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**ENVIRONMENTAL AND SOCIAL  
MANAGEMENT PLAN FOR THE  
PROPOSED GAMBIA ELECTRICITY  
SUPPORT PROJECT FOR NAWEC**

**JULY 2015**

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## **ABBREVIATIONS AND ACRONYMS**

DPPH	Department of Physical Planning and Housing
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GEAP	Gambia Environment Action Plan
GEF	Global Environment Facility
HFO	Heavy Fuel Oil
IFMIS	Integrated Financial Management Information System
MOE	Ministry of Energy
MOFEA	Ministry of Finance and Economic Affairs
NAWEC	National Water and Electricity Company
NEA	National Environment Agency
NEMA	National Environment Management Act
NEMC	National Environment Management Council
ODS	Ozone Depleting Substances
PAGE	Programme for Accelerated Growth and Employment
PCBs	Polychlorinated Biphenyls
PIC	Prior Informed Consent
PIU	Project Implementation Unit
POPs	Persistent Organic Pollutants
PURA	Public Utilities Regulatory Authority
SEO	Senior Environmental Officer
T&D	Transmission and Distribution
TOR	Terms of Reference
UNEP	United Nations Environment Facility
VDC	Village Development Committee
WB	World Bank

## **EXECUTIVE SUMMARY**

### **Introduction and Background of the Study**

In 2014, the World Bank supported *Energy Strategy Study* for The Gambia evaluated status of the energy sector, including a report on the Technical Assessment on Power Generation, in the Gambia. High priority recommendations were made for immediate action to enhance efficiency in power generation and supply through a proposed project for the rehabilitation of NAWEC electricity infrastructure.

Although there are many benefits, there is also potential for adverse environmental and social consequences. Therefore, the Environmental and Social Management Plan (ESMP) specifically sets out the mitigation activities and responsibilities.

### **Objectives of the ESMP**

The objectives of this Environmental and Social Management Plan are:

- To identify, assess and manage potential negative environmental impacts associated with the proposed electricity project and ensure that appropriate mitigating measures are spelt out.
- To provide relevant, practical information for mitigation implementation.
- To establish clear procedures and methods for environmental and social planning, review and implementation in the aim of complying with environmental legislation.
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to the Project activities.

### **Methodology used in Developing the ESMP**

The approach used in the development of this ESMP is a combination of literature review, interviews and field visits. Project sites were visited and consultations held with institutional and community stakeholders.

For impact prediction and evaluation of significance, consideration was given to a combination of factors such as receptor, geographical extent, and timescale amongst others. Significance of an impact was characterised as (i) high positive significance, (ii) low positive significance, (iii) neutral - no discernible impact, (iv) low negative significance or (v) high negative significance:

### **Main Project Components and Locations include:**

#### *Electricity Generation*

Rehabilitation and maintenance of electricity generator, G8, at Kotu.

Major overhaul of electricity generator, G9, at Kotu

Rehabilitation and maintenance of electricity generator, G1, at Brikama I

Replacement of main switch gear system at Kotu A

Rehabilitation of steam system at Kotu D

Replacement of the heavy fuel oil separator units at Kotu D

Replacement of pumps at Kotu B



### Transmission and Distribution (T and D)

The Project includes general maintenance, rehabilitation, and reconfiguration of the existing T and D network in ten communities. Activities shall include replacement of extended medium voltage lines, excavation of substandard poles, erection of new poles with concrete to replace old ones, cable restringing, modification of low voltage service lines to consumers and replacement of pole mounted transformers.

Replace existing overloaded power transformers at Mile 5 Old Jeshwang and Brikama Medina to increase their capacities.

Replace capacitor banks at Mile 2, Wellingara and Bijilo Primary Substations.

### Installation of a new Information Technology (IT) Integration System

NAWEC setup is extremely large and complex, therefore, the package aims to ensure a more consistent and systematic programme for billing, payroll, accounts, procurement, and store management etc.

### Technical Assistance

In addition to infrastructure improvement, the Project shall include capacity enhancement in financial management, reporting, tariff evaluation and energy auditing amongst others to ensure the entire system of electricity generation is cost effective and sustainable. There is also complimentary support to the Public Utilities Regulatory Authority (PURA) for tariff model review.

### **Environmental Baseline Conditions**

Landscape of the Project area is flat and all sites are developed. There are no forests and ecological sensitive areas that will be disturbed by the Project.

Communities are well developed with education, health, communication infrastructure and other social amenities.

### **National Acts and Regulations**

Some of the national laws and regulations that will guide the implementation of this project:

- The National Environment Management Act (NEMA) 1994
- Environmental Impact Assessment (EIA) Regulations, 2014
- Environmental Quality Standards Regulations, 1999
- Environmental Discharge (Permitting) Regulations, 2001
- The Anti-littering Regulations, 2007
- The Hazardous Chemicals and Pesticides Control and Management Act, 1994
- The Hazardous Chemicals Regulations, 2001
- The National Waste Management Bill, 2007
- Public Health Act, 1990

- The Gambia Roads and Technical Services Authority Act, 2003
- Local Government Act, 2002
- State Lands Act 1990 (amended 2008) & Land Acquisition and Compensation Act, 1990
- Physical Planning and Development Control Act, 1991 & Development Control Regulations, 1995.

**Relevant National Policies for consideration include:**

- The Program for Accelerated Growth and Employment (PAGE)
- The National Energy Policy (2014 - 2018)
- The Gambia Environmental Action Plan (GEAP)
- The National Health Policy (2012-2020)

**Relevant International Conventions and Treaties**

The Gambia is Party to the following international Conventions and Protocols, all of which have some bearing on this project:

- The Stockholm Convention on Persistent Organic Pollutants (POPs)
- The Basel and Bamako Conventions on the trans-boundary movement of hazardous wastes and their disposal.
- The Rotterdam Convention on Prior Informed Consent (PIC)

**World Bank Environmental and Social Safeguard Policies**

The World Bank Operational Policy 4.01 on Environmental Assessment is triggered as the proposed Project has some potential negative socio-environmental impacts. This Policy requires that environmental assessment is carried out to predict the potential socio-environmental impacts so that appropriate safeguard plans can be prepared to avoid or mitigate the adverse impacts during generator rehabilitation, T & D construction and operation phases.

**Relevant Institutions for the Project ESMP implementation include:**

- The Ministry of Environment, Climate Change, Water Resources, Parks and Wildlife
- The National Environment Agency (NEA)
- The Ministry of Energy (MOE)
- National Water and Electricity Company (NAWEC)
- Ministry of Finance and Economic Affairs (MOFEA)
- The Ministry of Local Government
- Public Utilities Regulatory Authority (PURA)

**Outcome of Consultations and Field Visits**

Outcome of the consultations indicate that the Project will have many benefits, and stakeholders are looking forward to its commencement. Concerns raised were typical on health and safety,

and fair distribution of electricity supply. It was highlighted that communities must be involved for ownership and support to the Project.

Visits to the power plants highlighted that rehabilitation and maintenance of generators is a continuous process, and there is local expertise to some extent. The main problem is on provision of spare parts. Sludge oil production and management is also a major issue for consideration at all times during generator operation.

In most areas visited, the T and D network is overloaded and circuits overstretched resulting to low voltage. Substandard poles are common and certain areas within the existing T and D circuits lack connection. NAWEC has already started surveying and developing plans of the areas.

### **Potential Positive Impacts**

- Increased quality and efficiency in electricity supply.
- Creation of employment during the Project works and by improved economic activities.
- Improved economy, business and tourism activities.
- Improved education, health.
- Safer T and D network.

### **Potential Negative Impacts**

- Oil spills affecting land, water, agriculture, tourism, and habitants of the polluted land
- Accidents (Public and Occupational) such as road traffic, falls, electrocution, and burns.
- Air pollution during operation of the generators.
- Queries by non beneficiary communities around Project sites.

### **Mitigation Measures**

- Implementing a sludge management plan including spill prevention.
- Emergency cleaning of spills before they spread.
- Environmental monitoring of air quality
- Use of alternative fuel producing less or no sludge.
- Provision and use of personal protective gear
- Training and provision of safety information
- Adequate management and disposal of waste
- Adequate supervision and monitoring of Project works and during operation
- Public information and consultation to seek support.
- Mining companies to supply the Project with sand and gravel must be approved by the NEA and Geological Department, and only use Government approved quarries.

### **Roles and Responsibilities of Stakeholders**

NAWEC, through the Project Implementation Unit (PIU) is responsible for the overall implementation of the Project and its ESMP. The Senior Environment Officer will ensure the respective roles of each stakeholder are carried out on time. NAWEC must ensure contractors are aware of their implementation responsibilities through the contracts.

According to Section 31 of the EIA Regulations, 2014, the NEA shall monitor routinely to guide and audit the progress of the ESMP implementation to ensure compliance

### **Training and Sensitization**

During the study, constraints that may affect the implementation of the ESMP were identified including logistics and human capacity for implementation and monitoring. Therefore, a programme of environmental management training and sensitisation is recommended for effective implementation. Important issues to be considered during training include:

- Project and ESMP implementation arrangements
- Relevant laws
- Project benefits and potential negative impacts
- Guidance mitigation measures and good practice
- Monitoring requirements
- Public information requirements
- Related community development issues for socio-economic improvement.
- Sludge management
- Occupational health and safety

### **Monitoring, Reporting and Auditing of the ESMP**

Monitoring of the ESMP implementation is essential in ensuring the project is environmentally sound, by checking that the recommended mitigation measures have been carried out effectively in a timely manner for all the activities.

The PIU, of which the Senior Environment Officer and Health and Safety Officer at NAWEC will be key members, shall monitor the overall ESMP implementation whilst they will in turn be monitored by the NEA Environmental Inspectors and EIA Programme Officers.

Effective communication between and amongst the NEA and NAWEC must be done through periodic progress reports and independent environmental audit be carried out midterm of Project implementation.

### **ESMP Implementation Budget**

To ensure that the mitigation measures in the ESMP are fully implemented, resources must be readily available and a total budget of \$ 183,500.00 has been estimated.

## **Conclusions**

Evaluation of the activities and sites have shown that the proposed NAWEC Electricity Project is likely to create some environmental and social impacts of varying significance, however, the Project can be executed in an environmentally sound manner if the ESMP is fully implemented to address these accordingly.

## **Recommendations**

The ESMP highlights the following recommendations for success during and after the Project:

- Policy and decision makers from all relevant institutions must be sensitised on the Project ESMP before the Project activities commence to ensure their roles are understood and concerns have been addressed.
- Training and sensitisation must be continuously integrated in the daily activities of the Project.
- A formal Steering Committee comprising MoE, MoFEA, NAWEC and PURA is proposed whilst NAWEC serves as the implementing agency with a PIU formed.
- Monitoring and evaluation officers at the NAWEC PIU in collaboration with the NAWEC Senior Environment Officer must be clearly assigned the responsibility of ESMP monitoring as there is a tendency to keep focus on technical work progress alone.
- The cost of ESMP implementation must be incorporated in the main Project budget to ensure availability of resources when needed.
- NAWEC to sign a Memorandum of Understanding with NEA in ensuring full ESMP implementation and compliance.
- The Health and Safety Officer at NAWEC needs more training on safety at work.
- It is important that all contracts must include clauses on responsibility for environmental and social protection including implementation of the ESMP applicable to contractors and their workers.
- Suppliers of earth materials such as sand and gravel must be certified by the NEA and Geological Department to mine, and only Government approved quarries shall be used.
- Recruitment for this Project during all phases must give priority to qualified women considering the high percentage of men already expected to participate.
- An independent environmental audit shall be carried out mid-term of Project implementation.
- The NEA must aim to finalize and adopt the Waste Bill, 2007, to cover specific requirements for waste management of all types including sludge oil.
- Review the current practice of collecting, storing, transporting, recycling or converting the sludge and other wastes generated at the power stations with a view to making the practice more environmentally friendly.
- NAWEC, with support from relevant stakeholders should develop standards to guide location of poles and Tand D routes within communities and open land.
- Suppliers of spare parts should provide technical support in installing parts from their company.

- Develop the relevant policies and laws to regulate the industry in line with the country's international obligations.
- Develop a sector-wide internal environmental policy for NAWEC whose implementation will be the responsibility of the in-house Senior Environmental Officer.
- The NEA needs to call NEMC meetings regularly to give update on the current developments and challenges; to give the NEA the necessary political support to enhance GEAP implementation and similar environmental policies.

## **CHAPTER 1: INTRODUCTION**

### **1.1 Introduction and Background of the Study**

In 2014, the World Bank supported *Energy Strategy Study* for The Gambia evaluated status of the energy sector, including a report on the Technical Assessment on Power Generation, in the Gambia. High priority recommendations were made for immediate action to enhance efficiency in power generation and supply.

Consequently, the Government received a project preparation advance from the World Bank (WB) to prepare a quick win electricity project for the National Water and Electricity Company (NAWEC). This proposed project shall address the problems of low generation capacity and losses in distribution through maintenance and rehabilitation of existing generators, and replacement of inefficient transmission and distribution infrastructure alongside metering.

Although the aim of the proposed project is to provide adequate electricity for social and economic development, there is also potential for adverse environmental and social consequences. Therefore, it is important at this planning stage to assess the potential impacts of the project during the works and operation phases, to ensure that negative impacts are mitigated whilst the positive ones are enhanced for sustainability.

The proposed mitigation measures for the identified impacts will be prescribed in the Environmental and Social Management plan (ESMP) that specifically sets out the mitigation activities and responsibilities.

### **1.2: Objectives and Structure of the ESMP**

#### **1.2.1 Objectives of the ESMP**

The objectives of this Environmental and Social Management Plan are:

- To identify, assess and manage potential negative environmental impacts associated with the proposed electricity project and ensure that appropriate mitigating measures are spelt out.
- To provide relevant, practical information for mitigation implementation.
- To establish clear procedures and methods for environmental and social planning, review and implementation in the aim of complying with environmental legislation.
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to the Project activities.

## **1.2.2: Structure of the ESMP**

Having set the background for developing the ESMP, components and location of the Project are stated in order to predict the associated potential impacts. Baseline environmental and socio-economic conditions before the Project are described, highlighting the current status against changes that may cause potential impacts.

Apart from the corporate social responsibility of ensuring an environmentally sound Project, there is need for compliance to the laws governing such Projects. Thus, the general legal framework for the assessment and management of environmental and social safeguards of development projects in the Gambia are discussed as provided in the National Environment Management Act (NEMA), 1994, in addition to other complementary statutory instruments. The World Bank's safeguard policies are also examined as applicable to this Project.

As environmental management issues are cross-cutting and involve various stakeholders, the institutional framework for implementation of the Project and its ESMP are also outlined.

The identified impacts are consequently assessed and their significance evaluated as presented in the matrix (Section 6.1).

Based on expert knowledge, observations and widespread consultations, mitigation measures for each negative impact is identified to prevent or reduce the effect. These are presented in the ESMP proper in Chapter 7 to include responsibilities and monitoring.

Conclusions and recommendations are finally presented, outlining the main issues.

## **1.3 Methodology used in Developing the ESMP**

### **1.3.1 General Method**

The approach used in the development of this ESMP is a combination of literature review, interviews and field visits to proposed sites. Literature reviewed includes background study to this Project, relevant laws and similar projects. This has provided much insight into the potential

positive and negative impacts of such projects to enable predictions with reasonable accuracy of the potential impacts of this project.

Sites for the Project were visited paying particular attention to the socio-economic, physical and environmental characteristics of the various areas, including their respective development-environment situation and relationships. The process was participatory, drawing on the local knowledge and involving the local people, also recognizing the relationship among resources, resource users, institutions, socio-economic and cultural setting. Relevant stakeholders met at local settings included village heads or “Alkalos” and a Ward Councillor.

Other institutions and stakeholders who are expected to play a major role in the project were also consulted to determine their roles and status of preparedness in implementing the ESMP from this study. They included the National Environment Agency (NEA), Ministry of Energy, NAWEC, Public Utilities Regulatory Authority (PURA), and Department of Physical Planning and Housing (DPPH). A summary of persons met and issues discussed is shown in Annex 12.1.

The consultations with the stakeholders were carried out to specifically achieve the following objectives:

- To provide information about the project and to tap stakeholder information on key environmental and social baseline information in the project area
- To provide opportunities to stakeholders to discuss their opinions and concerns.
- To inform the process of developing appropriate management measures as well as institutional arrangements for effective implementation of the project.

### **1.3.2 Principles and Method used in Screening the Potential Significant Impacts**

The Project activities can present potential risks based on the surrounding environment (physical, biological and social) they take place.

The interaction of the hazard of an activity with the sensitivity of the surrounding environment leads to an impact. The occurrence and significance of the impact depends on level of compatibility of both the activity and the type of the environment.

Considering the combination of various factors, significance of an impact shall be characterised as (i) high positive significance, (ii) low positive significance, (iii) neutral - no discernible impact, (iv) low negative significance or (v) high negative significance. These include:

- The project activities leading to hazards and risks:- their nature, magnitude, direct or indirect.
- The sensitivity of the receptor: - for the beneficiaries, for instance, is the receptor a woman, child or elderly considered as more sensitive. Sensitivity of the physical or biological environments such as wetlands? Flora or fauna of ecological significance?



- Temporary scale:- Will the impact have effect in the short, medium or long term (permanently)?
- Geographical scale:- Does the impact affect one family, one village, one region, etc?
- Are there cumulative minor or localised negative impacts leading to major problems?

The screening to evaluate the significance of potential impacts of this Project was based largely on expert opinion, information from the consultations and observation of existing structures. The evaluation matrix is presented in Chapter 6.

## **CHAPTER 2: PROJECT DESCRIPTION**

### **2.1 Project Objectives**

The main objectives of the proposed NAWEC Electricity Rehabilitation Project are to increase electricity generation, and create a more effective and efficient transmission and distribution network. Access to more reliable and adequate supply is priority to the Project considering the growing demand and reduction of losses by the time electricity reaches the final user from its point of generation.

It aims to rehabilitate and carry out maintenance works on selected electricity machinery located at the Kotu and Brikama I Power Stations, and upgrade the transmission and distribution infrastructure in various communities.

The Project shall increase revenue collection through meter replacement and enhance the capacity of NAWEC staff being trained under this Project.

### **2.2 Main Project Components and Locations**

#### **2.2.1 Electricity Generation**

- Rehabilitation and maintenance of electricity generator, G8, at Kotu.
- Major overhaul of electricity generator, G9, at Kotu
- Rehabilitation and maintenance of electricity generator, G1, at Brikama I
- Replacement of main switch gear system at Kotu A
- Rehabilitation of steam system at Kotu D
- Replacement of the heavy fuel oil separator units at Kotu D
- Replacement of pumps at Kotu B

### **2.2.2 Transmission and Distribution (T and D)**

- General maintenance, rehabilitation, and reconfiguration of the existing T and D network in the following areas:
  - Farato
  - Busumbala
  - Old Yundum
  - Brikama Town
  - Brikama College
  - Brikama Gallilee
  - Brikama Dara Hydar
  - Sanyang Village
  - Abuko Oldfield
  - Fajikunda

Planned activities for the above sites include the upgrade of extended medium voltage lines, replacement of substandard poles with new poles, cable restringing and modification of low voltage service lines that serve consumers.

Pole mounted transformers shall also be installed at strategic locations for offloading.

- Replace existing overloaded power transformers at Mile 5 Old Jeshwang and Brikama Medina to increase their capacities.
- Replace capacitor banks at Mile 2, Wellingara and Bijilo Primary Substations.
- Meter replacements and metering of substations.

### **2.2.3 Installation of a new Information Technology (IT) Integration System**

NAWEC setup is extremely large and complex, therefore, the package aims to ensure more systematic programmes for billing, payroll, accounts, procurement, and store management etc. This is intended to integrate the systems and provide associated financial management, reporting and training.

### **2.2.4 Technical Assistance**

In addition to infrastructure improvement, another accompanying component of the Project is in the form of capacity enhancement, financial management, reporting, tariff evaluation and energy auditing amongst others to ensure the entire system of electricity generation is cost effective and sustainable. There is also complimentary support to PURA for tariff model review.

## **CHAPTER 3: THE ENVIRONMENTAL BASELINE CONDITIONS**

### **3.0 General Baseline Conditions**

With the exception of Mile 2 and Mile 5 Substations, most conditions of the Project areas are the same as they relatively fall within a defined area with similar environments. Therefore, the physical, biological and socio-economy of the study area will be defined in general.

### **3.1 Biophysical Environment**

#### **Landscape**

The landscape of The Gambia is virtually flat comprising the flood plain in which alluvial material was deposited. The Project areas are occupied by residences, industries, private farms and social amenities, with areas such as Wellingara and Fajikunda fully built. Open fields are not common in the chosen areas.

The existing Mile 2 and Mile 5 Substations fall within the Tanbi Wetland Complex which is a Ramsar Site of Ecological Significance with mangroves, and varied aquatic and bird species. Only capacitor banks will be replaced at these sites and no new structures or access routes are required. Thus, there is no likely impact of the Project on this sensitive natural habitat.

#### **Climate**

The Gambia lies in the Sahelian belt with a sudano-sahelian type of climate characterised by a long dry season from October to early June and a short rainy season from mid-June to early October. Rainfall in most parts of the country is about 1020 mm, ranging from 800 mm in the east to 1700 mm at the western end of the country where most of the Project activities fall.

Drought has however affected rainfall, and for the past 15 years has been creating erratic and unexpected rains, and in most years reduced rain. Moreover, periodic heavy rains can be experienced in the Project area with rainwater runoff from the Generation Stations flowing within communities with potential contaminants.

#### **Drainage**

Except for a few coastal streams outside the Project area, natural drainage in The Gambia is centred along the River Gambia and its tributaries. As it enters The Gambia territory 680 kilometres from the source in the Fouta Djallon Highlands in Guinea Conakry, the River Gambia flows generally along an east - west axis with 85% of the runoff generated outside The Gambia where larger part of the drainage basin is located.

At Abuko, within the T and D network with a proposed transformer at Oldfield, there is a natural rainwater gully drain that empties into the River Gambia. Erosion is evident from the unstable soil and unsystematic route.

## **Water Resources**

The water resources of The Gambia comprise seasonal rains, ephemeral ponds, depression storage and the perennial main River Gambia.

### Surface Water

Rainfall in The Gambia contributes to water availability through recharge of underground aquifers, and the River Gambia is tidal throughout its length within the estuarine zone distinct. Despite large areas, The Gambia's basin section contributes little to the flow of the River. The bulk of the flow is derived from the headwater regions and middle basin in Guinea and Senegal, which together form 86 percent of the basin.

### Ground Water

Exploitable ground water occurs in the shallow sandstone and the deep sandstone aquifers separated by marls, clay and argillaceous limestone. Both aquifers occur throughout the country. There are wells in use within the Project area for domestic purposes.

## **Wildlife**

Wildlife in The Gambia is of vast variety, although diversity is reducing and some species only remain in small populations at limited areas. The main threats to wildlife are hunting, impacts from destruction of habitats or movement paths, and sometimes killings for farm and farmer protection.

Reserves and national parks have been designated as legally protected areas in an aim to preserve diversity, encourage wildlife population growth for scientific studies, education and tourism purposes. This Project does not fall within a protected area.

## **Forests**

Forests of The Gambia are important with multiple functions. The upland forests provide fuel wood energy, construction and building materials, food and local medicine for both rural and urban settlements. The forests contribute significantly to the socio-economic development of the country by providing resources, job opportunities and income.

The coastal forests, including the mangrove forests, provide the local communities with wood products for construction and energy. The coastal forests also provide protection against coastal and river bank erosion and breeding grounds for many varieties of fish, oysters, and other sea mammals. The mangroves which provide natural habitat for oysters also provide many communities, mostly women, with some source of subsistence through sale of the dead branches as fuel wood and oysters.

No mangroves or upland forests, particularly at Brikama Nyambia, will be affected by the Project.

## **3.2 Socio - economic environment**

### **Population and Community Development**

The Gambia's population stood at 1.9 million people in 2013 according to the Population and Housing Census Report. Brikama and Fajikunda are the most densely populated areas of the Project with other areas currently developing at a fast rate.

Communities within the Project area shall benefit from more employment directly on Project activities, or new and expanding businesses that may come up. More income will lead to better quality of life and development of the society.

### **Health**

The health service delivery system in The Gambia is three tiered and based on the Primary Health Care Strategy. Currently, there are five hospitals across the country, six major health centres and thirty-two minor health facilities. At least 400 health posts at the primary (community) level exist. The public service delivery is complimented by NGO and private run facilities.

Brikama and Fajikunda operate major health centres with their main referral hospital in Banjul, the Edward Francis Small Teaching Hospital.

Although public health facilities are given priority in electricity supply, the Project shall definitely improve health quality delivery due to fewer constraints on lighting needs, use of medical equipment, water pumping and private power generation expenses.

### **Agriculture and Livestock**

Nearly 75 percent of the rural population of The Gambia are employed in agriculture. This sector contributes between 20 to 33 percent to the country's GDP. The agricultural sector is characterized by subsistence production of rain fed food crops (coarse grain, rice etc.), semi-intensive cash crop production (groundnut and horticultural production), and traditional livestock rearing.

There are few private livestock farms and orchards within the Project area that will not be disturbed. Instead, there shall be efficient electricity supply for operational activities. A small area of land around Kotu Power Plant is used for subsistence farming.

### **Land Tenure and Property Rights**

Property rights and land tenure provide equal incentives to all for improved land management. The State Lands Act of 1990 and the Land Acquisition and Compensation Act, 1990, which take care of land tenure and property rights, have a cautious land acquisition plan. The Act designates State Lands in Banjul, the Kanifing Municipality, Kombo South, Kombo Central and Kombo North to be administrated by the State rather than by districts authorities.

As practiced by the NAWEC Planning Officers, irrespective of state land, communities and land users will be requested to consent for T and D networks where there is possible need for encroachment, specifically for Projects requiring space for new infrastructure. Communities are supportive of development projects that directly benefit them and as this Project covers maintenance, rehabilitation, and upgrading of existing facilities, there is no need for resettlement in providing space.

## **Gender**

Gender is defined as “the assigning of ‘male’ and ‘female’ labels to social roles and attributes (economic, social and cultural), as if they arise from sexual differences, although these attributes are acquired by a process of socialization” (National Women’s Bureau, 2009). Therefore, gender as a social construct has continued to be considered an important pillar in sustainable development including the environment sector.

In the Gambian society in general and particularly in the rural settings, the approach to issues that concern women is generally conservative. There is gradual advancement and national laws and policies are incorporating women issues as stated in the international conventions adopted by The Gambia.

The National Women’s Federation has been established to help bring to the forefront concerns of women across the Country. There are also financial credit systems such as those by the Village Savings and Credit Agency and the Gambia Women’s Financial Association put in place to encourage improvement in the economic power of women, thus subsequently, build capacity to control their lives and natural environments. Special education programmes also encourage girls to attend formal schooling in an aim to prepare them for decision making. Gender considerations are included in the important national development guides Poverty Reduction Strategy Papers, and Vision 2020: The Gambia Incorporated. However, positive difference can only be meaningful if started at the grassroots.

Other achievements include training of both women and men by the National Women’s Bureau in leadership skills in order to understand the importance of women in socio-economic development. More women are now participating in decision making, having been trained on public speaking, advocacy and confidence building. Indirectly, improved leadership skills will lead to more participation in other areas such as environmental management.

Women are also increasingly taking up higher positions in central Government and at the local authority level with the more recent selection of female Alkalos and councillors to lead communities.

Although in The Gambia men tend to dominate with assets, including secure land tenure, this Project shall benefit households and enterprises irrespective of who heads it.

## **Education**

The Government of the Gambia has adopted education as one its priority areas and has put efforts in various means to ensure quality education is accessible to all. Education projects have supported teacher training, adult and non-formal education and tertiary education amongst many others.

There are numerous schools of various levels within the Project areas that will benefit from better electricity supply and there is no potential negative impact on them.

## **Public Services**

All the areas have access to electricity, though varying quality and amount, and there shall be improved water supply in certain areas where electricity to pump water for distribution is currently limited.

Telecommunication cables run in most areas although most private users are now switching to the use of mobile phones.

Apart from the power stations and primary substations that fall near built highways, the T and D routes are all earth roads.

# **CHAPTER 4: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK**

## **4.1 National Acts and Regulations**

The following national laws and regulations will guide the implementation of this project:

### **4.1.1 The National Environment Management Act (NEMA) 1994**

The NEMA, 1994, was promulgated as the primary legislation in environmental management, providing a structured institutional and legal framework for sound management of the environment and natural resources in The Gambia.

It empowers the National Environment Agency (NEA) with powers to:

- establish criteria and set the standards for environmental quality for effluent discharges and solid waste disposal.

- identify materials, processes and wastes that are dangerous to human or animal health and the environment, and recommend regulations and guidelines for the management of materials, processes and wastes.
- prepare guidelines for managing environmental disasters including those of major oil spills, gas leakages, and spills of other hazardous substances. The NEA has powers to decide who would be responsible for any clean up and generally what should be done when such discharges take place.
- appoint environmental inspectors who are empowered, among other things, to take samples of articles or substances which the Act prescribes and submit them for testing or analysis; and to carry out periodic inspections of establishments whose activities are likely to significantly impact on the environment.

Part V of the NEMA stipulates the requirements for EIA of proposed projects, and for more specific EIA guidance, regulations were passed under this Act to that effect.

#### **4.1.2 Environmental Impact Assessment (EIA) Regulations, 2014**

Once the concept is decided, the project developer (in this particular case Government of The Gambia through NAWEC) is required to submit a project brief to the NEA accompanied by a duly completed EIA Screening Form for Environmental Approval. Based on the information on the brief and screening form, NEA will decide if a full environmental impact study is required.

The EIA Regulations, 2014, state exactly which projects require EIA, the procedure, responsibilities of stakeholders and fees.

Furthermore, Section 3 (1) (b) of the EIA Regulations, 2014, states that the Regulations apply “to any major repairs, extensions, alterations, or non-routine maintenance for any existing project” such as electricity generation, transmission and distribution.

Projects are classified ‘A’ meaning a full EIA study is required; temporarily ‘B’ when more information is required to make a decision; and ‘C’ where a full EIA study is not required although approval may be with conditions.

Considering the fact that the NAWEC electricity Project is mainly rehabilitation, maintenance and upgrade of existing infrastructure and the many socioeconomic benefits it shall bring, a Class C categorization is suggested. The main reason is that the limited potential negative impacts that are inevitable, can be mitigated through implementation of this ESMP.

This Projects EIA Screening Form will be submitted to NEA for consideration whilst the ESMP is being reviewed to start the screening process.



#### **4.1.3 Environmental Quality Standards Regulations, 1999**

The Environmental Quality Standards Regulations of 1999, formulated under the NEMA, sets out quality standards applicable to ambient air, saline waters, surface freshwaters and groundwater. The NEA maintains these standards and may liaise with the relevant institutions for monitoring.

#### **4.1.4 Environmental Discharge (Permitting) Regulations, 2001**

The purpose of the permitting system is to control discharges from industries and other establishments, including households operating or carrying out processes potentially harmful to the environment.

Pollution Control is established under part VIII of NEMA, and it prohibits the discharge of materials, substances and oil into the environment. These Regulations require the registration of processes, and NEA may refuse to issue permits to these processes to discharge their wastes if their potential to pollute could exceed the limits of the Environmental Quality Standards.

#### **4.1.5 The Anti-littering Regulations, 2007**

These regulations are enforced by the NEA to ensure that solid and liquid waste from any source is managed in a manner that is not harmful to the environment including the human beings, flora and fauna.

#### **4.1.6 The Hazardous Chemicals and Pesticides Control and Management Act, 1994**

This Act was enacted for NEA to regulate the indiscriminate sale and misuse of chemicals, particularly pesticides. The Act calls for the mandatory registration of all hazardous chemicals and provides a wide and comprehensive framework for the control and management of the manufacture, distribution and use of hazardous chemicals and pesticides. The Act covers pesticides and all other hazardous chemicals from consumer, industrial, to agricultural chemicals.

It is important to emphasize at this point that NEMA provides both regulatory and legislative framework for environmental management in the country. It is not specific to hazardous chemical or pesticides but covers all environmentally related issues, and therefore indirectly deals with persistent organic pollutants (POPs).

#### **4.1.7 The Hazardous Chemicals Regulations, 2001**

Although these Regulations deal with chemicals other than pesticides, under Schedule 3 containing Group I chemicals, all chemicals subject to the Stockholm (POPs) Convention are included. Part II, Section 11 of these Regulations prohibits the importation, manufacture, distribution or sale of these chemicals without prior authorization.

#### **4.1.9 Public Health Act, 1990**

The Public Health Act was enacted to make provision for public and environmental health related matters. The Act also covers the collection, removal and sanitary disposal of rubbish, night soil and other offending matter. The Act also mandates the Director of Health Services to abate nuisances and remove or correct any condition that may be injurious to public health.

#### **4.1.10 The Gambia Roads and Technical Services Authority Act, 2003**

The Act aimed at establishing “The Gambia Roads and Technical Services Authority and the Roads Fund that shall, among other things, be responsible for the administration, control and maintenance of all roads in The Gambia and for financing the operations of the Authority, and for matters connected therewith”. The Authority established is presently known as the National Roads Authority and chairs the Road Reserve Committee which NAWEC is represented to avoid disturbance to road clearance by service facilities.

#### **4.1.11 Local Government Act, 2002**

The Act was passed to establish and regulate a decentralised local government system for the Gambia. It makes provision for the functions, powers and duties of local authorities and for matters connected therewith. According to Part II of the Act, the Gambia is demarcated into divisions (now Regions), areas, cities and municipalities. The Project falls within Banjul City Council, Kanifing Municipality and West Coast Region.

Part V establishes the functions of the councils in planning and implementing social services programmes and projects for general welfare of the community.

The Local Government Act, 2002, defines “Alkalo as the village headperson, and Councillor a member of the Council (City, Municipal or Area Council established under the same Act)”. Their roles are mainly of liaison between their communities and outside parties from central government, the private sector and non-governmental organizations.

The Alkalo leads its community in decision making and communicates development activities to them. Traditionally, they are respectfully visited by new to their village and consulted before any Government, private or non-governmental organization project is developed in their jurisdiction.

For these reasons, the Alkalos were consulted on the Project for their information, any concerns, expectations and support.

Brikama, where most of the T and D areas fall, is divided into four administrative wards and the Councillor of Nyambia Ward was also consulted on the proposed Project.

#### **4.1.12 State Lands Act, 1990 & Land Acquisition & Compensation Act, 1990**

The above legislations take care of land tenure and property rights. State lands are designated in Banjul, the Kanifing Municipality, Kombo South, Kombo Central and Kombo North to be administrated by the State rather than by districts authority. Therefore, Government may claim the affected land required to ensure adequate road clearance, however, with adequate consultation, resettlement or compensation.

The State Lands Act was amended in 2008.

#### **4.1.13 Physical Planning and Development Control Act, 1991 & Development Control Regulations, 1995**

These were put in place to ensure developments in The Gambia are in line with land use planning and construction standards. They are enforced by the Department of Physical Planning and Housing.

#### **4.1.14 The Gambia National Gender and Women Empowerment Policy 2010 – 2020**

The Gambia National Gender and Women Empowerment Policy 2010 – 2020 is being implemented to mainstream gender in national and sectoral planning and programming to ensure equity and equality in The Gambia. Through its ten main objectives, women are encouraged to be well informed and take part in decision making at all levels for sustainable development.

#### **4.1.15 The Women’s Act, 2010**

The Women’s Act was passed in 2010 to provide the legal provisions for the advancement and development of Gambian women and girls. It highlights a number of rights and protection from discrimination and violence against women

## **4.2 Relevant National Policies**

Important national policies that will guide the development and implementation of this ESMP essentially consist of the following:

### **4.2.1 The Program for Accelerated Growth and Employment (PAGE)**

The Program for Accelerated Growth and Employment (PAGE) is The Gambia's development strategy and investment program for 2012 to 2015. Based on Vision 2020 and various sector strategies succeeding the Poverty Reduction Strategy Paper II, it was developed drawing on lessons learnt from the execution of past strategies to consolidate the country's achievements.

The national priorities expounded in the PAGE revolve around sustainable environmental management and exploitation of the natural resources, and to consolidate the gains registered in the health and education sectors.

### **4.2.2 The National Energy Policy (2014 - 2018)**

Implementation of this policy is coordinated by the Ministry of Energy (MOE) which incidentally is the proponent of this investment (the rehabilitation and construction of electricity grids). Clearly, MOE recognizes that energy is central to the Gambia's many economic, social and environmental concerns, and therefore notes that access to clean and sustainable sources has a profound impact on poverty, problems of health and environmental degradation.

This Policy consequently places a high premium on avoiding or minimizing the impacts of the various fossil-fuel (imported petroleum products) and renewable sources of energy on which the country depends to meet its energy requirements. It aims to address the impacts that occur typically at the localized, national, regional or larger scales, on media (such as soil, air, water) and global warming pollution. This is particularly relevant in view of the fact that Gambia is Party to important regional and international treaties and conventions, including the POPs Convention mentioned earlier.

MOE therefore undertakes to introduce environmental assessment processes on all types of investments in the sector before they are implemented. There is however, insufficient capacity within the sector to implement the environmental management component of the Policy. Therefore, it is recommended that the following be considered:

- Review the current practice of collecting, storing, transporting, recycling or converting the sludge and other wastes generated at the Kotu Power Station with a view to making the practice more environmentally friendly.
- Develop the relevant policies and laws to regulate the industry in line with the country's international obligations.
- Develop a sector-wide internal environmental policy whose implementation will be the responsibility of the in-house Senior Environmental Officer.

### **4.2.3 The Gambia Environmental Action Plan (GEAP, 2009 -2018)**

The Gambia Environmental Action Plan (GEAP) has been the first integrated environment and natural resources management policy document of the country. It provides the framework for environmental policy planning and natural resources management on a continuous basis. It is now in its second phase of implementation (GEAP II -2009 -2018).

An important achievement of the GEAP implementation process has been the institutionalization of an environment and natural resources management framework, and specifically the establishment of the Environmental Impact Assessment (EIA) process in the country under the purview of a multi-sector Environmental Impact Assessment Working Group housed at the NEA headquarters.

However, a major GEAP challenge has been the dormancy of the National Environment Management Council (NEMC), in that it does not meet as regularly as required, and the members have not always been kept abreast with the GEAP coordination and implementation process. This has resulted in considerable loss of political mileage and support for NEA, and consequently reduction in financial and material support over the years which further impacts negatively on GEAP implementation.

### **4.2.4 The National Health Policy (2012-2020)**

The National Health Policy of the Ministry of Health and Social Welfare aims at contributing to the socioeconomic development and wealth creation of the country by promoting and protecting the health of the population through equitable provision of quality health care within the context of Primary Health Care. This mission essentially puts the concept of health beyond the confines of curative care to other socio-economic determinants of health.

The Policy further aims to reduce the frequency of environmental health and safety related diseases or conditions by 30 per cent by 2020 through policy measures such as:

- Enforcement of environmental health related laws
- Instituting proper management of solid, gaseous and liquid wastes

Successful implementation of the policy measures will result in reducing morbidity and mortality of major diseases, reduce health risks and exposures associated with negative environmental consequences.

## **4.3 Related International Conventions and Agreements**

### **4.3.0 Relevant International Conventions and Treaties**

The Gambia is Party to the following international Conventions and Protocols, all of which have some bearing on this project:

#### **4.3.1 The Stockholm Convention on Persistent Organic Pollutants (POPs)**

Perhaps the most important convention that is relevant to this project is the Stockholm Convention which deals with the management of Persistent Organic Pollutants (POPs). In this Convention, participating governments agreed to take actions to reduce or eliminate the production, use, and/or release of certain of these chemical pollutants. One of these pollutants include the PCBs (polychlorinated biphenyls) found in electrical transformers and large capacitors being operated by NAWEC, and potentially containing PCB oils.

In addition to PCBs, other POPs such as dioxins and furans can unintentionally be produced from some industrial processes and from combustion (for example, municipal and medical waste incineration, dumpsite fires, open burning of domestic and other domestic waste).

The control and management of these substances to comply with the requirements of the Convention in the Country was initiated in 2003, with assistance from Global Environment Facility (GEF) / United Nations Environment Programme (UNEP) when The Gambia developed a National Implementation Plan for the management of POPs. The Plan identified significant gaps in both the policy and legislative frameworks that need to be addressed for successful implementation of the POPs Convention in The Gambia. An inventory was taken on the contaminated NAWEC equipment and change was made to more environmentally friendly substitutes.

Specifically, the process revealed that there is no specific Regulation under the Hazardous Chemicals and Pesticides Control and Management Act of 1994, which would cover all aspects of the management (inventory, labelling, reporting), handling (maintenance, transport, disposal) and phasing out of PCBs and PCBs containing material (equipment and wastes).

The proposed NAWEC Electricity Project shall not import PCB run electrical equipment.

#### **4.3.2 The Basel and Bamako Conventions**

The Gambia has been a party to the Basel Convention since 1997 and to the Bamako Convention since 2001. These Conventions are related to trans-boundary movement of hazardous wastes and their disposal. The Stockholm Convention refers to the guidance documents elaborated under the Basel Convention with regard to environmentally sound disposal of POPs containing and contaminated wastes.

### **4.3.3 The Rotterdam Convention on Prior Informed Consent (PIC)**

This Convention covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by participating Parties. The Convention was ratified by The Gambia in November 2001.

The PIC Procedure is based on the principle of prior informed consent, that international shipment of a chemical, that is banned or severely restricted to protect human health or the environment, should not proceed without the agreement, or contrary to the decision of the Designated National Authority, NEA for the Gambia, in the participating importing in the country.

The objective of the Convention is to foster a shared responsibility to protect human health and the environment between exporting and importing countries. It enables the world to monitor and control the trade in certain hazardous chemicals. It gives importing countries the power to decide, which of these chemicals they want to receive and to exclude those, they cannot manage safely. If trade does take place, requirements for labelling and provision of information on potential health and environmental effects will promote the safe use of these chemicals.

### **4.3.4: The RAMSAR Convention on Wetlands of International Importance, 1975**

This Convention aims at controlling the encroachment on, and loss of, wetlands that carry important ecological functions. It was ratified by The Gambia in 1996, and in 2001 the Tanbi Wetland Complex was listed as a wetland reserve of international importance. It covers an area of 4,500 hectares stretching from Banjul to Mandinary.

Mile 2 and Mile 5 substations fall in the Tanbi Wetland proper whilst Abuko and Fajikunda fall in the outskirts of the reserve.

## **4.4 World Bank (WB) Environmental and Social Safeguard Policies**

In addition to the need to comply with the environmental laws and regulations of the Gambia, this Project will also be carried in compliance with the World Bank's environmental and social safeguard policies.

These safeguard policies are designed to protect the environment and the society from potential adverse effects of projects, programmes, plans and policies. The World Bank's safeguard operational policies (OP) are:

- OP 4.01 Environmental Assessment, including the Public's participation
- OP 4.04 Natural Habitats
- OP 4.09 Pest Management
- OP 4.11 Cultural Heritage

- OP 4.12 Involuntary resettlement of populations
- OP 4.10 Indigenous populations
- OP 4.36 Forests
- OP 4.37 Safety of Dams
- OP 7.50 International Waterways-related Projects
- OP 7.60 Projects in disputed areas

Having evaluated the potential impacts, WB's Operational Policy 4.01 on Environmental Assessment is the only one triggered as the proposed Project has some potential negative socio-environmental impacts. This Policy requires that environmental assessment is carried out to predict the potential socio-environmental impacts so that appropriate safeguard plans can be prepared to avoid or mitigate the adverse impacts during generator rehabilitation, T & D construction and operation phases.

OP 4.04 on Natural Habitats has not been triggered even though two Project sites, Mile 2 and Mile 5 substations, are within a wetland reserve, the Tanbi Wetland Complex. Both facilities already exist and there is neither expansion into the wetland nor use of the surroundings of the substations for any Project activity. Capacitor banks will be replaced using existing access routes.

OP 4.12 on the Involuntary Resettlement of Populations was not triggered as there will be no resettlement of households or communities for any component of the Project.

OP 4.36 on Forest protection was also not triggered as no forest will be encroached on or its resources fell for this Project. The Nyambia Forest in Brikama, on one side opposite the Brikama Power Station, and adjacent to the Brikama Medina substation on the other side, will not be affected by any Project activity.

The remaining safeguard policies have no link to the Project for consideration.

The capacity of NEA and other collaborating partner institutions in the country in the EIA process was built by the World Bank through a capacity building environmental project and consequently, the Gambia's guidelines and procedures are essentially tailored after the WB's with modifications to suit the national circumstances.

The Gambia and WB environmental assessment systems are aligned in the sense that both have a requirement for assessment of Projects, such as this one, for environmental and social sustainability. The classification after screening, however, and the procedural requirements based on the significance of impacts differ. For these reasons, stakeholders involved in the implementation of this ESMP will be sensitised on the national and WB requirements for understanding of the expectations.



**Table 1: Comparison of The Gambia and World Bank EIA Screening Outcomes**

Classification	THE GAMBIA		WORLD BANK	
		Requirements		Requirements
Class A	Highly significant potential adverse impacts	Full EIA study	Highly significant potential adverse impacts; usually irreversible.	Full EIA study
Class B	Inadequate screening information	Provide more information to make a final classification	Less adverse and reversible with mitigation.	Management plans developed for mitigation.
Class C	Minimal or no significant impact	If minimal, a management plan or other conditions may be required	Minimal or no impact	No further requirement.
Class FI	Not applicable. Such projects are screened like any other.		Financial intermediary is involved	As for Class A or B based on screening.

## 4.5 The Institutional Framework

The following institutions are going to play important roles in the implementation of the ESMP recommendations:

### 4.5.1 Ministry of Environment, Climate Change, Water Resources, Forests, Parks and Wildlife

This is the oversight Ministry for the NEA, and it oversees implementation of the environment policies adopted by the NEMC. The Ministry is headed by the Minister who is supported by the Permanent Secretary and his staff.

The NEMC, chaired by the President of the Republic was created by NEMA, 1994, as the main policy-making body for environment and natural resources in the country, and it includes certain Cabinet Ministers as members, and others that the President may co-opt.<sup>1</sup> The Council oversees the implementation of the GEAP process under the coordination of the NEA. The Executive Director of the NEA serves as Secretary to the Council.

The Ministry's functions include policy and coordination of environment related departments, whilst the NEA is the technical implementing body for environmental management.

<sup>1</sup>The following Ministers are the NEMC members: Environment and Climate Change; Fisheries; Agriculture; Health and Social Welfare; Finance and Economic Affairs; Trade, Industry and Employment; Local Government and Lands.

#### **4.5.2 The National Environment Agency (NEA)**

The NEA is operating under the Ministry of Environment and Climate Change, Water Resources, Forests, Parks and Wildlife. It was created in 1994 and carries out the task of coordinating multi-and cross-sectoral environmental and natural resource management issues through the framework of networks and technical working groups organized along programmatic lines.

The Working Groups have a broad membership base drawn from institutions with complementary mandates for environmental and natural resource management. These include Ministries, NGOs, and the private sector operators involved in the area of environmental management. The Working Groups, including the EIA Working Group, act as a “clearing house” for the respective programme, ensuring coordination among the stakeholders. They are also a conflict resolution forum, and institutional policy harmonization platform.

In this Project, NEA is responsible for ensuring compliance with NEMA, as well as the EIA Regulations. The Agency is represented in all the regions of the country and will support the project by exercising its permitting and monitoring powers, particularly at Brikama and the Headquarters in Kanifing.

Its technical capacity is generally inadequate especially with regards to logistics that limit its monitoring and enforcement functions. Therefore, it is recommended that NEA’s capacity be enhanced in this regard.

#### **4.5.3 The Ministry of Energy (MOE)**

The MOE is the parent oversight institution of NAWEC, the beneficiary of this Project. MOE provides policy guidance for the sector through the Permanent Secretary under the guidance of the Minister. It is expected to provide overall coordination and leadership in the implementation of this Project including the role of the inter-phase between NAWEC and other stakeholders. A formal Steering Committee comprising MoE, MoFEA, NAWEC and PURA is proposed whilst NAWEC serves as the implementing agency, with a PIU formed.

#### **4.5.4 National Water and Electricity Company (NAWEC)**

NAWEC through the PIU, will be the main implementer of this Project and ESMP. It is responsible for the operation and maintenance of all the power generation facilities in the Country, the transmission and distribution of power, and collecting the electric revenue for all customer classes.

#### **4.5.6 Ministry of Finance and Economic Affairs (MOFEA)**

MoFEA plays an important role in this Project because it is responsible for financing its preliminary investigations such as feasibility and environmental assessment studies, through the IMFIS Project. The MoFEA is ensuring that environmental issues are given due consideration before the Project commences.

#### **4.5.7 The Ministry of Local Government**

This institution oversees the local government authorities in the areas where the Project will be implemented within Banjul City Council, Brikama Area Council and the Kanifing Municipality. Their participation at the grassroots level will help facilitate works of the Project by encouraging community support. The DPPH also falls under this Ministry.

#### **4.5.8 Public Utilities Regulatory Authority (PURA)**

PURA is a multi-sector regulator of utilities in The Gambia established in 2003 by the Gambia Public Utilities Authority Act of 2001. It is mandated to regulate electricity, broadcasting telecommunications, transportation, water and sewage sectors. Due to lack of capacity at present, broadcasting and transportation have not yet been addressed.

It monitors quality, issues licenses, adjusts tariff and controls competition. In addition to its main functions, PURA shall assist NAWEC in capacity building to ensure complementary components of this Project are implemented to increase profit from electricity generation, transmission and distribution.

#### **4.5.9 Communities**

The general public in Project sites, with the local knowledge and constant presence, are expected to play an oversight and maintenance role by reporting to NAWEC, NEA or other relevant authorities, any activity that may interfere with the works or during use of the infrastructure in the long-term.

In supporting communities, the Alkalos are key in influencing decisions for change and have been useful in resolving misunderstandings at local level.

## **CHAPTER 5: OUTCOME OF CONSULTATIONS AND FIELD VISITS**

### **5.1 Consultations**

Interviews were held with relevant personnel from stakeholder institutions and community heads to discuss the proposed Project, their role in its implementation, benefits, and concerns to be considered at the planning stage.

#### **5.1.1 Perceived Benefits**

Benefits of the proposed Project identified by the respondents include efficient electricity supply that shall subsequently improve value of the area, quality of life, businesses, health and education amongst others. The upgraded T and D structures shall ensure public and worker safety.

#### **5.1.2 Concerns Raised**

Questions were raised on the equitable distribution of supply through routing of lines and worries that the poor may not benefit much from such Projects.

Furthermore, occupational health and safety during the Project was highlighted in addition to the need for effective monitoring of the ESMP implementation and enforcement of other laws.

#### **5.1.3 Key Suggestions**

Suggestions include:

- Emphasis on the importance of the Project implementation and the need for quick start, rather than just stopping at studies upon studies.
- Develop standards to guide location of poles within communities and open land.
- The Health and Safety Officer at NAWEC needs training on safety at work.
- Suppliers of spare parts should provide technical support in installing parts from their company.
- Involve communities for ownership and support to the Project.

### **5.2 Field Visits**

#### **5.2.1 Main Findings: Electricity Generation**

Visits to the power plants highlighted that rehabilitation and maintenance of generators is a process that is regularly done as part of routine operations, and there is local expertise to some extent. However, provision of the expensive spare parts is challenging, leading to shutdown of generators despite the much needed supply.

Sludge oil production and management is also a major issue for consideration at all times during generator operation. There is also minimum waste from old parts as these are reused and repaired a number of times until worn out.

### **5.2.2 Main Findings: Transmission and Distribution Network**

In most areas, the T and D network is overloaded and circuits overstretched despite resulting experience of low voltage. Furthermore, as development and demand increases, the existing quality is likely to worsen.

Substandard poles are common and certain areas within the existing T and D circuits lack connection. NAWEC has already started developing plans of the areas where the T and D network will be improved.

There are no forests or sensitive areas of ecological significance that are likely to be affected within the Project areas.

## **CHAPTER 6: ASSESSMENT OF POTENTIAL IMPACTS AND MITIGATION MEASURES**

### **6.1 Evaluation of Environmental and Social Impacts**

(The Evaluation Matrix follows)

Table 2: Evaluation of Significance of Potential Environmental and Social Impacts

	PARAMETER	POTENTIAL IMPACT	POTENTIAL IMPACT SIGNIFICANCE ON SPECIFIC PROJECT PHASES AND COMPONENTS			
			DURING GENERATOR WORKS	DURING GENERATOR OPERATION	DURING T & D WORKS	DURING T & D OPERATION
P H Y S I C A L	Surface Water	Pollution from oil spills	0	-2	0	0
	Ground Water	Pollution from oil spills	0	-1	-1	0
	Air Quality / Climate	Dust and particulate matter emissions	-1	-2	-1	0
	Geology & Soils	Localised erosion; destruction of natural resources from illegal mining	0	0	-1	0
	Noise & Vibration	Increased noise pollution from engines and lines	-1	-2	-1	-1
	Landscape and Aesthetics	Waste and excess materials left on site; haphazard connection of lines	0	-1	-1	-1
B I O L O G I C A L	Fisheries & Aquatic Ecosystem	Loss of aquatic live from oil spills	0	-2	0	0
	Terrestrial Ecosystem (Birds, Wildlife etc.)	No significant potential impact	0	0	0	0
	Agriculture & Livestock	Agricultural land contaminated from oil spill	0	-1	0	0
	Forest & Vegetation	No significant potential impact	0	0	0	0
S O C I	Public Health and Safety	Accidents; poor waste management; dust and increased noise nuisance	0	0	-2	-1
	Occupational Health and Safety	Risk of poor health from particle inhalation; excessive noise; falls; fires and heavy loads etc.	-2	-2	-2	-1

O E C O N O M I C	Land Ownership / land use	No significant potential impact from displacement or relocation	0	0	-1	0
	Community Development	Development of infrastructure and	0	+2	0	+2
	Employment & Income Generation	Employment on Project related works	+2	+2	+2	+2
	Communication / Transportation	Traffic disruption; improved telecommunication	0	+2	-1	+2
	Economy	Improved economy directly and secondarily	0	+2	0	+2
	Energy	More reliable and quantity of power supply for socio-economic development	0	+2	0	+2
	Gender	Increased income of women from petty trading and employment on the Project	+2	+2	0	0
	Education	Improved education for next generations	0	+2	0	+2
	Community Stability / Vulnerable groups	Conflict resulting from choice of electricity distribution routes	0	0	0	-1
	Culture / Tourism /Archaeology	More reliable energy for tourism activities; beach pollution from spills	0	-1 / +2	0	+2

Evaluation key for the matrix

-2 High Negative Impact  
-1 Low Negative Impact  
0 No Significant Impact

+1 Low Positive Impact  
+2 High Positive Impact



## **6.2 Description of Significant Environmental and Social Impacts with Corresponding Mitigation Measures**

### **6.2.1 Potential Positive Impacts**

The Project will have positive impact as energy is the basis for all development. Residents and businesses will increase once there is efficient electricity supply. It will encourage investment in fisheries and agriculture including horticulture and husbandry, for activities such as irrigation, value addition and cold storage.

Investors in other sectors such as manufacturing, health, tourism, and education will have an added benefit of locating their businesses within the project area to save on personal electricity generation which is expensive and not sustainable.

Once the project is ready for implementation, employment will be created for construction of poles, maintenance of generators and during operation. Indirectly, employment will be generated where new business move to these areas due to reliable electricity supply. Income generation from petty trading of food by women to workers will also be realized. NAWEC is therefore, urged to use unskilled labour from the specific Project sites and women, where and when appropriate.

Likewise other sectors, education will be equally enhanced as students can work under safe lighting, use computers and other equipment such as laboratory equipment. Education offices can also work effectively with better supply of electricity.

Upgrade of the T and D network shall also ease power distribution once regional trade of electricity is possible, hence an upgraded infrastructure will already be available.

### **6.2.2 Potential Negative Impacts**

#### ***6.2.2.1 Negative Impacts on the Physical Environment and proposed mitigation***

##### **A: Negative Impacts on Surface Water**

Operation of the rehabilitated electricity generators at Kotu Power Station will increase the electricity generation capacity accompanied by obvious need for more fuel, thus, increased production of oily sludge following separation of the heavy fuel oil.

Considering the surroundings and occurrences of major sludge oil spills in the past, there is high likelihood of uncontrolled sludge and other oil spillage around the station, with tendency of oil transportation to the sea via the adjacent Kotu Stream.

Duration is usually short term and the frequency is low as the movement is usually facilitated by rainwater runoff carrying the oil during rainy season between June and October. Unfortunately, the potential extent is high due to quick mix of seawater with the sludge oil and potential spread along kilometres of the coast affecting fishing, the beach and hotel activities along the contaminated strip.

#### Mitigation

Explore the purchase of higher quality heavy fuel oil compatible to the engines that require e no, or minimal separation. If the sludge is inevitably produced, prevention of spills is essential by adequate containment, storage and collection for appropriate treatment. Staff must be given refresher training on sludge oil management including emergency response to accidental spills.

Sludge oil shall only be transported in closed systems and rainwater runoff drains separated from oil effluent.

#### B: Negative Impacts on Ground Water

There is potentially low impact on ground water if spills are not cleaned immediately, particularly where there are open wells and in wetlands with high water table. Contamination with hydrocarbons is possible.

Although most T&D line replacement shall be adjacent to the existing ones, there is a possibility of puncturing underground water pipes as there are no real-time plans indicating areas to avoid.

#### Mitigation

Accidental oil spills must be cleaned immediately to avoid seepage, and burst pipes reported in time for repairs. The surroundings of each new pole must be examined well before excavation.

#### C: Negative Impacts on Air Quality

During the rehabilitation phase of the generators, there will be release of fumes and aerosol from activities such as welding and painting of parts. These will be minimal as the proposal is to get brand new spare parts for the generators. During operation, emissions such as particulate matter will be released especially when generators have just been started.

Cleaning, excavation and transportation of earth materials may produce dust that shall be limited to T&D infrastructure installation. These effects will be short term in nature and confined to the sites.

#### Mitigation

Activities causing air pollution must be carried out in the open to avoid accumulation and encourage ease of dispersion. The new engine parts and regular maintenance shall contribute in ensuring emissions from the engines are within reasonable standards. NEA shall monitor ambient air quality.

During T&D works, materials likely to produce dust must be dispensed at strategic locations away from community activities. The public should also be advised where to temporarily move activities such as petty trading or mere social camps, when deemed necessary.

#### D: Negative Impacts on Geology and Soils

Materials for pole stabilization may come from illegal gravel/sand mines contributing to secondary negative impacts in these areas. There is also a possibility of soil disturbance in excavating for the poles that may result or contribute to soil erosion. The extent of impact from the project will be minimal on the soil as the poles can only be installed on level ground. However, impact on the poles is likely where there is wind and or water erosion.

#### Mitigation

Poles must only be fixed on stable ground. Where the topography is uneven, a proper foundation must be laid and priority given to relocation of poles to more even land for sustainability and safety. Contractors must be cautioned through the clauses in their contracts to use only certified sand/gravel suppliers that are approved by the NEA and Geological Department.

#### E: Negative Impacts from Excessive Noise Nuisance

Substantial noise pollution is expected from running of these heavy duty engines. However, as all engines are housed centrally within NAWEC premises, the nuisance is localized, though of long term duration. Less significant noise pollution will be produced by machinery during installation of the poles.

In the T&D network, there is potential for increased noise nuisance from conductors under certain conditions like humid weather and bear cables that may cause alarm to the public. It is usually more evident in high voltage lines which have adequate clearance from the ground and public facilities.

#### Mitigation

Generators in the existing stations at Kotu and Brikama are presently being operated with limited nuisance being felt from the offices within the power station. Control towers are well enclosed and the sound insulated, therefore, where new unrelated activities are planned, these must be away from the generators. Appropriate noise reduction means must be included with regular maintenance for proper operations.

#### F: Negative Impacts on Landscape

There will be no landscape impact from generators as they already exist in buildings located within the stations.

For the T&D, there may be minimal impact on landscape where the balance of construction materials and waste are not collected. In some congested areas, distribution lines are too many or interwoven, thus, not pleasing to the eye. When the infrastructure is not in use anymore for whatever reason, they must be safely decommissioned or cleared and not left on site.

### Mitigation

All excess materials and waste produced in the process must be collected and the land returned to its original state. NAWEC surveyors must also be constantly supervised to ensure that most efficient connections are made with less crisscrossing of lines.

### **6.2.2.2 Negative Impacts on the Biological Environment**

#### A: Negative Impacts on Aquatic and Terrestrial Ecosystems

During oil spills that extend to the sea, fish, crab, frogs, snails and other fauna are likely victims. Although the Project does not encroach on huge agricultural fields, there is subsistence rice farming round the vicinity of Kotu Power Station that may be affected during spills.

### Mitigation

To prevent sludge oils spills as earlier discussed and rapid response in case of incidents.

#### B: No Significant Impact on Forests and Vegetation

The Project sites are within existing communities and there are no anticipated significant impacts on biodiversity. The Kabafita Forest in Brikama extends to lands opposite the Brikama Power station with a road separating them, likewise Brikama Medina substation that already exists and there is no need to trespass on the Nyambai Forest across the road. No vegetation will be removed for the project except pruning of trees that grow around the lines, and trimming for new line extensions within the communities. Miles 2 and 5 substations are in the Tanbi Wetland Complex but as earlier discussed, there are no anticipated significant impacts from capacitor bank replacement activities alone.

### Mitigation

Workers must only use the existing access to the site and all packaging materials collected for reuse as always practiced.

### **6.2.2.3 Negative Impacts on the Socio-economic Environment**

#### A: Negative Impacts on Public Health

Generator rehabilitation activities are within existing NAWEC facilities with controlled access to the public, therefore, impact in public health and safety is insignificant.

During T&D works within the communities, residents, children and bystanders are at risk of accidents from the equipment, vehicles and improperly placed or stored materials. Waste left on site can also be a health and safety hazard to the community. Risk of fires and electrocution during operation of the T&D will be low from the new insulated cables. However, during operation of substations, fire precautions and fighting equipment must be considered.

### Mitigation

It is essential to clear all sites after the fixing of poles and the old ones recycled (concrete may be turned to rubble for construction and filling of potholes whilst metal sold as scrap for further processing) Wooden poles treated with salt can be used as fuel wood whilst others treated with hazardous chemicals be disposed at approved dumpsites. Access to the sites must also be restricted during working hours so as to avoid accidents and theft incidents. Activities must be coordinated well to prevent accidental destruction of property through falling poles or invasion by equipment and machinery. Safety signs and symbols will be used at strategic locations.

### B: Negative Impacts on Health of Workers

There is high risk of health and safety to workers during all phases of the project. Hazards include fumes, fire, working at heights, working with heavy equipment and parts, excessive noise and slippery surfaces amongst others.

All NAWEC staff and those to be employed by contractors for the project must be informed of the associated risks and hazards; Use of personal protective equipment and reporting of accidents is essential for the review and improvement of safety guidelines. Training on the job for safe operations is also important in safety management.

NAWEC, through the Senior Environmental Officer, Fire Safety Officer and Health and Safety Officer shall ensure a safe work environment such as cleaning slippery oily surfaces, provisions of first aid kits and how to use them.

Access around, and within power plants must be improved for ease of movement in emergencies. NAWEC must also plan and limit construction and other items around generators and substations. Fire protection and fighting equipment, which are available for use in case of emergencies, must be maintained.

### C: Negative Impacts on Land Use and Land Ownership

All T&D installations are planned to be on public right of way, however, in less built areas with limited availability of master plans, poles may be unknowingly placed at locations that encroach on private land which have not been fenced.

### Mitigation

The negative impact is very low as the areas are already known and where required, especially with lack of space for safe location, land owners or users will be contacted for consent. Surveyors must learn to choose slightly different locations on a one to one basis based on the conditions at the site.

A reported example in Brikama is where a mosque had voltage too low to run fans. The councillor talked to residents nearest to the source and their domestic service pole was moved outside the compound to connect the mosque. Based on the type of activity, request for transfer of poles is usually addressed by NAWEC without problems.

#### D: Negative Impacts on Community Stability

Community instability and conflict may arise where the poor or marginalized groups are not considered as part of the project. Community heads have reported how access to electricity is given to the rich who can afford the service whilst the poor suffer.

#### Mitigation

The project has identified the sites based on the most critical with regards to overloading and evidence of transmission losses. Surveyors must continue to ensure lines are not proposed based on social status.

#### E: Impact on Tourism

Oil spill may impact on tourism around Kotu as earlier discussed, notwithstanding, tourism and cultural programmes stand to benefit from efficient electricity supply for running their activities. There are no known sites of archaeological significance within the Project area.

#### Mitigation

Accidental spills to be prevented and contained before reaching the beach.

#### F: Impact on Communication and Transportation

Provision of adequate electricity will increase telecommunication efficiency for running daily activities, however, low temporal impact will be felt from road traffic interruption during the process of fixing poles.

#### Mitigation

Ensure diversions are created and reopened once works are done, and avoid infrastructure of other services such as telephone lines.

## CHAPTER 7: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

### 7.1 Matrix on Mitigation of Impacts related to Rehabilitation and Maintenance of Electricity Generators

Table 3: Potential Impacts and Corresponding Mitigation Measures for the Electricity Generation Facilities

Activity	Potential Negative Impacts	Mitigation Measures	Responsibility for mitigation	Responsibility for monitoring	Timeframe	Budget (\$US)
<b>REHABILITATION AND MAINTENANCE OF GENERATORS</b>						
Transportation of equipment, machinery and generator parts.	Accidents from movement of heavy machines and parts.	Use only road worthy vehicles and experienced drivers.	Contractors	NAWEC	Upon arrival of spare parts.	Not applicable as incorporated in contract sum
	Traffic disruption by slow moving vehicles.	Avoid rush hours and busy routes for safer and freer traffic flow.				
Replacement of obsolete generator components such as pumps, oil separator, switch gear, lubricants etc.	Employee affected by musculoskeletal problems.	<ul style="list-style-type: none"> <li>Provide mechanical equipment such as cranes, forklift trucks etc. to move heavy loads.</li> </ul>	Contractors	NAWEC	During rehabilitation and maintenance works	Not applicable as incorporated in contract sum
	Public health and aesthetic effects from improper waste disposal.	<ul style="list-style-type: none"> <li>Store waste away from public access for final disposal at approved dumpsites.</li> <li>Sell scrap materials and oil for recycling.</li> </ul>	Contractors and NAWEC engineers Maintenance staff	NAWEC Senior Environment Officer (SEO) and NEA	During works	10,000.00
	PCB contamination	<ul style="list-style-type: none"> <li>Import only PCB free equipment.</li> <li>Confirm that all existing equipment are PCB free as reported.</li> </ul>	NAWEC PIU / Procurement Officers	NAWEC Monitoring and Evaluation Team; NEA	During procurement of parts	Not applicable
Maintenance activities such as welding, painting, oil and changing /	Air pollution.	<ul style="list-style-type: none"> <li>Create adequate ventilation where fumes are expected or in open space for efficient dispersion.</li> </ul>	Maintenance supervisor	NEA in collaboration with NAWEC SEO.	Daily, during works	Not applicable

repair of other parts.	Risk of poor health of workers.	<ul style="list-style-type: none"> <li>• Provide adequate safety information, training and personal protection equipment such as safety boots, hats, ear protectors and goggles.</li> <li>• Collect all hydrocarbons from generation sites to prevent slippery surfaces.</li> <li>• Allow frequent staff breaks to improve concentration and prevent human errors, particularly working above eye level, with small parts or repetitively.</li> </ul>	Maintenance staff	Contractor NAWEC Health & Safety Officer NEA	Daily, during works	5,000.00 for NAWEC.  Contractor to provide own PPE as part of agreement.
All maintenance and rehabilitation activities.	Lack of employment and related effects on development.	<ul style="list-style-type: none"> <li>•Employ Gambian engineers where the expertise is available as there are existing workers on routine maintenance.</li> <li>•Women shall be given priority where they are available</li> </ul>	Contractors, NAWEC	PIU	Before commencement of works	Not applicable
<b>OPERATION OF GENERATORS</b>						
Fuel / sludge oil handling and storage.	Land and water contamination from oil spills affecting agriculture and tourism etc.	<ul style="list-style-type: none"> <li>•Explore the use high quality fuel to reduce sludge.</li> <li>•Ensure timely collection of sludge oil by the treatment company.</li> <li>•Separate and contain oily drains from rain water drains.</li> <li>•Review and provide resources for spill risk reduction and response plan.</li> </ul>	Procurement Officer  PIU  SEO	NEA	During long-term operation.  Assess drainage system at start of Project for cleanup and drain separations.	40,000.00



Generator operation	Emissions of air pollutants.	<ul style="list-style-type: none"> <li>•Regular maintenance and routine servicing of generators.</li> <li>•Use high quality fuel.</li> </ul>	NAWEC Generation Director	SEO NEA	Long-term during operation	From separate long term budget beyond scope of this Project
	Increased noise and Vibration nuisance.	<ul style="list-style-type: none"> <li>•Provide ear protectors</li> <li>•Use silencers and sound insulators where applicable.</li> <li>•Regular maintenance of generators.</li> <li>•Do not overload generators</li> </ul>	NAWEC Health & Safety Officer  Generator operators	Contractor NEA NAWEC  Generation Director	Daily, during works	2,000.00 for NAWEC.
	Risk of poor health of workers.	<ul style="list-style-type: none"> <li>• Provide adequate safety, and fire prevention information, training and personal protection equipment.</li> <li>• Staff monitoring the engines to use control rooms and not sit by generators.</li> <li>• Maintain adequate fire fighting resources such as smoke alarms, extinguishers and hydrants</li> <li>• Finalize fire safety plan to include drills</li> <li>• Limit hazards at work environments through evaluation of critical control points.</li> <li>• Allow controlled buffer between power stations and property.</li> <li>• Ensure there is free access around and within stations for movement during emergencies such as fires.</li> </ul>	NAWEC Health & Safety Officer	Contractor NAWEC Generation Director NEA	Daily during works	2,000.00 for NAWEC.

	Effects on land, water, fauna, and public health from improper waste management.	<ul style="list-style-type: none"> <li>Liquid and solid waste from routine operation be separated, collected and stored for disposal or treatment at approved sites.</li> </ul>	<ul style="list-style-type: none"> <li>Operators</li> </ul>	SEO NEA	During long term operation	Should be part of NAWEC's operational budget
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## 7.2 Matrix on Mitigation of Impacts related to the Upgrade of the Transmission and Distribution Network

Table 4: Potential Impacts and Corresponding Mitigation Measures for the Transmission and Distribution Facilities

Activity	Potential Negative Impacts	Mitigation Measures	Responsibility for Mitigation	Responsibility for Monitoring	Timeframe	Budget (\$us)
<b>WORKS ON THE TRANSMISSION AND DISTRIBUTION FACILITIES</b>						
Pole erection.	Ground water contamination from punctured underground water pipes during excavation.	<ul style="list-style-type: none"> <li>•Inspect sites before works.</li> <li>•Immediately report incidents for repairs.</li> </ul>	Contractor	NAWEC Planning and T&D Officers	During construction and replacement of T and D infrastructure.	Not applicable to all.
	Illegal sourcing of sand and gravel for pole erection.	<ul style="list-style-type: none"> <li>•All mining companies providing sand and gravel for pole erection must be approved by the NEA and Geological Department.</li> <li>•As conditioned in their approvals, such companies must only mine at approved Government quarries.</li> </ul>	NAWEC	NEA in collaboration with Geological Department		
	Destruction of telecommunication lines along	<ul style="list-style-type: none"> <li>•Avoid removal of other service lines.</li> </ul>	Contractor	NAWEC Planning and T&D Officers		
	Erosion or change in landscape around poles.	<ul style="list-style-type: none"> <li>•Sites around new poles must be immediately levelled and cleared of excess materials and old poles for the appropriate management.(reuse/recycle/disposed at approved sites)</li> </ul>	Contractor	NAWEC Planning and T&D Officers		
	Removal of vegetation.	<ul style="list-style-type: none"> <li>• Trees along the routes shall only be trimmed for safe line alignment.</li> </ul>	Contractor	NAWEC Planning and T&D Officers		

	Use of property that is not state owned.	<ul style="list-style-type: none"> <li>• Choose alternative locations.</li> <li>• Seek approval from owners as such development activities are welcome.</li> </ul>	NAWEC Planning Officers	Planning Manager		
Fixing of lines.	Aesthetically unpleasing	<ul style="list-style-type: none"> <li>• Avoid criss-cross of cables unnecessarily.</li> </ul>	NAWEC Planning Officers	Planning and T&D Managers		
	Traffic hazards from pole location	<ul style="list-style-type: none"> <li>• Erect double poles for transformers parallel to walls where applicable.</li> <li>• Avoid fixing poles that affect access to roads.</li> <li>• Develop standards for routes.</li> </ul>	Contractors, NAWEC Planning Officers	Planning and T&D Managers		
All works on T & D network.	Lack of employment.	<ul style="list-style-type: none"> <li>•Employ Gambian and locals, particularly for unskilled labour.</li> <li>•Women shall also be given priority in employment.</li> </ul>	Contractors, NAWEC	PIU		
	Risk of poor health of workers during works especially from falls and electrocution.	<ul style="list-style-type: none"> <li>• Provide training, risk information, and appropriate machinery.</li> <li>• Develop and use standard operating procedures to avoid electrocution.</li> </ul>	Contractors  T & D Manager	SEO		
	Risks to public health	<ul style="list-style-type: none"> <li>• Inform affected locals prior to carrying out dusty activities.</li> <li>•Clear all waste and excess materials immediately after pole erection.</li> </ul>	Contractors	Health and safety Officer		
<b>OPERATION OF TRANSMISSION AND DISTRIBUTION NETWORK</b>						
T & D network Operation	Increased noise nuisance from lines.	<ul style="list-style-type: none"> <li>•Replace bare cables with insulated ones.</li> <li>•Routes of high voltage lines shall be aimed away from residences.</li> <li>•Regular maintenance.</li> </ul>	T & D Electrical Engineers to coordinate these activities.	T & D Manager	During long term operation of the network	Not applicable

		<ul style="list-style-type: none"> <li>•Avoid overloading.</li> </ul>				
	Risks to public health.	<ul style="list-style-type: none"> <li>•Regular maintenance of lines to avoid sparks.</li> <li>•Routine pruning of trees particularly before rainy seasons.</li> <li>•Prevent public access to transformers and substations.</li> <li>•Removal of disused poles and cables from communities.</li> <li>•Allow buffer between substations / transformers / high voltage lines and property.</li> </ul>	T & D Electrical Engineers to coordinate these activities.	T & D Manager		15,000.00
	Community instability.	<ul style="list-style-type: none"> <li>•Ensure fair distribution of electricity irrespective of economic or political status.</li> </ul>	Planning officers	Planning Manager; T & D Manager, PIU	At inception during surveys and mapping of proposed site	Not applicable
<b>TOTAL</b>						<b>74,000.00</b>

## CHAPTER 8: ESMP IMPLEMENTATION ARRANGEMENTS

### 8.1 Roles and Responsibilities of Stakeholders

NAWEC, through the Project Implementaion Unit (PIU) is responsible for the overall implementation of the Project and its ESMP. The Senior Environment Officer will ensure the respective roles of each stakeholder are carried out on time. NAWEC must ensure contractors are aware of their implementation responsibilities through the contracts.

The MOE and PURA, with their oversight responsibilities, shall liaise with NAWEC, housing the PIU, to ensure the Project is in line with legal requirements.

According to Section 31 of the EIA Regulations, 2014, the NEA shall monitor routinely to guide and audit the progress of the ESMP implementation to ensure compliance

### 8.2 Institutional Training and Sensitization

During the study, constraints that may affect the implementation of the ESMP were identified including logistics and human capacity for implementation and monitoring. Therefore, a programme of environmental management training and institutional capacity enhancement is recommended for effective implementation.

The PIU shall collaborate with the NEA for the required specialists to deliver a range of technical training on environmental and social management issues to the target groups to ensure implementers and monitors understand their roles and expectations of the ESMP to ensure a sustainable Project.

**Table 5: Proposed Training and Sensitisation**

<b>Target group</b>	<b>Training / sensitisation</b>	<b>Duration, Time and Frequency</b>	<b>Provider</b>	<b>Budget (US\$)</b>
Relevant workers including:  NEA Inspectors	<ul style="list-style-type: none"><li>• Introduction to the Project components and activities.</li><li>• Project implementation arrangements.</li><li>• Relevant environmental laws and policies including WB safeguard OP 4.01</li></ul>	A one day workshop before start of the Project.	Organised by the PIU and expertise provided by Senior technical officers from NEA	6,000.00

PIU monitoring and evaluation Officers	<ul style="list-style-type: none"> <li>• Importance and implementation of the ESMP.</li> <li>• Monitoring and reporting requirements.</li> <li>• Public information requirements.</li> </ul>		and NAWEC, including NAWEC's Training Centre.	
NAWEC planners and surveyors	<ul style="list-style-type: none"> <li>• Project benefits and potential negative impacts.</li> <li>• Guidance on all mitigation measures and good practice.</li> </ul>			
Contractors	<ul style="list-style-type: none"> <li>• Related community development issues for socio-economic improvement.</li> <li>• The need to collaborate with partners.</li> </ul>			
NEA EIA Officer, NAWEC SEO and Head of Project M&E Unit	<ul style="list-style-type: none"> <li>• Sludge management</li> </ul>	At start of Project	Study tour to best practice facility in West Africa	23,500.00 (travel, lodging, allowances)
NAWEC Health and Safety Officer	<ul style="list-style-type: none"> <li>• Occupational Health and Safety</li> </ul>	At start of Project	University of The Gambia	3,000.00
General Public	<ul style="list-style-type: none"> <li>• Project information</li> <li>• Cooperation with Project workers</li> </ul>	During existing NAWEC awareness programmes on the radio.	NAWEC	5,000,00
<b>TOTAL</b>				<b><u>38,500.00</u></b>

## CHAPTER 9: ENVIRONMENTAL COMPLIANCE MONITORING

### 9.1 Monitoring of the ESMP

Monitoring of the ESMP implementation is essential in ensuring the project is environmentally sound, by checking that the recommended mitigation measures have been carried out effectively in a timely manner. Monitoring also helps in evaluating whether the measures recommended are adequate in preventing, reducing or compensating the identified negative impacts. Efficiency of those responsible for the ESMP implementation and the proposed structures should also be reviewed and the necessary changes made accordingly.

The main issues to be monitored include activities that have been earlier identified to have potential significant negative impacts on environmental and socio-economic parameters, and corresponding mitigation. Monitoring and evaluation of the ESMP will be mainstreamed in the general monitoring system of the Project at various levels.

The Senior Environment Officer and Health and Safety Officers at NAWEC shall monitor the overall ESMP implementation whilst they will in turn be monitored by the NEA Environmental Inspectors and EIA Programme Officers. Notwithstanding, the joint screening visit of the EIA Working Group and training workshop before Project commencement shall ensure consistency in understanding roles and responsibilities.

It is the responsibility of the Project Monitoring and Evaluation Officer to ensure that all involved stakeholders are facilitated as requested to monitor the ESMP implementation.

**Table 6: ESMP Monitoring Programme including Budget**

Institution	Monitoring activity	Timeline	Recommended frequency	Requirements	Proposed budget (\$US)
NEA	Field visits by Environmental Inspectors to monitor implementation of the ESMP.	<ul style="list-style-type: none"> <li>• Whole duration of the Project.</li> <li>• During long term operation.</li> </ul>	Monthly visits to sites based on timing of the activity.	<ul style="list-style-type: none"> <li>• Fuel, communication, map and report preparations.</li> <li>• Air quality testing kits.</li> </ul>	<ul style="list-style-type: none"> <li>• 15,000.00 (8mths)</li> <li>• 15,000.00</li> <li>• From NEA's operational budget.</li> </ul>
NAWEC	Monitoring and evaluation personnel of the PIU / SEO at NAWEC to monitor ESMP measures to be implemented by NAWEC staff and Contractors.	<ul style="list-style-type: none"> <li>• Whole duration of the project.</li> <li>• During long term operation.</li> </ul>	At least weekly visits to Project sites after commencement.	Logistics for field visits and reporting	<ul style="list-style-type: none"> <li>• 35,000.00</li> <li>• From NAWEC's operational budget.</li> </ul>
				<b>TOTAL</b>	<b>65,000.00</b>



## 9.2 Reporting

Effective communication between and amongst the NEA and NAWEC (PIU) is essential. Monthly reporting of monitoring and evaluation results is recommended from NAWEC to NEA.

The NEA shall evaluate the reports and facilitate immediate improvement, where necessary, considering the short duration of the Project.

## 9.3: Environmental Auditing

Part VI of the EIA Regulation, 2014, make provisions for self-audit and audit by the NEA to ensure the ESMP is implemented as planned and identify potential impacts that have arisen due to any change in activity. It is a systemic review of the activities compared to the ESMP.

It is recommended that an independent environmental auditor be contracted to undertake a midterm performance review to prevent bias in reporting and recommend any necessary corrective measures on time. The audit shall include review of the ESMP implementation, recommended monitoring and reporting at all levels.

## 9.4 Cost estimation for Implementation of the ESMP

To ensure that the mitigation measures in the ESMP are fully implemented, training and sensitisation on the issues are essential in addition to constant monitoring. Therefore, as earlier estimated in the various sections required funding, the budget proposed for the ESMP of the Proposed NAWEC Electricity Rehabilitation Project is \$ 183,500.00.

It was highlighted that a Memorandum of Understanding be signed between the NEA and NAWEC to ensure the approved implementation budget is available for use when needed, such as for monitoring and capacity enhancement.

**Table 7: Total ESMP Implementation Budget**

<b>ITEM</b>	<b>BUDGET (\$US)</b>
Implementation of mitigation measures	74,000.00
ESMP Monitoring	65,000.00
Institutional Capacity Enhancement	38,500.00
Independent Environmental Auditing	6,000.00
<b>TOTAL</b>	<b>183,500.00</b>

## **CHAPTER 10: CONCLUSIONS AND RECOMMENDATIONS**

### **10.1: Conclusions**

Analyses of the consultations indicate that NAWEC places high importance to the Project in order to prevent unnecessary losses, contribute to meeting electricity demand and improvement of infrastructure for safe running and maintenance. Beneficiaries have also emphasized their need for the Project and appeal for quick implementation.

The study has further identified the likely positive and negative environmental and social impacts of the Project with most significant adverse impacts related to effects of potential hydrocarbon spill, and health and safety of workers. Reasonable mitigation measures, that can be easily applied, have been identified to address the major impacts and others with relatively low significance to avoid cumulative effects.

Most of the Project sites and facilities are existing, thus, there will be no change in land use, no activity out of scale or nature with its surrounding. Therefore, it is concluded that the proposed NAWEC Electricity Project can be executed in an environmentally sound manner on full implementation of the ESMP.

### **10.2: Recommendations**

The ESMP highlights the following recommendations for effective implementation:

- Policy and decision makers from all relevant institutions must be sensitised on the Project ESMP before the Project activities commence to ensure their roles are understood and concerns have been addressed.
- Irrespective of the proposed workshop, training and sensitisation must be continuously integrated in the daily activities of the Project.
- A formal Steering Committee comprising MoE, MoFEA, NAWEC and PURA is proposed whilst NAWEC serves as the implementing agency with a PIU formed.
- NAWEC monitoring and evaluation officers and the Senior Environment Officer must be clearly assigned the responsibility of ESMP monitoring as there is a tendency to keep focus on technical work progress alone.
- The cost of ESMP implementation must be incorporated in the main Project budget to ensure availability of resources when needed.
- NAWEC to sign a Memorandum of Understanding with NEA in ensuring full ESMP implementation and compliance.
- The Health and Safety Officer at NAWEC needs training on safety at work.
- It is important that all contracts must include clauses on responsibility for environmental and social protection including implementation of ESMP applicable to contractors and their workers.

- Suppliers of earth materials such as sand and gravel must be certified by the NEA and Geological Department to mine, and only Government approved quarries shall be used.
- Recruitment for this Project during all phases must give priority to qualified women considering the high percentage of men already expected to participate.
- An independent environmental audit shall be carried out mid-term of Project implementation.
- The NEA must aim to finalize and adopt the Waste Bill, 2007, to cover specific requirements for waste management of all types including sludge oil.
- To develop standards to guide location of poles within communities and open land.
- Suppliers of spare parts should provide technical support in installing parts from their company.
- Review the current practice of collecting, storing, transporting, recycling or converting the sludge and other wastes generated at the Kotu Power Station with a view to making the practice more environmentally friendly.
- Develop the relevant policies and laws to regulate the industry in line with the country's international obligations.
- Develop a sector-wide internal environmental policy for NAWEC whose implementation will be the responsibility of the in-house Senior Environmental Officer.
- The NEA needs to call NEMC meetings regularly to give update on the current developments and challenges; to give the NEA focus and direction and the necessary political support to enhance the environment.

## CHAPTER 11: BIBLIOGRAPHY

### 11.0: Bibliography

ECOWAS Renewable Energy Facility, *Electricity Transmission Losses Reduction in the City of Brikama*, Project Progress Report May 2013

Fichtner Management Consulting, *Energy Strategy Study: Technical Assessment on Power Generation in The Gambia*. November 2014

Government of The Gambia, *EIA Regulations, 2014*

Government of The Gambia, *Local Government Act, 2002*

Government of The Gambia, *National Environment Management Act, 1994*

Government of The Gambia, *Public Health Act, 1990*

Government of The Gambia, *The Women's Act, 2010*

National Planning Commission, *Final Report of the Mid-term review of Poverty Reduction Strategy Paper (PRSP II) 2007 – 2011*, March 2010

National Women's Bureau *The Gambia National Gender and Women Empowerment Policy: (2010-2020)*, 2009.

NAWEC, *Environmental Management System for Kotu 2003-2004*, June 2003.

NEA, *EIA Guidelines*, 1999

NEA, *EIA Procedures*, 1999

NEA, *State of the Environment Report: The Gambia*, 1997

NEA, *The Gambia Environmental Education and Communication Strategy*, 2011.

World Bank, *World Bank Boosts Energy Supply to Support Regional Trade and Integration in West African Countries*. <http://worldbank.org/en/news/press-release/2015/04/29/world-bank-energy-supply-reg...>

World Bank, *Operational Manual and Procedures on Environmental Assessment Management*, BP 4.01, 1999

World Bank, *Operational Manual Operational Policies OP 4.01 Environmental Assessment*, 1999

**CHAPTER 12: ANNEXES**

## Annex 12.1: Consultations and Field Visits

Table 8: Summary of Consultations and Field Visits by the Consultant

DATE	INSTITUTION / SITE	NAME OF INTERVIEWEE	DESIGNATION	ISSUES DISCUSSED
20.5.15	NAWEC	Demba Jallow	Corporate Planning Manager / PIU	<ul style="list-style-type: none"> <li>• Scope of proposed Project.</li> <li>• Necessary support documents, policies; concept notes; background studies.</li> <li>• Liaison between NAWEC / IFMIS / WB</li> <li>• Contact persons at NAWEC</li> <li>• Urgency of the Project and ESMP</li> </ul>
21.5.15	NAWEC	Alhaji A. S. Diallo	SEO	<ul style="list-style-type: none"> <li>• Discussed issues around Generator 7 that is currently under major overhaul to understand expectations of similar activities by the Project.</li> <li>• Weekly solid waste collection by private company</li> <li>• Responsibilities as SEO.</li> <li>• Need to work closely with NAWEC's Health &amp; Safety and Fire Safety Officers.</li> <li>• NEA environmental monitoring does not happen.</li> <li>• No use of environmental management programme.</li> </ul>
21.5.15	NAWEC	Sainey Sanyang	Fire Safety Officer	<ul style="list-style-type: none"> <li>• Management more concerned about health, safety and environment than before.</li> <li>• Adequate and reserve fire equipment such as smoke alarms, extinguishers and hydrants that are periodically maintained.</li> <li>• Consistent fire safety and prevention training.</li> <li>• Working on fire safety plan.</li> <li>• Personal protective gear must be provided and used accordingly by staff.</li> <li>• Suggests training of Health &amp; Safety Officer for better management.</li> </ul>

26.5.15	NEA	Malick Bah	Senior Programme Officer, EIA	<ul style="list-style-type: none"> <li>Proposed Project description.</li> <li>EIA requirements and possible classification.</li> <li>Confirm application procedures and fees for Environmental Approval.</li> <li>Screening visits by sub- EIA Working Group.</li> <li>Environmental status of the identified private company collecting sludge oil from NAWEC.</li> </ul>
3.6.15	NAWEC	Edrissa Jarjue	T & D Manager	<ul style="list-style-type: none"> <li>Identification of T &amp; D Project sites based on budget and most critical areas or poor voltage.</li> <li>Working on establishing transformer maintenance workshop at NAWEC Fajara Booster Station.</li> </ul>
3.6.15	PURA	Momodou Sompou Ceesay Matarr Touray Musa Njie	Water & Electricity Director Economist Water Manager	<ul style="list-style-type: none"> <li>About PURA, duties and responsibilities.</li> <li>Role in this Project implementation, Component 3 on capacity building.</li> <li>Concerns on health and safety at work.</li> <li>Concerns on enforcement and monitoring for environmental sustainability.</li> <li>Clarify use of the terms ‘transformers’ and ‘substations’.</li> </ul>
3.6.15	NAWEC	Alhaji Salifu Cham	Electricity Planning Manager	<ul style="list-style-type: none"> <li>Minimal environmental concern apart from trimming of trees along T &amp; D routes.</li> <li>No master plan used, specific area plans drawn as required.</li> <li>Provide maps and clarify T &amp; D routes.</li> <li>Community heads always contacted when routing new T &amp; D infrastructure.</li> </ul>
4.6.15	Department of Physical Planning and Housing (DPPH)	Ansu Fatty	Physical Planning Officer, West Coast Region	<ul style="list-style-type: none"> <li>Apart from the general Development Regulations of 1995, there are no guidelines on locating T &amp; D infrastructure.</li> <li>DPPH is a member of the Road Reserve Committee under the National Roads Authority.</li> <li>NAWEC planning officers used to work with them in new route layouts but not anymore.</li> <li>Suggest clearance where high voltage lines cross property such as large orchards.</li> </ul>



6.6.15	Brikama Dara Hydaro	Abdoulie Jarju	Alkalo	<ul style="list-style-type: none"> <li>• Brikama Power Plant nearby yet limited electricity supply and distribution.</li> <li>• Only the rich have the means of getting their own service lines connected.</li> <li>• Proposed project welcomed by the Community.</li> </ul>
6.6.15	Brikama Santa Su	Kebba Colley	Alkalo	<ul style="list-style-type: none"> <li>• Electricity available but not well developed.</li> <li>• The poor are sometimes lucky to get supply if others along the route can afford to get connected.</li> </ul>
6.6.15	Brikama Town Suma Kunda	Ansumana Njie	Alkalo	<ul style="list-style-type: none"> <li>• Good initiative by NAWEC.</li> <li>• His community shall be informed.</li> <li>• Disused cable abandoned by NAWEC in compound, and afraid of disposing it hence it is Government's property.</li> </ul>
6.6.15	Brikama Town	Nyambai Ward Councillor	Pa Amadou Manneh	<ul style="list-style-type: none"> <li>• Proposed Project is timely as they experience low voltage in the area despite connections.</li> <li>• Description of Brikama divisions in wards and kabilos plus Ward and Village Development Committees.</li> <li>• Communities supportive of development such as this as other sectors shall benefit such as water supply, health, industry and education.</li> <li>• Youth and women helpful in society and understand environmental issues with periodic cleaning exercises.</li> <li>• Will communicate the proposal to the community to collaborate with Project staff as required.</li> </ul>
9.6.15	Ministry of Energy	Baboucarr Bittaye	Energy Officer	<ul style="list-style-type: none"> <li>• Energy policies and regulatory framework.</li> </ul>
9.6.15	Gambia National Petroleum Company	Madun Sanyang (telephone interview)	Financial Director	<ul style="list-style-type: none"> <li>• Quality of fuel to reduce sludge oil.</li> <li>• Supply based of specifications provided.</li> <li>• Tankers transferring HFO from the depot to NAWEC stations are assessed for road worthiness and tank quality, with reports of recent rejections to avoid accidents.</li> </ul>

DATE	PROJECT SITE	PARTICIPANTS	DESIGNATION	ISSUES DISCUSSED / OBSERVATIONS
21.5.15	Brikama Medina substation, Brikama I Power Plant, Brikama Town T&D, Kotu Power Plant	Demba Jallow Alhajie A.S.Diallo Edrissa Jarjue Fatou Faal Manuel M. Sanchez  Plus others specific to the sites below.	Corporate Planning NAWEC SEO, NAWEC T&D Manager, NAWEC WB Social Specialist WB Power Engineer	<ul style="list-style-type: none"> <li>• Mainly scope and components of proposed Project</li> </ul>
	Brikama Town	As above	As above	<ul style="list-style-type: none"> <li>• Electricity available but poor quality due to weak T&amp;D network.</li> <li>• Poles old, substandard and overloaded.</li> <li>• Cables changed to twisted, safer insulated lines.</li> <li>• Central pole-mounted transformer to break and distribute load.</li> <li>• Assess any need for relocation, resettlement.</li> <li>• Poles shall be adjacent to existing ones to avoid disturbance.</li> </ul>
	Brikama Medina	George Sambou	Substation Manager	<ul style="list-style-type: none"> <li>• Replace transformer from 5 to 10 MVA to due to increased demand.</li> <li>• Existing condition is functional and shall be stored as standby or used elsewhere.</li> <li>• Site existing and no need to interfere with the adjacent Nyambia Forest.</li> </ul>
	Brikama Power Station	Alan Monroe	Station Generation Manager	<ul style="list-style-type: none"> <li>• Sludge oil collected by private company or infrequently incinerated on site.</li> <li>• Four separators at site with two used at a time for five generators.</li> <li>• Waste spare parts minimal due to reconditioning or transfer of parts to other generators.</li> <li>• No specific officer for environment, health and</li> </ul>

				<p>safety but supervised by Manager.</p> <ul style="list-style-type: none"> <li>Control room fully functional to monitor operations.</li> </ul>
	Kotu Power Station	Baboucarr Faal	Power Generation Director	<ul style="list-style-type: none"> <li>Description of all proposed works at Kotu and Brikama.</li> <li>Visit to the main switch gear, control rooms and generators.</li> <li>Suggests that the company supplying parts shall install them with support from local staff experienced in this area.</li> <li>Position of steam system not practical to work by gravity.</li> </ul>
3.6.16	Brikama Town (Galillee ) T & D	Benedict Jarju Ebrima Bah	Electrical Engineer T &D Electrical Engineer T &D	<ul style="list-style-type: none"> <li>Evidence of cable overloading.</li> <li>Substandard poles.</li> <li>Replaced lines to be sold as scrap.</li> <li>Planned use of insulated cables for safety and durability.</li> <li>Wooden poles destroyed by termite infestations.</li> </ul>
	Brikama Dara Hydar T & D			<ul style="list-style-type: none"> <li>New network extension structures from recent Venezuelan Project.</li> <li>This Project to continue on areas not treated.</li> </ul>
	Brikama Town T & D			<ul style="list-style-type: none"> <li>Best practice is not to overstretch lines beyond 1km from transformer although impossible with current demand.</li> <li>Pole mounted transformer nest to praying ground may be placed parallel to the fence.</li> </ul>
	Brikama College T & D			<ul style="list-style-type: none"> <li>Transformer currently underutilised, therefore, to be replaced by smaller capacity, and transferred at more strategic location to serve other areas.</li> </ul>
	Old Yundum T & D			<ul style="list-style-type: none"> <li>Area developing fast with increasing demand.</li> <li>Supply overstretched from Busumbala.</li> </ul>
	Busumbala T & D			<ul style="list-style-type: none"> <li>Existing new structures from similar Project, however, residential development has outgrown the network with various overstretched circuits.</li> </ul>

	Farato T &D			<ul style="list-style-type: none"> <li>• Lack of T &amp; D facility in relatively new communes.</li> <li>• Existing capacity to be redistributed with installation of new transformer.</li> <li>• Replace old poles and link existing circuits.</li> <li>• Area not vegetated and partially built up.</li> </ul>
	Wellingara T& D; Substation			<ul style="list-style-type: none"> <li>• Wooden poles need changing.</li> <li>• Electricity circuits overloaded.</li> <li>• Reports of high energy losses in this area.</li> </ul>
9.6.15	NAWEC Bijilo SubStation	Kawsu Touray Khaddy Saidy	Substation operators	<ul style="list-style-type: none"> <li>• Capacitor bank looks reasonably new but not functional.</li> <li>• Need to disconnect underground cables connected to capacitor bank before removal.</li> <li>• Use of manual winder on transformer to adjust voltage fluctuations as the automatic system is non functional.</li> </ul>

**Annex 12.2: Maps**

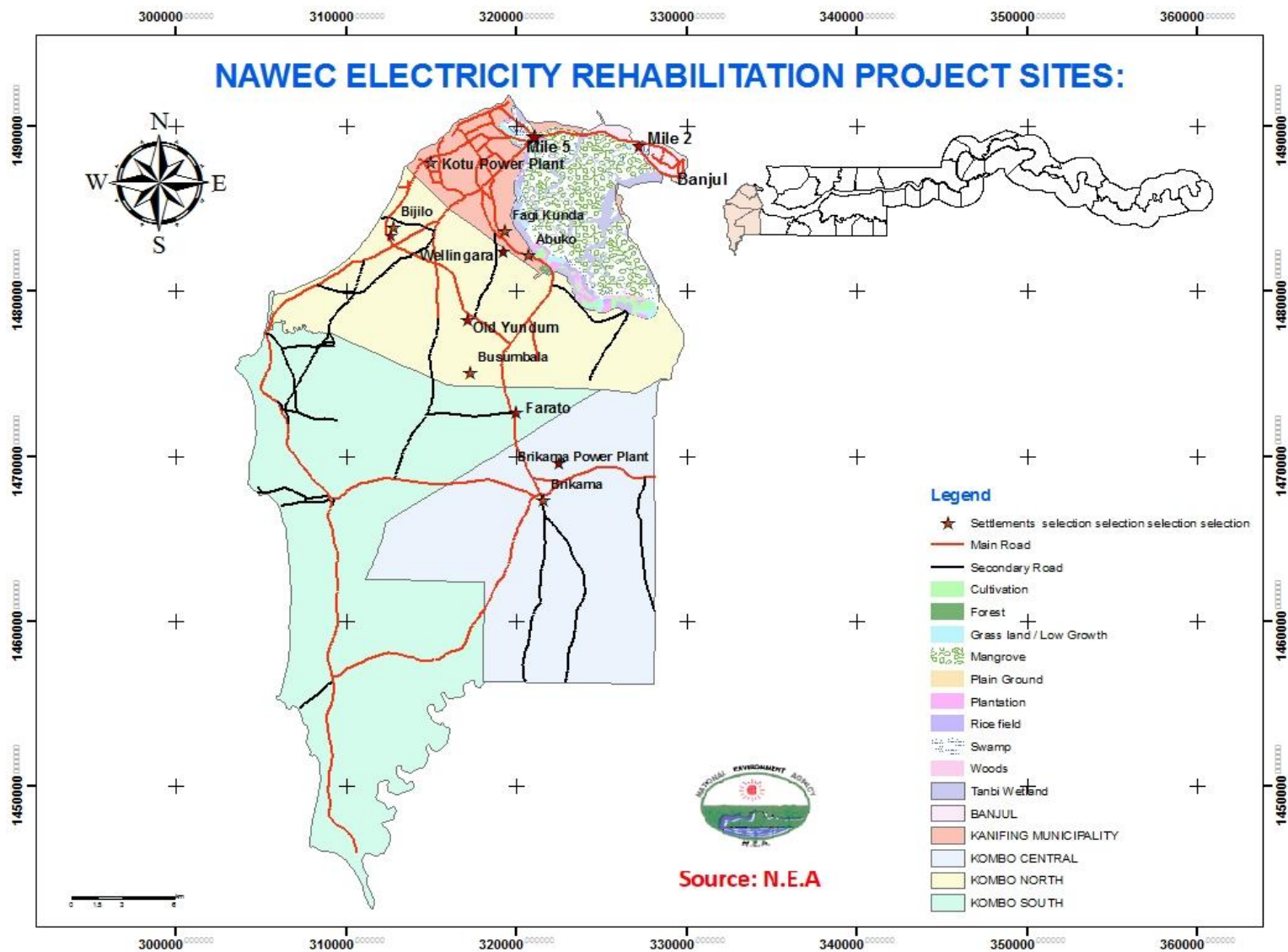


Figure 1: Map illustrating proposed project areas.

**PROPOSED ELECTRICITY TRANSFORMER 4 AT BUSUMBALA**

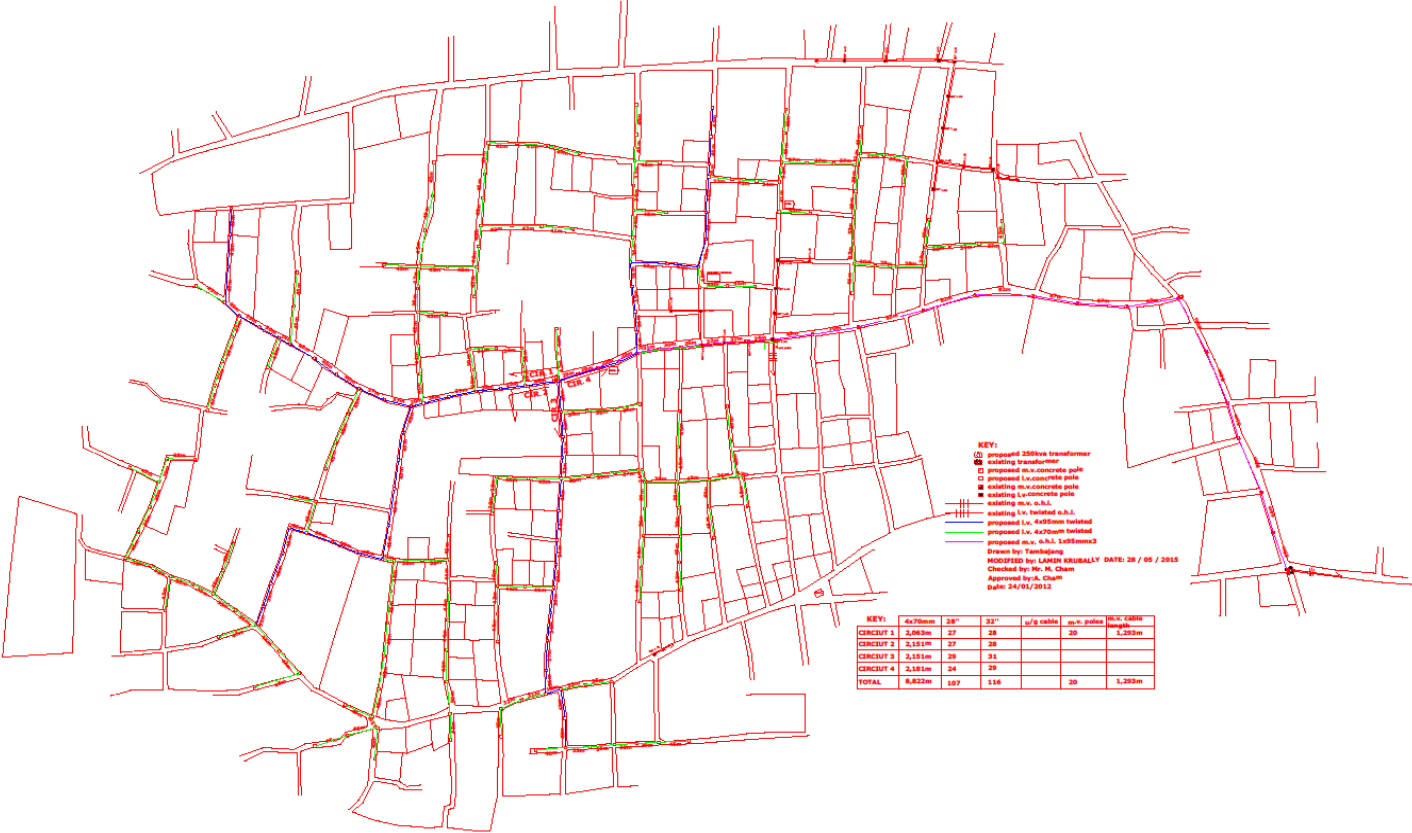


Figure 2: Map of Busumbala showing proposed T &D intervention

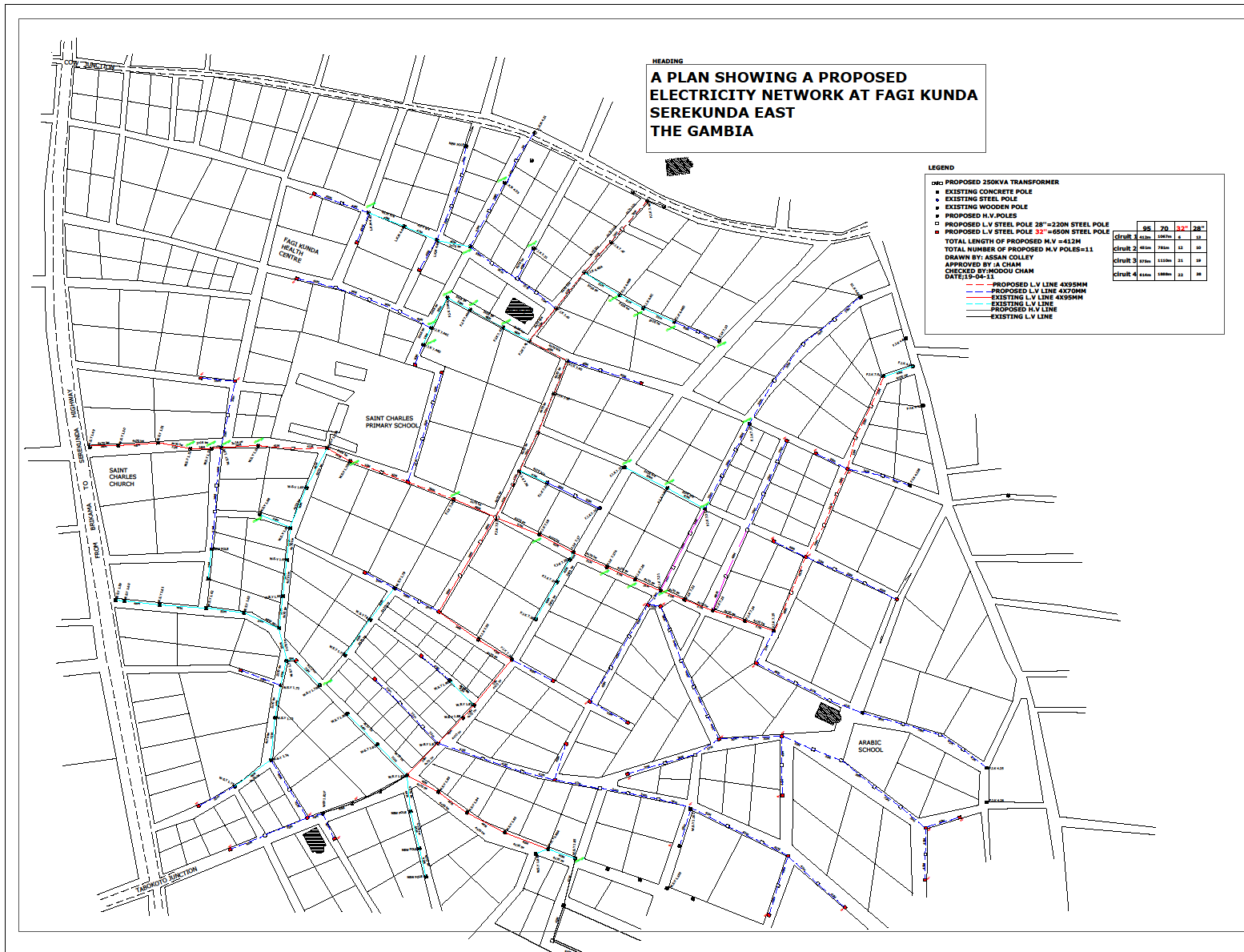


Figure 3: Map of Fajikunda showing proposed T &D intervention



**PROPOSED ELECTRICITY NETWORK AT FARATO VILLAGE**

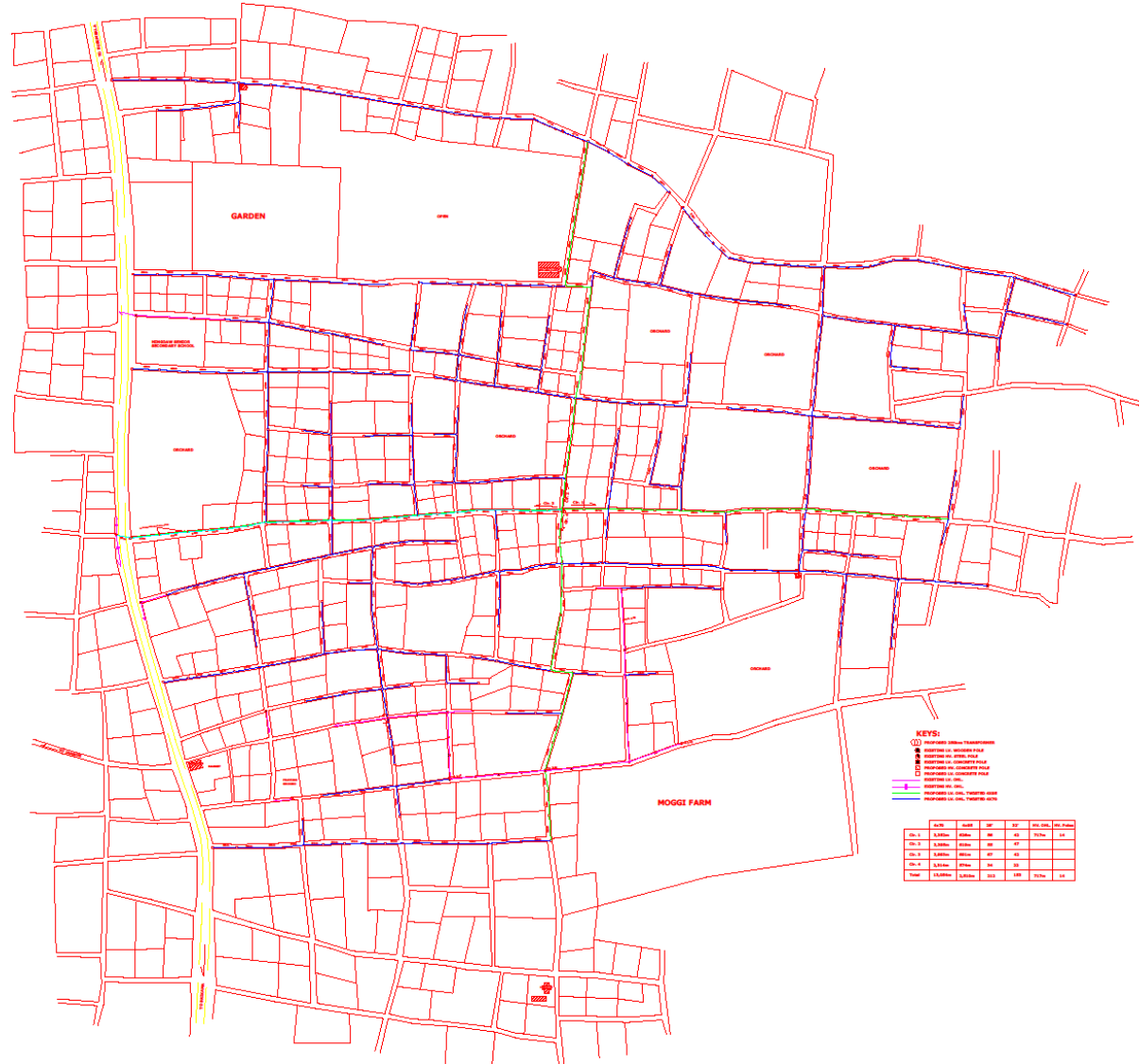


Figure 4: Map of Farato showing proposed T & D intervention

**UPGRADING 250KVA TRANSFORMER AT SANYANG VILLAGE(KOMBO SOUTH) PROPOSED 33KV LINE AND 250KVA TRANSFORMER**

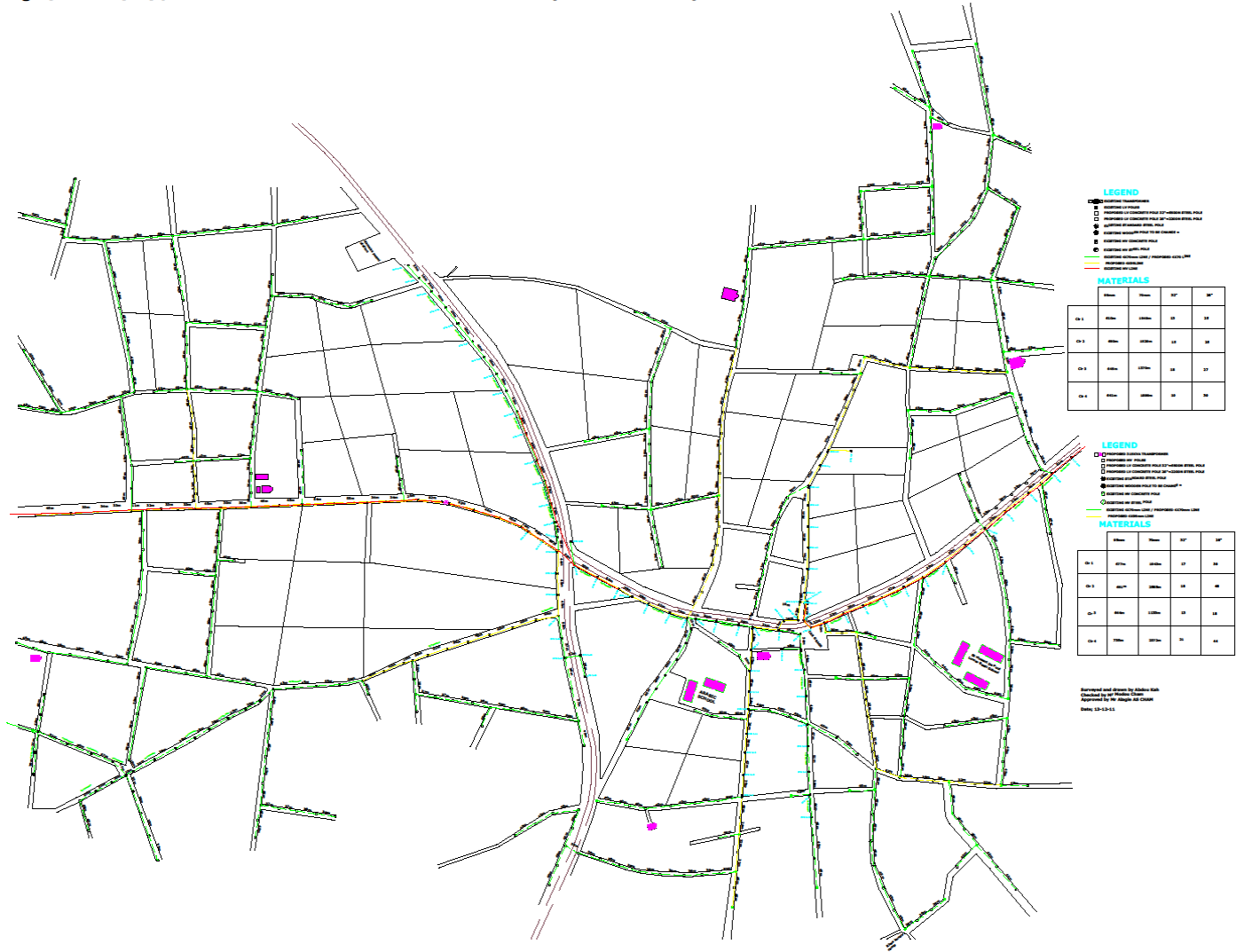


Figure 5: Map of Sanyang showing proposed T &D intervention

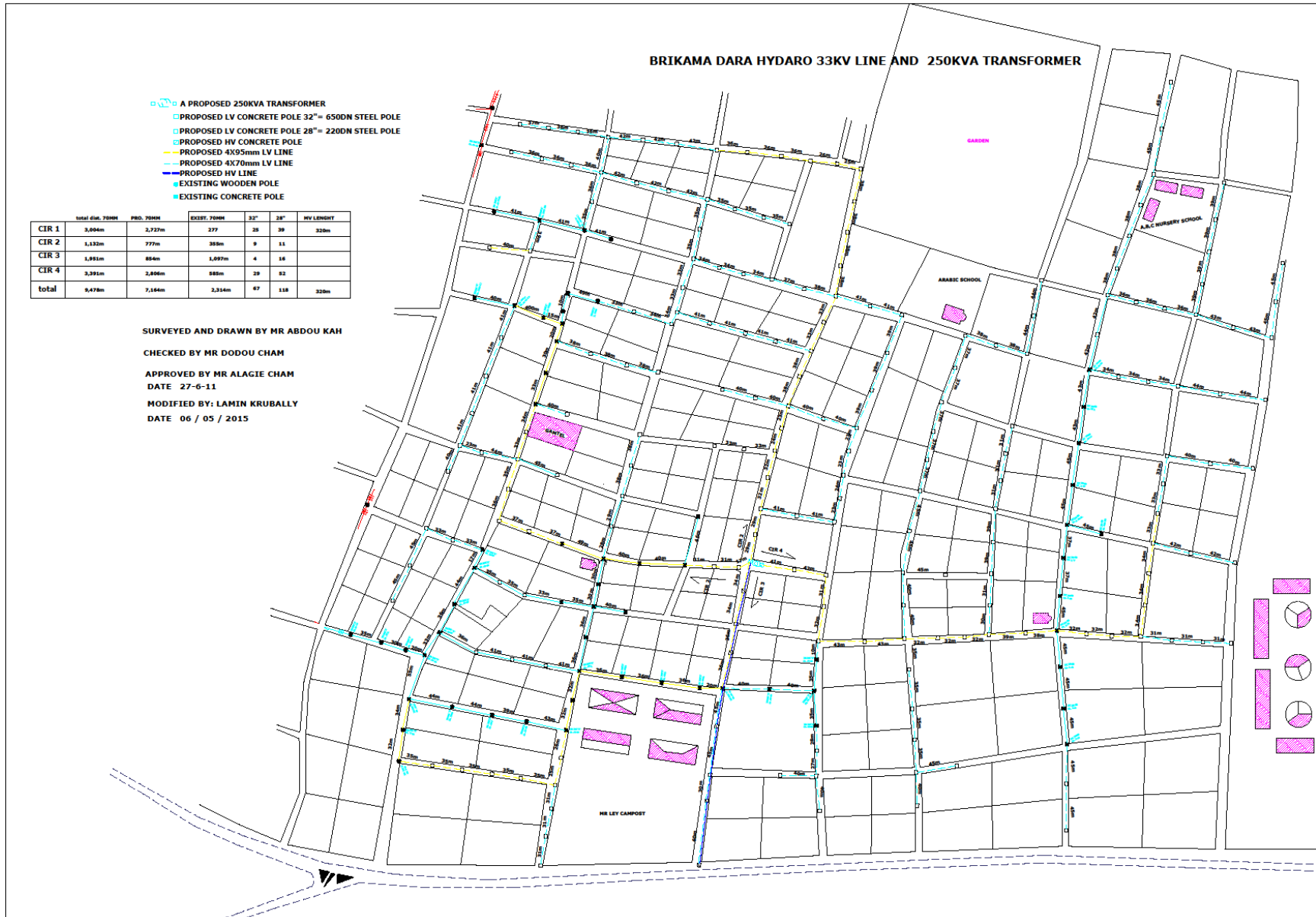


Figure 6: Map illustrating T and D intervention at Brikama Dara Hydaro

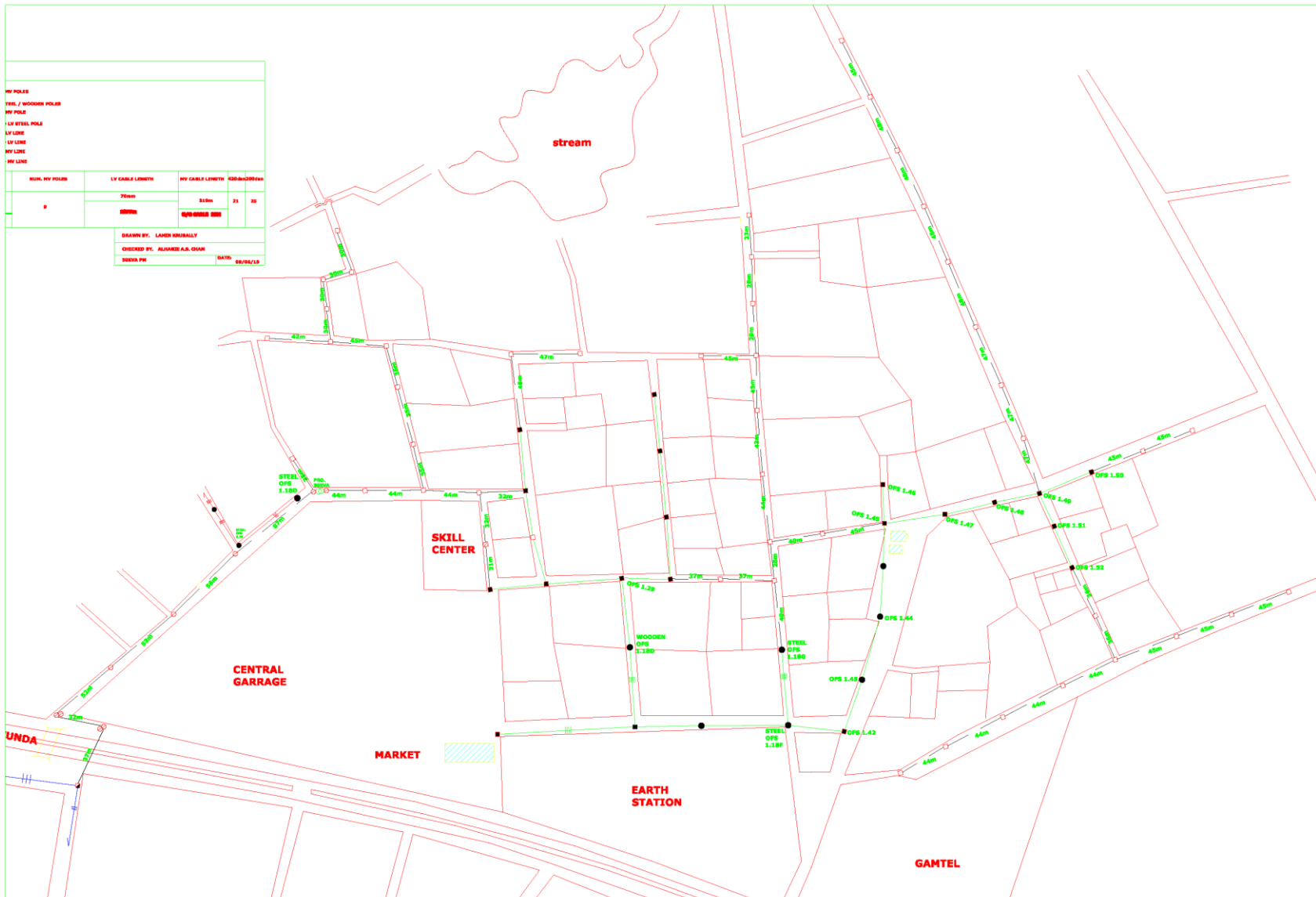


Figure 7: Map illustrating proposed T and D intervention at Abuko

# PROPOSED UPGRADING LV LINE NETWORK AT BRIKAMA KABAFITA

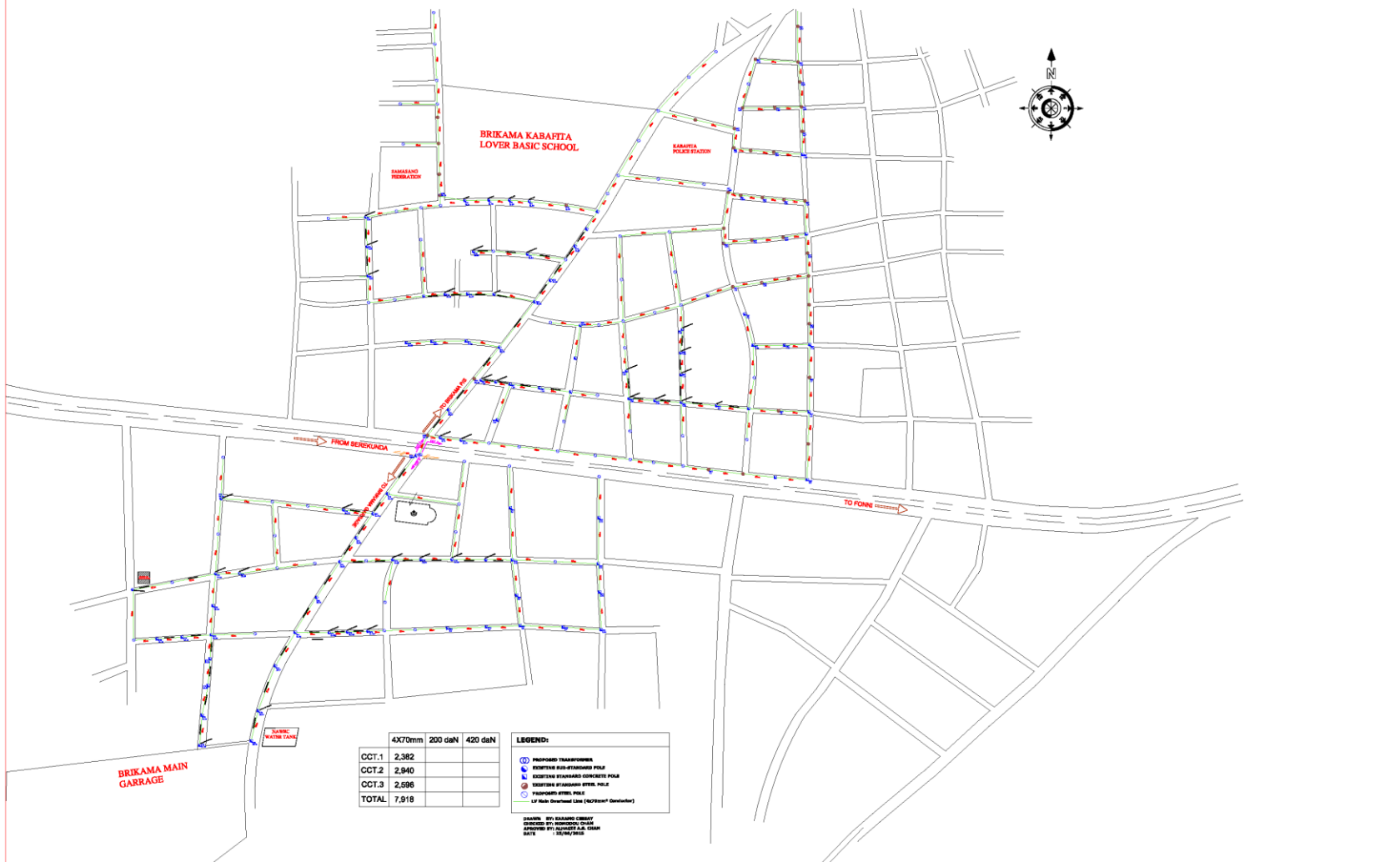


Figure 8: Map illustrating proposed T and D works at Brikama including Kabafita

**PROPOSED POLE MOUNTED TRANSFORMER FOR  
OLD YUNDUM 2  
KOMBO NORTH, WESTERN REGION.**

**SURVEYED BY : OUSMAN JATTA, BAKARY  
SABALLY ABOU GAYE, GIBRIL JOBE &  
MUHAMMED CAMARA**

**DRAWN BY : GIBRIL JOBE**

**DATE : JUNE 23, 2015**

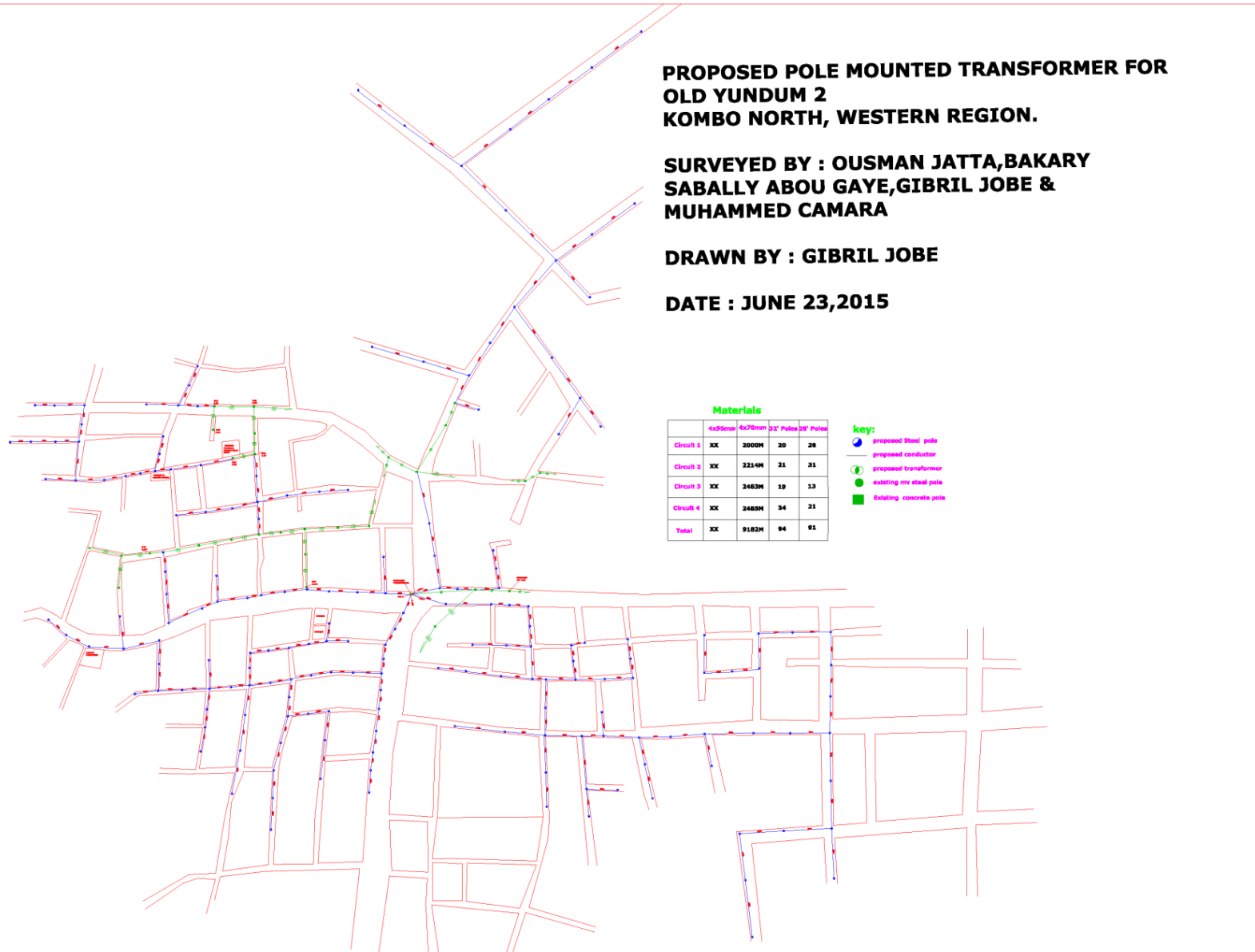


Figure 9: Map illustrating Proposed T and D intervention at Old Yundum (1)

**PROPOSED POLE MOUNTED TRANSFORMER FOR  
OLD YUNDUM 2  
KOMBO NORTH, WESTERN REGION.**

**SURVEYED BY : OUSMAN JATTA,BAKARY  
SABALLY ABOU GAYE,GIBRIL JOBE &  
MUHAMMED CAMARA**

**DRAWN BY : GIBRIL JOBE**

**DATE : JUNE 23,2015**

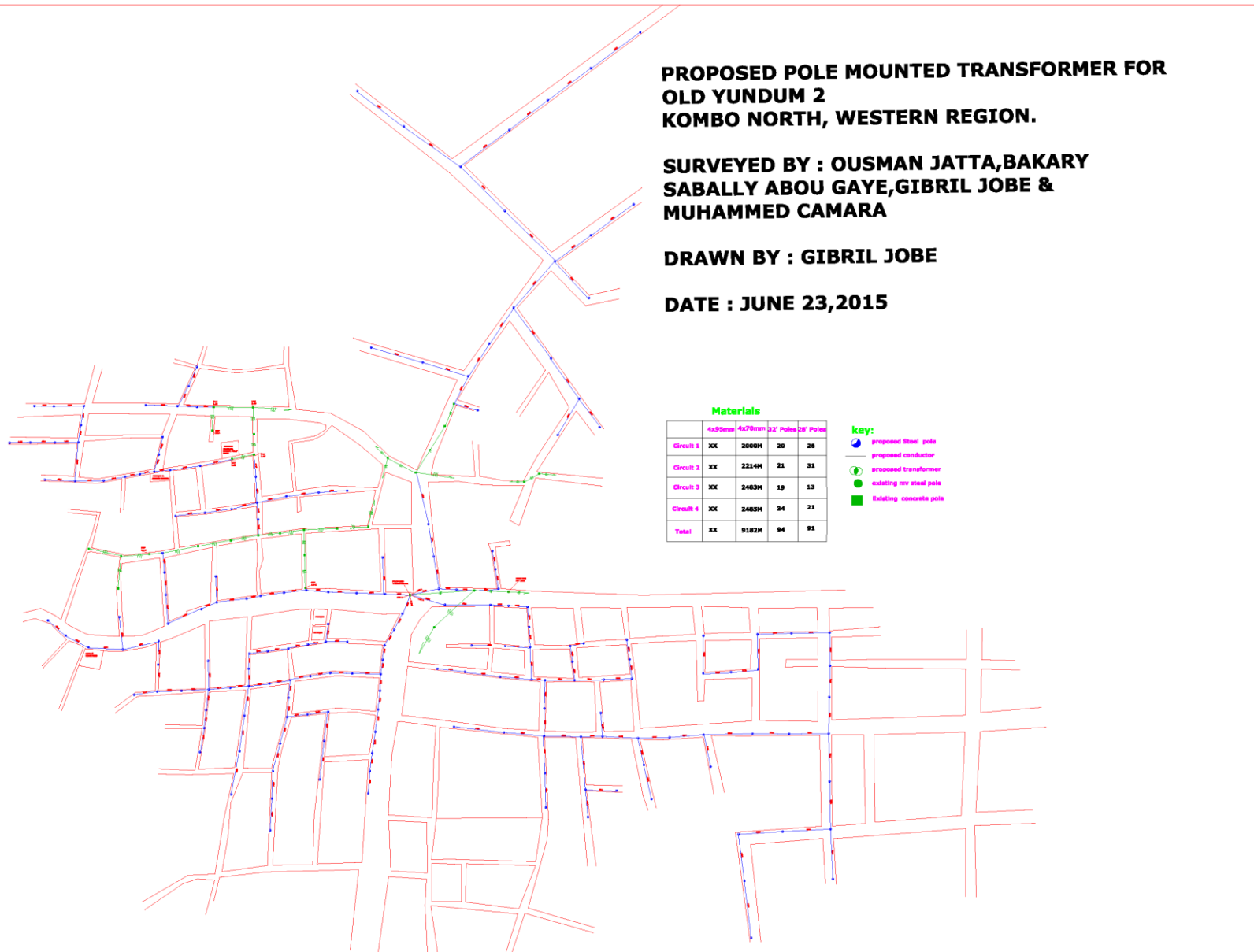


Figure 10: Map illustrating Proposed T and D intervention at Old Yundum (2)

### Annex 12.3: Baseline photo gallery



**Figure 11: Non-functional capacitor bank at Bijilo Substation.**

Its replacement shall not cause major negative impacts. It is important to bear in mind the handling techniques and disposal.





**Figure 12: Transformer poles unnecessarily protruding on the road.**

Fence was there prior to installation.



**Figure 13: Gully at Abuko Oldfield**

New NAWEC pole erected after erosion fell the previous one which is still left at the site (circled).



**Figure 14: Another disused structure left at site in Brikama**





**Figure 15: Brikama Medina Substation on the right with road clearance from Nyambia Forest.**



**Figure 16: Oil contaminated effluent discharged openly, and bund formed with earth to prevent spread.**

This was taken at Brikama II, not within Project scope, however, it shows the general lack of capacity to manage oily sludge well.





**Figure 17: Open drain with sludge oil at Kotu Power Plant**



**Figure 18: Substandard pole at Brikama**





**Figure 19 : Existing pole at Wellingerra with evidence of instability at the base**



## **12.4: Study Terms of Reference**

### **A. BACKGROUND**

The Government of The Gambia (GoTG) has received a Project Preparation advance from the World Bank to prepare the Quick win Electricity project for NAWEC. The project is to be implemented on Existing Generation and T&D facilities with potentials cover new areas depending on the resource envelop.

### **B. SCOPE OF SERVICES**

The GoTG seeks the services of a suitably qualified and experienced Consultant to provide the services outlined in these Terms of Reference which are to:

1. Undertake a qualitative and quantitative analysis of the environmental and social impacts and risks of the project.
2. Prepare corresponding Environmental and Social Management Plans for the quick fix rehabilitation project and Operations/Maintenance Phases of the project.

The implementation of an eventual management plan should be made abundantly clear with the involvement of the National Environment Agency to ensure proper and unbiased monitoring

The implementation and monitoring cost as such must be spell out and included in the project budgeted and costed adequately.

This TOR is to be read in conjunction with the project's detailed technical specifications and all other relevant project documents. The Consultant will review critical documents in view of subsequent design decisions that may have been considered by the Government and NAWEC and determine whether additional baseline data or information are required. Recommendations for additional work, if required, will be proposed in the Inception Report.

### **C. DETAILED TASKS FOR THE CONSULTANT**

**Task 1: Undertake a qualitative and quantitative analysis of the environmental and social impacts and risks of the project.**

In order to complete this task, the consultant should undertake the following activities:-

- (i) **Determine the Project's Influence Area** – The consultant is to determine, define and map out the project's land based influence areas based on the proposed location of land based infrastructure, and construction methods. The consultant will clearly delineate these areas into two zones – (i) Power stations and environment (ii) Transmission and distribution network routes.

- (ii) The consultant will undertake a detailed and extensive review and catalogue all relevant land areas that overlap or are adjacent to the project's area of influence, illustrate these on maps, and describe the legal status, significance and developmental restrictions and compliance requirements.

**(iii) Baseline Data in the Project Influence Area** - The Consultant will undertake a comprehensive gathering, collection and review of the required baseline data from existing credible sources within these areas. Where data required to prepare site-specific Environmental and Social Management Plans are missing, inadequate or unreliable, the Consultant will undertake the necessary surveys and/or collection in the bio-physical and/or social environment to obtain this data. The Consultant shall present the obtained baseline data at the appropriate level of detail pertaining to:

- (i) The physical land-based environment such as geology, climate and meteorology, surface and ground water hydrology, etc.);
- (ii) biological environment, (i.e., flora and fauna, habitat and ecosystems values, rare and endangered species, migratory species, presence or absence of critical natural habitats as defined by the World Bank's Natural Habitats Policy (OP 4.04) in the areas within or adjacent to the project's influence area, etc.);

**(iii)** Socio-economic and cultural environment, including fishing activity, land use, land acquisition needs, potential adverse impacts on livelihoods, and Physical Cultural Resources as defined by World Bank Policy on Physical Cultural Resources (OP4.11), where applicable; and

**(iv)** Information on existing or planned infrastructure/projects in these areas that may have direct, induced and/or cumulative impacts on this project's activities.

**(v) Review of Applicable Law** : The consultant will review all relevant and applicable environmental laws of The Gambia and all international laws protecting life, fisheries, protected areas, and other assets within the Gambia, and adequately identify the compliance requirements of these laws.

**(vi) Review of applicable World Bank requirements-** The consultant will review the applicable World Bank safeguards policies and their respective requirements to ensure project compliance.

v.) Consult with all other stakeholders (eg. National Environment Agency, NAWEC, Ministry of Petroleum, Ministry Energy, PURA, National Roads Authority, Ministry of Finance and economic Affairs etc..)

Applicable or potentially applicable World Bank Policies:

Environmental Assessment (EA) (OP 4.01): This policy, inter alia, requires (i) detailed qualitative and quantitative analysis to determine project impacts,(ii) determination of tangible measures to

prevent, minimize, mitigate or compensate for these adverse impacts, (iii) public consultation and disclosure as part of the EA process and (iv) requires an Environmental Management Plan (EMP), or as in this case, an Environmental and Social Management Plan (ESMF), to address set of mitigation, monitoring and institutional measures to be taken during design, implementation, operation of maintenance phases of the project.

Natural Habitats (OP 4.04) – This policy requires the conservation of natural habitats and specifically prohibits the support of projects that involve significant conversion or degradation of critical natural habitats, as defined by the policy. The policy further requires the EA to identify impacts on biodiversity and species and to determine endemism, endangered species and to determine project impacts on these species and to propose acceptable mitigation and monitoring measures.

Physical Cultural Resources (PCR) (OP 4.11) – This policy seeks to avoid the disturbance and or destruction of PCR as defined by the policy by the projects activities. PCR includes places of worship, buried artifacts, cemeteries and archeological assets, etc. The policy further requires: (i) EA to undertake a thorough desk review and/or site investigation to pre-identify and locate PCR's in the project influence area;(ii) EA/EMP to propose management measures; and (iii) incorporation of chance find clauses in civil works contracts during construction and maintenance stages.

Involuntary Resettlement (OP 4.12) – This policy addresses direct economic and social impacts from the projects activities that will cause (a) involuntary taking of land resulting in (i) relocation or loss of shelter, (ii) loss of assets or access to assets or (iii) loss of income sources or livelihoods and (b) involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons. The policy requires siting of project infrastructure to be so chosen so as to avoid these impacts altogether or to minimize them to the extent possible. Where these cannot be avoided, the policy requires the preparation of either or both of these instruments (i) resettlement policy Framework, (ii) Resettlement Action Plan, and for meaningful consultations with potentially affected people. The policy prohibits Community donations of lands for location-specific infrastructure.

**(vii) Analysis of Direct, Induced and Cumulative Environmental Impacts** - The Consultant will undertake a detailed analysis to determine the positive and negative environmental and social impacts associated with each phase of the project, i.e., Phase 1 - Rehabilitation and construction of land-based infrastructure, (ii) Phase 2- Operations & Maintenance Phase. For each phase in the project influence area and/or marine protected areas identified above, based on the project's technical specifications, the Consultant will undertake an in-depth and detailed quantitative and qualitative analysis for likely timeline scenarios using appropriate methodologies to predict and/or determine the intensity, scale, and scope of the direct, induced and cumulative positive and negative environmental impacts associated with this project. These impacts are to be determined as a change in the baselines identified above.

**(viii) Analysis of Alternatives** - The Consultant will provide an evaluation of reasonable alternatives for routings, sites for substation, etc. by assessing the extent to which these alternatives may be more appropriate from an environmental, socioeconomic, and cultural requirement than the proposed measures, technical specifications, corridors, and plans proposed as part of the project design. In consultation with technical specialists on electricity infrastructure, including consultant retained by the Bank and consultant retained by [the

Steering Committee], the Consultant may be asked to propose alternative feasible changes in the proposed project alignment, and other associated land based infrastructure to reduce or otherwise to more sustainably manage these impacts.

**(vii) Meaningful Consultations** – The Consultant will identify and hold meaningful consultations with local potentially affected peoples and other stakeholders, to present and discuss the findings and proposed measures in the ESMP, and to seek their respective views and inputs before finalizing the ESMP. The Consultant will maintain adequate records of this process and will present a detailed summary in the final reports. The Consultant will use suitable participatory methods to identify and consult potential Project Affected Peoples. In its inception report, the consultant will include a consultation plan to be agreed with the client.

**(vii) Institutional Assessment** - Having determined the environmental and social issues that would be associated with this project, the consultant is to undertake a detailed qualitative review of the relevant national ministries, agencies, and other institutions with responsibility and/or jurisdiction for management of the project and its environment and social impacts, with the purpose of (i) determining their capacity to manage these issues and (ii) making recommendations to the government on how best to effectively address any identified capacity gaps during project implementation.

## **Task 2: Prepare an Environmental and Social Management Plan (ESMP) –**

The purpose of the Environmental and Social Management Plans are to provide guidance to contractors, and to the operators of the facilities, on the measures and actions to be taken during implementation and operation of the facilities to eliminate, mitigate, or offset adverse environmental and social impacts, or to reduce them to acceptable levels.

The consultant will prepare the Environmental and Social Management Plan for each phase of the project, (Design/Construction/Rehabilitation; and Operations and Maintenance), in accordance with the World Bank's OP 4.01 which will include: (a) details of environmental mitigation and monitoring program to be implemented; (b) clear definition of institutional arrangements and responsibilities for ESMP implementation; (c) assessment of current institutional capacity to implement the ESMP and proposed capacity building/institutional strengthening activities; and (d) scope, budget, schedule, frequency, location and responsibilities for implementation of environmental mitigation, monitoring, and capacity building and institutional strengthening activities.

The predicted adverse environmental and social impacts for which mitigation is required should be identified and briefly summarized. The ESMP identifies feasible and cost effective measures to reduce potentially significant adverse environmental and social impacts to acceptable levels. Each mitigation measure should be briefly described with reference to the impact to which it relates and the conditions under which it is required (e.g., continuously, or in the event of contingencies). Environmental performance monitoring should be designed to ensure that mitigation measures are implemented, have the intended result, and that remedial measures are undertaken if mitigation measures are inadequate or the impacts have been underestimated.

### **D. Organization**

The Ministry of Finance and Economic affairs, Ministry of Energy, NAWEC and the World Bank will expedite their respective reviews in order to provide comments rapidly enough to allow the

tight schedule below to be achieved. The estimated effort for this assignment is about 25 person-days spread over a five (5) week period. The majority of the work should be completed within 3 weeks from the date of contract signature, by which time a draft should be available for Government and World Bank review. The consultant will revise the draft based on comments received, and assist the Government in making the disclosure. Stakeholders will be given a maximum of 7 days to review the final draft ESMP, at the end of which the consultant will support the Government in conducting at least one stakeholders meeting (more may be required under national legislation) – and will document in an annex to the final ESMP the dates and attendance lists, the comments and questions received, and the disposition of those comments and questions in the ESMP. The consultant will make any revisions necessary in the ESMP based on the stakeholder inputs.

#### E. Reports and Schedule

The following calendar and delivery dates are proposed:

Activities Product/Report					
	1	2	3	4	5
Entry Meeting and inception report					
Draft ESMP					
Consultation meeting(s) and disclosure					
Final ESMPs					

#### Required Skills of the Consultants

The Consultant must be highly competent and have relevant academic qualifications and project experience to deliver the services that are being sought in this TOR.

The consultant should have a BSc Degree in Environmental science or Engineering with at least 10 years’ work experience or an MSc in Environmental science with at least 5 years work experience. The Consultant should have skills and competencies in Environment assessment for Rehabilitation of Thermal power plants and T&D infrastructure, international environmental Energy law, metering and loss reduction ,environmental assessments of Land resources, natural resource management etc, The consultant should have at least five years’ experience & knowledge in World Bank safeguards and associated instruments.

She/he should be conversant with Government of the Gambia policies and legal provisions on land acquisition, resettlement and ownership.

#### G Reporting Requirements

The Consultant is required to submit the draft report to the PIU and the Focal Point for Energy project PCU IFMIS project by 8th June 2015. The final report incorporating comments and input from the consultation should be finalized no later than 30th June 2015.