ENVIRONMENTAL AND SOCIAL MANAGEMENT
AND MONITORING PLAN

Ministry of Energy and Mineral Development
Rural Electrification Agency

ENERGY FOR RURAL TRANSFORMATION PHASE III

GRID INTENSIFICATION SCHEMES PACKAGED UNDER WEST NILE,
NORTH NORTH WEST, AND NORTHERN SERVICE TERRITORIES

JUNE, 2019
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<th>Full Form</th>
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<tr>
<td>CDO</td>
<td>Community Development Officer</td>
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<tr>
<td>CFP</td>
<td>Chance Finds Procedure</td>
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<td>DEO</td>
<td>District Environment Officer</td>
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<td>ESMP</td>
<td>Environmental and Social Management and Monitoring Plan</td>
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<td>ESMF</td>
<td>Environmental Social Management Framework</td>
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<td>ERT III</td>
<td>Energy for Rural Transformation (Phase 3)</td>
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<td>EHS</td>
<td>Environmental Health and Safety</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>ESMMP</td>
<td>Environmental and Social Mitigation and Management Plan</td>
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<tr>
<td>GPS</td>
<td>Global Positioning System</td>
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<td>GRM</td>
<td>Grievance Redress Mechanism</td>
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<td>MEMD</td>
<td>Ministry of Energy and Mineral Development</td>
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<td>NEMA</td>
<td>National Environment Management Authority</td>
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<td>OPD</td>
<td>Out Patient Department</td>
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<td>OSH</td>
<td>Occupational Safety and Health</td>
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<td>PCR</td>
<td>Physical Cultural Resources</td>
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<td>PCU</td>
<td>Project Coordination Unit</td>
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<td>PPE</td>
<td>Personal Protective Equipment</td>
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<td>REA</td>
<td>Rural Electrification Agency</td>
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<td>RoW</td>
<td>Right of Way</td>
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<td>UEDCL</td>
<td>Uganda Electricity Distribution Company Limited</td>
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<td>WENRECO</td>
<td>West Nile Rural Electrification Company</td>
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EXECUTIVE SUMMARY
This report presents the Environmental and Social Management and Monitoring Plan for Grid Intensification activities packaged under West Nile, North North West, and Northern Service Territories. All the grid intensification schemes under the above service territories are scattered in the districts of Adjumani, Moyo, Nebbi, Pakwach Koboko, Zombo, Arua, Yumbe, Maracha, Abim, Agago Oyam, Gulu and Amuru.

The works to be undertaken under the Grid intensification component include; network design, supply, erection installation, testing and commissioning of the proposed grid intensification works. Preparation of an Environmental and Social Management and Monitoring Plan of the Grid intensification activities used the following methods; site visits, stakeholder consultative meetings, and review of relevant legal and legislative requirements, World Bank Safeguards requirements and project documents including ESMF.

The project is expected to present a number of positive environmental and social impacts that include job creation and reduced GHG emissions among others. It is also not expected to have significant negative impacts on the immediate surroundings during its construction and operation phase; given the nature of activities and the locations of the project. In this report, a number of impacts associated with this project, both positive and negative have been highlighted. While positive impacts will be enhanced, mitigation measures to minimize the negative impacts have been identified and recommendations made for their implementation in the detailed implementation plan herein.

The likely potential negative impacts are manageable, localized and of short term in nature. Further, the impacts are known and can be mitigated. This plan has provided adequate mitigation measures for the identified negative impacts and measures to enhance the positive aspects associated with the project. REA and the Supervising Consultant shall closely monitor the environmental and social aspects of project activities to ensure that the mitigation measures proposed herein are implemented.
1 INTRODUCTION

Background Information
This report presents the Environmental and Social Management and Monitoring Plan for proposed Grid Intensification activities packaged under West Nile, North North West, and Northern Service Territories.

Grid intensification and associated connections is a component under ERT-III phase. This component involves construction of short extensions to the MV and LV network to reach potential customers who are close to the existing grids. Specifically, the grid intensification project will include short extensions to the medium voltage power lines (not exceeding 5km and installation of transformers) and low voltage (LV) network (six poles) to potential customers who are relatively close to the existing grid. Beneficiaries of the project include households, social institutions and (small) businesses.

The areas where the projects are planned to be implemented are mainly built up areas that are near to the existing lines. All the project areas where the power extensions will be undertaken have no sensitive ecosystems.

This Environmental and Social Management and Monitoring plan has been developed in line with the National Environmental and Social requirements, Environmental and Social Management Framework (ESMF) for ERT-III as well as World Bank guidelines and policies. The National environmental and social requirements are similar to the World Bank guidelines and policies in many aspects that include categorization of the projects into less, medium and high risks; need for enhanced conservation of physical environment and protection of social rights; need for engagements with the project affected parties etc. This project is categorized as low risk both under the World Bank and National safeguards categorization.

Objectives of developing an ESMP
The objective of developing this ESMP is to outline the arrangements relating to:

- Identification of the anticipated environmental and social impacts from the construction works of the distribution line.
- The implementation of the recommended mitigation and enhancement measures,
- Monitoring of the mitigation measures implementation process.
- Institutional arrangements for implementing the environmental and social aspects of the project;

Scope of the ESMP
This ESMP covers intensification projects planned in the following WENRECO and UEDCL operational areas in the districts of Adjumani, Moyo, Nebbi, Pakwach Koboko, Zombo, Arua, Yumbe, Maracha, Abim, Agago, Oyam, Gulu and Amuru.
details of the projects, their scope (size and area) are presented as annexures herein. The ESMP further covers the environmental and social aspects of the project during construction and operational phases.

**Methodology**
The methods used in the development of this ESMP included but were not limited to:

**Site inspection and observation**
Visits were made to the proposed project areas during the course of developing this ESMP. Site visits were conducted with the aim of identifying potential causes of environmental and social risks. This was aimed at ensuring that appropriate enhancement and/or mitigation measures are prescribed to manage any potential risks.

**Consultation with stakeholders**
Consultations were carried out through interviews and discussions with relevant stakeholders including communities to ensure public participation in the ESMP development process.

REÁ Team Engaging management of Arua Institute of Health sciences

**Document Review**
The Literature reviewed included; Background data concerning the local communities, including from the UBOS National Census (2014); Demographic and Health Survey (2006), and District Development plans, legal and policy frameworks, ESMF for ERT III and the World Bank safeguard requirements among others.
2 PROJECT DESCRIPTION
The Rural Electrification Agency has been tasked by the Government of Uganda to implement the On-grid Energy Access component under the Energy for Rural Transformation Project Phase Three (ERT III). Under this project component there are four sub-components and Grid Intensification and Associated connections is one of the sub-components under ERT-III project. This component involves construction of short extensions to the MV and LV network to reach potential customers who are close to the existing grids. Specifically, the grid intensification project will include short extensions to the medium voltage power lines (not exceeding 5km and installation of transformers) and low voltage (LV) network (six poles) to potential customers who are relatively close to the existing grid. Beneficiaries of the project include households, social institutions and (small) businesses. The areas where the projects are planned to be implemented are mainly built up areas that are near to the existing lines. All the project areas where the power extensions will be undertaken have no sensitive ecosystems. Although it is desired that the power lines run along the road reserves, in some cases due to sharp corners and the need to avoid some sensitive ecosystems the lines may not strictly go along the Road Reserve.

Materials and methods (Technical consideration)
Overhead Power Lines Route
The proposed overhead 33kv power Distribution Line will be constructed along the existing road reserves (where feasible) so as to minimize the negative environmental and social impacts. In some cases the provisional design will pass the Distribution line too close to buildings (shops) and will have to move them to pass behind the shop alignment. The low voltage lines are allowed to move as close as possible to the buildings to ease connection costs by the end-users. This serves the main objective of the project which is to extend power to the villages and upcoming Rural Growth Centres (RGC) together with other institutions such as schools, Health Centres, resorts and upcoming industries and entertainment centres among others.

Voltage Levels
Uganda Electricity Transmission Company Ltd (UETCL) uses voltage levels of 132kV and 66kV at transmission. UMEME the electric power distribution company uses 33kv and 11kV at Sub-transmission/distribution, and 415/240V for low voltage distribution. The proposed Grid Extension project is based on the 33kV for the overhead lines and shall be 3 phase throughout with three line conductors in horizontal flat formation and a continuous earth wiring running along above the three conductors.

Three-Phase Versus Single-Phase
Three phase sub-transmission is favoured mainly because of its advantage in terms of conductor size for a given load. This criterion applies when the conductor requirement due to the load is higher than the requirement for the mechanical resistance of the line.
As is expected, at the initial stage for upcoming Rural Electrification Schemes, the loads are initially very light and the above mentioned criterion would not apply. Instead, single phase line has been preferred either as Two Wire Neutral Return (TWNR) or Single-Wire Earth Return (SWER). This could offer considerable cost reductions as compared to three phase lines. However, from the consumer side, the single-phase schemes do not allow three-phase loads to be supplied and the cost savings have to be balanced against the possible drawbacks to the large consumers who may have to procure large single phase motors at higher prices. This is why in most of these rural electrification projects, a three phase 33kv line is selected and considered more suitable.

Conductors
The conductor selected is AAAC100 (100m2 All Aluminium Alloy Conductor) for the main line and AAAC50 for short spurs, transformer T-Offs and all LV distribution networks. The size was selected as the most economical for anticipated loads taking into account line losses. The type AAAC as compared to ACSR (Aluminium Conductor Steel Reinforced), and AAC (All Aluminium Conductor) was selected because it does not find a ready market with the Aluminium Hallow-ware manufacturers who normally buy vandalized ACSR and ACC Conductors.

Poles
Creosote treated wooden poles were selected because of their availability, cost as well as the technical skills available to handle such poles. Concrete and Mild steel poles were considered as the second option and mainly because of cost these two poles have not been used in Uganda. Creosote was selected for treatment in preference to Tanalith due to the poor experience in Uganda of Tanalith treated poles. There seems to be a problem with Tanalith treated poles since they seem to start rotting after a short time as short as two years.

Insulators
Pin type porcelain insulators will be generally used rigidly mounted on a steel cross-arm on top of the pole. These are passive materials without any effect on the environment. The design takes into account wind gusts of up to 80 knots. The insulators a rigidly mounted but the conductors can swing in the wind. The design has allowed for swings at maximum loads without the conductors touching.

Line Construction
The 33kv power lines will be constructed mainly with 12m high creosoted treated wooden poles, with an average spacing of 110m. The holes for the wooden poles will be of diameter 350mm and depth of 2000mm. Steel wire (7/4.00) stay sets will be installed at intermediate angle poles, section poles, T-offs and terminal structures. The stay wires shall be anchored by a stay block buried at depth of 2.0m and about 3m
from the base of the pole. The stay block shall consist of 1000mm long creosote treated woodblock or 300mm x 300mm x 300mm concrete block.

Addition to that, H-type section poles shall be erected every 1.5km and each H-type pole consists of two poles erected 2m apart with one cross-arm together with four stay sets installed along the line corridor. At heavy angles, the stay wire will be installed at 45 degrees angle from the pole.

It is estimated that more than 850, 12m wooden poles will be required for the 33kv line which is 95km long. The minimum clearance required for the 33kv line from the ground or highest water level will be 6.0m and 3m from the nearest point on a building. The clearance from the edge of the road shall be a minimum of 2m.

The LV distribution network will require approximately 1300, 10m wooden poles. The distance between poles for the LV distribution is 50m maximum.

**Transformers**

At each load centre, a sub-station of appropriate capacity say 25KVA, 50KVA and or 100KVA shall be established to distribute power to the local consumers. Each sub-station consists of a transformer which will step down the voltage from 33kv to 415V 3phase or 240 single phase. Most of the consumers will require a single phase supply although some consumers presently running maize grinding mills may require the 3 phase supply.

The transformers shall be mounted on poles depending on the size. 25KVA will be mounted on a single pole while the 50KVA and 100KVA will be mounted on an H-pole. This consists of two poles with the transformer mounted on a steel platform between the two poles.

The transformers are made of a steel tank with copper coils immersed in mineral oil in the tank. Possible impacts are oil leakage, transformer burning due to overloads, possible vandalisation to steal the oil.
3 POLICY AND REGULATORY FRAMEWORK FOR THIS ESMP

Key laws and regulatory frameworks that will guide the implementation of environmental and social aspects of the grid –intensification project include:

**National Environmental and social management Policies**
1. The National Environment Management Policy, 1994
3. The National Cultural Policy, 2006;
4. The National Water Policy, 1999;
5. The National Land Use Policy, 2011;
6. Forestry policy, 2001
7. Energy policy, 2001
8. Public Health Policy 1964
9. The National Gender Policy, 1997;
10. The National HIV/AIDS Policy, 2004;

**National Legislation and Regulations**
2. The National Environment Act, Cap 153;
3. The Electricity Act, 1999
4. The Public Health Act, 1964
5. The Land Act, Cap 227;
6. The Land Acquisition Act, 1965;
7. The Workers Compensation Act, 2000;
8. The Water Act, Cap 152;
9. The Local Governments Act, Cap 243;
10. The Uganda Wildlife Act, Cap 2000;
11. The Occupational Safety and Health Act, 2006;
12. Historical Monument Act, 1967;
13. The National Forestry and Tree Planting Act, 2003;
15. The National Environment (Waste Management) Regulations, 1999;
16. The National Environment Regulations (Noise Standards and Control), 2003
17. The National Environment (Control of Smoking in Public Places) Regulations, 2004
**World Bank Safeguard Policies**

The safeguards policies triggered are:

1. OP 4.01 Environmental Assessment
2. OP 4.04 Natural Habitats
3. OP 4.11 Physical Cultural Resources
4. OP 4.12 Involuntary Resettlement
5. OP 4.36 Forests

Additionally, the following World Bank Group’s Environment, Health and Safety guidelines shall also

1. General Environmental, Health, and Safety (EHS) Guidelines
2. Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution

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4  GENERAL BASELINE CHARACTERISTICS OF THE PROJECT AREAS
WEST NILE SERVICE TERRITORY
West Nile service territory is mainly constituted by the districts in the west Nile region of Uganda and these include; Arua, Maracha, Zombo, Nebbi, Koboko, Yumbe & Moyo. Major towns in the Region include; Paidha in Zombo District, Arua Municipality and Nebbi Municipality. The physical environment in all the districts of this region is almost the same. Therefore the physical baseline characteristics of one district can be extrapolated to all the districts.

It is important to note that on the physical environment, the proposed project areas are built up with no sensitive ecosystems. Therefore there will be minimal clearance of crops and trees as part of the project activities.

In all the proposed project areas, no forest that will be affected was identified during the field survey exercise since the Grid intensification project will be implemented in built up areas. An assessment and valuation of the existing private plantations that will be affected will be undertaken by the REA way leaves team and compensation will be effected before construction activities commence.

Grid Intensification project in west Nile service territory will be implemented in the Districts of; Adjumani, Moyo, Nebbi, Arua, Koboko, Moyo, Maracha and Zombo Districts. The project will cover 58.9km of medium Voltage 33KV, 98.5 km of 3Phase low voltage and 26.7 km of 1 phase low voltage reticulation.

ADJUMANI DISTRICT
LOCATION
Adjumani district is located in the north-western region of Uganda, between latitudes 31° 24” and 32° 4” east of Greenwich line; and longitudes 2° 53” and 3° 37” north of the Equator. The district lies on the eastern bank of the Albert Nile, which is its common border with Moyo District. It borders the districts of Amuru in the south and east, Arua and Yumbe in the west, and Moyo in the North. Adjumani is one of the districts that form Uganda common border with the Republic of South Sudan in the northeast.

Livestock
Livestock keeping (cattle, goats, sheep, pigs and poultry) is the second most important economic activity with low yields due to wide spread pest, diseases, poor pasture, and lack of safe-drinking water sources for animals. The most common animal diseases in the district are tick borne, foot and mouth, rinderpest and intestinal and liver flukes. On average, a sizeable number of households keep between 2-3 animals. Other people depend on sale of local building materials, firewood, charcoal, mat making, brewing, petty trade and casual labour. Estimated income from sale of farm
produce cannot be predicted, as people do not keep records. Majority of the population spend their income on payment of school fees, and purchase of more domestic animals, consumables (daily household needs) medical care and leisure.

**Fisheries**
Fishing is the third important economic activity in the district with 5% of the population depending on it for their livelihood. The main types of fish catch are Tilapia, Nile patch and Claris. Subsistence fish farming are used like Korokota and under sized nets. Transportation is still done on bicycles which limit the marketing of fresh fish.

**Forest**
The district is well endowed with natural forest, but it is under exploited. 1.5 % is covered with forest plantation. Zoka forest is the main biologically diverse forest. There is an accelerated rate of deforestation mainly due to encroachment on protected areas such as central forest reserves, conversion of forests into crop and grazing land, charcoal burning and over-harvesting of forest resources, high population growth, ineffective law enforcement sometimes due to political interference and degazetment of protected areas. This has direct negative impact on the livelihoods of the poor in relation to declining firewood sources, rainfall regime, soil erosion control and related environmental services

**Energy**
Approximately 0.03%, 0.07% and 99.9% of the total population uses Electricity/gas, paraffin and other energy sources respectively (UBOS, 2002). However, the main sources of energy for lighting are paraffin (41.4%) and firewood (24.9%). Electricity supply in the district was thermal and only available from 7 p.m. to 12p.m. till 2014 when the district was connected to the national grid, hydro powered. An increasing number of households, local government offices and NGOs use solar panels to power electrical appliances although high initial costs have kept away potential users. Unpredictable and inefficient energy sources are an obstacle to small and medium industrialization in the district.

**Industry**
Industrialization is generally low in the district and dominated by cottage industry preoccupying 0.42% of the population. Other activities include: carpentry woodwork (5.7%), metal products (3.2%), leather manufacturing (4.6%), mechanical repairs (3.3%), brick laying (6.5%), food & cash crop processing (58.3%), and embroidery and other crafts (17.98%) (UBOS, 2014). Women who are able to obtain the majority of raw materials locally mainly do embroidery and crafts
Trade
It is estimated that about 1.2% of the district’s populations earn their living through commerce. Small retail trade is the common commercial activity in the district. Items sold include a range of locally manufactured and imported goods. A significant section of the district’s trade is in agricultural produce. Cross-border trade is lucrative along the South Sudan border. Due to the large extent of poverty in the area manifested in generation of low local revenue relative to the district administration responsibilities and activities. The major source of local revenue is market dues tender fees which constitutes over 50% of total revenue. The central government provides funds to meet development and recurrent costs and in many cases earmarks funds as conditional grants to the district. The decentralization process has, however, provided an enabling environment for community based development and some supplement from the donor and NGO support to the district.

Topography and Vegetation
Adjumani District lies at an approximate altitude ranging from 900 to 1500 metres above sea level. It is principally gentle undulating land merging into rock outcrops. The southern part of the district, especially the area occupied by Ciforo Sub-county comprises of highlands dropping into broad flat-bottomed valleys while the north stands at a low slope gradient. The district is mainly underlain by a complex formation consisting of highly weathered and exposed hard-core rocks, quartzite sandstones, and clay. Hard-core rock and sand are used in construction work; murram is mined and used for road works while clay is for pottery and brick industry. Open water bodies comprise 2.5% of total land area with River Nile (Albert Nile) being the major feature of the district. Other prominent rivers include Itirikwa, Esiya, Ayugi, Tete, Adidi and Zoka. In Adropi sub-county there are prominent seasonal streams like Assisi, Adropi, Robidire, Oliji, Ariwa, Minia, Surumu, Ura eyi that drain into river Nile. The district is also endowed with a hot spring, located at Amuru in Pakele sub-county.

Adjumani is endowed with considerable vegetation cover. Permanent wetlands with a variety of vegetation particularly papyrus occupy the banks of River Nile (Albert Nile). Seasonal swamps also occupy a sizeable area of the district. The Arawa highlands and the equatorial forest of Zoka, in Ofua sub-county, dominate the southern part of the district. Other areas are predominantly savannah woodland and grassland with grasses ranging from 0.5-2.0 meters high.

Geology and Hydrology
No known hydro-geological study has been carried out in the district. Nevertheless, the area is mainly underlain by a complex formation consisting of highly weathered and exposed hard-core rocks, quartzite sandstones, and clay gneiss. Hard-core rock
and sand are used in construction work; murram is mined and used for road works while clay is for pottery and brick industry

**Ground Water Potential**

The main surface water resource in Adjumani district is the river Nile, which forms a natural boundary of the district on the southwest, west and north. The nearest distance from Adjumani town to the river is about 20 km. Other surface water resources are permanent streams such as Esia and Itirikwa (in Ciforo), Tete and Ayugi (in Dzaipi), which drain in the Nile. There are also seasonal streams, which flood during the rainy season but dry out during the peak of the dry season (January-March). The groundwater resource is potentially good, particularly for well development. However, in some areas it is very difficult to drill boreholes, e.g. Itoasi village and Ibibiaworo village in Dzaipi and Pakele sub counties respectively.

**Soils**

Adjumani soils were formed as a result of geological and weathering processes. They are mainly hydromorphic soils characterized by undifferentiated river alluvium dominated by grey and yellow sandy clays represented by the Mulembo series of medium to high productivity. Although all soils in the district are generally fertile, Ofua sub-county has the richest soils.

**Atmosphere**

The climate of Adjumani District is tropical in nature with moderate rainfall and temperature. The rainfall pattern is bimodal with annual rainfall varying between 750 mm to 1500 mm. The rainfall seasons fall between April to June and August to November, with peak rainfall usually experienced in May. Dry conditions are experienced from December to March. However, over the past five years parts of the district have experienced unusually long dry spells with low and unpredictable yearly rainfall. This has widely been attributed to cycles in climatic conditions that have also affected the River Nile water level. The most affected areas are the sub-counties of Adropi, Ciforo and Dzaipi. Ofua and Pakele are wetter and cooler.

**Administrative and Political Structure**

Adjumani was pronounced a district on 17 July 1997. It was originally one of the three counties in Moyo District known as East Moyo. The district has been split into two counties in July 2015 owing to her population increase. The two counties are Adjumani East and Adjumani West. Boundary is the same as that of the district. The district is comprised of nine sub-counties and one town council, a Town Board of Pakele and proposed Town Board of Ciforo pending the approval of Minister of Local Government. The lower Local Governments (LLGs) include: Adropi, Pachara, Ciforo, Ukusijoni, Dzaipi, Arinyapi, Ofua, Itirikwa, Pakele and Adjumani Town Council. There are 54 parishes and 206 villages.
**Wetlands Resources**

Wetlands cover 46.8sq.km of the total area of the District (1.5%). The largest wetland in the district is along the Nile. The District has seasonal and permanent wetland. The seasonal wetlands are found in most parts of the district while the permanent ones exist along the Nile and the Southern parts of the District and along rivers Zoka, Esia, Itirikwa and Tete. Traditionally, the District wetlands have been used as source of materials for crafts, hunting area and fishing areas. Seasonal wetlands and margins of permanent wetlands have been used for grazing livestock, growing of crops and source of domestic water. **No wetland ecosystem will be affected by the grid intensification activities**

**Ecosystems Diversity**

The Landscapes include the Albert Nile stretch, the escarpment and hills above the Nile’s eastern side, and the rolling countryside of southern Adjumani District. Vegetation is diverse comprising of medium altitude moist deciduous forest in the Zoka forest, forest savannah mosaic, Butyrospermum and Combretum savannahs, and wetlands. The banks of the Nile are fringed by Khaya forest, and there are extensive areas of Papyrus along the Nile. Seasonal wetlands and a few permanent wetlands are found in the district. The wildlife population in the district including Sitatunga, elephants, buffaloes, kobs, giraffes, waterbucks, hartebeest.

![Image of ESMP Development team consulting Deputy CAO – Adjumani District]

**NEBBI DISTRICT**

**Bio-Physical Environment**

**Drainage and Topography**

Nebbi lies between altitudes 2289ft to 5224ft above sea level. The generally extensive plains of the east gently rise into the undulating hills of the west. Jonam County has a
generally flat relief. The drainage system is basically constituted by the Albert Lake and Nile River which are of major economic value to Nebbi. Other rivers of economic importance include Namrwodhu which contain potential sites for electricity generation besides; there are several other minor rivers, springs and wetlands.

Climate
Nebbi District is characterised by strong seasonal variations in rainfall, temperatures and winds. The average yearly rainfall in the West Nile - lowlands area is between 680 - 1350 mm while the West Nile - highlands area this is between 740 - 1490 mm. Monthly rainfall figures indicate that on average, the district receives less than 100 mm for seven months of the year. Mean minimum temperature in the district is between 17.5°C and 20°C per year whereas the mean maximum temperature is 30° per year. The district experiences a relatively high humidity during the rainy seasons reaching maximum in September and the lowest is in the dry season reaching minimum in February.

Vegetation Cover
The vegetation of the district is mainly wooded savanna, grass savanna, plantation forest, riparian vegetation and post cultivation communities. The mixed savanna is characterized by; *Butyrosperum* savanna associated with *Hyparrhenia* spp; dry *Acacia* savanna associated with *Hyparrhenia* spp and *Hyparrhenia* in this group. The plantation forests consist mainly of plantations of pine and *eucalyptus* species.

Area Geology and soils
The parent rock consists of basement complex and gneiss around Zeu, Parombo and Warr; amphibolites at Zeu area, schist and granite around Parombo and Nebbi; Kaiso red sand around Rogem and Pakwachi; and recent alluvial sand in the Panyamur area along the shores of Lake Albert. The soils in the West Nile lowlands area are mainly greyish - brown sands over weathered rock in the west. Highly leached, red sounds and loamy-sands are found along the Nile valley. These are of low productivity. There are also dark grey, calcareous clays (Ora series) found in this area and are mainly of low to medium productivity. These have moderate to low erosion hazard and are suitable but of low productivity for cotton.

Social Economic Environment
Population
The population of Nebbi District according to the National Housing and Population Census, provisional results for 2014 estimated the population at total of 385,220 people. It registered a higher population amongst women estimated at 200,713 compared to that of men at 184,507. The least populated areas in the district are the urban centres with 57,335 against the rural areas at 327,885.
Ethnic composition
The Nilotics of Alur and the Jonam constitute the majority of the Uganda population of the district. Other ethnic groups include the Sudanic Lendu.

Economic activities in the project area
The vast majority, approximately 80% of Nebbi’s people live in the rural areas and derive a substantial portion of their livelihood from agriculture with a few people in formal employment. The main source of income is agriculture and the main crops for sale include arabic coffee, irish potatoes, flue-cured tobacco, wheat and vegetable and the tea at Okoro. Cash is also obtained from the sale of small quantities of livestock by a few farmers. Other sources of income include non-farm activities such as formal employment, crafts and service, small businesses such as shops and stalls for trading fish mongering, restaurants and tea-rooms, pottery, bicycle repairs etc. The nature of the project area is semi-urban and is characterized by retail shops and small businesses with the major activities being trade in food stuff and fish from the nearby Lake Albert.

Land tenure system
Similar to other districts in Uganda, Nebbi has three land tenure types as provided for in the Constitution of Uganda i.e. customary/communal, private mailo and lease hold land tenure. A large percentage of land in the district is held under customary/communal land ownership with a few people particularly in urban areas having free hold tenure while others rent it from the town board. There are also areas considered as public land e.g. forest reserves and water bodies. Family members and/or clan elders administer customary land and land is rarely bought or sold and accessibility is normally through inheritance.

Social services and infrastructure
Electricity and water supply
Water in Nebbi district is obtained from water supply schemes, springs and boreholes as well as rain harvesting. Less than half of the population has access to safe drinking water, supplied by protected springs and boreholes. The rivers, streams and wetlands also provide water in the district.

ZOMBO DISTRICT
Bio-Physical Environment

Drainage and Topography
The topography of Zombo is generally hilly steep U shaped and V shaped valleys in all the Sub counties. The highest peak is on Agu Hill in Abanga Sub County. The hills are characterized by undulating ranges sweeping across the Sub counties of Paidha, Abanga, Jangokoro, Zeu, Kango and recedes towards, and into, Arua District. A
similar pattern is exhibited in Nyapea Sub County running almost parallel cutting through Nebbi and Arua District. There are stretches of flat lowland in Angol and Anyola parishes in Atyak Sub County, the transitional landscape from hilly, highlands to flat, lowlands of Padyere and Madi-Okolo counties of Nebbi and Arua districts respectively. The transition is characterized by a steep escapement of Rift Valley origin on the eastern margins of Nyapea and Atyak Sub-counties’ which borders with Nebbi and Arua. Zombo District is well drained with ground water and major perennial water bodies, notably Nyagak, Ora, Ayuda, Adida, Omol, Leda, Aniza and Nyibola Rivers among others. The project site is of gentle gradient draining towards the eastern direction.

**Climate**

Zombo District experiences largely tropical climate, and in some cases bordering temperate climate due to her location within the Eastern topographical rainfall zone. Rainfall is bi-modal in nature with peaks in May and October. The fast short and usual unreliable rainfall is from late March to May, while the second and more reliable rain falls in July-October period. Dry spells are experienced in June-July and December to early March. Temperatures are generally low throughout the district, especially during the rainy period. These weather pattern however feature frequent overlaps and intersections, in some cases there are longer sunshine and dry periods, while in other cases, rainfall occur practically all the year round.

**Vegetation cover**

The District is mostly covered by Savannah and open grassland characterized by tree species such as eucalyptus, pines, cypress, Grivellea, terminalia, combretum, to mention. However, the fairly high population density in the District has adversely affected the original vegetation. Wooded lands are being cleared for agriculture, to provide construction wood for the (semi-permanent) dwellings and wood fuel which is used by 99% of the population. A lot of the natural vegetation has been depleted. It is not uncommon today to see bare hilltops and slopes, with scattered acacia and other tree species and shrubs, a scenario which was uncommon, unseen and unheard of in the past.

**Area Geology and soils**

The common soil types are red and dark clay and loamy soils that are mature and fertile. The red soils are commonly found on the hill slopes and are muddy clay with high retention capacity for water that make the roads along the hill sides difficult to navigate by motorists. The red muddy soils are equally difficult to cultivate and thereby present a hindrance to the local population engaged in peasant agriculture for their livelihood. On the other hand, the dark loamy soils are very fertile and are found commonly at the foot of the hills and highlands. It is believed that the soils
could have come as a result of past tectonic activities at the time of the formation of the various hills. Other soil types in the district are the grey, skeletal and sandy soils mostly found in Paidha Sub county and parts of Abanga and Zeu Sub counties.

Social Economic Environment

Land use types
The various land use types in Zombo district include; Environmental (Agriculture approx. 84%, forestry), Infrastructure (roads coverage, communication networks, electricity, water supply), Settlements, industrial, institutions (pre-primary, primary, secondary, tertiary, health centres, religious institutions, civic), recreational. The land use type at the project site and its immediate neighbourhood is commercial in nature characterised by a Rock fuel filling station, retail shops, and other business.

Population
As per the Housing and population census of 2014, Zombo has a total population of 240,368 of which 115,411 are male and 124,957 females. The least populated areas in the district are the urban centers with an estimated population of 45,847 people and 194,521 people in the rural areas.

Ethnic composition
Zombo district is mainly made up of the Alur (Luo) ethnicity people and spread with numerous tribes like the Kebu, Lendu, Lugbara and Madi. The Alur are one of the various ethnic groups that inhabit the west Nile part of Uganda. They live amongst the Okebu, Lendu, Kakwa, Alinga and other ethnic groups of West Nile. However, unlike their neighbors who are Sudanic, the Alur are Luo.

Economic activities in the project area
The majority of household members in Zombo are involved in Agriculture as their main economic activity. Atyak (62.4%) had the highest number of households engaged in Agriculture while Paidha TC registered the least (36%). Findings show that Paidha TC had the highest percentage of people that are involved in Trade (6.6%) and Atyak has the least (0.6%). Manufacturing as a main economic activity is the least practiced economic activity with just 1% of the households engaged in it. Provision of Services as a main economic activity was mostly evidenced in Paidha Town Council while the least is in Atyak and Nyapea. Some households are engaged in other economic activities and these are mostly found in the Sub counties of Paidha TC and Nyapea. Being a growing trading center most of the people in Zeu are engaged in petty and retail trade alongside farming. The filling station will be the first investment of such a magnitude in the trading center.
Land tenure system

Similar to other districts in Uganda Zombo has three land tenure types as provided for in the Constitution of Uganda i.e. customary/communal, private mailo and lease hold land tenure. A large percentage of land in the district is held under customary/communal land ownership with a few people particularly in urban areas having free hold tenure while others rent it from the town board. There are also areas considered as public land e.g forest reserves and water bodies. Family members and/or clan elders administer customary land and land is rarely bought or sold and accessibility is normally through inheritance.

Waste management

Zombo district has a fair distribution of sanitary facilities with the overall distribution of those with a toilet facility estimated at 81% in Zombo District with the highest concentration in Zeu S/C (85%) and the lowest registered in Jangokoro S/C (77%). 59% of the households in the District use pit as a solid waste disposal facility, followed by garden at 13%, then bush at 11%, others at 10% and skip bin at 7%. At the time of the study, the filling station had already been established with a VIP Latrine for human waste disposal and garbage bins placed at the side for handling of domestic waste. However, the trading centre still faces a challenge as regards disposal of solid waste since it doesn’t have a gazette dumpsite in place.

Social services and infrastructure

Electricity and water supply

The predominant source of water for drinking comes from protected springs (65%) followed by rivers, lakes, ponds and streams (14%), followed by unprotected water springs (12%), and then boreholes (4%) follows. All other methods follow at just 2%. Overall, 79% of people in Zombo district travel up to three kilometers to access water implying that water access was a serious problem. The bigger part of the district does not have access to electricity hence the grid intensification will go a long way in enhancing the electricity supply in the area.

Access, transportation and communication

The district has a fairly good access to transportation and communication networks. Several initiatives by government and private partners have brought about the establishment of rural road network development plan to include national roads, district roads as well as community access.

ARUA DISTRICT

Arua district lies between latitude 20 30’N and 30 50’N and longitude 300 30’E and 310 30’E in the north western part of Uganda. It is bordered by Yumbe in the North
West, Moyo district in the north east, Maracha district in the North West, Democratic Republic of Congo in the west, Nebbi district in the south, and Amuru district in the east. Arua town, the Administrative and commercial headquarters is 520 kilometres away from Kampala, Uganda’s capital city.

Arua district comprises mainly of rolling plains rising from the Nile floor in the rift valley (600m above sea level) to the Congo - Nile water divide (1200 to 1400 meters above sea level). Arua’s landscape can generally be grouped into three topographical zones.

**Topography**

Arua district comprises mainly of rolling plains rising from the Nile floor in the rift valley (600m above sea level) to the Congo - Nile water divide (1200 to 1400 meters above sea level). Arua’s landscape can generally be grouped into three topographical zones.

- **Madi Plateau** - Occurs at an altitude of about 900 meters above sea level. It occupies the eastern parts of the district in Terego and Madi - Okollo Counties. Several broad valleys that cut across to enter River Nile dissect this plateau
- **Western highland** - this upper plateau occurs at an altitudinal range of 1200 to 1800 metres above sea level. The parent rocks include basement complex metamorphose which is responsible for the formation of the hilly terrain. The zone generally covers the central western parts of Arua district especially in Ayivu and Vurra Counties. The slopes in Vurra consist of many facets
- **Rift valley** - The rift valley escarpments are highest in the South and fade off to the North. They consist of several fault carps arranged, roughly parallel with the Albert Nile. These scarps separate the Rift valley plains from the Madi plateau. The rift valley lowlands consist of wide seasonal swamps. All major valleys are aggraded and consist of alluvial and swamp deposits.

**Geomorphology**

Arua district consists of a monotonous Madi vast plain with occasional hills rising abruptly from it termed as zone of tar and inselburgs. At the Nile, rift valley, faults are seen at about 300 meters in height. Rift valley deposits occur and are backed by a series of scarps arranged in an echelon, which separate the rift valley plain from the Madi Plain. Large scarps in the West, above which is the West Nile Plateau which in turn stops the plain. This succession of plains is largely due to rift valley movement hence two erosion surfaces have been established, the Madi plain which is part of the African end of tertiary surface, and another principal erosion surface which is the older Gondwana surface. The major valleys are aggraded with alluvial and swamp deposits. The aggradations are partly geomorphic, but also associated with dense growth of papyrus and other plants, which block streams and cause deposition of sediments.
Climate
Arua district has a bi-modal rainfall pattern with light rains between April and October. The wettest months are normally August and September, which receive 120mm/month. The average total rainfall is 1250mm. The mean monthly evaporation ranges from 130mm - 180mm. In the dry season (December - March) temperatures remain high throughout.

Soils
The soils covering most of the district are mainly ferralitic and sand loams. These soils have fine textile with rather loose structure, which are easily eroded and leached. Most soils are acidic. Soil types in the district include
- Yellow - red sandy, clay loams latosols varying from dark grey to dark which are slightly acidic and mainly derived from granite, gneissic and sedimentary rocks. They occur on gently undulating - hilly topography
- Brown - yellow clay loams with laterite horizon with a variety of dark brown to dark greyish brown, which are slightly acidic. These occur on flat ridge tops or as of undulating topography
- Light - grey- white mottled loamy soils with laterite horizon ground, structure less loamy 19 sands. They are acidic - allocative and mainly found on the lower and bottom slopes.

Water resources
Arua district generally lacks adequate surface and ground water resources. Although the Nile is a very reliable water source and has attracted significant settlement pattern along it, it is not strategically located and less than 0.2 percent of the total area of the district. It benefits only Madi-Okollo County
- The Albert is fed by streams and ground water during the heavy rains and loses its water during the dry season through evaporation and also to the surrounding unconsolidated sands, silt and gravel which recharge the water content of the surrounding countryside through natural means
- River Enyau is one of the important rivers in the district. It is fed by river Nara and drains to the East

Wetlands
Wetlands cover approximately 3 percent (215 km2) of the total land area of the district. This allows water to stay in one place long enough to maximize infiltration and thus access to water supplies for plants. There has however been a lot of encroachment on the wetlands for crop cultivation and unless the trend is reversed, the district’s wetlands will be completely destroyed in future.
*Findings indicate that there is no fragile ecosystem which will be affected by the project. The project will be implemented in the built up areas and only a few private eucalyptus trees, mangoes, avocados and nature trees were noticed in the Right of way.*

*Figure 3: Natural tree species along the Row, Close to Arua Institute of Health*

Wetlands cover approximately 3 percent (215 km²) of the total land area of the district. This allows water to stay in one place long enough to maximize infiltration and thus access to water supplies for plants. There has however been a lot of encroachment on the wetlands for crop cultivation and unless the trend is reversed, the district’s wetlands will be completely destroyed in future.

**ECONOMIC ACTIVITY AND EMPLOYMENT**

*Working persons*

Persons aged 10-15 years who were working 61,879 representing 47.0% Persons aged 10-17 years who were working 84,543 representing 49.7% Persons aged 18-30 years who were working 135,488 representing 79.4% Persons aged 16-64 years who were working 297,857 representing 81.8%. Persons aged 18 years and above who were working 287,630 representing 83.2% and Persons aged 60 years and above who were working 20,647 representing 68.5% *(UBOS National Population and Housing Census Data – 2014)*

Like many Ugandan districts, the economy of Arua is dependent on agriculture and employs over 81 percent of the total population. Fertile soils and suitable climate combine to support the cultivation of a number of crops in most parts of the district. Agriculture is mainly subsistence (80%) and takes place on smallholdings of
approximately two acres using mainly simple farming tools (hoes, pangas and harrowing sticks). Only 0.5 percent of the population is engaged in commercial agriculture. Family members constitute the single most important source of labour.

- Both food and cash crops are grown. The major food crops include cassava, beans, groundnuts, simsim, millet and maize. Tobacco is the major cash crop and is the main source of livelihood for the majority of the population in the district. It is grown mainly in the fertile highlands. Cotton used to be grown in the lower and drier plains but due to marketing problems, it has been abandoned. Efforts are however underway to revamp cotton production. There is also an insignificant growing of coffee, which is done mainly in the temperate areas along the border of Arua and Nebbi district. There is renewed interest in the promotion of coffee production in many areas of the district now.

Other important economic activities in the district include; formal employment, which employs about 9 percent of the population, petty and formal trade, which employs 3.8 percent and 0.7 percent respectively and cottage industry that employs 2.3 percent. The remaining proportion of the population depends on family support and other miscellaneous activities.

Figure 4: Goat rearing along the project scope in Euta Village – Arua District
ACCESS TO COMMUNITY SERVICES

- **Access to a Primary school**: Households that are 5 km or more to the nearest primary school, whether public or private are 10,285 representing 7.0% while Households that are 5 km or more to the nearest public primary school 14,218 representing 9.7%

- **Access to a Secondary school**: Households that are 5 km or more to the nearest secondary school, whether public or private 44,951 representing 30.7% while Households that are 5 km or more to the nearest public secondary school are 64,660 representing 44.1%

- **Access to a Health Facility**: Households that are 5 km or more to the nearest health facility, whether public or private are 35,799 representing 24.4% while Households that are 5 km or more to the nearest public health facility are 48,732 representing 33.2%

- **Access to a Police post /Police station**: Households that are 5 km or more to the nearest Police Post/Police Station are 46,336 representing 31.6% of coverage

HOUSEHOLD BASED AGRICULTURAL ACTIVITIES

Arua District Households engaged in crop growing are estimated to be 127,057 representing 86.7%. Households engaged in maize growing are 71,665 representing 48.9%. Households engaged in coffee growing are 1,384 0.9 Households engaged in growing of beans are 84,823 representing 57.8%. Households engaged in growing of millet are 22,673 representing 15.5% Households engaged in growing of sweet potatoes are 30,142 representing 20.6%, Households engaged in growing of matooke are 12,502 representing 8.5%, Households engaged in livestock farming are 102,469 representing 69.9% Households engaged in either crop growing or livestock farming are 131,889 representing 89.9% (UBOS National Population of Housing and Census Data – 2014): **In general, West Nile major business opportunities are found in major towns and small retail business ventures scattered in pre-urban areas and trading centers.**
KOBOKO DISTRICT

Topography and drainage

Koboko District comprises mainly of flat rolling plains occurring at 3,160 to 5,283 feet above sea level with isolated undulating hills mainly in the western and northern parts of the District towards the Sudan boarder, with a slight slope towards the east. The area where the three international boarders meet consists mainly of hills and rocks hosting remains of some indigenous savannah woodlands.

Geology and soils

The soils covering most of the District are mainly ferralitic and sand loams with fine textile and rather loose structure. The commonest Soil types in the District include: dark cotton soils, clay loams latosols varying from dark grey to dark which are slightly acidic and mainly derived from granite, gneissic and sedimentary rocks. They occur on gently undulating - hilly topography. Brown - yellow clay loams with laterite horizon with a variety of dark brown to dark greyish brown, which are slightly acidic. These occur on flat ridge tops or as of undulating topography near the border with Democratic Republic of Congo. Light - grey- white mottled loamy soils with laterite horizon ground, structure-less loamy sands.

Climate

Koboko district like other West Nile Districts has a bi-modal rainfall pattern with some dry spells in June and between November and March. The wettest months are normally August and September, which receive 120mm/month. The average annual rainfall is 1,250mm. The mean monthly evaporation ranges from 130mm - 180mm.
the dry season (December - March) temperatures remain high (above 300 C) throughout.

Vegetation

The predominant vegetation in Koboko District is savannah woodland with bushy forest cover found in the northern part of the District in the sub counties of Kuluba and Ludara and at the sides of Liru Mountains in Lobule. Midia Sub-county is generally flat and covered with bush shrubs. The bushy forests in the northern part of the District mainly comprise of natural trees with few forests comprising of planted trees. The hills in the east have fertile soils around them that has led to people migrating to settle along the hill foots and slopes.

The Socio-economic Environment

Economic Activities

The livelihood of people in the district is dependent on agriculture, which employs over 80% of the total population. Fertile soils and suitable climate combine to support the cultivation of a number of crops on subsistence basis on smallholder pieces of land using mainly simple farming tools (hoes, pangas and harrowing sticks). Both food and cash crops are grown in the district with tobacco as the major cash crop and is the main source of livelihood for nearly a third of the population in the district. Goat rearing, Rice, Apiculture and groundnuts enterprises are increasingly being undertaken to ensure food security and generate household income especially under NUSAF vulnerable group support projects. In addition to agriculture, a good proportion of the population is engaged in various businesses, notably general merchandise, transport services, petty trade and agri-business, with very little value additions. This has been made possible by the strategic location of the District at the entrance of both Sudan and Democratic Republic of Congo.

Land tenure and use

Land ownership in Koboko is mainly through Customary, Freehold and leasehold. Land titling has only been taken serious in the recent past and it is estimated that about 15% of the population in Koboko now have land titles as compared to 3% in 2002. The number of persons with leasehold now stands at over 30% a great improvement from the previous situation in the District. Over 88% of the total Koboko District land is arable with less than 12% covered by rivers and streams, Forests and Hills. Most of this land is being used for subsistence farming. The affected PAPs have committed to provide access to the distribution line which will majorly traverse the road reserve and common boundaries.
Demography and ethnic composition

According to statistical data from the National Population and Housing Census, 2014 Provisional results, Koboko had a total population of 208,163 persons (106,072 females and 102,091 males). 37,825 of the district population reside in the urban areas while 170,338 reside in the rural areas. The census registered a reduction in the population growth rate from 6.24 in 2002 to 3.98 in 2014. Koboko Town is cosmopolitan; many tribes from Sudan and DRC blend with the district’s tribes mainly the Kakwa dialect and speak many languages including Lingala, Bantu, English and Kiswahili.

Social services and infrastructure

Electricity and water supply

The district is endowed with adequate surface and ground water resources. District safe water coverage stands at 46% from sources such as protected springs, boreholes and rivers such as River Apa, Kaya at the South Sudan boarder, Kechi, Ora and Kochi in the district. The district benefits from 1.5 MW of thermo electricity serving up to 2,800 customers including in neighboring districts of Arua, Paidha, Yumbe and Nebbi. Most of the area residents are not connected to the grid hence the proposed project will boost electricity supply and spur economic development in the area.

Access, transportation and communication

Koboko District is one of the Districts in Uganda with poor road network making its accessibility difficult. The total murram road in kilometres is about 150kms with 48kms as trunk roads under central Government management. The district has access to major mobile telephone networks including MTN, Airtel, UTL as well as the internet. There is one radio station (Radio Koboko), but the community has access to FM radio stations in other neighbouring districts. There are opportunities to access paid and affordable Television services enjoyed across the country.

Housing Types

Most of the housing in the area (illustrated in the photographs below) especially in trading centres comprise of permanent structures constructed using bricks, cement and sand while the roofing is of iron sheets. The villages are mostly comprised of semi-permanent structures constructed with mud bricks and wattle but with iron sheet roofs.
Source of Cooking Fuel
Majority of households rely on firewood for cooking. Solar energy is mainly used for lighting especially among those who are considered middle income by the rural folks as evidenced by solar panels on roof tops.

Physical Cultural Resources
No major physical cultural resources were encountered during the field reconnaissance.

YUMBE DISTRICT
Topography and drainage
The District is generally flat, although there are several hills in the eastern part, and in the north there are two hills namely Midigo and Kei. Apart from subterranean hydrology, there is no major surface water body in the district except Albert Nile with few dendrites and parallel patterned tributaries that originate from the inland-River Kochi, Datcha and Newa. The project site is of flat terrain.

Geology and soils
The Precambrian rocks of basement complex underlie Yumbe district. The rocks are composed largely of granite fascia grade rocks, which generally form enclaves in the gneiss complex. On hilltops. Grey granite and gneiss are left exposed in many places. These granites and gneiss are intensively metamorphosed and deformed. Predominant soils are ferralitic and sand bans are soil type most widely spread covering large areas. These soils are fine textured with loose structure erodible and easily leached. Most soils are acidic. Vertisols are found in the northwestern parts of Yumbe district. These have poor drainage and thus easily become water logged. There is a lateritic layer in most soils. This reduces the rooting depth and moisture conditions where it is close to the surface, making the land difficult to cultivate. Subsoils lack minerals except for building/construction purposes. Soil types include:

- Yellow-red sandy, clay loams, latosols varying from dark Grey to dark brown and are slightly acidic mainly derived from granite, gneiss and sedimentary rocks. They occur on gently undulating –hilly topography.
- Brown-yellow clay loams with laterite horizon with variation of dark brown to dark greyish brown and slightly acidic. These occur on flat ridge tops or on top of undulating topography.
- Light Grey-mottled loamy soils with laterite horizon ground (water laterite), structureless loamy sands. These are acidic-alkaline and are mainly found on lower and bottom slopes.
Climate

Yumbe receives an average total rainfall of 1250mm. It experiences a two seasonal rainfall, light rains between April and October. The wettest months are usually August-September with less than 120mm/month. The period December-February is dry with less than 60mm/month. The rain is associated with the northern and southern movements of the inter-tropical front. Mean monthly evaporation ranges from 130mm-180mm. The prevailing wind is from the east to the west with frequent windstorms during the dry season. Temperatures are generally low during the nights of dry seasons Dec-March) and high during day hours whereas during wet seasons, temperatures remain high throughout.

Vegetation

The natural vegetation used to be characterized by open lands with Savannah grasslands of equatorial types with small pockets of natural forests on hills and along the Sudan border, northern parts of the district. The vegetation cover of the district is mainly Savannah woodland and therefore rich in biodiversity. The vegetation may be divided into the following: -

- **Forests**: This type is again divided into low and high altitude forests. But in Yumbe, the predominant type is the high altitude forest. The former is mainly found along valleys. The high altitude forests are found on hilly places where climatic conditions are favorable for their development. It consists of natural forest on Mt. Kei in the northeastern part of the district. Associated grass species found in the forests are *Hyparrhenia rufa*, *Panicum maximum* and Klipspriner (on Mt. Kei only).

- **Savannah**: This is by far the predominant vegetation in the district. The vegetation is *Butyrospermum-Hyparrhenia* Savannah. It is characterized by such trees as *Isoberlinia doka*, *Daniehcliveri* and *Afzelia africana*. In the central parts of the district, the vegetation mainly consists of *Butyrospermum-Hyparrhenia* Savannah with dry Hyparrhenia grass Savannah and also Palm Savannah. Also present are dry *Combretum acacia-Heteropogon* and *Butyrospermum-Hyparrhenia* Savannah.

The Socio-economic Environment

Economic Activities

Agriculture is the backbone of the economy of Yumbe district with over 95% of the households depending on subsistence farming as their principal resource of livelihood. The sector provides employment to over 90% of the active rural population. According to records available in the agriculture department, the estimates and area
available with potential for agriculture in the district is about 1982km², of which only a lower percentage is currently under cultivation. The district has a high potential for a wide range of agricultural products both crops and animals. Major crops grown include; cassava, sweet potatoes, maize, sorghum, millet, rice, tobacco, cotton, coffee, beans, cow peas, pigeon peas, groundnuts, cabbages, tomatoes, onions. Animal Husbandry practices in the district are mainly of indigenous cattle breed such as the zebu (BOS Indicus) reared mainly for beef production; dowry and milk production that is of secondary importance.

Land tenure and use
Land in the district is held under four tenure systems as described below:

- Customary land tenure; means a system of land tenure regulated by customary rules and acquisition is usually through inheritance. A father allocates Land to his sons who in turn assign it to their wives to cultivate. Much of the proposed project area is on this form of land tenure.
- Leasehold land tenure; means holding of land for a given period from a specified date of commencement, on such terms and conditions as may be agreed upon by the lessor and the lessee.
- Communal land tenure system; this system is gradually disappearing due to increase in population size. It is communally owned and common in all sub-counties.
- Mailo land tenure system. This is titled and owned perpetually by individuals or groups.

The main land use type in the district is agriculture although while socio economic activities include Trade.

Demography and ethnic composition
Yumbe district is largely inhabited by the Lugbara and the Kakwa. The Lugbara constitute over 95% of the total district population. The other tribe, the Kakwa lives in the northeastern parts; Kerwa and Mijale Parishes in Midigo sub-county and some are found around Lodonga Basilica in Drajini sub-county. Yumbe district has eight sub-counties with a total population of 485,582, 229,811 males and 255,771 females as per the 2014 National Housing and population census. Population of the district by residence is 35,606 for urban and 449,976 for rural.

Social services and infrastructure
Yumbe Town council is about 600km away from Kampala and is accessed by way of a tarmac surface road via Arua district. Most parts of the district are accessed by use of motorized murram surface roads. the district has access to all mobile telephone
networks. The population mainly accesses water from boreholes and protected water springs.

**Housing Types**

Most of the housing in the area especially in trading centres comprise of permanent structures constructed using bricks, cement and sand while the roofing is of iron sheets. The villages are mostly comprised of semi-permanent structures constructed with mud bricks and wattle but with iron sheet roofs.

**Source of Cooking Fuel**

Majority of households rely on firewood for cooking. Solar energy is mainly used for lighting especially among those who are considered middle income by the rural folks as evidenced by solar panels on roof tops.

**Physical Cultural Resources**

No major physical cultural resources were encountered during the field reconnaissance.

**MOYO DISTRICT**

**Location and Area**

Moyo District is located in the north-western corner, or West Nile region of Uganda. The Nile River forms its southern and eastern border, the Sudan its northern border, and Yumbe district its western border. In total, the district covers an area of 2,059 Km², of which 192Km² is rivers and swamps, 172Km² is gazetted forest and game reserves. Approximately 78.9% of the districts’ land is arable or suitable for cattle grazing and a population density of 115 persons per Km². The distance from the district headquarters to Kampala via Arua and Gulu is 640 and 480 kilometres respectively.

**Administrative Structure**

Administratively, the district is divided into two counties namely: West Moyo and Obongi. It has eight sub-counties and one Town Council, 44 parishes and 225 villages. The two counties of Obongi and West Moyo are managed by Assistant Chief Administrative Officers, while each sub-county is being headed by substantive sub county Chiefs and Town Clerk for the town council. Overall, the Chief Administrative Officer is the Chief Executive and accounting officer of the district and Local Council V Chairperson is the political head of the district. He supervises local council one to five
Topography
The District’s Topography is characterized by low planes and rolling hills along the Nile River, at 900m above sea level rising to a series of hills and peaks. The highest peak is mountain Otze at 1500m above sea level. The Nile River bank rises sharply upwards producing a landscape characterized by plateaus, flat topped hills, inter sparse with deep valleys and giving rise to steep slopes. Drainage occurs towards the Nile, through a series of rivers, which are seasonal and mainly supplied by rainwater. These features provide beautiful sceneries for tourist attraction.

Climate
Moyo District receives about 1267mm of annual rainfall. It has a distinct dry period that begins from December to February. November and March have moderate rainfall. The two major peaks in rainfall occur in April (short rainy season) and between August and October (major rainy season). Areas along the Nile receive lesser rain (860mm) than the rest of the district. The highest temperature recorded was 45°C in the months of January to February and lowest 29°C in the months of August to October.

Vegetation
Although the hills in sub-counties of Metu and Itula are covered by forests, the major vegetation cover in the district is savannah woodland with isolated thorn shrubs found near the streams and rivers.

Major Economic activities
According to the census report, about 80% of the households in Moyo District depend mainly on subsistence agriculture as their main economic activity. Only 9.7% of the population was dependant on earned incomes and 0.4% on property income. The major crops grown include sweet potatoes, sorghum, cassava, simsim, groundnuts, finger millet, maize, cowpeas and beans. Fishing is another main economic activity in the district. The Nile River is the main source of fish within the district.

Poverty and livelihood
The people of Moyo view poverty as lack of means to satisfy basic material and social needs, as well as a feeling of powerlessness. There is gender and location specific variations in the way the local people define poverty. Source of monetary livelihood and comfort of accommodation like good sanitation are paramount in urban areas while possession of productive assets like land and livestock are more critical in the rural areas. Women are concerned more with lack of land, water, family planning services resulting in large family size, lacking assistance, household food and poor welfare of children when they define poverty. Men relate poverty mostly to the inability to engage in meaningful employment and lack of productive assets. To the
youth, the degree and extent of social connectedness and family welfare indicate the level of poverty. Therefore, the strategy to address poverty requires multi-faceted approaches. The people of Moyo use a number of indicators that give meaning to the above characteristics. These indicators are generally grouped under material and non-material indicators. The most common material indicators include lack of food, clothing, shelter, money and inability to send children to school or for health services. In both rural and urban communities men were more concerned about income and assets of production – land and livestock as material indicators. Women on the other hand were mostly concerned with assets for domestic use and consumption such as lack of food, bedding, gardens and spending much on treatment of children.

The most used non-material indicators include sickly, elderly, beggar, lacking children for support, having dirty compound. Gender specific perceptions were apparent. Men were concerned about the quality of life of families such as naked children, quarrels in homes and none participation in family functions. The women’s conception relates to the character of husbands such as lazy and drunkard husbands, and obligations of women pregnancy and travel long distance with produce.

The major causes of poverty in the household include:

- Natural calamities like drought, flood, and hail storms.
- Laziness and drunkardness among the community.
- Corruption tendencies in both government and community levels
- High unemployment levels among the youths
- Poor health among the population caused by high morbidity and mortality
- Extended families and polygamous life with large family sizes
- Poor conditions of social infrastructure and other amenities like electricity

Moyo in general has less developed social economic amenities compared to Arua and Adjumani Districts. The major business opportunities such as trade, and exchange
markets are championed in Moyo town. Basic and small retail business opportunities such as grain milling, timbering, fishing along the Nile and border trade with South Sudan are scattered in small towns and pre-urban areas. Agriculture is a dominant economic activity and tobacco is a leading commercial crop grown in the Area.

Figure 7: A diesel Powered Grain mill located in Opiro Village, Ebihwa Parish, Moyo District

NORTH NORTH WESTERN SERVICE TERRITORY

This service territory is located in the North North Western Part of the country bordering South Sudan in the North, West Nile in the West and Central North service territory in the south and Northern Service territory in the East. It covers the districts of Gulu, Amuru and Oyam. The physical environmental baseline characteristics of the area are almost the same. Therefore the physical baseline characteristics of one district can be extrapolated to all the districts.

Under Batch 2, the Grid Intensification project will be cover the districts of Oyam, Gulu and Amuru. Various scattered distribution medium voltage (33&11) lines totaling to 53.95 km, of 3phase low voltage network will be constructed. In addition to the network, 29 distribution transformers and 99 single meters shall be installed in the service territory
Rivers
The Albert Nile flows along the western border of Acholi Sub-region and the Victoria Nile flows along their southern borders with Lango Sub-region. Achwa River flows through the middle of Acholi Sub-region and is a boundary between Gulu, Lamwo and Pader districts. Agago River branches off from Achwa River and runs through the middle of Pader and Agago districts. These rivers are major obstacles to movement of people and goods, especially in the rainy season.

Altitude
The altitude ranges between 600 and 1,200 m above sea level. Nangeya Mountains are in the north-eastern area along the border with Karamoja Sub-region and they are approximately 2,200m above sea level. Agoro Mountains are located in the northern part of Lamwo District along the international border with South Sudan and they are 2,600m above sea level. The south-western area along Albert Nile is relatively low and ranges between 600 and 800 m above sea level. The rest of the area is generally flat. Many wild animals live near the Albert Nile in the western part of Amuru and Nwoya Districts and near the Victoria Nile in the southern part of Nwoya District because of a favourable climate. The Murchison Falls National Park is located in the southern part of Nwoya district.
Climate
Acholi Sub-region enjoys dry and rainy seasons the same as the rest of Uganda. The rainy season runs from late March to the end of November and hits two peaks in a year. The average rainfall was approximately 1,450mm per annum during 2006 to 2010. Compared to the southern part of Uganda, such as Kampala, the rainy and dry seasons in Acholi Sub-region are clearly distinct in terms of rainfall.

Agricultural Activities
Agriculture is the backbone of the regional economy in Acholi Sub-region. The major source of household incomes is sale of crops. More than 80% of the population is estimated to engage in agriculture based upon the interviews with district offices in Acholi Sub-region. The major crops in the study area are as shown in the following table. Maize, sorghum and millet are principal foods for the people living in the study area. Upland rice is recently in fashion to be grown as a cash crop. Cotton once came down in price however it has tended to recover recently.

GULU DISTRICT AND NEIGHBOURING DISTRICTS

Topography
The relief of Gulu and the neighboring Districts consists of complex low landscape with relatively uniform topography marked by few sharp contrasts like Oroko and Ajulu hills to the north, Ayamo, Awere and Omoro hills in the east (Omorodistrict). Generally, the altitude ranges between 1000 -1200 meters above sea level.

Soils
According to Langlands (1974) classifications, the soil of Gulu and the neighboring Districts consists of ferruginous soil with a high percentage of sandy soils and therefore susceptible to erosion. Due to its sandy nature, the soil has low water retention capacity and high rate of water infiltration. The soils are usually deep with little differentiation into clearly defined zones and possess fine granular structure, others moulded into large, weak coherent clods that are very porous. Gulu district and the neighboring Districts are endowed with vast fertile soils like in Oрапwoyo in Odek, Adak in Lalag and generally speaking, the entire soils in the district’s can support quite a number of both cash/food crops including bananas and coffee. This has resulted into very high crop yield supplying the neighboring districts including Southern Sudan.

Hydrology
The up and down wrapping of underground rocks accompanied by faulting, shearing and jointing has influenced the drainage pattern in the district to form a dendrite drainage pattern. Here many rivers and streams are held responsible for the formation of this drainage pattern. The major ones are those flowing into the Nile, which
include rivers: Tochi, Aswa, Pece, Odek, Akoyo, Unyama, Abera, Lagude, Larwodo, Chome, Laminonyut, Abwoch, Ocaga, just to mention a few.

Climate
The type of climate experienced in Gulu and the neighboring Districts consists of dry and wet seasons. The average total rainfall received is 1,500 mm per annum with the monthly average rainfall varying between 1.4 mm in January and 230 mm in August. Normally the wet season extends from April to November with the highest peaks during May, August and October, while the dry season begins in November and extends up to March. The average maximum temperature is 50 degrees centigrade and the minimum being 18 degrees centigrade. Relative humidity is high during the wet season and low in the dry season.

Vegetation
The vegetation of Gulu and the neighboring Districts as classified by Langlands (1974) consists of intermediate savannah grassland. This type of vegetation is that found between the moist and the dry savannah. The vegetation type is characterized by open canopy of trees of 10-12 meters high and underlying grasses of 80 centimeters high. The trees are fire resistant and are therefore able to regenerate themselves after being burnt with fire. The common tree species here include; Acacia, Focus Natalensis, contyetum, Banasus, Aethicpum (Fanpalm) while the common grasses include; imperate cylindice, Hypemaria Rufa, Digitria scalarum. There are also some herths like Bidens Pilosa, Ageralum Coinzolds, Amarathus species and Latana Camara. However, man’s activities have tended to interfere with the natural vegetation of the place and this has led to the development of secondary vegetation. The common tree and grass species here include; Eucalyptus, Jacaranda, Cupressus, Theruvaian, Pienes, Hibiscus, Bougain Vilae and Flamboyant

Cultural Units
Acholi has a cultural institution being headed by the paramount chief of the Acholi, Rwot David Onen Achana II who is resident in Gulu town. The institution is well organized with 52 chiefs drawn from different clans in the whole of Acholi land and they are the ones that form the council of Rwodi under their leader, Rwot David Onen Achana II. In addition, Ker Kal Kwaro Acholi has a cabinet composed of people with very high integrity and learned, headed by the prime minister. (2012 Gulu district statistical abstract)

Physical environment: there are no protected or fragile ecosystems that will be affected in the project areas. However few scattered trees of fruits in particular mangoes in the right of way will be protected in the project design and line configuration in addition to use of Arial Bundled conductors (ABC)
ACCESS TO COMMUNITY SERVICES

- **Access to a Primary school:** Households that are 5 km or more to the nearest primary school, whether public or private are 2,962 representing 5.3% while Households that are 5 km or more to the nearest public primary school are 3,945 representing 7.1%

- **Access to a Secondary school:** Households that are 5 km or more to the nearest secondary school, whether public or private are 15,723 representing 28.4% while Households that are 5 km or more to the nearest public secondary school are 17,871 representing 32.2%

- **Access to a Health Facility:** Households that are 5 km or more to the nearest health facility, whether public or private are 6,334 representing 11.4% while Households that are 5 km or more to the nearest public health facility are 8,412 representing 15.2%

- **Access to a Police post /Police station:** Number Percent Households that are 5 km or more to the nearest Police Post/Police Station are 14,308 representing 25.8%

**OYAM DISTRICT**

**Location and size**

Oyam District is located in Lango sub-region in Northern Uganda. Because of the historical composition of Greater Lira District previously composed of present district of Lira, Apac, Oyam, Otuke, Alebtong, Amolatar, Kole and Dokolo with similar geographical composition in terms of soils and vegetation cover, the ESMP development team opted to use Lira District Baseline information as the representative data for the service Territory and Lango Sub-region. Agriculture is the dominant economic activity carried out in the Service territory. Other economic activities carried out in the area include; bee keeping, crop farming, trade, charcoal burning etc.
**Figure 6: Bee keeping Project in the area**

On the physical environment for the North North West service territory, the team observed that there will be no fragile ecosystem or protected areas that will be affected by the grid intensification activities.

Findings from the consultations conducted in Oyam District indicate that there are no physical cultural resources that will be affected by the proposed project activities that are located within the project scope therefore the project should be implemented as per the scope explained to them by the REA team.

Under this service territory, trade and exchange market takes place in major urban towns and municipalities. Other minor trade, fishing, milling business, farming and agriculture at small scale takes place in training centres and peri-Urban Areas. Agriculture is a major economic activity in the area, currently, the area is under transition from insurgency and several economic activities are taking place.

**NORTHERN SERVICE TERRITORY**

This service territory is located in the Northern part of Uganda bordering South Sudan in the North, Kenya in the East, Central North in the South and North Eastern in the East. Under batch 2 for the Northern Service Territory, grid intensification will be undertaken in the districts of Agago and Abim. The physical environmental baseline characteristics of the area are almost the same. Therefore the physical baseline characteristics of one district can be extrapolated to all the districts.
Map of Northern Service Territory located in the Northern part of Uganda

Under Batch 2, grid Intensification component will be carried out in two districts of the service territory and these include: Agago, and Abim. Under this scope, 2.4km of distribution medium Voltage Distribution grid, 3.65km of 3Phase low distribution grid and 15.85km of 1Phase low voltage network shall be constructed in the area. Also 7 distribution transformers and 376 single phase meters shall be installed in the service area under this project scope.

**AGAGO DISTRICT**

**Bio-Physical Environment**

**Drainage and topography**

The district generally has flat landscape with intervals of undulating appearance especially on the eastern side with some inselbergs in the sub counties of Adilang, Lapono, Lukole and Parabongo. The district drains into the two rivers; Aswa and Agago which have several streams some of which are seasonal and dry out in the dry season.

**Climate**

The district has tropical type of climate with two seasons of dry and wet seasons. The wet season extends from April to November with highest rainfall peaks in April and August. Dry season extends from December to March. The total annual rain fall is
1330ml. The average monthly maximum temperature is 29°C and average monthly minimum temperature is 17°C.

Vegetation cover
The vegetation of the district is predominantly dry savanna type characterized by open canopy of trees 10-12 meters high and underlying grasses of 80 centimeters high comprising mainly of hyper hania, terinalia acacia and Buttersperrum species. The vegetation is predominantly dry savannah woodland, while in the northeastern part of the District are mountain forest and shrubs.

Geology and soils
Agago district is underlain by granitic and metamorphic rocks of the basement complex including rocks of quartzites, schists, amphibolites, charnockites, phyllites, mylonites etc. Much of these rocks have been very deeply pre-weathered providing the regolith to parent material of soils.

Socio-Economic Environment
Population
The population of Agago District is predominantly rural in nature with 169, 643 people living in the rural areas while 14,080 people live in urban centers. The 2014 Population and Housing Census preliminary results put the district at a total population of 183,723 with 88,148 males and 95,575 females.

Ethnic composition
Available records show that the largest single ethnic group in Agago District is the Acholi/Labwor which constitute about 94% of the total district population. The Langi, who are ethnically closely related to the Acholi are the second dominant group in the district and are just 4% of the population in the district. Other Ugandan ethnic groups do not have a significant number in the district. There are some refugees from southern Sudan but a few of them rarely settle outside gazzetted areas if any.

Economic activities in the project area
Subsistence agriculture is the main economic activity carried out in the district and the main source of income of the farm families in Agago. 90% of the population in the district is Subsistence farmers. The main food crops grown in the district include; finger millet, maize, sorghum, cassava, peas, beans and vegetables. The traditional and non-traditional cash crops grown include; Cotton, tobacco, soya beans, simsim, rice, sunflower and groundnuts. Other agricultural activities include; fish hunting and fish farming. Employment in NGO and government services and petty trade also provide income to the population in the district.

Land use systems and tenure arrangement
The district has three major land tenure systems. The predominant one is the customary land tenure system. Land is normally obtained through inheritance from
father to son and controlled by the household and elders. A few individuals, especially from urban centres and institutions obtain land through leasehold, which was previously managed by the town council, but now is directly under the District Land Board. The district administration, development partners and religious institution in the district are established on freehold land.
5 ENVIRONMENTAL & SOCIAL MITIGATION AND MONITORING PLAN

An environmental and social mitigation plan has been developed to assist in mitigating and managing environmental and social impacts associated with the construction and operation of the lines. The ESMP has been developed to provide a basis for the implementation and monitoring of Environmental and Social management aspects of the project. The ESMP also assigns action responsibilities to various actors and timeframes within which mitigation measures and monitoring should be done.

The ESMP in table 1 delineates specific actions for mitigating the potential impacts, stakeholders responsible for the implementation of proposed measures, the specific performance indicators to be used during inspection and monitoring, the responsible parties, and cost.
### Table 1: Environmental and Social Management Plan Matrix

<table>
<thead>
<tr>
<th>No.</th>
<th>Environmental/Social Impact</th>
<th>Activity</th>
<th>Project Phase</th>
<th>Impact Location</th>
<th>Mitigation Measures</th>
<th>Responsible Party</th>
<th>Monitoring Indicator</th>
<th>Responsible party for monitoring</th>
<th>Target</th>
<th>Costing Notes</th>
<th>Annual Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>All impacts</td>
<td>All activities in Project Site</td>
<td>All phases</td>
<td>Entire route</td>
<td>a) Achieve full compliance with the World Bank EHS Guidelines, National Environmental and Social Safeguards, and EIA requirements upon which this ESMP is based, through regular monitoring and addressing on-site situations and through applying the relevant mitigation measures. b) REA to issue permits, in consultation with relevant authorities, for incidents of non-compliance, and always in line with NEMA.</td>
<td>REA</td>
<td>i) Compliance with all EIMP requirements. ii) Number of non-compliance fines issued.</td>
<td>i) NEMA ii) Responsible District Local Government iii) PCU/MEMD</td>
<td>100% Compliance with EIMP.</td>
<td>REA Safeguards Personnel in place.</td>
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<td>2.</td>
<td>All impacts</td>
<td>All activities in Project Site</td>
<td>Construction</td>
<td>Entire route</td>
<td>a) Sensitive the Contractor’s workers including foremen, supervisors and labourers in the requirement for and full implementation of the EIMP. b) Ensure an adequately qualified and experienced Environmental and Social Personnel to assist with specific route and pole location of the infrastructure, prior to the commencement and, as well as regular independent monitoring and stakeholder engagement throughout the construction period. c) Put in place simple Construction Method Statements for activities in sensitive areas densely populated areas.</td>
<td>Contractor</td>
<td>i) Show appointment of institutional arrangement with NEMA, to put in place the EO to regularly monitor and report to REA, PAPs and local authorities on project performance, measured on the requirements of the EIMP. ii) Construction Method Statements in place for activities in sensitive areas.</td>
<td>Prior to commencement of contract activities and on-going.</td>
<td>i) REA Supervising Consultant NEMA ii) Responsible District Local Government iii) PCU/MEMD</td>
<td>i) Effective Monitoring Mechanism in place. ii) Quarterly ESMP meetings held with stakeholders.</td>
<td>Construction period for is estimated at 15months. 2 x Safeguards Experts x 15 months x USD1,500/month 45,000</td>
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<td>3.</td>
<td>Fauna biodiversity (wild animals)</td>
<td>Asian species (excluding electricity vines)</td>
<td>Design, construction, operation &amp; maintenance</td>
<td>Entire route</td>
<td>a) Design for the horizontal alignment of conductor lines, to reduce the probability of bird flight collisions. b) Visibility enhancement objects such as marker balls, bird deterrents or diverters will be installed where required</td>
<td>REA</td>
<td>i) Horizontally placed lines. ii) Visibility enhanced objects installed</td>
<td>Once-off at final design stage.</td>
<td>REA/ PCU/MEMD</td>
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<td></td>
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<td>Construction</td>
<td>Entire route</td>
<td>i) No wild animals to be caught, killed or harmed during construction, in compliance with the provisions regarding prohibitions against acts affecting protected species, including outside protected areas, according to the Uganda Wildlife Act, 2000.</td>
<td>Contractor</td>
<td>i) Record of sting’s of wild animals through checking with local communities.</td>
<td>Constructi on period with monthly monitorin g</td>
<td>i) REA Supervising Consultant NEMA ii) Responsible District Local Government iii) PCU/MEMD</td>
<td>vi) Zero wild animals or birds are captured and/or killed.</td>
<td>No direct cost.</td>
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<td>4.</td>
<td>Flora biodiversity</td>
<td>Clear native vegetation in right-of-way, material storage areas and construction yards.</td>
<td>Design</td>
<td>Entire route</td>
<td>a) Locate the route design within the road reserve, avoiding trees and dense vegetation, as far as is possible, and only deviate from it if necessary. Attention is focused on that if one side of the road has remnant forest or old/mature large trees, while the other side does not and is clear, then relocate the route on the clearest side of the road. Such final line routing must be considered carefully within final design and include the consideration of minimising the removal of both natural vegetation and private woodlots. b) The proposed distribution line plan should avoid destruction of old/mature trees and associated organisms, where these may occur along the Project Site. For example, and to the extent possible, the routing should deviate from trees with diameter at breast height size of 0.2m or above.</td>
<td>REA</td>
<td>i) Number of native trees affected by the project. ii) Number of old fruits trees (mango, avocado, etc.) affected by the project.</td>
<td>Once-off during final design phase.</td>
<td>i) REA Supervising Consultant NEMA ii) Responsible District Local Government iii) PCU/MEMD</td>
<td>v) Reduce to absolute minimum area of native vegetation and trees affected by the project. vi) Under 20 native trees affected by the project. vii) Zero old fruits trees (mango, avocado, etc.) affected by the project. viii) Minimise the number and area of</td>
<td>REA to scope and cost final design.</td>
</tr>
</tbody>
</table>
### Mitigation Measures

- in view of the significant value of such trees in the context of regeneration of species and continuity of life required to restore and strengthen ecosystem resilience.
- Final pole positions must be checked on the site, to ensure that all environmental and social features within the final route are protected. Remnant ecologically sensitive areas should be avoided, at all cost. Where it is not possible to avoid such sensitive areas the routing of the distribution lines should be done in consultation with the respective authorities, local governments and residents, to plan around creating unnecessary damage to the remaining natural forests, plants, wetlands, crop lands, woodlots, private buildings and farm infrastructure, like hedgerows, avenues of trees/shrubs, walls and fences.
- Place the distribution lines above existing vegetation to avoid land clearing, where possible and where the underlying crops and/or vegetation remains low; retain this vegetation as far as is possible; it is costly to replace after the line is in place.
- Care should be taken, as far as is possible, to plan the proposed line routes to avoid natural vegetation, wetlands and private woodlots and to the extent possible, no access roads for construction or maintenance of the line should be developed to traverse wetland areas or areas hosting natural vegetation or private woodlots.

### Construction

#### Entire route

- **a)** Avoid clearing natural trees, forests and vegetation at all costs, as these species are under pressure in the Project Area.
- **b)** The distribution line must be strong, without having to clear low lying vegetation occurring within the RoW. Such vegetation could include crops and/or all remaining natural vegetation, and such must not be cleared for the stringing of the lines, during the construction phase. The final design thus requires careful planning.
- **c)** The proposed distribution line plan should avoid destruction of old/mature trees and associated organisms, where these may occur along the Project Site. For example, and to the extent possible, the routing should deviate from trees with diameter at breast height size of 0.2m or above, in view of the significant value of such trees in the context of regeneration of species and continuity of life required to restore and strengthen ecosystem resilience.
- **d)** When placing the final pole positions, ensure poles are carefully placed and well away from trees and/or remnant forest, as well as wetland areas, where possible, especially avoiding old/mature/large forests or forest, as far as is possible. This will ensure that the number of trees removed are utterly reduced or reduced to trimming of trees only.
- **e)** Limit clearing to a maximum of 5m wide to each side of the line where necessary, as the RoW and using a wider area only when necessary. Only vegetation 2.5m and taller needs to be cleared from the RoW, also only when necessary.
- **f)** Locate material storage areas and construction yards in existing cleared areas in trading centres

#### Wetland areas

- **a)** Avoid routing the line across deep wetlands. Design support structures for longer spans, to avoid/reduce the number of poles that need to be located in sensitive wetland areas.
- **b)** Design to place the distribution lines well above existing wetland vegetation, as far as is possible, to avoid vegetation clearing in wetland and riparian areas.

### Monitoring

- **i)** Area of native vegetation affected by the project.
- **ii)** Number of native trees affected by the project.
- **iii)** Number of old fruits trees (mangoes, avocados, etc.) affected by the project.
- **iv)** Area of wetland vegetation cleared.
- **v)** Number of poles placed in wetlands.
- **vi)** Number of holes dug in wetlands.

### Monitoring Period & Frequency

- **i)** Monthly
- **ii)** Monthly
- **iii)** Once-off during final design
- **iv)** Construction period with monthly application
- **v)** Construction period with monthly

### Responsible Party

- **i)** Contractor
- **ii)** Contractor
- **iii)** Contractor
- **iv)** REA & NEMA
- **v)** REA & NEMA
- **vi)** REA & NEMA

### Responsible party for monitoring

- **i)** REA
- **ii)** REA
- **iii)** Reponsable District Local Government
- **iv)** PCU/MEMD
- **v)** PCU/MEMD
- **vi)** PCU/MEMD

### Monitoring Indicator

- **i)** Area of native restoration
- **ii)** Number of native trees restoration
- **iii)** Area of old fruits trees restoration
- **iv)** Area of wetland vegetation restoration
- **v)** Number of poles restoration
- **vi)** Number of holes restoration

### Target

- **i)** Reduce to absolute minimum area of native vegetation affected by the project.
- **ii)** Under 10 native trees affected by the project.
- **iii)** Zero old fruits trees (mangoes, avocados, etc.) affected by the project.

### Costing Notes

- **i)** Covered in the final design costs.
- **ii)** Embedded in the construction costs.

### Annual Cost (USD)

- **i)** 5,000

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**Clear wetland vegetation through earthworks**

<table>
<thead>
<tr>
<th>No.</th>
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<th>Responsible Party</th>
<th>Monitoring Indicator</th>
<th>Monitoring Period &amp; Frequency</th>
<th>Responsible party for monitoring</th>
<th>Target</th>
<th>Costing Notes</th>
<th>Annual Cost (USD)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Wetland areas</td>
<td>Design</td>
<td>Wetland areas</td>
<td>Wetland areas</td>
<td>A) Avoid clearing natural trees, forests and vegetation at all costs, as these species are under pressure in the Project Area.</td>
<td>REA &amp; Consultant</td>
<td>A) Number of poles placed in wetlands.</td>
<td>Monthly</td>
<td>REA, Supervising Consultant</td>
<td>NEMA clearance.</td>
<td>Covered in the final design costs.</td>
<td>0.000</td>
<td>Covered in the final design costs.</td>
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<td>6</td>
<td>Wetland areas</td>
<td>Construction</td>
<td>Wetland areas</td>
<td>Wetland areas</td>
<td>A) Limit the area to be cleared to place poles to below 3m³ per pole.</td>
<td>REA &amp; Contractor</td>
<td>A) Number of holes dug in wetlands.</td>
<td>Application to</td>
<td>REA, Supervising Consultant</td>
<td>NEMA clearance.</td>
<td>Covered in the final design costs.</td>
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<td>Covered in the final design costs.</td>
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### Social Considerations

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<th>No.</th>
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<th>Annual Cost (USD)</th>
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<tr>
<td>7.</td>
<td>Employment</td>
<td>Employing local labour</td>
<td>Construction</td>
<td>Entire route</td>
<td>Labour can be employed from along the route, with strict adherence to international labour laws and local cultural sensitivities, as identified during consultations, focusing on</td>
<td>Contractor</td>
<td>i) Number of residents employed, including number of women</td>
<td>(i) REA Supervising Consultant (ii) NEMA (iii) Responsible District Local Government v) PCU/MEMD</td>
<td>(i) Zero recruitment of children (ii) 1/3 of the labour</td>
<td>EMP Awareness Training for all site personnel.</td>
<td>8,000</td>
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<td>6.</td>
<td>Fragile ecosystems</td>
<td>Construct line solution near wetlands</td>
<td>Construction and operation</td>
<td>Wetland areas</td>
<td>Place the distribution lines above existing vegetation to avoid clearing wetland and riparian vegetation, as possible and where the underlying vegetation remains low, retain this vegetation during the stringing of lines.</td>
<td>Contractor</td>
<td>i) Area of wetland and riparian vegetation impacted by the poles and route. ii) Area/number of invasive species removed.</td>
<td>(i) REA Supervising Consultant (ii) NEMA (iii) Responsible District Local Government v) PCU/MEMD</td>
<td>(i) Zero wetland and riparian vegetation to be removed. (ii) Complete removal of alien species in RuW.</td>
<td>Direct cost only on the removal of invasive species</td>
<td>20,000</td>
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<td>5.</td>
<td>Sustainable use of soil</td>
<td>Pollution incidents within Project Site</td>
<td>Construction and operation</td>
<td>Pole and transformer sites, construction yard</td>
<td>Avoid the contamination and pollution of soils with hazardous material like fuels and oils, through the proper handling of construction materials and ensuring effective waste management</td>
<td>Contractor</td>
<td>i) Volume of contaminated soil on the Project Site</td>
<td>(i) REA Supervising Consultant (ii) NEMA (iii) Responsible District Local Government v) PCU/MEMD</td>
<td>(i) Zero soil pollution.</td>
<td>Included into waste management allowance.</td>
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<td>4.</td>
<td>Uninterrupted wild fire</td>
<td>Construction, operation &amp; maintenance</td>
<td>Entire route, especially densely vegetate area</td>
<td>e) Avoid making open fires, especially during dry climatic conditions and when dry grass and other dry vegetation close by could start a wild fire. f) Provide firefighting equipment, during construction and adequately train personnel in firefighting skills. g) Properly clear vegetation around poles and close to electricity lines, to avoid safety and fire risks and damage being done to infrastructure, should a fire be burning.</td>
<td>Contractor</td>
<td>() Number of fire incidents and details of any firefighting activities and requirements.</td>
<td>(i) REA Supervising Consultant (ii) NEMA (iii) Responsible District Local Government v) PCU/MEMD</td>
<td>(i) Zero fire incidents.</td>
<td>Allowance is made for the purchase of firefighting equipment.</td>
<td>5,000</td>
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<td>3.</td>
<td>Clearing for the right of way in farmlands</td>
<td>Construction</td>
<td>Farms</td>
<td>a) Crops and trees will only be cut or damaged where avoidance is impossible, the contractor will restrict damage to spots where poles are to be planted. Indiscriminate damage within the way leave will not be permitted. b) Clearing of trees should be for only those that are more than 2m high within the RoW, and the tall trees and branches adjacent the power lines that are of safety concern. c) Communities will be continuously sensitized on the issue of wayleaves to ensure that the conflicts between the project and communities are minimized. d) Where losses of vegetation/crops are inevitable, compensation measures be instituted as per approved District Land Board rates and in line with the REA Resettlement Framework, and the Abbreviated Resettlement Action Plan that has been prepared alongside this Environmental and Social Management Plan.</td>
<td>Contractor</td>
<td>ii) Height of poles used for electricity purposes abetted. iii) No. of sugar cane plantations avoided during construction registered and monitored. iv) Area cleared of vegetation. v) ARAP developed and implemented.</td>
<td>(i) REA Supervising Consultant (ii) NEMA (iii) Responsible District Local Government v) PCU/MEMD</td>
<td>(i) Minimal damage to farmlands.</td>
<td>Clearance embedded in works Compensation embedded in ARAP</td>
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<td>2.</td>
<td>Environmental/ labour</td>
<td>Local</td>
<td>Site fabrication wild</td>
<td>Clearing of trees should be for only those that are more than 2m high within the RoW, and the tall trees and branches adjacent the power lines that are of safety concern.</td>
<td>Contractor</td>
<td>ii) Height of poles used for electricity purposes abetted. iii) No. of sugar cane plantations avoided during construction registered and monitored. iv) Area cleared of vegetation. v) ARAP developed and implemented.</td>
<td>(i) REA Supervising Consultant (ii) NEMA (iii) Responsible District Local Government v) PCU/MEMD</td>
<td>(i) Minimal damage to farmlands.</td>
<td>Clearance embedded in works Compensation embedded in ARAP</td>
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<td>Clearance embedded in works Compensation embedded in ARAP</td>
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**Clearance for the right of way in farmlands**

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<td>8.</td>
<td>Social cohesion or disruption &amp; Influx of people</td>
<td>External construction</td>
<td>Entire route</td>
<td>a)</td>
<td>The Contractor should be monitored independently and regularly to ensure strict compliance with contractual obligations, including adherence to stipulated standards of conduct and behaviour of construction workers.</td>
<td>Contractor</td>
<td>i) Record of any incidents of negative social implications from the project filed with REA.</td>
<td>j) REA</td>
<td>Zero tolerance for incidents of highly significant negative social implications.</td>
<td>Stakeholder liaison costs are allowed for, for Contractor personnel to spend time dealing with local stakeholders and authorities. USD500/month for 3 liaison officers</td>
<td>36,000</td>
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<td>9.</td>
<td>Potential child abuse</td>
<td>Employing and managing labour</td>
<td>Entire route</td>
<td>a)</td>
<td>Avoiding employing workers below 18 years by insisting on viewing potential employees’ National Identity cards to ascertain proof of age before recruitment.</td>
<td>Contractor</td>
<td>i) Reports of orientation meetings ii) Presence of child protection plan and implement it iii) Report cases of child abuse to authorities iv) Collaboration with labor and the respective Probation and Welfare officers for cases of child abuse or violating workers’ rights</td>
<td>j) REA</td>
<td>Zero incidences of child abuse</td>
<td>No direct cost</td>
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<td>10.</td>
<td>Social order disruption or pollution</td>
<td>During line section</td>
<td>Entire route</td>
<td>a)</td>
<td>Restrict construction activities to daytime hours only b) No activities will be allowed on site beyond 6.00 pm in order to check on the noise pollution much felt at night. c) Put in place a code of conduct to be followed by the workforce and avoid causing unnecessary inconvenience to the community</td>
<td>Contractor</td>
<td>i) Complaints registered from community ii) Incident register for workers iii) Code of conduct in place</td>
<td>j) REA</td>
<td>Zero incidences of disrupting social order</td>
<td>No direct cost</td>
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<td>11.</td>
<td>Conflict with communities/Affluence due to influx of labour</td>
<td>Employing labour</td>
<td>Entire route</td>
<td>a)</td>
<td>Ensure workers are mainly recruited from project areas b) Awareness raising (Engagement) for both the workers and the community c) Implement a functioning and easily accessible Grievance mechanism</td>
<td>Contractor</td>
<td>i) Records of employees ii) Functioning GBM Codes of Conduct</td>
<td>j) REA</td>
<td>Zero conflict Any Grievance managed properly and in a timely manner</td>
<td>Grievance management costs are allowed for, for Contractor personnel to spend time dealing with conflicts</td>
<td>10,000</td>
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- For each issue, mitigation measures are implemented to address potential negative social impacts and ensure compliance with contractual obligations.
- Monitoring indicators are established to track progress and compliance.
- Responsible parties are assigned to ensure accountability and effective implementation of mitigation measures.
- Targets are set to achieve zero incidences of specific social disruptions or negative social implications.
- Costing notes specify the costing approach and the annual cost associated with each mitigation measure.
|-----|----------------------------|----------|---------------|--------|----------|---------------------|------------------|---------------------|--------------------------|--------------------------------|--------|----------------|------------------|
| 12  | Labor related sexual harassment and abuse of women and girls including GBV | Employment and management of labour | Construction / operation | Entire route | a) Awareness raising (Engagement) for both the workers and the communities  
b) Workers to sign and adhere to code of conduct that among others includes requirement for non-tolerance to sexual harassment including GBV  
c) Engagement of workers on the laws against defilement and other sexual offences including work place policy of sexual harassment  
d) Monitoring reports of workers behavior conduct during construction works  
e) Engagement of workers on the family and child protection unit of police | Contractor | i) Awareness/engagement reports  
ii) Project workers grievance Redress committee, Labour force Management Plan, in line with the Labour Act and OHS Act. Labour Force Management Plan to address issues of workers’ welfare, child labour, workers code of conduct, sexual harassment among workers, compensation in cases of accidents, payments and contracts, and a grievance management mechanism  
b) All workers to have contracts and identification tags  
c) Persons seeking employment will have to be screened, including reference from the local Council Chairpersons of their villages of origin before engagement.  
d) To mitigate negative impacts arising from recruitment of labour from distant places, the contractor should hire local labour mainly.  
e) Both men and women will be given equal employment opportunities and that there will be fair treatment and non-discrimination among staff. | Constructi on period with monthly monitoring | i) Supervising Consultant  
ii) NEMA  
iii) Respective District Local Government  
iv) Ministry of Gender Labour and Social Development  
v) PCU/MEMD | Zero incidences related to sexual violence/GBV | A block figure on management of sexual related violence allowed | 20,000 |
| 13  | Labour issues – employment and working conditions | Employment and management of labour | Construction / operation | Entire route | a) Contractor to have in place a project workers grievance redress committee, Labour force Management Plan, in line with the Labour Act and OHS Act. Labour Force Management Plan to address issues of workers’ welfare, child labour, workers code of conduct, sexual harassment among workers, compensation in cases of accidents, payments and contracts, and a grievance management mechanism  
b) All workers to have contracts and identification tags  
c) Persons seeking employment will have to be screened, including references from the local Council Chairpersons of their villages of origin before engagement.  
d) To mitigate negative impacts arising from recruitment of labour from distant places, the contractor should hire local labour mainly.  
e) Both men and women will be given equal employment opportunities and that there will be fair treatment and non-discrimination among staff. | Contractor | i) Project Workers Grievance Redress committee in place and functional  
ii) Labour Force Management Plan  
iii) Workers code of conduct  
iv) Contracts for workers in place.  
v) Register of reported abuse cases against women and girls if any and actions taken  
vi) Reports of engagement meetings  
vii) Labor requirements awareness reports  
viii) Presence of workers register | Constructi on period with monthly monitoring | i) REA  
ii) Supervising Consultant  
iii) NEMA  
iv) Respective District Local Government  
v) Ministry of Gender Labour and Social Development  
vi) PCU/MEMD | Zero incidences related to employment and work conditions | No direct cost | - |
| 14  | Workers behaviour – affecting women, girls | Employment and management of labour | Construction / operation | Entire route | a) A code of conduct to be developed and enforced by the Contractor for employees, to address abuse of women and girls that may lead to broken marriages, early pregnancies, sexual exploitation  
b) The code of conduct to address inappropriate and risky behavior  
c) Encourage women and other affected persons to report cases of abuse | Contractor | i) Community and worker targeted prevention and response interventions  
ii) Cases reported  
iii) Cases concluded | Constructi on period with monthly monitoring | i) REA  
ii) Supervising Consultant  
iii) NEMA  
iv) Respective District Local Government  
v) Ministry of Gender Labour and Social Development  
vi) PCU/MEMD | Zero incidences related to workers behaviors affecting women and girls | No direct cost | - |
| 15  | Accidents during construction | During installation of poles | Construction | Entire route | a) Put in place temporary road signage  
b) Follow the recommended speed limits  
c) Workers given adequate and appropriate PPE  
d) Tool box meeting/awareness meetings  
e) Safety signage at risky places of work | Contractor | i) Visible and readable signage  
ii) Tool box meeting reports  
iii) PPE issuance records | Constructi on period with monthly monitoring | i) REA  
ii) Supervising Consultant  
iii) NEMA  
iv) Respective District Local Government  
v) Ministry of Gender Labour and Social Development  
vi) PCU/MEMD | Zero indices of accidents | No direct costs | - |
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<td>16</td>
<td>Potential disruption of roadside businesses</td>
<td>Construction</td>
<td>Entire route</td>
<td>a) A key consideration for the proposed project is the ability to effectively involve key stakeholders in a realistic and positive participatory process to combat gender violence and the abuse and mishandling of women and children on such government infrastructure projects and the Contractor must present a plan to address such. b) A comprehensive HIV/AIDS Awareness and Management Plan must be implemented throughout and for the duration of the construction phase, with post-completion monitoring and reporting to REA and NEMA, collaborating with NGOs and CBOs, as possible. c) Sensitisation of communities to be conducted and include electromagnetic fields, accidental electrocution, exposure to hazardous waste materials like fuels, oils and timber offcuts with creosote and/or CCA, safe levels of exposure and related impacts, to avoid speculation.</td>
<td>Contractor</td>
<td>i) Report progress on implementation of HIV/AIDS Awareness and Management Plan for the construction phase. ii) Regular update reports on sensitisation programme with local authorities and institutions.</td>
<td>Monitoring period &amp; frequency</td>
<td>REA Supervising Consultant, NEMA, Representative District Local Government Ministry of Gender Labour and Social Development, PCU/MED</td>
<td>i) All construction personnel to complete HIV/AIDS and Human Health Awareness Training. ii) At least quarterly meetings with PAP, local authorities and institutions.</td>
<td>HIV/AIDS Awareness Development Programme is allowed for during the construction period for all construction workers. 30 x USD200/person</td>
<td>15,000</td>
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<td>17</td>
<td>Communicatio n and transportation</td>
<td>Road closure</td>
<td>Construction Working Area</td>
<td>a) The Contractor must announce their intended arrivals in areas to local leadership and residents, prior to arriving to work in new areas along the proposed route. b) Work is to be conducted to minimise road blocking and closure, using appropriate traffic guides and signs near work areas, when roads are closed or slowed temporarily. c) The Contractor and the construction teams should deploy traffic guides at strategic sections of the roads to control traffic flow and avoid potential accidents. d) The Contractor should also use appropriated signage at specific locations to provide adequate warning to motorists and other road users of on-going construction work on the roads.</td>
<td>Contractor</td>
<td>i) Incidents of severely detrimental blockages of roads. ii) Incidents of power disruption.</td>
<td>Monitoring period with monthly reporting</td>
<td>REA Supervising Consultant, NEMA, Representative District Local Government Ministry of Gender Labour and Social Development, PCU/MED</td>
<td>i) Zero incidents of significant road closure.</td>
<td>Traffic control and signage is already covered under the Works budget</td>
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<td>18</td>
<td>Local economy</td>
<td>Power interruption</td>
<td>Operation</td>
<td>Design</td>
<td>a) Service Provider regularly maintain the power line to keep the power supply reliable. b) Consider the inclusion of further closely lying trading centres and social services that can benefit from the further supply of electricity.</td>
<td>Electricity distributor</td>
<td>i) Incidents of power disruption.</td>
<td>Annual monitoring</td>
<td>ERA, PCU/MED</td>
<td>i) Zero incidents of extended disruption due to faults on the distribution lines.</td>
<td>Forms part of responsibilities of Electricity distributor.</td>
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<td>19</td>
<td>Culture heritage</td>
<td>Construction on crew</td>
<td>Construction</td>
<td>Entire route</td>
<td>a) Necessary social safeguards shall be put in place to effectively managed, to avoid unnecessary and negative social impacts resulting from the promise of this project, as identified during stakeholder consultation. b) Contractors must ensure that their supervisors, employees and all sub-contractor personnel adhere to the strict social interaction guidelines, to avoid unnecessary harm on vulnerable groups, such as children and women. Construction teams are not to have direct contact with women or children and such should be observed by all stakeholders of the project. c) Appropriate fines may be issued by REA, directed towards the Contractor, in cases of non-compliance towards the provisions of the EMP. d) Chance Finds Procedure must be adhered to</td>
<td>Contractor</td>
<td>i) Number of incidents resulting in negative cultural and social impacts and details thereof. ii) Chance Finds Procedure in place.</td>
<td>Construction period with monthly monitoring</td>
<td>REA Supervising Consultant, NEMA, Representative District Local Government Ministry of Gender Labour and Social Development, PCU/MED</td>
<td>i) Zero incidents of highly significant negative cultural implications.</td>
<td>Costs for mainly reporting allowed, otherwise this is part of the works</td>
</tr>
<tr>
<td>20</td>
<td>Cultural objects (PCRs)</td>
<td>All project activities</td>
<td>Construction and operation</td>
<td>Entire route</td>
<td>a) If any religious institution along the site it going to be directed impacted upon by the proposed line, then specific discussions during final planning can be conducted. b) Implement the Chance Finds Procedure, if any physical heritage of importance is found during the implementation of the project. c) At the local level, additional consultations will be carried out prior to commencement of works by the contractor, particularly on sites of cultural importance along the ROW. d) Where cultural resources are encountered, compensation will be provided including support for relocation, such as</td>
<td>Contractor</td>
<td>i) Incidents of impacts. ii) Record of chance finds.</td>
<td>Construction period with monthly monitoring</td>
<td>REA Supervising Consultant, NEMA, Representative District Local Government Ministry of Gender Labour and Social Development, PCU/MED</td>
<td>i) Zero negative impacts to PCRs and other heritage resources.</td>
<td>No cost allowance is made, and the probability is low.</td>
</tr>
<tr>
<td>No.</td>
<td>Environmental/Social Impact</td>
<td>Activity</td>
<td>Project Phase</td>
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<td>Mitigation Measures</td>
<td>Responsible Party</td>
<td>Monitoring Indicator</td>
<td>Responsible party for monitoring</td>
<td>Target</td>
<td>Costing Notes</td>
<td>Annual Cost (USD)</td>
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</tbody>
</table>
| 21. | Gender impacts              | All project activities | Construction and operation | Entire route | a) Conducting appropriate sensitisation on gender issues at all levels within the Project Area and creation of awareness on the responsibility of all concerned during the various phases of the project to address specific gender concerns. This should entail consultation with both women and men in the Project Area and within the construction teams. b) REA and the Contractor should ensure that:  
- effective gender responsive and equality activities under the proposed project are duly defined and implemented through participatory engagement;  
- the quantifiable and non-quantifiable, gender and social mitigation measures related to direct and indirect impacts are achieved; and  
- a Social Impact Management specialist is deployed on the project to oversee among others, gender mainstreaming in the project cycle, is implemented. c) HIV/AIDS awareness campaigns must be regularly conducted for workers and local communities, as well as activities promoting access to health services, treatment and counselling. | Contractor, Electricity distributor | i) Coherent Gender Awareness Plan to be implemented.  
iii) Changes in the reported numbers of gender-based violence incidents.  
iv) Number of local community level meetings held per month. | Contractor, Electricity distributor | i) REA  
j) Supervising Consultant  
k) NEMA  
l) Respective District Local Government  
m) Ministry of Gender Labour and Social Development  
v) PCLI/MEMD | i) Implementation of Gender Awareness Plan.  
ii) All personnel to attend HIV/AIDS Awareness Training.  
iii) Decrease in the number of gender-based violence incidents.  
iv) At least monthly local community meetings held to communicate project related matters. | Gender Awareness Monitoring Programme amongst site personnel and PAPs allowed | 12,000 |
| 22. | Vulnerable groups           | All project activities | Construction and operation | Entire route | a) A Child Protection Plan will be developed and provided to all the Contractors and school management to discourage the Contractors from using children as labourers. In addition, Contractors will be required to avoid employing workers who are below eighteen years old. They will also be required to keep records that show the ages of their workers. b) Ensure that the community and local leadership have access to and know of and report abuse using the national child abuse hotline 116. The existence of the hotline can be displayed throughout near the construction site and in the community at large. c) The Contractor should ensure that mechanisms for close monitoring of workers’ behaviour/requirements are in place e.g. Contractor could discreetly engage the police to identify anonymous informers from among the workers to monitor and report any negative behaviour by the workers including child abuse related misconduct. display a call line or suggestion box where the community can provide feedback on workers behaviour. d) REA and the Contractor should ensure that all local leaders and women/child representatives are fully oriented to the labour force related risks for children engaging in construction related activities. e) Talks with the Contractor and his workforce by relevant officials (including the police) on child protection should be | Contractor, Electricity distributor | i) Issues recorded at the regular ES Committee Forum, which can be established and formed from local leaders in the areas of the project.  
ii) REA and the Contractor are to form active drivers of this committee, so that especially emerging social issues have a platform on which to be addressed.  
iii) Changes in the number of reported incidents of child abuse.  
iv) Gender-based issues, relevant here, are covered in specific section above. | Contractor, Electricity distributor | i) REA  
j) Supervising Consultant  
k) NEMA  
l) Respective District Local Government  
m) Ministry of Gender Labour and Social Development  
v) PCLI/MEMD | i) Project related environmental and social issues tables at each meeting for the duration of the construction phase.  
ii) REA and Contractor actively communicate with the environmental and social Management Committee.  
iii) Reduction in the numbers of child abuse incidents. | Forms part of the role of the Stakeholder Liaison personnel from the Contractor, as well as part of the general sensitisation programs as costed | - |
<table>
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<tr>
<th>No.</th>
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<th>Costing Notes</th>
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</tr>
</thead>
</table>
| 23. | Education | All project activities | Construction and operation | Schools | a) All schools must be contacted during the final round of design, to check on access and availability of electricity.  
   b) Schools should be sensitised on the need to keep off construction sites and away from construction workers.  
   c) Workers to be instructed to observe silence, while working across sections of the routing near schools and not to interact with any school children.  
   
   Encouraged and appropriately scheduled, including continuous popularisation of the child help line 116. Parent/guardians should be sensitised and held accountable for children leaving and arriving home before dark.  
   f) Conducting appropriate sensitisation on gender issues at all levels within the Project Area and creation of awareness on the responsibility of all concerned during the various phases of the project to address specific gender concerns and especially as they relate to women. This should entail consultation with both women and men in the Project Area and within the construction teams.  
   g) HIV/AIDS awareness campaigns for workers and local communities and activities promoting access to health services, treatment and counselling.  
   h) REA and the Contractor should ensure strict compliance with the provision of relevant safeguard policies with respect to persons with disabilities. REA and the Contractor should ensure that there are full and effective participation of persons with disabilities and other vulnerable groups, like children and through representative organisations, in all phases of the project, including monitoring and evaluation.  
   
   Ensuring the local content provision should be emphasised to minimise labour requirements needed from outside the community.  
   
   The Contractor should involve local leaders in labour recruitment to ensure that people hired have no criminal record.  
   Workers should regularly be taken through safety drills and emergency preparedness training allowing for quick and efficient responses to accidents that could result in human injury or damage to the environment.  
   The Contractor should have on site an Occupational Safety and Health Policy and Action Plan addressing safety and health and occupational including environmental activities. All project activities and operation should adhere to established national and international OHS management, general safety requirements, fire prevention, machinery, plant and equipment, etc. in line with the Occupational Safety and Health Act, 2006;  
   iv) Adequate and appropriate PPEs are issued and their use enforced.  
   v) Zero human safety training record allowed for here.  
   vi) One awareness meeting and discussion at each school located within proximity schools and the Project Site.  
   vii) Four (4) monthly awareness meetings held with construction personnel.  
   viii) Forms part of EIMP Awareness Training and the role of the Safeguards Experts | REA, Contractor | i) Number and regular awareness talks held at schools per month.  
   ii) Number of awareness meetings held with construction staff per month.  
   Constructi on period: monthly monitoring.  
   
   REA  
   Supervising Consultant  
   NEMA  
   Respective District Local Government  
   Ministry of Education and Sports  
   PCU/MEMD  
   
   One awareness meeting and discussion at each school located within proximity schools and the Project Site.  
   Four (4) monthly awareness meetings held with construction personnel.  
   Forms part of EIMP Awareness Training and the role of the Safeguards Experts | - | - |
| 24. | Human health and safety including occupational health and safety | All project activities | Construction and operation | Entire route | a) Measures to prevent and control OHS issues during the construction, maintenance and operation of the project should adhere to established national and international OHS guidelines that are specific for electricity distribution line projects. These measures should also have site-specific targets and an appropriate timetable for achieving them, as related to:  
   i) The Contractor should have on site an Occupational Safety and Health Policy and Action Plan addressing workers and PAPs on occupational safety and health issues, workplace conditions, welfare, accidental electrocution, hazardous materials and waste management, general safety requirements, fire preparedness, machinery, plant and equipment, etc. in line with the Occupational Safety and Health Act, 2006;  
   ii) The Contractor should conduct HSE sensitisation with PAPs directly affected by the project;  
   iii) The Contractor should have HSE induction for all workers, and undertake daily tool box meetings prior to works; and  
   iv) Workers should regularly be taken through safety drills and emergency preparedness training allowing for quick and efficient responses to accidents that could result in human injury or damage to the environment.  
   c) The Contractor should involve local leaders in labour recruitment to ensure that people hired have no criminal record.  
   d) The local content provision should be emphasised to minimise labour requirements needed from outside the community.  
   
   Zero tolerance for criminal records and activities.  
   Monthly safety inspections and audits.  
   100% staff trained in OHS procedures and practices.  
   Zero human safety or incident rating to be upheld as primary target.  
   Adequate and appropriate PPEs issued and their use enforced.  
   The PPEs are costed under works and therefore not allowed for here | Contractor, Electricity distributor | i) Number of awareness meeting/training held with construction staff.  
   ii) Number of safety audits performed.  
   iii) Number of workers trained in OHS procedures and practices.  
   iv) Number of PAPs and/or representatives attending meetings.  
   v) Incident reports  
   vi) PPE issuance records  
   Constructi on period: monthly monitoring.  
   
   REA  
   Supervising Consultant  
   PCU/MEMD  
   NEMA  
   Respective District Local Government  
   Ministry of Education and Sports  
   PCU/MEMD  
   
   Zero tolerance for criminal records and activities.  
   Monthly safety inspections and audits.  
   100% staff trained in OHS procedures and practices.  
   Zero human safety or incident rating to be upheld as primary target.  
   Adequate and appropriate PPEs issued and their use enforced.  
   The PPEs are costed under works and therefore not allowed for here | - | 5,000 |
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<tr>
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</thead>
</table>
|     | e) The Contractor should have HSE induction for all workers, and undertake daily tool box meetings prior to works, including work at heights;   
    f) Ensure adequate provision of PPEs (gloves, safety shoes, safety belts, overalls and goggles), as well as continuous awareness on the need for use of PPEs and enforcement of usage;   
    g) Ensure that live-line work is conducted by trained workers with strict adherence to specific safety and insulation standards. Qualified or trained employees working on transmission systems should be able to achieve the following:   
    h) - Distinguish live parts from other parts of the electrical system   
    i) - Determine the voltage of live parts   
    j) - Understand the minimum approach distances outlined for specific live line voltages   
    k) Ensure proper use of special safety equipment and procedures when working near or on exposed energized parts of an electrical system;   
    l) During maintenance, switch off and fully de-energize the main power;   
    m) All workers on sites should be well trained on the risks and their tasks including safety measures of working at heights;   
    n) In regard to working at heights, the following additional measures shall be taken:   
        - Ensure that proper safety wear (Climbing shoes, safety belt, and a helmet) must be used.   
        - Testing structures for integrity prior to undertaking work;   
        - Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall- Arrested workers, among others;   
        - Safety belts should be of not less than 16 millimeters (mm) (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibers become evident;   
        - When operating power tools at height, workers should use a second (backup) safety strap;   
        - Signs and other obstructions should be removed from poles or structures prior to undertaking work;   
        - The contractor should assess whether the linemen are under the influence of alcohol before issuing assignments.   
    o) The Contractor to use poles that have been well seasoned and dried and not having dripping creosote;   
    p) The poles should not be placed in waterlogged areas and neither should they come in contact with public drinking water sources;   
    q) Disposal of off cuts of poles should not be by burning but be collected and handed to a licensed hazardous waste management agency;   
    r) Wash work clothes stained with creosote separately from other household clothing;   
    s) Workers should regularly be taken through safety drills and emergency preparedness training allowing for quick and efficient responses to accidents that could result in human injury or damage to the environment; |
Though scientists and the general public have raised concerns over potential health effects associated with exposure to EMF, to cause any serious health risk is extremely low frequency, by the National Institute of Environmental Health Sciences (2002), to cause any serious health risk. Magnetic fields result from the flow of electric current and the fields increase in strength as the current increases. Electric fields are shielded by materials that conduct electricity, and other materials, such as trees and building materials while Magnetic fields pass through most materials and are difficult to shield. However, both electric and magnetic fields decrease rapidly with distance. The power frequency EMF typically has a frequency in the range of 50 – 60 Hertz which is considered to be extremely low frequency, by the National Institute of Environmental Health Sciences (2002), to cause any serious health risk. Though scientists and the general public have raised concerns over potential health effects associated with exposure to EMF there is no empirical data that shows adverse health effects from exposure to typical EMF levels from power distribution lines and equipment according to the ICNIRP. Some health concerns such as frequent exposure of people to high EMF could lead to cancer has been raised.

### Table 1: Mitigation Measures for Risk of spread of HIV/AIDS and other communicable diseases by workers of the project affected communities

<table>
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<tr>
<th>No.</th>
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<th>Responsible party for monitoring</th>
<th>Target</th>
<th>Costing Notes</th>
<th>Annual Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.</td>
<td>Risk of spread of HIV/AIDS and other communicable diseases by workers of the project affected communities</td>
<td>a) Sensitive communities on their sexual rights</td>
<td>Construction</td>
<td>Contractor</td>
<td>l) Presence of HIV/AIDS and other communicable diseases prevention and management plan</td>
<td>Contractor</td>
<td>Constructi on period with monthly monitoring</td>
<td>REA</td>
<td>Zero cases of HIV brought about by the project</td>
<td>HIV management/awareness allowed for</td>
<td>20,000</td>
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<tr>
<td></td>
<td></td>
<td>b) Put in place an HIV prevention plan and implement it</td>
<td></td>
<td></td>
<td>ii) HIV/AIDS Management/prevention Reports</td>
<td></td>
<td></td>
<td>Supervising Consultant</td>
<td>NEMA</td>
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<td></td>
<td></td>
<td>c) Report perpetrators of violence against women and children to the police</td>
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<td>iii) Frequency of sensitization meetings for both workers and community members in the project area</td>
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<td></td>
<td>PCU/NEMD</td>
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<td></td>
<td>d) Distribute condoms freely to both the project employees and the general community in the project area</td>
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<td>iv) Evidence of collaboration with existing service providers</td>
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<td>Respective District Local Government</td>
<td>v)</td>
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<td></td>
<td></td>
<td>e) Contractor to liaise with District authorities for related services</td>
<td></td>
<td></td>
<td>v) Ministry of Gender Labour and Social Development</td>
<td></td>
<td></td>
<td>Ministry of Gender Labour and Social Development</td>
<td>vi)</td>
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<td></td>
<td></td>
<td>f) Encourage communities to report cases of illicit sexual behavior by contractor workers</td>
<td></td>
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<td>vi) PCU/NEMD</td>
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<td></td>
<td>PCU/NEMD</td>
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<td></td>
<td>g) All workers must have access to medical care</td>
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<td>h) Contractor to liaise with District authorities for related services</td>
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<td></td>
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<td>j) All workers must have access to medical care</td>
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</table>

### Table 2: Mitigation Measures for Electromagnetic fields and Community Health and Safety

<table>
<thead>
<tr>
<th>No.</th>
<th>Environmental/Social Impact</th>
<th>Activity</th>
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<th>Annual Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.</td>
<td>Electromagnetic fields and Community Health and Safety</td>
<td>a) The minimum clearance distances of the distribution lines and conductors specified in the technical designs shall strictly be maintained. The voltage levels of the lines are 33 kilo Volts and 400 Volts which typically do not emit extremely high EMF.</td>
<td>Power transmission</td>
<td>Contractor</td>
<td>l) Awareness raising on EMF</td>
<td>Contractor</td>
<td>During operation</td>
<td>REA</td>
<td>Zero case of EMF impacts incidences</td>
<td>The mitigation measures here are costed under works and therefore not allowed for here</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) For the Low Voltage networks which generally are close to buildings and houses, the Aerial bundled Conductor (ABC) shall be used. This type of conductor is shielded or insulated to minimize the risk of electrocutions and reduce the strength of EMF</td>
<td></td>
<td></td>
<td>ii) The minimum clearance distance as spelled out in the WB EHS guidelines for power transmission adhered to</td>
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<td>NEMA</td>
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<td></td>
<td></td>
<td>c) The trees that do not interfere with the line routes shall not be cut down and no building structures shall be demolished</td>
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<td></td>
<td>iii) All transformers pole mounted</td>
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<td></td>
<td>Ministry of Gender Labour and Social Development</td>
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<td></td>
<td></td>
<td>d)</td>
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<td>iv) No trees in front of the houses shall be cut</td>
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</table>

Electric and Magnetic fields (EMF) are invisible lines of force emitted by and surrounding any electrical device, for instance power lines and electrical equipment. Electric fields are produced by voltage and the fields increase in strength as the voltage increases. Magnetic fields result from the flow of electric current and the fields increase in strength as the current increases. Electric fields are shielded by materials that conduct electricity, and other materials, such as trees and building materials while Magnetic fields pass through most materials and are difficult to shield. However, both electric and magnetic fields decrease rapidly with distance. The power frequency EMF typically has a frequency in the range of 50 – 60 Hertz which is considered to be extremely low frequency, by the National Institute of Environmental Health Sciences (2002), to cause any serious health risk. Though scientists and the general public have raised concerns over potential health effects associated with exposure to EMF there is no empirical data that shows adverse health effects from exposure to typical EMF levels from power distribution lines and equipment according to the ICNIRP. Some health concerns such as frequent exposure of people to high EMF could lead to cancer have been raised.
Landscape Considerations

27. Visual impacts & surrounding area

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<thead>
<tr>
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<th>Annual Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>Route planning</td>
<td>Design</td>
<td>Entire route</td>
<td>a) Due consideration must be taken during the final design stage, to plan and place the final route alignment and pole position, with due consideration and resulting in minimal disturbance to the sensitive rural landscape and setting.</td>
<td>REA, Contractor</td>
<td>i) Reduction in vegetation clearing to reduce visual change in the landscape.</td>
<td>Once-off during final design and ground-truthing.</td>
<td>i) Zero loss of visual impacts.</td>
<td>No direct cost.</td>
<td>-</td>
</tr>
</tbody>
</table>

28. Land use and potential A Surrounding land use and potential

<table>
<thead>
<tr>
<th>No.</th>
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<th>Annual Cost (USD)</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>All activities</td>
<td>All phases</td>
<td>Entire route</td>
<td>a) Comprehensive and continuous sensitisation of PAPs, should be conducted throughout the project cycle.</td>
<td>REA, Contractor</td>
<td>i) Area of cropland affected by the project.</td>
<td>Constructi on period with monthly monitoring.</td>
<td>i) Under 10,000m² of cropland affected by the project.</td>
<td>This cost covered under RAP scope of work.</td>
<td>-</td>
</tr>
</tbody>
</table>

29. Possibility of multiple land use

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td></td>
<td>All activities</td>
<td>All phases</td>
<td>Entire route</td>
<td>a) Existing low-level crops be disturbed as little as possible, and where such is unavoidable, fair compensation be addressed within a RAP study for the project.</td>
<td>REA, Contractor</td>
<td>i) Number of incidents regarding maintenance clearing of crops on the ROW.</td>
<td>Constructi on period with monthly monitoring.</td>
<td>i) Reduce the clearing of crops to an absolute minimum.</td>
<td>Compensation for loss of woodlots and crops will be calculated in the RAP. Restoration costs have already been estimated and included.</td>
<td>-</td>
</tr>
</tbody>
</table>

30. Construction waste

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>Construction activities</td>
<td>Construction</td>
<td>Entire route</td>
<td>a) The Contractor must have on-site waste storage facilities within their construction facilities, including provision to contain and temporarily store hazardous waste.</td>
<td>REA, Contractor</td>
<td>i) Waste generated and record of recycling, reuse and disposal of construction waste.</td>
<td>Constructi on period with monthly monitoring.</td>
<td>i) Zero % loss of hazardous substances on the site.</td>
<td>100% coverage of waste record, from entering the Project Site to waste disposal site.</td>
<td>Waste management awareness training, included in EDHP Awareness Training, as well as waste management (including hazardous waste) collection, storage and disposal costs</td>
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<td>No.</td>
<td>Environmental/ Social Impact</td>
<td>Activity</td>
<td>Project Phase</td>
<td>Impact Location</td>
<td>Mitigation Measures</td>
<td>Responsible Party</td>
<td>Monitoring Indicator</td>
<td>Responsible party for monitoring</td>
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<td>31</td>
<td>Emissions</td>
<td>Construction activities</td>
<td>Construction</td>
<td>Entire route</td>
<td>a) Any equipment containing SF6 (green-house gas) should be installed and monitored, with due consideration given to disposal of such waste.</td>
<td>Contractor</td>
<td>(i) Materials list and handling procedures for equipment containing SF6 or similar green-house gas.</td>
<td>(i) REA Supervising Consultant, (ii) NEMA, (iii) PCU/MEMD</td>
<td>i) Disposal of all equipment to proper hazardous waste facilities.</td>
<td>No additional cost allowances.</td>
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<td>32</td>
<td>Alien Invasive Species</td>
<td>Construction and operation</td>
<td>Construction</td>
<td>Entire route</td>
<td>a) REA and the Contractors should ensure that the restoration of the disturbed areas using only native plant species is carried out. REA should ensure that the Contractor engages the services of relevant experts with knowledge and experience in species identification and the eradication of exotic species. b) Further, there should be regular and proper maintenance of road reserves to minimise the likelihood of the spread of invasive species that are particularly aggressive, such as Lantana camara, already evident on the site. c) REA should consider how best to put in place an effective 5-year Alien Vegetation Eradication Plan, to best manage the further spread of exotic species in the wayleave or RoW, extending into these rural agro-ecosystems.</td>
<td>REA</td>
<td>(i) Coherent Alien Invasive Eradication Plan, with adequate budget to implement it for the project duration. ii) Collaboration with NARO and other stakeholders in addressing AIS impacts and eradication.</td>
<td>(i) REA Supervising Consultant, (ii) NEMA, (iii) PCU/MEMD</td>
<td>ii) Effective eradication of Alien Invasive Species in the Project Site. iii) Collaboration with other stakeholders to address the eradication of high risk exotic weeds.</td>
<td>The eradication of exotic weed species can be costly and is directly affected by various factors, including species and threat status, location, scale of invasion and the method of eradication. A lump sum allowance is made to deal with eradication at pole positions.</td>
<td>10,000</td>
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<td>33</td>
<td>Impacts due to Equipment storage areas/worker camps</td>
<td>Storage and accommodation</td>
<td>Construction</td>
<td>Entire line route</td>
<td>a) The workers camp will not be constructed b) Equipment storage areas raised and with absorbents in case of leaks. e) Provide adequate Proper sanitation facilities d) Segregate waste into biodegradable, non-biodegradable and hazardous and dispose appropriately; e) Ensure regular maintenance of site equipment f) Upon completion of the contract, all elements of the equipment storage area shall be removed and respective sites, as far as possible, to its original condition</td>
<td>Contractor</td>
<td>(i) Presence of separate sanitation facilities for both men and women ii) Number of bins at site clearly marked iii) Equipment maintenance records in place iv) Presence of safety procedures for fuel storage and dispensing in place</td>
<td>(i) REA Supervising Consultant, (ii) NEMA, Respective District Local Government Ministry of Gender Labour and Social Development PCU/MEMD</td>
<td>Zero incidences related to equipment storage/workers camps</td>
<td>No direct costs</td>
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6. ROLES AND RESPONSIBILITIES FOR IMPLEMENTING THE ESMP

This section sets out the roles and responsibilities for the management of the project’s safeguards aspects.

MEMD (PCU)
The PCU shall be responsible for oversight role of coordination of the project including monitoring and reporting of implementation of mitigation measures in this ESMP and general compliance of the project with environmental and social safeguard requirements. The Unit shall also provide support for social due diligence including support for prevention and response to GBV/VAC through the service providers for Social Risk Management.

REA
REA will assume overall responsibility for implementing this ESMP. During construction, the Contractor will be employed as such; REA will assume overall responsibility over the Contractor’s compliance standards and obligations in the implementation of the ESMP (as well as wider contractual obligations). REA shall also monitor the activities of the Supervising Consultant and shall also take the overall responsibility of reporting. In the project design, REA together with the service providers shall jointly supervise the Contractors. Therefore, they shall monitor and give advice to ensure that the contractors implement the mitigation measures as detailed out in this ESMP. They shall also be responsible for reporting on the progress of ESMP implementation process.

Supervising Consultant
The Supervising Consultant shall be responsible for everyday management of the project and shall monitor and give advice to ensure that the contractor implements the mitigation measures as detailed out in this ESMP. The Supervising Consultant shall also be responsible for reporting on the progress of ESMP implementation process.

Contractor
During the construction phase, REA will engage Contractors to undertake the construction of the project in line with the approved designs. The Contractors will be responsible for complying with all relevant legislation and adhere to all mitigation measures specified in the ESMP. The Contractors must have sufficient, adequate and competently resourced to fulfill the environmental and social requirements established in this ESMP and supporting documentation. The Contractor’s Safeguard’s personnel will
take responsibility for mitigation and management of potential environmental and social issues during project implementation. Specific Safeguard’s personnel responsibilities include the following:

a. Take responsibility for mitigation and management of potential environmental and social issues on site;
b. Liaise with the Employer Safeguard’s Team regarding site visits and briefing sessions;
c. Liaise with service providers regarding the ESMP requirements;
d. Organize and maintain briefing session records and mitigation and monitoring documentation on all matters of HSE;
e. Respond to site inspection findings; and
f. Receive and respond to any complaints from external parties on project issues on HSE.

Remedies that shall be applied by REA for of systematic non-compliance with the ESMP by the Contractor:

(i) The Contractor shall be legally and contractually held liable and shall be required to remedy any non-compliance at his/her own cost. For example, in case of clearing trees that are outside the corridor, the Contractor shall be required to compensate the owners or offset the non-compliances.

(ii) REA shall invoke clauses within the Contract which stipulates that in case of non-compliance, the REA shall withhold a certain percentage of the contract price.

(iii) The Contractor shall also be referred to the Environmental Police for prosecution, should it be required.

(iv) The works may also be halted at the contractor’s cost until the non-compliances have been addressed.

The National Environment Management Authority
NEMA is specifically mandated by the National Environment Act (NEA) Cap. 153 as the principal agency in Uganda charged with the responsibility of coordinating, monitoring, supervising, and regulating all environmental management matters in the country. One of the key institutional mandates of NEMA include among others ensuring the observance of proper safeguards in the planning and execution of all development projects including those already in existence that have or are likely to have significant
impact on the environment. The role of NEMA is monitoring the project implementation in accordance with the National Environment Act and the respective regulations.

**Local Government Administration Structures**

District and Local Council Administration in the project districts will be vital in implementation of the project by mobilizing political goodwill and sensitizing communities on the project as well as their District Environment and Community Development Officers taking care of environmental and social aspects of the project at their levels. The DEOs and CDOs in the respective areas of project implementation will have to monitor the projects to ensure that mitigation measures are adequate and are well integrated in the subproject proposals. The Role of the DEOs and CDOs will also be to ensure that the projects are implemented in accordance with national laws and regulations. They will also attend the monthly site inspection meetings for the project and be able to point out issues of concerns. Specifically the CDOs will oversee implementation of compensation aspects and other social issues such as complaints.
7. REFERENCES

ESMF for ERT-III (2014)

Environmental, health, and safety guidelines for electric power transmission and distribution. International Finance Corporation of the World Bank Group

The National Cultural Policy, 2006-Ministry of Tourism and Wildlife
The National Water Policy, 1999, Ministry of Water and Environment-Kampala
The National Land Use Policy, 2011; Ministry of Lands, Housing and Urban Development.
The National Gender Policy, 1997, Ministry of Gender, Labour and Social Development, Kampala-Uganda
The National HIV/AIDS Policy, 2004;
The National Policy for the Conservation and Management of Wetland Resources, 1995;
The National Forestry Policy, 2001
The Constitution of the Republic of Uganda, 1995;
The National Environment Act, Cap 153;
The Public Health Act, 1964
The Land Act, Cap 227;
The Water Act, Cap 152;
The Uganda Wildlife Act, Cap 200;
The Occupational Safety and Health Act, 2006;
Historical Monument Act, 1967;
The Electricity Act, 1999
The Wild Act, 1996
The National Forestry and Tree Planting Act, 2003;
The National Environment (Environment Impact Assessment) Regulations;
The National Environment (Audit) Regulations, 2006 (12/2006); and
The National Environment (Wetlands, Riverbanks and Lakeshores Management) Regulations (SI 153-5).
Uganda Population-Based HIV Impact Assessment (UPHIA), 2017
World Bank EA guidelines 1993-4 Environmental Assessment Source Book
ANNEX I: PROJECT SCOPE

Northern, North North West and West Nile ESMP Scope for ERT III – INTENSIFICATION PROJECT

Three service territories (Northern, North North Western and West Nile Service Territory)

A) **West Nile Service Territory**

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<th>Voltage, kV</th>
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<th>LV R/L, km</th>
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<th>1-phase LV R/L, km</th>
<th>3-phase transformers, kVA</th>
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ANNEX I1: Chance Finds Procedures

Chance find procedures will be used as follows:

- Stop the construction activities in the area of the chance find;
- Delineate the discovered site or area;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the Directorate of Museums and Monuments take over;
- Notify the supervisory Engineer who in turn will notify the responsible local authorities and the Directorate of Museums and Monuments under the Ministry of Tourism, Wildlife and Antiquities (within 24 hours or less);
- The Directorate of Museums and Monuments 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 and Monuments (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 Directorate of Museums and Monuments. 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 Directorate of Museums and Monuments; and
- Construction work could resume only after permission is given from the responsible local authorities and the Directorate of Museums and Monuments concerning safeguard of the heritage;
- These procedures must be referred to as standard provisions in 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 National Museum concerning the safeguard of the heritage; and
- Relevant findings will be recorded in World Bank Implementation Supervision Reports (ISRs), and Implementation Completion Reports (ICRs) will assess the
overall effectiveness of the project’s cultural property mitigation, management, and activities, as appropriate.
ANNEX 111: EMERGENCY RESPONSE PLAN

Emergency Response

An emergency is any unplanned occurrence caused by either natural or manmade events which can lead to deaths, significant injuries, cessation of operations, physical and environmental damage and economic losses.

Emergency management is therefore critical when planning, mitigating, responding and recovering from the potential impacts of these events.

The emergency management process is site specific and varies according to the type of operations, geographic location, proximity to the neighbouring communities and the history of such occurrences. Therefore, one of the first stages in developing an emergency response plan is the identification of the potential hazards and threats of the lines.

An emergency response plan shall be documented and cover the areas mentioned below.

1. Identification of the persons responsible for the emergencies and safety. This person will keep the plan up dated (at least annually) and ensure that it is disseminated to all the relevant stakeholders.
2. Preparatory actions which must be taken in case of emergencies with forewarning and state the persons assigned with various responsibilities.
3. Response actions to be taken in case of an emergency.
4. Cleanup measures after the emergency
5. Provision of firefighting equipment which must be serviced by a reputable and registered firefighting equipment company.
ANNEX IV: GRIEVANCE MANAGEMENT MECHANISMS

A grievance management mechanism is proposed to be established to receive and facilitate grievance resolution of the affected persons. Liaison with area leaders and community groups significantly reduces the aggravation and hostility of locals.

Consultations with the area leaders indicated that the local population will work well with local leaders. It is recommended that this trend of cooperation continues throughout the life of the project to promote social integration and the development of mutually satisfactory solutions to project related problems affecting the local community.

Any complaints shall be resolved through negotiations with the affected party with the involvement of area leaders. Regular interaction with the affected persons will ensure that any problems encountered are dealt with at an early stage.

Grievance/Complaints Register shall be kept on site for any reference to ensure provision of appropriate response mechanism. When any grievance is received, the mechanism for dealing with it shall be as follows:

1. Grievance received;
2. Grievance recorded in the Grievance/ complaints Register;
3. For an immediate action to satisfy the complaint, the complainant will be informed of corrective action;
4. Implement corrective action, record the date and close case;
5. For a long corrective action, the complainant will be informed of proposed action; and
6. Implement corrective action, record the date and close case.
7. Appeal to Court - The Ugandan laws allow any aggrieved person the right to access to Courts of law. If the complainant still remains dissatisfied with the District Land Tribunal for complaints related to land, the complainant has the option to pursue appropriate recourse via judicial process in Uganda. Courts of law should be a “last resort” option, in view of the above mechanism however PAPs are free to seek redress with the courts of law after exhausting all the GRM levels.

Membership of the GRCs will be voluntary and it will be functional throughout the project life. The size of the GRC will depend on the number of villages within the cluster. It will comprise:

1. The GRC Chairperson, who will be a trusted village elder, (for example a religious representative) and not any of the LC chairpersons. This is to avoid conflicts about jurisdiction, political inclination and also to ensure public trust of the committee in case some community members do not trust their chairpersons;
2. Vice Chairperson who may be an opinion leader or a respected member of the community;
3. Secretary (responsible for recording grievances in the log book and taking minutes during GRC sittings);
4. The LC3 chairperson for the sub county with jurisdiction over the villages in the cluster;
5. The LC I chairpersons of each of the affected villages in the cluster or their representatives will be ordinary members.
ANNEX V: CODE OF CONDUCT

In order to minimize impacts due to workers behavior, the Contractor shall prepare and submit a code of conduct to REA. The code of conduct shall contain obligations on all project staff (including sub-contractors and day workers) that are suitable to address the following issues, as a minimum.

1. Compliance with applicable laws, rules, and regulations.
2. Compliance with applicable health and safety requirements (including wearing prescribed personal protective equipment, preventing avoidable accidents and a duty to report conditions or practices that pose a safety hazard or threaten the environment)
3. The use of illegal substances (like drugs, taking alcohol while at work, smoking in public)
4. Non-discrimination (on the basis of family status, ethnicity, race, gender, religion, language, marital status, birth, age, disability, or political conviction)
5. Interactions with community members (to convey an attitude of respect and non-discrimination)
6. Sexual harassment (to prohibit use of language or behavior, in particular towards women or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate)
7. Prevention of HIV/AIDS and other sexually transmittable diseases,
8. Violence or exploitation (for example the prohibition of the exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading or exploitative behavior.
9. Protection of children (including prohibitions against abuse, defilement, or otherwise unacceptable behavior with children, limiting interactions with children, and ensuring their safety in project areas.
10. Sanitation requirements (to ensure workers use specified sanitary facilities provided by their employer and not open areas).
11. Avoidance of conflicts of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favors, are not provided to any person with whom there is a financial, family or personal connection
12. Respecting reasonable work instructions (including regarding environmental social norms)
13. Protection and proper use of property (to prohibit theft, carelessness or waste)
14. Duty to report violations of this code
15. Non retaliation against workers who report violations of the code, if that report is made in good faith.
The code of conduct shall be written in plain language and signed by each worker to indicate that they have:

1. Received a copy of the code;
2. Had the code explained to them;
3. Acknowledged that adherence to this code of conduct is a condition of employment; and
4. Understood that violations of the code can result in serious consequences, up to and including dismissal or referral to legal authorities depending on the type of offense.
ANNEX VI: STAKEHOLDER CONSULTATION LISTS

RURAL ELECTRIFICATION AGENCY

<table>
<thead>
<tr>
<th>NO</th>
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# RURAL ELECTRIFICATION AGENCY

## Subject:
KEMP - BRT III Intensification Schemes
Western ST.

## Date:
19-07-18

## Venue:
KENRECO SP

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73
RURAL ELECTRIFICATION AGENCY

Subject: Health Services

Date: 9/10/2015  Venue:  

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## Rural Electrification Agency

**Subject:**
KMP - CRU8 INTENSIFICATION

**Date:** 8/4/18  
**Venue:** Kaps Village, P.M. Parish, Kabiney Sub-County, West P

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Engen Lawrence 074714530  
Acada Washington  
Ojagot Joseanin 0765314816
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