaged pipes and faulty taps will be fixed promptly by qualified staff.	Rainwater gutters and collection tanks installed	Monthly	Contractor' environmentalist	During the construction works.	Provided in the contract budget

Table 11: The Management and Monitoring Plan for solid waste management

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Impacts of wastes generated on site to the soil, air and human health	Put in place proper house-keeping and implement wastes management hierarchy (avoid, reduce, reuse and recycle) Develop and enforce waste management procedures Install dustbins or receptacles and apply wastes sorting at source Dispose of wastes at a recognized landfill	Waste hierarchy observed on site Refuse bins installed on site Waste sorted on site	Weekly	Contractor's environmentalist	During the construction works.	Provided in the contract budget

Table 12: The Management and Monitoring Plan for Gender based Violence and Child Abuse and Exploitation

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Impacts due gender based violence and child abuse/ exploitation due to lack of awareness	GBV and CAE awareness meeting shall be organized prior to commencement of the works and once in a month to all workers. Defaulters shall be informally and formally warned and strict sanctions (loss of employment, reported to competent authorities) shall be applied to defaulters A GBV and CAE committee composed of the project manager, the contractor's environmental and social specialist, the human resources of the contractor and women representative at the cell level.	GRC, GBV and CAE committee in place Awareness meeting reports	Monthly	Contractor's environmentalist	During the construction works.	Provided in the contract budget

Table 13: The Management and Monitoring Plan for Gender and disabled discrimination

Impacts	Proposed mitigation/remarks	Indicator	Frequency	Responsible	Time	Cost (RwF)
Impacts on gender and people with disabilities due to discrimination during recruitment, hiring and work	Ensure positive discrimination in job allocation to distribution lines construction workers whereby women are given priority (at least 30 %) and to tasks they would do best, based on their potential. Where access to private property or public resources/ places is severed, the contractor should provide safe temporary access that is both gender-friendly and usable by disabled persons. In this regard, temporary culverts instead of wood planks would be more appropriate. Workplace environment including tools and fixtures should be gender-friendly.	Recruitment report Field observation	Monthly	Contractor's environmentalist	During the construction works.	Provided in the contract budget

CHAP 7 TRAINING AND AWARENESS PLAN

Training and site specific are very important in order to ensure proper ESMP implementation and monitoring. The training and awareness plan aim at equipping the staff and workers involved in the construction of the medium voltage lines in Rutsiro and Karongi districts with required skills related to activities with environmental and social potential high negative impacts.

These trainings and awareness programme shall be provided by the Contractors' environmental and social expert or a consultant recruited particularly for this task.

The proposed table below shows the training/ awareness title, the proposed trainee, schedule, responsible and related estimated cost.

TITLE	TRAINEE	SCHEDULE	RESPONSIBLE	COST (RWF)
Grievance Redress Mechanism and roles of the GRM Committee	Grievance Redress Committee	Once a month Election for the entire project	Contractor	150,000
HIV, STD, Malaria prevention and testing programme	All workers	Once in a month	Contractor	120,000
Gender Based Violence and Child Abuse Prevention	All workers	Once in a month	Contractor	240,000
Tool box programme for newly recruited workers	Recruited workers	Weekly	Contractor	No cost

CHAP 8: CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

The ESMP identified and highlighted a number of issues pertaining to the proposed medium voltage lines construction. The issues/impacts have been assessed and described in some detail to gain an adequate understanding of possible environmental effects of the proposed project during construction and mitigation measures in response to negative aspects have been proposed.

The Environmental Management Mitigation / Monitoring provides way forward for in relation to negative impacts mitigation, monitoring indicators, frequency of monitoring, responsible for monitoring and costs estimates.

The consultant is recommending that the Contractor assign an environmental and social expert to undertake the monitoring of the mitigation measures for the medium voltage lines in Rutsiro and Karongi Districts during its construction.

Given the nature and location of the project, the conclusion is that the potential impacts associated with the proposed project are of a nature and extent that can be reduced, limited and eliminated by the application of the proposed appropriate mitigation measures in this ESMP with some recommendations.

8.2. Recommendations

It is recommended based on the ESMP for the construction of the medium voltage lines in Rutsiro and Karongi districts and supplementary information that the contractor if responsible but not limited to the following:

1. The inventory and compensation of the affected properties should also be done prior to commencement of the distribution lines construction,
2. Assign the implementation of the ESMP and other tools to a registered and qualified environmental and social specialist to ensure compliance;
3. The contractor shall comply with this ESMP, the EIA any other documents and requirements in compliance with national and international environmental and social safeguards laws and policies,
4. Training, awareness, tool box meetings and awareness campaigns on HIV and STD prevention, GBV and environmental management are organized,
5. Excavated soils should be used for backfilling or else transported to designated dump

sites while trucks are covered,

6. To avoid dust pollution, excavations should be done after watering the areas and dust masks provided to implicated workers;
7. Noisy activities shall be carried out during working hours when people are at work;
8. Refuse bins to be installed at strategic positions to avoid accumulation of wastes a housekeeping team shall be appointed to regularly monitor the waste management
9. A Grievance Redress Committee shall be formed to record and solve grievances on site and register them in a logbook.
10. Women should be given priority while recruiting or hiring workers especially the casual labour,
11. The contractor should not employ kids less than 18 years and should comply with the national labour law.
12. Bush clearing should be avoided where possible and/ or minimized especially during poles construction and access
13. No hunting shall be allowed by the workers or residents as prohibited by national regulations.
14. During stringing people shall be informed and proper communication equipments and techniques used.
15. In order to have access permission to private land, the Contractor assisted by local authorities shall carry out awareness and sensitization meetings on a regular basis,
16. At the decommissioning phase, the camp site and storage be rehabilitated to almost its initial state before project implementation,
17. Burning of wastes shall be avoided on site,
18. Transport of workers shall not be mixed with transport of materials at the same time,
19. Proper sign posts (men at work, limit speed, big trucks crossing) shall be provided at all road crossings, residential area and where activities are taking place,
20. Areas highly prone to erosion shall be identified and protected during construction,
21. Excavated soil shall not be exposed for a long time especially during rainy seasons
22. Backfilling should be applied after excavation to reduce soil erosion
23. The contractor shall ensure by all means avoid to destroy existing infrastructures (water pipelines, electrical cables, public lighting, road and fibber optic). The contractor shall contact the infrastructure owner whenever there is a risk of damaging the infrastructures.
24. Mobile toilets like ECOSAN shall be provided at strategic points during project

implementation and ensure there a cleaner on full time basis to clean them.

25. All workers shall have valid medical insurance "mutuelle de santé" prior to commencement of construction works,
26. The contractor shall have valid insurance certificates of the project activities, vehicles and equipments
27. Although blasting is not planned to be used, any blasting shall not be allowed without permission from the district authorities and EDCL and any social, economic and environmental consequence or damage shall be borne/ paid by the contractor;
28. The contractor shall ensure waste segregation prior to their disposal;
29. Dispose of wastes at a recognized landfill approved by the districts;
30. Whenever there are scaffolding works or any work at height, workers should be provided with good safety harnesses and proper signage provided at that area to warn workers and residents on the work, taking place,
31. Copies of this ESMP should be displayed in the contractor's offices at all time;

REFERENCES

Law n°48/2018 of 13/08/2018 on environment

EDCL, 2017. Environmental and Social Impact Assessment for EPC WEST.

World Bank OP/BP 4.01. Environmental assessment

World Bank OP/BP 4.12. Involuntary resettlement

World Bank OP/BP 4.04. Natural habitat

World Bank OP/BP 4.11. Physical cultural resources

EDPRS 2008-2012. Economic Development and Poverty Reduction Strategy.

Government of Rwanda, 2008.Ministerial order No. 003/2008.Relating to the requirements and procedure for Environmental Impact Assessment, 2008.

Government of Rwanda, 2008.Ministerial order No. 004/2008.Establishing the list of works, activities and projects that have to undertake Environmental Impact Assessment, 2008.

Government of Rwanda, 2008.Ministerial order No. 007/2008.Establishing the list of Animal and plant species, 2008.

ANNEXES

Annex 1: Checklist for monitoring

Check list for the construction camp site, storage and offices

Impacts	Indicator	Frequency	Time
Storage of materials including hazardous materials	Separate storage with impervious floor	Weekly	Before construction of the camp site, storage and offices
Storage materials are exposed and accessible by unauthorized people and workers	Storage demarcated and fenced	Weekly	During construction works of the lines
Poor handling of hazardous materials	Staff trained	Monthly Daily	During the construction of the medium voltage lines
Poor camp site rehabilitation at the end of construction	Trees and grasses planted.	During and after construction works	At the end of the construction works.

Check list for Environmental Training and Awareness

Impacts	Indicator	Frequency	Time
Environmental, social requirements noncompliance due to lack of knowledge and awareness	Reports of training, awareness programme and tool box meetings	Monthly	During the construction works.

Check list for impacts due to vegetation clearing Monitoring

Impacts	Indicator	Frequency	Time
Impacts related vegetation clearing, removing of trees. People will have their properties destroyed	Proof of compensation Landscaping plan available Wood wastes are availed to initial owners	Weekly	During the construction works.

Checklist for impacts on land use and tenure

Impacts	Indicator	Frequency	Time
Crops and assets are affected or destroyed	Proof of payment to affected people for their properties	Weekly	Before commencement of the construction works.
PAPs are not compensated prior to commencement of works Farmers are not allowed to cultivate on their land low height crops	Compensation report provided prior to commencement of works Farmers cultivate the compensated plots	Weekly	Prior to the commencement of works During construction

Check list for impacts due to extraction and use of building materials

Impacts	Indicator	Frequency	Time
Impacts to natural resources due to the extraction and use of raw construction materials related to unauthorized extraction and dumping, excessive wastes	District License for quarry and sand mining No excessive materials on site Excessive wastes reused	Weekly	During the construction works.

Check list for noise control

Impacts	Indicator	Frequency	Time
Impacts due to noise emitted from line construction	Complaints from residents Portable barriers installed	Weekly	During the construction works.
	Vehicles inspection Certificates	Monthly	

Check list for impacts on air quality

Impacts	Indicator	Frequency	Time
Dust pollution due to excavation works affecting the quality of air	Hauling covers available for all trucks Number of watering times in dry season	Weekly	During the construction works.
Air pollution from exhaust fumes from trucks and other equipment	Number of maintenance of trucks and equipment Vehicle inspection certificate available	Weekly	

Check list for soil pollution

Impacts	Indicator	Frequency	Time
Impact of soil pollution due oil spills	Designated maintenance area provided Store for oil with impervious floor constructed	Weekly	During the construction works.

Checklist for impacts on water use

Impacts	Indicator	Frequency	Time
Impacts due to excessive water usage from the national utility	Rainwater gutters and collection tanks installed at the camp site, storage and offices	Monthly	During the construction works.

Checklist for solid waste management

Impacts	Indicator	Frequency	Time
Impacts of wastes generated on site to the soil, air and human health	Waste hierarchy observed on site Refuse bins installed on site Waste sorted on site	Weekly	During the construction works.

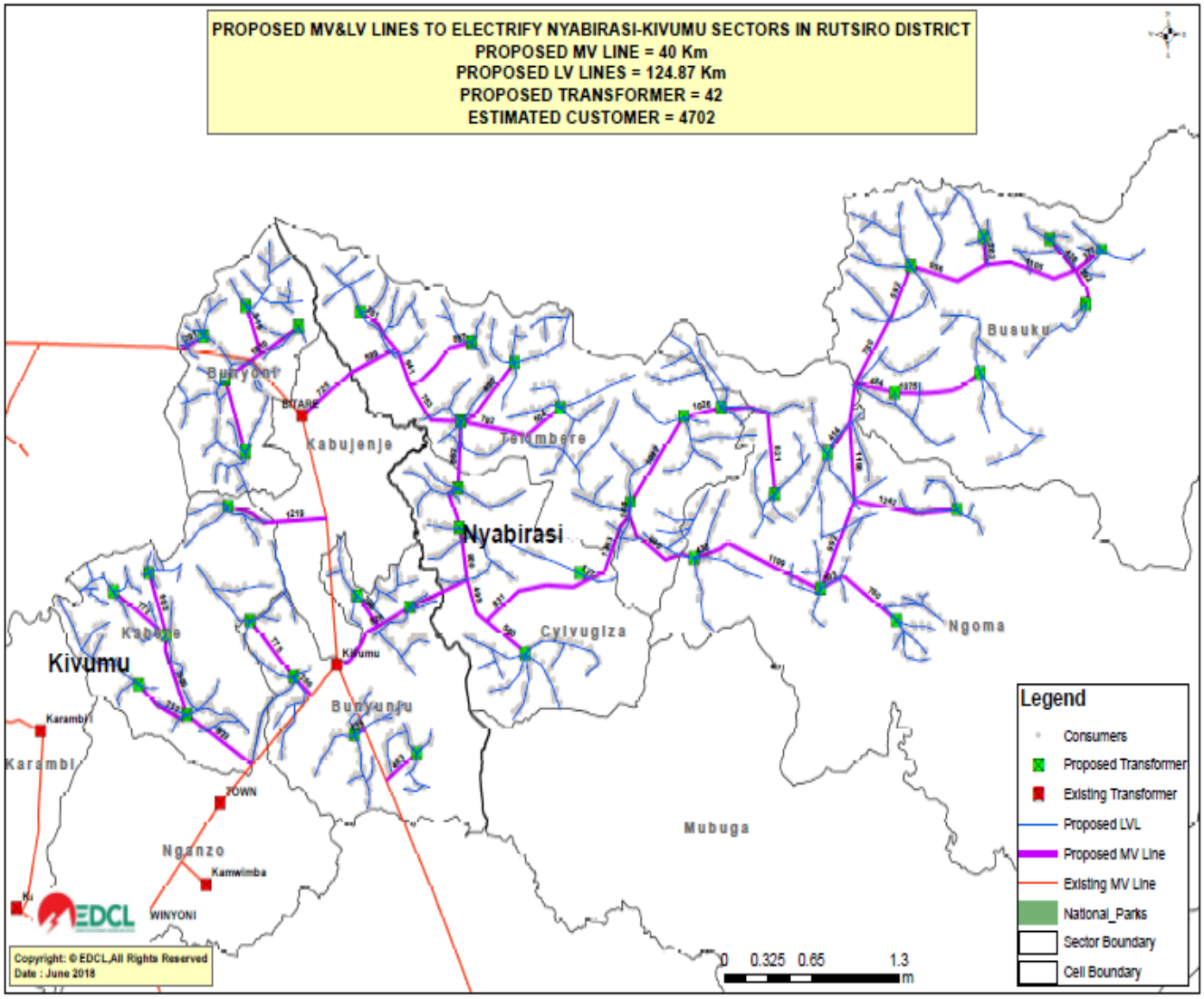
Checklist for Gender based Violence and Child Abuse and Exploitation

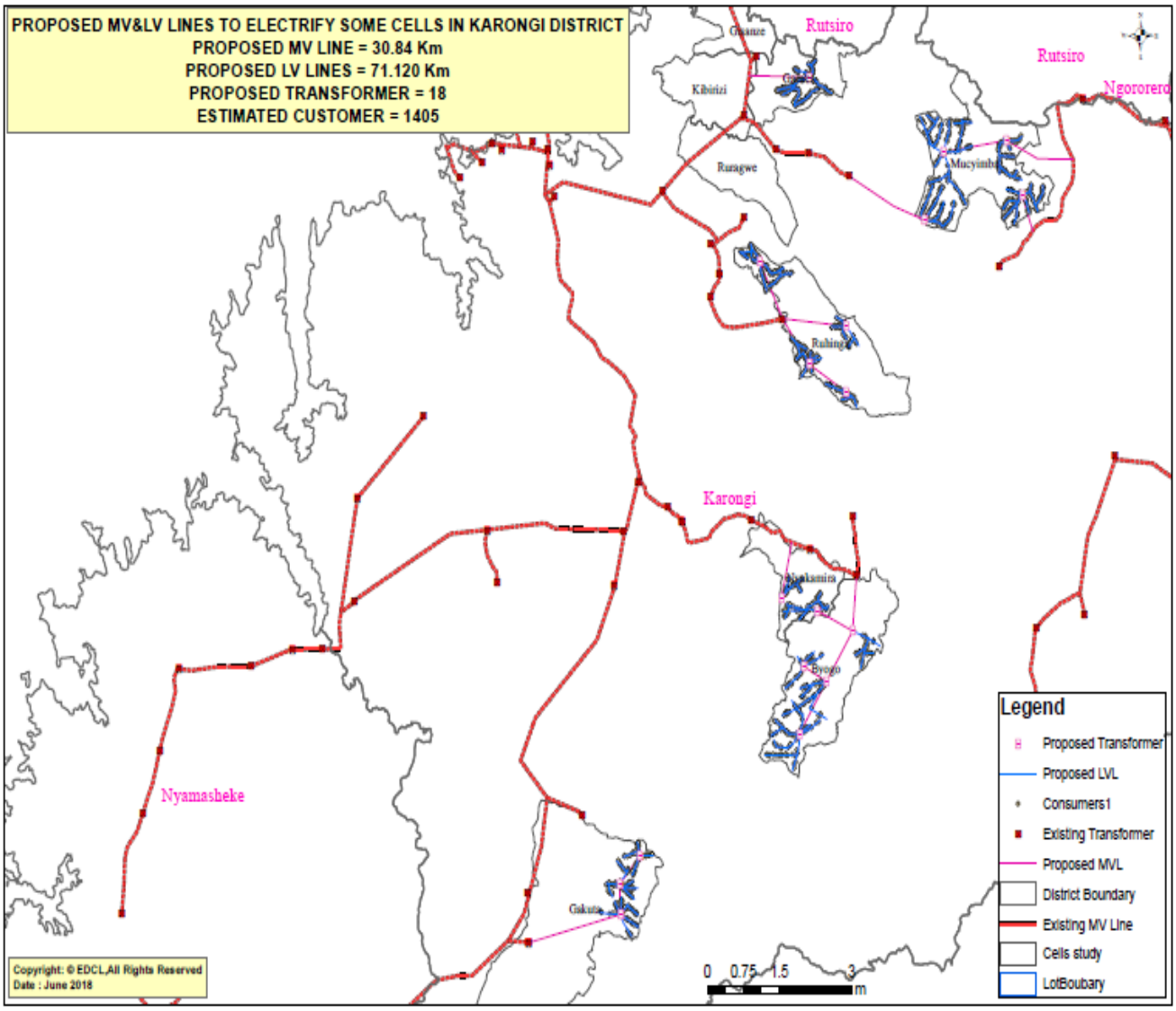
Impacts	Indicator	Frequency	Time
Impacts due gender based violence and child abuse/ exploitation due to lack of awareness	GRC, GBV and CAE committee in place Awareness meeting reports	Monthly	During the construction works.

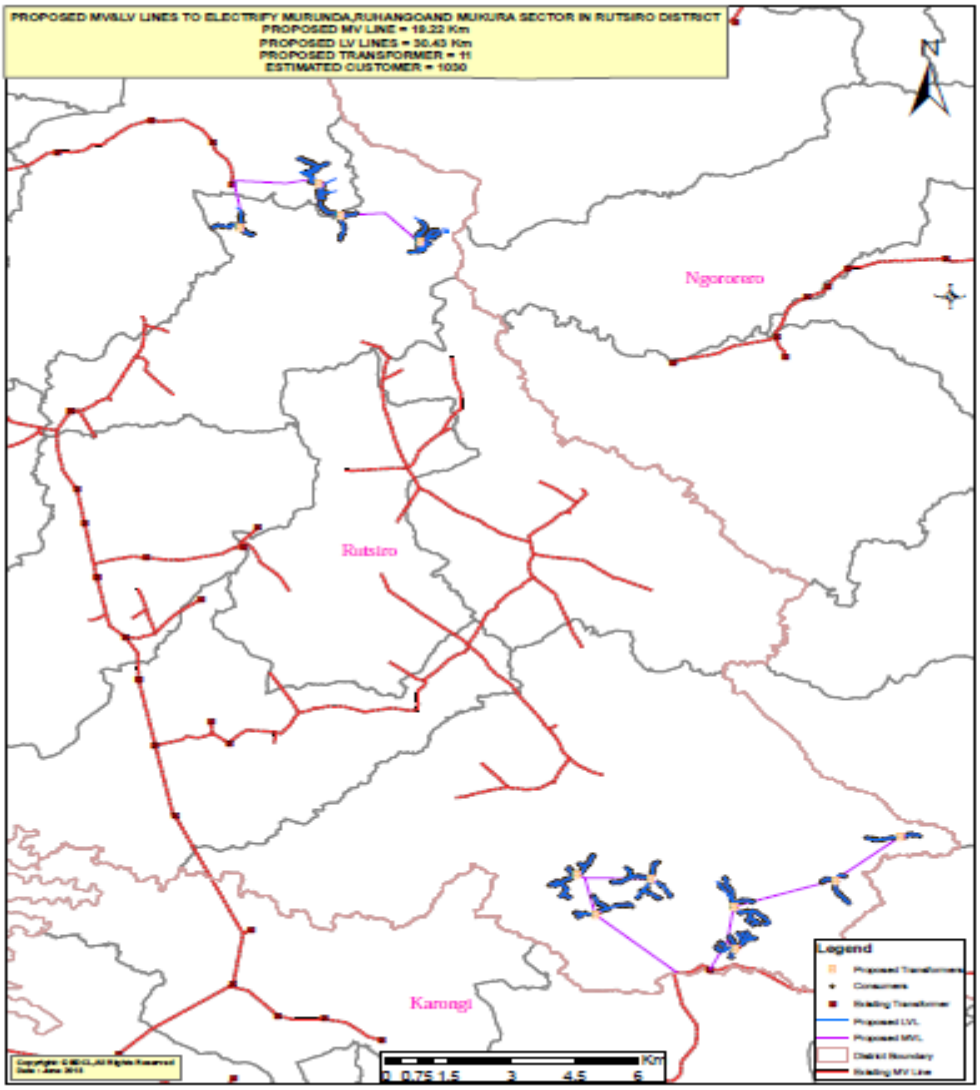
Check list for Gender and disabled discrimination

Impacts	Indicator	Frequency	Time
Impacts on gender and people with disabilities due to discrimination during recruitment, hiring and work	Recruitment report Field observation	Monthly	During the construction works.

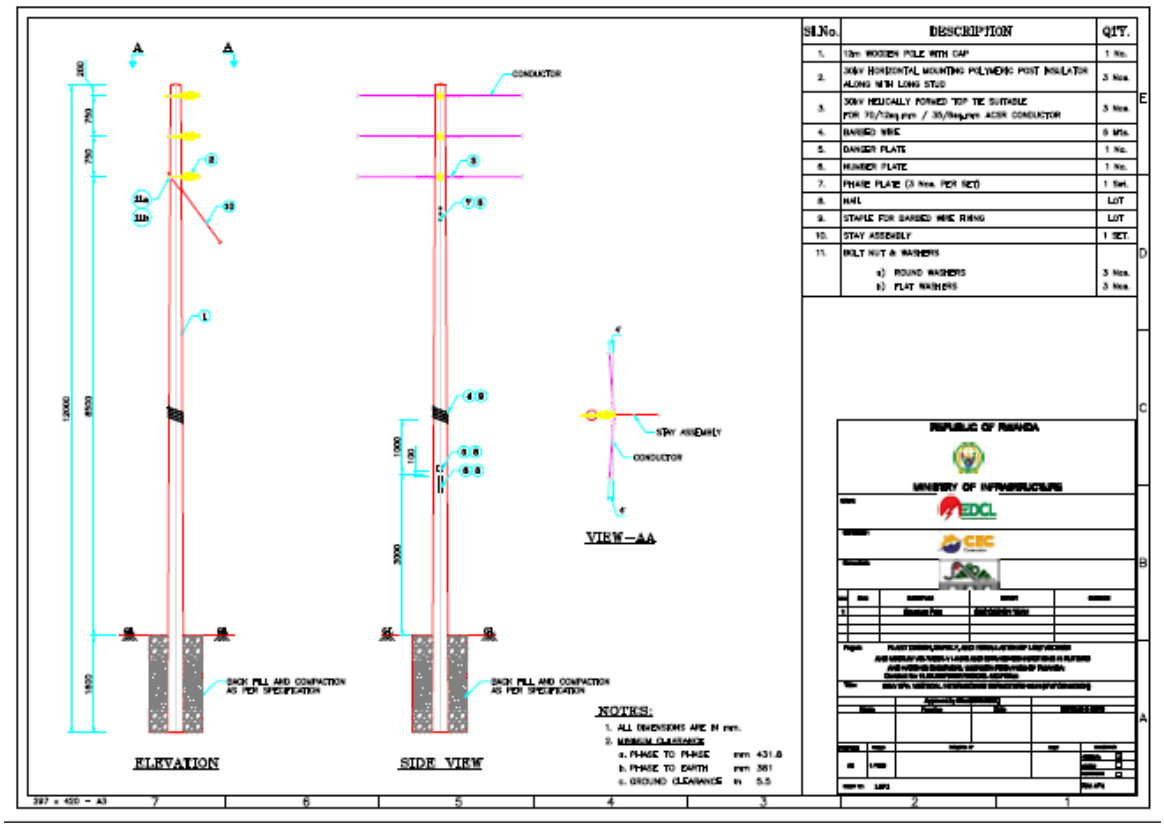
Annex 2: Maps and line routes




PROPOSED MV&LV LINES TO ELECTRIFY SOME CELLS IN KARONGI DISTRICT
PROPOSED MV LINE = 30.84 Km
PROPOSED LV LINES = 71.120 Km
PROPOSED TRANSFORMER = 18
ESTIMATED CUSTOMER = 1405
Rutsiro
Rutsiro
Ngororero
Kibirizi
Ruragwe
Karongi
Nyamasheke
Gakura
Legend
Proposed Transformer
Proposed LVL
Consumers1
Existing Transformer
Proposed MVL
District Boundary
Existing MV Line
Cells study
LotBoubary
0 0.75 1.5 3
m
Copyright: © EDCL,All Rights Reserved
Date : June 2018


PROPOSED MV&LV LINES TO ELECTRIFY MURUNDA,RUHANGOAND MUKURA SECTOR IN RUTSIRO DISTRICT
PROPOSED MV LINE = 19.22 Km
PROPOSED LV LINES = 30.43 Km
PROPOSED TRANSFORMER = 11
ESTIMATED CUSTOMER = 1030
N
Ngoroero
Rutsiro
Karongi
Legend
Km
0 0.75 1.5 3 4.5 6

Annex 3: Pole drawings with foundations and heights



Annex 4: Project Implementation Schedule