MINISTRY OF WATER AND ENVIRONMENT

DIRECTORATE OF WATER DEVELOPMENT RURAL WATER SUPPLY AND SANITATION

INTEGRATED WATER MANAGEMENT AND DEVELOPMENT PROJECT

ENVIRONMENTAL AND SOCIAL IMPACT STATEMENT FOR LOMUNGA RURAL GROWTH CENTRE WATER SUPPLY IN YUMBE DISTRICT

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APRIL 2024

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AIDS	Acquired Immune-Deficiency Syndrome
AOI	Area of Influence
CAO	Chief Administrative officer
CBD	Convention on Biological Diversity
CBOs	Community-Based Organisations
CDO	Community Development Officer
CITES	Convention on International Trade in Endangered Species
dBA	Decibel Amperes
DDP	District Development Plan
DEA	Directorate of Environmental Affairs
DLGs	District Local Governments
E	Easting
EA .	Environmental Assessments
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EI	Environmental Inspector
EMMP	Environmental Managemet and Monitoring Plan
EMP	Environmental Management Plan
ENR	Environment and Natural Resources
EO	Environmental Officer
EOC	Equal Opportunities Commission
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessments
ESIS	Environmental and Social Impact Statement
ESMF	Environment and Social Management Framework
ESMP	Environmental and Social Management Plan
GBV	Gender-Based Violence
GOU	Government of Uganda
GPS	Global Positioning System
HS&E	Health, Safety and Environment
HH	Household
HSMP	Health and Safety Management Plan
IWMDP	Integrated Water Management and Development Project

IWRM	Integrated Water Resource Management
MoGLSD	Ministry of Gender, Labour and Social Development
MWE/MoWE	Ministry of Water and Environment
N	Northing
NEA	National Environment Act
NEMA	National Environment Management Authority
NPHC	National Population and Housing Census
OP	World Bank Operation Policy
OS	Operational Safeguard
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PAP	Project Affected Person
PDO	Project Development Objective
RGC	Rural Growth Centre
SEA	Sexual Exploitation and Abuse
SPP	Source Protection Plans
SEAP	Social and Environment Action Plan
TOR	Terms of Reference
UBOS	Uganda Bureau of Standards
VAT	Value Added Tax
WB	World Bank
WBG	World Bank Group
WHO	World Health Organisation
WSP	Water Source Protection
UNHCR	United Nations High Commissioner for Refugees

EXECUTIVE SUMMARY

The government of Uganda (GoU) through the Ministry of Water and Environment (MWE), with financial support from the World Bank, under the Integrated Water Management and Development Project (IWMDP) is undertaking Water and Sanitation sub-projects in small towns and rural growth centres. The Project Development Objective (PDO) is to improve access to water supply and sanitation services, capacity for integrated water resources management and the operational performance of service providers in project areas.

The proposed interventions in the IWMDP will contribute to the achievement of National Development Plan III objectives, Vision 2040 and achievement of the Sustainable Development Goals, SDG#3 - ensuring healthy lives and promoting well-being for all at all ages, SDG#4 - ensuring availability and sustainable management of water and sanitation for all and SDG#10 - reducing inequalities within and among countries.

The Project focuses on three strategic areas: (i) delivering necessary Water and Sanitation Services (WSS) infrastructure and catchment management measures in targeted areas; (ii) supporting water-related institutions (MWE, local government, and service providers) to establish and consolidate operational efficiency and service quality in small towns and rural areas; and (iii) strengthening national and regional capacity to improve Integrated Water Resource Management (IWRM). The Project comprises four components: Component 1–WSS in Small Town and rural Growth Centers which covers Support to Small Town and rural Growth Centres and Support to Refugee and host Communities; Component 2–WSS in Urban Large Towns; Component 3–Water Resource Management and, Component 4–Project Implementation & Sector Support. Sub-components.

Component 1: provides support activities designed to improve the sustainable provision of water supply and sanitation services to refugee settlements and host communities. The sub-component will target the districts of Yumbe, Arua, Moyo (including Obongi district newly created from Moyo), Adjumani in West Nile, Lamwo in Northern and Kiryandongo in Central Uganda, where about 70 per cent of the refugees in Uganda are being hosted.

To address the water supply gap in Yumbe, 6 solar-powered piped water supply systems and 22 toilets have been proposed. These water supply and sanitation infrastructure will be implemented as part of the strategy to improve access to clean water, improved sanitation and hygiene in the refugee host communities. Under the IWMDP, funds have been reserved for the preparation of the Environmental Social Impact Assessment (ESIA), Water Source Protection (WSP) and Resettlement Action Plan (RAP) feasibility study, engineering design under consultancy services, construction works as well as the implementation of full-scale source protection measures.

Project Location

The proposed Lomunga Rural Growth Centre will be located in, Bijjo Sub-County of Yumbe District. The catchment villages for the project are Dandubo crossing to areas of Maragala, Aliba, Opaligo, Wandi, Kamuka, Kawule, Kirilo, Ojinga, Yambura and Londiba villages of different parishes that make up Bijo Sub-county.

Proposed project infrastructure

The borehole will be equipped with a submersible vertical pump capable of extracting water within the specified safe yield. The pumping system will transport water through the mains to a centralized storage tank. The transmission and distribution network will span 7080 m and 27500 m respectively.

The borehole pump station consists of a wellhead positioned on a 2x2m concrete platform, accompanied by a 60 m^2 blockwork structure housing pipework fittings and electrical controls. This pump station is located on a 10,000 m^2 site enclosed by a 2.1m high concrete post and chain link fence, with access provided by a 3m wide gravel road.

The submersible pump will be installed using an HDPE riser pipe, featuring an air release valve (ARV)/vacuum breaker valve at the riser's top, a swing check non-return valve, a scour/blow-off valve, and surge protection in the form of a pressure relief valve. Additionally, a helix- bulk flow meter will be incorporated into the pumping main for accurate flow measurement.

Water pumping is anticipated for 8 hours daily, directing it into a ground-reinforced concrete reservoir with a capacity of 100 m^3 at the borehole site. From this reservoir, a surface pump with a discharge rate of 90 m^3/hr and a head of 150 m will transfer water to the main storage tank, elevated 12 m above the ground, with a capacity of 250 m^3.

The operational setup of the water supply system necessitates the construction of several buildings, encompassing:

1. **Pump House:** A pump house with an area of 60 m^2 at the borehole station will be established.
2. **Chemical Dosing House:** A building measuring 3.0 x 6.0m will be erected at the water reservoir site, designated for housing chlorine dosing equipment and chemical storage.
3. **Staff House (Optional):** An optional residential building covering an area of 96 m^2 will be available to accommodate two staff members.
4. **Office and Laboratory Building:** A comprehensive building spanning 110 m^2 will be constructed to serve as an office, laboratory, and tools store.

The following equipments will be used during the construction of a piped water and sanitation project:

a) Excavator - for digging trenches for pipelines and reservoirs.
b) Backhoe loader - for excavating and loading materials.
c) Dump truck - for transporting materials like sand, gravel, and pipes.
d) Bulldozer - for clearing land and levelling the ground.
e) Wheel loader - for moving materials around the construction site.
f) Compactor - for compacting soil and materials.
g) Concrete mixer - for mixing concrete for foundations and structures.

h) Crane - for lifting heavy materials and equipment.
i) Welding machine - for welding pipes and structures.
j) Pump - for dewatering trenches and pumping water during construction.
k) Generator - for providing power to construction equipment and tools.
l) Surveying equipment (theodolite, level, GPS) - for surveying and layout of the project.
m) Pipe cutting and threading machine - for cutting and threading pipes to size.
n) Jackhammer - for breaking concrete and rocks.
o) Shoring equipment - for supporting trenches and excavations.

Approximately 150 personnel will be for the Lomunga RGC piped water supply and sanitation project, 70% of whom must be local. The project will abide by World Bank safeguarding standards, Ugandan labour laws, and environmental, health, and safety guidelines.

Need for the Environmental and Social Assessment

The implementation of the Lomunga Rural Growth Centre piped water supply and sanitation Project will result in several environmental and social impacts that require an Environmental and Social Impact Study. Furthermore, the project falls under the Fifth Schedule of the National Environment Act No. 5 of 2019 as amended, which lists projects to be considered for ESIA. Section 19 (3) of the National Environment Act No. 5 of 2019 made the utilization of water resources, water supply and sanitation facilities mandatory for Environmental and Social Impact Assessment for all projects or policies that may, are likely to or will have significant impacts on the environment so that adverse impacts can be identified, avoided, reduced, mitigated or compensated for based on the mitigation hierarchy.

The assessment is in line with the World Bank's Operational Policy 4.01 on Environmental Assessment. An Environmental and Social Impact Assessment (ESIA/ESMP) is mandated for projects that are identified to have potential adverse environmental and social effects. Given that the planned project activities are anticipated to present site-specific environmental and social risks and impacts, conducting an ESIA aligns with the policy requirements outlined in OP 4.01. The World Bank project categorization, further guides the assessment process and associated mitigation measures. This categorization helps determine the level of scrutiny and attention required based on the potential environmental and social impacts of the project. This project is categorized in Category B since it is anticipated to have limited adverse social and environmental impacts that are site specific, largely reversible and can readily be addressed through the proposed mitigation measures.

Therefore, this ESIA study seeks to ensure compliance of the project with applicable national and World Bank environmental and social safeguard policies, while also providing the overall framework for addressing social and environmental risks.

The primary objective of this project is to enhance sustainable access to safe water and basic sanitation in the rural growth centre within selected districts hosting refugees. The anticipated benefits of this initiative include:

a) Decreased prevalence rates of waterborne diseases, particularly cholera, dysentery, and diarrhoea.

b) A substantial reduction in health-related costs and time spent on water collection, resulting in significant savings for rural households.

c) Alleviation of the burden associated with fetching water, particularly benefiting women and young girls in rural areas.

d) Creation of opportunities for income-generating activities for women, as reduced water-fetching responsibilities contribute to increased free time.

e) Improved enrollment ratios, especially for girls, and an enhancement in the female literacy rate.

f) Mitigation of social conflicts linked to water usage.

g) Effective management and maintenance of water supply and sanitation facilities.

h) Human capacity development and job creation in water management, involving private operators in the construction, management, repair, and maintenance of water supply facilities.

Study Approach and Methodology

The ESIA study adhered to the guidelines set forth by the National Environment Management Authority (NEMA) in Uganda (1997). The research process began with internalizing the Terms of Reference and developing appropriate data collection tools. The methodology included a scoping study, literature review, stakeholder consultations, investigations, engagement with key stakeholders, socio-economic activity surveys, water resource assessments, biodiversity studies, noise assessments, mapping, photography, visual observations, impact screening, and impact assessment, followed by evaluation and analysis

The Environmental Social Impact Assessment (ESIA) study relied on data collected along the proposed project route, complemented by an examination of documents provided by the Developer and other sources such as feasibility study reports, the Environmental and Social Management Framework (ESMF), World Bank Safeguards policies, IFC Environmental Health and Safety Guidelines for Water and Sanitation Projects, and district-provided documents like District Development Plans and state of environment and health reports.

Stakeholder engagement was a key focus of the ESIA methodology, involving discussions, meetings, and interviews with various entities including Yumbe District Local Government officials, Bijjo Sub-County officials, United Nations High Commissioner for Refugees (UNHCR), the Office of the Prime Minister, Bijjo Subcounty Leadership, and members of the local community to gather perceptions, views, and concerns.

Institutional, Legal and Policy Framework

Reference was made to the Feasibility and Preliminary Design Report Lomunga Rural Growth Center, July 2023, several national policies and legislation e.g. the National Environment Policy (1994), Water Policy (1999), National HIV/AIDS Policy (2007), Policy

on Conservation and Management of Wetland Resources (1995), The constitution of the Republic of Uganda (1995), National Environment Act No.5, 2019, Water Act (Cap 152), Occupational Health and Safety Act (2006), Local Government Act (1997), Physical Planning Act (2010) as ammended 2020 etc. World Bank Safeguard policies such as OP/BP 4.01 - Environmental Assessment, OP/BP 4.04 - Natural, OP/BP 4.11 - Physical Cultural Resources, OP/BP 4.10 - Indigenous Peoples, OP/BP 4.12 - Involuntary Resettlement were also reviewed

Relevant National environmental regulations were also reviewed including some international protocols that Uganda is a signatory to.

Environmental setting around the proposed project

The Project area (Bijo Sub-County) comprises of undulating landscape, sloping northeast wards into rivers that drain the area forming wide valleys. The highest point is 987m and the lowest is 847 m above sea level. Kirilo borehole is 847 m above sea level and Reservoir site is 934 above sea level in Gila parish. The project area drains in the north-eastwards into River Limika.

The climate of Yumbe district is tropical with moderate rainfall and temperature. The district experiences extreme seasonal variation in monthly rainfall. The district receives an average total rainfall of 1250mm. The area experiences two seasonal rainfall, light rains between April and October. The wettest months are usually July to November with over 120mm/month. The period December-February is a long dry with less than 60mm/month. The rains are associated with the northerly and southerly movements of the inter-tropical front. Mean monthly evaporation ranges from 130 mm to 180 mm.

The landscape setting for Lomunga RGC is defined as a modified landscape with extensive subsistence croplands, bushland/grassland, shrubs and plantation agriculture. In general, most of the natural vegetation cover within the project corridor had been reduced by human presence leaving small patches of natural transitional vegetation amidst vast degraded habitats. The project area is endowed with considerable vegetation cover. The area can be broadly categorised as a wooded grassland. Different plant species were recorded in the entire project area. There are also several crop plots to be traversed by the transmission line to the reservoir.

The natural vegetation comprises open lands featuring equatorial savannah grasslands and occasional small forests on hills and along the South Sudan border.

During the field survey, numerous tree species were identified, including *Mangifera indica, Borassus flabellifer, Vernonia amygdalina, Markhamia platycayx, Cupressus lustanica, Artocarpus heterophylla, Bridelia micrantha, Croton macrostachyus, Tectona grandis, Entada abbysinica, Tamarindus indica, Acacia abyssinica, Ficus natalensis, Milicia excelsa, Maesa lanceolata, Kigelia Africana, Psidium guajava, Erythrina abyssinica, Grevillea robusta, Coffea arabica, Vitellaria paradoxa, Albizia grand bracteata, Albizia coriaria, Markhamia lutea, and Euphorbia candelabrum, among others. Additionally, various herbs such as Hygrophylla integrifolia, Centella asiatica, Crassocephalum montuosum, Garlisonga parviflora, Sonchus asper, Tridax procumbens, Commelina diffusa, Ipomoea batatas,*

Cupressus lustanica, Curcubita maxima, Colocasia esculentus, and *Hypogea rachis* were observed in the project site.

The overall vegetation in the project area encompasses a wide range of species, with most having low conservation significance. Notably, two species—*Vitellaria paradoxa and Milicia* excelsae, are classified as Nearly Threatened at the global scale (NT).

The results of the fauna surveys indicate that there is still a presence of various species of mammals in the proposed project. The evidence documented suggests they occur in low levels of abundance.

Social Economic baseline

The district has an average household size of 7.6 persons with a total fertility rate of 6.7 children per woman. 70.3% of the population in the district are married Adults and 26.1% of the females aged 50 and above are widowed. This implies a relatively large household size in the project area, which is associated with less wealth and high poverty levels according to the 2015 National Household Survey reports (UBOS, 2015).

The settlement pattern in the sub-county accommodates mostly the linear, nucleated and scattered patterns of settlement. This has been greatly influenced by several factors including; linear settlement patterns evidenced along the main roads that networked the sub-county. Nucleated settlement patterns have been influenced by productive resources such as areas with fertile soils, and clean water for both consumption and production, especially along the valleys and hills to the North of the Sub-County. Such areas have often developed and are rapidly developing.

The households in Lomunga RGC are involved in crop farming as the main source of income, followed by those engaged in produce business (2%) and casual labour (2%). Households involved in crop farming and retail trade are likely to benefit from the project during the construction phase by selling their agricultural produce and trade commodities

The land in the project area is mainly communally owned and governed by the customary system of land tenure.

There are about 8 water sources, however, the main source is the public boreholes (91%). (32%) of households move an average of 0.5km to the main water source and fetching water is mainly the responsibility of women and girls (48%).

Stakeholders consulted welcomed the project with integrated management of the different phases of the project between local, sub-county and district leadership as the project is intended to bridge the social challenge of "Improving access to clean and safe water".

Potential positive impacts during construction

The following positive benefits are expected to accrue from this project during construction;

- Creation of local employment opportunities
- Improved health and better standards of living
- Increased market for agricultural produce and local goods
- Increased income to Material/ Equipment Suppliers and Contractors

- Improved Skills for Local Communities
- Economic growth
- Increased Revenue to the government

Potential negative impacts during construction

The major negative risks and impacts associated with the proposed Lomunga RGC Water and sanitation project are summarised in the Impact/Risk Mitigation (Chapter 8) and the Social and Environmental Management and Monitoring Plan section (Chapter 9). The most significant environmental and social impacts, rated as of medium significance and higher, are:

- Pollution of water and soil resources
- Construction activities like excavations and vehicle movements during construction are likely to generate noise levels beyond the current levels. Exposure of communities and workers to high noise levels can be a health concern.
- The influx of people and the increase in social disruption and human health issues, related specifically to GBV Child abuse, the influx of people and HIV/AIDS, with which specific management is required to guide social interaction during the construction period
- Excavations, construction activities, transportation of workers and equipment may pose occupational and community safety risks
- Soil erosion and siltation of river.
- Poor sanitation around project sites
- Spread of invasive species
- Land take for the borehole sites, pumphouse water treatment site access routes and water reservoir tank

The mitigation measures for the above-listed potential impacts include: Proper containment and re-use of cut and spoil/excavated soils for backfilling the excavated pits, hoarding off of key construction sites like intake sites, water storage sites, provision and enforcement of adequate and appropriate personal protective wear, The affected property and crops/trees shall be compensated in line with the approved RAP, Communities in the project area should be engaged and sensitised about all the components and requirements of the project. After construction, there should be landscaping and then grass left to recolonize the disturbed area naturally.

MWE in collaboration with the local authorities shall undertake catchment management activities to support local environmental protection programs including support of afforestation initiatives to enhance tree cover areas as a way of reducing project footprint, especially within the project sites such as reservoir and intake sites. Movement of the equipment (vehicles, contractors and the entire construction crew) shall follow designated pathways or agreed-upon access roads to avoid unintended damages to fauna. The affected sites shall be restored to almost their original position. Trenching, pipework laying as well as well and backfilling will be done concurrently. For open pits, the contractor shall ensure that every evening, they are covered while being secured with warning tape.

Following construction, rehabilitation of all areas disturbed during the construction phase and that are not required for regular maintenance operations shall be undertaken to desired ecological conditions and all exposed areas shall be re-vegetated using indigenous species. To minimize interference with traffic, digging trenches and piping across roads shall be conducted in hours with less traffic preferably on weekends and the contractor shall develop and implement a traffic management plan.

To mitigate social impacts, workers shall as much as possible be recruited from the project area, and develop and implement a comprehensive stakeholder management and engagement plan, Structures like shrines and graves shall be avoided as much as possible, and all public institutions like schools and health centres in the project footprint will be connected to the water supply and requirements for vulnerable groups(like child protection and prevention of GBV)will be mainstreamed and integrated into project activities.

Monitoring of ESMP implementation

This environmental and social management & monitoring plan, for the proposed construction works and operation of the proposed water supply and sanitation project identifies the potential environmental and social aspects that should be managed and monitored. It identifies parties responsible for monitoring actions, associated costs, indicators and training or capacity-building needs and reporting.

Institutional Structure and Responsibilities: The following parties shall be involved in the ESMP during the pre-construction, construction and operation phases:

The Ministry of Water and Environment (MWE) will be responsible for ensuring environmental and social performance for the water supply and sanitation project. The Supervising Engineer will be responsible for overseeing construction, monitoring contractors, and employing specialists. The Project Manager will implement the ESMP, ensuring resources are provided, and personnel are trained. MWE will guarantee compliance with social and environmental safety measures.

The Resident Engineer will review and approve the ESMP before work commencement. Yumbe District Environmental Officer will monitor, regulate environmental protection and monitoring the project area. During site preparation and construction, the contractor will be responsible for ensuring compliance with all relevant legislation and standards, as well as adherence to all environmental and socio-economic mitigation measures specified in the Environment and Social Management Plan. The contractor is also responsible for managing the potential environmental, socio-economic, safety and health impacts of all contract activities whether these are undertaken by themselves or by their subcontractors.

Environmental monitoring will be undertaken at different levels as described below

Surveillance: Undertaken by the Supervision Engineer on behalf of MWE.

Quarterly Monitoring: Joint by all relevant stakeholders at various levels.

Audit activities: To be done by a NEMA registered Environmental Auditor.

Spot checks: By Supervising Engineer, MWE, Contractor, District Leadership, NEMA.

Routine inspections will cover environmental and social management on the site, with daily, weekly, monthly, and quarterly inspections to identify issues and ensure maintenance. Contractors must prepare monthly and quarterly reports, verifying activities in line with Ugandan laws, regulations and World Bank Safeguard policies. Critical incidents will be reported to MWE within 24 hours and to the World Bank within 48 hours.

To fulfil the Contractor's contractual reporting requirements, either a stand-alone Monthly Environment and Social report shall be generated, or the Contractor's Monthly Progress Report shall adequately cover safeguards. The report will outline various actions made to manage the project's environmental and social components following the terms of the contract, Ugandan laws, norms, plans, and policies, as well as World Bank Safeguard policies. The supervising consultant will also need to confirm and approve this report. Planning is usually done continuously for the management of environmental aspects. To that end, each month's success report ought to include a plan for the upcoming month's social and environmental events.

The estimated cost of ESMP implementation is 3.12% of the total project cost of 11,178,794,274 Billion Uganda Shillings

Conclusions

The proposed Lomunga RGC water supply and sanitation system is not foreseen to cause irreversible environmental and social impacts. A comprehensive environmental and social assessment has been carried out and adequate mitigation measures have been devised for all the project phases, including pre-construction, construction and operation. The ESIA Report for Lomunga Water Supply and Sanitation System is therefore recommended for approval by NEMA.

1]INTRODUCTION

1.1 Project Background

The Government of Uganda (GoU) through the Ministry of Water and Environment (MWE), with financial support from the World Bank, under the Integrated Water Management and Development Project (IWMDP) is undertaking Water and Sanitation sub-projects in small towns and rural growth centres. The Project Development Objective (PDO) is to improve access to water supply and sanitation services, capacity for integrated water resources management and the operational performance of service providers in project areas.

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Solar-powered piped water supply system with a ground water source, elevated water storage steel tanks and distribution pipe to a radius of at least 2km network capable of meeting the daily drinking water needs of at least 5,000 people have been proposed. For purposes of this report, the environmental and social aspects presented are for Lomunga RGC.

For the proposed project to be undertaken in an environmentally safe and sound manner, an Environmental and Social Impact Assessment has been undertaken to identify impacts associated with the water supply and sanitation project and propose mitigation measures to prevent, minimise and effectively manage the implementation of project activities. The ESIA is prepared to provide relevant information to the authority and seek approval for the proposed project in Lomunga RGC Bijo Sub-County.

1.2 Current water supply and sanitation in Yumbe District

1.2.1 Water Supply

As outlined in the Yumbe District Development Plan (2021-2025), the district relies solely on exploiting underground water to supply fresh water to its communities. The safe water situational analysis reveals coverage of 48%, calculated based on a source-man ratio of 300 people served by 1 deep borehole, 300 people served by 1 shallow well, 200 people served by 1 protected spring, and 150 people served by 1 tap stand. According to the feasibility study, Yumbe District's access to safe water stands at 45% in rural areas and 63% in urban areas. Sub-Counties with the least coverage include Kerwa (30%), Midigo (31%), Kuru (40%), Kei (43%), Kululu (44%), and Ariwa (45%). In the rural areas of Yumbe alone, approximately 285,691 people lack access to safe water.

In areas with insufficient safe water sources, the majority of the district's population resorts to alternatives which include unprotected sources such as wells, streams, and rivers, posing risks to human health. In instances where communities have access to a protected source, households typically pay a flat fee of up to 1,000 Uganda Shillings per month. However, in areas lacking protected water sources, the community purchases water from vendors, paying between 1,000 to 5,000 Uganda Shillings for a 20-litre jerrycan of water.

Table 1-1: Current Water Supply Coverage by sub-County

S/N	*SUB COUNTY*	*PROJECTED POPULATION 2020*	*PEOPLE SERVED*	*SAFE WATER COVERAGE*
1	Apo	54,958	28,200	51.3
2	Drajini	42,719	28,300	66.2
3	Lodonga	44,484	23,500	52.8
4	Kei	62,490	25,300	40.5
5	Kululu	50,486	21,600	42.8
6	Kuru	55,782	20,300	36.4
7	Midigo	50,016	21,050	42.1
8	Kerwa	44,131	21,000	47.6
9	Odravu	57,783	31,050	53.7
10	Ariwa	32,834	14,400	43.9
11	Romogi	62,372	28,500	45.7
12	Kochi	56,488	29,100	51.5
13	Yumbe town council	47,544	26,850	56.5
	Aringa	**662,087**	**319,150**	**48.2**
	Rural water	**614,543**	**292,300**	**47.6**
	District	**662,087**	**319,150**	**48.2**

Source: DWO-Annual Report 2019

1.2.2 Sanitation Facilities

According to Yumbe District Development Plan (2021-2025), latrine coverage stands at 78.1% down from over 80% in 2019/2020. However, the hand washing coverage in the whole district stands at 72.9% up from about 50% in the previous years.

1.3 Feasibility study

To meet the current water supply needs of Lomunga RGC, the feasibility study recommended one borehole (Kirilo drilled in 2021 with sustainable yields of 100m^3/hr). The borehole is located in Bijo Sub-County, in the respective villages of Kiliro. The yield of the boreholes is of adequate capacity to meet the projected water demand for the proposed piped water supply system for Lomunga RGC. At the intake sites, there will be a pump house and a chemical dosing house. The pump house shall be connected to solar and a standby generator. Water will be transmitted from the source to the storage reservoir proposed site next to the Bura village from where water will be distributed by gravity to the different institutions and communities within the project area villages of Geya, Lomunga, Aliapi, Gira and Bura Parishes.

1.4 Project Location

The different components of the Lomunga RGC are located in Bijo Sub-County, Yumbe District. Tables 1-2 indicate GPS coordinates for the source and reservoir in Kiliro and Bura Villages respectively. These are also indicated in Figures 1-1 to Figure 1-3.

Table 1-2: GPS Coordinate for the Lomunga RGC Components

Component	**Village**	**GPS coordinates**	
Water source	Kirilo	3.430255	31.3090798
Pumphouse	Kirilo	3.430255	31.3090798
Reservoir	Bura	308324	378856

Figure 1-1: Water Transmission and Distribution Network

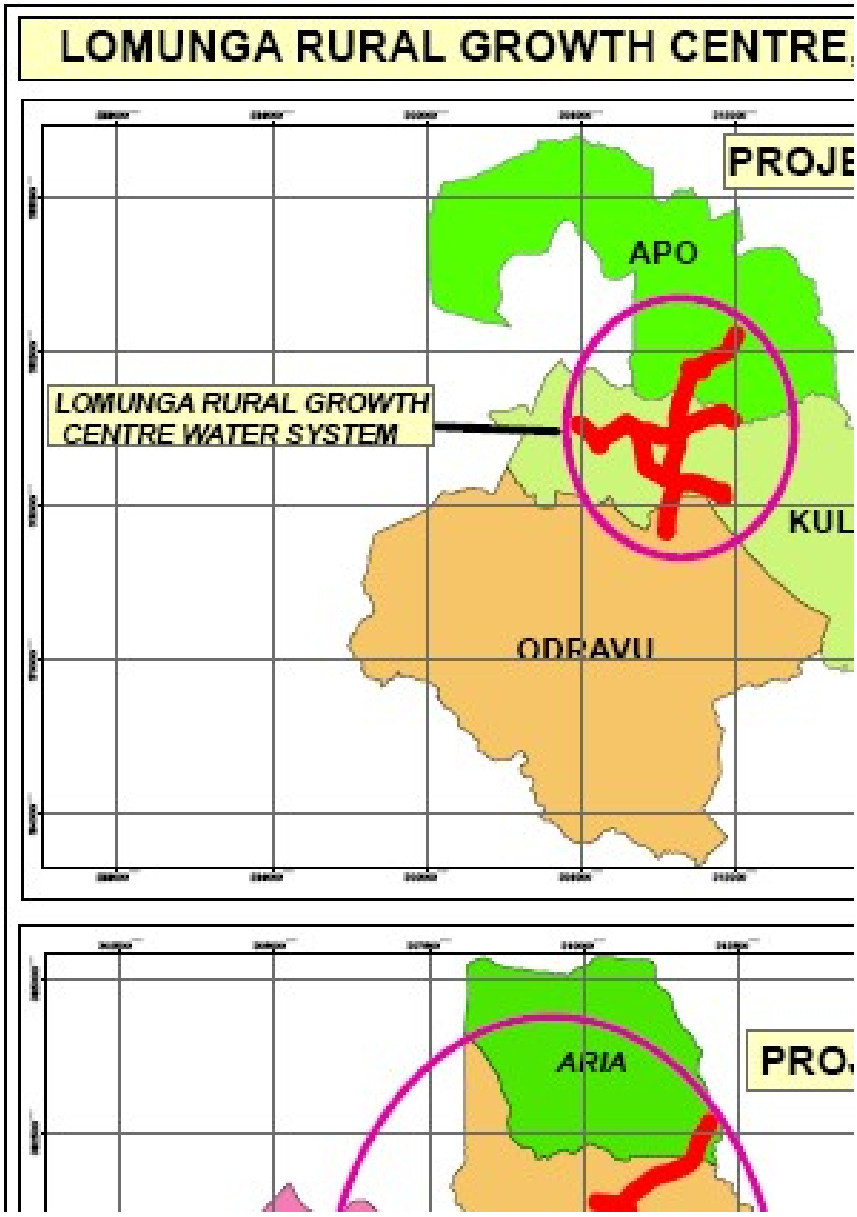


Figure 1-2: Lomunga RGC Water Supply System Project Areas

Figure 1-3: Lomunga RGC Water Supply System

1.5 Project Justification

In Yumbe District, the source of fresh water includes ground water, springs, rivers, wells, streams, gravity flow schemes and boreholes. Water is needed in all aspects of life, for human consumption and production. Rising demand for increasingly scarce water resources is leading to growing concerns about future access to water, particularly where water resources are shared by two or more sub-counties or districts and areas in the eastern belt of the district where the geology makes underground water very scarce.

Though significant strides have been recorded recently, the water supply situation in Yumbe district is not satisfactory. There are also critical challenges (Yumbe District Development Plan 2020/2021 – 2024/2025), faced with access to water in the district including:

- Broken down community-based maintenance system due to inactive water user committees. This is tremendously affecting the functionality of water facilities in the district;

- Lack of hand pump spare parts dealers in the district. This affects responses to repairs and increases repair costs;
- Receding ground water tables in some areas of the district during prolonged dry periods greatly affects the functionality of boreholes,
- Low ground water potential also affects the development of water facilities in some areas.

Improving the quality of life necessitates the exploitation of available water resources for the provision and accessibility of clean water. The district doesn't have much surface water but with some groundwater potential. These sources are being exploited for various usages ranging from human consumption to production.

Suggested strategies to address some of these bottlenecks in water include; strengthening the community-based maintenance system in the district to improve functionality; and instituting a spare parts depot at the District Water Office to serve as a revolving fund to ensure that the water user communities access the spares within their reach and at affordable costs. The district's proposed strategies of motorizing Kiliro drilled production wells to pump water into a storage reservoir and flow under gravity for collection by the community at established tap stands is considered a viable solution to the water crisis in the district.

1.6 The Developer Contact Details

Table 1-3: Contact details of the project developer

Definition	**Details**
Client (Project proponent)	The Permanent Secretary Ministry of Water and Environment of Uganda (MWE)
Contact Details	Ministry of Water and Environment, Directorate of Water Development, Rural Water Supply Department, Plot 3-7, Kabalega Crescent Road, P.O. Box 20026, Kampala, Email: ps@mwe.go.ug / mwe@mwe.go.ug, Telephone: +256 41 4505942.
Funding Agencies	World Bank and GOU

1.7 Project investment cost

The cost estimate for the proposed works for the Lomunga RGC piped water supply and sanitation system is UGX 11,178,794,274 Uganda Shillings Only. For more details. (*Refer to. Appendix 2)*

1.8 The Need for Environmental Impact Assessment

The implementation of the Lomunga Rural Growth Centre piped water supply and sanitation project require an Environmental and Social Impact Study. The piped water supply and sanitation Project falls under the Fifth Schedule of the National Environment Act No. 5 of 2019 as amended, which lists projects to be considered for ESIA. Section 19 (3) of the National Environment Act No. 5 of 2019 as amended made the utilization of water resources, water supply and sanitation facilities mandatory for Environmental and Social Impact Assessment for all projects that are likely to or will have significant impacts on the environment so that adverse impacts can be identified, avoided, reduced, mitigated or compensated based on the mitigation hierarchy.

Overall, the project triggered four (4) World Bank Operational policies which included Environmental Assessment (OP/BP/GP 4.01), Natural Habitat (OP 4.04), Physical Cultural Resources (OP 4.11), Involuntary Resettlement (OP/BP 4.12). In addition, safeguards implementation shall comply with the requirements of the World Bank Group Environmental, Health, and Safety (EHS) Guidelines for general Construction and Decommissioning as well as the EHS guideline for Water and Sanitation. The ESIA has been developed in conformity with the National and World Bank safeguards policies and framework.

Following the environmental and social screening of the proposed project activities, Lomunga RGC water supply and sanitation is classified as Environmental Assessment (EA) Category B since the anticipated negative impacts will be localized, site-specific, and small to moderate in scale. The project is not anticipated to generate any potential large-scale, significant and/or irreversible impacts. It is also not located in environmentally sensitive areas, and its associated impacts can be mitigated with relatively standard mitigation measures.

1.9 Purpose and Objectives of the Environmental Social Impact Assessment

Section 110 (Part X) of the National Environment Act, 2019 requires that all projects or policies that may, are likely to or will have significant impacts on the environment should be subjected to Environmental and Social Impact Assessment (ESIA) so that adverse impacts can be eliminated or mitigated. These projects (for which ESIA is mandatory) are listed in the fifth schedule of the Act.

The purpose of the Environmental Impact Assessment therefore, is to provide necessary information on the proposed activity to guide the Authority and the Lead Agencies in decision-making and ensure that the project is implemented to enhance environmental and social sustainability of the project.

The prime objective of this ESIA study is to assess and identify any significant positive or negative impacts arising from the activities of the proposed project. This assessment will help the developer, the Lead Agencies such as the Local council, district local government, and NEMA in undertaking informed decisions and ensuring compliance of this development with the Ugandan legislation

The specific objectives of the study included;

a) To describe baseline Environmental and Social conditions of the project site and its environs, including the bio-physical, social and cultural aspects, and to assess how these conditions will be affected by the proposed project.

b) To Assess the site suitability of the proposed project components taking into consideration Environmental and socio-economic concerns by discussing project alternatives.

c) Identify, analyze and evaluate the type and extent of likely environmental and social risks and impacts on the existing biophysical and socio-economic environment and their enhancement/mitigation measures that will cost-effectively address the risks and impacts associated with the project;

d) Undertake public consultations with stakeholders to discuss the environmental and social impacts, as well as key project benefits

e) Compile an Environmental Social Impact Statement (ESIS) incorporating an Environmental Social Management Plan (ESMP) for all aspects of the development to guide decision-making and act as the basis for future monitoring of the project by the developer and Environmental Management Authorities

2 STUDY APPROACH AND METHODOLOGY

2.1 Overall Approach

The ESIA followed the process as outlined in the National Environment Management Authority (NEMA) Guidelines for Environmental Impact Assessment in Uganda, 1997 (NEMA 1997).

The project environment, components, activities, impacts and future operations have been examined. To fulfil the requirements of the study, several methods applied during the ESIA study to assess the environmental and social baseline conditions of the project area and the extent, duration and nature of potential impacts and the receptors. The assessment methods used to conduct the assessment are detailed below:

2.1.1 The Environmental Impact Assessment Process

The ESIA process in Uganda is guided by regulations in Section 114 of the National Environment Act Cap 2019. The ESIA Regulations of 2020 set out the procedures and criteria for the submission, process and consideration of and decisions on applications for the Certificate of Approval of projects.

The EIA process in Uganda is divided into three main phases (Figure 2-1), which are the Screening Phase, the Environmental Impact Study (EIS) Phase and the Decision-Making Phase. A detailed description of the EIA process in Uganda in general can be obtained from the "Guidelines for Environmental Impact Assessment in Uganda" (NEMA, July 1997).

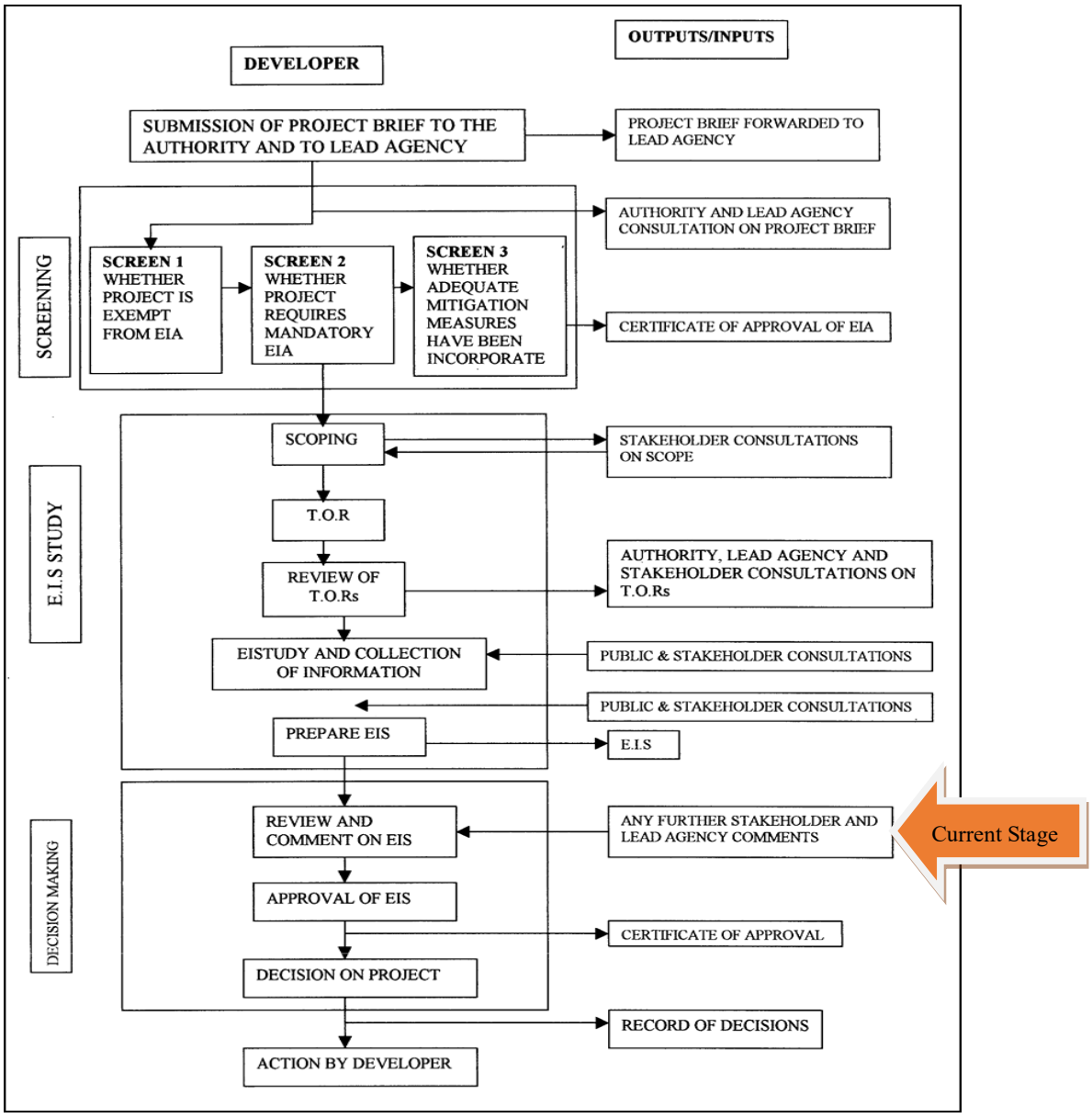


Figure 2-1: ESIA Process in Uganda

2.1.2 Field Visit

This marked the first joint field inspections and meetings with representatives of the project proponent and local authorities in the area to pave the way for further involvement of their officers in subsequent meetings and consultations. The main objective of these meetings was to agree on expectations of the assignment, its execution procedure, focal and reference points of the proposed project and work plan.


Plate 2-1: Meeting with Yumbe District Local Government

2.1.3 Scoping Study

An essential element of the ESIA is the environmental scoping study which was undertaken following World Bank OP. 4.01 and the EIA Regulations,2020. A scoping study was undertaken to determine the extent and approach of the ESIA at an early stage in the planning process, identify the important issues to be examined during the ESIA, and thus develop the Terms of Reference (ToR) for the ESIA. The TORs were subsequently approved by NEMA on 9th June 2023 following consultation with lead agencies (Appendix 1- NEMA Approval Letter for TOR).

2.1.4 Literature Review

The purpose of the literature review was to determine the requirements of the project in terms of all relevant legislation, as well as reference the assessment of similar projects and good practices elsewhere, to gain insight into the current state of the area.

During the ESIA process, the team reviewed documents provided by the Developer and those from other sources such as Feasibility study reports, Environmental and Social Management Framework (ESMF) for the Integrated Water Management and Development Project-, IFC Environmental Health and Safety Guidelines for Water and Sanitation Projects, World Bank Safeguards policies and other documents provided by district staffs on project location such as District Development Plans, district state of environment and health reports among others.

Other documents reviewed include relevant National Household survey reports, (UBOS, 2014, 2020), The Project Appraisal Document for IWMDP, 2018, The Environmental and Social Management Framework (ESMF) for the Integrated Water Management and Development Project (IWMDP), policies, regulations, legal framework relevant to water and sanitation sector.

2.1.5 Public /Stakeholder Consultation and Participation

Public participation ensures that due consideration is given to public values, concerns and preferences. It encompasses the public actively, sharing in the decisions that government and other agencies make in their search for solutions to issues of public interest.

Public consultation in this project was done with the following aims:

- To inform the community and other stakeholders about the proposed project and its objectives.
- To seek views, concerns and opinions of the local community and other people around the area concerning the project.
- To establish if the local people foresee any positive or negative environmental effects from the proposed project and if so, how they would wish the perceived impacts to be addressed.
- Propose and discuss solutions and mitigation measures to the potential negative impacts and various concerns development.

The following principles were taken into consideration during stakeholder engagement:

- **Openness and life-cycle approach:** Public consultations for the proposed project were arranged during the whole life-cycle, carried out openly, free of external manipulation, interference, coercion or intimidation;
- **Informed participation and feedback:** Information was provided to and widely distributed among all stakeholders in an appropriate format; opportunities were provided for communicating stakeholders' feedback, for analysing and addressing comments and concerns;
- **Inclusiveness and sensitivity:** Stakeholder identification was undertaken to support better communications and build effective relationships. The participation process for the projects was inclusive. All stakeholders at all times were encouraged to be involved in the consultation process. Equal access to information was provided to all stakeholders.
- Special attention was given to vulnerable groups, in particular women, youth and the elderly

Stakeholder consultations were carried out during the assessment process, to ensure that all stakeholder concerns were incorporated into project planning and implementation in line with the statutory consultation requirements under World Bank environmental and social safeguards policies, as well as the first schedule of the Uganda ESIA Regulations 2020.

Data on the potential environmental and social impacts and stakeholder perceptions, views and concerns were collected through focus group discussions, community meetings and personal interviews with the target audience including but not limited to all communities within Lomunga RGC.

The emphasis of the consultations was laid on environmental and social concerns expected in the process of laying transmission and distribution water pipes within the project area,

obligations of the various parties in mitigating the various impacts anticipated and the procedure for operating the water and sanitation project among others.

Discussions with the proponent and consultation with relevant officials at the Yumbe District Headquarters and Bijo sub-county were held. Similarly, verbal interviews with key project beneficiaries and key stakeholders were carried out. Consultations were conducted at the National and Local levels. Consultations were held with the Ministry of Water and Environment, Yumbe District Local Government, Bijo Sub-County officials, LC1 chairman of project villages and their respective local community members.

2.1.6 Field survey methods

2.1.6.1 Flora survey method

To study the vegetation structure and composition of Lomunga RGC, a methodology combining field observations and sampling was employed, guided by a Global Positioning System (GPS Garmin 62CSx) to locate plots along the proposed project pipeline alignment, borehole sites, and reservoir site. The systematic sampling technique was used, ensuring each unit had an equal probability of inclusion in the sample. The first unit was selected using random numbers, and subsequent units were selected automatically according to a predetermined pattern. Plots were placed within 30m limits, alternating along the proposed transmission and distribution routes. Standard nested circular plots were established at 0.5 km intervals along water transmission and distribution lines from the boreholes to the reservoir site.

A random sampling technique was applied to sample vegetation at the proposed reservoir, borehole site, trading centres and access roads. The circular plots consisted of a 10m radius plot for trees with a diameter at breast height (DBH) of ≥10 cm, a 5m radius plot for lianas, shrubs, and trees with a DBH ≤ 10cm but ≥2.5 cm, and a 2m radius plot for all grasses and herbs. Specimens of plant species that could not be immediately identified were collected, photographed, and pressed on-site for further confirmation at the Makerere University Herbarium (MHU), where identification and archiving were conducted.

2.1.6.2 Field survey methods for fauna

Herptiles.

a) Visual Encounter Survey (VES) method

Herptiles (Reptiles and amphibians) were surveyed using the Visual Encounter Survey (VES) method. Random search during VES increases the chances of finding animals in addition to covering a wider survey area. The water and sanitation project corridors were used as a transect and VES for reptiles was conducted following the transmission and distribution corridor visually searching for animals. This method involved a search on the ground, in the leaf litter, along the seasonal wetlands that traversed the project area and in proximity gardens and encountered species were noted. Species were assessed against the IUCN Redlist to understand their conservation status.

b) Interview with Local People

Reptile surveys for this assignment were also conducted through interviews with local people, on sightings of physical signs (skin shades and colour, prints, bones, faecal samples etc.) of Reptile presence within the area.

Sampling design

Herptiles were sampled along the proposed water transmission and distribution corridor covering a sampling width of 30m from the edge of the road along the proposed line since herptiles are highly mobile animals. The sampling interval was determined by the spatial distribution of the chosen habitats.

2.1.7 Air Quality surveys

The assessment focused on the Criteria of Air Contaminants (CAC) and Greenhouse Gases, which reflect the project emissions of concern for human and environmental health. Major sources of outdoor air pollution in the project area will be vehicular traffic, human and economic activities. Air pollutants considered in the assessment included Particulate Matter of both inhalable particle sizes between PM10 and below PM2.5, Nitrogen Dioxide (NO2), Carbon Monoxide (CO), Volatile Organic Carbons (VOCs) and Carbon dioxide (CO2).

MX6 Multigas Monitor Industrial Equipment was used to measure air quality parameters. Air quality measurements were taken on the Carbon dioxide, Carbon monoxide, Nitrogen Oxides (NOx), Volatile Organic Carbons (VOCs) and Carbon dioxide (CO2)

Suspended Particulate Matter (SPM) was sampled using a Hand-held laser particles counter. Model 3887, which sucks and filters particles from a known volume of air sample. Particle sizes of 0.3µm, 0.5 µm, and 5.0 µm are measured and the results of concentration are displayed on the screen and recorded accordingly. The principle involved in the Suspended Particulate Matter (SPM) sampling method is that the particles are filtered from the known volume of an air sample by a suction apparatus. The results of the concentration of particulate matter are displayed on the screen and recorded.

All measurements were taken during the day, a state that generates varying readings from night-time readings due to influencing environmental seasonal or human factors such as existing economic activities, human or vehicular movements, wind velocity and high or low temperatures.

Spot measurements were undertaken during the field survey and measurement lasted 10-15 minutes at each air quality monitoring location during which GPS coordinates were taken and maps developed. All field data was recorded using a standard data capture form. All conditions (such as vehicle traffic, human activity, motor engines running, and weather) during measurements were also recorded. Measurements at the intake site (borehole site and pump house site, sample sites along the transmission and distribution route, key receptor areas especially within trading centres, health facilities, schools and the proposed site at the reservoir tank were taken accordingly

All ambient air quality measurements presented, were benchmarked against the World Health Organisation Air Quality Guidelines (WHO AQG), 2006, and the International Finance

Corporation of the World Bank Group (IFC) Environmental, Health, and Safety Guidelines: Environmental Air Emissions and Ambient Air Quality (2007).

2.1.8 Noise Assessment Survey

Noise pollution is defined as unwanted sounds or sounds that are loud or unpleasant. Sounds are considered noise pollution if they adversely affect wildlife, or human activity or are capable of damaging physical structures regularly.

In addition, it is considered noise pollution if sound disturbs any natural process even if the sound does not occur regularly. Noise from various sources intrudes unreasonably into the daily activities of human beings and animals creating adverse effects.

The sound level was measured by using Precision Integrating Sound Level Meter Type: 4 in one Digital Sound Level Meter, Model CEM DT 8820 (range 35 – 130 dBA) for noise, (-20 – 750^{o}C) for temperature, (25% - 95%) relative humidity and (0 – 20000 LUX) for light intensity.

The charged sound level meter was adjusted for slow time response. Baseline noise measurements were undertaken at locations along the project area with potential receptors (trading centres, health facilities, schools, the intake site, pump house site, sample sites along the transmission and distribution route and the proposed site at the reservoir tank) were taken accordingly with maximum and minimum recordings taken for the particular site and respective average sound levels calculated as the final readings. Data obtained from baseline noise monitoring was processed and presented according to the analysis and compared with the maximum permissible noise levels.

2.1.9 Mapping and Photography

Spatial location data for the major project component sites (reservoir tank, intake area, pump house, water office, sanitation facilities) and key receptor areas were captured using Global Positioning Systems (GPS), and maps were processed and generated using Geographic Information Systems (GIS). Photographs of the site's status quo, stakeholders' meetings and the surrounding environment were taken using digital cameras to record empirical evidence as presented in the various sections of the report.

2.2 Geotechnical Soil Tests

According to the design report, the geotechnical investigations were carried out as a prerequisite for the designs following approval of the draft design of the proposed water supply and sanitation system.

The key activities comprised; excavating one (1 No.) test pit at the reservoir tank site to a depth of 1.0m, excavating one (1 No.) at the borehole site to the depth of 0.5m, soil sampling (retrieving both disturbed and undisturbed soil samples), description of soil properties, conducting Dynamic Cone Penetrometer(DCP) at the existing ground and 0.5m (borehole) and 1.0m (reservoir) depth in each of the test pits for covered Regional Growth Center of Lomunga, logging and establishing the occurrence of ground water in each trial pits where

encountered, laboratory analysis of retrieved soil samples. For findings of the geotechnical tests, refer to section 5.1.7).

The test pit positions were predetermined as enumerated by the coordinate's locations below;

Table 2-1: Test pits Locations

RGC	Reservoirs		Boreholes	
	E	N	E	N
Lomunga	308417.0	378505.0	311988.3	379549.6

2.2.1 Social Economic Baseline Methodology

Social baseline conditions are important in understanding the potential socio-economic impacts of the project components such as its effect on existing social services, availability of local labour and induced changes in population dynamics (in-migration, effects on domestic violence, family breakups, child labour, school dropout rate, early marriages and HIV/AIDS among others). Factors such as literacy levels in the local community influence how objectively a project is perceived and appreciated.

The objective of the socioeconomic baseline study was:

a) To assess the existing situation of the proposed project area.

b) To analyze the socioeconomic impact of the proposed project on the local community.

c) To collect the community's expectations and fears about the proposed project.

d) To build a prior trust between stakeholders of the project and the local community

2.2.1.1 Sampling Methods

The socioeconomic baseline adopted the following methods

a) Purposeful/convenience sampling: Samples were picked from all the lowest administrative units for Lomunga RGC and the district local government political leaders and technical personnel as representatives of the whole catchment area.

b) Random sampling: Households were randomly selected from the village lists that were provided by the respective LCI chairpersons. After obtaining the household lists, a simple random sampling method was used to select the sampled households targeting the head of household. Where no one was found at home, a substitute was randomly selected.

The study sampled about 10% of households from Lomunga RGC. The sample size is provided in Table 2-4 below.

2.2.1.2 Methods of data collection

a) **Key Informant Interviews**

Key informant interviews were conducted to gather information from leaders at District, sub-county levels and community. The sample at the district level included the Chief Administrative Officer, LCV Chairperson, District Natural Resources Officers, District Environment Officers, District Community Development Officers, Engineers, District Physical Planners and District Water Officers, District Education officers, and District gender and probation officers; details of these engagements are in Appendix 3

	
Engagement at Bijo sub-county	Engagement with Yumbe district water office

b) **Focus Group Discussion**

This technique involves a small group of respondents (usually 6-10 respondents) who were interviewed together in a common location. The interviewer leads the discussion and ensures that every person has an opportunity to respond. Focus groups allow a deeper examination of complex issues than other forms of survey methods. Two focus group discussions were held with the women groups, traders and sub-county leaders.

	
Engagement at Lomunga RGC RGC	Engagement at Lomunga RGC

c) **Structured interviews**

Primary data was collected by interviewing randomly sampled households from the rural growth centre members of the study population. The in-personal structured interview method was used to collect household data with the aid of a structured questionnaire.

The table below 2-4 summarises the data collection methods, study participants and sampling method used.

Table 2-2: Summary of study participants and sampling method used

Data Collection Method	Participant category	No of Participants	Sampling Method
Structured Questionnaire	Local Residents	239	Probability sampling (Random)
Key Informant Interviews	Sub-County Officials	20	Purposive
Focus Group Discussion	Women groups& Traders	2	Purposive

Direct observation and photography

Direct observation and photography were used to obtain useful and timely information by observing key features in the area such as nearby communities, public institutions such as schools, health centers, markets, roads, water sources, cultural sites, land use patterns and economic activities among others. The team obtained key insights and informed findings that helped in understanding the potential impacts and risks i.e. positive and negative related to the catchment area context.

Data analysis

a) **Quantitative data analysis**

Data was regularly cleaned before entry. Quantitative data from the questionnaires was entered and analyzed using the Statistical Package for Social Scientists (SPSS). Frequency and percentage tables as well as bar charts were generated and used to present the quantitative results.

Qualitative data was transcribed and arranged according to existing and emerging themes through content analysis methods. The qualitative analysis largely followed the questions and themes of the study within the interviews and FGD guide.

2.3 Impact Assessment Criteria

The assessment identifies the intensity of the predicted impacts resulting from construction and operation of the project and the resulting level of effect against identified sensitive receptors. These impacts and effects occur as a result of an interaction between project works and the identified baseline. To determine the level of effect (severity or significance), the likely intensity of the impact and the sensitivity of the receptor are defined.

Table 2-3: Likelihood of occurrence classification

Probability of occurrence		
Level	**Probability**	
5	Certain	• Very likely to occur (5) Could occur either immediately or within a short period (likely to occur most weeks or months)
4	Likely	• This impact will probably occur in most circumstances if controls are not applied (several times a year) (4)
3	Possible	• This impact could occur at some time if controls are not applied May happen every 1 to 15 years). It is expected that the impact will occur; Chance of occurrence (3)
2	Unlikely	• This impact is not likely to occur. Chance of Occurrence (2).
1	Highly unlikely	• Very unlikely to occur (1)

The criteria for evaluation of the magnitude of environmental and social impacts has been categorised in terms of:

Probability: Probability of occurrence is evaluated by the predicted impact on the subject environment on a Likert scale (Certain, Likely, Very, Possible, Unlikely and Highly unlikely)

Extent: evaluates the area of occurrence/influence by the impact on the subject environment; whether the impact will occur;

- on the site, in a limited area (within 1 km radius of the site);
- locally (within 5 km radius of the site);
- Regionally (district-wide, nationally or internationally).

Duration: evaluates the duration of impact on the subject environment, whether the impact will be

- temporary (< 1 year) or during construction phase only;
- medium term (5 – 10 years or lasting after construction has been completed);
- Long-term (>10) or permanent.

Intensity: the quantifiable effects of impacts, measured where possible, against the appropriate standard for a respective environmental component. This includes existing standards, guidelines or scientific evidence and in worst case scenario expert judgment,

(Scale of 1 -3: Low, Medium or High).

Magnitude: Magnitude has been represented by the combination of intensity, duration, frequency of occurrence of event or impact, and anticipated extent of impact.

Using professional interpretation of the criteria mentioned above (extent, duration, and magnitude) in combination with the likelihood of occurrence (Table 2-5) and several other factors including ecological/social sensitivity, acceptable regulatory and legal limits, and the sensitivity of the receptor. The **overall Impact Significance**: A product of sensitivity and Magnitude and is assigned a rating of Low, Medium or High.

Type of Impact: Categorises into direct, indirect or cumulative effects of the specific impact.

Direction: Negative or Positive. Reversibility: Irreversible or Reversible

Table 2-4: Criteria for rating overall impact significance (environment parameters)

Impact rating	**Description of impact**
High	• Highly noticeable effects on the environment, difficult to reverse. • Widespread degradation of resources restricts the potential for further usage. • A significant contribution to a known global environmental problem when compared with the industry worldwide. • Sub-lethal effects upon a globally or regionally endangered species compromising reproductive fitness and/or resulting in long-term disruption/disturbance to normal behaviour. • Air quality/noise approaching occupational exposure limits. Water quality parameters approaching maximum stipulated values. • Periodic widespread nuisance both on and off-site.
Medium	• Noticeable effects on the environment, reversible over the long term. • Localized degradation of resources restricts the potential for further usage. • Sub-lethal effects upon a globally or regionally endangered species with no effect on reproductive fitness and/or resulting in disruption/disturbance to normal behaviour returning to normal in the medium term. • Elevated contribution to global air pollution problem partly due to preventable releases. • Frequent breaches of water/air quality and noise guidelines. • Causing localized nuisance both on and off-site.
Minor	• Noticeable effects on the environment, but returning naturally to the original state in the medium term.

Impact rating	Description of impact
	• Slight local degradation of resources but not jeopardizing further usage. • Disruption/disturbance to the normal behaviour of a globally or regionally endangered species returning to normal in the short term. • A small contribution to the global air problem is through unavoidable releases. • Elevation in ambient water/air pollutant levels greater than 50% of guidelines. • Infrequent localized nuisance.
Negligible	• No noticeable or limited local effect upon the environment, rapidly returning to its original state by natural action. • Unlikely to affect resources to a noticeable degree. • No noticeable effects on globally or regionally endangered species. • No significant contribution to the global air pollution problem. • Minor elevation in ambient water/air pollutant levels well below guidelines. • No reported nuisance effects.

Table 2-5: Criteria for rating overall impact significance (Social and economic parameters)

Criteria	Significance Definition	
Harm to People	Potential; to cause fatalities, mutilations or serious chronic health problems to a person	High
	Potential to cause Lost Time Incidents	Medium
	Not likely to result in Lost Time Incidents	Minor-Negligible
Assets	Major damage to on-site infrastructure, halting operations and incurring substantial delay in supplying replacement equipment	High
	Minor damage to individual items of equipment for which a spare part or replacement can be quickly mobilized to the development	Medium
	Damage resolved by on-site reserves, maintenance equipment and on-site personnel	Minor-Negligible
Reputation	Incidents attracting critical reporting requiring the company to take measures to maintain its reputation, or for which the company could be prosecuted and receive a token fine or be required to pay compensation to third parties	High

Criteria	Significance Definition	
	Incidents attracting local news coverage and complaints, which involve expense in engaging local communities to apologize, clarify issues and make amends	Medium
	An incident that does not provoke complaints	Minor-Negligible

A tabulated summary of all impacts is presented followed by a discussion of impacts anticipated, mitigation or enhancement measures proposed in chapter 8, table 8:1.

2.3.1 Cumulative Impact Assessment Methodology

Cumulative environmental effects can be defined as effects on the environment which are caused by the combined results of past, current and future activities. The combined, incremental effects of human activity, referred to as cumulative impacts, pose a serious threat to the environment. While they may be insignificant by themselves, cumulative impacts accumulate over time, from one or more sources, and can result in the degradation of important resources. The following methodology was adopted:

Step 1: Scoping Phase I –

VECs, Spatial and Temporal Boundaries: This involved the identification and establishment of VECs, spatial and temporal boundaries of assessment. It further involved identification and agreement on VECs in consultation with stakeholders, determining the time frame and establishing the geographic scope. This guided on knowing whose involvement is key; which VEC resources, ecosystems, or human values that were affected by the development. The known or anticipated cumulative impact issues within the area; concerns for cumulative impacts were identified in consultation with stakeholders, including potentially affected communities in addition to other regional assessments prepared for other projects within the area or region.

The temporal scope for the Cumulative Impact Assessment (CIA) was defined in relation to the lifespan of the Lomunga water and sanitation Project (as described in Chapter 4: Project Description) and the duration of the Project's impacts. In summary, Site Preparation and Enabling Works are scheduled to commence in 2024. The operation of the Project is scheduled to last 20 years after which decommissioning will take place. In total, the Project duration through all phases will be approximately 21 years although the Project's impacts may last beyond this date.

Step 2: Scoping Phase I –

Other Activities and Environmental Drivers: This involved the identification of other past, existing, or planned activities within the analytical boundaries. Assessment of their potential presence of natural and social external influences and stressors. This guided in knowing if there were any other existing or planned activities affecting the same VEC and if there are any natural forces and/or phenomena affecting the same VEC. Though not documented, it

was reported that there are plans in the future to extend electricity grid to the area. The development of such infrastructure in the area will further increase infrastructural developments in form of transformers and distribution lines in the project area and neighbouring areas. All these infrastructural development projects have similar socio-economic and biophysical impacts and all the major cumulative impacts of these projects have been highlighted in chapter 8.

Step 3: Establish Information on the Baseline Status of VECs

This involved understanding the VEC's potential reaction to stress, its resilience, and its recovery time through the assessment of trends. This is because determination of the trend of change in the baseline condition of a given VEC over time may indicate the level of concern for cumulative impacts. Therefore, it was helpful; to know the existing condition of the VEC; establish the indicators to be used to assess such conditions; identify any other additional data needed and know those who may already have this information required. Data was limited and targeted to indicators that would allow the determination of any changes in VEC conditions as it provides a baseline condition that integrates the collective effects of all existing developments and exogenous pressures. Other developments within, or likely to overlap with, the Project AoI were noted based on the stakeholder consultations since no feasibility and surveys have been done.

Step 4: Assess Cumulative Impacts on VECs

This involved estimating the future state of the VECs that may result from the impacts they experience from various past, present, and predictable future developments through identification of potential environmental and social impacts and risks; assessment of expected impacts as the potential change in the condition of the VEC (i.e., viability, sustainability) and identification of any potential additive, countervailing, masking, and/or synergistic effects.

This guided in answering the questions on key potential impacts and risks that could affect the long-term sustainability and/or viability of the VEC; the known or predictable cause-effect relationships and the interaction of these impacts and risks to each other. Given the scale of the Project Area of Influence (AoI), particularly in relation to the project's indirect impacts, the anticipated developments considered have been prioritised based on the following criteria:

- The development's impacts are likely to overlap with the Project AoI;
- The development is of a type and scale that means it is likely to result in significant environmental and social impacts;
- The development is likely to have impacts on the VECs that fall within the scope of the CIA;
- The development is reasonably defined at the time the CIA was conducted; and
- The development is likely to proceed based on its known status.

While the CIA is not solely focussed on the electricity distribution that was noted during consultations, it recognises that electricity distribution developments are the primary source

of cumulative impacts in the area that was assumed and that these developments are interrelated to a certain extent.

Step 5: Assess Significance of Predicted Cumulative Impacts

The significance was evaluated not in terms of the amount of change, but in terms of the potential resulting impact on vulnerability and/or risk to the sustainability of the VECs assessed implying evaluation of CIs in the context of ecological thresholds.

The impact assessment methods for the CIA are aligned with the methods used for the ESIA (based on the magnitude of the impact against the receptor's sensitivity). The significance of a cumulative impact is evaluated in terms of the impact on the sustainability of the VEC i.e. the risk that the threshold will be exceeded.

VEC sensitivity considers how a particular VEC may be susceptible to a given potential impact. More sensitive VECs may experience a greater degree of change, or have less ability to deal with the change, compared with less sensitive receptors that may be more resilient or adaptable. VEC sensitivity is based on multiple characteristics, namely:

- Vulnerability: the degree to which a VEC is vulnerable to change (i.e. higher sensitivity) or resilient to change (i.e. lower sensitivity). A VEC that is declining towards an unsustainable state and/or critical threshold would be of high sensitivity; and
- Value: the degree to which a VEC is valued by stakeholders or protected, with higher value receptors (based on ecological, cultural, social, economic, or other grounds) having a higher sensitivity.

The sensitivity of a receptor may be rated as high, moderate, low, or negligible based on the criteria set out in Table 2-6 below.

Table 2-6: Sensitivity Criteria

Sensitivity	Description
High	The VEC has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental value, or of international or national importance.
Medium	The VEC has a low to moderate capacity to absorb change without fundamentally altering its present character, is of some environmental value, or of regional importance
Low	The VEC is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The VEC is resistant to change and is of little environmental value.

Impact magnitude

The magnitude of a given impact is the degree of change from the baseline conditions within the Study Area, and is determined through the consideration of the following factors:

- Extent: the spatial extent e.g. the area impacted, population affected;
- Duration: how long the impact will last i.e. temporary (e.g. during construction) or long-term or permanent; and
- Frequency: how often the impact will occur (e.g. a one-off event, periodic, or continuous); and
- Reversibility: the length of time for baseline conditions to return (e.g. reversible in the short-term or long-term, or irreversible).

The magnitude of an impact can be rated as high, moderate, low or negligible based on the criteria set out in Table 2-7 below.

Table 2-7: Impact Magnitude Criteria

Magnitude	**Description**
High	Major long-term or permanent alteration to key elements/features of the baseline conditions such that the character/composition of baseline condition will be fundamentally changed.
Moderate	Permanent loss or alteration to key elements/features of the baseline conditions such that the character/composition of the baseline condition will be materially changed.
Low	Changes arising from the alteration will be detectable but the underlying character/composition of the baseline condition will be similar to the pre-development situation
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a "no change" situation.

Impact Significance

nificance

e

Once the VEC sensitivity and impact magnitude have been rated, the overall significance of the impact is predicted based on the risk to the sustainability of the VEC. The resulting significance level was also interpreted based on professional judgement and expertise.

2.4 Structure of the Environment Impact Statement

This Environmental and Social Impact Statement is divided into 9 Chapters as indicated in Table 2-8 below;

Table 2-8: Structure of the ESIA

Chapter 1	Gives the introduction to the project and the report
Chapter 2	Contains the project description
Chapter 3	Discusses the legislation taken into consideration that has a bearing on this project;
Chapter 4	Presents the biophysical baseline information of the project area
Chapter 5	Presents the social baseline information of the project area
Chapter 6	Presents project alternatives;
Chapter 7	Presents stakeholder engagement and disclosure;
Chapter 8	Describes potential impacts and suggested mitigation measures;
Chapter 9	Contains the ESMP.
Chapter 10	Conclusion and Recommendations

3 PROJECT DESCRIPTION

3.1 Introduction

To address the water supply gap in Bijo Sub-County, a solar-powered piped water supply system with a ground water source, elevated water storage steel tank and distribution pipes capable of meeting the daily drinking water needs, as the pressure permits.

3.2 Land Acquisition

The project will acquire land for all project-related components. The ESIA assessed the conditions of the sites. The risks and challenges related to the land acquisition were assessed concerning relocation, loss of residential land, or loss of shelter, economic displacement (loss of land, crops, assets, or access to assets leading to loss of income sources or other means of livelihood); alternative sites and the possibility of land conflicts.

3.2.1 Total Land Requirements

The project will require land to host project infrastructure. According to the design consultant, pipelines are to be laid along roads and within road reserves. A working corridor of 3m along the pipelines is anticipated. Working corridors will be restored after completion of work, and repossessed by the respective owners. Although MWE and the design consultant do not anticipate land take for pipelines, it's better to assume that land take will be mandatory for the entire water transmission/distribution pipeline. Total land requirements for the Lomunga WSS have been estimated at **18.54 acres**. However, the project case scenario is that the treated water transmission main and primary distribution network will follow a road reserve hence actual land required for the project is **14.49 acres.** This excludes land requirements for access road construction which will be determined by the contractor and based on his approach to the assignment. Details of various land takes are presented in the table below.

Table 3-1: Land Requirements for the Proposed Project

Scheme	**Component**	**Dimensions (m)**		**AREA**		
		Length	**Width**	**m^2**	**Acres**	**Hectares**
Lomunga	Borehole	146	100	14,600	3.61	1.46
	Reservoir	30	30	900	0.22	0.09
	Office	30	30	900	0.22	0.09
	Total			16,400	4.05	1.64
Land requirements for the raw water mains, transmission and primary distribution assuming a width of 3 meters						
Scheme	**Component**	**Details**			**Length (km)**	**Land need (acres)**
Lomunga	Transmission Pipe 1 from Borehole 1 to the Proposed Reservoir	A 3-meter width easement corridor			4,455	3.30

	Distribution Pipe	A 3-meter width easement corridor	15,088	11.18
	Total		**19,543**	14.49
Total land requirements for all infrastructure (acres)				**18.54**

Note Primary distribution mains to follow road reserve hence no need for land acquisition since it is public land. Therefore, the actual land to be acquired is approximately ***14.49 acres****.*

3.3 The water supply system

Lomunga RGC will comprise of two components i.e., water supply and sanitation systems. These are discussed in the sub-sections below.

The water component will include solar-powered piped water systems sourcing water from the Kiliro borehole and pumping it into the reservoir elevated at Bura Village from where it will be distributed to different points. The borehole will be equipped with a submersible vertical pump of capacity suitable to abstract water equivalent to the safe yield.

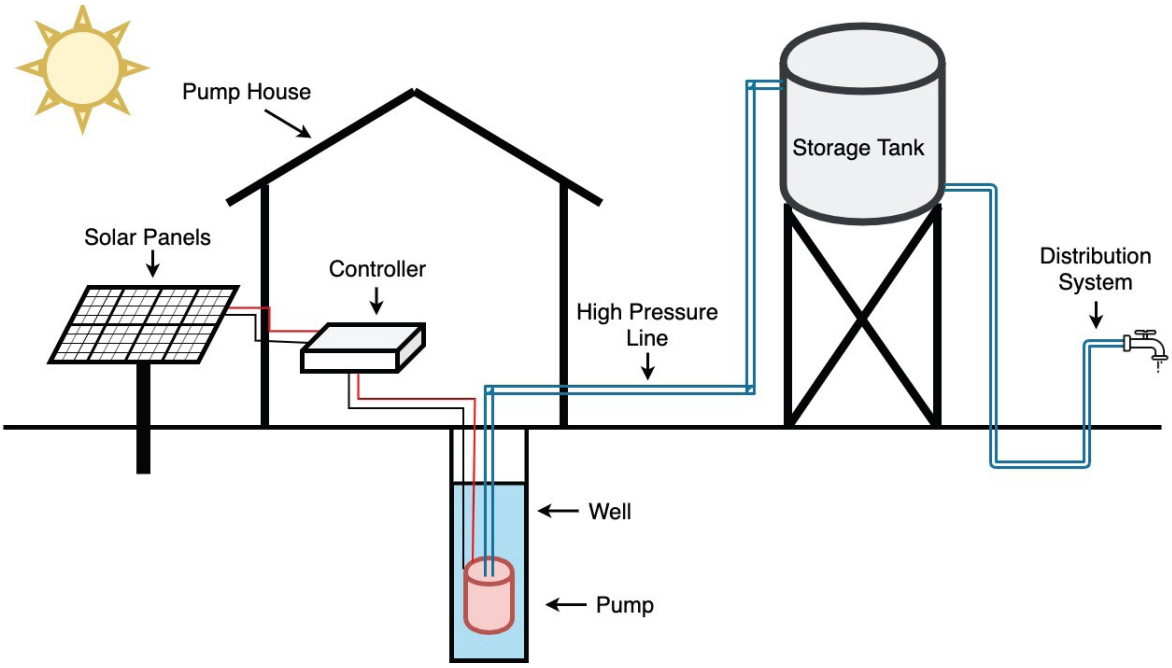


Figure 3-1: Overview of Solar Powered Water System.

3.3.1 Design Overview – Water Supply

The design criteria adopted for the detailed design of the Water Supply System were based on the MWE Water Supply Design Manual, 2013 and other international standards deemed applicable as described in the following sections in this chapter.

The design involves hydraulic designs and sizing of the system components with due consideration of best practices.

3.3.2 Water abstraction system

The water development strategy is to abstract the current and projected water demand for Lomunga RGC from the borehole as follows:

Kirilo Borehole	Coordinates	- 312072E
		- 379603N
• Output	90 m^3/hr	- (720 m^3/day for 8 hours of operation a day)

The borehole will be equipped with a submersible vertical pump of capacity suitable to abstract water equivalent to the above safe yield. The pumping mains from the borehole will deliver water to a central water storage tank.

The borehole pump station comprises the wellhead in the middle of a 2x2m concrete platform and a 60 m^2 blockwork structure housing the pipework fittings and electrical controls. The pump station is situated on a 10,000 m^2 site that is enclosed with a 2.1m high concrete post and chain link fence. Access will be by a 3m wide gravel access road.

The submersible pump will be installed with an HDPE riser pipe, an air release valve (ARV) /vacuum breaker valve at the top of the riser, a swing check non-return valve, scour/blow-off valve and surge protection in the form of a pressure relief valve.

A helix-type bulk flow meter will be installed on the pumping main for flow measurement records.

Pumping of water is envisaged for 8 hours a day into a ground-reinforced concrete reservoir (100 m^3) at the borehole site. From this reservoir, a surface pump (90 m^3/hr discharge and 150 m head) will pump water to the main storage tank (250 m^3) elevated at 12 m from the ground.

The pumping mains from the individual borehole are described in Table 3-2 below.

Table 3-2: Pumping Mains Details

Source	**Pipe Material**	**OD (mm)**	**Length (m)**
Kirilo BH DWD 89613	HDPE PN16	250	4,455

3.3.3 Water Treatment Units

The following components for the treatment of the borehole ground water have been designed based on the test results conducted in July 2023:

- Aerator
- Flocculator

- Sedimentation tank
- Filtration; rapid sand filter
- Disinfection / Chlorination; Dosatron dosing equipment

3.3.4 Ancillary Buildings

Buildings will be constructed for the operation of the water supply system including the following;

• Pump houses	- 60 m^2 pump house at the borehole station.
• Chemical dosing house	- 3.0 x 6.0m building at the water reservoir site to house the chlorine dosing equipment and chemical storage.
• Staff house (optional)	- 96 m^2 residential building to house two staff
• Office and laboratory building	- 110 m^2 office building, laboratory and tools store.

3.3.5 Power supply and Electrical installations

Whereas Lomunga RGC has a grid power supply system, the objective of the proposed water supply project is for a solar-powered water supply system. This is intended for saving energy costs in the operation of the system aiming at more affordable water services in the rural project area.

Therefore, two alternative sources of power supply have been considered for the running of the submersible borehole pumps, viz;

- Solar power system
- Standby generator power supply

An analysis of the above power supply system has been made as follows.

Solar power system

A solar system has been designed to supply the borehole station. The required solar power system is to comprise the following component

Table 3-3: Solar Power System Components

Location	Specifications	
• Kirilo BH DWD 69427	**Submersible pump** Flow rate (q) = 90m^3/h Workload = 100 m head	**Surface pumps** ***(1 duty, 1 standby)*** Flow rate (q) = 90m^3/h Workload = 150 m head
	Daily Power Demand for 8 hours = 750.KWhr	

Location	Specifications
	• PV Power rating = 300Wp • No. of Solar Panels = 660 Panels • PV panels per array = 10 Panels • Inverter rating = 22KW, 3phase • Total No. of inverters required = 47

The specifications for electrical wiring, installations and fittings shall be of approved international standards.

Solar-powered or photovoltaic pump (PVP) systems are an effective alternative to grid/generator electric pumps. They run automatically and require little maintenance and few repairs. The maintenance of PVP systems is restricted to regular cleaning of the solar modules.

Generator sets

The following capacities of prime generator sets have been sized for each pumping station respectively.

Location Specifications

- Kirilo BH DWD 89613 125 KVA

3.3.6 Central Water Storage Reservoir

A 250 m^3 cold-pressed steel section panel water storage reservoir based on 30% of the maximum day demand of the 20^{th} year, in accordance with Section 9.2 (ii) of the Water Supply Design Manual (January 2013-Second Edition of the Ministry of Water and Environment). The tank will be elevated 12m above ground level to feed the distribution network.

3.3.7 Distribution pipe network

A hydraulic analysis model of the distribution pipe network layout has been carried out using EPANET 2.2.0 software with the following parameters:

- 12m elevated storage tank;
- Elevation of the nodes taken from the topographical survey;
- Pipe diameters, lengths and pipe material;

The layout model is presented in Figure 3-3 below. The residual pressures at the nodes range between 8.54 m to 66.71 m at peak flows. The velocities in the pipelines range from 0.28 m/s to 1.05 m/s at peak flows.

3.3.8 Water Treatment

Based on the test results of the borehole water source that are within the national drinking water standards, the water from the project boreholes may not require treatment. However, it is recommended as a minimum requirement, for precaution, to provide for filtration and disinfection because of the plausible abrupt change in suspended solids and microbiological qualities that could be harmful to human health. The following treatments are considered.

- Filtration to inline micro-filter to manufacturer's specification based on the pumping flow rate.
- The dosing of calcium hypochlorite for disinfection will follow the design criteria below:
    - ✓ Chlorine solution strength 10%
    - ✓ Effective chlorine content 65%
    - ✓ Specific gravity of hypochlorite solution 1.1

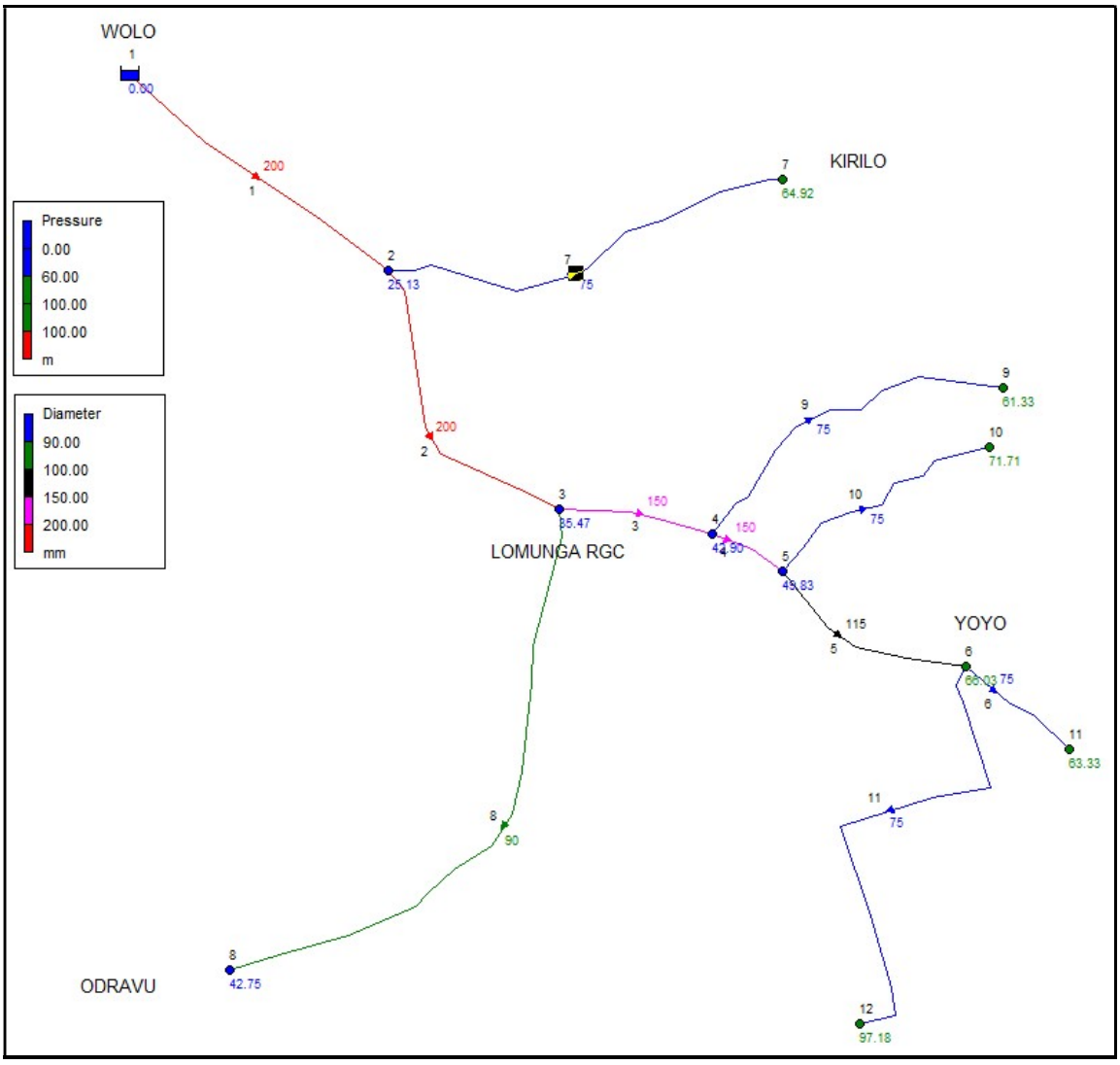


Figure 3-2: EPANET Hydraulic model

The summary of the distribution pipe sizes and respective lengths is in the table below. The entire distribution pipe network has of total length of 14,947 m.

Table 3-4: Summary of Distribution Pipes

OD	DN	Material	Length (m)
40	30	HDPE PN 10	1820
63	50	HDPE PN 10	540
90	75	HDPE PN 10	4060
110	90	HDPE PN 10	3680
125	100	HDPE PN 10	740
160	150	HDPE PN 10	1580
180	150	HDPE PN 10	477
225	180	HDPE PN 10	37
250	225	HDPE PN 10	1755
280	225	HDPE PN 10	258
Total			14,947

The area will be served with 55 service connections and 6 PSPs, each with 2 taps. These will be located in strategic locations of the project area taking into consideration the settlement concentrations and a maximum walking distance of 1.5 km, following Section 7.3.1 of the Water Supply Design Manual (January 2013-Second Edition of the Ministry of Water and Environment).

However, due to the management problems associated with PSPs, more emphasis will be put on yard taps and private connections. Those who are willing to pay for yard taps and/or private connections will be connected to the system. Households that may not afford connection may collect water from yard taps in their neighborhood at a fee to be charged by the yard tap owners. For the households that may not afford the charges for the piped water from those with private connections, they will continue to be served by the free existing point water sources in their neighborhood.

A distribution line has been designed to serve communities surrounding the project borehole source as a matter of prudence.

3.4 Sanitation Systems

3.4.1 Waste water disposal

Wastewater will be produced due to the increased consumption of water after the installation of the piped water supply system. However, a centralized conventional waterborne sewerage system is not practical in the project area due to the low levels of water consumption rate, the semi-permanent type of housing structures and affordability by the majority of the residents.

Soak-away pits are recommended for wastewater disposal for households, institutions and public places that cannot afford a water-borne system such as septic tanks.

3.4.2 Faecal waste management facilities

3.4.2.1 Households and institutions

Households and institutions without plumbing fixtures will continue using pit latrines for human/faecal waste disposal.

Households and institutions with water-borne sanitation facilities and private water service connections are expected to have septic tanks for faecal waste treatment. These facilities should be private installations.

Households and institutions should be encouraged to construct lined pits that can be emptied when filled. Line pit latrines save on cost and space in constructing new latrines when the old ones are full. The pit lining also minimizes ground water pollution in the area.

The Lomunga RGC water supply and sanitation project is intended to have household 235 connections including tap yards, and 15 Public stand points (PSPs).

3.4.2.2 Public places

Public places such as taxi/bus parks, market places and stadia need to be provided with public waterborne sanitation facilities. The maintenance of the public sanitation facilities should be the responsibility of the authorities of the respective public places. The public sanitation facilities will be located at the following sites:

Table 3-5: Sanitation facilities for public places

SITE ALLOCATION FOR THE SANITATION FACILITIES UNDER MoWE				
S/No	**Sub-county**	**Parish/ward**	**Village**	**Site name and description**
1	Yumbe T/C	Arunga	Boma cell	Boma Ground (it's a football ground that accommodates different activities within the town council)
2		Ariguiyi	West Yumbe	Yumbe main market (it's the main market for Yumbe Town Council)
3	Ariwa S/c	Awinga	Okubani	Okubani Market
4	Bijo S/C	Lomunga	Lomunga	Lomunga trading center

5	Barakala T/C	Onoko	Barakala trading center	Barakala T/C

The designs for toilets for institutions and public places should be designed with separate facilities for males and females with consideration for persons with disabilities.

The components of the facilities are listed below;

Table 3-6: Components of the Sanitation facilities

	Male side	**Female side**
Number of toilet stances	3	4
Number of shower stances	3	3
Number of toilet stances for PWDs	1	1
Number of shower stances for PWDs	1	1
Urinal	1	
2000 litre overhead tank	1	1
Biodigester Septic tank with associated soak pit		
Handwash facilities		
3000 litre Rainwater harvesting tank		

3.4.3 Faecal sludge management

A central faecal sludge management facility is under construction in Yumbe Municipality for further treatment for the safe disposal of sludge from the septic tanks.

Sensitization campaigns should be carried out in the project area for the above-proposed interventions.

3.5 Construction Methods

This chapter presents a description of the anticipated construction methods for the designed works. The actual choice of construction method and resources will be the Contractor's responsibility as dictated by the site conditions, productivity, construction schedule and methodology, all of which have a bearing on the cost implication.

In all construction activities safety of operations is paramount. It entails carrying out construction activities and operation of equipment by experienced personnel under the supervision of experienced and qualified staff and the use of well-serviced construction equipment in good working condition. Safety on site will be managed by close supervision of the contractor's Health and Safety Officer and the Engineer's construction supervision staff of the site activities concerning the working environment following the applicable Environment, Safety, Health and Social Safeguard Policy and regulations.

3.5.1 Earthworks

The earthworks including site clearance, general filling, excavation and trenching can be carried out either by manual labour or mechanical equipment (refer to section 3.6.2) depending on the size of quantities and complexity.

3.5.2 Concrete works

Concrete production is expected to be by the use of concrete mixers. Manual production for small works and where the use of a mixer may be impractical will be employed.

3.5.3 Structural Steel

The lifting of heavy structural steel sections will be done by cranes. The steel sections will be joined by either bolts or welding.

3.5.4 Reinforcement Steel fixing

Various sizes of reinforcement steel bars will be cut to required lengths and bent to design shape either manually or by machines and will be placed and fixed for the works by manual labour.

3.5.5 Masonry

All masonry work is to be done by manual labour using the necessary hand tools.

3.5.6 Pipe laying

Pipe laying is expected to be carried out by manual labour using the necessary hand tools and pipe lifting equipment for the heavy pipes.

3.5.7 Electro-Mechanical Installations

All electro-mechanical installations are to be carried out by manual labour using the necessary hand tools and mechanical lifting equipment by qualified personnel.

3.6 Project Management

During the construction phase, the project shall have a supervising consultant who shall oversee the implementation of the project on behalf of the developer. The supervising consultant will have in place an environmental and social safeguards team comprising a Health & Safety officer, an environmental safeguards officer, social safeguards officer, among others.

The operation and management option is to hand over the water supply system and public sanitation facilities to the Northern Umbrella of Water and Sanitation (NUWS). Within the decentralization framework, the experience and capacity of the Umbrella organization, applied directly to the management of the newly constructed facilities will increase the likelihood of sustainable commercial operations and management of the town systems in the next 5-10 years. The Umbrella organisation is under the Urban Water Department of the Ministry of Water and Environment and can effectively plan and manage budgets agreed

within a contract framework. It can use the experience gained elsewhere in the past 5 years to extend services to rural & urban poor areas.

3.6.1 Labor Force

Approximately 100 workers will be required for the contractor, along with 10 for the supervising consultant, 10 for the stakeholder engagement consultant, and 5 for the Ministry of Water and Environment (MWE), during the construction phase of the proposed Lomunga RGC solar motorized piped water supply and sanitation project. There will be about 150 personnel at the project site, split up into categories including key staff, skilled, semi-skilled, and unskilled labourers. Seventy percent of these workers are expected to be locals, and their management will follow World Bank safeguard policies, environmental, health, and safety norms, as well as Ugandan labour laws.

3.6.2 Equipment

The equipment that will be used during the construction of the Lomunga RGC water supply and sanitation project includes:

1. Excavators: Used for digging trenches and excavating earth for the installation of pipelines and other structures.
2. Excavator Compactors: These are excavators equipped with compaction attachments, such as vibrating plates or drum compactors, that can be used to compact soil or other materials after excavation.
3. Bulldozers: Used for clearing and levelling the ground.
4. Dump trucks: Used for transporting materials such as gravel, sand, and earth.
5. Wheel loaders: Used for loading and transporting materials on-site.
6. Backhoes: Used for digging trenches and other excavation work.
7. Compactors: Used for compacting soil and other materials to create a stable base for construction.
8. Concrete mixers: Used for mixing and pouring concrete for structures such as foundations and water tanks.
9. Pipe laying equipment: Used for laying and connecting pipes for the water supply system.
10. Cranes: Used for lifting heavy materials and equipment.
11. Welding equipment: Used for welding pipes and other metal structures.
12. Pumps: Used for pumping water during construction and for testing the water supply system.
13. Generators: Used for providing power to equipment and tools on-site.

4 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 Introduction

This section presents a summary of key policies, laws, regulations and guidelines relevant to the environmental and social management of the project. It also identifies agencies, departments and institutions responsible for the monitoring and enforcement of legal requirements specified therein.

Key Ugandan legislation governing the conduct of Environmental Social Impact Assessment (ESIA) are the National Environmental Act No.5 of 2019 and the Environmental Social Impact Assessment Regulations (2020). The National Environmental Act established the National Environment Management Authority (NEMA) and entrusts it with the responsibility to ensure compliance with the ESIA process in the planning and execution of development projects.

4.2 National Policies Framework

Table 4-1: National Policy Framework

Legislation	Key provisions/requirements	Application to the proposed project
Policies and Strategies		
The National Environmental Management Policy, 1994	The overall goal of the policy is the promotion of sustainable economic and social development that enhances environmental quality without compromising the ability of future generations to meet their needs. The policy states that an Environmental Impact Assessment should be conducted for a policy or project that is likely to have impacts on the environment. The developer has prepared an ESIA to address environmental and social issues.	Regarding this project, the preparation of this ESIA is consistent with the provisions of the policy. In addition, the provisions in this policy are consistent with the World Bank safeguards policies that require the preparation of environmental and social assessments for development projects before their implementation. Mitigation measures are suggested for identified impacts and implementation will be monitored to control any consequences from lack of which.
The National Land Use Policy 2006	The overall goal for the national land use policy is "To achieve sustainable and equitable socio-economic development through optimal land management and utilization in Uganda".	Policies, programmes and projects can be used to effectively implement land use plans. The locations for the facilities shall be in line with the land policies
Buy Uganda Build Uganda (BUBU) policy, 2014	BUBU is relevant to the project because it encourages the production, purchase, supply, and consumption of local goods and services. BUBU also provides capacity-building programs to local suppliers of goods and services.	Such Projects are one of the places where BUBU can be promoted by ensuring locally produced goods are accessed.
The Uganda National Land Policy, 2013	In support of the national objectives on poverty eradication and economic growth, while at the same time ensuring sustainable utilization of natural resources including land and water, the National Land Policy's main goal is 'to ensure an efficient, equitable and optimal utilization and management of Uganda's land resources for poverty reduction, wealth creation and overall socio-economic development'.	This is expected to improve the prosperity of the communities.
The Uganda Forestry	This policy aims at sustainable management of the forest resources in protected areas, public and private land. It also	The construction will lead to the loss of some planted trees. However, the contractor will plant some trees at the end of the

Policy, 2001	aims to promote increased forest production by the private sector and communities. This policy was drafted on the understanding that Uganda is endowed with a rich diversity of forestry resources, but that these resources are highly threatened by over-exploitation	project works on available spaces on the site.
The National AIDS Policy and National HIV/AIDS Strategic Plan 2015/16-2019/20	This Policy underlines the link between GBV and HIV along with recognizing gender-based HIV vulnerability and all aspects of cultural attitudes and practices regarding sex and sexuality that put women at risk. The policy emphasizes integrating sexual and gender-based violence (GBV) prevention and human rights into HIV prevention programming. The policy among others encourages scaling up of comprehensive sexual and reproductive health (SRH)/HIV programs targeting vulnerable populations such as adolescents (both inside and outside schools) and young people, women, girls and people with disabilities.	The contractor will be encouraged to participate in HIV/AIDS services such as voluntary counselling and testing as well as free condom distribution to reduce risk.
National Gender Policy (NGP), 2007 and National Action Plan on Women (2007)	This Policy focuses on promoting gender equality and empowerment of women and provides a strategic framework that guides the implementation of gender-focused interventions to combat gender-based violence. The priority area on gender and rights commits the Government and other actors (including CSOs, and UN agencies) to develop and implement interventions to combat gender-based violence in all its forms and at all levels.	Key in the project is, that the policy outlines the legitimacy of gender equality as a fundamental value that should be reflected in Uganda's development choices, poverty reduction strategies and institutional practices which no doubt is consistent with the Banks safeguards policy on gender.
The National Water Policy, 1999	The objective of the policy is to guide the development and management of the water resources of Uganda in an integrated and sustainable manner, to secure and provide water of adequate quantity and quality for all social and economic needs, with full participation of all stakeholders and mindful of the needs of future generations.	Construction will require water which poses a risk of conflict in case the contractors use domestic water sources such as the community borehole. The contractor will assess alternative sources of water to reserve community resources.
National Policy on	The policy emphasizes early intervention to prevent re-	There is an acknowledged existence of Sexual and gender-based

Elimination of Gender-Based Violence, 2016	victimization of and long-term effects for girls, including interpersonal violence, sexual coercion, alcohol and drug abuse and mental health problems, Reporting cases of violence against children immediately.	violence (SGBV) in the community. The common forms of SGBV include sexual advances, assault, rape, fraud and verbal abuse. The Contractor will have a sexual harassment policy that is communicated to all workers as well as continuous sensitization on GBV, risk and prevention mechanisms. During operation, the water user management committees will require training and capacity building in gender and child protection issues.
National Policy on HIV/AIDS and the world of work, 2007	The policy obliges developing entities to mainstream HIV/AIDS interventions alongside the planned developments. defines the roles of key stakeholders namely government, employers, workers and the private sector including the informal sector, people living with HIV/AIDS, civil society organizations and development partners. Amongst the roles of employers is the formulation of a sound HIV/AIDS policy, around the principle of non-discrimination, equality, confidentiality, care and support and incorporation of HIV/AIDS training into new worker inductions.	HIV/AIDS mainstreaming is a contractual obligation that will involve collaboration with nominated service providers for HIV/AIDS. The contractors may also sign MoUs with health centers. It is strongly recommended that the services be extended beyond the construction workers to include the immediate surrounding communities.
National Legal Framework		
The Constitution of the Republic of Uganda, 1995	The Constitution is the supreme law of Uganda and it provides for the protection of the environment while it's Article 39 guarantees the right of every Ugandan to a clean and healthy environment. The constitution, therefore, requires that the project be implemented without endangering human health and the environment.	Civil works must be undertaken within the observance of the constitutional rights and responsibilities of the public and state.
The National Environment Act 2019	The new National Environment Act was passed to repeal, replace and reform the law relating to environmental management in Uganda. Every developer must undertake an environmental assessment for projects listed in Schedule 5 of the Act and a Project Brief for projects listed in Schedule 4.	For all new materials sites to be established for the project, NEMA approval must be secured while all existing sites should undertake/provide proof of compliance such as having undertaken corrective actions emanating from their environmental compliance audits. The Contractor should work closely with the District Environment Officer to identify sites

	28. Functions of district environment and natural resource committees. (1) The functions of the district environment and natural resources committee are— (f) to monitor all activities within its local jurisdiction to ensure that such activities do not have any significant impact on the environment. (2) The district environment and natural resources committee shall receive funding from among the sources of funds available to the urban or district council for performing its functions under this Act.	where construction waste can be reused or disposed of. Yumbe district environment and natural resource committees will be involved in periodic monitoring of the project both during the construction and operational phases. The Yumbe District Environment Officers will participate in the review of environmental and social impact assessment reports, environmental audit reports and other reports to be submitted to NEMA regularly.
The Physical Planning Act 2010	The Act is to provide for the establishment of a National Physical Planning Board; to provide for the composition, functions and procedure of the Board; to establish district and urban physical planning committees; to provide for the making and approval of physical development plans and the applications for development permission; and for related matters.	"Local physical development plan" means a plan for an area or part of an area of a city, municipal, town or urban council and includes a plan regarding any trading centre, marketing centre or rural area. The project is expected to be in line with the approved physical development plans of the area
The Land Acquisition Act, 1965	This Act provides for the acquisition of land after its valuation and along approved procedures which ensure adequate, fair and timely compensation to the landowners.	Land acquisition is envisaged for some project components that will be constructed on private land
The Historical Monuments Act, 1968	The Act provides for the preservation and protection of historical monuments and objects of archaeological, paleontological, ethnographical and traditional interest and other matters connected therewith. Section 2 provides for the declaration of preserved objects and sub-section (1) mandates the preservation of an object of archaeological, paleontological, ethnographical, traditional or historical interest.	Some cultural sites or objects of significance to indigenous communities might be unearthed/encountered during construction. Necessary consultations should be undertaken, and a process followed in line with the requirements of this Act.

The Local Governments Act, Cap 243 as amended	The Local Governments Act (LGA) operationalizes the principle of decentralization enshrined in the Constitution. The Act accordingly establishes local governments and administrative units in Uganda and empowers them to manage the development of their respective areas of jurisdiction. In managing development, the law mandates local governments and administrative units to provide certain services.	The proposed project is within the jurisdiction of Yumbe Local Governments headed by a Local Council V (LC V) Chairman and Chief Administration Officer (CAO) who are the political head and technical head respectively. Various district offices whose functions would be relevant to the project include offices of Natural Resources/Environment, District Health Inspector, District Planner, Community Development Officer, District Director of Health Services, District Water Officer, Town Council and District Engineer. Equally important is village-level local council administration (LC I and LC III). Leaders at these levels of local administration are closer to residents and therefore important in effective community mobilization, sensitization and dispute resolution. Local government structures are important for mobilizing support for the project as well as monitoring its social-environmental impacts both during the construction and operation phases.
Public Health Act, Cap 281	Section 105 of the Public Health Act imposes a duty on the local authority to take measures to prevent any pollution dangerous to the health of any water supply that the public has a right to use for drinking or domestic purposes.	The contractor will take all lawful, necessary and reasonable measures to ensure the general public safety in relation to any likely negative impacts/cause nuisance or contravening this Act as a result of the project.
The Water Act Cap, 152 1997	The Act provides for the use, protection and management of water resources and supply in Uganda. The Water Resources Regulations of 1998 established under this Act stipulates a requirement to apply for a permit to construct, own, occupy or control any works on or adjacent to the land as per Regulation 10.	Any disposal of waste shall need to be in line with the waste discharge regulations; proper management of fuel/oil spills is essential for minimizing the chances of water contamination. The effluent discharged must meet the standards.
Traffic and Road Safety Act, Cap.361	Section 119 of the Traffic and Road Safety Act stipulates that every person who uses, parks or stands a motor vehicle, trailer or engineering plant on any road carelessly or without reasonable consideration for other persons using the road commits an offense.	The contractor is to ensure the worthiness of vehicles, manage the speed of the vehicles as well and establish a considerate parking site during construction to avoid inconveniences to other road users.

The Occupational Safety and Health Act, 2006	The Occupational Safety and Health Act of 2006 makes provisions for the health, safety, welfare and appropriate training of persons employed in workplaces. It makes it mandatory for employers to have more than 20 workers in place implement a Health and Safety policy and provide adequate safety gear to workers. Part 3 of this act outlines the duties, obligations and responsibilities of employers. These include but are not limited to employers providing protective clothing where a worker is to be exposed to pollutants or chemicals that could be hazardous to health. Also, section 13 states that it is the responsibility of an employer to take as far as is reasonably practicable, all measures for the protection of his or her workers and the general public from the dangerous aspects of the employer's undertaking at his or her own cost. Employers are also held responsible for ensuring that the working environment is kept free from any hazard due to pollution by employing technical measures, applied to new plants or processes in design or installation or added to existing plants or processes, or employing supplementary organizational measures. The employer is also to provide protective gear and supervise the health of workers.	The contractor in partnership with MWE will ensure that safety precautions are undertaken by workers through the provision of appropriate training, supervision and protective gear at all stages of the project development. Initial efforts will be taken by MWE by submission of layout plans to the Department of Occupational Safety and Health in the Ministry of Gender, Labour and Social Development for approval and advice before construction commences.
The Land Act, Cap 227, of 1998	The Land Act, Cap 227 of 1998 provides for the tenure, ownership and management of land. Under Section 44 the Government or the local government shall hold land in trust for the people and protect natural lakes, ground water, natural streams, wetlands and any other land reserved for ecological purposes for the common good of Ugandans.	The Land Act vests land in Uganda to the people in relation to the four land tenure systems. Permanent land take will be acquired legally in observation of the requirements of this act.
The Employment Act, 2006	The Employment Act 2006 is the governing legal statutory instrument for the recruitment, contracting, deployment, remuneration, management and compensation of workers. The	Persons employed by the project need to be issued with contracts and their welfare taken care of by the employer.

	Act Mandates Labour officers to regularly inspect the working conditions of workers to ascertain that the rights of workers and basic provisions are provided, and workers' welfare is attended to.	
The Workers' Compensation Act, Cap. 225	The Worker's Compensation Act outlines responsibilities and obligations for both parties (employer and employee) in guaranteeing the safety and health of the workers. The Act outlines matters of compensation for injuries and accidents as well as the responsibility of employees to take care of their health and safety while on the project.	Employers/contractors must have in place a workers' compensation insurance policy.
The Road Act, Cap 358	The Road Act (Cap 358 of the Laws of Uganda) provides for the need to maintain basic control over developments along roads to ensure maintenance of clear visibility along sections of the road in line with safety needs.	The contractors of the project in different sites are obliged to ensure safety along the access roads by use of safety signage, speed limits, traffic controllers and humps.
The National Forestry and Tree Planting Act, 2003	Section 38 of this Act requires that a person intending to undertake a project or activity, that may impact a forest, should undertake environmental and social impact assessment studies to evaluate the magnitude and extent of forest destruction and the mitigation measures for salvaging the forest.	Some project sites have some trees that are likely to be cut down during project implementation, hence, the need for a detailed assessment of impacts across such sites.
Labour Disputes (Arbitration and Settlement) Act, 2006	The Act amongst others, makes provision for referring disputes to the industrial court subject to the discretion of the labour officer and circumstances of the agreement or disagreement.	The requirements of the act will be followed to resolve any conflicts arising from employment.
Children Act Cap 59	The act defines a child as a person below the age of 18. It lists the right for children to be with their parents, circumstances under which they should not, foster care and adoption procedures as well as mandates of local authorities and roles of community.	There is a marked presence of children around the project area. Some children may seek contract employment and think that they do not need school to make it in life since they already have ideas and knowledge on how to make money. Secondly, when school starts, some children might drop out of school to continue with work. Child labour will be prohibited during project implementation.

National Regulatory Framework		
The Environmental Social Impact Assessment Regulations, 2020	This is a frame guide on how ESIA for development projects is to be conducted and what fees are to be paid for approval purposes of the project.	The developer has prepared this ESIA with a particular focus on the content specified within the First Schedule of these Regulations.
The National Environment (Wetlands, River Banks and Lake Shores Management) Regulations, No. 3/2000	The objective of these regulations is to; provide for the conservation and wise use of wetlands and their resources in Uganda, give effect to clause 2 of article 237 of the constitution of Uganda, ensure water catchment conservation and flood control, ensure the sustainable use of wetlands for ecological and tourist purposes for the common good of all citizens, ensure that wetlands are protected as habitats for species of Fauna and Flora, provide for the regulated public use and enjoyment of wetlands, enhance research and its related activities, minimize and control pollution.	However, for cases where the Contractor identifies a good source of materials (sand), then a sand mining permit must be secured from NEMA.
The Water Resources Regulations, 1998	These regulations are meant to ensure that the abstraction of water and discharge of wastewater is carried out sustainably and that water resources are protected from over-exploitation and pollution	Construction will require water that will be abstracted from nearby rivers to avoid conflicts with communities over water sources. The small volumes abstracted from any water source shall be recorded and maintained.
National Environment (Standards for Discharge of Effluent into Water or on Land) Regulations, 1999	These regulations provide standards for effluent discharge. Section 6 (2) details the maximum permissible limits for 54 regulated contaminants, which must not be exceeded before the effluent is discharged into water or on land.	Construction activities will generate effluent waste. The contractor should employ appropriate measures to manage effluent waste generated by project activities. Regarding wastewater and human waste, the design has provided for 1 toilet both with separate stances for men, women and PWDs.
The National Environment (Noise Standards and Control) Regulations, 2003	Part III Sec. (1) requires machinery operators to use the best practicable means to ensure that the emission of noise does not exceed the permissible levels.	Noise could be an undesirable aspect of the construction phase arising from construction equipment and haulage fleet, works and workers. Noise generation is inevitable during construction activities, so these standards shall apply.
The Waste Management	The Regulations require waste disposal in a way that would not	These provisions apply to the proposed Lomunga RGC Water

Regulations of 2020	contaminate water, soil, and air or impact public health. Regulations require a person who owns or controls a facility or premises, which generates waste to minimize the waste generated by adopting cleaner production methods.	Supply and Sanitation Project for the construction process, domestic waste and construction waste. The contractor and other institutions responsible for the generation of this waste shall comply with the provisions of this regulatory standard

4.3 Key Multilateral Environmental Agreements (MEAs)

4.3.1 International Protocols and Conventions

Table 4-2: International Protocols and Conventions

International Protocols and Conventions	Key Provisions and Relevancy
African Convention on the Conservation of Nature, 1968	Encourages individual and joint action for the conservation, utilization and development of soil, water, flora and fauna for the present and future welfare of mankind, from an economic, nutritional, scientific, educational, cultural and aesthetic point of view.
United Nations Framework Convention on Climate Change (UNFCCC), 1992	The Convention requires parties to avoid adverse effects on the environment and adopt measures and policies to control carbon dioxide emissions in technologies, considering their common, yet differentiated responsibilities, as well as their specific national and regional development priorities, objectives and circumstances. They are required to take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example, impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment of projects or measures undertaken by them to mitigate or adapt to climate change.
United Nations Convention to Combat Desertification (UNCCD), 1994	Binding international agreement linking environment and development to sustainable land management. The Convention addresses specifically the arid, semi-arid and dry sub-humid areas, known as the drylands, where some of the most vulnerable ecosystems and peoples can be found. The 10-Year Strategy of the UNCCD (2008-2018) was adopted in 2007 *to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability.*
Montreal Protocol for the Protection of the Ozone Layer, 1987	The protocol was designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion. All of the ozone-depleting substances controlled by the Montreal Protocol contain either chlorine or bromine (substances containing only fluorine do not harm the ozone layer). The provisions of the Protocol include the requirement that the Parties to the Protocol base their future decisions on the current scientific, environmental, technical, and economic information that is assessed through panels drawn from the worldwide expert communities.
Stockholm Convention on Persistent Organic Pollutants, 2001	Protects human health and the environment from Persistent Organic Pollutants that remain intact in the environment for long periods and can become widely distributed geographically and accumulate in the fatty tissue of humans and

International Protocols and Conventions	Key Provisions and Relevancy
	wildlife, which can lead to serious health effects.
International Labour Organisation Convention, 1998	Sets out basic principles and labour rights at work, based on international best practices.

4.3.2 World Bank Operational Policies

The Operational Policies provide a basis on which the World Bank screens proposed projects to determine the appropriate extent and type of Environmental Assessment to be undertaken. The Bank classifies proposed projects as Class A, B, C or F1 depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. The categorization of projects is based on an assessment of their likely environmental and social impacts. Below is a brief description of the different categories:

- **Category A Project:** which may have potentially significant adverse social or environmental impacts that are diverse, irreversible, or unprecedented;
- **Category B Project:** may have potentially limited adverse social or environmental impacts that are few, generally site-specific, largely reversible, and readily addressed through mitigation measures;
- **Category C Project:** likely to have minimal or no adverse social or environmental impacts, including certain financial intermediary projects with minimal or no adverse risks; and
- **Category FI Project**: Assigned to business activities undertaken by Financial Intermediaries or through delivery mechanisms involving financial intermediation.

The table below summarizes safeguards policies that were triggered by the project.

Table 4-3: World Bank Operational Policies

OP No.	World Bank Safeguards Operational Policies triggered by the project	Triggered/Not Triggered	Key Provisions and Relevance
OP 4.01	Environmental Assessment	Triggered	In general, the project falls under Category B of the World Bank´s classification of projects requiring an ESIA/ESMP given that its potentially adverse environmental and social impacts will be site-specific, few if any are irreversible, and in most cases, mitigation measures can be readily designed.

OP No.	World Bank Safeguards Operational Policies triggered by the project	Triggered/Not Triggered	Key Provisions and Relevance
			Additionally, the World Bank Environment Health and Safety Guidelines (EHSGs), with specific reference to the EHSGs for water and sanitation projects, apply to the project.
OP 4.04	Natural Habitat	Triggered	The Bank supports the protection, maintenance, and rehabilitation of natural habitats and their functions. The conservation of natural habitats is essential for long-term sustainable development. The project will pass through some seasonal wetlands and bushes and therefore OP 4.04 is triggered due to the potential loss or degradation of natural habitats as a result of physical project activities
OP 4.12	Involuntary Resettlement	Triggered	This is the guiding policy when a project results in involuntary resettlement. OP 4.12 describes the detail and elements that a resettlement plan should include. These include objectives, potential impacts, socio-economic studies, legal and institutional framework, eligibility, valuation and compensation of losses, resettlement measures, relocation planning, community participation, grievance redress procedures, implementation schedule, costs and budgets, and monitoring and evaluation. This report conforms to the WB policy requirement on contents and structure. OP 4.12 is triggered due to land acquisition at the water intake, and water storage tanks.
OP 4.11	Physical Cultural Resources	Not Triggered	This policy gives guidelines for the preservation of cultural property and seeks to avoid their elimination, otherwise, mitigation activities be undertaken to limit the adverse impacts as far as possible. Whereas there are no serious cultural properties along the proposed water transmission and distribution corridors, chance finds could be encountered during construction especially while trenching channels for the water transmission pipes. Detailed in the ESMP are measures to mitigate impacts on cultural properties. PCRs identified within the project area include graves and places of worship. Excavations may encounter and

OP No.	World Bank Safeguards Operational Policies triggered by the project	Triggered/Not Triggered	Key Provisions and Relevance
			find items of archaeological/paleontological value. Hence a chance finds procedure has been developed for this project.
	World Bank Policy on Access to Information (July 1, 2010)	Triggered	This policy is triggered since there is a need for disclosure of information to all the stakeholders. There is a need for disclosure of information to all the stakeholders. Compliance shall be ensured by disclosing the information to all the stakeholders such as district technocrats, sub-county leadership, Local council leaders, and communities among others during the consultation process and the information is accessible.
	Forests OP/BP 4.36	Not Triggered	The proposed site for project implementation and the immediate neighborhood do not have any forest or land gazetted as a forest reserve
	Pest Management OP 4.09	Not Triggered	No application of pesticides is envisaged in the project

4.3.3 The World Bank Group Environmental, Health and Safety Guidelines for Water and Sanitation project

The EHS Guidelines for water and sanitation projects include information relevant to the operation and maintenance of (i) potable water treatment and distribution systems, and (ii) collection of sewage in centralized systems (such as piped sewer collection networks) or decentralized systems (such as septic tanks subsequently serviced by pump trucks) and treatment of collected sewage at centralized facilities. The document lists environmental issues, occupational health and safety concerns and community health and safety impacts that are associated with water and sanitation projects. All the issues presented in these guidelines were either taken care of at the design stage or are discussed and mitigated as part of this report.

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). When one or more guidelines are applied as required by their respective policies and standards. The industry sector EHS guidelines are designed to be used together with the General EHS

Guidelines document, which guides users on common EHS issues potentially applicable to all industry sectors.

The guidelines shall govern both workers' (occupational) safety and public safety. The applicability of the EHS Guidelines is tailored to the hazards and risks established for each project based on the results of an environmental assessment in which site-specific factors are considered members of the World Bank Group are involved in a project, the EHS

The guidelines provide for effective management of environmental, health, and safety (EHS) issues entails the inclusion of EHS considerations in the project activities through:

a) Identifying project hazards and associated risks as early as possible;
b) Involving EHS professionals, who have the experience, competence, and training necessary to assess and manage EHS impacts and risks, and carry out specialized environmental management functions
c) Understanding the likelihood and magnitude of the risks
d) Prioritizing risk management strategies to achieve an overall reduction of risk to human health and the environment;
e) Favouring strategies that eliminate the cause of the hazard at its source;
f) Incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences;
g) Preparing workers and nearby communities to respond to accidents;
h) Improving EHS performance through a combination of ongoing monitoring of facility performance and effective accountability

The following has been considered when assessing the potential risks related to health and safety

a) Infrastructure and Equipment Safety
b) Hazardous Materials Safety
c) Environmental and Natural Resource Issues;
d) Community safety and exposure to project-related risks
e) Emergency Preparedness and Response.

4.4 Institutional framework

The Project will be implemented by the Ministry of Water and Environment (MWE) and the host District Local Governments of Yumbe.

Ministry of Water and Environment as the Developer is responsible for the management, coordination and supervision of project activities including the implementation of environmental and social safeguards requirements as detailed in the ESMP.

However, during construction, the Contractor will be responsible for the day-to-day implementation of the ESMP under the direct supervision of the MWE. Legally, the host district local governments are responsible for day-to-day monitoring of the environmental and social aspects of the project while at the National level, the National Environment Management Authority (NEMA) and the Department of Occupational Safety and Health (DOSH) of the Ministry of Gender, Labour and Social Development are responsible for the monitoring of environmental, social and safety aspects of the project respectively. This section mainly sets out the roles and responsibilities for the management of the project's safeguards aspects by different government institutions.

4.4.1 Ministry of Water and Environment

The Ministry of Water and Environment (MoWE) has the overall mission: to promote and ensure the rational and sustainable utilization, development and effective management of water and environmental resources for the socio-economic development of the country. The ministry has three directorates: the Directorate of Water Resources Management (DWRM), the Directorate of Water Development (DWD) and the Directorate of Environmental Affairs (DEA). MWE regulates water resources utilization and wetlands management through DWRM and DEA respectively. In addition to regulatory functions, MWE shall take the lead on the implementation of the project and shall ensure all recommendations contained in the mitigation plan are implemented.

4.4.2 National Environment Management Authority

National Environment Management Authority (NEMA) was established under the National Environment Act No.5 of 2019 as the principal agency in Uganda charged with the responsibility of coordinating, monitoring, regulating and supervising environmental management in Uganda. In this context, NEMA will be responsible for reviewing and approval of this environmental impact assessment, ensuring proposed mitigation measures are implemented, monitoring compliance with approval conditions, and ensuring any other impacts that may arise are mitigated.

4.4.3 National Forestry Authority

The National Forestry Authority (NFA) is a government statutory entity responsible for the management of Central Forest Reserves (CFRs) on a sustainable basis, as well as, for supplying high-quality forestry-related products and services in Uganda. Although there was no natural forest within the project area, there were pockets of planted forests mainly comprising teak trees along the water transmission and distribution network, NFA will be interested in ensuring tree clearance of the plantation forests is minimized. Under catchment management, there is a component of tree planting and NFA would come in to provide training on the best practices for tree planting while also supplying high-quality seedlings.

4.4.4 Wetlands Management Department

Wetlands Management Department (WMD) is mandated to manage wetland resources and its goal is to sustain the biophysical and socio-economic values of the wetlands in Uganda for present and future generations. The Wetlands Management Department is a key stakeholder of the project because some key project components are located in wetlands. The department will have to be engaged for input to the water protection plan of the Kirilo Catchment area.

4.4.5 Directorate of Water Resources Management

The Directorate of Water Resources Management (DWRM) is responsible for managing and developing the water resources of Uganda in an integrated and sustainable manner to provide water of adequate quantity and quality for all social and economic needs of the present and future generations. The Directorate comprises four departments namely Water Resources Monitoring and Assessment Department, Water Resources Planning and Regulation Department, Water Quality Management Department and the International Transboundary and Water Affairs Department.

4.4.6 Ministry of Lands, Housing and Urban Development

The Mandate is "To ensure a rational: sustainable and effective use and management of land and orderly development of urban and rural areas as well as safe, planned and adequate housing for socio-economic development". The MoLHUD, through the Office of the Chief Government Valuer, and the District Land Boards, will guide land acquisition and property valuation, where required including approval of the Resettlement Action Plan

4.4.7 Ministry of Local Government

The 1997 Local Government Act provides for the decentralization and devolution of government functions, powers and services from the central to Local Governments and sets up the political and administrative functions of local governments. The Local Governments are responsible for the protection of the environment in their respective areas of jurisdiction. Local Governments shall be consulted on projects to be located within their jurisdiction and on matters that affect their environment. At the District Level, the District Environmental Officers, District Engineer and Community Development Officers in the respective areas of project implementation will participate in monitoring the projects to ensure that mitigation measures are adequate and advise or point out additional compliance requirements following their inspections. The District Land Boards and Lands Officers will guide on issues of compensation or land acquisition.

4.4.8 Ministry of Gender, Labour and Social Development

The Ministry of Gender Labour and Social Development is a Government Ministry with a responsibility to empower communities in diverse areas. The Ministry promotes cultural growth,

skills development and labour productivity while promoting gender equality, labour administration, social protection and transformation of communities.

This Ministry has one of its major tasks to ensure that all Ugandans enjoy better standards of living, especially the disadvantaged and vulnerable groups." The Directorate of Labor, Employment and Occupational Safety and the Directorate of Gender and Community Development in the Ministry are responsible for the inspection of the workplace environment to safeguard occupational safety, the rights of workers and gender equity. Specifically, DOSH Activities in ensuring enforcement of OSH at workplaces carry out the following activities: i) Developing/reviewing occupational safety and health policy, laws, regulations, technical standards, strategy, guidelines, code of conduct and manuals. ii) Registering all workplaces in the country. This assessment recognizes key gender health and safety and social issues, emerging from stakeholder consultation and places emphasis on the management of such in the ESMP.

4.4.9 The Equal Opportunities Commission (EOC)

The Equal Opportunities Commission (EOC), was established by the Equal Opportunities Act 2007. The Commission is mandated to provide a framework for redressing imbalances, which exist among marginalized groups while promoting equality and fairness to all. The Commission was established under Article 32 (3 – 4) of the Constitution and is a body corporate with perpetual succession and a common seal and may sue or be sued in its corporate name and, may do, enjoy or suffer anything that bodies corporate lawfully do, enjoy or suffer.

The Commission gives effect to the State's constitutional mandate to eliminate discrimination and inequalities against any individual or group of persons on the grounds of sex, age, race, colour, ethnic origin, tribe, birth, creed or religion, health status, social or economic standing, political opinion or disability, and take affirmative action in favour of groups marginalized based on gender, age, disability or any other reason created by history, tradition or custom for redressing imbalances which exist against them; and to provide for other related matters.

4.4.10 Yumbe District Local Government

Yumbe District local government is mandated under the Local Government Act and the National Environmental Act to ensure that all project activities are implemented following the national legal and policy framework. The district is responsible for major functions and services previously carried out by the central government i.e., land administration and surveying; the construction and maintenance of feeder roads, and; the provision and maintenance of water supplies. Therefore, these District Local Governments are key stakeholders in the project.

4.5 Permits and Licenses Required by Project Proponent

Table 4-4: World Bank Operational Policies

Regulations/ Standards/ Approvals	Description	Reference	Issuing Institution	Applicant
ESIA certificate	The certificate will be provided after approval of the ESIA report	National Environment Act, 2019	National Environment Management Authority (NEMA)	Developer
Workplace Registration Certificate	Every workplace is required to be registered and must commit to abide by all of the country's labour laws	Occupational Safety Health and Welfare Act (1997)	Ministry of Gender, Labour & Social Development	Construction contractor
License to handle and store hazardous waste	Every establishment producing hazardous waste in their production line/ processes need to acquire a license for handling and storage of hazardous waste	National Environment Act, 2019	National Environment Management Authority (NEMA)	Construction contractor
Water Abstraction Permit	For water abstraction, it is a requirement for the project to obtain water abstraction rights	Water Resources Act	Directorate of Water Resources and Management (DWRM)	Developer
Road cutting permit, Permit for working in road reserves	The project plans to construct a water pipeline which will most likely need to cross roads or be laid in the road reserve boundary, this shall require a permit from the Roads Authority	Road Traffic Act (1998)	UNRA and Moyo District Local Government	Construction Contractor
Development Planning Permission ermission	The project is within the jurisdiction of the Yumbe District Councils, which will require to approve the designs and the plans	Physical Planning Act 2010 as Amended 2020	Yumbe District/ Local Government	Developer

	for the proposed water supply and Sanitation Infrastructure			

5 BASELINE BIOPHYSICAL ENVIRONMENT

5.1 Physical Environment

5.1.1 Climate

The climate of Yumbe district is tropical with moderate rainfall and temperature. The district experiences extreme seasonal variation in monthly rainfall. The district receives an average total rainfall of 1250mm. The area experiences two seasonal rainfall, light rains between April and October. The wettest months are usually July to November with over 120mm/month. The period December-February is a long dry with less than 60mm/month. The rains are associated with the northerly and southerly movements of the inter-tropical front. Mean monthly evaporation ranges from 130 mm to 180 mm.

Temperatures are generally low during the nights of dry seasons (Dec-March) and high during day hours whereas during wet seasons, temperatures remain high (28-29^{o}C) throughout. The area has a humidity of over 80% in most months which reduces to below 50% during dry seasons especially in December to March.

5.1.2 Topography of the Project Area

Yumbe District is generally flat (plateau) in the middle, with hilly terrains in the North and a low-lying Nile belt. The district is elevated at 600-1200 meters above sea level. Although in the Northern, North West and North East, there are several hills with two Mountains of Kei and Midigo in the north.

Bijo subcounty is fairly flat with limited undulations. The highest point is 987m and the lowest is 847 m above sea level. Kirilo borehole is 847 m above sea level and the proposed reservoir site is 934 above sea level in Gila parish. The reservoir will have to be raised at a considerable height to achieve the required gravity flow pressure to all distribution points.

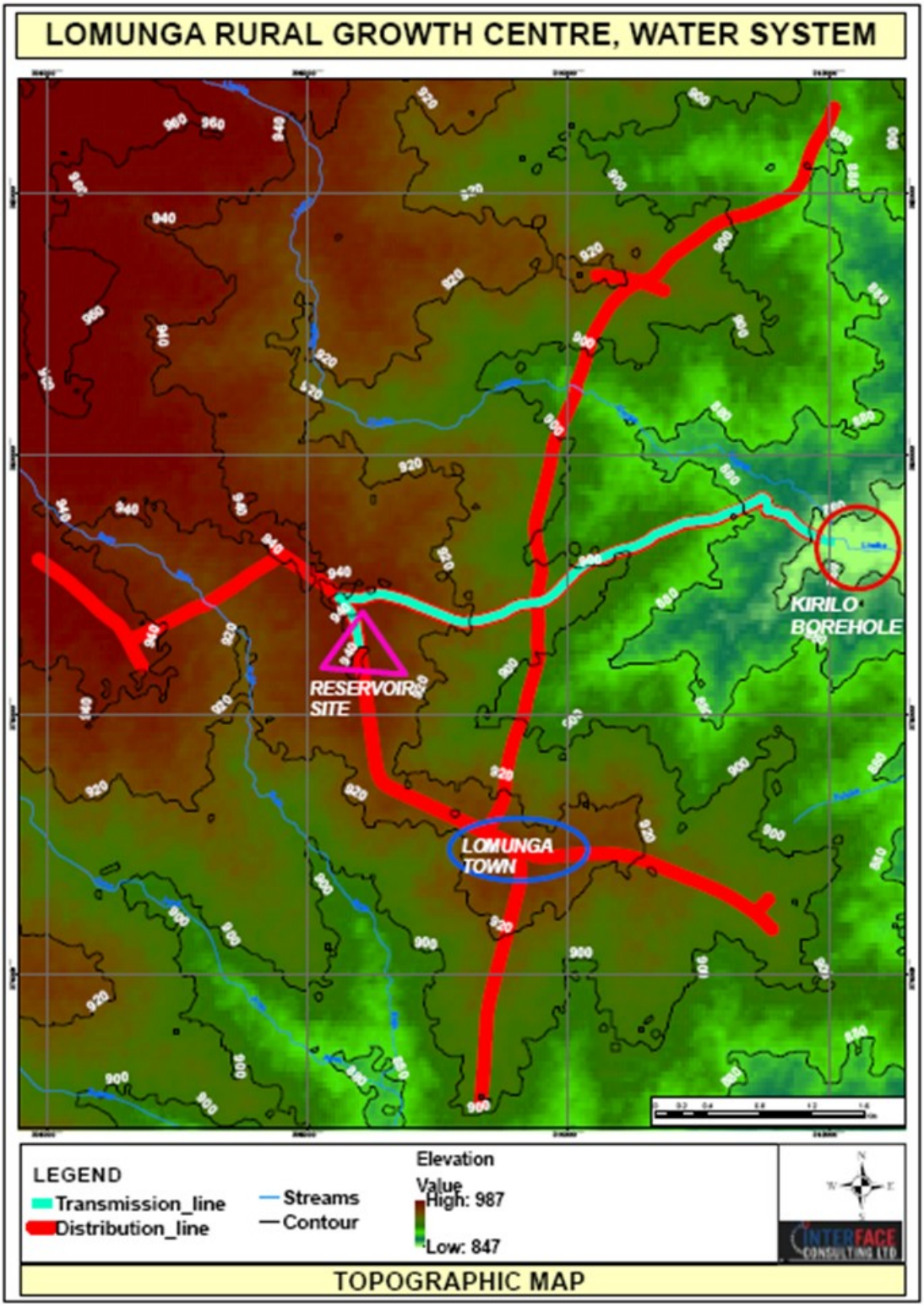


Figure 5-1: Topographic formation of Bijo Subcounty

5.1.3 Drainage and water resources

Apart from subterranean hydrology, there is no major surface water body in the District except Albert Nile with few dendrites and parallel patterned tributaries that originate from the inland.

The project area is drained by several seasonal rivers (indicated in Figure 5-2) including Limika, Jurei, Bujo and Kuluba River systems flowing south-westwards and emptying into the Albert Nile downstream.

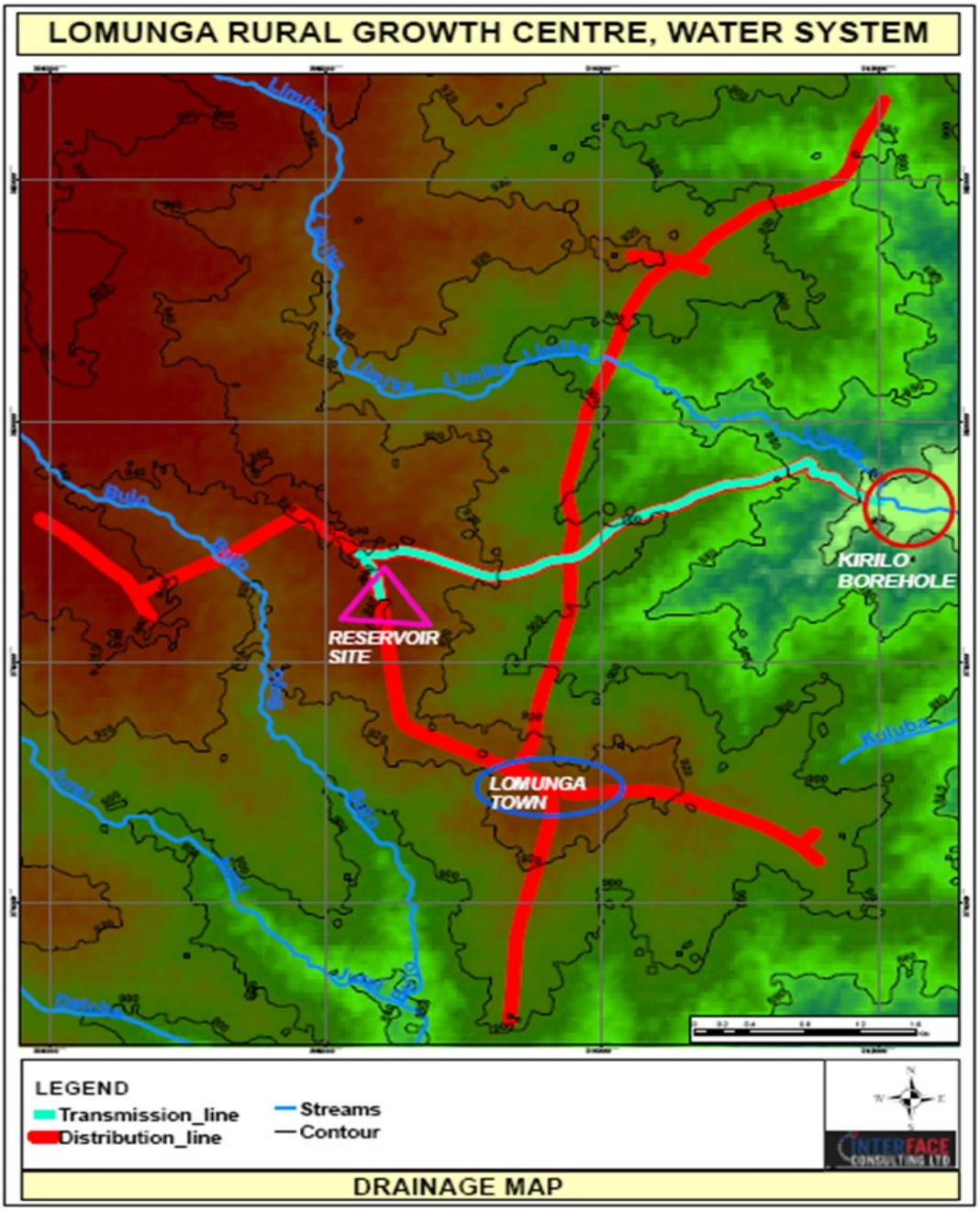


Figure 5-2: Bijo Drainage system

5.1.4 Geology and soils

The Precambrian rocks of the basement complex underlie Yumbe district. The rocks are composed largely of granite fascia-grade rocks, which generally form enclaves in the gneiss complex. On hilltops, Grey granite and gneiss are left exposed in many places. These granites and gneiss are intensively metamorphosed and deformed.

Soils in Lomunga are generally considered moderately fertile with shallow soil depths of 30cm and easily nutrient-weathered and leached. It generally has loamy soils which are fairly fertile. Some alluvial deposits found on the lower portions of the slopes are relatively more fertile. Predominant soils are sandy loam, laterite soils and sandbags are the soil types most widely spread covering large areas these have poor drainage and thus easily become waterlogged. These soils are finely textured with loose structures erodible and easily leached.

There is also a lateritic layer in most soils. This reduces the rooting depth and moisture conditions where it is close to the surface, making the land difficult to cultivate. Soil types include: -Yellow-red sandy, clay loams, and latosols varying from dark grey to dark brown and are slightly acidic and mainly derived from granite, gneiss and sedimentary rocks.

5.1.5 Noise

Noise is an 'unwanted sound' and can be considered a nuisance, particularly when sensitive receptors are exposed to it at high magnitudes or unusual frequencies. Vibration can also cause a nuisance, whilst potentially causing damage to structures. Unregulated or controlled noise often interrupts performance or communication thus predisposing a person to a risk of accidents, injuries, dangerous occurrences, stress, anxiety, illnesses such as noise-induced hearing loss (which could be permanent or temporary loss), tinnitus and physical damage among others. The onset of outcomes due to exposure (effects) are dependent on the threshold, time of exposure to the noise, and biological, physical and emotional factors surrounding the person at risk.

From the baseline noise measurements, a total of eleven (11) points were sampled along the key receptor areas (intake points and reservoir tanks, schools, health facilities, trading centres and settlements)

Observation:

Results of noise measurements are provided in Table 5-1 below which show the state of compliance with daytime regulatory limits of 55 dBA respectively corresponding to land use zoning of "Mixed Residential (with some commercial and entertainment" as per First Schedule (Maximum permissible noise levels) Part 1 in National Environment (Noise Standards and Control) Regulations, 2003.

Noise emissions findings from various project sampled areas with considerations of the potential receptor areas revealed that:

- ✓ The average (LAeq) noise level assessment at all the sampled areas ranged from (40.1-52.9) dBA. With all areas having Low Noise levels within the permissible levels. However, this Noise level emission is likely to change in this area during the operational phase of the project.

The project area is categorized as a mixed rural and semi-urban. Lomunga Town is the main trading centre with commercial activities, mini-industrial and religious activities. The recorded noise level along the Lomunga RGC is indicated in Table 5-1 and Figure 5-4.

Table 5-1: Noise measuring points within Lomunga RGC

Location description and coordinates WGS 84	**Duration (minutes)**	**Recorded noise level**			**Existing noise sources**		**Maximum Permissible Noise Limits Day (dBA)**
		LAeq	LAF Max	LAF Min	Natural	Anthropogenic	
Kirilo borehole 312065.84 m E 379275.07 m N	15	**43.5**	45.2	40.2	Birds, people	Motor traffic in the area	55
Gila reservoir 308447.01 m E 378508.92 m N	15	**44.4**	52.6	45.6	Birds, people	Motor traffic in the area	55
Gila trading center 307826.54 m E 379201.62 m N	15	**45.2**	49.6	44.1	people	Motor traffic in the area	55
Distribution line, Yambura village (residential settlement) 310430.14 m E 381350.53 m N	15	**46.4**	54.0	39.4	Birds, people	Motor traffic in the area	55
Lomunga secondary school 309899.46 m E 377430.20 m N	15	**45.2**	56.8	34.5	Birds, people	Motor traffic in the area	45
Lomunga trading center 309584.73 m E 376982.96 m N	15	**52.9**	60.0	45.5	People	Motor traffic in the area Music	55
Distribution line (Lomunga Primary School) 309093.32 m E 377231.01 m N	15	**45.5**	58.1	39.5	Birds, people	Motor traffic in the area	45
Distribution line (Kululu	15	**48.6**	50.5	38.7	Birds,	Motor traffic	45

Primary School) 311399.65 m E 376500.67 m N					people	in the area	
Distribution line, Wandi Village (Residential settlement) 309370.79 m E 375695.14 m N	15	**49.1**	46.4	40.3	Birds, people	Motor traffic in the area	45
Lomunga mosque 309455.60 m E 377059.96 m N	15	**45.2**	56.2	40.2	Birds, people	Motor traffic in the area	45
Distribution line, Aliapi Primary School 306724.19 m E 378376.83 m N	15	**40.1**	46.2	39.8	Birds, people	Motor traffic in the area	45

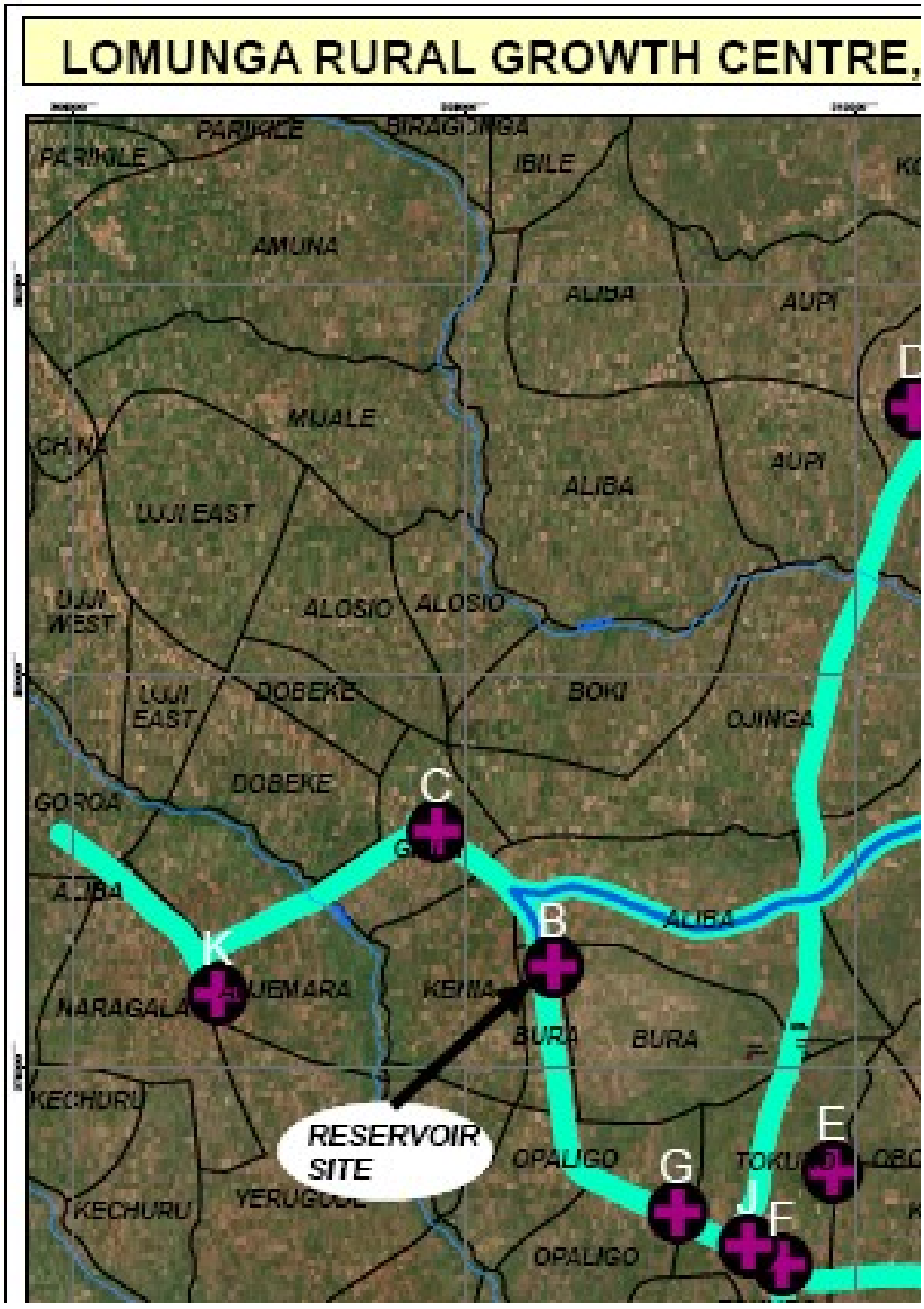


Figure 5-3: Noise measuring Points

5.1.6 Air Quality Baseline (Particulate Matter and Gas Measurement)

Air quality assessment at selected points along the key receptor areas (intake points and reservoir tanks, schools, health facilities, trading centres and settlements) to benchmark baseline air quality conditions before the implementation of the project was carried out. Below are tables showing the results of baseline air quality assessments.

Results For Particulate Matter

The Table below presents results for PM 2.5 and PM 10 taken at selected receptors at the intake, reservoir tank, borehole site and along the project routes

Observations:

From the Table below, it was observed that:

- Various sampling points were taken at selected receptors at the intake, reservoir tank, borehole site and along the project routes. The Particulate matter concentrations ranged from (2.1-8.2) for PM 2.5 µg/m3 at all project areas sampled for PM2.5.
- The PM10 concentrations ranged from (2.6-14.6) µg/m3 with most of the areas having Low concentrations below the permissible levels of Suspended particulate matter in the atmospheres due to the ongoing activities in the area for PM10.
- The existing particulate matter is Low with many sources from the open ground spaces and pollen grains from the plants in the areas sampled.

Table 5-2: Readings for Particulate matter (particles/m^3) measured

Dust Sampling Location and Coordinates	**Real-time reading**	**$PM_{2.5}$/ 25 Average Recording**	**PM 10 50 µg/m^3 Average Recording**	**Temperature**	**Humidity**	**Current Weather conditions**	**Potential Sources/Activity**
IFC 2007 and WHO Air Quality Guidelines (AQG), 2005							
Kirilo borehole 312065.84 m E 379275.07 m N	15	7.5	10.2	30.8	54.6	Sunny day	Generally suspended dust particles in the atmosphere
Gila reservoir 308447.01 m E 378508.92 m N	15	2.5	8.2	30.6	50.2	Sunny day	Generally suspended dust particles in the atmosphere
Gila trading center 307826.54 m E 379201.62 m N	15	5.5	14.6	30.8	48.5	Sunny day	Generally suspended dust particles in the atmosphere
Distribution line, Yambura village (residential settlement) 310430.14 m E 381350.53 m N	15	4.6	12.6	28.6	46.8	Sunny day	Generally suspended dust particles in the atmosphere
Lomunga secondary school 309899.46 m E 377430.20 m N	15	2.1	5.6	32.6	49.7	Sunny day	Generally suspended dust particles in the atmosphere
Lomunga trading center 309584.73 m E 376982.96 m N	15	8.2	2.6	30.8	49.2	Sunny day	Generally suspended dust particles in the atmosphere
Distribution line (Lomunga Primary School) 309093.32 m E 377231.01 m N	15	7.3	10.2	34.1	42.4	Sunny day	Generally suspended dust particles in the atmosphere
Distribution line (Kululu Primary School) 311399.65 m E 376500.67 m N	15	4.1	5.6	35.0	41.5	Sunny day	Generally suspended dust particles in the atmosphere

Dust Sampling Location and Coordinates	Real-time reading	$PM_{2.5}$/ 25 Average Recording	PM_{10} 50 µg/m^3 Average Recording	Temperature	Humidity	Current Weather conditions	Potential Sources/Activity
IFC 2007 and WHO Air Quality Guidelines (AQG), 2005							
Distribution line, Wandi Village (Residential settlement) 309370.79 m E 375695.14 m N	15	3.1	5.2	38.1	35.6	Sunny day	Generally suspended dust particles in the atmosphere
Lomunga mosque 309455.60 m E 377059.96 m N	15	5.1	7.1	37.7	37.2	Sunny day	Generally suspended dust particles in the atmosphere
Distribution line, Aliapi Primary School 306724.19 m E 378376.83 m N	15	4.2	6.5	38.6	38.2	Sunny day	Generally suspended dust particles in the atmosphere
IFC general EHS guidelines recommend that emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards by applying national legislated standards, or in their absence, the current WHO Air Quality Guidelines (2007).							

5.1.6.1 Gas Emissions

Gas emission sampling was carried out at project potential sources and receptors areas to establish the existing gas emissions concentration in the area. These will also be affected by the current existing pollution sources like motor vehicles, generators and open bush burning.

Below are the findings of Gas emissions concentration levels for specific receptors in the table with the potential existing sources

From the Table below, along the transmission and distribution lines (receptors such as schools, health facilities, settlement areas and trading centers, the proposed intake points and the reservoir tank the gas emissions were carried out at various project components to check the point source emissions level from various combustible processes and below are the findings.

- Ambient average oxygen concentrations at all sampled points ranged from 15 percent volume.
- Average values for all gases across the different sites monitored did not vary significantly and were very low compared, conforming to the WHO Ambient Air Quality standards at the time of 0 0.005 0.01 0.015 0.02 0.025 0.03 PM2.5 (mg/m3) Time (hours) PM2.5 levels at the project area, WHO AQG(mg/m3)71 the survey although there are no standards for VOCs yet. The low levels of gases can be attributed to limited activities at the sites monitored as these are located in rural areas with little traffic except for trading centres.
- There were no concentrations identified for compounds of Carbon monoxide, Hydrogen and Sulphide, LEL (Methane) and VOCs during the time of sampling with all the sampled areas below detectable levels (BDL).

Table 5-3: Details of the Gas Emissions Assessments

	Duration 15minutes	**Carbon Monoxide CO (PPM)**	**Hydrogen Sulphide ($\mu g/m^3$)**	**LEL Methane CH_4**	**VOC (mgNm-3)**	**Impact rating**	**Potential Sources**
National Environment (Draft Air Quality Standard for Ambient Air)		9.0	15	*	6	Low/medium/High BDL (Below Detection levels)	
Kirilo borehole 312065.84 m E 379275.07 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes
Gila reservoir 308447.01 m E 378508.92 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes
Gila trading center 307826.54 m E 379201.62 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes
Distribution line, Yambura village (residential settlement) 310430.14 m E 381350.53 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes
Lomunga secondary school 309899.46 m E 377430.20 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes
Lomunga trading center 309584.73 m E 376982.96 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes
Distribution line (Lomunga Primary School) 309093.32 m E 377231.01 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes
Distribution line (Kululu Primary School) 311399.65 m E 376500.67 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes

Distribution line, Wandi Village (Residential settlement) 309370.79 m E 375695.14 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes
Lomunga mosque 309455.60 m E 377059.96 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes
Distribution line, Aliapi Primary School 306724.19 m E 378376.83 m N	15	0	0	0	0	BDL	Combustible process from vehicles and motorbikes

WHO AQG: NO2: 0.2mg/m3 or 0.106ppm (1-hour averaging) WHO AQG: SO2: 0.5mg/m3 or 0.2ppm (10-minute averaging) WHO, 1999: CO: 10mg/m3 or 9ppm (8-hr averaging)

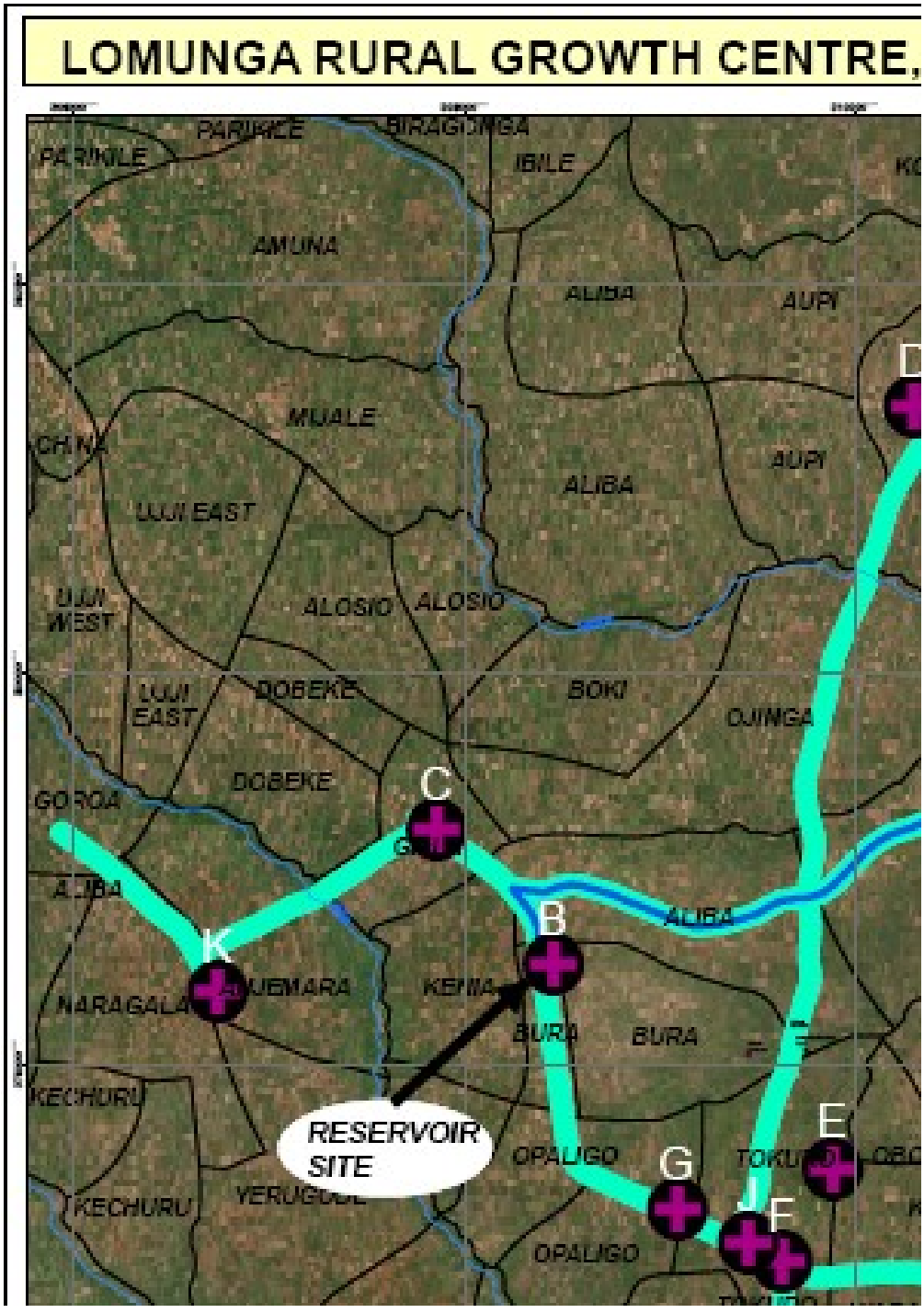


Figure 5-4: Air quality Monitoring points

There will be a temporary increase in fugitive dust emissions particularly; PM10 and PM2.5 from excavations and construction activities of the proposed project infrastructures hence an increase in ambient air particulate matter concentrations at the site neighbourhood. MWE and nominated contractors will adopt all air pollution control measures presented under Chapter 8 to avoid inconveniencing the immediate neighbours to the project site.

5.1.7 Geotechnical Soil Tests

5.1.7.1 Seismology

The district is located within Uganda's North-western area, which is zone 1 of the seismic zoning system. Zone 2 has a moderate likelihood of earthquake occurrence and is seismically active. As a result, moderate earthquake-resistant designs are required. The structural elements, on the other hand, shall be engineered to withstand tremors caused by seismic activity. Seismic Code of Practice for Structural Designs (US 319: Uganda National Bureau of Standards, First Edition: June 2003).

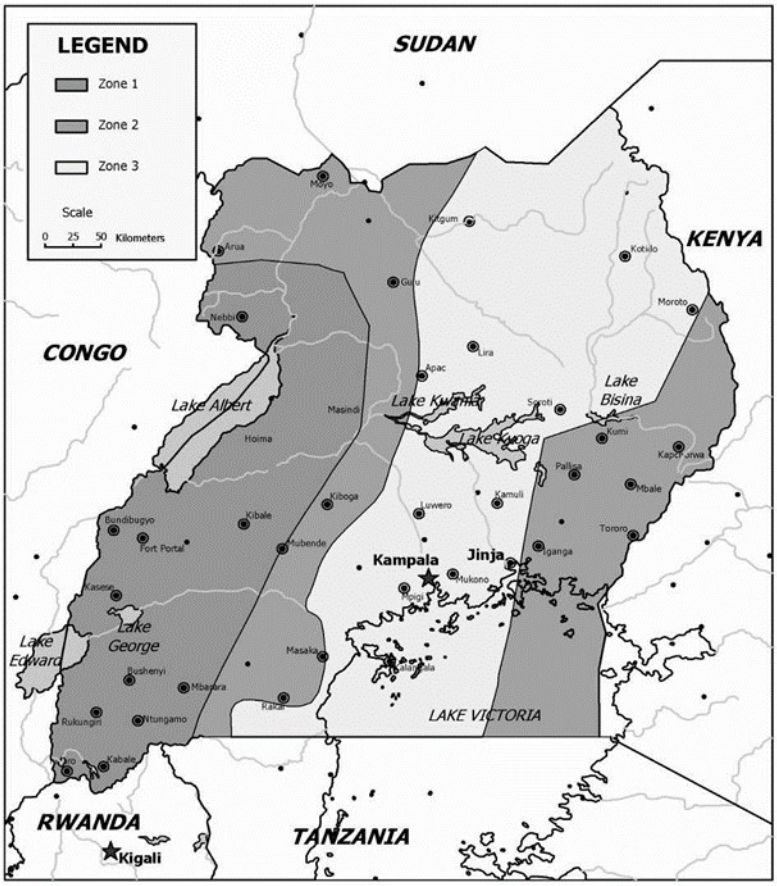


Figure 5-5: Seismic zoning map of Uganda and Project Location (US 319)

5.1.7.2 Seismic Site Characterisation

The map shows contours (Zones 1, 2, 3) of peak ground acceleration (PGA) corresponding to an average return period of 475 years with the following values of PGA:

PGA = 1.0 m/sec^2 for zone 1

PGA = 0.8 m/sec^2 for zone 2

PGA = 0.7 m/sec^2 for zone 3.

The site lies within zone 1 of the seismic zoning of Uganda, implying that there is a high risk of earthquake occurrence and thus a need for seismic design action, in line with the Seismic Code of

Practice for Structural Designs; Uganda National Bureau of Standards, First Edition: June 2003 and earthquake resistant design according to 1997 UBC (Universal Building Code).

Seismic zone factors are shown in the table below.

Table 5-4: Seismic Zone Factor, Z

Zone	1	2A	2B	3	4
Zone Factor, Z	0.075	0.15	0.20	0.30	0.40
Soil Profile Type	SD	-	-	-	-
Seismic Coefficient, Ca	0.12	-	-	-	0.44 Na
Seismic Coefficient, Cv	0.18	-	-	-	0.64 Nv

Note: The zone shall be determined from the seismic zone map shown in Figure 1 shown above.

C_a = acceleration-dependent seismic coefficient

C_v = velocity-dependent seismic coefficient

S_D = Stiff soil profile with SPT-N values between (15-50) and shear wave velocity between (180-360) m/s

Na = Near - Source Factor (acceleration-dependent)

Nv = Near-Source Factor (velocity-dependent)

5.1.7.3 Water Table

The water table was not encountered in test pits (ranging from 0.00 to 1.00 meter) at the borehole and reservoir locations. Therefore, the water will not affect the bearing capacity of the soil at the mentioned borehole locations.

5.1.7.4 Dynamic Cone Penetrometer results

Dynamic Cone Penetration (DCP) test was conducted at the existing ground level and depth of 1.0m (reservoir) and 0.5m (borehole). This test was conducted to evaluate the consistency of the underlying soils. Test results are summarized in the table below.

Table 5-5: Summary of DCP Test Results and Consistency

RGC	Test Pit Location	Depth (m)	Layer	Depth-range(m)	Thickness (mm)	Penetration rate (mm/blow)	Layer
Lomunga	Borehole	0.00	I	0.000-0.300	300	42.86	Loose
			II	0.300-0.790	490	9.25	Dense
		0.50	I	0.500-0.840	340	30.91	Loose
			II	0.840-1.290	450	16.07	Medium Dense

	Reservoir	0.00	I	0.000-0.790	790	31.60	Firm
		1.00	I	1.000-1.405	405	45.00	Firm
			II	1.405-1.545	140	4.00	Very Stiff

Based on the DCP test results, the consistencies are as indicated below;

- The soils at the borehole site exhibited loose—dense consistency while at the reservoir, the soils exhibited loose—stiff consistency.
- Soil strata of very loose and very soft consistencies are not suitable for foundation purposes as they have low bearing strengths. They can only be used after improvement by densification and compaction.

5.1.8 Classification and Identification of Soils

Laboratory classification tests were carried out on the Disturbed soil samples recovered from the test pits at the RGCs. Soil classification was carried out using the Unified Soil Classification System as seen in the table below.

Table 5-6: Index Properties and USCS Classification for Retrieved Soil Sample

RGC	SAMPLE LABEL	Depth (m)	Percentage of soil grain size			Atterberg limits			Ic	NMC (%)	USCS
			>5mm	5 - 0.075 mm	<0.075 mm	LL %	PL %	PI %			
Lomunga	Borehole	0.5	7	66	27	37	18	19	1.5	8	Clayey Sand with gravel
	Reservoir	1.0	0	34	66	56	21	35	0.9	24	Fat clay

At the investigated RGC sites, the soil strata are as indicated below;

- Lomunga; The borehole site test pit is composed of Clayey Sand with gravel (SC) soils with medium plasticity of 19%, having natural moisture content generally lower than the plastic limits of soil, with a consistency index of 1.5.

At the reservoir site, the test pit is composed of Fat Clay (CH) soils with a high plasticity of 35% having natural moisture content generally higher than the plastic limits of soil and a consistency index of 0.9.

5.1.8.1 Shear Strength Test Results

Shear strength tests were conducted on undisturbed soil samples retrieved from the test pits at 1.0m depth from the reservoir sites of all the suggested RGCs. Laboratory shear strength test results revealed that the soils are mixed C-Ø soils. Such soils derive their shear strength from both cohesion and inter-particle friction. The results are summarized in the table below.

Table 5-7: Summary of Soil Shear strength parameters

TP Location	Depth (m)	Shear Parameters		Bulk Density γ (Mg/m3)
		Cohesion Intercept, C (kPa)	Angle of Friction, Ø (degrees)	
Lomunga	1.00	12	23	1.820

The explored test pits exhibited cohesion values ranging from 12kPa with an angle of internal friction of 23^0 and bulk density of 1.820Mg/m^3. The shear strength parameters can be used in foundation designs.

5.1.8.2 Bearing Capacity Evaluation

Bearing capacity values were determined using SPT-N values derived from Dynamic Cone Penetrometer test results carried out at existing ground and 1.0m (reservoir) and 0.5m (borehole) depth and Shear strength analysis which was conducted on undisturbed soil samples obtained from all test pits at 1.0m depth.

Evaluation of bearing capacities based on N-values.

Bearing capacity values were determined using SPT N - values derived from Dynamic Cone Penetrometer test results carried out at existing ground and 1.0m (reservoir) and 0.5m (borehole) depth in the test pit to obtain the penetration rate measured in mm/blow and thereafter converting into blows per 100mm in accordance with the method developed by (Ampadu, Ayeh, & Boadu, 2018) as follows:

1. For coarse-grained soils above the groundwater table, the correlation is a non-linear equation represented by N_{SPT} = 1.78 (N_{DCP})0.77;
2. For fine-grained soils above groundwater level, the correlation equation is $NSPT$ =0.216N_{DCP} + 7.6; and
3. For both fine-grained and coarse-grained soils below the groundwater level, the correlation equation is given by N_{SPT} = 0.216N_{DCP} + 0.4.

Where:

N_{DCP} = blows per 100mm (the number of blows required to drive the DCP cone 100mm into the ground); and

N_{SPT} = blows per 300mm (the number of blows required to drive the split spoon sampler 300mm into the ground) using a hammer of 10kg and 63.5kg for DCP and SPT equipment respectively.

Evaluation of bearing capacities based on N-values

The maximum pressures the soils are capable of resisting were estimated from the field N-values based on empirical relations and the following assumptions:

- The Peck et al (1967) relationship between N-values and unconfined compressive strength is valid for cohesive soils;
- Footing width 1.0m and
- The maximum allowable settlement in non-cohesive soils is 25mm

The corresponding bearing capacity values are summarized in the table below.

Table 5-8: Evaluated Bearing Capacities of Sub Soils Based on N- Values

RGC	LOCATION	Depth	Layer	Depth-Range (M)	Thickness (Mm)	Soil Type	Penetration Rate	Ndcp	Nspt	Unconfined Compressive Strength	Undrained Cohesion	Ultimate Bearing Capacity	Allowable Bearing Capacity
		(m)					mm/blow	blow/100m	blow/300mm	q_u	c_u	q_{ult}	q_{all}
										(kPa)	(kPa)	(kPa)	(kPa)
LOMUNGA	BOREHOLE	0.00	I	0.000-0.300	300	Sand	42.86	2	3	45	22	115	38
			II	0.300-0.790	490		9.25	11	11	146	73	375	125
		0.50	I	0.500-0.840	340		30.91	3	4	58	29	148	49
			II	0.840-1.290	450		16.07	6	7	95	48	245	82
	RESERVOIR	0.00	I	0.000-0.790	790	Clay	31.60	3	8	109	54	279	93
		1.00	I	1.000-1.405	405		45.00	2	8	106	53	272	91
			II	1.405-1.545	140		4.00	25	13	170	85	438	146

For cohesive soils, the relationship qu = 13.1 x Design N-value is used for evaluation of the Unconfined Compressive Strength qu, the cohesion Cu = qu/2 and qult = 5.14 x Cu. qall is evaluated using a factor of safety of 3 Allowable Bearing capacity with settlement limited to approximately 25mm for cohesionless soils read off directly from the Chart (Published by Terzaghi and Peck 1967).

Note:

DCP test results above are given based on the layer strengths of test observations taken at given depths based on the bearing capacities evaluated using SPT-N values;

At Lomunga RGC; the bearing capacity reflected at 1.0m depth at the reservoir site is 91kPa and at 1.405 – 1.545m depth is 146kPa. The bearing capacity at 0.5m depth at the borehole site is 49kPa and 82kPa at the depth of 0.840 – 1.290m

Evaluation of bearing capacities based on the Shear Strength Parameter

The maximum pressures the soils are capable of resisting have been estimated from the shear strength parameters obtained from the laboratory tests.

The following assumptions were made;

i. A 1.0m square footing was assumed along with the following considerations;
ii. Terzaghi's bearing capacity equations are valid for laboratory test results,
iii. Failure mechanism is by both general shear and local shear; and
iv. The factor of safety against shear failure is 3.0.

The detailed evaluations are summarized in the table below.

Table 5-9: Summary of Evaluation for Bearing Capacity based on Local Strength Parameters

TP Location	Depth (m)	Modified Shear Parameters		Bulk Density (Mg/m^3)	Allowable Bearing capacity (Local shear) (kPa)
		Cohesion Intercept, C' (kPa)	Angle of Friction, Ø' (degrees)		
Lomunga	1.00	8	16	1.820	86

Bearing capacity evaluations based on local shear failure mechanism indicated close bearing capacities ranging to 86kPa within the explored depth of the test pits at the reservoir sites.

For the borehole site, the most critical unit is the backwash tank with area and pressure __. During construction when soil is opened up, further analysis of the foundation soil will be carried out for the confirmation of the bearing capacity. Should the general foundation soils be of a lower bearing capacity than that of the trial pit foundation, treatment will be necessary and will involve a fill of compacted hardcore of a layer not less than 500mm thickness beneath the formation level of the respective structures.

5.1.8.3 Structural Designs

The structural designs are based on accumulated experience, optimizing the fundamental requirements and at the same time minimizing costs.

Design loads

The following loads have been considered in the detailed design of the structures:

- Dead loads
- Live loads
- Wind loads
- Seismic/Earthquake loads

- Hydrostatic pressure and dynamic thrust
- Uplift and buoyancy
- Earth pressure
- Erection loads

5.1.8.4 Seismic /Earthquake Loading Analysis

As per US 319:2003 UGANDA STANDARD Seismic code of practice for structural designs.

The seismic coefficient method (static analysis) has been considered for analysis since all the structures are less than 40m in height.

The procedure for analysis is as outlined below;

Design load combinations for limit state design method.

The design loads including earthquake shall not be less than:

DL + 1.3LL +1.25E

Where E is the earthquake load

i. Determining Total lumped Seismic weight, W

Determining seismic weight at each level.

The seismic weight at each level is taken as the sum of dead loads and the seismic live loads between the mid heights of adjacent storeys (for buildings).

Add all the seismic floor weights to obtain the total lumped seismic weight, W.

The seismic live loads are taken as a percentage of the design live loads as follows:

- Up to 3 KN/m^2 25%
- Above 3 KN/m^2 50%

Period of vibration $T_l = 0.09H/D'^{0.5}$

The design horizontal seismic coefficient C_d = CZIK

Symbol	Definition	Value used
• C -	Basic seismic coefficient	= 0.08 (The Site subsoil category is Type II)
• Z -	Seismic zoning factor	= 1
• I -	Structural importance factor	= 1.5
• K -	Structural performance factor	= 1

C_d = 0.12

5.1.9 Design Information

This design information used for the designs is presented in Table 10-21 below.

Table 5-10: Design Information

	PARAMETER DESCRIPTION	VALUE USED FOR THIS DESIGN
1	Code of Practice	BS 8007
2	Grade of concrete	C 30 for water-retaining structures C 25 for all others
3	Grade of steel	500 N/mm^2
4	Minimum cover to reinforcement	50 mm
5	Minimum lap for reinforcement	40 times the bar diameter
6	Seismology	
7	Seismic zone	1
8	Average excavation below the existing ground surface level for each	To be determined from the geotechnical investigations
9	References	Design of Liquid-retaining concrete structures. Second Edition. Robert D. Anchor. BS EN 1998-1:2004 Design of Structures for Earthquake Resistance. General rules, seismic actions and rules for buildings US 319:2003 Seismic Code of Practice for Structural Designs; Uganda National Bureau of Standards, First Edition. Geotechnical Investigation Report for the Proposed Construction of a Water Treatment Plant and Reservoir Tanks.

5.1.10 External Works

The external works at the pumping stations and the reservoir site include the following:

- Access road and parking
- Chain-link fencing on concrete posts, metallic frame gates and guard house
- Walkways paved with 80mm thick pre-cast concrete pavers laid on well-compacted gravel earth material.

- Landscaping for the borehole pumping stations has been designed for smooth drainage of stormwater to avoid flooding. Unpaved sections will be planted with approved grass.

5.2 BIOLOGICAL ENVIRONMENTAL

5.2.1 Flora

There are different segments of vegetation along the project from the source to the reservoir. These include savanna mosaic of bushlands and thickets graduating into extensive woodlands at the water source.

Bijo natural vegetation is characterized by open lands with savannah grasslands of equatorial types with small pockets of natural forests on hills and along the South Sudan border, northern parts of the district.

The field survey identified several tree species including *Mangifera indica, Borassus flabellifer, Vernonia amygdalina, Markhamia platycayx, Cupressus lustanica, Artocarpus heterophylla, Bridelia micrantha, Croton macrostachyus, Tectona grandis, Bridelia micrantha, Entada abbysinica, Tamarindus indica, Tectona grandis, Acacia abyssinica, Ficus natalensis, Milicia excelsa, Maesa lanceolata, Kigelia Africana, Psidium guajava, Erythrina abyssinica, Grevillea robusta, Coffea arabica, Vitellaria paradoxa, Albizia grand bracteata, Albizia coriaria, Markhamia lutea and Euphorbia candelabrum* among others. Several herbs e.g., *Hygrophylla integrifolia, Centella asiatica, Crassocephalum montuosum, Garlisonga parviflora, Sonchus asper, Tridax procumbens, Commelina diffusa, Ipomoea batatas, Cupressus lustanica, Curcubita maxima, Colocasia esculentus and Hypogea rachis* among others, were also identified in the project site.

Overall, several vegetation species were recorded as present in the project area as noted above. Most of the species were of low conservation except one *Vitellaria paradoxa*, one *Milicia excelsae* which are categorized as threatened species to be vulnerable and Nearly threatened at the global scale (NT) respectively on the IUCN Red List and require conservation action to guarantee future survival in the wild..

Based on the IUCN Red List of Threatened Species 2018 none of the recorded species are of conservation concern, they are all recorded as of least concern (LC).

Figure 5-6: Flora community around the project site

5.2.2 Mammals

Yumbe District is generally a modified environment. The project site is near rural settlements with woodlots/tree plantations, riverine areas, grasslands and cultivated areas. The natural habitat had been altered for agricultural activities and settlement. The variety of animals that were encountered and inventoried is quite low. The species inventoried are therefore only presented here as an index of biodiversity and not a total biodiversity statement.

The results of these surveys indicate that there is still a presence of various species of mammals in the proposed project. The evidence documented suggests that mammals occur in low levels of abundance.

Even when the actual mammals were not seen, signs and evidence of their occurrence in the area were surveyed. In total 8 signs were recorded in the proposed project area while over 80 persons responded to the occurrence of mammals in the area

The table below lists the mammal species that were recorded in the proposed Project area based on interviews with members of the local community as well as signs of their presence.

Table 5-11: Species of mammals recorded in the proposed project area

		Frequency		
Order	Species name	Interview	Signs	sightings
Insectivora	Hedgehog *Atelerix albiventris*	6		
Primates	Vervet Monkey *Chlorocebus pygerythrus*			38
Primates	Pata's Monkey *Erythrocebus patas*	14		15

Carnivora	Marsh Mongoose Atilax paludinosus			
Carnivora	Side-striped Jackal *Canis adustus*	12	8	
Carnivora	Dwarf Mongoose *Helogale parvul*		4	
Largomopha	Savanna Hare *Lepus capensis*	20		
Rodentia	Porcupine *Hystrix cristata*	8		

Though these were noted to be observed in reasonable numbers, at the time of surveys, there was no evidence that they occurred in large populations in the project area.

Of the mammal species recorded we can't pronounce that the proposed project area is critical for their conservation. The general landscape has a huge anthropogenic footprint – both from the local people for resource extraction, livestock raising and agricultural practices which could potentially be sources of conflict with wildlife.

5.2.2.1 Aquatic species

Secondary information was collected about the presence of fish species in river Limika which is the main water source. The results indicate that the river has very few species of fish. The common species include; *Lepisma saccharina* (Silver fish) and *Genus Protopterus* (mad fish). These are species that are readily available in most of the surface water bodies in Uganda and are therefore not endangered or classified as near extinction.

Generally, the project area's fauna has been greatly reduced due to habitat degradation owing to human settlements and cultivation. The only mammals recorded were the domesticated animals i.e., cattle, goats and pigs. However, the few remaining fauna are housed in habitats such as scattered trees, bushes and farmlands. The project area's remaining habitats were observed not to harbour high species richness and abundance but a few species that can withstand disturbance, especially the habitat generalists.

5.2.2.2 Birds

Several species were observed within the project area and the surrounding habitats. The bird species identified included the *African Pied Hornbill, African Pied Wagtail, Angola Swallow, Ant Eater Chat, Barn Swallow, Black-Headed Gonolek, Black-Headed Heron, Black-Throated Apalis, Blue-Naped Mousebird, Blue-Spotted Wood Dove, Common Sand Martin, Common Sandpiper, Crowned Hornbill, Golden Pipitt, Golden-Breasted Bunting, Great Blue Turaco,* and the *Green-Throated Sunbird* among Others.

Open habitat birds accounted for the highest proportion of bird species, followed by forest generalists and lastly, wetland or marshy vegetation bird species. All species recorded were of least concern according to the IUCN red list (IUCN, 2021). This is because most of the birds remaining in the area are habitat generalists that can survive in altered habitats, not restricted and found spread across the entire country.

5.2.2.3 Herptiles

The project area was dry, with hardly any aquatic areas save for only one River Limika. Therefore, amphibians are most likely to be found within and around the pond area. However, reptiles such as snakes, Agama lizards, and skinks/geckos could inhabit other areas such as rock refugia, trees, shrubs and homes. No species recorded during the study is listed on the IUCN Red List (IUCN 2020)

A few amphibians of low concern were identified and these included; *Amietophrynus maculatus, Amietophrynus garmani, Ptychadena mascareniensis, Ptychadena anchietae* and *Ptychadena oxyrhynchus.* On the other side, only *Agama agama, Trachylepis maculilabris, Varanus niloticus, Lygodactylus gutturalis* and *Naja melanoleuca* were the recorded reptiles. All the recorded reptiles are not endangered species according to IUCN.

5.2.2.4 Butterflies

The identified species included; *Amauris niavius*, *Amauris tartarea, Byblia anvatara, Danaus chrysippus, Junonia westernanni, Appias epaphia,* and *Belenois aurota* among others. All species identified are evaluated as not endangered according to the IUCN Red List.

5.3 SOCIAL ECONOMIC BASELINE ENVIRONMENT

5.3.1 Overview

The baseline survey examined the socioeconomic profiles of the target beneficiary communities in Lomunga Rural Growth Centre in Bijo sub-county. Specific data on demographic characteristics, housing typology, income sources, crop and livestock production, income streams and expenditure patterns, access to water, sanitation and hygiene, waste disposal, health service delivery, education service delivery, HIV/AIDS and gender-based violence were assessed.

5.3.2 Demographic Information

The demographic information examined various variables including respondents' gender, relationship to household, age, marital status, religious affiliation, ethnicity and education attainment, land tenure, land use, economic activities, and health, among others.

5.3.3 Gender of Respondent

The baseline examined the sex of the respondents. Findings indicate that a larger proportion of the respondents were female (60%) compared to their male counterparts (40%). This is attributed to the fact that by the time of the interview, the men were reported to be engaged in income-generating activities in Lomunga Trading Centre and other areas.

Table 5-12: Percentage of respondents by sex

Sex	Frequency	Percent
Male	96	40%
Female	143	60%
Total	**239**	**100%**

Source: Baseline survey, 2023

5.3.4 Relationship of the respondent to the household head

Table 5-13 shows that half (51%) of the respondents were household heads, (47%) were wives to the household heads and (2%) were biological children to the head of the household. This is an indication that the views given in this baseline survey are a true representation of the socioeconomic conditions of the beneficiary households in Lomunga RGC.

Table 5-13: Relationship to household head

Relation to the household head	Frequency	Percent
Household Head	122	51%
Wife to Household Head	112	47%
Child to Household Head	5	2%
Total	**239**	**100%**

Source: Baseline survey, 2023

5.3.5 Age of Respondents

Baseline findings indicate that a large proportion of the respondents were aged between 19 to 50 years. Table 5-14 below shows that (48%) of the respondents were aged between 31 to 50 years while (34%) were aged between 19 and 30 years. This is an indication of a youthful population that is likely to benefit from employment opportunities especially casual jobs during the construction phase. Findings also suggest that (7%) of the respondents were aged 61 years and above. This is considered an elderly age group and vulnerable that may require special support to benefit from the project including holding project activities in locations easily accessible to them.

Table 5-14: Age category of respondents

Age category	Frequency	Percent
< = 18yrs	0	0%
19 to 30yrs	81	34%
31 to 50yrs	115	48%
51 to 60yrs	26	11%
61yrs >	17	7%

Total	**239**	**100%**

Source: Baseline survey, 2023

5.3.6 Marital Status of the Respondents

Table 5-15 below indicates that the majority (67%) of the respondents were in monogamous marriages, followed by close to a quarter (23%) in polygamous marriages, (5%) were divorced while (5%) were widowed. Given that most of the respondents are in some form of marriage, the possibility of the project causing domestic violence is relatively high.

Table 5-15: Marital status of respondent

Marital status	Frequency	Percent
Married Monogamous	160	67%
Married Polygamous	55	23%
Divorced	12	5%
Widowed / Spinster	12	5%
Total	**239**	**100%**

Source: Baseline survey, 2023

5.3.7 Religion of respondent

Almost all the beneficiary households of Lomunga RGC belong to the Muslim faith. Findings in Table 5-16 below suggest that (96%) of the respondents were Moslems with the Anglicans composed of only (3%) while the Catholics were (1%). The project should be cautious of organizing activities on religious days especially Fridays when the Muslim community conducts prayers.

Table 5-16: Religion of respondent

Religion	Frequency	Percent
Muslim	230	96%
Anglican	7	3%
Catholic	2	1%
Total	**239**	**100%**

Source: Baseline survey, 2023

5.3.8 Level of Education

According to the baseline survey, more than a third (31%) of the respondents reported having attended primary level but had not sat PLE while (37%) did not have any form of formal education. (10%) had completed the primary level. Given the semi-literate nature of

the beneficiary population, project messages and Information Education and Communication (IEC) materials should be translated into the commonly used local languages.

Table 5-17: Education level of respondent

Education level	Frequency	Percent
None	88	37%
Primary/not completed	74	31%
Completed Primary	17	7%
O-level/incomplete	31	13%
O-level complete	17	7%
A-level	5	2%
Post-secondary	7	3%
Total	**239**	**100%**
Literacy level	**Frequency**	**Percent**
Cannot read and write	148	91%
Can read and write	15	9%
Total	**188**	**100%**

Source: Baseline survey, 2023

The baseline survey also examined the literacy levels of the respondents. Findings in Table 5-17 show that most (91%) of the respondents could not read and write in any language while a small proportion (9%) could read and write in any language. The literacy level is consistent with the general educational attainment of the respondents which is relatively low.

5.3.9 Ethnicity

Bijo sub-county is largely inhabited by the Aringa ethnic group which constitutes (93%). However, there are other tribes including Lugbara, Kuku, Kakwa and Madi and also some refugees of Sudanic origin.

5.4 Population

Table 5-18 shows that Bijo sub-county has a population of 41,455 with females comprising more than half (55%) of the total population. Lomunga RGC has a total population of 3,452 with the males (52% / 1812) being more than the females (48% / 1,640). The beneficiary households within Lomunga RGC should be targeted and mobilized to participate in all project activities.

Table 5-18: Bijo sub-county population projections by parish and land size

Sn.	Parish	No. of villages	Male	Female	Total

1.	Alaipi	5	1438	2211	**3649**
2.	Ojinga	7	1241	2136	**3377**
3.	Lomunga	5	1812	1640	**3452**
4.	Meroba	6	1683	2115	**3798**
5.	Gilla	6	1847	1832	**3255**
6.	Geya	5	1847	1914	**3761**
7.	Neringa	5	1276	1480	**2756**
8.	Dukerenga	5	916	1312	**2228**
9.	Onjiri	5	1279	1737	**3016**
10.	Midia	5	1114	1413	**2527**
11.	Ujji	5	1829	2004	**3833**
12.	Alelinga	5	1323	1811	**3134**
13.	bura	5	1206	1475	**2681**
Total	**13**	**69**	**18,375**	**23,080**	**41,455**

Bijosub-county development plan, 2021/22 - 2024/25

The project intends to serve a population of 6,253 within Lomunga Rural Growth Centre

5.5 Land tenure system

The land tenure system in Bijo sub-county is predominantly customary. Bijo sub-county development plan noted that the customary land tenure system has hindered the commercialization of Agriculture and other economic developments. Land is predominantly owned by men given that West Nile is a patriarchal society. According to Mokoro (2014),[1] over 86% reported accessing land in West Nile under customary land ownership through their husbands. Access to land by women was not dependent on formal documentation but on being married to a man who owned land.

5.6 Settlement patterns & housing

The settlement pattern in the sub-county accommodates mostly the linear, nucleated and scattered patterns of settlement. This has been greatly influenced by several factors including; linear settlement patterns widely evidenced along the main roads that networked the sub-county.

[1] Mokoro (2014); Land Rights in Africa

Figure 5-7: Nature of settlement and housing typology

Nucleated settlement patterns were also influenced by productive resources such as areas with fertile soils, and clean water for both consumption and production, especially along the valleys and hills to the North of the Sub-County.

5.7 Housing typology

5.7.1 Permanence of residence

Table 5-19 below shows that overall, a large proportion (49%) of the respondents live in temporary houses (mud floors, mud and wattle walls, grass thatched) as shown in Figure 5-8 above, followed by those living in semi-permanent houses (39%) i.e. (unburnt bricks, mud floors, iron sheet roof) while (12%) lived in permanent structures (cemented floor, burnt brick, iron sheet roof). Furthermore, the findings indicate that the majority (70%) of the houses are grass-thatched while more than a quarter (27%) are roofed with iron sheets.

Table 5-19: Housing typology

Type of house	**Frequency**	**Percent**
Permanent	29	12%
Semi-permanent	93	39%
Temporary	117	49%
Total	**239**	**100%**
Type of roof		
Grass thatched	167	70%
Iron sheet	65	27%
Other	7	3%

Total	**239**	**100%**

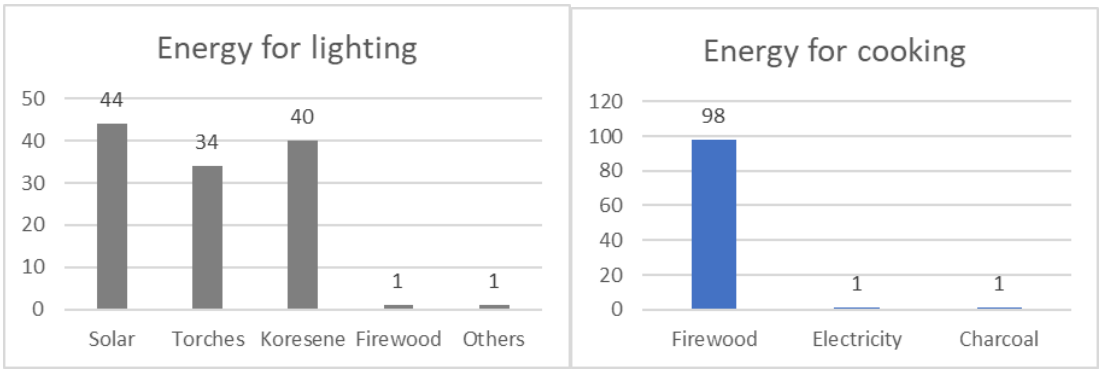
Source: Baseline survey, 2023

According to the District Development Plan III 2020/2021 – 2024/2025, most areas of the district have poor housing conditions constituting (33%) permanent buildings, (32%) Semi-permanent and (32%) temporary structures, with better structures in the trading centres.

The type of housing structure largely dictates the water service level for the household. However, private household connections for water supply are possible mostly for permanent structures. Households living in semi-permanent and temporary housing structures may require the provision of yard taps or public stand posts in their compounds or strategic places in their communities respectively.

5.7.2 Source of energy for lighting and cooking

The survey examined the major sources of energy for lighting and cooking. Findings in Figure 5-9 denote that there are 3 major sources of energy for lighting including solar registering (44%), followed by Koresene (40%) and torches (34%). Concerning energy for cooking, almost all (98%) of the interviewed households use firewood. Lomunga community should be discouraged from encroaching on the water catchment area for firewood and burning of charcoal.



Source: Baseline survey, 2023

Figure 5-8: Source of energy for lighting and cooking

5.8 Economic status

Economic status was examined in terms of the major sources of household income, household monthly income and expenditure patterns.

5.8.1 Household's main source of income

The baseline survey assessed the main source of income among beneficiary households. Results in Table 5-20 reveal that almost all (90%) of the households in Lomunga RGC are involved in crop farming as the main source of income, followed by those engaged in

produce business (2%) and casual labour (2%). Households involved in crop farming and retail trade are likely to benefit from the project during the construction phase by selling their agricultural produce and trade commodities.

Table 5-20: Main source of income for the household head

Income source	Frequency	Percent
Crop farming	215	90%
Produce business	5	2%
Casual labour	5	2%
Retail trade	2	1%
Transport business	2	1%
Others	10	4%
Total	**239**	**100%**

Source: Baseline survey, 2023

5.8.2 Household monthly income

Table 5-21 below shows the range of household incomes per month. Findings show that (26%) of household heads earn Shs 50,000 and below, more than a quarter (26%) earn between Shs 50,001 to 100,000 while (13%) earn 150,001 to 200,000. Close to a quarter (20%) earn above Ushs 200,000. This is a very low-income project area as most households' earnings are much below at least $1 a day, a sign of abject poverty.

Table 5-21: Household monthly income

Income range	Frequency	Percent
<50,000	62	26%
50,001 to 100,000	62	26%
100,000 to 150,000	31	13%
150,001 to 200,000	36	15%
200,001	48	20%
Total	**239**	**100%**

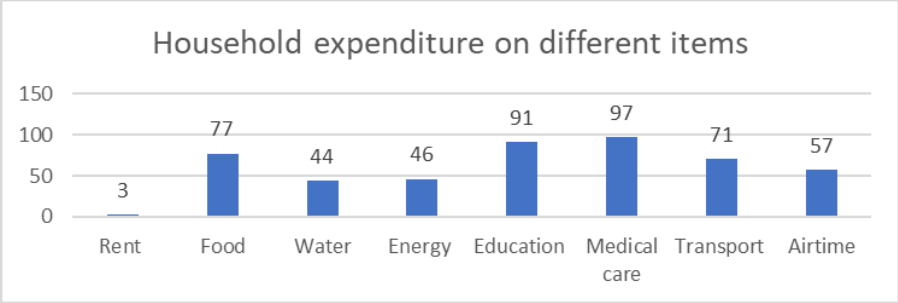
Source: Baseline survey, 2023


Figure 5-9: Lomunga Trading Centre

The income streams likely to be impacted include the displacement of businesses along the road reserve during the construction and laying of water pipes especially temporary kiosks selling food stuffs and fuel products. However, the impact is anticipated to be negligible as small businesses will be temporally closed and reopened after restoring the excavated trenches while business properties especially retail shops will be avoided where possible.

5.8.3 Household expenditure patterns

Figure 5.11 below shows the percentage of households' expenditure on the different basic items. Findings reveal that most (97%) of the households spend on medical care, followed by expenditure on education (91%), food (77%), transport (71%) and airtime (57%). By creating local employment opportunities, especially during the construction phase, the project is likely to boost household income and expenditure patterns.



Source: Baseline survey, 2023

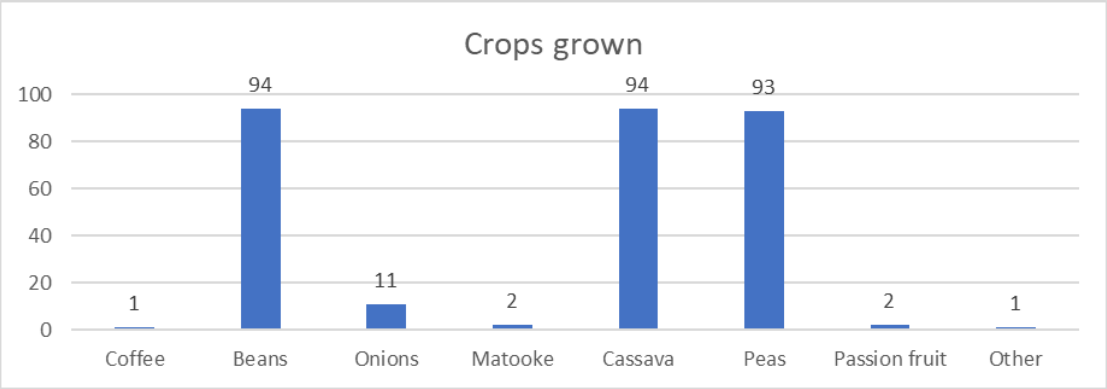
Figure 5-10: Percentage of household average monthly expenditure on necessities

5.9 Household production systems

The baseline survey examined household production in terms of both crop farming and livestock production.

5.9.1 Crop farming

The findings in Figure 5-12 indicate that the 3 main crops grown include beans (94%), cassava (94%) and peas (93%). Any livelihood restoration program should focus on improving farming methods for crops already grown by the beneficiary households. Discussions with Bijo Community Development Officer (CDO) noted that crop farming faces numerous challenges including extended spells of drought, rampant diseases, poor methods of farming and rudimentary farming implements which affect production and productivity.

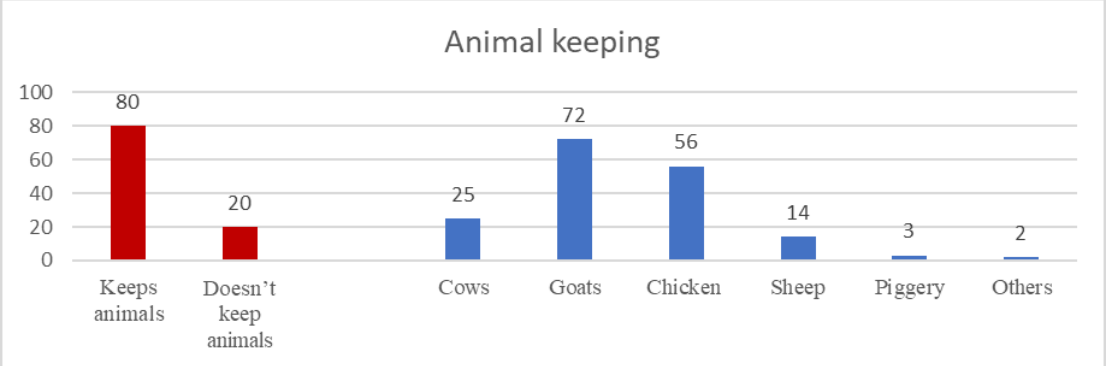


Source: Baseline survey, 2023

Figure 5-11: Crops grown by households

5.9.2 Domestic animals kept by households

During the assessment of household animal husbandry practices, most (80%) of the respondents said that they keep domestic animals/birds while (20%) are not involved in livestock production. Findings in Figure 5-10 further show that the majority (72%) of the households keep goats, followed by chicken (56%), cows (25%) and sheep (14%).



Source: Baseline survey, 2023

Figure 5-12: Livestock production

5.10 Access to water

5.10.1 Main water source

The baseline assessed the main and alternative water sources accessed by the beneficiary households in Lomunga RGC. Findings in Table 5-22 indicate that there are about eight (8) water sources, however, the main source is the public boreholes (91%). Findings further suggest that rainwater harvesting (28%) was considered the first major alternative water source, followed by unprotected wells (21%) and public boreholes (15%).

Table 5-22: Main and alternative water sources

Water source	Main water source	Alternative source
Public borehole	91%	15%
Unprotected well	4%	21%
Yard tap	0%	4%
Rainwater harvesting	0%	28%
Private borehole	3%	0%
Swamp/stream	0%	15%
Public stand-post	1%	1%
River	1%	14%
Total	**100%**	**100%**

Source: Baseline survey, 2023

Given the absence of a piped water system in Lomunga RGC, there is a need to sensitize the community to embrace the proposed water supply project that will extend safe and clean water to their communities.

5.10.2 Distance from Homes to Main Water Source

Table 5-23 below shows that (32%) of households move an average of 0.5km to the main water source, followed by more than a third (36%) who move between 0.5 to 1km while (22%) move between 1.1 to 2km. It should also be noted that (11%) move 2.1 to 5km to the main water source. The proposed water supply system will bring water points close to the community and the distance to the nearest water point will be significantly reduced.

Table 5-23: Average distance to main water source

Average distance	Frequency	Percent
0 – 0.5km	75	32%
0.5 – 1km	85	36%
1.1 – 2km	53	22%
2.1 – 5km	26	11%
5.1km>	0	0%
Total	**239**	**100%**
Hours spent on water collection		
0 - 0.5 hrs	55	23%

0.51 - 1hrs	112	47%
1.01 - 2 hrs	60	25%
2.01 – 3 hrs	7	3%
3.01> hrs	5	2%
Total	**239**	**100%**

Source: Baseline survey, 2023

Regarding the average time spent on water collection, Table 5-23 above further shows that over (70%) of households spend between 0 to 1hrs on water collection while a quarter (25%) spend between 1.01 to 2hrs. From the above findings, the water supply system design should aim at reducing the walking distance and the time taken to collect water at the household level. According to the Water Design Manual Second Edition (MWE) 2013, the maximum walking distance from a public standpipe to the dwellings served should normally not exceed 500m in rural areas. The design should ensure that the Lomunga project area meets the above criteria of a walking distance not exceeding 500 meters.

5.10.3 Role of women and girls in water collection

Findings in Table 5-24 reveal that the burden of fetching water is mainly on women and girls (48%), followed by all household members (25%) while about (21%) of the respondents noted that water collection at the household level is the responsibility of solely women. Findings also suggest that girls and boys are actively involved in collecting water (12%). Field observations reveal that the common means of fetching water by women and girls was by the head while bicycles are mostly used by men and boys.

Table 5-24: Responsibility of fetching water at the household level

Who fetches water	Frequency	Percent
Women & girls	115	48%
All household members	60	25%
Women	50	21%
Boys & girls	29	12%
Girls	10	4%
Vendor	10	4%
Boys	5	2%
Women & boys	2	1%

Source: Baseline survey, 2023

Improved water access and hygiene through on-site water will not only improve their well-being and mitigate vulnerability to gender-based violence but will free up girls' time for

uninterrupted schooling; women's time for agriculture, work and entrepreneurship; and women and girls' time for engaging in social activities that support their mental and emotional well-being.

5.10.4 Challenges associated with water Collection

The baseline survey assessed the water collection challenges during wet and dry seasons. Findings in Table 5-25 reveal that during the wet and dry seasons, Lomunga RGC faces several water collection challenges. However, the predominant challenges experienced during the wet season include over-crowding (34%) and poor-quality water (31%) while during the dry season, the major challenges associated with water collection are over-crowding (64%), inadequate water (16%) and long waiting time (14%).

Table 5-25: Challenges with water collection

Water collection challenges	Wet season	Dry season
Over-crowding	34%	64%
Poor quality water	31%	0%
Difficult terrain	5%	0%
Long waiting time	9%	14%
Conflicts	11%	3%
Inadequate water	8%	16%
Children playing at the source	1%	2%
Total	**100%**	**100%**

Source: Baseline survey, 2023

Figure 5-13: Borehole Source at Lomunga Mosque

The proposed project should aim at addressing and solving the above challenges by designing a water supply system with a reliable flow of water.

5.10.5 Amount of Water Used by Households

On average, a large proportion (64%) of the households use between 5 to 10 jerrycans of water per day, followed by (24%) that use between 5 jerrycans and below and (11%) use between 10 to 15 jerrycans a day. See Table 5-26 for details. This finding points to the notion that Lomunga RGC does not meet the WHO recommended average of 20 litres per person per day.

Table 5-26: Amount of water used at the household level

Amount used	Frequency	Percent
< 5	57	24%
5.1 to 10	153	64%
10.1 to 15	26	11%
15.1 to 20	2	1%
20 <	0	0%
Total	**239**	**100%**

Source: Baseline survey, 2023

5.9.6 Main uses of water in Lomunga RGC

According to Figure 5-15, the main uses of water in the project area include domestic use (99%) and brick-making (49%). Other water uses include washing cars, irrigating crops and making the local brew.

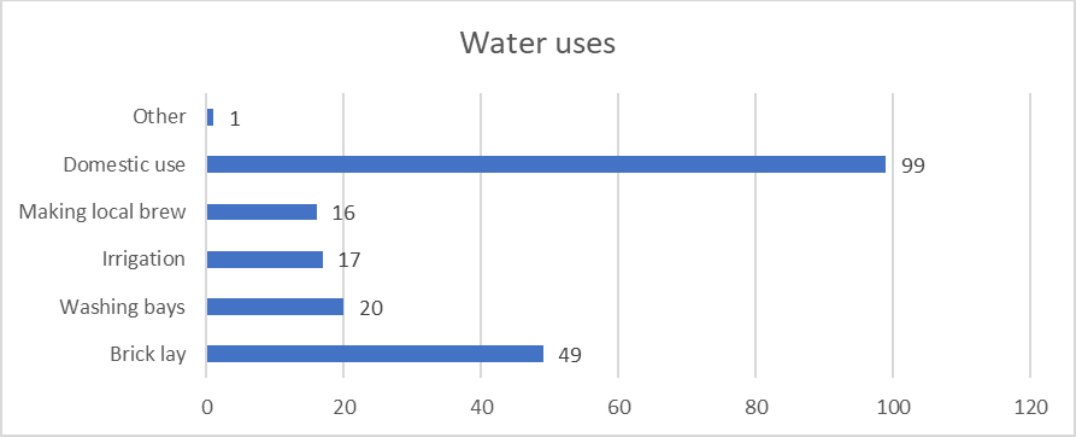


Figure 5-14: Water uses

The design should aim at improving accessibility to clean water involving an adequate supply

of the amount of water needed, mitigating risks of poor hygiene, and reducing the walking distances and the time taken to collect water for the households.

5.10.6 Households' payment towards maintenance

Table 5-27 below shows close to half (49%) of households pay for domestic water while almost all (98%) of the households pay for the maintenance of the existing water sources. This is a positive indicator of the willingness of the beneficiary households to contribute user fees for the sustainable operation and maintenance of the proposed water supply system.

Table 5-27: Payment for domestic water and maintenance of water sources

Pays for water	Payment for domestic	Payment for maintenance of water
Yes	49%	98%
No	51%	4%
Total	**100%**	**100%**

Source: Baseline survey, 2023

During the operational phase of the project, there will be a need for stakeholder engagement in the sustainable operation and maintenance of the water supply system through contributing water user fees by the water users.

5.10.7 Women's Involvement in the Management of Water Sources

The baseline survey assessed the women's involvement in the management of water sources. Findings suggest that almost all (94%) of the women are involved in the management of water sources and are part of the water user committees. Table 5-28 further explores the roles women play on the water user committees.

A large proportion (64%) of the respondents noted that women act as treasurers on the user committees, (23%) noted women serving in the capacity of secretaries while a third (32%) revealed that women are chairpersons of the different user committees. The project under the stakeholder engagement component should empower and build the capacity of women to take on a more active role in the sustainable management of the proposed water supply and sanitation project since women are the main users of water at the community and household levels.

Table 5-28: Women's involvement in water management

Women involved	Frequency	Percent
Yes	224	94%
No	15	6%

Total	239	100%
Women roles	**Frequency**	**Percent**
Treasurer	139	62%
Secretary	52	23%
Chairperson	72	32%
Other	18	8%

Source: Baseline survey, 2023

5.11 Sanitation and hygiene

Under sanitation and hygiene, the baseline survey examined the following key variables. Availability of toilet facilities, challenges with toilet facilities, existence of public toilets, waste disposal and prevalence of waterborne diseases.

5.11.1 Availability of toilet facilities

The baseline survey findings indicate that almost (90%) of the households had a toilet facility while a small proportion (10%) did not. There is a high likelihood that homes without their toilet facilities are prone to health-related hazards. The survey further assessed the type of toilet facility possessed by households. Findings suggest that almost all (94%) of the households had a traditional pit latrine while very few (3%) reported using VIP latrines. A negligible proportion reported having waterborne and Ecosan toilets. Refer to Table 5-29 for details.

Table 5-29: Availability and type of toilet facility

Availability of facility	Frequency	Percent
Yes	215	90%
No	24	10%
Total	**239**	**100%**
Type of toilet facility	**Frequency**	**Percent**
Traditional pit latrine	202	94%
VIP latrine	6	3%
Waterborne	2	1%
Ecosan	2	1%
Total	**212**	**100**

Source: Baseline survey, 2023

5.11.2 Challenges with toilet facilities

The major challenges faced in the construction of pit latrines in the project area include;

rocky grounds, collapsing soils, swampy areas and high poverty to afford the building materials for pit latrines.

5.11.3 Public toilets

The survey examined the presence of public toilets in Lomunga RGC. Findings suggest that the majority (76%) of respondents confessed that there were no public toilets in Lomunga RGC. Table 5-30 also reveals that the majority (77%) of the respondents expressed the need for public toilets while close to a quarter (23%) expressed no need for sanitary facilities. The existing toilet facility that belonged to Lomunga Mosque was being used by some members of the community as seen in Figure 5-15.

Figure 5-15: Existing toilet at Lomunga Mosque

This will need to be addressed under the sanitation component of the project. The location of the sanitation facilities should be based on demand and the status of the existing toilet facilities according to the population projections.

Table 5-30: Presence and need for public toilets

Presence of public toilets	**Frequency**	**Percent**
Yes	58	24%
No	181	76%
Total	**239**	**100%**
Need for public toilets	**Frequency**	**Percent**
Yes	174	77%
No	7	23%

Total	**181**	**100**

Source: Baseline survey, 2023

5.11.4 Waste Disposal

The baseline survey assessed the disposal of wastewater and solid waste. Findings indicate that wastewater is disposed of in various ways, however, according to Table 5-31, the three (3) common ways of disposing of wastewater include dumping into gardens (82%), dumping into the compound (38%) and disposing of it in the road (20%). The use of soak-away pits is not common in Lomunga RGC registering only (6%). Regarding disposal of solid waste, a large proportion (57%) of the respondents noted that they dispose of solid waste in rubbish pits, (43%) scatter it in gardens while (22%) collect and burn it. Focus group discussions with the Lomunga community and women groups in addition to field observations suggest that there is no proper method for waste collection and management in Lomunga RGC.

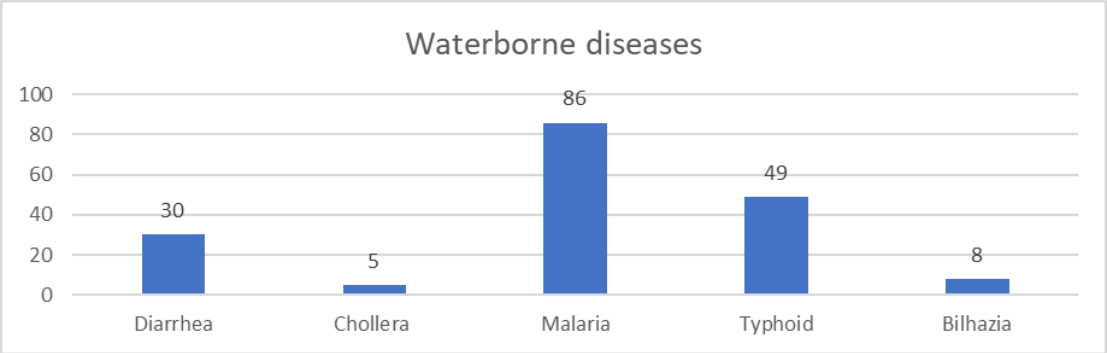
Table 5-31: Water and solid waste management

Disposal of wastewater	**Frequency**	**Percent**
Dumping in garden	196	82%
Dumping into compound	91	38%
Dumping in the road	48	20%
Drained in soak-away pit	14	6%
Others	0	0%
Disposal of solid waste	**Frequency**	**Percent**
Dump in rubbish pit	136	57%
Scatter in garden	103	43%
Collect and burn	53	22%
Dump in the open area	38	16%
Dumb by the roadside	2	1%

Source: Baseline survey, 2023

5.11.5 Waterborne Diseases

Baseline survey findings on the prevalence of waterborne diseases in the project area revealed that there were three common waterborne diseases in Lomunga RGC which included malaria (86%), typhoid (49%) and diarrhea (30%). Given the high prevalence of waterborne diseases in the project area, the construction of reliable sources of clean and safe water and sanitation facilities in strategic locations within Lomunga RGC will be instrumental in fighting against the spread of waterborne diseases.



Source: Baseline survey, 2023

Figure 5-16: Common waterborne diseases

5.12 Health service delivery

5.12.1 Number and nature of health units

The entire Bijo sub-county has only one health facility i.e., Aliapi Health Centre II. The health facility has a population of 41,446 people from the 13 parishes that make up Bijo sub-county. The health center has irregularities in drug supplies. It also registers a high influx of patients from the peripheral sub-health units such as Kululu, Odravu, Kuru and other dispensaries in the entire district.

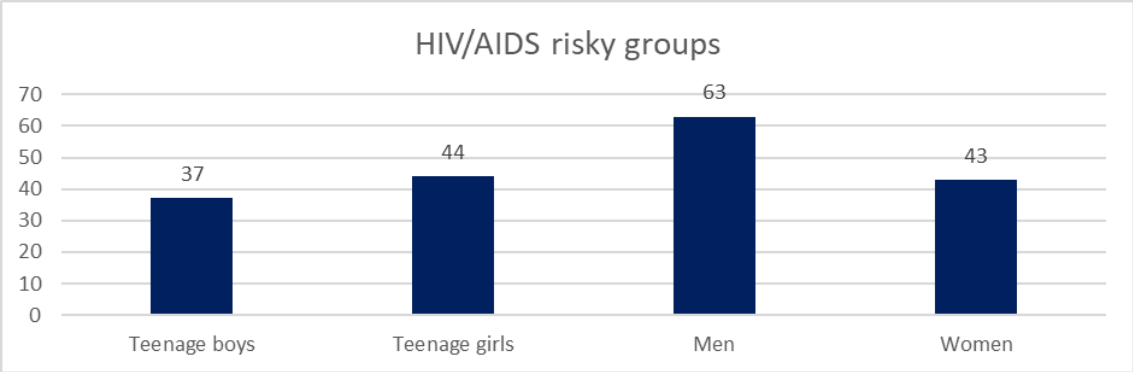
Aliapi Health Centre II offers the following services; health promotion and education services, immunization services, growth promotion and monitoring, conducting school health programs, undertaking epidemics and disaster preparedness and responses, offering antenatal care services, conducting emergency deliveries, nutrition assessment and counseling, post-natal services, family planning services, HIV/AIDS counseling and testing, STI/HIV/AIDS counseling, prevention and treatment, prevention and control communicable diseases, conduct community dialogues, adolescent and reproductive health services, communication sensitization on GBV and human rights and treatment of minor physical and psychological trauma.

Lomunga Trading Centre has a total of 5 drug shops that are not registered with the National Drug Authority and are likely manned by unqualified personnel which puts the health of the population at high risk.

5.12.2 HIV/ AIDS Situation

The survey findings suggest that all (100%) of respondents were aware of HIV/ AIDS. The survey assessed the existence of HIV/AIDS risky groups in the Lomunga project area. Findings in Figure 5-18 indicate that the four risky groups are men (63%), teenage girls (44%), women (43%) and teenage boys (37%). Discussions with the Yumbe District Community Development Officer revealed that young women are more at risk of getting HIV/AIDS as a result of the project workers luring them into sexual affairs since they will be earning regular income. The contractor shall have a strict ethical code of conduct that

prohibits workers from engaging in transactional sex and love affairs with married women and school girls.



Source: Baseline survey, 2023

Figure 5-17**:** Awareness of HIV/AIDS and Risk Groups

5.12.3 Access to clean and safe water

During the focus group discussion and interviews with some key stakeholders in Lomunga Trading Centre and Aliapi Health Centre II, it was reported that a significant majority of people used water from the borehole but during dry seasons, patients (expecting mothers) are expected to fetch water to be used during their child delivery from streams which are located in long distances.

According to the Community Development Officer (CDO) of Bijo Sub-County, health facilities in Lomunga RGC frequently experience water shortages, which hinders the maintenance of proper hygiene standards. This situation has resulted in substandard hand hygiene practices, which are critical for infection prevention within the project area. The lack of adequate sanitation and water supply in these health centers has directly affected maternal health outcomes. For instance, infections during pregnancy have heightened the chances of preterm birth and maternal mortality in Lomunga RGC

5.13 Educational Institutions

5.13.1 Primary schools

Bijo Sub-County has 3 pre-primary schools, 6 government-aided primary schools, 2 private primary schools and 1 secondary school i.e., Lomunga secondary school.

Figure 5-18: Kululu Primary School

According to Bijo sub-county 3-year development, the areas of concern for primary schools include;

- Some schools such as Geya P/S, Aliapi P/S, Lomunga P/S and Ojinga P/S have inadequate classrooms.
- Clean and safe water is still a big challenge in schools such as Lomunga P/S where the borehole water flow is very low and unreliable while Aliapi P/S shares the borehole with the community.
- In most primary schools, the sanitary facilities are inadequate with not enough stances for both boys and girls and with no changing rooms for girls.
- Some of the schools' land has been encroached on by the host communities due to a lack of documented evidence of ownership.
- There is also poor retention and low completion among primary pupils.

The sub-county has adopted the following strategies to address the above concerns;

- Lomunga, Aliapi and Govule primary schools should be prioritized for sanitary facilities.
- Ojinga Primary School and Aliba Islamic Primary School should be prioritized for the extension of water points.
- Bijo sub-county should mobilize the community to send and keep children in school. Communities should be empowered and enforce bylaws against keeping school-age-going children at home.
- Lomunga Secondary School should be considered for the construction of a classroom block under the school facility grant.

5.14 Gender-Based Violence

The survey assessed the prevalence of gender-based violence (GBV) in Lomunga RGC. Findings suggest that most (89%) of the respondents were not aware of the prevalence of gender-based violence in their community while a small proportion (11%) had heard or witnessed women and girls abuse. In addition, (19%) of the respondents noted that child abuse exists in Lomunga RGC and this correlates with the findings from the Bijo Police Post officials who noted the most common forms of GBV as physical and sexual physical and sexual violence. Other included economic violence and social and emotional violence. Rape, dowry-related violence and other traditional practices harmful to women remain critical concerns in Yumbe District.

The District Community Development officer noted that the drivers of GBV household poverty, power relations, access to asset ownership, illiteracy, and negative attitudes towards women. The effects of GBV include divorce which affects women more than it affects men, withdrawal, child neglect, school dropout, especially for girls, and low self-esteem. Sexual violence is a disease that has both short-term and long-term impacts on the mental and physical health of survivors, yet it remains high in the communities. Polygamous families in most communities of Yumbe record high incidences of GBV. Men in such relationships tend to provide for one wife and her children and neglect the other family

Despite the low prevalence of gender-based violence, the project may have some cases of gender-based violence if compensation for the affected destroyed crops is misappropriated by male spouses. In addition, violence against women may be a result of men not permitting their wives to take up the job opportunities offered by the project and also not agreeing on the time women should work.

The survey assessed the measures that should be taken to address GBV and violence against children. Table 5-32 reveals the three key measures suggested for preventing GBV and violence against children including sensitizing the community about the dangers of GBV (54%), imprisonment of culprits (18%) and subjecting culprits to community service (16%).

Table 5-32: Prevalence of gender-based violence in the community

Knowledge of GBV in the community	**Frequency**	**Percent**
Yes	27	11%
No	212	89%
Total	**239**	**100%**
Knowledge of child abuse in the community	**Frequency**	**Percent**
Yes	45	19%
No	194	81%
Total	**264**	**100%**
Measures for preventing GBV		

Sensitization on dangers	129	54%
Imprisonment of culprits	43	18%
Community service	38	16%
Chasing culprits from the area	14	6%

Source: Baseline survey, 2023

5.15 Land and Property Ownership

Land in Yumbe District is mainly communally owned and governed by the customary system of land tenure. Under this tenure arrangement, land ownership is vested in the lineage and is allocated by a father to his sons, who in turn, assign it to their wives and children for cultivation. Women therefore tend to be excluded from owning land, although they are allowed the right of use.

Property inheritance continues to be a challenge, especially for women. It is a crisis exacerbated by the traditional norms, beliefs and values embedded in the cultures of West Nile. Widows in most of the communities are not allowed to inherit property after the husband's death, an issue that has had tragic impacts on the lives of women.

5.16 Physical Cultural Resources (PCR)

Worship centers, graves and communal burial grounds were the PCR recorded in the project area. Burial grounds are areas where family members remember their departed ones and it is one of the safeguarded identities in the cultural setting of a given ethnicity. Most of these were non-recognizable because they were earth graves and some had been washed away.

Efforts will be made to ensure that all burial grounds along the proposed route for the proposed water transmission and distribution pipes will not be affected since most of them are outside the Road reserve. However, details of what may be affected will be captured during the Resettlement Action Plan (RAP).

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6 STAKEHOLDER CONSULTATION AND DISCLOSURE

6.1 Introduction

The Stakeholder engagement and consultation process was undertaken as per the requirements of the National Environment (Environmental and Social Impact Assessment) Regulations 2020. Under sub-regulation (1) of the regulation (16) of the National Environmental and Social Impact Assessment Regulations (2020) and best international practice, the project developer is required to undertake relevant stakeholder consultations during the ESIA process as detailed below. The developer shall, in carrying out the consultations under regulation 16;

(a) Choose the mode of consultation, taking into account the nature and location of the project and the key issues to be consulted on;

(b) Give advance notice of the proposed consultation, with a minimum notice of seven days;

(c) Hold meetings with relevant stakeholders, communities likely to be affected by the project and the public to explain the project, its likely benefits, likely negative impacts and proposed mitigation measures, and to receive their oral or written views;

(d) Where the consultations involve holding meetings, ensure that the venues and time for the meetings are convenient to the relevant stakeholders, communities likely to be affected by the project and the public; and

(e) Ensure that the comments received during consultations are recorded, made publicly available and taken into account during the environmental and social impact study.

Source: Extracted from the National Environment (Environmental and Social Assessments) Regulations 2020

6.2 Public participation objectives

Meaningful consultation by communities (especially targeted groups) and stakeholders that are likely to be affected by or benefit from the proposed water and sanitation scheme will continue to be sought throughout the project life cycle, commencing as early as possible. The objective of such stakeholder consultation was to ensure that communities contribute to the development of management plans and provide feedback on the activities preceding the proposed project.

Consultations were conducted to solicit broad community support for the project and to ensure that the affected community endorsed the proposed mitigation/risk reduction and management measures. Stakeholders' consultation sought to create awareness about the project and obtain their perceived positive and negative social and environmental impacts. Specifically, consultations were undertaken to;

a) Explain the project and create awareness;

b) Ensure Compliance with both national regulations and international best practice

c) Obtain baseline environmental and social conditions in the proposed project area based on local knowledge;

d) Obtain perceived economic, social and environmental benefits so that they can be enhanced during project implementation and operation;

e) Capture perceived potential negative environmental and social impacts so that they can be mitigated;

f) Provide equal opportunity to stakeholders to get involved in project planning;

g) Manage Expectations and Concerns: by providing a mechanism for stakeholders to engage with the Project about their concerns and expectations and provide a mechanism for receiving, documenting and addressing comments received;

h) Build trust with the stakeholders.

6.3 Stakeholder identification

Identification of stakeholder groups started with investigating groups/agencies that present threats and opportunities associated with the proposed Lomunga Rural Growth Centre Water Supply and Sanitation Project. This was based on some key questions below:

a) Who will the project benefit/ affect?

b) Who are the key players in the development and implementation of the project?

c) What key resources will be impacted?

d) Who is most dependent on resources likely to be affected?

e) Who possesses claims on resources to be affected – including legal jurisdiction and customary use?

f) Are several government sectors and ministry departments involved?

g) Which agencies license certain aspects or resources to be affected (forestry, wetlands, wildlife areas)?

h) Are there major events or trends currently affecting the stakeholders (e.g., development initiatives, migration, population growth)?

The ESIA team particularly targeted officials of Yumbe District and Bijo Sub-County. A stakeholder engagement plan was prepared to guide the ESIA study in identifying stakeholders and their probable interests. These included; directly affected and indirectly affected community members, local leaders, district leadership and Government Agencies.

A database of all individuals, communities, interested parties, organizations, and institutions was generated (and continually updated), and the identification of the stakeholders was based on two different levels (local, and national).

Table 6-1: Stakeholder Categories

No	Stakeholder	Interest/ Mandate
1	MoWE	▪ They are the implementing agency that bears project conception knowledge and have to establish mechanisms for compliance with ESHS requirements.
2	Yumbe District Local Government & Bijo Sub County Councils and LC	▪ Approve and supervise the implementation of Local policies and government programs in their areas of jurisdiction ▪ Mobilize the community Follow up on grievances Monitor Social and Environmental concerns related to the project Coordinate District level planning to ensure that project interventions are in line with the ▪ District Development Plans Support the technical supervision of consultants e.g.; District Engineer ▪ Mandated to oversee all construction activities, Environment, Social, Health and Safety in the District
3	Project Partners (Red Cross & UNHCR, OPM)	▪ Charged with overall coordination of project activities in the District ▪ Monitor grievances redress mechanism within the District related to the project ▪ Support the technical supervision of consultants e.g.; District Engineer
4	Health Workers	▪ Sensitize the community on HIV and AIDS
5	Community members	▪ Provide ownership of the project, report ▪ safeguard issues, provide information for ▪ grievances management ▪ To solicit views, comments, and recommendations from the community

6.4 Stakeholder mobilization

Consultation of government agencies and district officials was done through formal meetings held with the respective agencies and district leadership. A letter of introduction for this purpose was issued by the Ministry of Water and Environment, the client. To date, the different national agencies consulted include the Ministry of Water and Environment. Agencies such as the Ministry of Gender Labour and Social Development, and the National Environment Management Authority among others. At the District level, key stakeholders from relevant departments such as Natural resources and Community development, planning and engineering were mobilized.

At the community level, mobilization was through different structures as highlighted below. At the District, the CAO was notified about the intention of the ESIA team to conduct consultations with affected communities. A contact person from the water department was then allocated by the office of the CAO to guide the team and liaise with the leadership of

Bijo Sub-County. At the Sub County, the leadership was notified about the project and their views sought.

At the village level, identified villages and their representatives were mobilized through L.C.I. leaders. Local leaders from the identified villages would then select a central meeting place where village members and their leaders convened. Meetings were held with local leaders, representatives of the youth, women, the old and disabled, potential water users, land owners and users among others.

6.5 Methods of engagement

Stakeholder engagement during the ESIA study involved different methods. These included formal meetings, key informant interviews, focus group discussions and public meetings as illustrated in Table 6.2 below.

Table 6-2: Summary of stakeholders identified and consulted during the ESIA process

Activities	Stakeholder	Purpose of Information sharing/ disclosure
Awareness/sensitization meetings by the ESIA team	PAPs, Landowners, beneficiaries and communities	General overview of the project and implications
Focus groups	Women Youth Elderly Persons with disability Area leaders Other interest groups	General overview of the project and implications Disclosure of mitigation measures and grievance mechanism Identification of views and expectations
Village meeting / public consultation	All PAPs Indirectly affected people Beneficiaries Communities	General project overview Identification of views and expectations Disclosure of mitigation measures Acquisition of information for input into ESIA
Formal meetings	Government bodies Local government	Overview of project and implications Disclosure of mitigation measures Acquisition of information for input into ESIA
Key informant interviews	Local government Government officers Local and political leaders Cultural Leaders	Overview of project and implications Baseline data Feedback on the project proposals

6.6 Stakeholder consultation findings

Key issues merging from the consultations

Consultations with the stakeholders were held between 30th January 2023, 3rd July, 5th July and 6th July 2023. Some of the key issues/expectations raised during the consultations are summarized in Tables 6-3 and 6-4 below.

6.6.1 Engagement schedules

Stakeholders were mobilized and engaged at their convenient time and venues as shown in table 6.3 below.

Table 6-3: Stakeholder engagement schedule

Stakeholder	Venue	Designation	Date
Yumbe District Political and Technical Officials	District Headquarters	CAO and District Chairperson	3rd /July/2023
District Water Office	District Water Office Premises	District Water Engineer	3rd /July/2023
Bijo sub-county political & technical officers	Sub-county headquarters	Sub-county chief Parish Chief CDO Agriculture officer District Environmental Officer LCIII Chairperson Sub-county SAS	5th /July/2023
Lomunga RGC community	Awoba trading centre	Residents	5th /July/2023
Lomunga women groups	Awoba trading centre	Women	5th and 6th /July/2023

Table 6-4: Summary of key issues from consultation meetings

Stakeholder	Key issues raised	Response
Yumbe district political and technical officers	• Yumbe district has a very big challenge with water consumption. Yumbe's safe water coverage is 50% while the national safe water coverage is approaching 70%. This means Yumbe is short by 20%, particularly in villages where they are hosting refugees. The last census conducted in 2014, indicated that the population was at 400,000 and currently the projected	• Water demand for the project is based on the current and projected population growth in Yumbe district. • Preliminary designs are out

	population is approximately 750,000 with an approximate population of refugees at 240,000. The average population in other districts is approximately 200,000 and this is an indicator that Yumbe has a very big host community population, and this population influx presents challenges. How will the project meet the increasing water demand for yumbe. • nd this is an indicator that Yumbe has a very big host community population, and this population influx presents challenges. How will the project meet the increasing water demand for yumbe. • s an indicator that Yumbe has a very big host community population, and this population influx presents challenges. How will the project meet the increasing water demand for yumbe. • Concern about the delivery timeframe for the proposed project as the drilling works of the boreholes started in 2018 (5 years ago) and according to him, not much has been done as he would expect to see contractors now on the different sites. • Ensure that the locals are given priority when it comes to labour to reduce the levels of poverty in Yumbe district. • We understand that water user committees are not active and communities have been used to drawing water from boreholes without paying user fees but only contribute in case of mechanical breakdown. How will the proposed supply system be maintained?	and MWE has now embarked on ESIA without which the project cannot proceed. The project implementation is flowing the due course as stipulated in the NEMA guidelines • Under the IWMDP, local content is strictly observed • The project will engage a stakeholder engagement consultant to revitalize and build the capacity of existing water user committees • The stakeholder engagement consultant will be tasked to sensitize communities on the importance of paying water user fees for sustainable O&M of the water supply system.
Bijo sub-county leaders	• To ensure ownership of the project, the local community should be involved in project activities right from the start. • Community leaders should be provided with project schedules including all planned activities to inform and involve the community in the different project activities. • The water supply should be extended to schools with water harvesting tanks because these tanks have proved insufficient during the dry season. • For the project to be socially accepted, residents should be given priority when recruiting for local labour, especially for jobs that do not require technical skills. • The sub-county should benefit from the project by locally supplying construction materials such as sand, bricks, cement, and stone aggregate among others. This will in the long run widen the Bijo sub-county local revenue base. • Many water sources have been identified and drilled yet the project intends to use one. The Ministry of Water should in the long run use the other water sources to develop more water supply systems to meet the increasing water demands of the	• The project will develop a stakeholder engagement plan that will elaborate on how communities will be continuously engaged • Selected public institutions with poor access to water will be targeted. However, during the operation of the project, the water supply system will be extended to public institutions. • The project will strictly apply the local content policy.

	local population.	
Lomunga community	• There is fear that the school girls may be impregnated by the contractor's workers. The project should put in place measures against workers involved in love affairs with school girls. • The project should have a strict code of conduct against employing children below the age of 18 years. • There should be due diligence of the contractor in terms of their capacity to deliver the project within the agreed timelines. • The contractors should be vetted to have in stock modern equipment to execute the works within the agreed schedules. • The project should have terms and conditions for all the jobs to avoid exploitation of workers through underpayment and unfair dismal of workers. • The contractors should seal off the construction sites to avoid animals and school children falling into excavated trenches. • The water pipes should be excavated deep to avoid being cut by farmers when digging in their gardens. • All the affected properties including land and crops should be well documented and adequately and fairly compensated.	• Contractor's workers will be required to sign a code of conduct • The contractors will be selected through a transparent process following PPDA procurement guidelines • The laying of pipelines will follow approved structural designs to avoid damage during the operational phase • A RAP will be carried out to assess, record and compensate affected properties in a timely and adequate manner.
Lomunga Women groups	• The project should employ a large number of women. This will be realized by preserving some jobs for women such as cooking, fetching water, storekeeping, and revegetating cleared surfaces. • For women to benefit from the compensation, the project should empower them to witness compensation processes, especially during verification and disclosure. • The contractors should have and enforce an ethical code of conduct against workers who engage in love affairs with married women and school girls. • The working hours for women on project jobs should be during the day i.e., 8 am to 5 pm to avoid domestic violence that may be caused by wives reporting home late. • The men should be sensitized to the need to have their wives get project jobs for the good of their families. • The project should not establish new water user committees but rather work with the existing ones by strengthening and building their capacity in O&M of the proposed water supply system. • The project should sensitize the community on the benefits of paying water user fees. This is attributed to the fact that compliance for payment of user fees is low.	• The project will enforce local content • Contractor will be required to develop and enforce a code of conduct • All workers will be required to sign a code of conduct to avoid social ills • The stakeholder engagement consultant will strengthen and build the capacity of the existing water user committees • The contractor will be required to develop a GBV management plan to mitigate against the risk of GBV and SEA/SH.

	• The risk of GBV happening as a result of the project is low. This is partly attributed to the existence of the paralegals at the sub-county level. These paralegals should be strengthened to sensitize residents on the dangers of GBV and also empowered to make referrals for reported cases of GBV.	
Lomunga Senior Secondary School	• The school has both local and refugee students. However, the water source is not sufficient to meet the water needs of the increasing school population. • The school relies on a community borehole which frequently breaks down. The proposed water supply system will help in addressing the problem. • The school has a water harvesting tank but is not functional during the dry season. By extending a water point to the school, the existing water sources will be reinforced and this problem of unreliable water flow will be addressed. • There is a fear that during the construction and laying of transmission and distribution pipes, learning will be interrupted because the school is near the road reserve. • There is a fear that during the construction phase, the casual workers will use inappropriate language which will corrupt the morals of the students. • It is anticipated that the project will improve the nutrition program of the school which heavily relies on water for improved cooking of a balanced diet.	• Public institutions with inadequate water sources will be extended to the new water system including schools and health centers • To avoid interruption of learning, construction of the pipeline will be timed during times when schools are off or not busy • The contractor will be required to develop a workers' code of conduct that will guide against inappropriate behavior.
UNHCR Protection House - Bijo	• The project will relieve the households of the water demands of the high number of reporting refugees. UNHCR has a storage tank supplied by AIRD but not adequate to meet the water demands. • The facility should be given a water supply point that is separated from that of the community because it handles refugees who are not permitted to interact with the host communities. • The project will reduce waterborne disease since the community borehole where the facility draws water for drinking is not safe. • The project should introduce water user fees for the sustainable operation and maintenance of the water supply system. • The proposed water supply system will help avoid the health risks associated with the community boreholes whose water is not treated and is unsafe for human consumption because it contains living organisms.	• The water supply system has been designed based on the current and projected future water demands of the catchment area • For the sustainable management of the water supply system, the users will be required to pay a smaller user fee • The proposed water supply system will be key in mitigating waterborne diseases through the provision of clean and safe water.
Bijo Police Post	• The project is likely to increase cases of domestic violence especially where women will get casual jobs without their	• Community sensitization meetings will be held with

	husbands' consent. • Violence against women and children caused by fetching water, especially in insecure hours i.e., early morning and later in the evening will be reduced. • During the construction phase, it is anticipated that prostitution will increase and the area is likely to receive sex workers from different towns of West Nile. The project and local leaders should put in place measures to prevent prostitution in the area. • According to the police records, child labour stands at 2% while sexual harassment against school girls stands at 6%. There is a likelihood that the project will increase cases of child labour and the defilement of school girls.	targeted messages for men to allow women to work on the project. • By installing more water points across the community, risks associated with fetching water in the early hours will be mitigated against • Child labour will be mitigated by ensuring that the contractor develops a child protection protocol and also implements the labour management plan that prohibits employing children in project-related activities.

Figure 6-1 indicates a pictorial view of some of the stakeholder meetings conducted during the ESIA study

Engagement with Yumbe District Officials

Engagement with Yumbe District Water Officials

Engagement with Bijo Subcounty officials

Visit to Kirilo Borehole site with community members

Engagement with Lomunga Community

Figure 6-1:Pictorial evidence of consultations during the ESIA Study

7 PROJECT ALTERNATIVES

7.1 Introduction

Analysis of feasible environmentally and socially sound alternatives for this project touches on several aspects including a no-project development option, the water project construction intervention option, alternative sites for the pipelines, timing and scheduling and environmental classification alternatives.

7.2 The proposed Lomunga RGC Project

The proposed Lomunga RGC is set to bridge the water supply and sanitation gap by utilising solar solar-powered piped water supply system with a ground water source, elevated water storage steel tank and distribution pipes capable of meeting the daily drinking water needs. The project will increase sustainable access to safe water and basic sanitation in the Lomunga rural growth center.

7.3 The No Project Alternative

SDG target 6.1 aims to increase universal and equitable access to safe and affordable water supply for all by 2030. Uganda's Vision 2040 aims to transform Uganda's economy to a middle-income status and have a portable water supply to every parish in the country. In a bid to achieve sustainable and equitable economic development for all, the Ministry of Water and Environment intends to establish Piped water supply systems in Rural growth centres in refugee hosting Districts.

According to Yumbe District Development Plan (2021-2025), The safe water coverage for the district is only 48% (based on a source man ratio of 300 people served by 1 deep borehole, 300 people served by 1 shallow well, 200 people served by 1 protected spring, and 150 people served by 1 Tap stance). The district has for a long time been struggling to cope with chronic water shortages and the inadequacies of their existing water infrastructure. During dry seasons the majority of households in the study (31.8%) traveled a maximum of 0.5km to the main water source, 35.6% traveled between 0.51 to 1km to the main water source, 21.8% between 1.1 to 2km to the main water source and 10.9% travel above 2km in search of water, hence wasting significant economic time and energy in addition to poor hygiene. The cost of water limits consumption and water use and escalates the possibility of an outbreak of water-borne diseases.

The main challenges facing the communities in both wet and dry inadequate water is overcrowding, and dry up of boreholes.

A No Project alternative will leave the residents of Bijo in this current dire situation and deny them adequate drinking water, sanitation, and hygiene which are essential ingredients to ensure human health.

7.4 Alternative Sources of Water

7.4.1 Limika (Stream) Surface water

As regards surface water, the nearest surface water source within the project area is Limika Stream. Even though the water stream source would provide the required water quantity even during the dry season, the cost of treating this water would be very expensive since the river is highly polluted and water quality is very low due to high turbidity

Therefore, the option of exploiting surface water sources as an alternative to the Lomunga RGC Water supply system is not a feasible one. It's very expensive and not reliable.

7.4.2 Borehole alternatives

Three boreholes were drilled in Lomunga as alternatives for the project. Two were along Lomunga-Barakata road in Bura village with borehole A (DWD 92071) at coordinates 309668.53 m E, 378125.94 m N and borehole B at coordinates 309453.97 m E, 378014.19 m N. The third was in Kiliro village at coordinates 312065.84 m E, 379275.07 m N. Only Kirilo borehole was selected as the final water source for the project due to its higher water yield capacity as compared to the two sources in Bura village.

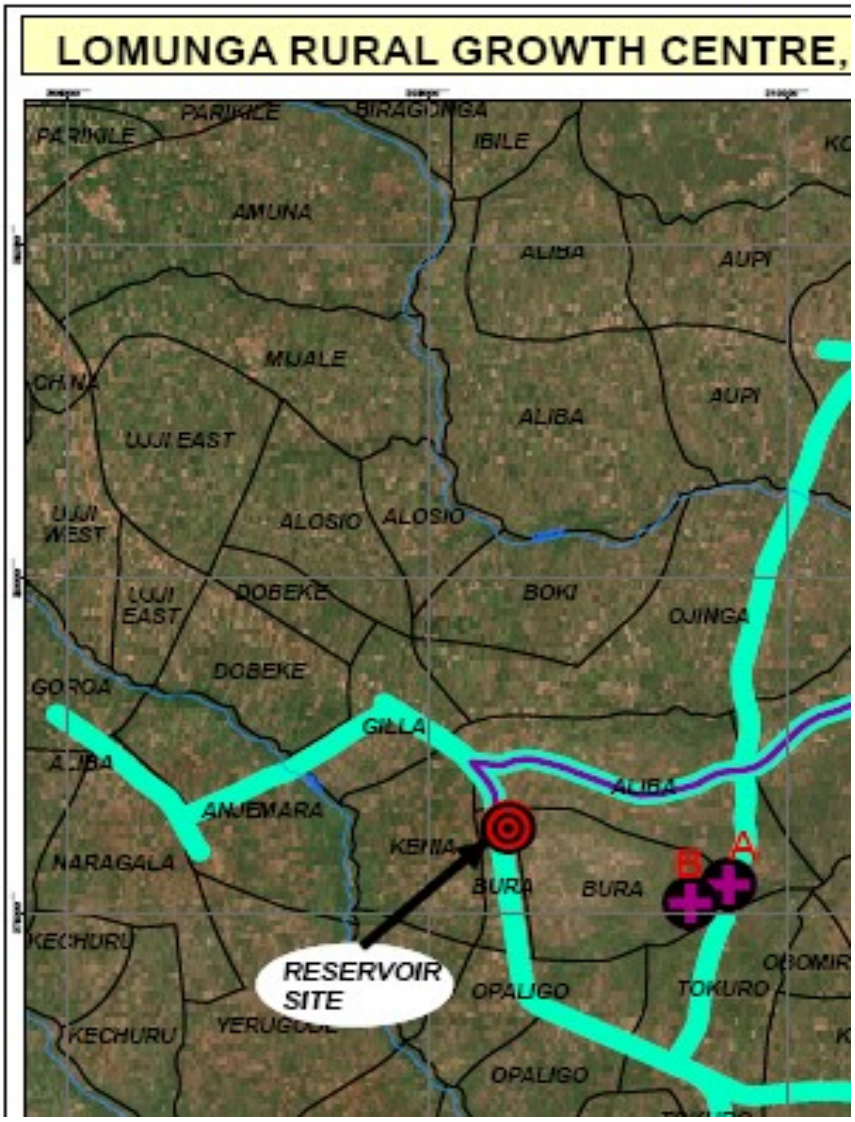

Figure 7-1:Pictorial evidence of consultations during the ESIA Study

In conclusion, Kiliro Borehole with a sustainable yield of 100 m^3/hr presents a suitable source for the water supply. The groundwater source shall ensure sustainable water supply systems to serve the target communities to contribute to the elimination of water trucking in the host and refugee settlements. The existing surface water source even though reliable could be expensive in terms of addition to the high treatment cost due to seasonal pollution and high turbidity.

7.4.3 Roof Catchment:

A roof becomes a catchment when it is used for harvesting rainwater. Then it can be called a "Roof catchment". Roofs are the most common type of catchment used for harvesting rainfall. Rainwater harvesting from impervious roofs made of corrugated iron sheets corrugated plastic and clay tiles is a popular method for providing portable water directly from rainfall. The system provides water at home, is affordable, easy to practice regardless of

physical or climatic conditions and can be designed to suit different conditions (available finances, roof area, family size, rainfall or roof area).

Institutions such as schools, health facilities, offices, churches and other such buildings have large roofs that can be used to harvest larger quantities of water.

They however need good management to regulate water abstraction rates as the water will be used by many people. Wherever possible, the roofs of individual households are preferable to communal systems. Roof water harvesting is particularly attractive where the main alternatives are surface water sources are unavailable and groundwater is either difficult to secure or has been rendered unusable by fluoride, salinity or arsenic.

Roof catchment was not ideal because tapping roof water is not capable of meeting the water demands of Lomunga since most of the rural houses in the project area were grass-thatched making it impossible to harvest rainwater. However, key institutions like Lomunga Primary Schools and Sub-County Offices already harvest rainwater from the large roofs that will supplement the Piped water system.

7.5 Alternatives Pipeline Material

Materials commonly used to construct water pipes include polyvinyl chloride (uPVC), cast iron, copper, steel and in older systems concrete or fired clay. Joining individual water pipe lengths to make up extended runs is possible with flange, nipple, compression or soldered joints.

In this project, the use of concrete, cast iron and copper was not considered.

The type of pipelines to be used will be polyvinyl chloride (uPVC) and galvanized pipe steel. This galvanized coating keeps the water from corroding the pipe. The project will also use High-density polyethene (HDPE) or polyethene high-density (PEHD) is a thermoplastic polymer produced from the monomer ethylene with a high strength-to-density ratio, HDPE is used in the production of corrosion-resistant piping. The use of asbestos concrete pipes was rejected owing to the environmental and social risks and so is the use of concrete pipes or copper pipes due to cost implication and conformity with the best practice in the industry which has scaled down on their usage.

7.6 Alternative Project Routes

Alternative siting will involve re-routing the water pipeline network to other sites other than along road networks. This will be very costly for the proponent as it will require them to search and negotiate for land. It also does not make any economic sense not to take advantage of the land available along road networks demarcated for such projects.

7.7 Sanitation Options

The Lomunga water supply and sanitation system includes a sanitation component for both households and institutions. Onsite and off-site sanitation systems have been analysed as shown below: Central Sewerage System

The Central Sewerage system is an offsite treatment system. It is a water-borne system that requires a reliable source of water in the form of an in- house connection or a yard tap.

Relatedly, it requires that adequate waste water should be generated to drive the excreta down the sewers. For areas with existing water supply systems, an indication of sewage generation is the existence of septic tanks. From the sampled households in the project area, no household had access to a flush toilet, and all public toilets are Ventilated Improved Pit latrines. The area also has no waste water treatment plant in the vicinity to enable the final treatment of the waste water. Sewerage systems and their associated infrastructure are expensive to install, their efficiency notwithstanding. This means that a centralized sewerage system is not suitable for the project area.

7.7.1 On-Site Sanitation Systems

On-site sanitation systems comprising septic tanks and Ventilated Improved Pit Latrines are efficient systems that can serve rural populations. They are relatively cheaper to install, easy to construct and maintain although septic tanks require emptying from time to time. On-site sanitation systems can be progressively upgraded with time to connect them to a sewerage network. A Fecal Sludge treatment plant has been recently constructed in Yumbe Town Council to enable the final treatment of faecal sludge. Given the low investment costs, nature of settlement patterns, environmental and social realities, the ESIA therefore proposes the implementation of onsite sanitation systems for Lomunga Water Supply and Sanitation as follows:

a) Septic tank system for the medium-income group i.e., households with in-house connections,
b) Ventilated Improved pit latrines for low-income groups i.e., households with yard taps and those who use public stand posts.

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7.8 Power supply options

Lomunga RGC has no grid power supply system currently. Therefore, two alternative sources of power supply have been considered for the running of the submersible borehole pumps, viz;

- Generator sets
- Solar power system

An analysis of the above power supply system has been made as follows.

7.8.1 Generator sets

The following capacities of prime generator sets have been sized for each pumping station respectively.

A comparison of the solar power and the diesel generator power supply systems is presented below.

Table 7-1: Comparison between solar power and diesel power generator

FACTORS	GENERATOR POWER	SOLAR POWER

1. Reliability	Offers reliable constant power supply	Solar can be affected by weather leading to failure to adequately charge the batteries for full efficiency to run the system.
2. Capital Cost	The capital cost for the generator is lower compared to the solar system of similar capacity.	Solar initial infrastructure costs are very high. The current estimate is at UGV 1,863 million for Kiliro station. The recovery period of the capital cost for the solar system is less than 3 years (based on the O&M elements that are eliminated for the generator sets)
3. Environmental impact	Environmentally less friendly due to air pollution, noise and dirt.	Environmentally friendlier.
4. Vulnerability	Minimal vulnerable risks such as vandalism	Very vulnerable to vandalism.
5. Space (land) requirement	Minimal land space	The solar system required will occupy a minimum of 536m^2 of land.
6. Useful economic life	Economically viable for 15 years	Economically viable for 30 years
7. O&M costs	Generator operating and maintenance costs are high and regular in terms of fuel, frequent periodic servicing, repairs of the equipment and spare parts replacements.	Cheaper operating and maintenance costs require changing of batteries every 3 years, lamps, cleaning and replacement of panels.
8. Suitability for backup	Generators can act as a backup for the solar system.	The solar system charges batteries during the day and pumps at night.

Based on the analysis above the benefits of the solar system outweigh the use of the power generator. As a renewable source of power, solar energy has an important role in reducing greenhouse gas emissions and mitigating climate change, which is critical to protecting humans, wildlife, and ecosystems and this is in line with the project initiatives. Solar energy is therefore proposed as the preferred energy source for the Lomunga Water Supply and Sanitation system.

8 POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

8.1 Introduction

This chapter identifies and evaluates significant environmental consequences associated with the pre-construction, construction and operation phases of the proposed project. While positive impacts shall be enhanced, the proposed mitigation measures shall be implemented as suggested to minimize or eliminate the predicted negative environmental and social impacts.

8.2 Impact Evaluation and Analysis

This section assesses the level of potential impacts based on various criteria including the severity of impacts, duration, geographical scope, and the existence of readily identifiable cost-effective mitigations. The impact assessment also considers the impacts identified by the stakeholders consulted. The methodology for impact evaluation is contained in chapter 2, section 2.3

Potential and apparent impacts have been identified based on proposed activities to be undertaken, through specialist studies on-site and through a consultative process with key stakeholders as summarised in the environmental and social matrix Table 8.1 below.

Table 8-1: Environmental and Social Impact Matrix

Impact	**Source**	**Probability of occurrence (LMH)**	**Receptor**	**Magnitude**				**Overall significance**		
				Frequency (1-3)	Duration (1-3)	Extent (1-3)	Intensity (1-3)	Impact Sensitivity	Magnitude	Impact Significance
Increased Spread of HIV/AIDS & othe communical Diseases	An influx of migrant labour, sexual behaviours	H	Community	2	3	3	1	Medium (2)	High (11)	High
Land take	ROW Acquisition	H	Community	1	3	2	2	Medium (2)	Medium (1)	Medium
Gender & vulnerable groups related impacts	An influx of migrant labour and increased income in the communities	H	Community	1	3	2	2	Medium (2)	Medium (8)	Medium
Soil compaction and loss of soil structure	Site clearance, road construction, movement of heavy machinery	M	Community, flora and fauna	1	2	1	1	Low (1)	Low (5)	Low
Noise and Vibration	machinery and construction activities	H	Community and fauna	1	2	2	2	High (3)	Medium (7)	High
Air quality alteration & emissions	machinery and construction activities	H	Community and fauna	2	2	1	2	Medium (2)	Medium (7)	Medium
Pollution of soil, surface and	pollution of soil, and water resources due to waste oils, spills, sediments	H	Community, water resources, flora	1	3	2	2	High	Medium	High

Impact	Source	Probability of occurrence (LMH)	Receptor	Magnitude				Overall significance		
				Frequency (1-3)	Duration (1-3)	Extent (1-3)	Intensity (1-3)	Impact Sensitivity	Magnitude	Impact Significance
groundwater	and other wastes		and fauna					(3)	(8)	
Erosion and siltation of water resources	Increased water runoff and erosion, Vegetation clearance	M	Community, flora	1	2	2	2	Medium (2)	Medium (6)	Medium
Occupational Safety and Health hazards	Risks in terms of occupational health and safety	H	Community	2	3	2	2	Medium (2)	High (9)	High
Loss of Flora	Pre-construction and Construction phase site clearing	H	Community, flora and fauna	2	1	2	2	Medium (2)	Medium (7)	Medium
Introduction of alien and invasive species	site clearing, construction and operational stages due to the movement of soils and trampling	M	Community, flora and fauna	1	3	2	1	Medium (2)	Medium (7)	Medium
Disturbance of Fauna and Habitat Alteration	Construction phase disturbance, noise, human presence and pollution	M	All vegetation Mammals, reptiles amphibians, fish	1	1	2	1	Low (1)	Low (5)	Low
Influx of construction workers and Labour 7 social ills	lack the security of a definite tenure and basic social and employment protection, social ills	H	Community and workers	1	2	2	2	Medium (2)	Medium (7)	Medium
Visual Alteration	visual scenery alteration in the project	M	Community,	1	3	1	1	Low	Low	Low

Impact	Source	Probability of occurrence (LMH)	Receptor	Magnitude				Overall significance		
				Frequency (1-3)	Duration (1-3)	Extent (1-3)	Intensity (1-3)	Impact Sensitivity	Magnitude	Impact Significance
	area		Landscape and fauna					(1)	(6)	
Impacts on Physical Cultural Resources and Indigenous People	Property and cultural aspect disturbance	M	Community	1	2	1	1	Low (1)	Low (4)	Low
Theft and Vandalism	Construction camps construction, equipment storage, serviced, materials stockpiles	M	Community	1	2	1	1	Low (1)	Low (5)	Low
Poor sanitation/Waste Management	Wastes generated could be both hazardous and non-hazardous	H	Community, flora and fauna	1	3	2	2	Medium (2)	Medium (8)	Medium
Increase in Traffic accidents and Safety	Traffic and Road accidents	H	Community and fauna	1	3	2	2	High (3)	Medium (8)	High
Operational Phase										
Pollution of soil, surface and groundwater	Pollution of soil, and water resources due to waste oils, spills, sediments and other wastes	M	Community, water resources, flora and fauna	1	2	2	2	Medium (3)	Medium (7)	Medium
Noise and Vibration	Machinery and construction activities	M	Community and fauna	1	2	2	2	Medium (3)	Medium (7)	Medium

Impact	Source	Probability of occurrence (LMH)	Receptor	Magnitude				Overall significance		
				Frequency (1-3)	Duration (1-3)	Extent (1-3)	Intensity (1-3)	Impact Sensitivity	Magnitude	Impact Significance
Visual Alteration	visual scenery alteration in the project area	M	Community, Landscape and fauna	1	3	1	1	Low (1)	Low (6)	Low
Occupational Safety and Health hazards	Risks in terms of occupational health and safety	H	Community & Workers	2	2	1	2	Medium (2)	Medium (7)	Medium
Poor sanitation around the project site	Wastes generated could be both hazardous and non-hazardous	M	Community & Workers	1	3	1	1	Low (1)	Low (6)	Low
Visual Alteration	visual scenery alteration in the project area	M	Community, Landscape and fauna	1	3	1	1	Low (1)	Low (6)	Low
Theft and Vandalism	Construction camps construction, equipment storage, serviced, materials stockpiles	M	Community	1	2	2	2	Low (1)	Medium (7)	Medium

8.3 Construction Phase Environmental and Social Impacts

8.3.1 Flora (vegetation clearance and destruction of crops)

The analysis of the impact discussed in this section is related to the possibility that construction of the project infrastructure may involve site clearance which could remove and/or disturb vegetation in affected areas. For instance, construction of the pump and guard house, office and reservoir may lead to clearance of vegetation at such locations leading to loss of terrestrial, agroforestry and crop vegetation.

The vegetation traversed by the project is indicated in Section 5.2.1. Project infrastructure such as the pump house/office, and transmission line traverses through savanna grassland and crop gardens. The vegetation cover in Bijo Subcounty is highly transformed from its original natural state and in contrast, hosts few remaining species. Very little remaining natural vegetation cover of conservation importance remains, due to extensive human activities. Most of the existing vegetation are fruit trees (mainly mangoes) and agroforestry trees (teak. There is no characterization of rare and/or restricted-range species in the actual project footprint.

Species of high conservation value such as *Vitellaria paradoxa* and *Milicia excelsae Magnifera indica* which are rated as vulnerable according to IUCN exist.

The clearing of transmission and distribution corridor, movement of equipment and contractor staff and laying of pipes will lead to the spot destruction of vegetation through existing grassland, crop gardens and savanna woodlands. The location of the pump house will result in noticeable destruction of vegetation such as woodland but will not affect any species of high conservation.

Although the systematic clearing of the 3-meter strip of land in the road reserve will destroy vegetation, the impact on the conservation status of the affected flora & ecosystems is expected to be minor-low since there are no specific species of conservation concern that will be destroyed along this corridor.

Risk assessment matrix

The impact of vegetation clearance along the water transmission/distribution line and or at the reservoir, Pump house and access road sites, though permanent (at points where infrastructure will be erected), will be localized, minor in magnitude, is reversible and non-cumulative, thus a minor change will occur. Therefore, the impact of construction activities on the vegetation and habitats is expected to be minor which could be mitigated to a further low significance with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Loss of vegetation	Local	Medium	Temporary	Certain	Medium

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Mitigation Measures	• A RAP shall be developed and implemented by MWE to ensure that affected crops are compensated. Compensation should be in line with the World Bank and Government Chief Valuers approved RAP report. • Before compensating destroyed crops, and the affected persons, adequate community sensitization meetings shall be carried out to ensure that the PAPs are aware of the entire program including the visitation schedule per village, parish and or sub-county and how each PAP with be contacted and approached for payment. • Engage local communities in conservation efforts, including sustainable resource management practices and alternative livelihoods that reduce pressure on the identified species (*Vitellaria paradoxa, and Milicia excelsae)* which are categorized as threatened species) and their habitats. • Species of conservation concern should be identified within the project sites, marked out or protected during the project implementation. • Including threatened species in restoration projects, can lead to the successful conservation of these species, many of which do not currently have conservation measures in place, Specific restoration activities such as re-planting of appropriate indigenous trees and domestication of some indigenous tree species such as shea trees, bamboo among others can be promoted. • Tree planting for Watersheds: The watershed approach is seen as a better way to identify and conserve watersheds so that they continue to provide ecosystem services through water source protection plans. • Support appropriate alternative livelihood enterprises such as tree nurseries and distribution of seedlings as a measure for water source catchment protection • Raise awareness among local communities, stakeholders, and policy makers about the importance of these species and the need for their conservation. • The construction of the proposed water transmission and distribution lines shall only commence when all the affected farmers have been fully sensitized to the pending activities. Before the construction phase, farmers shall be sensitized on the pending project at least 6 months in advance such that cultivation under the line and within the water pipe corridor is stopped or reduced. This will give affected farmers ample time to plan. • Limit the project activities to the footprint of the required project area; • Prohibit off-road driving and parking outside of the project area, perimeter fence and designated parking area; • Establish a containerized storage for construction/ project materials to limit the number of movements; and • Stockpile the surface soil on the side of the project site for future use in landscaping.				

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
	• After construction, there should be landscaping and then grass left to recolonize the disturbed area naturally. The Developer shall set aside funds to contribute towards local environmental programs. MWE shall remit funds towards district and sub-county afforestation projects as part of the catchment management program to compensate for biomass lost during corridor clearing and habitat fragmentation. In case the destruction is due to the contractor's negligence, it will be the responsibility of the contractor to make compensation. MWE shall take the overall responsibility however, the contractor takes liability for those plants/trees destroyed either knowingly or unknowingly and which are outside the Corridor. • The contractor should restore sites where activities will be carried out at all the project sites. The topsoil that will have been removed before pitting the trenches for the pipeline should be put back to cover the trenches so that the crops can regrow in a natural environment. Excess soil, stones and boulders should be dumped in an area that has been approved by the District Environment Officer. • MWE should also identify and support afforestation initiatives to enhance tree cover areas as a way of reducing its project footprint. • Identify and protect critical habitats for any target species in the project area				
Cumulative Impact	At the time of assessment, no visible projects were being implemented or planned, however, it was noted that extension of the electricity grid to the rural areas is likely in the future. Therefore, the compounding effect on Vegetation clearance as a result of other projects may lead to increased soil erosion, as vegetation helps to hold soil in place. This will lead to the sedimentation of water bodies such as Limika stream affecting its water quality and aquatic habitats. The impact significance is medium to High. ***Mitigation Measure*** • Plant trees and restore vegetation to mitigate the impacts of climate change. • Encourage sustainable land use practices, such as agroforestry and re-afforestation in local communities				
Residual Impact	Due to the construction of the project, there is the likelihood of minor residue negative impact even after the implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.3.2 Land take

The analysis of the potential impact discussed in this section is based on the fact that land will be acquired during the implementation of the proposed project activities. The baseline information indicates that land ownership in the project areas is mainly communally owned

and governed by the customary system of land tenure system (see section 5.5) and agriculture is the main form of land use in the area.

Land take and associated impacts are only limited to the pre-construction and construction phases. Land for the establishment of the pump house, the reservoir, and other project components would have been acquired before the commissioning of project activities and any further project activities following the construction of infrastructure are planned within the footprint of the project site.

The construction of the project infrastructure will necessitate the acquisition of land for permanent activities. Permanent land take will result from the construction of the pump house and the reservoir facilities, and related infrastructure such as access roads, and fences among others.

To access the sites during project construction and operation, it could be necessary to upgrade the community road, including widening the existing road as well as constructing new link roads to the project site, these activities could further lead to permanent loss of land to the project. All the land required for the construction of project structures and infrastructure is owned by the local community under the communal/ customary land tenure system.

This impact will lead to the permanent abandonment of activities such as farming, and animal rearing that are being carried out within the project footprint. In addition, land take is likely to threaten the food security of the local communities that depend on land for both agriculture and fruit harvesting.

According to the present project design, there will be no physical relocation of any house as a result of the proposed project.

The impact is only limited to the construction phase as there are no further significant land requirements during the operation of the Water Supply and Sanitation System even though extensions could happen.

Risk assessment matrix

The identified effects of land take and habitat due to construction activities were assessed to be moderate which could be mitigated to a further low significance with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Loss of land to the water infrastructure	Local	Low	Long term	Certain	Medium

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Mitigation Measures	• Land required for project infrastructure such as the pump house and associated components will be legally acquired and paid for. • A RAP shall be developed and implemented by MWE to ensure that affected crops are compensated. Compensation should be in line with the World Bank and Government Chief Valuers approved RAP report. • Limit the project activities to the footprint of the required project area; • Prohibit off-road driving and parking outside of the project area, perimeter fence and designated parking area; • Establish a containerized storage for construction materials to limit the number of movements; and • Stockpile the surface soil on the side of the project site for future use in landscaping.				
Cumulative Impact	The increased land take from other projects may affect the agricultural activities of local communities, particularly those who depend on agriculture and fruit harvesting for sustenance. The combined cumulative land take for all developments in the area represents a minor reduction in the overall land available for crop farming and animal husbandry, which is likely to minimally reduce the overall agricultural production over the short to medium term at least. The impact significance is medium due. ***Mitigation Measures*** • Seek community input on land-use decisions to ensure development aligns with local priorities • Liaise with the Land acquisition committee for standard rates and compensation timing to avoid double impact or disruption of the same community or individuals • Develop and implement land use planning strategies that ensure minimal disruption to agricultural activities. This could involve identifying alternative areas for project development that have less impact on agricultural land.				
Residual Impact	Due to the construction of the project, there is the likelihood of minor residue negative impact even after implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.3.3 Soil erosion and siltation of water resources

Site preparation activities will include clearance of vegetation within the footprint of the pump house/ office, reservoir, lay-down areas and access road, among other facilities to be developed. These activities will result in the stripping of vegetation and topsoil, which will need to be stockpiled, backfilled and/or spread on-site. This will loosen the ground due to the removal of plant roots and expose the ground to agents of erosion. Compaction of the ground will also result in accelerated rates of stormwater runoff which directly increases the rate of

soil erosion. Eroded soil could also affect the silting of the Limika Stream downstream of the Kirilo borehole source project area. This could also affect the aquatic ecosystem.

The impact is only limited to the construction phase as there is no further significant vegetation clearance and ground disturbance operation of Lomunga RGC Water Supply.

Risk assessment matrix

The identified effects of soil erosion and siltation of water resources due to project construction were assessed to be substantial which could be reduced due to proper implementation of the mitigation measures.

Impact	**Extent**	**Magnitude**	**Duration**	**Probability of occurrence**	**Overall Assessment**
Soil erosion and siltation	Local	Medium	Temporary	Possible	Medium
Mitigation Measures	• Site preparation should be undertaken systematically to reduce the risk of open-ground erosion. • There will be controlled clearance of vegetation and this should be limited to only sections that are required for the establishment of project infrastructure. • An efficient drainage system should be incorporated into the project design to cater for efficient and effective drainage of stormwater from the project site and along the access road. Where possible, construction activities should not take place during heavy rain seasons. • Disturbed areas will be rehabilitated using suitable indigenous cover grasses. • Landscaping of affected areas should be undertaken following the completion of the construction phase to stabilize surfaces.				
Cumulative Impact	The construction activities of projects such as the electricity distribution network envisaged will lead to increased siltation in the water quality of Limika Stream since it is located downstream of the production source as sediments will carry pollutants and contaminants into the stream, affecting its safety for consumption by animals and the local community if not well mitigated. The impact significance is medium to Low. ***Mitigation Measures*** • Implement erosion control measures such as terracing, reforestation, and erosion control blankets to reduce soil erosion. • Regular maintenance of water infrastructure to remove sediment buildup and repair erosion damage.				
Residual Impact	Due to the construction of the project, there is the likelihood of minor residue negative impact even after implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.3.4 Disturbance of Fauna (Loss of wildlife, invertebrates, birds, etc.)

The analysis in this section focuses on the potential impact of the project on fauna within the project area, particularly concerning the disturbance caused by vegetation removal and construction-related activities such as noise and vibrations. The removal of vegetation not only destroys fauna habitat but also disrupts or alters habitats for birds, which were the main fauna identified in the area according to the baseline data presented in section 5.2.2. Additionally, the project area is characterized by human settlement and limited natural vegetation, indicating a highly modified environment. This may lead to the establishment of new invasive species. However, it is possible to address these potential biodiversity impacts at all stages of the project, from planning and implementation to post-construction. It's important to note that the impact is primarily limited to the construction phase, as there is no significant vegetation clearance during the operation of the Water Supply and Sanitation System.

Risk assessment matrix

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Loss of biodiversity	Local	Low	Temporary	Likely	Low

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Mitigation Measures	• Movement of equipment (vehicles, contractors and the entire construction crew) must follow designated pathways or agreed-upon access roads. This will avoid unintended damage to fauna. • The contractor should restore sites where activities will be carried out at all the project sites. If a wild animal is encountered, the Contractor shall notify the Environment department at the district//UWA so that it is managed and taken to a secure place. • Trenching, pipework laying as well as well and backfilling will be done concurrently. The contractor shall plan to only excavate trenches after securing and delivering pipes to be laid to reduce on maintenance of open pits. • Implement environmental awareness programs/training among all project employees, particularly during construction. They should be trained to identify arboreal or burrowing species exposed by vegetation and soil stripping and should have immediate access to a competent specialist on site (e.g., the Environment Officer) who can capture and translocate them to an undisturbed area. • There are no specific measures for the protection of invertebrates because of the difficulty in identifying these species for those unfamiliar with entomology and practical reasons concerning topsoil collection and storage. However, all mitigation measures related to minimizing habitat fragmentation, prevention of soil and water pollution, minimizing trampling and control of invasive species should be applied. • Restrict vehicle movements to and from the project site to the project access road - off-road driving should be prohibited. • Following construction, rehabilitation of all areas disturbed during the construction phase and that are not required for regular maintenance operations must be undertaken. • All exposed areas are to be re-vegetated using indigenous species				
Cumulative Impact	Construction activities and infrastructure development will most likely lead to the loss or fragmentation of habitats, affecting the local fauna of species. The key indicator species have been studied an included in the report that formed the basis of the biodiversity assessment. Increased projects within the same footprint may not result in significant impacts since most of the animals close to the project area were domestic. However, this does not rule out any migratory species that may be encountered. The impact significance is medium. ***Mitigation Measures*** • Implement habitat restoration measures to offset habitat loss and fragmentation. • Schedule construction activities to minimize disturbance during sensitive times such as breeding seasons. • Reduce traffic speeds to avoid road kills from speeding vehicles				
Residual Impact	Due to the construction of the project, there is the likelihood of minor residue negative impact even after implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.3.5 Visual Alteration (Aesthetics pollution)

The topography of the area comprises limited and low undulating landscape sloping eastwards. (See section 5.1.2). Site clearance, excavations and heaping of spoil soil or storage of the construction materials will be visible because of the nature of the area and maybe aesthetic to some people.

The construction activities if not masked to blend with the environmental setting might affect the visual amenity around the area, especially for Bura Village.

The project will involve the construction of a pump house, water reservoirs, an office and sanitary facilities. These being above ground may lead to visual pollution for those who might be concerned about seeing them. Because of this, the project may attract complaints from a section of the affected people which may slow down the project implementation pace. A well-planned and designed development of this nature with well-kept green areas may be aesthetically pleasing to the eye compared to the current land use. Although this will be permanent, the extent will be local and the magnitude is low hence the impact is rated as minor.

Risk assessment matrix and mitigation measures

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Aesthetics pollution	Within a Limited area	low	permanent	Likely	Minor
Mitigation Measures	• Restore disturbed areas following completion of construction activities; • Construct a perimeter fence around the project site before the establishment of the project component; • Landscaping will be done around the water supply infrastructure. Planting trees, shrubs, and flowers will also be done to create a visually appealing environment • Plant native vegetation along reservoirs, to prevent erosion, and enhance the overall landscape. • Consider creating buffer zones with a mix of trees and plants to protect water quality. • Sensitize community members on the planned development				
Cumulative Impact	The visible construction activities may be perceived differently by different stakeholders, with some considering them unsightly or disruptive to the natural environment. The impact significance is medium ***Mitigation Measures*** • Design infrastructure and construction activities to minimize visual impact and blend harmoniously with the surrounding landscape. • Engage with local communities and stakeholders to understand their concerns and incorporate their feedback into the project design and implementation. • Use natural or man-made screening, such as vegetation or fencing, to visually shield construction activities from view				
Residual	There is the likelihood of a minor residue negative impact even after the implementation of the				

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Impact	proposed mitigation measures during the operation of the water supply system.				
Reversibility	Yes				

8.3.6 Noise generation

During the implementation of project activities, noise will be generated which could become a nuisance to the local communities within and neighbouring homesteads along the access road. Baseline noise levels at the project site were determined. The baseline noise levels were then used to assess the likely increase in noise levels as a result of the proposed construction activities. Reference was also made to the National Environment (Noise Standards and Control) Regulations, 2003 and in particular to permissible noise levels for different environmental settings (see Table 8.1) as well as the Maximum permissible noise levels.

The noise created at the site during construction is not expected to noticeably alter baseline noise levels, but some events may result in noise levels that exceed the maximum permissible noise levels for construction sites. Noise levels generated will pose a greater nuisance if construction activities take place at night. However, based on current planning this is not envisaged.

Table 8-2: Maximum permissible noise levels for construction sites and accelerating vehicles

Facility	Maximum Permissible Noise Levels dB (A)	
	Day*	Night*
Construction Sites		
(i) Hospitals, schools, institutions of higher learning, homes for the disabled, etc.	60	50
(ii)Buildings other than those prescribed in paragraph (i) above	75	65
(iii) Industrial	85	65
Accelerating Vehicles		
Vehicles intended for carriage of goods and having a maximum mass exceeding 3.5 tonnes		
a) With an engine power of less than 75KW	81	
b) With an engine power of not less than 75Kw but less than 150KW	83	
c) With an engine power of not less than 150KW	84	

The letters "A" following the abbreviation "dB" designate a frequency-response function that filters the sounds that are picked up by the microphone in the sound level meter. (A) is used to measure hearing risk and for compliance with the Occupational Safety and Health

Act, 2006 regulations that specify permissible noise exposures in terms of a time-weighted average sound level or daily noise dose.

Time Frame (The time frame takes into consideration human activity).

Day: 6.00 a.m-10.00 p.m., Night: 10.00p.m- 6.00 a.m.

Source: Environmental Legislation of Uganda Handbook (2003).

The major sources of noise and vibration during the construction of the project infrastructure will be mainly from construction equipment and the construction crew. Some of these noise sources are continuous e.g., access road construction activities, while others are intermittent, such as earthworks, site levelling, ramming of the mounting structures, etc.

Generated noise will alter baseline noise levels but it is unlikely that noise levels will exceed the maximum permissible noise levels for construction sites. In addition, unlike the noise associated with the actual site activities, the noise generated along the access road will not be continuous and/or stationary and this noise is therefore not considered particularly relevant, nevertheless noise mitigation measures have been suggested for the access road as well.

Intermittent noise levels will be generated at both construction sites (Pump House and Reservoir) and along transportation routes. Noise could disrupt learning activities at schools along the Yumbe – Rhino Camp Road such as Lomunga Primary School, and disrupt community communication among homesteads, especially in Bura Village where the reservoir is proposed to be constructed. Noise will also be a nuisance to prayer activities, especially at mosques.

It is important to note however, that, noise levels generated tend to reduce exponentially with increasing distance from the source, and therefore irrespective of the sensitivity of the receptor, it is the intensity of the impact that influences the severity of the noise impact.

Risk assessment matrix

The identified effects of noise generation and vibration as a result of project construction were assessed to be moderate which could be mitigated to lower significance with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Noise and vibration	Local	Medium	Short-term	Certain	High

mitigation Measures	• Prior notice/community awareness will be undertaken for the local community members to keep them informed of what will take place/schedules of the project activities so that they can plan accordingly. Where necessary, they will be advised to avoid some sections at certain times of the construction phase to avoid noise disturbances/nuisance; • Noise events will be scheduled for appropriate times of the day to avoid disturbance of any programmed community gatherings; • Construction activities will be limited to only daytime hours; • Unnecessary noise from the construction crew (such as loud music) will be prohibited; • Adherence to national noise regulations as stipulated in the National Environment (Noise Standards and Control) Regulations (2003) will be ensured; • A grievance mechanism will be established to enable local people to express their concerns; • Noise monitoring will be undertaken within the area and at nearby sensitive receptor sites during construction; • The use of well-maintained and serviced equipment that generates low noise levels will be emphasized; • Workers involved in construction activities will be provided with requisite Personal Protective Equipment; • Idling of machinery including vehicles will be prohibited unless necessary; • The use of horns should be reserved for safety considerations, and not used as a common communication method; and • Acoustic insulation (e.g., screens or bunds) will be deployed, when necessary, especially on compressors, when possible.
Cumulative Impact	The increase in noise levels from construction activities will most likely lead to noise pollution and this is likely to occur in the same project footprint, which can have adverse effects on human health and well-being in receptor areas such as Lomunga trading center, institutions along distribution lines etc. The impact significance is High. ***Mitigation Measures*** • Engage with local communities to raise awareness • All entities should follow the limits provided in the National Environment (Noise standards and Control) regulations 2003
Residual Impact	Due to the construction of the project, there is the likelihood of a minor residue negative impact even after the implementation of the proposed mitigation measures.
Reversibility	Yes

8.3.7 Pollution of soil, surface and groundwater

During the conduct of the implementation of project activities, poor waste management and oil and fuel leaks will contaminate the soil, surface and ground water thus affecting its quality.

Sources of hazardous chemicals that may temporarily contaminate the environmental quality were identified and analysed on a case-by-case basis. These were then used to discuss the likely decline in the soil and water quality that is likely to be caused as a result of the implementation of activities.

Potential contaminants during the construction phase for the Lomunga Water Supply and sanitation System include packaging (paper, plastics, wood); plastic liners; food; oil spillages, and worn-out personal protective and oily rugs. If not properly managed, this waste has the potential to contaminate soil in or within the vicinity of the project area as well as nearby water bodies such as Limika Stream which is located downstream of the production source.

Risk assessment matrix

The identified effects of pollution of the soil surface and ground water due to project construction were assessed to be substantial and could be reduced to lower significance with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Pollution of soil, surface and groundwater	Local	Medium	Short-term	Possible	High

Mitigation Measures	• The project proponent will ensure that all wastes generated during construction activities such as conductors, steel and metallic bars, insulators and other accessories are collected and disposed of appropriately at designated sites; • All organic waste generated at the project site such as food waste shall be collected and transported by a licensed waste collection entity to designated landfills/dumping sites within the project area; • All plastic waste generated in the course of undertaking works such as mineral water bottles, polythene bags, and jerry cans, will be collected preferably in waste bins/ mobile vans and handed over to a licensed waste collector or re-used; • All wastes emanating from the refuelling procedures and contaminated soils will be treated as hazardous waste; • Undertake monitoring of the soil quality and devise corrective action when changes attributed to project implementation have been observed; • The waste management hierarchy will be followed during the construction phase. According to this hierarchy, source reduction of waste will be the first option and disposal of unavoidable waste as the option of the last resort; • Undertake routine preventive maintenance of motorized equipment to avoid any fuel leakage and spills; and • All waste generated from project activities will be collected and disposed of following the local district guidelines, National Environment (Waste Management) Regulations 1999 and international best practices.
Cumulative Impact	Contaminants can leach into nearby water bodies such as the Limika Stream, leading to water contamination. This can pose risks to public health through the consumption of contaminated water or food grown in contaminated soil. The impact significance is High. ***Mitigation Measures*** • Dispose of waste in accordance with local regulations and guidelines to prevent contamination of soil and water. • Provide training to workers on proper waste management practices and raise awareness among the local community about the importance of waste management. • Regular monitoring of waste management practices to ensure compliance with regulations and to identify and address any issues promptly.
Residual Impact	Due to the construction of the project, there is the likelihood of minor residue negative impact even after implementation of the proposed mitigation measures.
Reversibility	Yes

8.3.8 Soil compaction and loss of soil structure

During the implementation of proposed project activities, soils within the project perimeter will be compacted which may result in loss of its functioning. The main cause of this impact will be the movement of the construction equipment within the project perimeter, pressure exerted on the ground may result in the compaction of sub-surface soils.

Soil compaction alters soil's physical and chemical properties by reducing the composition of air, reducing the rate of infiltration and formation of a hard pan which increases soil resistance to root penetration. As a result, the productivity of the soil decreases, hence the loss of soil functioning.

Risk assessment matrix

The identified effects of soil compaction and loss of soil function due to project construction were assessed to be minor.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Soil compunction and loss of soil functions	Within a Limited area	Low	Short-term	Possible	Minor
Mitigation Measures	• Limit the project activities to the footprint of the required project area; • Prohibit off-road driving and parking outside of the project area, perimeter fence and designated parking area; • Establish a containerized storage for construction materials to limit the number of movements; and • Stockpile the surface soil on the side of the project site for future use in landscaping.				
Cumulative Impact	The interaction of the construction of the proposed project with "other" projects and/or plans, especially the envisaged electricity distribution lines in the area may lead to increased soil compaction due to the movement of the construction equipment that may alter the physical and chemical properties of soil, reducing its ability to support soil organisms and perform essential ecosystem functions such as nutrient cycling and water regulation. The impact significance is Low to moderate. ***Mitigation Measures*** • Establish designated access routes for construction vehicles to minimize their impact on sensitive soil areas. • Designate specific staging areas for construction vehicles to park and unload materials without traversing sensitive soil zones.				
Residual Impact	Due to the construction of the project, there is the likelihood of minor residue negative impact even after implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.3.9 Alteration of air quality due to generation of dust and emissions

Construction activities will result in dust emissions as a result of vegetation clearance at the proposed project site for the establishment of the different water supply and sanitation system infrastructure components and along the access road route as a result of vehicular movement. Dust will also be generated during the transportation of required construction materials from

the different source points to the proposed project site. Fugitive dust may be stimulated by heavy wind and storm along the cleared access road, cleared project site and from soil stockpile(s).

Dust emissions, particularly in the form of particulate matter (PM10 and PM25) at the proposed project site and majorly along the roads that will be used to access the site during construction are likely to pose a nuisance to local community members and other road users, who in addition to project workers will constitute the key sensitive receptors.

The proposed project area is generally rural with interfaces of natural vegetation and lands under cultivation. The area is largely vegetated which limits exposure of soils to wind, and the dust raised by wind could be essentially retained by vegetation. There are also low levels of traffic through the village and as such, low fugitive dust levels at the proposed project area.

The most significant sources of gaseous emissions during the construction phase are expected to be from the operation of vehicles and equipment.

The construction equipment could include but will not be limited to; cranes, excavators, trucks, and roller compactor machines. The gaseous emissions caused by the project based on the above listed equipment, are expected to include CO^2, NO^2, SO^2, volatile organic compounds and BTEX, since most of the construction equipment and machinery will be powered by diesel engines.

Air quality impacts from the construction of the water supply infrastructure would be temporary and dependent on both manmade factors (e.g., intensity of activity, control measures, etc.) and natural factors (e.g., wind speed, wind direction, soil moisture, etc.). However, even under unusually adverse conditions, these emissions would have, at most, a minor, transient impact on off-site air quality and be well below the ambient air quality standard. Overall, the direct air quality and GHG emissions impact of the construction of the water supply system would not be minor.

There are small-scale industrial developments within the proposed project area, and primary sources of air emissions in the area would be the traffic that plies the community roads (Yumbe- Rhino Camp), produce/grain milling machines and generator operations for power generation in the Lomunga trading centre approximately 1km from project site reservoir.

Emissions associated with Lomunga RGC are therefore not expected to noticeably alter air quality or cause concentrations that exceed the National Environment (Draft Air Quality) Standards 2006 for Uganda, based on experience of similar construction site activities; and the lack of other significant cumulative impacts from vehicles, other projects, or wildfires.

Continuous and long-term exposure to polluted air is associated with effects on human and animal health, especially respiratory-related infections. Such health complications are not anticipated due to the non-continuous nature of the emissions.

Risk assessment matrix

The identified effects on air quality as a result of the generation of dust associated with project construction activities were assessed to be minor.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Alteration of air quality due to generation of dust and emissions	Within a Limited area	Medium	Short-term	Possible	Medium
Mitigation Measures	• The access road should be routinely dampened by watering trucks/sprinkling water so that surfaces remain damp at all times when in use during construction. The proponent should make provisions to have an adequate amount of water and appropriate equipment to disperse water onsite at all times; • All truckloads that enter or leave the site should be covered to minimize dust along community roads; • Clearing of land should be carried out systematically - with clearing restricted to only the required areas to minimize disturbed and exposed areas; • Stockpiles of construction materials should be shielded from wind using materials or tools such as tarpaulins or they should be dropped at low heights and monitored. In addition, they will be located away from the public (e.g. residential areas; • All vehicle movements should be subject to risk assessment (which allows for the incorporation of project-specific controls) and all drivers should be inducted on health, safety and social and environmental issues; • A speed limit of 40km/h for light vehicles and 30km/h for heavy vehicles should be maintained on the community road to access the project site; • Community awareness and sensitization about the proposed project should be created before construction activities so that community members become more vigilant and are aware of what to expect in terms of potential nuisances; • A grievance mechanism will be put in place to address grievances from local communities. • Construction equipment deployed at the project site will be in good condition and will be routinely maintained to ensure they are efficient and emit relatively low exhaust fumes; • Open burning of waste should be discouraged; • Vehicles and machinery should be fitted with appropriate exhaust systems and devices; • Machinery and vehicles should be serviced regularly and following the manufacturers' specifications to maintain efficiency; • All emission-producing equipment should be operated only when necessary and unnecessary idling of equipment will be avoided; • Journey management will be undertaken to ensure that only the necessary trips required for the construction activities are made.				

Cumulative Impact	Impacts may occur from the compounding of an issue (e.g. pollution from different sources affecting the same receptor). Such impacts include Inhalation of dust particles generated by the movement of construction vehicles within the project area can pose respiratory health risks, especially to vulnerable populations such as children, the elderly, and individuals with pre-existing respiratory conditions. The impact significance is medium ***Mitigation Measures*** • Implement dust control measures such as watering of roads and construction areas, use of dust suppressants, and covering of materials to minimize dust emissions. • Raise awareness among local communities • Proper site management practices, including minimizing the area of disturbance and scheduling construction activities to minimize dust generation during sensitive times.
Residual Impact	Due to the operation of the project, there is a likelihood of minor residue negative impact even after the implementation of the proposed mitigation measures.
Reversibility	Yes

8.3.10 Increased traffic and associated risks

During the implementation of the different phases of the project, traffic in the area will increase as a result of project-related vehicles and equipment that will be brought into the area.

The anticipated level of traffic as a result of project activities was determined and analysed on a case-by-case basis. This was then used to discuss the likely increase in traffic in the area as a result of project activities.

Construction activities have risks of accidents from heavy trucks, vehicles and equipment movements. The accidents may not be limited to road kills, they could also be collisions involving community traffic, especially of the community Roads. These accidents could impact livestock and people causing injuries and fatalities. The cause of an accident could be over-speeding, reckless driving or driving under the influence of drugs. There is a considerable volume of traffic plying the case-by-case Yumbe- Rhino Camp Road and limited/ no traffic within the Kiliro Village.

Risk assessment matrix

The identified effects of traffic risks due to project construction were assessed to be substantial which could be mitigated to a lower

significance with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment

Increased traffic and associated risks	Local	Low	Long term	Possible	High
Mitigation Measures	• Traffic warning signages should be erected along the community Road notifying road users of ongoing activities on site; • Establish a driving policy for vehicle and equipment operators; • Establish a grievance resolution mechanism for handling any community complaints and establish proper reporting lines; • Report any accident involving project trucks and equipment to the local authority and the police; • Provide training for drivers to respect other road users; and • Develop and implement a traffic management plan for project vehicles and equipment.				
Cumulative Impact	An increase in vehicular traffic may lead to increased accidents involving heavy trucks and vehicles that are likely to result in injuries and fatalities among both livestock and people in the vicinity of the construction site and along community roads in Lomunga RGC. The impact significance is medium. ***Mitigation Measures*** • Ensure that all vehicles and equipment used in the construction project are properly maintained to reduce the risk of accidents • Implement traffic management measures such as speed limits, signage, and road markings to improve road safety along Yumbe -Rhino camp road				
Residual Impact	Due to the construction of the project, there is a likelihood of minor residue negative impact even after implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.3.11 Poor sanitation around the project site

The potential for the waste generated during project activities to be poorly handled and result in a decline in the sanitation levels within the project area is assessed in the section below.

Construction waste to be generated during this phase may include emptied cement containers, used oils from construction vehicles, machinery and equipment, and packaging materials in the form of plastics and paper. In addition, domestic wastes that may include food waste, food packaging materials brought to the site by construction workers, and effluents and human waste, among others will also be generated during the construction phase.

If not properly handled, domestic and construction waste may turn out to be a sanitation hazard and attracting vermin such as rodents and plastic wastes could affect the health of livestock if ingested. Waste handling facilities were not available in Lomunga Trading Centre particularly at the proposed project sites (proposed source and reservoir) although it is typical

of rural areas to dispose of waste in open land spaces, gardens and pits. Additionally, no waste litter was observed within the project area.

Poor sanitation could also result from poorly disposed construction and human waste. There are limited constructed pit latrines around the project site for use by project workers.

Risk assessment matrix

The identified effects of poor sanitation as a result of project construction activities were assessed to be Moderate and could be reduced to minor with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Poor sanitation around the project site	Local	Medium	Long term	Possible	Medium
Mitigation Measures	• The contractor will ensure that all waste generated from construction activities is properly collected and handled before disposal. Biodegradable, non-biodegradable, hazardous and non-hazardous wastes will be segregated accordingly during collection; • Install and properly maintain a mobile toilet on site for use by the construction crew; • All waste collected should be disposed of appropriately e.g., a licensed waste collector should be contracted to transport waste material from the site to the designated disposal area; • Anti-vermin safeguards (such as covering bins with lids) will be put in place; and • Construction activities will aim to reduce, reuse and recycle waste in preference to disposal.				
Residual Impact	Due to the construction of the project, there is the likelihood of minor residue negative impact even after implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.3.12 Introduction of alien and invasive species

Although the proposed project site currently has different land use forms including natural grassland, woodland, and crop gardens which are therefore 'slightly disturbed' and thus prone to invasive plant species, invasive plant species may be introduced in the area as a result of implementation of the proposed project activities.

In addition to the above, loss of indigenous vegetation may lead to increased spread of invasive plant species already on site by creating favourable grounds for the spread of existing invasive species on site. The baseline assessment of the proposed project site did not identify any invasive plant species.

Construction equipment that is not properly cleaned and sterilized has the potential to transport seeds of invasive species from other parts outside the project site. There are a variety of carriers of exotics ranging from boot soles to cherry pickers.

The use of resources/ murram obtained from elsewhere to construct the project facilities and access roads and the removal of native vegetation may result in the introduction of alien invasive plant species. Such species can spread quickly and inhibit the growth of native species.

Landscaping of the facility after construction tends to leave open areas that can lead to invasion by the introduction of alien species. Other invasive species may be introduced as ornamental plants during landscaping. This would eventually affect the ecological integrity and biodiversity in the area.

Risk assessment matrix

Impact	**Extent**	**Magnitude**	**Duration**	**Probability of occurrence**	**Overall Assessment**
Introduction of alien and invasive species	Local	Low	Long term	Possible	Medium
	• Indigenous plant species will be considered for landscaping the compounds at the project site (where required) as opposed to the use of alien plants; • Areas that will act as a source of murram should first be examined for the presence of invasive species and if any are found, these should first be eliminated before murram is excavated; • Areas where murram is placed should be monitored and any invasive species, removed mechanically.				
Mitigation Measures	• Any recognized IAS will be cleared from the area before it spreads. Invasive species will be controlled throughout the construction period by mechanical removal before flowering; • Areas where murram has been placed will be monitored and any invasive species will be removed manually; • Native topsoil and rootstock removed during site preparation will be stored for subsequent restoration works. • Re-vegetation will be accomplished using indigenous species; and • Landscaping monitoring will be undertaken over at least one year, and any invasive species will be removed manually.				
Cumulative Impact	Construction equipment will most likely act as a vector for the spread of invasive plant species by transporting seeds from one area to another. These species will outcompete native				

	plants, leading to a loss of biodiversity and altering ecosystem functions in Lomunga RGC. ***Mitigation Measures*** • Implement long-term monitoring programs to track the success of invasive species management efforts. • Use adaptive management approaches to adjust strategies based on monitoring results and changing environmental conditions.
Residual Impact	During the construction of the water supply infrastructure and components, there is a low likelihood of minor residue negative impact even after the implementation of the proposed mitigation measures.
Reversibility	Yes

8.3.13 Increased spread of HIV/AIDS and communicable diseases due to population influx

The analysis of the potential impact discussed in this section is related to the possibility that during the implementation of the proposed Lomunga RGC, there may be an increased spread of sexually transmitted diseases. The potential for increased spread of sexually transmitted diseases to occur is assessed below.

The proposed project is expected to attract various categories of people in search of employment opportunities at the project, especially during construction. Some of these will be locals while others will come from outside the project area. The migrant workers may be largely male and of young age. Their continuous movement from place to place keeps them away from their wives and families rendering them susceptible to sexual relationships, which normally exposes them to the risk of HIV/AIDS or other sexually transmitted diseases (STDs).

Though the workers are at the greatest risk, the people in the community are also at risk due to possible sexual relations with the migrant construction workers. Though the impact is temporal (exists only as long as the construction is taking place), the consequences of contracting a disease like HIV/AIDS may be irreversible.

The baseline information is presented in Sections 5-12, 5-12-1 and 5.12.2. The spread of communicable diseases like tuberculosis, diarrhoea, cholera and skin diseases is also likely to increase as more people come to work in the area. Without adequate water, skin and eye infections will spread easily. However, the extent of disease transmission between the communities and in-migrants will depend on the level of interaction between the two, the size of the workforce and their health status, the nature of the casual migrants, and their susceptibility to disease infection. In addition, the living conditions, access to healthcare and workforce management, will also influence the significance of disease transmissions.

Risk assessment matrix

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Increased spread of HIV/AIDS and communicable diseases due to population influx	Local	High	Long term	Possible	High
Mitigation Measures	• Undertake awareness and sensitization campaigns on the dangers of sexually transmitted diseases including HIV/AIDS and methods of spread and control. The HIV/AIDs awareness trainer will be expected to collaborate with local NGOs, CBOs and District Health Officers for sustainability and integration of activities into the existing structures of the local health institutions • Carry out pre-employment medical checks on new and potential employees as part of the recruitment process; • Ensure that the workers' camp and construction areas are open only to formal employees; • Provide the workforce with access to primary healthcare onsite, insecticide-treated mosquito nets, prescriptions, prophylactics, condoms, testing for TB, STDs and HIV/AIDS; • Engage an NGO to prepare community institutions for any influx of in-migrants (for example, by developing by-laws and community policing systems for larger numbers of in-migrants); • Support local healthcare facilities through training of local healthcare professionals, regular supply of medical supplies and up-to-date equipment; • Establish a community health program including providing support to existing or new local programs such as mother and child nutrition, community health awareness, HIV/AIDS awareness, hygiene and immunization, malaria control measures (indoor spraying of insecticides, personal protection measures, and control of mosquito larvae), and local Voluntary Counselling and Testing (VCT) programs; and • Induct workers in relevant codes of conduct that minimize exposure to risky lifestyles including unsafe sex practices.				
Cumulative Impact	Due to the increase in the migrant population with its associated social impacts such as increased Sexual encounters between migrant workers and community members in Lomunga RGC can serve as a conduit for the increased spread of HIV/AIDS and other sexually transmitted diseases (STDs) within the community. This can result in higher infection rates and pose a significant public health challenge. The impact significance is Medium to High. ***Mitigation Measures*** • Establish Voluntary Counselling and Testing (VCT) centres to encourage individuals to know their HIV status.				

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
	• Liase with the concerned entity of common community liaison or engagement • Undertake continuous sensitisation of communities in the affected areas				
Residual Impact	During the operation of the water supply system, there is a likelihood of minor residue negative impact even after the implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.3.14 Theft and vandalism of property

With construction activities ongoing at the site, a lot of construction materials will be required for these activities which if not properly handled could attract the wrong elements who steal some of these items which include cement, iron bars and timber among others. If this is not adequately addressed, it could sabotage the smooth running of construction activities.

Risk assessment matrix

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Theft and vandalism of property	Local	Medium	Short term	possible	Low
Mitigation Measures	• A Containerized storage facility for some of the construction materials (cement, iron bars and timber) will be set up at the construction site with secure locking and manned by a storekeeper; • The casual labourers hired at the site will be screened with the help of the local leaders to screen the wrong elements; • Security guards will be contracted to watch over the activities at the construction site; and • The developer in collaboration with the local leadership will hire people from the project area to benefit from a neighborhood watch scheme.				
Residual Impact	There is a likelihood of minor residue negative impact even after the implementation of the proposed mitigation measures during the operation of the Lomunga Water Supply and Sanitation System.				
Reversibility	Yes				

8.3.15 Child labour and violence against children

The project has the potential to cause child labour and violence against children. This is based on the fact that according to the UBOS Population and Housing Census – 2014, 48% of Yumbe district population falls between the age category of 10-19. In addition, the project will increase opportunities for communities around Lomunga RGC to sell goods and services which will attract children to engage in income-generating activities. Upper primary children will also be attracted to benefit from casual labour job opportunities that will be generated by the project. This is likely to lead to an increase in school dropouts, especially among upper primary school children.

The project is likely to lead to violence against children. Violence against children can be inform of physical, sexual and neglect. The project is likely to expose children to violence through hiring children for work, and defilement of young girls by the contractors' workers which is likely to result in early and unwanted pregnancies among school-going girls. The project is also likely to lead to sexual abuse through the use of inappropriate language by the contractor's workers.

The likelihood of the impact occurring is moderate and the level of the impact is high. Therefore, the overall impact significance is moderate.

Risk assessment matrix

The identified effects of traffic risks due to project construction were assessed to be minor and can be mitigated with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Child abuse/violence against children	Local	Medium	Short term	Likely	Medium

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Mitigation Measures	• Stakeholder engagements about the social ills of child labour should be routinely conducted • The contractors should develop, adopt and reinforce the code of conduct that is against child labour and violence against children and also child protection protocols • Develop a labour management plan with provisions that prohibit child labour as enshrined in the Labour Act • All contractor workers should sign a code of conduct committing towards not violating children's rights. • Ensure that the community and local leadership have access to and know of and report abuse using the National Child Abuse Hotline 611. The existence of the hotline can be displayed near the construction site and in the community at large. • The contractor shall ensure that mechanisms for close monitoring of worker's behaviour/conduct are in place e.g., the contractor could discreetly engage the police to identify anonymous informers from among the workers to monitor and report any negative behaviour by the workers including child abuse-related misconduct, display a call line or suggestion box where the community can provide feedback on workers behaviour. • rkers including child abuse-related misconduct, display a call line or suggestion box where the community can provide feedback on workers behaviour. • MWE and the contractor shall ensure that all local leaders and women/child representatives are fully oriented to the labour force-related risks for children engaging in construction-related activities. • Talks with the contractor and his workforce by relevant guests (including the police) on child protection shall be encouraged and appropriately scheduled, including continuous popularization of the child helpline 611. • Any person involved in child abuse shall be dealt with following the law.				
Cumulative Impact	Increased economic activity and migration to Lomunga RGC during the construction phase may also heighten the risk of violence against children, including physical, sexual, and emotional abuse. The impact significance is medium ***Mitigation Measures*** • Conduct training sessions for project staff, community leaders, and service providers on identifying and addressing signs of child abuse and exploitation. • Establish safe spaces and support networks for children to seek assistance and counselling in cases of violence or abuse.				

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
	• Engage with local authorities and law enforcement agencies to strengthen enforcement of child protection laws and ensure perpetrators are held accountable for their actions.				
Residual Impact	There is a likelihood of minor residue negative impact even after the implementation of the proposed mitigation measures during the operation of the Lomunga Water Supply and Sanitation System.				
Reversibility	Yes				

8.3.16 Social ills or Influx of construction labour

The influx of workers, typically young males seeking construction jobs will likely be associated with a series of social challenges such as crime, alcoholism/illicit drug abuse, Sexual Exploitation and Abuse (SEA) of women and girls, and prostitution. These are often related to the spread of sexually transmitted diseases including HIV/AIDS. Vices such as drug abuse and prostitution would affect social coherence and security in project communities tarnishing the image and intent of an otherwise good project.

A. Crime, drug abuse and prostitution

Unless sensitization of all workers is undertaken by the contractor, this impact is highly sensitive (considering that the project area hosts refugee settlements). Duration of the above-mentioned social ills will be short-term ending with the completion of road construction but associated social and health effects can be long-term and irreversible, especially addiction to drugs making the impact magnitude high.

B. HIV/AIDS Risk

The influx of male workers into the project area may increase the risk of HIV/AIDS transmission. The concentration of young males in worker's camps may lead to illicit and unsafe sexual behaviour that may push up infection rates in the local areas. However, since most of the labour force will be below 40 years old and residents, it is expected that behavioural change will help stabilize the infection rate. Risky sexual behaviour and drug abuse are ranked as likely to occur due to common attitudes of contract labour though this will be moderated by high rates of sensitization on HIV/AIDs. However, should infections occur due to lapses in awareness, sensitivity is high and impact magnitude is **high.** This is therefore an impact of **Major** significance.

C. Sexual Harassment (SH)

Sexual harassment can occur between workers, particularly male workers against female workers, when there is insufficient sensitization of workers against prohibitions for sexual harassment, as well as the absence of reporting and disciplinary measures.

D. Sexual Exploitation and Abuse (SEA)

Construction workers are predominantly males. When attitudes that condone gender inequality and abuse of power are prevalent in the work sites and/or the culture, this may increase the risk for women and girls in the community of sexual exploitation and abuse committed by construction workers, particularly in settings where there is impunity for this violence. A large influx of male construction workers may also contribute to human trafficking, whereby women and girls are forced into sex work.

E. Gender-based violence (GBV) at the community level

This impact refers to GBV that women and girls may experience as a result of Project implementation. This includes, for example, an increase in intimate partner violence (IPV) when compensation schemes that share funds equally among husband and wife at the household level do not provide adequate sensitization and safety measures to reduce the potential for increased tensions due to females receiving funds.

This also refers to other GBV-related risks incurred as a result of projects creating changes in the communities in which they operate and causing shifts in power dynamics between community members and within households. Male jealousy, a key driver of GBV, can be triggered by labour influx on a project when workers are believed to be interacting with community women with the fear that it could exacerbate the risk of family breakdown.

Risk assessment matrix

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Social issues	Local	High	Short –medium-term	Possible	Medium

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
	• The contractor shall involve local (LC) leaders in labour recruitment to ensure people hired have no criminal record. • Local governments and the contractor shall collaborate with police to contain criminal activities. • A register of all construction workers shall be filed with local authorities to aid in tracking cases of child neglect. • With the assistance of a competent sub-contractor, the contractor shall draft an HIV/AIDS policy • A service provider for professional HIV/AIDS activities shall be procured and engaged • The contractors shall put in place worker place committees to oversee the implementation of HIV/AIDS control activities. • The contractor will provide counselling support and a work-based positive culture to post-test workers • The contractor will provide condoms to all workers free of charge in private and areas of confidence. • Peer-based awareness and counselling shall be instituted within the workforce. • All workers (permanent or temporary) will be required to sign the project code of conduct before commencing their assignments. • A worker Grievance mechanism shall be established and operated. • Signing of codes of conduct by workers • Ensure that there is recruitment of (a) service provider(s) to support prevention (sensitization) and response (referral pathway) activities. • Develop and implement a SEA/SH action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA/SH action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing Involving Major Civil Works (Sept 2018). The SEA/SH action plan will include how the project will ensure necessary steps are in place for: ✓ Prevention of SEA/SH: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; ✓ Response to SEA/SH: including survivor-cantered, multi-sectoral referral and assistance to complainants; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level ✓ Engagement with the community: including development of confidential community-based complaints mechanisms GM; mainstreaming of SEA awareness-raising in all community engagement activities; IEC materials; regular community outreach to women and girls about social risks and their SEA-related rights; ✓ Management and Coordination: including integration of SEA/SH in job descriptions, employment contracts, performance appraisal systems, etc.; development of contract policies related to SEA/SH, including whistleblower protection; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated SEA focal points and trained community liaison officers as applicable.				

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Mitigation Measures	• Develop and implement provisions that ensure that gender-based violence at the community level is not triggered by the project, including: ✓ effective and ongoing community engagement and consultation, particularly with women and girls; ✓ review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; resettlement; etc. ✓ The specific plan for mitigating these known risks, e.g., sensitization around gender-equitable approaches to compensation and employment; etc.				
Cumulative Impact	The presence of a large number of migrant workers in Lomunga RGC, coupled with social challenges such as crime and substance abuse, will strain social cohesion and lead to increased tensions and conflicts within project communities as well as the availability of alcohol and illicit drugs among migrant workers which can contribute to substance abuse and addiction, leading to adverse health outcomes and increased risk of accidents and violence in the project area. The impact significance is medium to High **Mitigation Measures** • Implement substance abuse prevention programs targeting migrant workers, including education on the risks of drug and alcohol abuse and access to counselling and treatment services. • Implement community engagement and integration programs to foster positive relationships between migrant workers and residents. • Establish community policing initiatives or neighbourhood watch programs to enhance security and prevent criminal activities				
Residual Impact	Due to the construction of the project, there is a likelihood of minor residue negative impact even after the implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.3.17 Occupational health and safety of workers

Construction will involve excavations, compaction, working with cement, welding, woodwork and working at elevated heights among others. The workers will be exposed to various forms of hazards including wastes, dust, noise, gaseous emissions from vehicular movements, possibility of accidents, injuries, and exposure to communicable diseases and HIV/AIDS.

The construction site is expected to employ about 150 workers on average to participate in the construction of the project infrastructure. These will be involved in a range of activities like excavation, masonry, steel fixing, carpentry, excavations, lifting, working at heights, stonework, drilling, welding, demolitions, offloading materials from trucks, and mechanical and electrical works among others.

If no mitigation measures are in place, the construction site with all its features presents a hazard to the health and safety of workers and visitors on site. Nevertheless, most of the potential hazards are avoidable although minor injuries have been reported to be inevitable at most construction sites. These may include shallow cuts and bruises. Deaths have been reported at construction sites within Uganda, the probability of this occurring is low considering that in most cases, death has occurred at sites due to other reasons mainly inappropriate architectural drawings being adapted in areas other than those where structures were originally intended, or lack of supervision and adherence to standard construction best practices. There are also cases of failure of mechanized equipment.

The extent of this impact will be limited to the site and the magnitude will be medium considering the number of workers at the construction site, the sensitivity of the receptor will be high.

Risk assessment matrix

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Occupational health and safety of workers	local	High	Temporary-long term	Possible	High

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Mitigation Measures	• Use the lightest tools for any given job; • Ensure that equipment and machinery are securely fastened down and where necessary rail guarded; • Deploy properly trained personnel/ flagmen to control traffic, especially for construction vehicles turning to the site; • Regular toolbox meetings will be conducted; • Ensure adequate planning and supervision of trial mixes and works; • Ensure regular inspection of formwork, falsework and temporary supports before loading or pouring concrete; • Ensure barriers are in place before work including guardrails and warning tape; • Use properly trained personnel to carry out construction works; • Regularly inspect equipment and machinery and routinely maintain them according to manufacturer's instructions; • Provide warning tape for example "falling debris", and any other suitable barriers to prohibit unauthorized access to the workplace; • Progressive wetting of work areas to minimize dust emission will be done; • Work areas will be cleaned up Progressively to prevent debris/rubbish from becoming a trip hazard; • Undertake job risk analysis and provide appropriate Personal Protective Equipment to all workers. These may include hard hats, dust masks, ear plugs, safety goggles, safety boots, gloves and overalls • Ensure safe access to work at height using appropriate ladders, scaffolds, harnesses and safety belts. • Ensure the proper use of PPE for example helmets, nose masks, safety shoes, gloves, welding goggles, safety belts, and overalls. This may be achieved through regular training on the proper use and handling of the PPE; • Ensure even spreading of heavy loads on temporary structures; • Secure site boundaries with fences or hoardings as appropriate; • Mechanical aids will be used for movement or placement of heavy loads; • Ensure safe working heights through the provision of work platforms, scaffolds and adequate supervision; • Provide workers with safe drinking water and food where needed; • Establish contact with the nearest referral medical facility for assistance during an emergency; • A well-equipped First Aid kit for use during minor incidents will be available on-site, and training in administering first aid will be provided; • All workers will be trained in occupational health safety and incident response; • All areas on site will be demarcated and labelled appropriately using instructional and cautionary signs and • The fenced structure will have emergency exits, fire assembly points, firefighting equipment, and lightning arrestors.					

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Cumulative Impact	Workers engaged in diverse construction activities will most likely be exposed to various occupational hazards, including machinery accidents, exposure to hazardous substances, and musculoskeletal injuries. The impact significance is Medium-High. ***Mitigation Measures*** • Conduct comprehensive risk assessments for each construction activity to identify potential hazards and implement appropriate control measures. • Provide personal protective equipment (PPE) such as hard hats, safety goggles, gloves, and harnesses to all workers, and enforce their use at all times. • Implement safety protocols and procedures for working at heights, including the use of guardrails, safety nets, and fall arrest systems. • Provide training and certification programs for workers on safe work practices, equipment operation, and emergency procedures.					
Residual Impact	Due to the construction and operation of the project, there is the likelihood of minor residue negative impact even after implementation of the proposed mitigation measures.					
Reversibility	Yes					

8.3.18 Physical Cultural Resources impacts

Some cultural properties as highlighted in (section 5.16) exist in the project area (mainly cemeteries). Although most of the major cultural sites identified are quite far from the proposed project infrastructure, the possibility that some cultural features (along the transmission route or where the treatment plant and other infrastructure will be located) can be encountered can't be ruled out. In general, the impact on Physical Cultural property will be minor since hardly any existing cultural property is likely to be affected.

Risk assessment matrix

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Impact on Physical Cultural Property	Within limited area	Medium	Temporary	Possible	Minor

Mitigation

- Sites that are buried may be discovered during project implementation. Such discoveries of archaeological nature are termed as **'archaeological chance finds**. These could be concentrations of pottery, animals and human bones, worked stone etc. Chance Find Procedures as presented in section 9 shall be adhered to. In summary, the following shall be undertaken:
    - On discovering evidence of possible scientific, Paleontological, historical, prehistoric, or archaeological remains, the contractor shall notify the

Department of Museums and Monuments giving the location and nature of the finds.

- The Contractor shall cease work in the vicinity of the site and request the responsible officer from the Department of Museums and Monuments to inspect the site and make recommendations on possible salvage within 72 hours.
- The Contractor shall exercise care so as not to damage artefacts or fossils uncovered during excavation operations and shall provide such cooperation and assistance as may be necessary to preserve the findings.

- To mitigate damage to archaeological resources, it is proposed that the construction foremen inform the construction crew to be aware of the possibility of discovering fossils or archaeological remains, what form these would take (bones, fossils in rock, shards or pottery, arrow heads etc.) and the procedure to be followed shall be as stated above.
- Further still, the contractor shall develop and implement avoidance procedures. In the event of human remains, there shall be no further excavations or disturbance of the site until the responsible police authorities have been informed.

8.3.19 Gender and vulnerable groups

8.2.19.1 Gender Impacts

This impact is related to the effect of the proposed project on direct and indirect gender impacts focusing specifically on access and utilization of resources and reducing the gender poverty gap.

The project has considerable potential to generate positive impacts on women's and men's livelihood opportunities and empower women, through inclusion in roles from which they have traditionally been excluded. The project has the potential to make a significant difference in women's health, labour burdens, time use, safety and security, and increase possibilities for income generation.

The provision of safe water to all, men and women within the trading centres, government institutions and facilities such as health centres, churches, mosques, schools etc., will be perceived by the District Local Government Officials at various levels and by the local communities, as a direct positive impact of the project on gender considerations. In addition, the impact on the local economic and employment dynamics and especially the anticipated opportunities for both men and women to provide local supplies and services will be an additional benefit in the context of gender equality.

Women in a rural setting such as the Project Site, are predominantly engaged in demanding household chores including spending long hours fetching water for domestic use. The supply of community piped water will provide time savings that will in turn widen women's opportunities to gain employment and income outside the home.

However, the project also has the potential to reinforce existing gender disparities and biases, in which positive benefits (employment, compensation, etc.) are felt disproportionately more by men and the negative impacts by women. For example, stakeholder consultations in the Project Area identified the following concerns which they perceived as potentially negative gender-biased impacts of the project:

a) limited engagement of women in project activities;

b) increase in sexual harassment of women and young girls by construction workers;

c) increase in sexually transmitted diseases including HIV/AIDS;

d) sexual exploitation of young girls which could lead to increased incidents of school drop-out;

e) social tension within households, gender-based violence, disruption of family units; and

f) In addition, evidence from previous infrastructure projects demonstrates that women-owned businesses (kiosks, grinding, milling, tailoring, grocery shops, etc.) have less access to property and land for economic activities, and even less access to credit needed for business investment, including electricity connection. The need to address this imbalance will require careful consideration, as it cuts across several government sectors and entities, including financing institutions.

Risk assessment matrix

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Gender impacts	Local	Medium	Long term	Likely	Medium

Mitigation Measures

1. A key consideration for the proposed project is the ability to effectively involve key stakeholders in a realistic and positive participatory process to combat gender violence and the abuse and mishandling of women and children on such government infrastructure projects and the Contractor must present a plan to address such.
2. Conducting appropriate sensitization on gender issues at all levels within the Project Area and creating awareness of the responsibility of all concerned during the various phases of the project to address specific gender concerns. This should entail consultation with both women and men in the Project Area and within the construction teams.
3. MWE and the Contractor should ensure that:
   a) effective gender responsive and equality activities under the proposed project are duly defined and implemented through participatory engagement;
   b) the targets and indicators for monitoring the gender impacts and outcomes are clearly defined in the contract documentation;

c) the quantifiable and none quantifiable, gender and social-related direct and indirect benefits have been defined and duly achieved; and

d) a social specialist is deployed on the project to oversee among others, gender mainstreaming in the project cycle is observed and implemented.

e) A Gender Awareness Program be established and an HIV/AIDS awareness campaign must be regularly conducted for PAPs, workers and local communities, as well as activities promoting access to health services, treatment and counselling

8.2.19.2 Impacts to vulnerable groups

This impact is related to the effect of the proposed project on vulnerable groups (women, children, persons with disabilities).

- Stakeholder consultations conducted in the project identified child abuse as a problem that has emerged from previous infrastructure projects. There is therefore concern in the local communities and amongst some of the leadership at various levels that this project may also have the potential to impact school children as vulnerable members of society.
- The proposed project travers's areas with schools and settlements and some project workers could likely engage in sexual relations with school and under-aged children. This could result in an increase in child pregnancy/marriage, which was established to be at about 8% in the project area. In addition, sex work involving children and school dropout, defilement of school children and marrying school girls, were also cited as potential impacts that could be generated by the project. The local communities are also concerned that during the construction phase of the project, as has happened in previous infrastructure projects, the Contractors are likely to be tempted to use children as labourers, to save money on labour costs; this amounts to child labour and abuse.
- As mentioned in previous sections of this document, the project has the potential to make a positive and significant contribution to women's livelihoods through the provision of employment opportunities, increased income levels, improved maternal healthcare and gender empowerment.
- Equally though, the project has the potential to exacerbate existing gender inequalities and lead to a situation in which women become the target of the potential negative impacts of the project. Examples of such impact include limited engagement in available project work and tasks; sexual harassment and exploitation; social tension in some homes; disruption of marriages; and gender-based violence, among others.
- Male construction workers are also likely to lure school girls with money and other gifts which ultimately leads to incidents of sexual exploitation of young girls, pregnancies and school dropout. School attendance is also likely to be affected; some children might decide to skip school to earn money from the project, while others may spend time simply watching construction works.

- For people with disabilities, access to water is an essential service. In addition, people with disabilities are often more likely to have less income and therefore struggle to get employment, afford water costs, and therefore end up requiring greater assistance for basic services. There is concern that people with disabilities are likely to experience the same challenges throughout the life of this project.

Risk assessment matrix

In general, incidents of child abuse, gender-based violence, sexual harassment and exploitation of women, as well as the exclusion of persons with disabilities are issues of serious concern that require considerable attention and remedial action by all concerned parties in infrastructure projects, such as the proposed distribution line project. While the above negative impacts are likely to be localised in geographical extent, their cumulative effects will continue to be felt during the operation and maintenance phases of the project. Consequently, the significance of the impact of the project on vulnerable groups is considerable in intensity and duration.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Vulnerable group impacts	Local	High	Long term	Likely	Medium

Mitigation Measures

- A Child Protection Plan should be developed and provided to all the Contractors and school management to discourage the Contractors from using children as labourers. In addition, Contractors will be required to avoid employing workers who are below eighteen years old. They will also be required to keep records that show the ages of their workers.
- Ensure that the community and local leadership have access to and know of and report abuse using the National Child Abuse Hotline 116. The existence of the hotline can be displayed near the construction site and in the community at large.
- The Contractor should ensure that mechanisms for close monitoring of worker's behaviour/conduct are in place e.g., the Contractor could discreetly engage the police to identify anonymous informers from among the workers to monitor and report any negative behaviour by the workers including child abuse-related misconduct, display a call line or suggestion box where the community can provide feedback on workers behaviour.
- MWE and the Contractor should ensure that all local leaders and women/child representatives are fully oriented to the labour force-related risks for children engaging in construction-related activities.

- Talks with the Contractor and his workforce by relevant officials (including the police) on child protection should be encouraged and appropriately scheduled, including continuous popularization of the child helpline 116. Parents/guardians should be sensitized and held accountable for children leaving and arriving home before dark.
- MWE and the Contractor should ensure strict compliance with the provision of relevant safeguard policies concerning persons with disabilities. MWE and the Contractor should ensure that there is full and effective participation of persons with disabilities and other vulnerable groups, like children and through representative organizations, in all phases of the project, including monitoring and evaluation.

8.2.19.3 Potential abuse to women and girls

The proposed water and sanitation project is likely to attract women who will be employed as labourers. During employment and execution of their duties, it is possible that their sexual rights as women may be abused by educe and unchecked sexual behaviours of contractors and their workers. Impacts relating to women will include issues like denial of employment opportunities, and gender-based violence when husbands forcefully demand their wives pay. Other potential negative impacts on women include exposure to HIV/AIDS and STIs and increased sexual exploitation of young girls which may likely lead to unwanted pregnancies, drop-out from school and others. These are large negative impacts which are of medium significance and magnitude making the overall impact moderate. These are proposed to be mitigated through the following measures:

Risk assessment matrix

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Abuse to women and girls	Local	Medium	Temporary	Likely	Medium

Mitigation measures

- Workers will be sensitized on their sexual rights. MWE shall Work with the contractor on establishing zero-tolerance policies and codes of conduct related to violence against women and girls (VAWG). All employees must be made aware of the zero-tolerance policy and codes of conduct for employees.
- All workers shall receive adequate briefing and education on the laws against defilement and other sexual offences.
- To the extent possible, there will be gender sensitivity in task allocation;

- The contractor shall conduct gender sensitization to the workforce on matters such as gender-sensitive communication and the gender-sensitive conduct of workers towards women including putting in place toilets segregated by gender amongst others;
- There will be a Specialist (Social Specialist) to oversee amongst others gender mainstreaming in the project.

8.4 Operation phase impacts

8.4.1 Pollution of soil, surface and ground water

During the the project's operational activities, poor waste management and oil and fuel leaks may contaminate the soil, surface and ground water thus affecting its quality. Sources of hazardous chemicals that may temporarily contaminate the environmental quality were identified and analysed on a case-by-case basis. These were then used to discuss the likely decline in the soil and water quality that is likely to be caused as a result of the implementation of activities.

Pollution of water resources could result from any chemical and oil spillage/ leakages from chemical storage, workshops and along transportation routes that could be infiltrated into water resources in the area. Poor handling of spent chemicals could also result in pollution. Poorly managed waste (domestic waste) could also result in environmental component pollution.

Risk assessment matrix

Impact	**Extent**	**Magnitude**	**Duration**	**Probability of occurrence**	**Overall Assessment**
Pollution of soil, surface and ground water	Local	Medium	Long term	Possible	Medium
Mitigation Measures	• Undertake routine maintenance of motorized equipment to improve operation efficiency and control spillages; • Construct perimeter drainage around fuel handling areas that should drain into an interceptor from where oil can be skimmed off and handled following hazardous waste handling procedure; • Put in place spillage contingency measures for all chemicals including cleaning equipment and train staff in spill clean-up. Chemical-contaminated materials will be handled following hazardous material/ waste handling procedures; • Design and install a septic tank system for human sanitary purposes; • Provide disposal facilities for waste; and • Undertake regular monitoring of soil and water resources for any pollution and ensure efforts to remediate in case any pollution is detected.				
Cumulative	Improper disposal of wastes during maintenance from several project activities including new projects in the area will lead to leaching of pollutants into soil and water sources, contaminating				

Impact	Limika stream and soils in the project area. The impact significance is medium. ***Mitigation Measures*** • Implement strict protocols for handling, storage, and transportation of chemicals and hazardous materials to minimize the risk of spills and leaks. • Conduct regular inspections and maintenance of storage facilities, workshops, and transportation routes to identify and address potential sources of contamination. • Utilize double containment systems, secondary containment, and leak detection devices to prevent and detect spills.
Residual Impact	Due to the construction of the project, there is the likelihood of minor residue negative impact even after the implementation of the proposed mitigation measures.
Reversibility	Yes

8.4.2 Noise generation

During the operation of project activities, the noise will be generated during maintenance activities of the water facilities such as trenching, and servicing of equipment among others which could become a nuisance to the local communities within and neighbouring project infrastructure, homesteads along the access road. Baseline noise levels at the project site were determined. The baseline noise levels were then used to assess the likely increase in noise levels as a result of the proposed construction activities. Reference was also made to the National Environment (Noise Standards and Control) Regulations, 2003 and in particular to permissible noise levels for different environmental settings (see Table 8.3).

Table 8-3: Maximum permissible noise levels for construction sites and accelerating vehicles

Facility	**Maximum Permissible Noise Levels dB (A)**	
	Day*	**Night***
Construction Sites		
(i) Hospitals, schools, institutions of higher learning, homes for the disabled etc.	60	50
(ii)Buildings other than those prescribed in paragraph (i) above	75	65
(iii) Industrial	85	65
Accelerating Vehicles		
Vehicles intended for carriage of goods and having a maximum mass exceeding 3.5 tonnes		
a) With an engine power of less than 75KW	81	
b) With an engine power of not less than 75Kw but less than 150KW	83	
c) With an engine power of not less than 150KW	84	

The letters "A" following the abbreviation "dB" designate a frequency-response function that filters the sounds that are picked up by the microphone in the sound level meter. (A) is used to measure hearing risk and for compliance with the Occupational Safety and Health Act, 2006 regulations that specify permissible noise exposures in terms of a time-weighted average sound level or daily noise dose.

Time Frame (The time frame takes into consideration human activity).

Day: 6.00 a.m-10.00 p.m., Night: 10.00p.m- 6.00 a.m.

Source: Environmental Legislation of Uganda Handbook (2003).

Such noise is likely to slightly alter the ambient noise levels even though it is likely to be generated for a limited duration of time during a power outage from generators.

Risk assessment matrix

The identified effects of noise and vibration due to the operation of the Water Supply System were assessed to be low which remains low with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Noise and vibration	Local	Medium	Short-term	Possible	Medium
Mitigation Measures	• A grievance mechanism will be established to enable local people to express their concerns; • Noise monitoring should be undertaken within the area and at nearby sensitive receptor sites during the running of the training centre; • Undertake routine maintenance of motorised machinery to ensure they are efficient and generate reduced noise levels. • Workers involved in noisy activities will be provided with requisite Personal Protective Equipment; • Idling of machinery including vehicles will be prohibited unless necessary; • Traffic management measures such as speed control and preventive maintenance will be enforced during the operation of the pharmaceutical plant; • Noise machinery such as generators should be sited away from sensitive receptors; • Unnecessary operation of the generator will be minimised as much as possible; and • Operators in noisy areas will be provided with appropriate PPE				
Cumulative Impact	The continuous or intermittent noise from maintenance activities by the Northen Umbrella Authority such as trenching and equipment servicing especially Cummulative noise and				

	vibration due to simultaneous maintenance works will disturb the peace and quiet of local communities in Lomunga RGC especially those carrying out business in trading centres. The impact significance is medium-High. ***Mitigation Measures*** • Implement noise control measures such as sound barriers, acoustic enclosures, and mufflers on equipment to minimize noise emissions during maintenance activities. • Schedule noisy activities during times when they are least likely to cause disturbance to residents, such as during daytime hours or avoiding sensitive times like early mornings and late evenings. • Engage with local communities to communicate project schedules, activities, and potential noise impacts in advance, fostering understanding and cooperation.
Residual Impact	During the operation of the water and sanitation project in Lomunga RGC, there is the likelihood of minor residue negative impact even after the implementation of the proposed mitigation measures.
Reversibility	Yes

8.4.3 Visual Alteration (Aesthetics pollution)

The infrastructural components of the Water Supply System and the related facilities coupled with the proximity to the settlements will make the site visible.

Risk assessment matrix

Visual blight due to the the water supply system was assessed to be low which remains low with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Aesthetics pollution	Local	Low	permanent	Likely	Low
Mitigation Measures	• Landscaping should be undertaken to make the place attractive to any passerby • Undertake routine maintenance of the project infrastructure to be attractive.				
Cumulative Impact	Residents living near the project site components (borehole and reservoir tank) and other projects that shall be erected in the area may experience a loss of visual privacy due to the increased visibility of infrastructure components, leading to feelings of discomfort and intrusion. The impact significance is Low -medium ***Mitigation Measures*** • Optimize the site layout and placement of infrastructure components to minimize visibility from sensitive viewpoints such as residential areas and public spaces. • Utilize topography, existing vegetation, and built features to strategically conceal				

	or integrate infrastructure within the landscape, maximizing visual compatibility with the surrounding environment.
Residual Impact	There is the likelihood of minor residue negative impact even after the implementation of the proposed mitigation measures during the operation of the Water Supply System.
Reversibility	Yes

8.4.4 Occupational health and safety of workers

Workers performing maintenance or repair activities on pipelines may be at risk of drowning if they are not properly trained or equipped to handle emergencies such as sudden flooding or water surges. Elevated storage tanks or reservoirs may also pose a risk of falling or drowning for workers who need to access them for maintenance or inspection purposes.

The extent of this impact will be limited to the site and the magnitude will be medium considering the number of workers at the construction site, the sensitivity of the receptor will be high.

Risk assessment matrix

Impact	**Extent**	**Magnitude**	**Duration**	**Probability of occurrence**	**Overall Assessment**
Occupational health and safety of workers	Within limited area	Medium	Short-term	Possible	Medium
Mitigation Measures	• Install fencing or barriers around open water bodies such as reservoirs and ponds to prevent unauthorized access and reduce the risk of accidental drowning. • Install clear and visible warning signs indicating the presence of water bodies, potential hazards, and safety precautions to alert people to the risks of drowning. • Provide comprehensive safety training for workers and personnel involved in the operation and maintenance of water supply infrastructure, including protocols for working near water bodies and emergency response procedures. • Ensure that workers have access to appropriate safety equipment such as life jackets, personal flotation devices, and safety harnesses when working in or near water bodies or elevated structures.				
Residual Impact	Due to the construction and operation of the project, there is the likelihood of minor residue negative impact even after implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.4.5 Alteration of air quality due to generation of dust and emissions

There is likely an increment in dust levels during the operation of the Lomunga water supply system. During this phase, therefore, dust generation will be minimal and restricted to light vehicles associated with transport activities, such as staff commutes, maintenance activities, waste removals, and miscellaneous deliveries. This impact has therefore not been assessed further.

Gaseous emissions during this phase may majorly arise from light vehicles making deliveries to the project site, operation of generators and grass slashing. Operation vehicles will contribute to the increase of traffic flow in the area associated with maintenance activities, waste removals, and miscellaneous deliveries. Of particular importance is the traffic along the Yumbe- Rhino Camp Road which will be used by these vehicles. However, traffic during this phase will involve a limited number of light vehicles, making a limited number of trips to and from the site as required for day-to-day operations.

This impact is therefore considered negligble during the operations phase and has therefore not been assessed further.

Mitigation Measures:

- Regularly service and maintain project vehicles, generators and plants
- Whenever necessary, work with the traffic Police to enforce road safety regulations including speed limits;
- The Contractor shall provide all necessary PPE to staff (including, but not limited to High visibility jackets/vests, safety harnesses, gloves, safety boots, hard hats, dust masks, ear protectors, safety goggles, personal protective clothing) and take all reasonable measures to enforce the use of such PPE by staff. Measures may include, but shall not be limited to awareness raising sessions, training sessions, and financial penalties for failure to use PPE.

8.4.6 Poor sanitation around the project site

Solid waste, if not properly managed, can lead to visual blight, public health risks, malodours, soil and water pollution.

Improper management of human waste could also result in sanitation-related problems that could affect public health. During the operation phase, water-borne toilets would have been constructed on-site. The likelihood that waste will be disposed of in the surrounding area which would potentially pollute the area and also result in disease outbreaks like cholera and dysentery among others is minimal.

Risk assessment matrix

The identified effects of poor sanitation as a result of project operational activities were assessed to be minor and remain low with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Poor sanitation around the project site	Local	Low	Long term	Possible	Minor
Mitigation Measures	• The proponent will ensure that all waste generated from site operations is properly collected and handled before disposal. Biodegradable, non-biodegradable, hazardous and non-hazardous wastes will be segregated accordingly during collection; • All waste collected should be disposed of appropriately e.g., a licensed waste collector should be contracted to transport waste material from the site to the designated disposal area; • The on-site ablution facility will be serviced regularly; • Anti-vermin safeguards (such as covering bins with lids) will be put in place; Separate sanitary facilities for different gender will be constructed on maintained on site; • A staff will be dedicated to ensuring proper maintenance of toilet facilities; and • Septic tanks will be properly designed constructed and regularly emptied				
Cumulative Impact	Despite the provision of water-borne toilets in Lomunga trading centre, improper waste disposal practices such as open defecation or dumping of solid waste in the surrounding area can still occur due to lack of awareness, inadequate maintenance of sanitation facilities, or cultural habits and these is likely to increase with the several projects that may be implemented in the project area if mitigation measures are not well planned and adopted. The impact significance is Low-medium **Mitigation Measures** • Conduct community outreach and awareness campaigns to educate residents about the importance of proper sanitation practices, including waste disposal, hygiene, and cleanliness. • Foster community ownership and participation in sanitation initiatives through engagement, training, and capacity-building activities.				
Residual Impact	Due to the operation of the project, there is the likelihood of minor residue negative impact even after implementation of the proposed mitigation measures.				
Reversibility	Yes				

8.4.7 Theft and vandalism of property

The operational aspects of the Water supply and sanitation System might attract wrong elements who could attempt to steal property/cash or even vandalize equipment and machinery at the site.

Risk assessment matrix

Theft and vandalism of property during operation were assessed to be minor which remains low with proper implementation of the mitigation measures.

Impact	Extent	Magnitude	Duration	Probability of occurrence	Overall Assessment
Theft and vandalism of property	Local	Medium	Short term	possible	Medium
Mitigation Measures	• Any insecurity observed around the facility should be reported to the local security committee • Security guards will be hired to provide security at the site on a 24-hour alert • Collaborating with the local leadership so that the site can benefit from a "neighbourhood watch" scheme will be undertaken. • The facility shall have gates installed to limit the entry of wrong elements, especially during night hours • The developer should employ all unskilled workers from within the project area of influence if they qualify for the work at hand.				
Cumulative Impact	Unauthorized individuals may target valuable equipment, machinery, or materials stored at the pump house and other project equipment leading to losses and disruptions to the operations of different projects in the area. The impact significance is Low-medium ***Mitigation Measures*** • Employ trained security personnel or engage security firms to provide surveillance, monitoring, and protection services at the project site, especially during non-working hours and weekends.				
Residual Impact	There is the likelihood of a minor residue negative impact even after the implementation of the proposed mitigation measures during the operation of the water supply system.				
Reversibility	Yes				

8.5 Decommissioning phase Impacts

8.5.1 Introduction

Decommissioning normally takes place both at the end of the construction period and during the final phase of a project life-cycle. Environmental planning is, therefore, necessary before any decommissioning activities should be allowed to commence. The reason for this is that a project earmarked for decommissioning has in all likelihood been operational for some time, and as such, the environment within which it lies has stabilised in response to the presence of the associated infrastructure, activities and facilities. At the end of the construction phase,

decommissioning mainly targets temporary facilities associated with construction camps and site restorations.

The decommissioning of one or all components of the proposed project will therefore have some effect on the environmental status quo of the project site, either positively or negatively. This section contains various environmental guidelines that will assist decision-makers in making environmentally responsible and sustainable decisions in terms of which infrastructure to retain, which to develop further (and how to do this), and which to remove completely in so far as construction and operations of this project are concerned. In this way, the positive aspects of decommissioning may be maximized and the negative aspects minimized or even avoided.

8.5.2 Purpose and objectives of decommissioning

The generally accepted purpose of decommissioning is the release of valuable assets such as machinery and sites for alternative use, recycling and reuse of materials and the restoration of environmental amenities. In all cases, the basic objective is to achieve an end-point that is sensible in technical, social and financial terms, that properly protects workers, the public and the environment and, in summary, complies with the basic principles of sustainable development. Stringent regulatory controls protect the public, the environment and workers from the hazards associated with decommissioning activities.

8.5.3 Decommissioning at the end of the construction phase

The decommissioning process for the proposed project site will involve several activities that may contribute to some changes in the local environmental conditions. The decommissioning exercise will involve the dismantling of site facilities; backfilling all disturbed areas and transportation of materials out of the site for disposal or re-use in similar future projects. Materials from the site will remain from construction activities and include scrap metals and plastic pipes among others. These materials can be reused, recycled and donated to other organizations. Scrap materials can often be reused or refurbished. Some items could be used by the proponent for their next job, and many items can be sold to used-materials stores, scrap recyclers, waste exchanges or other outlets.

Various items shall be accumulated separately to facilitate recycling.

The table below gives a summary of mitigation measures proposed for decommissioning during the construction stage

Table 8-4: Decommissioning at the end of Construction Phase

Issue	Action required	Responsibility
Impacts related to the procurement of construction materials	Close all borrow pits under an approved plan to maximise future use and minimise health and safety hazards.	Contractor
Solid waste arising from	The site is to be cleared of all construction	Contractor,

Issue	Action required	Responsibility
construction activities	materials, including litter before handover	
Fences, barriers and demarcations	Fences, barriers and demarcations associated with the construction phase must be removed from the site	Contractor,
Disturbed areas	The site must be fully rehabilitated and stabilised (for example, through revegetation)	Contractor
Contractor camp	Decommission all contractor camp services including electricity, water and sanitation facilities	Contractor
Site Remediation	A meeting must be held on-site between the Engineer, Environmentalist and Contractor to approve all remediation activities and ensure that the site has been restored to a condition approved by the Engineer	Contractor and supervising consultant
Hazard to workers	I) Implement full H&S programme (Health and Safety Plan) and labour welfare provisions. II) Establish and operate an emergency evacuation procedure for casualties.	Contractor
Environmental cases identified	Rehabilitation Activities of Environmental Cases identified must continue throughout the defect liability period	Contractor and supervising consultant

8.5.4 Decommissioning during the final phase of the project

Decommissioning of the project infrastructure is anticipated to be after the end of the design life of the water supply and sanitation infrastructure. Decommissioning of the Project is envisaged after 20-30 years however this will only be if the entire pipeline requires overhaul and replacement. Otherwise, pipelines will be frequently replaced during routine operation and maintenance and thereby unlikely to be decommissioned. However, if they were to be decommissioned, before decommissioning, the contractor would prepare a decommissioning plan for the elements that will require decommissioning. Some of these pipelines, if uncovered, can have negative impacts on the health of those who come in contact with these materials.

Mitigation measures are outlined in Table 8-5 below.

Table 8-5: Decommissioning during the final phase of the project

Steps	Activity	Actions required	Responsible party
Step 1	Initiation	• Development of an objective worksheet and checklist incorporating references, legal and policies	Proponent
Step 2	Prepare a road map for decommissioning design	• Conduct a design review to validate elements of the design and ensure design features are incorporated in the decommissioning design. • Carry out public consultations	Proponent
Step 3	Prepare and award contract	• Prepare a contract that incorporates validated project information and award to a contractor as per the procurement rules.	Proponent
Step 4	Implement the project.	• Implement design elements and criteria on the project following specifications and drawings. • Inspect during decommissioning and at project completion to ensure that all design elements are implemented according to design specifications.	Contractor and proponent
Step 5	Non-conformance, corrective/preventive action	• Determine root cause • Propose corrective measures • Propose future preventive measures.	All responsible

8.6 Positive impacts

The proposed project will have positive impacts and these are outlined as follows with recommendations for their enhancement.

8.6.1 Employment opportunities

Employment opportunities for approximately 150 people will be available to construction-related professions, and other non-skilled employment opportunities for casuals. Cumulatively the project will present a beneficial social economic impact upon development. Other employment opportunities shall present themselves in the form of, security personnel, housekeepers, and porters at the construction site among others. The employment opportunities will, however, be temporary during the construction phase for about 12 months.

Enhancement measures

- Workers employed to work at the construction site or facility should be paid on time and have signed contracts.

8.6.2 Improved Site Aesthetics

Construction of the proposed water supply system and proper landscaping will give a better outlook of the area making it more visually attractive and appealing.

Enhancement measures

- Ensure proper clean-up and landscaping work after completion of the construction phase.
- There is a need to have a maintenance plan to keep the premises more visually attractive and appealing.

8.6.3 Improved Health of Households and Communities

The provision of an adequate, safe water supply has positive impacts on the health of users by greatly reducing the incidence of communicable enteric and infectious related diseases, which, in many instances occur in communities due to lack of adequate potable water supply. Potable water supplies as well as safe disposal of human excreta are needed to break the chain of transmission of diseases.

Enhancement measures

- Users will be educated on the proper use, regular cleaning and effective maintenance of both the household and public facilities. The communities will be sensitised about the proper disposal of wastewater generated as a result of improved water supply and how to use water sparingly with minimal or no wastage.
- Water tariffs should be set taking into consideration the different levels of users (and users should also be educated to avoid wasteful use of the resources.

8.6.4 Infrastructure Improvement

With improved water supply, the development of infrastructure like hotels, restaurants, etc will be triggered. Water supply will induce development, stimulate investment and employment and help improve marginal investment opportunities.

Enhancement measures

The extent to which development has a positive or negative impact will be determined by proactive government policy and strict planning and environmental enforcement by the responsible Local Government

8.6.5 Market for Construction Materials

Some of the construction materials will be procured locally and this will provide revenue to the local economy. Some of the materials produced locally can be procured from local

supplies. These will include sand, bricks aggregate stones, and cement. The proceeds from the sale of the raw materials for construction purposes at the proposed project site will boost the local economy in the form of increased earnings

Enhancement measures

Earth materials needed for construction, for example, murram, and aggregate (stones and sand) are obtained from quarry operations. These should be largely obtained from the project-affected districts. However, conscious or unwitting purchase of these materials from unlicensed operations indirectly promotes environmental degradation at illegal quarry sites and can cause medium- to long-term negative impacts. It will therefore be a contractual obligation for contractors to procure construction materials from quarries legitimately licensed by the project District Local Governments and duly approved by NEMA

9 ENVIRONMENTAL SOCIAL MANAGEMENT AND MONITORING PLAN

9.1 General Considerations

The Environment and Social management and monitoring plan proposed in Table 9.1 specifies mitigation measures and monitoring actions with time frames, specific responsibilities assigned and follow-up actions defined to check progress and the effects on the environment by the construction works of the project. Monitoring shall begin right away and shall continue through both the construction stage and through to the operation phase. One important aspect of monitoring shall be to assess the effectiveness of the mitigation measures suggested. Where they are found lacking, appropriate new actions to mitigate any adverse effects shall be undertaken.

Implementations of these measures have to be carried out at different stages of project construction & operation phases. During the detailed design stage, the consultant shall incorporate proposed mitigation measures in the design and tender documents. The contractual agreement shall also include articles to enforce the environmental issues. Construction stage activities are mainly the responsibility of the contractor and that of the construction supervision consultant. The actual physical implementation works are carried out mostly at this stage. The execution of construction works for the proposed Lomunga Rural Growth Centre project shall also equally treat the implementation of the physical works of environmental mitigation measures.

9.2 Scope and Objectives of the ESMP

This ESMP focuses on mitigating the impacts identified during the environmental assessment. It is an instrument that will allow the project component and the contractor to integrate environmental and social management measures during the various phases of the proposed project. This plan is meant to establish measures and procedures to control the identified impacts and monitor the progress of implementation of the recommended mitigation measures.

It will achieve the following in the long run:

a) Provide the National Environment Management Authority (NEMA) with a tool to make easy the evaluation of the implementation status of commitments made by the proponent during the ESIA study phase;
b) Provide clear and mandatory instructions to the contractor concerning their environmental and social responsibilities during the project implementation phase;
c) Ensure continuous compliance of the contractor with National legislation and policies regarding environment conservation and management;
d) Assure the regulators and interested and affected parties the satisfaction of their demands about the environmental and social performance of the project;
e) Ensure that adequate financial and human resources are allocated to the project to give effect to such requirements or commitments, and to ensure that the scale of ESMP-related interventions is consistent with the significance of identified impacts;

f) Provide a coherent and pragmatic framework for the implementation of the requirements, ranging from the formation of structures to administer the implementation, through the roles and responsibilities of the key project role-players, to the auditing and reporting of compliance; and
g) Ensure suitably qualified personnel with adequate power of authority are integrated with the various project implementation organisations to timeously identify and render appropriate and proactive corrective actions to unforeseen changes in project implementation not considered in the ESIA process.

Table 9-1: Environmental and Social Management and Monitoring Plan Matrix

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
Land take	Land take is limited to that acceptable for project components. Minimised disruption of community members and land conflicts	Restricted land clearance to that required for project components.	Land take monitoring report Land Ownership documents	MWE Contractors	Yumbe District Environment Officer Bijo Subcounty Leadership Village LC.1	Land acquisition Stakeholder mobilization and engagement Grievance Redress Mechanism	80,000,000.00
		Sensitise project-affected persons (PAPs) on the intentions of land acquisition.	Record of PAPs sensitization				
		Limit project activities within the boundary of the acquired plot	Clearly marked project				
Vegetation clearance and loss of habitats	Minimized clearance of vegetation	Replant affected areas with indigenous vegetation upon completion of construction activities.	Presence of indigenous vegetation in restored areas	MWE Contractors	Yumbe District Environment Officer	Biodiversity conservation	20,000,000.00
		Restrict access to the project site(s) through a designated route(s).	Presence of designated access route(s) to different project components/sites.				
		Peg out project components layout to be cleared. Avoid vegetation of conservation concern during the	Site clearance monitoring report				

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
		pegging out of project components					
		Limit project activities to the required project component footprint.	Properly marked project boundaries				
		Establish a grievance mechanism to enable local stakeholders to express their concerns.	Availability of resolved grievance records				
		Compensate for any lost crops and property following property valuation assessment.	Presence of compensation records for PAPs				
		Restore temporary disturbed areas.	Restored disturbed areas				
		Provide a detailed work plan of the proposed construction activities and abide by it.	Presence of a construction work plan				
Soil Compaction	Minimized and localized effect of soil compaction	Limit the land clearing to only the required footprint.	Approved structural plans	MWE Preferred contractors	Yumbe District Environmental Officer and Wetlands Officer	Biodiversity conservation	NIL
		Limit the project activities to the footprint of the required project area.					

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
		Designate a parking for project vehicles.	The presence of a parking on-site				
		Install a containerized storage for construction materials	Presence of a storage container on site				
Soil erosion	Minimised incidence of erosion	Limit vegetation clearance to project structures to be constructed.	Monitoring records for vegetation clearance	MWE Preferred contractors	Yumbe District Environmental Officer and Wetlands Officer	Erosion control Biodiversity conservation	5,000,000.00
		Preferably, undertake construction activities in the dry seasons.	Records of the construction phase activities				
		Re-vegetate project-affected areas to stabilize the ground.	Re-vegetation monitoring records				
		Establish proper drainage around the facility.	Existence of proper drainage around the project site.				
Introduction of alien and invasive species	Maintained the integrity of the area's vegetation	Clear any recognized IAS from the area before it spreads. Native topsoil and rootstock removed during site preparation will be stored for subsequent restoration works. Re-vegetation will be	Record of invasive species uprooted from the site	MWE Preferred contractors	Yumbe District Environmental Officer	Invasive plant identification	5,000,000.00

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
		accomplished using indigenous species.					
		Invasive species will be controlled throughout the construction period by mechanical removal before flowering.					
		Areas where murram has been placed will be monitored and any invasive species will be removed manually.					
		Landscaping monitoring will be undertaken over at least one year and any invasive species will be removed manually.					
Increased traffic and associated risks	Zero traffic accidents and incidents	Maintain records of all accidents and incidents involving project vehicles.	Accident and incidence records	MWE Contractors	Yumbe District Environmental Officer Bijo Subcounty Traffic Police Local	Traffic and logistics management and planning	10,000,000.00
		Undertake Journey-specific risk assessments.	Records of journey-specific risk assessments				
		Employ qualified and experienced drivers to operate vehicles.	Records of driver qualifications				

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
		Employ traffic guides (flag boys) to control community and project traffic.	Implementation of traffic management plan – presence of traffic guides along project roads		Leadership		
Pollution of soil and water quality	Maintained water quality to acceptable national standards	Install oil/water interceptors on site	Availability of suitably constructed oil/water interceptors	MWE Contractors	Yumbe District Environmental Officer Traffic Police Local Leadership	Water quality monitoring Spill response and clean-up	12,500,000.00
		Install human waste handling facilities.	Availability of waste handling facilities.				
		Install secondary containment at fuels, oils, and lubricants storage tanks.	Presence of secondary containment at fuel and oil storage areas.	MWE Contractors	Yumbe District Environmental Officer Traffic Police Local Leadership		
		Put in place a spill contingency plan with spill clean-up equipment and train workers on how to use them.	Availability of a spill contingency plan and evidence of its implementation				
		Undertake water quality monitoring from community water sources and any surface water body in the area.	Availability of water quality monitoring records				

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
		Limit access to worker's camps and construction areas only to authorized personnel.	Site access plan and subsequent access records				
		Monitor the quality of community water resources regularly.	Availability of water quality test results.				
Poor sanitation due to poor domestic waste management	Good hygiene and sanitation around the construction site.	Collect and sort all waste generated from the demolition of built-up structures.	Clean and hygienic construction site and surrounding Sorted waste material	MWE Contractors	Yumbe District Environmental Officer Bijo Subcounty Local Leadership	Waste collection and proper handling	8,000,000.00
		Train and conduct toolbox talks on proper waste management.	Availability of training records on proper waste management				
		Install and properly label waste bins for the collection of different categories of waste.	Presence of labelled waste bins				
Increased risk of spread of HIV/AIDS and STIs	Responsible behaviour among staff and contractors Safe sex practices among project	Accommodate workers except for local workers, in the workers' camp and provide access to health services such as HIV/AIDs counselling.	Presence of the workers' camp for workers with access to health facilities	MWE Contractors	Yumbe District Health Officer Yumbe Community	HIV/AIDS Spread control strategies	25,000,000.00

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
	personnel				Development Officer		
		Provide the workforce with onsite access to primary healthcare, insecticide-treated mosquito nets, prescriptions, prophylactics, condoms, and basic testing for TB, and STDs, especially HIV/AIDS.	The workers' camp with access to onsite primary healthcare facilities		Local Leadership		
Spread of communicable diseases	Controlled spread and outbreak of diseases	Continuous sensitization of the construction workers and neighbouring community against the spread of COVID-19 Stringent measures regarding observing the Standard Operating Procedures (SOPs) that prevent the spread of COVID-19 such as workers having their masks shall be followed Isolation of workers with signs and symptoms of COVID-19 should be done Hand washing points shall be put in place around and within the market. Encouraging the traders to go	Presence of ICT poster on site The presence of hand-washing cans	Contractors	Yumbe District Health and Environment office Bijo Subcounty Leadership	Disease early warning signs detection	12,000,000.00

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
		for immunization against the COVID-19 virus					
Alteration of air quality due to dust	Maintained the quality of the ambient air	Undertake routine watering of the access road during the dry season.	Availability of watering schedule for the access road.	MWE Contractors	Yumbe District Environmental Officer Bijo Subcounty Leadership	Air quality monitoring	12,500,000.00
		Cover construction trucks that deliver construction materials	Covering of construction materials during delivery				
		Clear vegetation according to the structural layout.	Availability of structural drawing for infrastructure components				
		Shield stockpiles of construction materials from wind.					
		Undertake community awareness and sensitization about the proposed project	Records of community meetings				
		A speed limit of 40km/h for light vehicles and 30km/h for heavy vehicles should be maintained on the community	Speed limit signage installed along access road				

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
		road to access the project site; Record and resolve all grievances associated with the generation of dust					
		Install a containerized storage for some of the materials to reduce movement	Presence of a containerized storage for equipment	MWE Contractors	Yumbe District Water Officer		
Vehicular and other equipment emissions	Gaseous emissions within acceptable limits following the National Environment (Draft Air and Emission) Regulations	Undertake routine maintenance of vehicles and equipment to maintain efficiency.	Machinery and vehicle maintenance records	MWE Contractors	Yumbe District Environmental Officer Bijo Subcounty Leadership		
		Subject vehicle movement to Journey management	Availability of completed journey management forms				
		Discourage Open burning of waste.	Availability of waste management procedure				
Noise and vibrations affect local communities	Noise generation in compliance with the set permissible noise levels (the Nation Environment (Noise Control and Mitigation)	Undertake noise monitoring within the project area and at nearby sensitive receptor sites.	Noise monitoring records	MWE Contractors	Yumbe District Environmental Officer Bijo	Noise pollution control and monitoring	14,000,000.00
		Use well-maintained and serviced equipment.	Maintenance records for vehicles and equipment				

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
	Regulation 2003)	Prohibit the idling of machinery including vehicles.	Vehicle and machinery standard operating procedures		Subcounty Leadership		
		Undertake routine maintenance of motorized equipment	Availability of maintenance records for equipment				
Occupational Health and Safety risks	Zero accidents at the construction site	Adhere to standard and comprehensive health and safety measures.	Health and Safety Management Plan implementation records	MWE Contractors	Yumbe District Environmental Officer Bijo Subcounty Leadership District Labour officer	Construction safety and health management	50,000,000.00
		Resolve any complaints resulting from excavations/ project activities According to the grievance mechanism	Well-maintained complaints register				
		Employ trained and experienced workers for all construction operations.	Qualification records for all construction workers				
		Provide for supervision of construction activities.	The presence of a construction supervisor at all construction sites				
		Provide workers with Personal Protective Equipment (PPE).	Requisite PPE provided to workers				

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
		Institute an emergency plan including First Aid services and evacuation plans.	Presence of onsite standard first aid boxes and first aiders. Documentation of emergency/evacuation occurrences in line with the emergency and evacuation plans				
Fire risks	Instituted fire preparedness measure	Institute a fire emergency plan including training on the use of firefighting equipment/materials such as fire extinguishers, sand, and water.	Presence of fully serviced fire extinguishers and firefighting training records	MWE Contractors	Yumbe District Environmental Officer	Fire preparedness and prevention	15,000,000.00
		Design and display safety signage at locations of fire hazard areas	Properly mapped fire hazards		District Labour officer		
Theft and vandalism of project property	Proper security and minimized incidents of theft from the site	Install a containerized storage facility for some of the construction materials Screen the casual labourers hired from the community with the help of the local leaders.	Availability of a containerized material storage on site	MWE Contractors	District Environmental Officer Bijo Subcounty Leadership Local Leadership	Remote security management	10,000,000.00
		Hire people from the project	Employment of				

Impact	Desired Outcome	Mitigation/Enhancement Measure	Monitoring Indicator (s)	Responsibility for implementation	External Monitoring responsibility	Required capacity Building	Estimated cost (UGX)
		area to benefit from a neighbourhood watch scheme.	people from the project neighborhood				
		Contract security guards to watch over the activities at the construction site.	Presence of security guards				
Visual and landscape effect	Project acceptance among community members	Restore disturbed areas following completion of construction activities;	Restored disturbed area	MWE Contractors	District Environmental Officer Bijo Subcounty Leadership	Landscaping Community engagement	70,000,000
		Construct a fence around the project site before the establishment of the project component.	The presence of a fence around the project site				
		Avoid sensitivity during setting out as much as possible	Presence of standing vegetation in project infrastructure				
		Sensitize community members on the planned development	Sensitization records for community members				
The **estimated construction ESMP total cost is 3.12% of** the **total project cost of 11,178,794,274 Billion Uganda Shillings**							**Uganda shillings 349,000,000**

9.3 Environmental & Social Action Plans and Method Statements

Action Plans from the Contractor will be required for overall Environmental Social (E&S) management Action Plans will indicate what further plans/programs the Contractor has compiled to manage, for instance, HIV/AIDS, gender equality, gender-based violence, and the abuse of children, amongst others. Method Statements from the Contractor are more specific and will be required for specific sensitive actions. A Method Statement describes how sensitive area work takes place, and is a dynamic document in which modifications are agreed on between the Contractor and E&S Supervising Consultant/s during the construction phase, as construction works progress. A Method Statement describes the scope of the intended work in a step-by-step process for the E&S Supervising Consultant to understand the Contractor's intentions and methods. This will enable them to assist in linking mitigation measures, which would reduce environmental and social impacts during the execution of these construction activities. For each instance wherein, it is recommended that the Contractor submits a Method Statement to the satisfaction of the E&S Supervising Consultant, the format should indicate the following:

- Description of the activity to be undertaken;
- Detailed description of the process of work, methods, equipment, materials storage and movement to work sites;
- Description/sketch map of the locality of work;
- The sequence of actions with commencement dates and completion date estimates;
- Management of any emergencies, like contamination and spills, if they should occur; and
- Show how E&S risks will be managed.

The Contractor must submit E&S component-specific Action/Management Plan/s and Method Statement/s before commencement of any particular construction activity, and work may not commence until these have been approved by MWE. The approval of the Methods Statement/s or E&S component-specific contractor management plan does not absolve the Contractor from other or additional obligations or responsibilities as contained in the terms of the contract, the ESMP, and their E&S Action Plan.

For this project, the Methods Statement/E&S specific contractor management plan that shall be required are:

a) Contractor Management Plans

The contractor will develop separate safeguards management plans alongside their Environment and Social Management Plans. The contractor's Environmental and Social Management Plan will serve as the primary document, outlining general control measures for impacts like air quality, waste management, water quality, noise control, erosion, waste disposal, safety, and health. Additionally, the contractor shall create Method Statements for specific activities, such as excavation, and submit them to the Supervision Engineer for

review before work begins. If the Engineer finds a Method Statement inadequate, the contractor will revise and resubmit it until approval is granted.

b) Influx Management Plan

While project-induced influx can benefit the project and host communities (e.g., by increasing business opportunities, improving the availability of goods and services, and offering employment to locals), the influx can pose significant risks and impacts. If not carefully managed, labour influx can negatively affect public infrastructure, utilities, public services, housing, health, food security, and social dynamics in the project area, especially in rural, remote, or small communities, which typically have less absorptive capacity than a large urban environment. The Plan will detail measures aimed at: a) avoiding or reducing negative influx impacts and enhancing positive impacts in the project area of influence; and b) providing capacity building for Contractors, local government, and communities to help them cope with project-induced in-migration.

c) Emergency Response Plan

The Emergency Response Plan (ERP) will cover the required actions for all situations that could generate emergencies during the project's construction phase. The ERP will provide guidance to manage emergency events during different stages of construction. It will include general guidelines and procedures for the management of emergency events including emergency management command structure and mechanisms for incident reporting and investigation.

d) Quality Management Plan

e) Plan

A quality management plan will lay out the quality policies and procedures that apply to the project's deliverables and processes, as well as who will be responsible for ensuring that the standards are followed. The contractor will have to possess a quality management plan, considering the nature of the project, to direct the quality control and assurance procedures and attain the desired results in terms of social, design, structural, and investment outcomes in compliance with regulations for social and environmental protections.

f) Gender Management and Social Equity Management Plan

The contractor is expected to also come up with a Gender Management and Social Equity Management Plan Plan. This will cover gender-related aspects, such as GBV risks at the community and worker level, Sexual Harassment to protect women workers as well as community members, mitigation measures, responses and who is in charge of different actions, show aspects of gender division of labour in terms of equality and equity, gender segregation (for example female workers having separate toilets and changing rooms from male workers), gender working conditions, provision of job opportunities where the contractor identifies areas where ladies are given high opportunities such as cleaning, human resource positions, working in laboratories, flag ladies among others.

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The plan shall show gender sensitivity and show a clear code of conduct. This shall also provide a checklist to help identify whether the project is gender complainant.

g) HIV/AIDS Management Plan

The Contractor in pursuit of his commitment to health and safety will organize training, and conduct awareness and education on the use of infection control measures in the workplace. The Contractor is expected to provide appropriate PPE to protect workers from the risk of exposure to HIV/AIDS and incorporate HIV/AIDS information in occupational health and safety inductions, provide guidelines in preventing the spread of HIV/AIDS and other sexually transmitted infections (STIs), publicize knowledge related to HIV/AIDS and STIs to the work crews and the surrounding communities, provide information on good HIV prevention interventions, including promotion of the correct use of condoms and ensure sufficient resources are available for HIV programs.

HIV/AIDS, malaria, and other vector-borne diseases pose significant risks to public health and have wide-ranging impacts on individuals, families, and communities. Implementing effective prevention, education, and vector control measures, as well as strengthening healthcare infrastructure, will be essential for mitigating these risks and reducing the burden of these diseases

h) Stakeholder Engagement Plan

Environment and Social Safeguards requirements recognize the importance of open and transparent engagement with project stakeholders. The success of any project is hinged on the level and quality of stakeholder engagement which is an inclusive process expected to occur throughout the project life cycle. Engagement is more useful when introduced in the early phases of project development and is mainstreamed into all levels of decision-making.

Under Stakeholder Engagement and Information Disclosure, the following scope is envisaged:

- Stakeholder identification and analysis: This requires the identification of key project-affected parties and those with interests in the project. At this level, the emphasis is on vulnerable people or groups of people whose situations are likely to be accelerated by project implementation. Identification should be able to bring out different sets of affected people and their interests.
- Stakeholder Engagement Plan: A Stakeholder Engagement Plan (SEP) shall be drafted in consultation with the Bank. The SEP will be disclosed at all appropriate levels to afford all affected and interested inputs into project design and implementation.
- Information Disclosure: The borrower is obliged to undertake timely and effective disclosure of information regarding the project including its purpose, nature, scale,

potential risks, impacts on the local communities and further present possible mitigation measures.

- Meaningful Consultations: Consultation is meaningful if a dialogue exists, communities and individuals should be allowed to interact with respect and dignity. Interactions should be based on prior disclosure of project-relevant information to all parties.
- Engagement during project implementation and external reporting: Continuous interaction with project-affected persons throughout the project lifecycle is key for the successful implementation of the project. Project-affected Persons shall be availed of all relevant information using appropriate means to enable them to reach an informed decision.
- Grievance mechanism: A grievance mechanism is expected to guide the resolution and management of concerns, complaints, and issues that may arise during the entire project life cycle. The GRM will be proportionate to identified potential risks and impacts.
- Organizational capacity and Commitment: MWE shall define clear roles, responsibilities, and authority and further designate properly skilled personnel to be responsible for the implementation of specific stakeholder assignments.

Before construction activities, and in pursuit of timely, meaningful and appropriate stakeholder engagement, the contractor shall develop a clear strategy for stakeholder engagement to assist in managing and facilitating engagement through the construction activities. The SEP at this stage will be guided by that developed by the borrower at the project planning stage. This stakeholder engagement plan will adopt an inclusive perspective. The SEP will inform ongoing stakeholder engagement through the various stages of construction, decommissioning and the defects liability period.

i) Child Protection and Management Plan

Contractors should be cognizant of the importance of child protection issues and their responsibility to uphold the rights of children at all times. A child protection plan should spell out measures to prevent any form of abuse of children such as sexual violence, exploitative labour, and sexual exploitation which include children. Additionally, the plan should have stringent punitive measures properly defined for potential perpetrators of child-related abuse. This should also be signed by contractor workers as part of their contractual obligations to guard against child abuse.

The Child Protection Plan shall include the following:

- Brief Overview of Child Concerns
- Policy, Legal and Regulatory Framework Governing Child Protection Issues
- Child Protection Risks at each site
- Contractor's Policy on Children and Codes of Conduct
- Child Protection Services by Contractor (Prevention & Mitigation)

- Arrangements for Referral & Linkage to Other Child protection services in the area
- Support Offered to Children to access justice
- Mentorship & Training
- Monitoring & Reporting
- Schedule of Engagements such as Community Meetings and Joint Stakeholder Meetings

j) Community Health and Safety Plan

The Plan will cover the hazards involved in project construction as well as any possible effects these activities may have on public health and safety. Both inside and outside the so-called project area of influence are potential sources of risks and project consequences to community health and safety. As a result, this plan's scope will centre on managing issues related to how construction operations, the labour force, and the community interact as well as mitigating the spread of infectious diseases (such as COVID-19 and Ebola, among others). Control measures that aim to prevent, lessen, or reduce the negative effects of project operations on community health and safety shall be included in the plan. Additionally, chances to enhance positive effects and contribute should also be taken advantage of.

k) Health and Safety Management Plan

The framework for the monitoring and management of occupational health and safety that the contractor will implement will be prepared in writing. Safety programs will be used to promote health and safety, avoid injuries, fatalities, and dangers to employees, subcontractors, properties, and the general public should normally be covered by the OHS plan.

9.4 Environmental and Social Monitoring Programme

9.4.1 Purpose Of Monitoring

To achieve the desired objectives, a monitoring program seeks to guarantee that suggested mitigation and enhancement actions are carried out; if not, the measures must be adjusted, discontinued, or replaced as necessary. Additionally, monitoring will enable evaluation of adherence to both national and World Bank regulations and guidelines. A monitoring system for the oversight, observation, and enforcement of E&S regulations has been established by the Ministry. The MWE teams, comprising the PST, as well as the contractors and supervisory consultants, make up the mechanism. Additionally, the ministry has set aside money specifically for this consultant to hire a specialist to handle stakeholder engagement tasks, GRM development, training, and tooling, and other E&S risk management operations.

9.4.2 Scope Of Environmental And Social Monitoring

Environmental monitoring will be undertaken at different levels as described below

- **Surveillance:** Undertaken by the Supervision Engineer on behalf of MWE.
- **Quarterly Monitoring:** Joint by all relevant stakeholders at various levels.

- **Audit activities:** To be done by a NEMA registered Environmental Auditor.
- **Spot checks:** By Supervising Engineer, MWE, Contractor, District Leadership, NEMA.

9.4.3 Monitoring Activities and Processes

9.4.3.1 Weather Forecasts

Weather monitoring and forecasting are important to ensure that the Contractor plans for activities and provides mitigation where weather especially rainfall may pose challenges. This will be critical during excavation works

9.4.3.2 Site Inspection

To cover all aspects of the site's environmental and social management, routine inspections will be conducted. Weekly, monthly, and quarterly inspections will confirm that the daily inspections are identifying any maintenance requirements and that these are being completed promptly. Daily inspections seek to identify any environmental issues and address them without delay. The Contractor shall conduct site inspections as directed by the Supervision Consultant.

9.4.3.3 Meetings

The project progress will be discussed in monthly site meetings, when safeguards issues will be adequately discussed and minuted. This will entail an assessment of the mitigation strategies' efficacy as well as its successes and non-compliances. As a response to the contractor's presentation and in light of the joint inspection, the Engineer, the client (MWE), and the World Bank will be able to discuss any environmental concerns on this forum.

9.4.3.4 Record keeping

MWE will see to it that all pertinent compliance and monitoring records are easily accessed. A lead agency or the Authority may require the developer to submit monitoring reports in a prescribed form, according to subsection (7) of the NEA (2019), which also states that "A developer shall maintain proper records of the monitoring undertaken under subsection (2), which shall be made available to the Authority or lead agency upon request."

9.4.3.4.1 Monthly and Quarterly Environmental and Social Report

To fulfil the Contractor's contractual reporting requirements, either a stand-alone Monthly Environment and Social report must be generated, or the Contractor's Monthly Progress Report must adequately cover safeguards. The report will outline various actions made to manage the project's environmental and social components following the terms of the contract, Ugandan laws, norms, plans, and policies, as well as World Bank Safeguard policies. The supervising consultant will also need to confirm and approve this report. Planning is usually done continuously for the management of environmental aspects. To that end, each month's success report ought to include a plan for the upcoming month's social and environmental events.

This Contractor's Monthly Report is expected to summarize the following:

a. Progress in implementing the CESMP and the standalone management plans;
b. Status of key approvals and documentation for the project;
c. Compliance with legal obligations and specifications;
d. Compliance with the commitment to child protection and GBV (SEA & SH) prevention and management
e. Findings of the monitoring programs, with emphasis on any breaches of the control standards, action levels or standards of general site management;
f. Summary of any complaints by the community and actions taken/to be taken; and
g. Key environmental activities for the next month.

Quarterly, the supervising consultant will prepare an Environment and Social Report covering similar thematic areas as listed above (for the quarter) that will be submitted to the developer (MWE). This report will inform the MWE quarterly report that will be shared with the World Bank and other stakeholders.

MWE should stipulate reporting requirements in the bidding documents for sourcing the project contractor and supervising consultant, and binding clauses should also be included in the subsequent contracts to ensure compliance.

9.4.3.4.2 Accident and Incident Reporting

While MWE will ensure comparable notification to the World Bank within 48 hours of their occurrence, the supervising consultant and contractor shall ensure reporting of any critical and severe occurrences to MWE within 24 hours of their occurrence.

9.4.3.4.3 Environmental compliance audit

In accordance with the National Environment Act of 2019 and the Audit Regulations of 2020, MWE shall assume responsibility for fulfilling the requirements for an environmental and social audit, neither more than 12 months nor less than 36 months following project completion or the start of operations, respectively.

9.4.4 Approval of the ESMP activities

Implementation of ESMP activities will be approved by MWE and safeguards compliance will be one of the bases for payment. Final payment for the contractor shall be tagged to the successful restoration of all disturbed areas and clean-up of all construction sites.

9.4.5 Enforcement Of Compliance

The supervising engineer will strictly supervise the implementation of the ESMP and where there are breaches, the supervising engineer shall issue written instructions, cautions, and warnings as applicable. Where the contractor fails to comply, contractual clauses shall be

invoked, and penalties or fines effected. If necessary, the civil works can be suspended if the contractor repeatedly fails to adhere to instructions. MWE shall penalize the supervising consultant if he fails to supervise and enforce ESMP implementation by the contractor

9.5 Institutional Implementation Arrangements

The Project will be implemented by MoWE through its regional entities (WMZs, WSDFs) in close collaboration with Yumbe District local governments and their partner (e.g., private sector operators). To facilitate integration within the sector, MOU/MOUs outlining joint responsibilities will be signed between the MoWE and Yumbe District Local Government.

The Project's primary stakeholders are the: (a) MoWE through which the project will be implemented in coordination with its relevant departments (e.g., DWRM, DWD, DEA); (b) Yumbe District Local Government(c) and local communities and consumers who will participate in project planning, and benefit from the outputs and outcomes of the project.

9.5.1 Role of NEMA

- The National Environmental Management Authority (NEMA) will, in consultation with a lead agency;
- First and foremost, must review and assess the ESIA for this proposed project site and activities for its approval *(before project construction).*
- Monitor all environmental issues to assess any possible changes in the environment and their possible impacts *(During both establishment and operation).*
- Monitor the operation of the project activity to determine its immediate and long-term effects on the environment. *(During project construction/operation).*
- Appointing an environmental inspector by the authority; who may enter the project premises at free will to monitor the effects on the environment of any activities carried out on the premises *(During project construction/operation)*.

9.5.2 Role of Yumbe District Local Government

- Engineer; inspect the project works as per the engineering specifications and verify all acquired permits.
- District Water Officer (DWO); inspects the project on behalf of the district technical administration wing/ Chief Administrative Officer (CAO). Monitor all technical water- works.
- District Environmental Officer (DEO); inspects the project sites on behalf of NEMA and monitors against NEMA approval project environmental conditions.
- Senior Community Development Officer (SCDO); inspect the project sites on behalf of the district and monitor against NEMA approval project social conditions, review and approve community engagement minutes and reports, and assess the effectiveness of the project grievance system
- The District Labour Officer (DLO); inspects the project sites on behalf of MGLSD, and monitors the project site working environment in relation to OHS-defined standards.

9.5.3 The Role of MWE

- MWE will have the secondary role in delivering on the measures set out in the ESMMP, as the developer.
- MWE has complied by utilization of services of a NEMA-registered environmental firm to guide in preparation of this ESIA for submission to the authority for its approval (before construction)
- Giving details of a proposed project before commencement and making copies of the nontechnical summary of any Environmental Impact Statement available at the site (before construction).
- MWE will be responsible for ensuring compliance with all relevant legislation as well as adherence to all environmental and socio-economic mitigation measures specified in the ESMMP (during construction).
- MWE through its Yumbe field office will appoint the technical members, the project focal person to oversee the day-to-day implementation of the ESMMP, and to whom the contractor will report.
- Undertake scheduled site supervision to determine the state of environmental and social compliance.
- Overall supervision of this ESMMP and evaluation of its implementation.
- Review the proposed project activities, methodologies and plans in relation to the requirements of the mitigation and management measures of this ESMMP.
- Receive, record, and investigate any grievance and order the contractor to make corrective actions and respond to the public on the corrections conducted. Work with communities to address any social issues. Handle social issues during the project operation stage.
- Carry out sensitization sessions for the community members and contractors about the project, safety and health measures, and environmental practices (during construction).
- Will serve to build strong and open communication with Local authorities, communities, and faith organizations among others within this project area.

9.5.4 The Role of the Contractor

- The hired contractor will have the primary role in delivering on the measures set out in the ESMMP, as a contractor.
- The contractor will be responsible for ensuring compliance with all relevant legislation as well as adherence to all environmental and socio-economic mitigation measures specified in the ESMMP (during construction).
- Ensuring that all environmental monitoring data is made available at regular intervals and that any divergences from performance standards will be fully explained, together with any necessary preventative (during construction).

- The contractor may appoint a Safety and Health officer preferably the site agent to develop and enforce safety and health precautionary measures for both the workers and the community at large (during construction).
- The contractor's site agent will act as the Contractor's Community Liaison Officer to bridge the gap between the contractor and the community, handle grievances, and face the project in the community (during construction). Ensure community concerns are addressed
- Implement project site layout design and project daily operational activities to ensure compliance with project engineering design and the ESMMP with regard to environmental protection and impact mitigation.
- Day-to-day monitoring of environmental matters - this will include wider environmental aspects including matters not directly concerned with the actual construction.
- Awareness raising and training of contractor's staff with respect to environmental issues; this will include notification of the severe penalties for non-compliance with instructions which may include dismissal. Design and conduct appropriate induction training for all workers on recruitment about safety, health, and environment while working in the project areas.
- Preparation of weekly and monthly environmental inspection and monitoring reports in a format acceptable to MWE
- Undertake mainstreaming of gender issues into the entire project including but not limited to work placements, tools and fixtures, sanitary utilities, creating awareness on sexual harassment and any other forms of discrimination based on gender, ethnic background and race.
- Ensure that all workers are provided with appropriate PPEs and further enforce their use at all times

9.5.5 Role of Supervising Consultant

The Supervising Consultant will be in charge of providing general direction and instructions to the contractor, including reviewing and approving the contractor's management plans. Their teams should at the very least include an Environment Specialist and a Social Specialist. In close collaboration with the MWE Safeguards Team, the Environmental and Social Safeguards Specialists will oversee the contractor. Furthermore, the Supervising Consultant will carry out planned site supervision to keep an eye on the contractors' documented or actualized condition of safeguards compliance. Along with other project-wide concerns, the Supervising Consultant will be responsible for monitoring adherence to and observance of environmental, safety, health, and social regulations.

9.5.6 Role of the Umbrella Organisation

- After construction, the piped water supply and sanitation system will be handed over to the Northern umbrella organization for management. This will play several roles as listed below;
- Provide operation and maintenance support to the scheme operators.
- Help to restore functionality in emergencies and implement repair works and scheme extensions,
- Provide training to local Water Boards,
- Promote payment for water services (water metering),
- Conduct advisory financial audits
- Monitor drinking water quality through regular sampling.

9.5.7 The Water User Committee (WUC)

It is recommended that a WUC be constituted where each tap stand shall nominate two representatives who shall represent the tap community in the central water user committee (CWUC). At least one of the representatives of each tap stand shall be a woman. The WUC shall consist of these 2 representatives of each tap stand and a local council 1 representative; the committee shall then form an executive consisting of a Chairman, Treasurer, and Secretary. The rest shall be members. Since the scheme covers more than one village, each of the 2 villages shall nominate a local council (LC1) representative to the WUC.

The role and responsibilities of the CWUC shall be as follows:

- Mobilize user communities to meet their obligations towards any form of contribution to the construction, operation, and maintenance of the scheme.
- Ensure effective representation of every tap stand at the CWUC meetings.

9.3.7 The role of the Scheme Operator (SO)

While the piped water supply and sanitation system shall be under the management of the Northern umbrella organization, the water Scheme shall be operated by a Scheme Operator (SO). The SO shall be an individual with zeal and willingness to manage the day-to-day affairs of the scheme for and on behalf of the Umbrella organization and the entire beneficiary community for an agreed management fee.

The roles and responsibilities of the SO will include:

- Ensure smooth running of the scheme and constant supply of water to the user community.
- Engage services of trained mechanics/plumbers to carry out repairs on the system when the need arises and pay them accordingly.
- Attend to community complaints and provide regular updates to the Umbrella organization and CWUC about such complaints.

- Maintain order at the water collection point
- Ensure the security of the scheme at all times.
- Keep a clean working environment
- Prepare monthly / quarterly technical and financial reports on the scheme operations and report to the Umbrella organization.
- Report suspected system malfunctions or illegal connections to the Umbrella organization and where necessary to the WUC.

9.6 Grievance Redress Mechanism

This section presents procedures for affected persons to lodge a complaint or express a grievance against the project staff or contractors during project implementation. It also describes the roles and responsibilities for addressing grievances. The objectives of the grievance process are:

a) Ensure that appropriate and mutually acceptable corrective actions are identified and
b) implemented to address complaints;
c) Verify that complainants are satisfied with the outcomes of corrective actions;
d) Avoid the need to resort to judicial proceedings.
e) The project will operate two major grievance redress mechanisms, namely:
   - Worker's grievance redress mechanism, and
   - Community Grievance Redress Mechanism.

Grievances are useful indicators of a project's performance therefore have to be treated with the due care they deserve.

A high number of grievances may be an indicator of poor work practices. Likewise, a low number of grievances may not necessarily mean everything is working out smoothly but could point to a nonfunctional system that is inaccessible to PAPs or is inefficient and ineffective in handling project-related complaints.

The following guiding principles shall be followed during grievance and complaint redress;

a) Equity and fairness in project implementation.
b) Access and effective participation of stakeholders in grievance management
c) Transparency and accountability in implementing the sub-project at all times and levels
d) Independence from all interested parties, and bound by a clear set of rules and standards.
e) Predictability in terms of clearly defined procedures/processes for addressing complaints with clear timelines for solving complaints.

9.6.1 Village and District Grievances Redress Committees

Dedicated Grievance Management Committees (GMCs) will be established to manage grievances during project implementation. The committees will utilize existing administrative structures with the support of technical teams to ensure easy access and inclusion of stakeholders and to facilitate the appeal process.

When required, the GMCs shall be formed at village/ parish levels, Sub-County, Town Council, Municipal Council, District levels, and MWE. This guideline does not propose a size fits all to structure, composition, and level of GMCs for all projects. The principle of proportionality should guide the degree of effort.

It is proposed that dispute resolution will depend on Grievance Redress Committees (GRC) which will be initiated at the village level to record grievances and also help in mediation.

The committee shall be formed either at the village or parish level given that linear projects traverse several communities. Committees must be accessible to communities at the village or parish level.

Village and Parish GRM committees will be established as voluntary committees for each infrastructure to be constructed at village or parish levels depending on the community dynamics, area covered and nature of works. Community GRM Committees will have 10 members including:

a) Chairperson,
b) Vice Chairperson,
c) Secretary,
d) Other Members (7) including a youth, Elderly Person, PWD and at least 3 members should be female. Quorum sitting shall be of at least five (5 members).
e) The LC I Chairpersons and Vice-Chairpersons will be ex-officials to these committees.

NB: The committee shall be formed either at the village or parish level given that linear projects traverse several communities. Committees must be accessible to communities at the village or parish level.

9.6.2 Roles and Responsibilities of Community GMC

a) Providing project information and attending to complaints that may be resolved by providing information
b) Registering all grievances from the community or as referred to at different levels
c) Addressing those grievances that are manageable by the committee
d) Referring any grievances to higher levels for action and further follow-up.
e) Escalating any unresolved grievances to appropriate levels as stated in these guidelines

f) Liaising with local leaders to ensure the health, safety and security of the communities, workers and construction materials during the project implementation

9.6.3 Project Workers Grievances Redress Committees

Each construction site shall have a Site GMC responsible for handling all community grievances related to construction including those grievances referred by the village/ Parish GMC. The Site GMC shall comprise the following;

a) The Resident Engineer/ Supervising Consultant (Chairperson)
b) The Contractor's Contract Manager
c) Sociologist for the Consultant
d) Sociologist for Contractor (Secretary)
e) Environmentalist for the Consultant
f) Environmentalist for the Contractor
g) Health and Safety Officer for the Contractor
h) 2 Community Representatives (1 Female and 1 Male)

This committee shall consolidate and address all grievances from the community at the site and escalate any matters appropriately to the respective Local Government and MWE.

Under the supervision of the consultant Site Sociologist, the contractor shall make immediate, responses to matters related to the project construction, contractor's workers, agents, sub-contractors or suppliers. Unresolved matters by the contractors shall be escalated or referred to the MWE's Grievance Redress Committee.

Complaints are likely to arise during construction activities. Project Workers' Grievance Committees (WGCs) shall be set up to receive and resolve such complaints. This may include; physical violence, non-compliance in the use of PPE, Illegal drug taking, possession of drugs or the consumption of alcohol during operations, undesirable working conditions in physical terms, changes without prior notice, poor employee relations, improper wage adjustments, dissatisfactory office policies in case of promotion, demotion, leaves, overtime, violation of laws, labor-management hostility, incidences of workplace favoritism and nepotism, among others. etc.

Any complaints that may not be handled by the WGCs shall be referred to the government authorities such as the Uganda Police. The WGCs will comprise the Project Manager, Foreman and the social and environmental safeguards personnel and representatives of the following categories of workers; Casual workers, Drivers, Operators and Turn men, Flag Personnel, Site Cooks and cleaners, and technicians. The disciplinary process will be conducted in five stages and can be initiated by an employee as well. These stages include; initial action where a reminder to the individual is provided, issuing a warning, stopping the work, removing the individual from the site; disciplinary report, escalation, discipline review and contract cancellation.

9.6.4 Roles of Workers Grievance Redress Committees

These committees shall proactively and fairly handle complaints registered by workers or employers. The Committee doesn't take on the obligations of the project management but rather provides an opportunity for any aggrieved workers of the employer to register complaints and have them resolved fairly. Workers' Grievance Redress Committee shall:

The roles of the Workers' Grievance Management System include:

a) Providing a forum for consultation, frank exchange of information, discussion and joint problem-solving between management and employee representatives on issues about staff welfare, rights, discipline; and any proposed changes dealing with policies, procedures and working conditions.
b) Receiving and reporting workers' complaints/grievances to management and negotiating for timely redress, / participating in arbitration of cases between workers and management through disciplinary hearings and/or between fellow workers through conflict resolution meetings
c) Representing the interests of workers regarding their terms and conditions of employment, staff welfare, staff development and other matters of concern to the workers, and negotiating with the contractor's management on their behalf accordingly.
d) Educating Workers on their rights, discipline, code of conduct, and the spirit of staff unity across the project as well as on respect for cultural diversity among workers of different races, tribes, religions and other cultural differences
e) Regularly soliciting employees' suggestions/opinions to management through appropriate and organized channels such as their representatives, suggestion box, or joint meetings from time to time
f) Act as a point of contact between the employees and employer's management; establish and maintain good relations, foster effective two-way communication and mutual understanding between workers on one hand, and with management on another.
g) Identifying and representing concerns of special interest groups on the project such as women, expectant and lactating mothers, workers with disabilities etc.
h) Organizing and conducting monthly Workers' meetings to review and discuss staff welfare, discipline and related matters; compile and share on-time meeting minutes with the contractor, supervising consultant and MWE pointing to key action areas requiring attention.
i) Reporting any incident(s) of violation of workers' rights, staff indiscipline and related issues to management for redress
j) Keeping an adequate log and other documentation of all matters that come before the Workers' committees for better reference and effective management

9.6.5 MWE'S Internal Grievance Redress Committee

At the Ministry of Water and Environment, a National Grievance Management Committee (GRM) shall consist of a MOWE Chair, the IWMDP Project Coordinator, the Coordinator for Social Safeguards (Secretary), the Coordinator for Environmental safeguards, the Social Safeguards Specialist, the Environmental Specialist, the chair of the community mediation board, and a member of a recognized non-government organization.

9.6.5 GMC at Sub-County Level

The committee will be formed at the sub-county level and its membership shall consist of;

a) Local Council III (chairperson);
b) The Sub County Chief,
c) Community Development Officer (Secretary)
d) Environment focal person
e) Representatives of PAPs
f) Parish Chief of the respective area where the complaint originated from.

9.6.6 GMC at Town Council/ Municipal Level

Given its extended nature of staffing and complexity, the town council grievance management committee shall include the following members;

a) LC III Chairperson/ Mayor (Chairperson)
b) Town Clerk
c) Council Community Development Officer (Secretary)
d) Environment Officer
e) Physical Planner
f) Representative of the PAPs

9.6.7 GMC at the District Level

At the District Level, the Grievances Management Committee shall consist of;

a) LC V Chairperson (Chairman)
b) Chief Administrative Officer or his/ her Representative
c) District Community Development Officer (Secretary)
d) Head of Natural Resources
e) District Water Officer
f) Representatives from the PAPs
g) District Lands officer

Note: Due to the complex nature of grievances, the committees can be extended to include any other relevant officers suitable for addressing the prevailing grievances.

9.6.8 Process of Handling Grievances

The following sub-section provides the procedure for receiving and hearing complaints as well as appealing against any decision from the grievance management committees at the

village, construction site, sub-county/ Town Council/ Municipal Council, District, MWE and other mandated agencies.

Receiving and Registering Complaints at the Village/ Parish Level

The following procedure will be followed in registering a complaint at all community GMCs

A verbal or written complaint is logged in to any member of the GMC by a complainant

a) The secretary seeks clarification of the specified details of the complaint
b) A complaint is registered into the complaints register provided by MWE
c) If the complaint is not clearly understood, requires urgent attention, is grave, fatal and/or bears serious implications, the GMC will visit the site for spot assessment and consultations
d) The Community GMC will sit and decide if the issue can be addressed at their level of required referral. If the concern can be addressed, the committee will sit with the complainant and decide on the course of action. The secretary will document the minutes and attendance list and if concluded, the complainant will sign off in the grievance register acknowledging the resolution of his/her grievance. If the matter cannot be resolved by the village GMC then the GMC will forward it to the construction site for immediate redress.

NB: It is recommended that the Contractor transfer all grievances in the village GMC and consolidate them in the construction site grievance register every week and follow up to ensure that all grievances were well handled. This is because all grievances that are project-related have been triggered by construction activities. The construction team should therefore be the pivot of grievance documentation, redress and follow-up.

a) Screening, Assessing and handling Community Grievances at the Construction Site

All complaints from the village/ parish GMCs shall be collected and consolidated into the main complaints register at the construction site. The Grievances Officer/ Contractor's Sociologist at the Construction site, will screen all complaints received to determine whether action can be taken at the level of his/her office in consultation with other responsible officials, the project contractor and the complainant. The site team should ensure that resolutions are made and compliant resolved within 5 days.

b) Referral/ Appeals to Sub County/ Town Council and Municipal Council Grievance Management Committees

The Contract Manager for the Contractor will refer unresolved grievances to the Sub-county Town Council or Municipal Grievance Grievances Management Committee for consideration. The Sub County GMC/ Town Council/ Municipal Council GMC will ensure that the grievance is addressed within 7 days.

Where the grievance hearing session is required, the complainant will be invited to the grievance hearing and redress meeting. Depending on the matter being addressed, it will be important that the area LC I Chairperson of the village where the complaint was lodged be

invited to attend the meeting along with the complainant. This is intended to ensure fairness and the LC I will be observing and making inquiries to ensure that both parties understand each other point of view.

This will instill confidence in the complainant as well. Upon successful resolution, the Chairperson of the Committee shall formally write to the complainant specifying details of actions, timeframes and any other details pertinent to the resolution. On agreeing to the resolution, the complainant will sign a consent form binding him/her to the negotiated resolutions.

c) Referral/ Appeals to District Grievance Management Committees (DGMC)

If the Sub County/ Town Council/ Municipal Grievance Management Committee fails to resolve the matter or if the complainant is not satisfied, the Chairperson on behalf of the GMC shall refer the matter to the District GMC. The DCDO will register the referred/ appealed case in the District Complaints Register that will be provided by MWE.

The DCDO who will also act as the Secretary to the DGMC will screen the matter referred and bring it to the attention of the LC V chairperson who will write to invite the complainant together with the respective LC I Chairperson to the DGMC within Seven (7) days. A fair hearing process will then commence at the DGMC and upon satisfaction of the resolutions/ agreement, the complainant shall sign the consent form and the grievance chairperson will officially write to the complainant with a copy to the LC III, Sub-county Chief/ Town/ Municipal Clerk and the contractor/ Consultant.

If the matter cannot be resolved by the DGMC, then it will be referred to the Ministry of Water and Environment. The CAO on behalf of the District will officially refer the case to the Permanent Secretary MWE with a copy to the Project Coordinator IWMDP for action within 14 days. The Complainant can also appeal to the PS MWE if s/he was not satisfied with the outcomes of the DGMC.

e) Referrals/ Appeals to MWE

Any unresolved grievances will be referred to MWE for appropriate action. The Grievance Desk (Principal Sociologist) shall work with PST to establish all necessary facts within 14 days of receipt of the complaint. A report with the recommended course of action shall be forwarded to the Project Coordinator for implementation and follow-up.

As much as possible, the Ministry team will engage the complainant at the district, sub-county or village levels to arrive at amicable solutions. Upon arriving at an agreed understanding, the complainant shall sign a consent form witnessed by the LC I Chairperson to close the grievance. If no agreement is reached at this level, the complainant shall be advised or shall decide on his/ her own to use any other lawful arrangements as may be applicable.

f) Implementation and Verification of Negotiated Corrective Actions

Agreed corrective action will be undertaken by the responsible agency/ part for example a Local government, MWE, contractor or authorized sub-contractor in close consultation with the complainant within the agreed timeframe and completed action recorded in the grievance database.

To verify satisfaction, the Grievance Committee will upon receipt of a completion report from the GO verify that corrective actions have been implemented. A signature of the complainant will be obtained on the consent form. If the complainant is not satisfied with the outcome of corrective action, additional steps may be undertaken to reach an agreement or an appeal will be lodged by the complainant.

9.6.9 Contractor/workers GRM

Workplace concerns are usually different from issues raised by project-affected communities and other stakeholders and therefore call for a separate mechanism to address them. For better organization and management of the contractor's workers' grievances and concerns, the contractor shall establish a Grievance Management Committee (GMC) to handle workers' welfare-related grievances including low pay, delayed payment, unfair termination of contracts, working overtime, heavy workload, sexual harassment, poor working conditions among others.

The workers' GMC shall be established and headed by a chairperson elected by workers representing the different sections of the contractor. The other members of the worker's GMC will include the Vice Chairperson, Secretary, Mobiliser and ex-officials who will be representatives of the workers from the different sections. The contractor's sociologist shall be the secretary to document and manage the grievance logbook, and minutes and writing the workers' GMC reports.

At the beginning of the project, contractor workers should be sensitized to the grievance redress mechanism and the measures put in place to channel their grievances and concerns and the referral pathways. The principle of accessibility should be highly emphasized by the workers' GMC.

9.6.10 Flow Chart of the Grievance Management Process

The grievance management process has several interdependent steps that will be followed as summarized below;

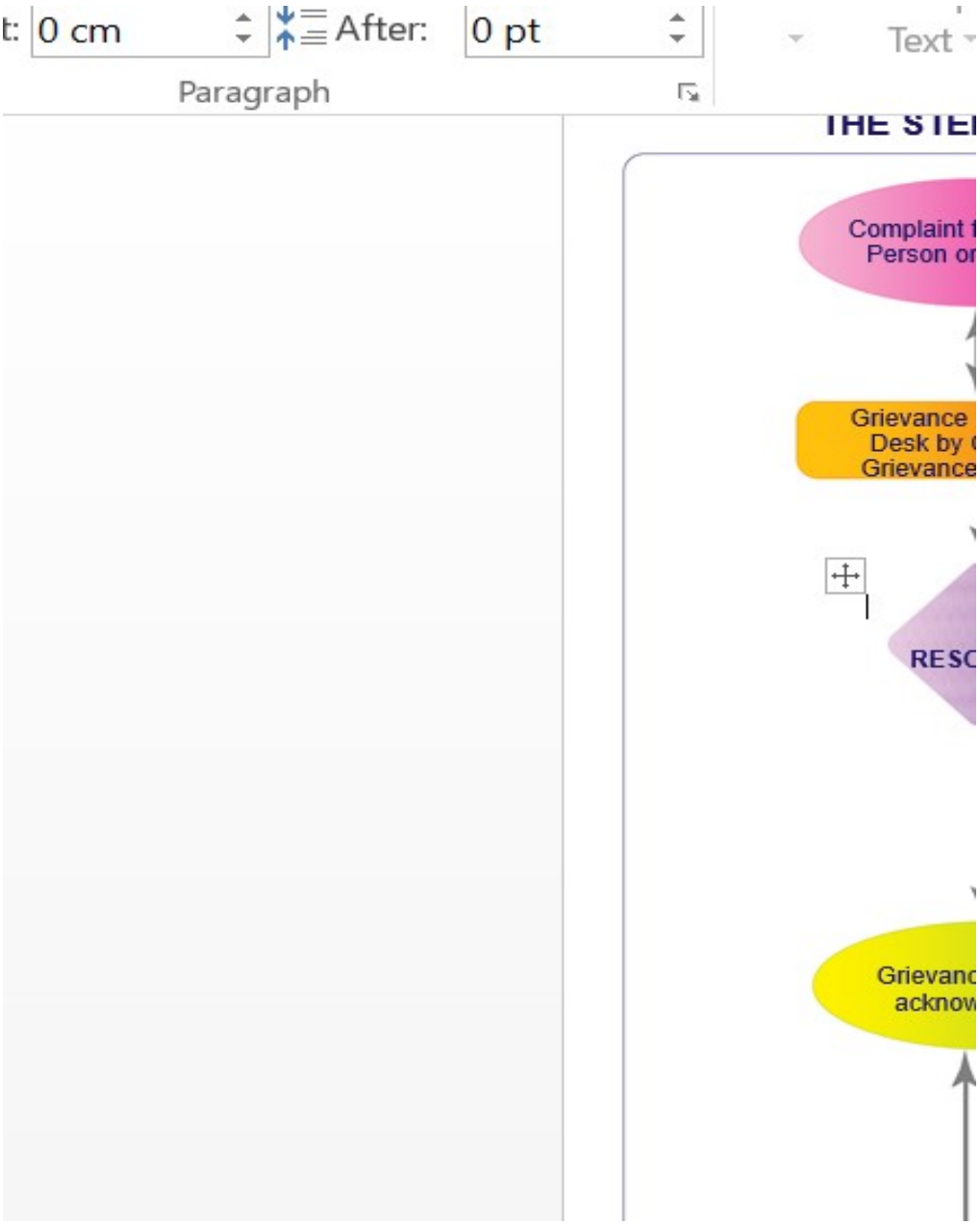


Figure: 9-1: The Grievance Handling Flow for Community (MoWE)

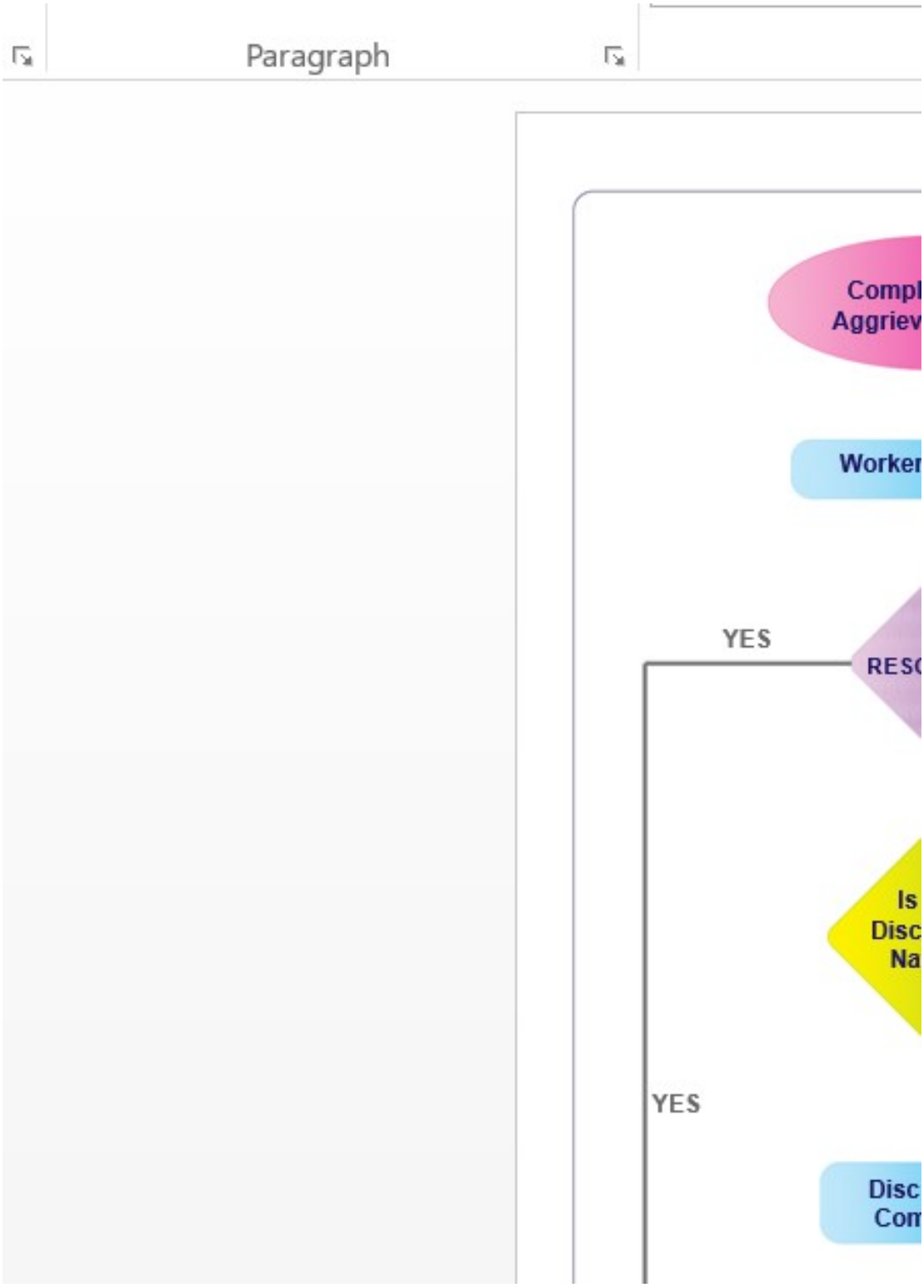


Figure: 9-2: The Complaints Handling Flow for Workers (MoWE)

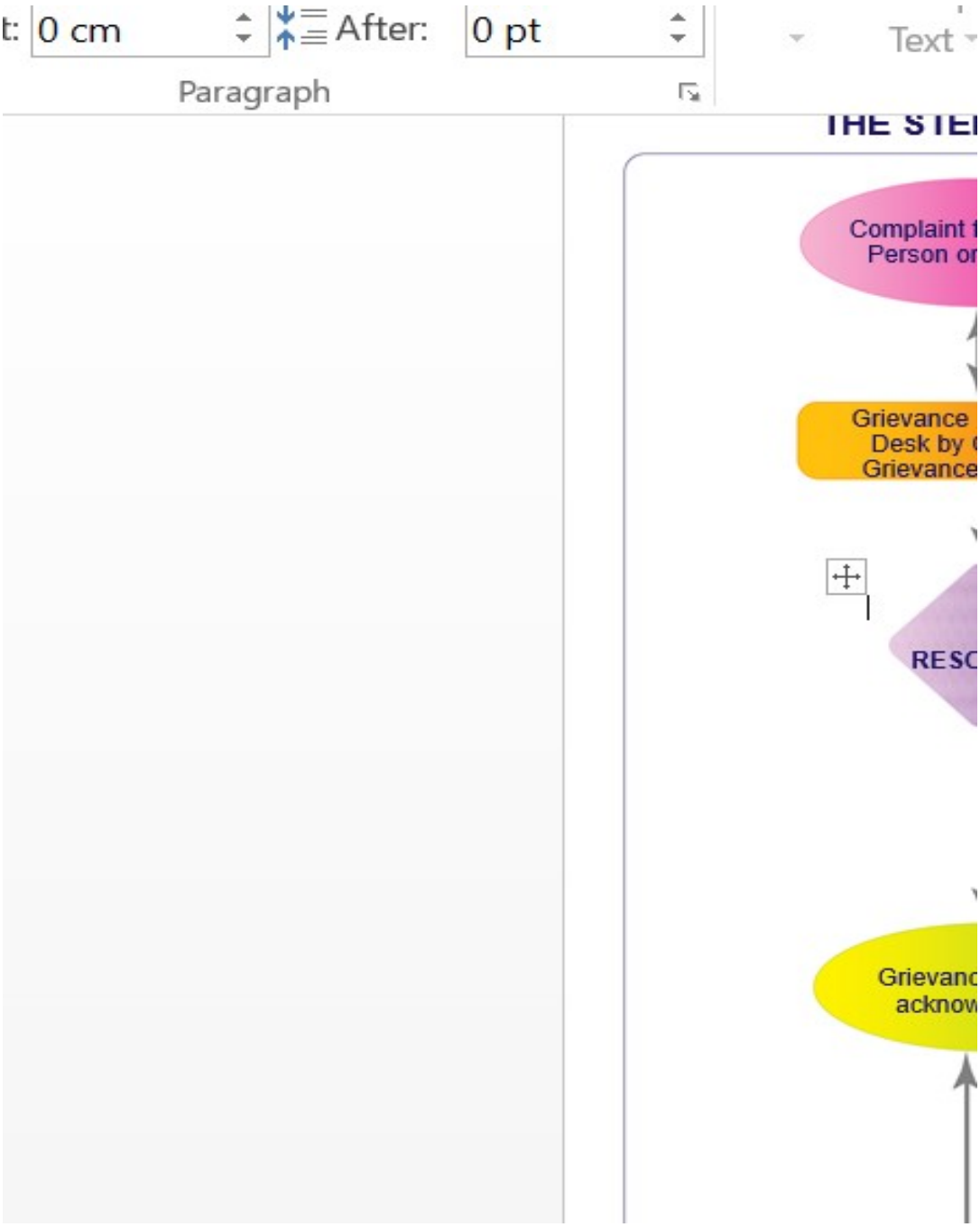


Figure: 9-3: The Grievance Handling Flow for Community (MoWE)

NB: In all cases, criminal matters (SEAH/GBV, CH, etc.) shall be explicitly handled following the Criminal Code Act and other laws governing criminal issues in Uganda. i.e. these cases shall be directly referred to the police for investigations and submission to the Office of Director of Public Prosecution for sanctioning.

In case the complainant is satisfied with the proposed solution, the solution will be affected and the grievance closed out. The complainant will sign a grievance closure form witnessed by the MWE or appointed representative.

- The second tier is where the complainant is not satisfied with the resolution at the first tier. A mediator will be identified to mediate between the complainant and MWE or contractor/consultant. Possible mediators include religious leaders, family/clan leaders, elders and CSO leaders or managers.
- At the second tier, a near process described in the table above will apply.
- In case the complainant is satisfied with the mediator's proposed solution, the resolution will be affected and the grievance closed out. The complainant will sign a grievance closure form witnessed by the mediator or appointed representative.
- In case the complainant is not satisfied with the mediation resolution, this GRM provides for recourse to the formal and traditional judicial system. For SEA/SH/GBV cases, the GRM shall adopt a survivor-centred approach facilitating safe and confidential access to services by complainants/survivors. The project shall support the survivor with psycho-social support by using the existing administrative, social and health structures like health centres.

9.6.11 Publicity of the GRM and GRCs

MWE shall ensure that stakeholder engagement plans include sensitization of stakeholders on the available grievance redress system for the project. The sanitizations shall be done through various channels including but not limited to meetings, IEC materials, radio talk shows and announcements among others.

It will be the responsibility of MWE to provide adequate resources including funds, personnel and equipment to operationalize grievance redress mechanisms on the project. On IWMDP, MWE has provided dedicated stakeholder engagement, and environment and social risk management consultants for every sub-project with an adequate budget to implement a grievance redress mechanism for each sub-project. During stakeholder engagements, resulting feedback shall be utilized to continuously improve the GRM of the project.

9.6.12 Monitoring and Evaluation of the Grievance Handling System

Complaints and grievances redress mechanism will be an integral part of the M&E framework of all the sub-project activities including site visits, field visits, and missions. Review of minutes of the committees, communications on file, updated complaints and grievances registers at the Community, Construction Site, Sub-County, Town Council, Municipal, District and Ministry levels shall be among the verification modalities for the different stakeholders.

Beneficiary satisfaction surveys which will be conducted by independent consultants that will be procured by MWE will also encompass the complaints and grievance mechanisms to assess the performance of the grievance redress mechanisms for each sub-project.

Monitoring and Evaluation Indicators shall among others include the following;

- No of GM Committees formed
- No of GM Committees trained
- No of grievance related community sensitizations conducted
- No of committees facilitated with basic stationery, standard grievance registers, & PPEs
- No of people (M, F) sensitized
- No of grievances registered
- The proportion of complaints resolved
- % of cases referred to higher committees
- % of cases appealed to other agencies of the Government
- % of resources spent on C&G

9.6.13 Training of the GRCs

The GRC will be trained on the following:

a) Execution of the terms of reference
b) Categorization of complaints/grievances
c) Referral pathway for each category of complaints/grievances
d) Basic mediation, conflict resolution techniques and skills
e) Communication and basic public relations skills
f) The property valuation process
g) Scope of the project and the associated risks
h) Code of conduct for the contractor
i) The committee's mandate: The committee will be charged with the responsibility of ensuring the timely resolution of complaints from site workers and PAPs to ensure project success.

9.6.14 Facilitation of the GRCs

MoWE will provide the following to facilitate the GRC's work:

a) Grievance Logbooks and related logistics;
b) Orientation/training of GRCs on grievance resolution;
c) Materials such as pens, notebooks; and
d) Branded items such as MWE T-shirts, pens, folders etc. for motivation.

9.6.15 Reporting Requirements

All grievances and any cases detected on-site and in the community that are project-related are recorded in the grievance register at all levels. Cases that are criminal for example sexual harassment, and gender-based violence shall be reported to Uganda Police, and the Ministry notified within 12 hours. Any other life-threatening grievances and incidents like accidents, homicides, etc. shall be reported to the Ministry immediately.

The Ministry shall then give initial notifications to the World Bank within 24 hours, and a detailed incident report submitted to the World Bank within 48 hours. All other mandate agencies like Uganda Police, and Community Development Officers shall be involved to have well-documented cases and investigations. The contractor shall provide in her monthly report the progress of implementing the grievance redress mechanism for the community and workers. The MWE shall also update the World Bank on the progress of grievance handling during monthly and quarterly reporting. During monitoring field visits by the MWE teams, there shall be meetings with GMC committees and reviewing their registers to ensure that all grievances are well documented and closed.

10 CONCLUSION

In this study, the need for the project was examined, its compatibility with the surroundings and economic benefits evaluated and environmental impacts assessed and analyzed. Adverse impacts were identified, and mitigation measures to avoid, reduce and minimize these impacts have been suggested. Measures to maximize the benefits and positive impacts of the project have also been identified. A costed ESSMP has been developed to ensure the mitigation measures are properly managed and monitored, and responsibilities for this have been duly assigned. Overall, the negative impacts of this project are largely insignificant and the benefits of implementing the project outweigh the negative impacts.

Based on the above, it is recommended that NEMA approve this project for implementation.

11 REFERENCES

a) Bijo Subcounty Development Plan 2021-2025
b) Government of Uganda, 2006. The Occupational Safety and Health Act, 2006.
c) International Finance Corporation 2012. Performance Standards on Environmental and Social Sustainability.
d) Kalema J. & Beentje H. (2012) Conservation Checklist of the Trees of Uganda. Royal Botanic Gardens, Kew
e) Ministry of Water and Environment (2013) Solar Powered Water Systems Design Guidelines
f) NEMA 2020, The National Environment (Environmental and Social Impact Assessment) Regulation 2020.
g) NEMA 2019. Environmental Legislation of Uganda.
h) Yumbe District Development Plan 2021-2025

12 APPENDICES

Appendix 1: NEMA Approved ToRs

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

NEMA House
Plot 17,19 & 21, Jinja Road.
P.O.Box 22255, Kampala, UGANDA.

Tel: 256-414- 251064, 251065, 251068
342758, 342759, 342717
Fax: 256-414-257521 / 232680
E-mail: info@nemaug.org
Website: www.nemaug.org

NEMA/4.5

9th June, 2023

The Permanent Secretary,
Ministry of Water and Environment,
Directorate of Water Development,
Rural Water Supply and Sanitation Department,
Plot 3-7, Kabalega Crescent, Luzira,
P. O. BOX 20026, Kampala, Uganda
E-mail: nmalizah@yahoo.com

REVIEW OF THE SCOPING REPORT AND TERMS OF REFERENCE PERTAINING TO THE PROPOSED LARGE SOLAR-POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN LOMUNGA, LOBE, AWOBA, NYORI-LODONGA, GOBORO AND RODO RURAL GROWTH CENTRES IN YUMBE DISTRICT

This is in reference to the Terms of Reference (**EIATOR10493**) for carrying out the Environmental and Social Impact Assessment (ESIA) for the above-mentioned project, which was submitted to this Authority on 31st May, 2023, for review and approval. This Authority has finalized the review and grants formal APPROVAL of the said TOR.

Please note that the approval of the TORs DOES NOT grant permission to start implementing any of the proposed project activities. This is not a Certificate of approval.

In addition, you are advised to consider the key aspects below during the conduct of the environmental impact study and the preparation of the ESIA report.

i. Ensure that the project description is comprehensive for each of the project components, including the designs of the different project components, in addition, clearly indicate the chemicals that will be used in the water supply system and how these will be stored, handled and associated waste disposed of.

ii. Undertake geotechnical and hydrogeological investigations of the proposed project sites/water sources so as to inform the design and construction of the Water Supply and Sanitation System.

iii. Carry out comprehensive consultations with all the relevant stakeholders including Yumbe District Local Government, Directorate of Water Resources Management, and the local community in the neighborhood of the proposed project sites. The views of the stakeholders consulted should be well documented/ addressed and lists of persons consulted appended in the EIA report.

Page 1 of 3

iv. Ensure that the relevant local government departments including, the Environment, water, Physical Planning and the Engineering departments, are consulted and concerns that may arise taken into account and incorporated in the design, construction and operation of the project.

v. Study the land tenure and identify potential project affected persons/properties at the proposed sites. Propose plans for land acquisition and/or compensation where required, including resettlement action plans, where applicable.

vi. Provide current baseline information of the project sites, the associated project components and their neighborhood, accurate GPS coordinates clearly indicating the boundaries of the project sites and the associated components and images/maps of the project sites.

vii. Provide site specific baseline information. In particular, assess site baseline soils and air quality taking into account key parameters relevant to the nature of the project. Append the results of the analysis from an accredited laboratory to the ESIA report.

Carry out an evaluation of all the negative impacts associated with the proposed Lomunga, Lobe, Awoba, Nyori-Lodonga Goboro and Rodo RGC Water Supply and Sanitation System and provide detailed mitigation and environmental management and monitoring plans that relate to the identified environmental impacts from the proposed project sites. In particular, the following issues should be comprehensively assessed and appropriate mitigation actions provided in the ESIA.

a. Potential waste streams from the construction and operation of the Piped Water Supply and Sanitation System and management of such waste, as well as measures for preventing pollution of the environment and degradation of any sensitive ecosystems that may be within the vicinity of the project sites;

b. Occupational health and safety issues likely to arise from the operation of the factory.

viii. Provide a clear and legible copy of the site layout plan (preferably on A-3 sized paper) showing the equipment, clear boundaries of the project sites and the associated components in relation to its environs.

ix. Include in the ESIA report comprehensive analysis of alternative /options to selected project location, design and technology among others.

x. Append to the ESIA report authentic copies of land ownership and acquisition documents.

xi. Indicate the project cost of the project and append a certificate of valuation issued by a qualified and registered valuer in accordance with the provisions of Schedule 5, 3(f) of the National Environment (Environmental and Social Assessment) Regulations, 2020.

xii. Provide evidence of payments of the 30% ESIA fees as required under regulation 49 (2) of the National Environment (Environmental and Social Assessment) Regulations, 2020.

Note that only registered Environmental practitioners including the team leader should be contracted to carry out the ESIA for the proposed project.

This is therefore, to recommend that you carry out the ESIA study for the proposed Lomunga, Lobe, Awoba, Nyori-Lodonga Goboro and Rodo RGC Water Supply and Sanitation System incorporating the guidance provided above.

We look forward to your cooperation and receipt of copies of the ESIA report for proposed further consideration.

Waiswa-Anold Ayazika
FOR: EXECUTIVE DIRECTOR

Appendix 2: Project Bill Of Quantities

MINISTRY OF WATER AND ENVIRONMENT
LOMUNGA WATER SUPPLY & SANITATION SYSTEM

ENGINEER'S ESTIMATE

GRAND SUMMARY

BILL NO.	DESCRIPTION	AMOUNT	
		(Ushs)	(USD)
			1USD =UGX 3750
1.0	PRELIMINARIES	435,930,000	116,248
2.0	KIRILO BOREHOLE SITE	1,827,703,057	487,387
3.0	KIRILO SOLAR	1,566,410,000	417,709
4.0	TRANSMISSION MAINS -KIRILO TO STORAGE RESERVOIR	1,673,387,450	446,237
5.0	STORAGE RESERVOIR	691,909,640	184,509
6.0	DISTRIBUTION SYSTEM	644,479,665	171,861
7.0	OFFICE BLOCK	603,160,831	160,843
8.0	TOILET BLOCKS	1,085,891,603	289,571
9.0	COMPENSATION	83,450,000	22,253
	SUB TOTAL 1	**8,612,322,245**	**2,296,619**
	Add 10% Contingencies	861,232,225	229,662
	SUB TOTAL 2	**9,473,554,470**	**2,526,281**
	Add 18% VAT	1,705,239,805	454,731
	GRAND TOTAL	**11,178,794,274**	**2,981,012**

MAKERERE UNIVERSITY
DEPARTMENT OF CIVIL ENGINEERING
PUBLIC HEALTH AND ENVIRONMENTAL ENGINEERING LABORATORY
Tel: 041-4543152 E-mail: rkulaba@cedat.mak.ac.ug

CERTIFICATE OF ANALYSIS -WATER QUALITY

CLIENT: Kagga and Partners

PROJECT: Consultancy Services for Feasibility Study, Detailed Engineering Design and Construction Supervision of Solar Powered Piped Water Supply Systems and Sanitation Facilities in Refugee Settlements and Host Districts in West Nile and Northern Uganda-Yumbe

Sampling date: 6th- 8th July 2023 **Delivery date**: 11th July 2023 **Date of analysis**:11th -13th July 2023

Sample ID / Parameters	1	2	3	4	5	6	7	8	Uganda portable standards*
pH	7.57	7.87	7.44	7.90	7.29	7.40	7.57	7.81	**6.5-8.5**
EC (µS/cm)	618	453	705	493	511	705	582	584	**1500**
Apparent colour (Ptco)	0	0	60	0	75	60	55	0	**ns**
Turbidity (FAU)	0	0	0	0	4	6	0	0	**5**
Total suspended solids (mg/L)	nd	nd	7	nd	13	10	3	nd	**Not detected**
Total Dissolved solids (mg/L)	450	348	492	378	418	552	462	390	**700**
Chlorides (mg/L)	3.8	1.4	2.5	1.6	1.4	2.5	1.1	0.1	**250**
Nitrates (mg/L)	0.37	0.09	0.11	nd	0.39	0.36	nd	0.19	**45**
Sulphates (mg/L)	3.0	11.0	1.0	0.3	2.3	0.5	4.2	0.6	**400**
Total Alkalinity (mg/L)	390	275	500	320	360	430	370	370	**ns**
Total Hardness (mg/L)	109	147	221	180	197	200	206	209	**300**
Fluorides (mg/L)	0.34	0.50	0.23	0.15	0.28	0.32	0.55	0.18	**1.5**
Ammonia (mg/L)	nd	nd	nd	nd	nd	nd	nd	nd	**0.5**
Total Iron (mg/L)	0.31	0.32	0.90	0.17	0.97	0.77	0.85	0.44	**0.3**
Sodium (mg/L)	50.8	50.2	50.6	47.8	80.7	50.9	60.3	70.4	**200**
Calcium (mg/L)	10.8	20.2	29.8	22.1	12.8	14.1	16.0	25.1	**150**

Parameters \ Sample ID	Drachia 1	Oriajin 2	Maru Buli buli village 3	Ajujinga 4	Ndesia BH Nyori 5	Lumunga 6	Rodo 7	Malanga 8	Uganda portable standards*
Magnesium (mg/L)	20.0	23.5	35.7	30,2	40.2	40.0	40.3	35.6	**100**
Manganese (mg/L)	nd	nd	nd	nd	nd	nd	nd	nd	**0.1**
Copper (mg/L)	0.83	0.50	0.63	0.67	0.68	0.92	0.72	0.60	**1.0**
Zinc (mg/L)	27.05	20.70	12.01	10.41	15.45	20.25	19.89	23.43	**5**
Lead (mg/L)	nd	nd	nd	nd	nd	nd	nd	nd	**0.01**
Mercury (mg/L)	nd	nd	nd	nd	nd	nd	nd	nd	**0.001**
Arsenic (mg/L)	nd	nd	nd	nd	nd	nd	nd	nd	**0.01**
Cadmium (mg/L)	nd	nd	nd	0.012	0.011	0.011	0.015	0.013	**0.003**
Aluminum (mg/L)	0.16	0.09	0.08	0.06	0.03	0.19	0.46	0.11	**0.2**
COD (mg/L)	27	nd	nd	1	nd	30	25	nd	**ns**

*Uganda National Bureau of Standards-Uganda Potable Water Specification (US EAS 12:2014; ICS 13.060.20); ns- not specified; nd-not detected; Detection limit for Nitrates, Ammonia, Manganese, Lead, Mercury, Arsenic, Cadmium and COD is 0.015mg/L,0.008mg/L, 0.01mg/L, 0.01mg/L, 0.01mg/L, 0.01mg/L,0.01mg/L and 10mg/L respectively.

Commentary

National drinking water standards are used to assess the potability of the sampled water from the different borehole locations. All the tested parameters of the sampled locations (except Total Suspended Solids, Total Iron, Zinc and Cadmium, cells in grey highlight) comply with national drinking water standards for treated water where specified. This compliance implies that no health risks or aesthetic problems are envisaged with the water with regard to these parameters when used for drinking. Sampled boreholes 1, 2, 4 and 8 were with clear water without any suspended solids observed while the rest of the samples were with unclear water and visible suspended solids (except for sample 7). That this is the case likely explains the levels of suspended solids, apparent colour as well as turbidity measured in the water drawn from these boreholes.

The sampled water except sample 4, is with high iron levels (>0.3mg/L). Presence of iron at levels >0.3mg/l is associated with discolouration of water (brown), deposits in the water and staining of laundry. The presence of iron, may lead to the accumulation of deposits in the distribution system. It is probable that the source of iron in the sampled waters is either the soils through which the water flows or soils within the catchment of these water sources. However, on observation, none of the samples exhibited this brown colour suggesting that the measured iron levels as well as the suspended solids are with minimal impact on the aesthetics of these waters.

All the sources were with high zinc levels above the recommended values (>5mg/L). Zinc can be introduced into water naturally by erosion of minerals from rocks and soil, since zinc ores are only slightly soluble in water. Zinc is only dissolved at relatively low concentrations. High natural levels of zinc in water are usually associated with higher concentrations of other metals such as lead and cadmium (in this case, we observe relatively high levels of Cadmium in some of the sampled sources 4-8).

Zinc is an essential nutrient for body growth and developrrent. However, drinking water containing high levels of zinc (> 5mg/L) can lead to stomach cramps, nausea and vomiting. Exposure to low levels of cadmium in water over time may build up cadmium in the kidneys and cause kidney disease and fragile bones. Cadmium is considered a cancer-causing agent.

High Aluminum levels beyond the recommended values were measured in sample 7. Aluminum is the most abundant metal and the third most abundant element in the earth's crust. Aluminum is also present in air, water, and many foods. Aluminum enters environmental media naturally through the weathering of rocks and minerals. Anthropogenic releases are in the form of air emissions, waste water effluents, and solid waste primarily associated with industrial processes, such as aluminum production. Health effects of Aluminum include diseases of the nervous system.

Checked by: Robinah N. Kulabako (PhD)
In-charge PHEE lab

Appendix 4: Stakeholder Attendance List and Minutes

Appendix 4 (a): Consultation Minutes carried at Yumbe district

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR LARGE SOLAR-POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN YUMBE DISTRICT. Minutes of meeting held with the District officials at Yumbe District Headquarters.
DATE: 3rd July 2023
START TIME:10:15 am END TIME: 12:55 am
District Headquarters
DISTRICT STAFF
1.) Asiku Abdul Mutalib – LCV 2.) Hajji Cox Sempebwa – D/CAO 3.) Ayiman Abdul – Ass. DWO 4.) Andama K Abdu – Ass. DWO-Mobilization 5.) Edema Habib Sebbi – DEO 6.) Ramadan Noah – DPP 7.) Bint Gadaffi – SCDO
INTERFACE CONSULTING LTD
1.) Moses Oluka 2.) Olivia Ashaba Ahebwa 3.) Martin Kasoozi 4.) Wycliff Ogillo 5.) Rasheedah Agero 6.) Denis Kato 7.) Osbert Nuwahereza
➢ Opening prayer ➢ Introductions ➢ Welcome remarks from the LC V Chairperson ➢ Presentation by the consultant ➢ Concerns raised and recommendations ➢ Closing remarks from the Deputy CAO

	DISCUSSION	RESPONSE
M/01	Opening prayer	
	An opening prayer was said by Ms Rasheeda Agero.	
M/02	Introductions	
	All members present for the meeting introduced themselves.	
M/03	Welcome remarks from the LCV Chairperson	
	The Chairperson welcomed the consultants The Chairperson expressed that he was happy that the consultants were finally on the ground because he had expected them one and a half months ago and that he was happy to help where needed. The Chairperson mentioned that Yumbe has a very big challenge with water consumption. He added that Yumbe's safe water coverage is 50% when the national safe water coverage is approaching 70%. This means Yumbe is short by 20%, particularly in villages where they are hosting refugees. The last census conducted in 2014, indicated that the population was at 400,000 and currently the projected population is approximately 750,000 with an approximate population of refugees at 240,000. The average population in other districts is approximately 200,000 and this is an indicator that Yumbe has a very big host community population, and this population influx presents challenges. He mentioned that Yumbe is extremely grateful to the government particularly, MWE because if you look at the district, having 6 water systems is something they appreciate. We are looking at providing safe water for the people. He welcomed the consultants and mentioned that the assistant DWO in charge of mobilization, Andama K Abdul had mobilized communities and were aware of our visit and expectant. He mentioned the concern of the delivery timeframe for the proposed project as the drilling works of the boreholes started in 2018 (5 years ago) and according to him, not much has been done as he would expect to see contractors now on the different sites. He advised the consultant to work closely with the team on the ground for guidance on the geographical establishments of the proposed location of the project components for example reservoir locations because they have a better understanding of the area.	The consultant explained that the process takes time as we have to incorporate the social issues and environmental impacts in the proposed so that the design consultant can come up with final designs with the least possible impacts to the project area.
M/04	Presentation by the consultant	

	Moses Oluka, the Team Leader of the ESIA assignment gave a brief description of the Environmental and Social Impact Assessment (ESIA) Resettlement Action Plan (RAP) And Source Protection Plans (SPP) for Large Solar Powered Piped Water Supply Systems and Sanitation Facilities in Yumbe District project. He explained that: The project is proposed to take place in 6 RGCs of Goboro, Lomunga, Nyori, Lobe, Awoba and Rodo in 5 sub-counties of Kochi, Bijo, Lodonga, Lobe Town Council and Kei respectively where Piped water systems will be put in place. The objective of the consultant's visit is to carry out the Environmental Social Impact Assessment (ESIA) and produce a draft ESIA for the 6 RGCs by the end of July. The prepared draft ESIA will be submitted to NEMA and will also be incorporated in the draft design drawings to aid in informing the final design drawings, which shall be submitted and thereafter the contractor shall be procured to start on the construction works.	
M/05	Concerns raised and recommendations	
	The is a need for the teams to work closely with local officials as they have a better understanding of the project area.	Noted.
	The is a need to move with the district representative to the proposed project areas so that the communities to relate readily to the project.	Noted
M/06	Closing remarks from the Deputy CAO	
	The concern for Nyori RGC in Lodonga S/C, the proposed design needs to be harmonized. He recommended the consultant review the proposed project components to make sure it's within the scope of works of the project. Nyori's concern is still pending.	Noted
	Mobilization of community sensitization meetings should be done through the Community Development Officers (CDOs) at the different sub-counties.	Noted

Appendix 4 (b): Attendance List for the Yumbe District Officials

Ministry of Water and Environment (MWE)
Large solar-powered piped water supply & Sanitation
Environmental and Social Impact Assessment (ESIA)

INTERFACE

STAKEHOLDER CONSULTATIONS

DISTRICT: YUMBE
VENUE: YUMBE DISTRICT HEADQUARTERS

DATE: 3-07-23
TIME: 10:15 - 10:55

No.	Name	Organization	Designation	Telephone contact/Email	Signature
1.	RASHEEDAH AGERO	Interface.	Environmentalist	0772017329 agerorash@gmail.com	[signature]
2.	Olivia Ashaba Ahebwa	Interface Consulting	Environmental Eng	0704533280	Olivia.
3.	Martin Barozi	Interface	Sociologist	0782997284	[signature]
4.	Andama. K. Abdu	YDLG	ADWO-M	0782658630	[signature]
5.	Ayiman Abdul	YDLG	DWO	0785568245	[signature]
6.	BINI GADAFFI	YDLG	SCDO	0788127028	[signature]
7.	DENIS KATO	Interface CE	Environmentalist	0773742262	[signature]
8.	Nuwaheroza Osbert	Interface Consulting	Landuse expert	0775104708	[signature]
9.	OGELLO VITALIS	"	Ecologist / GIS Expert	0782636120	[signature]
10.	DR COX Sempebwa (Hajj)	Yumbe DLG	D/CAO	0772501641	[signature]
11.	ELEMA HABIB SEBBI	YDLG	DEO	0778656058[illegible]	[signature]
12.	AJIKU ABDUL MUTALIB	YDLG	LCS	0772826238	[signature]
13.	RAMADAN NOAH	YDLG	DPP	0785719192	[signature]
14.	Oluka Moses	Interface	Interface Team leader	0777205209	

Appendix 4 (c): Attendance List for the Yumbe District Water Officials

Ministry of Water and Environment (MWE)
Large solar-powered piped water supply & Sanitation
Environmental and Social Impact Assessment (ESIA)

INTERFACE

Meeting with District Water Officials.

STAKEHOLDER CONSULTATIONS

DISTRICT: YUMBE
VENUE: YUMBE DISTRICT HEADQUARTERS

DATE: 3-07-23
TIME: 10:05

No.	Name	Organization	Designation	Telephone contact/Email	Signature
1.	Andama. K. Abdu	YDLG	ADWO-M	0782658630	[signature]
2.	MAGARA BERNARD	YDLG	DWO	0776548358	[signature]
3.	ANULE TWAHIRI AJAGA	YDLG	For DHO	0782832520	[signature]
4.	Ayiman Abdul	YDLG	ADWO - Water SS	0785568245	[signature]
5.	Oluka Moses	Interface	Team leader	0777205209	[signature]
6.	Olivia Ashaba Ahebwa	Interface	Environmental Eng	0704533280	Olivia.
7.	Nuwaheroza Osbert	Interface	Landuse expert	0775104708	[signature]
8.	DENIS KATO	Interface	ESIA Practitioner	0773742262	[signature]
9.	Rasheedah Agero	Interface	ESIA Practitioner	0772017329	[signature]
10.	OGELLO VITALIS	"	"	0782636120	[signature]
11.					
12.					
13.					

Appendix 4 (d): Consultation Minutes Carried out at Bijo Sub-County headquarters

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR LARGE SOLAR-POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN YUMBE DISTRICT. **Minutes of meeting held with the Bijo Sub-County Officials at the Headquarters.**	
MEETING DATE:	5th July 2023
START TIME: **END TIME:**	11:00 am 12:30 pm
VENUE:	Bijo Sub-county Headquarters
MEMBERS PRESENT:	**SUB-COUNTY OFFICIALS** 1. Sabir Zubeire – P/Chief 2. Edema Habib Sebbi – DEO 3. Valia Faima – CDO 4. Taibo Kadija – Ass. Accountant 5. Akabiru Salama – P/Chief 6. Risala Night – SACAO 7. Tiko Faima – P/Chief 8. Byarugaba Joseph – Police Officer **INTERFACE CONSULTING LTD** 1. Moses Oluka 2. Olivia Ashaba Ahebwa 3. Martin Kasoozi 4. Wycliff Ogello 5. Rasheedah Agero 6. Denis Kato 7. Osbert Nuwahereza
AGENDA	– Opening prayer – Introductions – Welcome remarks from the CDO – Remarks from CAO's representative – Presentation by the consultant – Concerns and recommendations raised

	DISCUSSION	RESPONSE
M/01	**Opening prayer**	
	An opening prayer was said by the CDO.	
M/02	**Introductions**	
	All members present for the meeting introduced themselves.	
M/03	**Welcome remarks from the CDO**	
	1. The CDO welcomed the consultants 2. The CDO mentioned that she has mobilized Local Councillors to mobilize for the community meetings so that there is a sense of ownership of the project by the communities. 3. The communities are expectant and yearning for the project. She further appealed to the consultant and MWE to do the necessary work for the successful execution of the solar piped water system in the shortest time possible.	
M/04	**Remarks from the CAO's representative**	
	1. Boreholes have already been drilled, now the next phase is the implementation which can be achieved through the completion of ESIA studies in collaboration with design reports. 2. Expected job opportunities through the provision of labour especially unskilled labour. 3. He mentioned that no additional money will be incurred to extend/transport water from the proposed transmission lines from the reservoir. 4. He also proposed the communities work hand in hand with the consultant to propose the best recommendations for communities concerning the proposed project.	
M/05	**Presentation by the consultant**	
	The consultant gave a brief description of the Environmental and Social Impact Assessment (ESIA) Resettlement Action Plan (RAP) And Source Protection Plans (SPP) for Large Solar Powered Piped Water Supply Systems and Sanitation Facilities in Yumbe District project. He explained that: 1. The project is proposed to take place in 6 RGCs of Goboro, Lomunga, Nyori, Lobe, Awoba and Rodo in 5 sub-counties of Kochi, Bijo, Lodonga, Lobe Town Council and Kei respectively where Piped water systems will be put in place.	

	2. The consultant presented the schematic drawing of Lomunga RGC showing the proposed transmission and distribution lines and reservoir location. 3. The objective of the consultant's visit is to carry out the Environmental Social Impact Assessment (ESIA) and produce a draft ESIA for the Lomunga RGC by the end of July. 4. The prepared draft ESIA will be submitted to NEMA and will also be incorporated in the draft design drawings to aid in informing the final design drawings, which shall be submitted and thereafter the contractor shall be procured to start on the construction works.	
M/06	**Concerns raised and recommendations**	
	1. The officials advised the consultant to take note of all the issues and concerns raised by community members during the project execution and implementation.	Noted
	2. The consultant should involve communities in the project at every stage of execution.	Noted
	3. In case a person's land, house, trees and crops are affected, will that person be compensated?	Yes, for cases where people's crops, trees and land (reservoir location and access roads where they don't exist) will be affected, valuation of such crops shall be undertaken and the respective people compensated. For the cases of affecting houses, that will be unlikely as the proposed distribution and transmission lines shall be constructed in the road reserves.
	4. Massive mobilization was done by the CDO so that all communities could be engaged in the project activities.	Noted
	5. When the taps get spoiled, who will be responsible for their operation and maintenance?	There will be a small fee that will be charged by the umbrella/water user committees for the proper operation and maintenance of the system.
	6. Will there be opportunities for the creation of jobs?	Yes, there will be employment opportunities especially unskilled labour as the World Bank dictates that 80% of the jobs be offered to the local communities.

	7. Will there be a potential market for local materials like sand, bricks etc. during the project construction as this is one of the ventures where the sub-county gets its revenue?	Yes, there will be a market for local materials during the construction of the project.
	8. There have been drilled borehole water sources in the area and abandoned, we request the consultant to check them out.	The consultant will go visit the drilled and abandoned water sources.
	9. When is the actual work expected to start?	The construction of the project is expected to start when the design reports have been finalized and the issues and concerns raised are factored into the designs.

Appendix 4 (e): Attendance List for BIJO Sub-County Officials

Ministry of Water and Environment (MWE)
Large solar-powered piped water supply & Sanitation
Environmental and Social Impact Assessment (ESIA)

INTERFACE

COMMUNITY SENSITIZATION MEETINGS

DISTRICT: YUMBE
SUB-COUNTY: BIJO
PARISH:
VILLAGE:

DATE: 5th July 2023
TIME: 11:00–12:30
VENUE: BIJO S/C HQs

No.	Name	Organization	Designation	Telephone contact/Email	Signature
1.	Olivia Achaba Ahebwa	Interface	Environmental Eng.	0704533280	[signature]
2.	OGELLO VITCLIFFE	Interface	Environmentalist	0752636120	[signature]
3.	[illegible] HABIB SEBBI	MDLG	DEO	[illegible]8656052[illegible]	[signature]
4.	AMVAKA XIGHT	BS		0760804027	[signature]
5.	ABIRU ZAITUN	BIJO	CDI		[signature]
6.	DUJI MARIAM	BIJO	Community		[signature]
7.	NADIA AISHA	BIJO	Community	0775212162	[signature]
8.	SUGU MOHAMMAD	BIJO	Production offr	0771206667	[signature]
9.	DRABU RUKIA	BIJO	Community		[signature]
10.	SABIR ZUBIERI	BIJO	P/CHIEF	0771466989	[signature]
11.	SWAIBU ABDALLAH	BIJO	DAY MAN	0779157777	[signature]
12.	HAMIZA MUHAMMAD	BIJO	Community m'ber		[signature]

Ministry of Water and Environment (MWE)
Large solar-powered piped water supply & Sanitation
Environmental and Social Impact Assessment (ESIA)

INTERFACE

COMMUNITY SENSITIZATION MEETINGS

DISTRICT: YUMBE
SUB-COUNTY: BIJO S/C.
PARISH:
VILLAGE:

DATE: 5th/JULY/2023
TIME: 11:00 - 12:30
VENUE: BIJO S/C HQs.

No.	Name	Organization	Designation	Telephone contact/Email	Signature
1.	VALIA FAIMA	BIJO S/C	CDO	0782254375	[signature]
2.	BYARUGABA JOSEPH	BIJO S/C	POLICE OFFICER	0761215958	[signature]
3.	TAIBO KADIJA	BIJO S/C	ASS ACCOUNTANT	0774609794	[signature]
4.	RISALA NIGHT	BIJO S/C	SACAO	+256782576112 [illegible]	[signature]
5.	TIKO FAIMA	BIJO S/C	P/chief	0786623545	[signature]
6.	DENNIS KATO	Interface	ESIA Practitioner	0773743262	[signature]
7.	RASHEEDAH AGERO	Interface	ESIA Practitioner	0795019329	[signature]
8.	NUWAHEREZA OSBERT	Interface	Landuse expert	0775104708	[signature]
9.	Oluka Moses	Interface	Team leader	0774205209	[signature]
10.	AZABIRU SALAMA	BIJO S/C	P/chief	0787625003	[signature]
11.	ATIGA ATIGASON	SEC WORKS BIJO	SEC. WORKS	0773626276	[signature]
12.					

Appendix 4 (f): Consultation Minutes for Community at Lomunga Trading Center

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR LARGE SOLAR-POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN YUMBE DISTRICT. **Minutes of meeting held with Lomunga community at the Lomunga trading center**	
MEETING DATE:	5th July 2023
START TIME: **END TIME:**	2:00 pm 4:00 pm
VENUE:	Lomunga trading center
MEMBERS PRESENT:	**SUB-COUNTY OFFICIALS** 1. Edema Habib Sebbi – DEO 2. Ajinga Ayigason – Sec. Works 3. Valia Faima – CDO 4. Atiku Yassin Alahahi – Vice Chairperson 5. Anguma Rashid Tura – LCI Chairperson 6. Muhamad Odrabi – Elder 7. Adaku Swadiki – Vice LCI Chairperson 8. Odonga Jibo Brahan – Elder **INTERFACE CONSULTING LTD** 1. Moses Oluka 2. Olivia Ashaba Ahebwa 3. Martin Kasoozi 4. Wycliff Ogello 5. Rasheedah Agero 6. Denis Kato 7. Osbert Nuwahereza
AGENDA	– Opening prayer – Introductions – Welcome remarks from the CDO – Remarks from CAO's representative – Presentation by the consultant

	– Concerns and recommendations raised	
	DISCUSSION	**RESPONSE**
M/01	**Opening prayer**	
	An opening prayer was said by the CDO.	
M/02	**Introductions**	
	All members present for the meeting introduced themselves.	
M/03	**Welcome remarks from the CDO**	
	1. The CDO welcomed the consultants 2. The CDO mentioned that he has mobilized Local Councillors to mobilize for the community meetings so that there is a sense of ownership of the project by the communities. 3. The communities are expectant and yearning for the project. He further appealed to the consultant and MWE to do the necessary work for the successful execution of the solar piped water system in the shortest time possible.	
M/04	**Remarks from the CAO's representative**	
	1. Expected job opportunities through the provision of labour especially unskilled labour. 2. He mentioned that no additional money will be incurred to extend/transport water from the proposed transmission lines from the reservoir. 3. He also proposed the communities work hand in hand with the consultant to propose the best recommendations for communities regarding the proposed project.	
M/05	**Presentation by the consultant**	
	The consultant gave a brief description of the Environmental and Social Impact Assessment (ESIA) Resettlement Action Plan (RAP) And Source Protection Plans (SPP) for Large Solar Powered Piped Water Supply Systems and Sanitation Facilities in Yumbe District project. He explained that: 1. The project is proposed to take place in 6 RGCs of Goboro, Lomunga, Nyori, Lobe, Awoba and Rodo in 5 sub-counties of Kochi, Bijo, Lodonga, Lobe Town Council and Kei respectively where Piped water systems will be put in place. 2. The consultant presented the schematic drawing of Lomunga RGC showing the proposed transmission	

	and distribution lines and reservoir location. 3. The objective of the consultant's visit is to carry out the Environmental Social Impact Assessment (ESIA) and produce a draft ESIA for the Lomunga RGC by the end of July. 4. The prepared draft ESIA will be submitted to NEMA and will also be incorporated in the draft design drawings to aid in informing the final design drawings, which shall be submitted and thereafter the contractor shall be procured to start on the construction works.	
M/06	**Concerns raised and recommendations**	
	1. There is fear that the school girls may be impregnated by the contractor's workers. The project should put in place measures against workers involved in love affairs with school girls.	Noted
	2. There should be strict measures put in place against employing children below the age of 18 years.	Noted
	3. Due diligence of the contractor in terms of their capacity to deliver the project within the agreed timelines should be undertaken.	Noted
	4. The contractors should undergo thorough vetting to make sure they have in stock modern equipment to execute the works within the agreed schedules.	Noted
	5. There is a concern about the rates that shall be used by the contractor for the employed workers, they recommended that the contractor use uniform rates during employment. They further suggested that the project should have terms and conditions for all the jobs to avoid exploitation of workers through underpayment and unfair dismal of workers.	Noted.
	6. How do you intend to deal with incidents of animals and school children falling into open excavated trenches during the project construction?	The contractors shall seal off the construction sites to avoid animals and school children falling into excavated trenches.
	7. The water pipes should be excavated deep enough to avoid being cut by farmers when digging in their gardens.	Noted
	8. In case a person's land, house and crops are affected, will that person be compensated?	Yes, for cases where people's crops and trees will be affected, valuation of such crops shall be undertaken and the respective people compensated. For the cases of affecting houses, that

		will be unlikely as the proposed distribution and transmission lines shall be constructed in the road reserves.

Appendix 4 (g): Attendance List for Community at Lomunga Trading Center

Ministry of Water and Environment (MWE)
Large solar-powered piped water supply & Sanitation
Environmental and Social Impact Assessment (ESIA)

INTERFACE

COMMUNITY SENSITIZATION MEETINGS

DISTRICT: YUMBE
SUB-COUNTY: BIJO
PARISH:
VILLAGE:

DATE: 5th/JULY/2023
TIME: 2:00 – 4:00
VENUE: LOMUNGA TRADING CENTER

No.	Name	Organization	Designation	Telephone contact/Email	Signature
1.	Martin Kasozi	Interface	Sociologist	0782997284	
2.	Fatina Habib Sebbi	[illegible]	DEO	0786560536	
3.	ASIGA AMIGASON	BIJO S/C	SEC WORKS	0778626276	
4.	AIIKU YASSIN ALAHAI	BIJO S/C	V/CP	0774865842	
5.	WAWA IKRAMU ADAMU	BIJO S/C		0770605359	
6.	AMAKU ASIRAFU	BIJO	VANIFO	0777711745	
7.	Ismal Abdala.	Bijo	Farmer.	0787322221	
8.	Alidriga Machamungu	Kululu	Driver	0783901606	
9.	[illegible]	Bijo	Farmer	0774025687	
10.	Kapere Abdala Avuja	KULULU	Peasant Farmer	0777253953	
11.	ANGUMA RASHID TARA	ANAFIO	LCI	0783900377	
12.	MUHAMAD ODRAGI	KULULU	ELDER	—	

Ministry of Water and Environment (MWE)
Large solar-powered piped water supply & Sanitation
Environmental and Social Impact Assessment (ESIA)

INTERFACE

COMMUNITY SENSITIZATION MEETINGS

DISTRICT: YUMBE
SUB-COUNTY: BIJO
PARISH:
VILLAGE:

DATE: 5th/JULY/2023
TIME: 2:00 - 4:00
VENUE: LOMUNGA TRADING CENTER

No.	Name	Organization	Designation	Telephone contact/Email	Signature
1.	Olivia Ababa Ahelwa	Interface	Environmentalist	0701533280	
2.	ISMAIL BALANDU ALI	" "	" "	0787147753	
3.	SWALI HUSSEIN	" "	" "	0788971953	
4.	KAWANA ABIBU ABDALLAH	"	" "	0779475266	
5.	SUKUTU RASULU	" "	" "	0771440931	
6.	ABRAHAM SWALI	Interface	"	0777162774	
7.	ANGUYO GODWIN	Lomunga Parish	Community Worker	0752478312	
8.	AMISA ANGERU SATI	" "	" "		
9.	ZUMURA RAFIBU	" "	" "	0771863008	
10.	ANDIFA RAMULA	" "	" "		
11.	BAKO NAIMA	" "	" "		
12.	TUMBARU RUKIA	" "	" "		

Ministry of Water and Environment (MWE)
Large solar-powered piped water supply & Sanitation
Environmental and Social Impact Assessment (ESIA)

INTERFACE

COMMUNITY SENSITIZATION MEETINGS

DISTRICT: YUMBE
SUB-COUNTY: BIJO
PARISH:
VILLAGE:

DATE: 5th/JULY/2023
TIME: 10:30am–1:30pm
VENUE: BIJO S/C

No.	Name	Organization	Designation	Telephone contact/Email	Signature
1.	MIGA AKIBARU DAUD	LOMUNGA	TOKURO WEST	07887568	[signature]
2.	JIDIA SALAMA	TOKURO WEST	TOKURO WEST	0789920973	[signature]
3.	OMUA BUBTAR Juma	TOKURO WEST	[illegible]	0775302691	[signature]
4.	ADAKU SWADIKI	OREWMIRI	V/LC	0786307111	[signature]
5.	ODOGA IBRO BRAHAN	OPALIGO	[illegible]	0764331611	[signature]
6.	AGU ADINAN	TOKURO	Member	0762319714	[signature]
7.	OMBELE RAJIB	WARAKA	VHT	0772537450	[signature]
8.	AMAKU ASKAFU	ANAFIO	farmer	0777711745	[signature]
9.					
10.					
11.					
12.					

Ministry of Water and Environment (MWE)
Large solar-powered piped water supply & Sanitation
Environmental and Social Impact Assessment (ESIA)

INTERFACE

Meeting with Bijo water committee & women group.

COMMUNITY SENSITIZATION MEETINGS

DISTRICT: YUMBE
SUB-COUNTY: BIJO
PARISH:
VILLAGE:

DATE: 5th/JULY/2023
TIME: 2:00 - 4:00
VENUE: LOMUNGA TRADING CENTER

No.	Name	Organization	Designation	Telephone contact/Email	Signature
1.					
2.	TIMBARO RUKIA	LOMUNGA	—	—	[signature]
3.	ALICE DAFA	LOMUNGA	—	0779367800	[signature]
4.	AJIRA SWADIKI	〃	—	—	[signature]
5.	BAKO NAIMA	LOMUNGA	—	—	[signature]
6.	ADRU SAMUSA	LOMUNGA	—		[signature]
7.	JAMILA SAISA	LOMUNGA	—	—	[signature]
8.	1 JOBIRU SAFINA	〃	—	—	[signature]
9.	SIDA ZUMURA	〃	—	0774430004	[signature]
10.	ICOKO MUSURA	〃	—	—	[signature]
11.	DEMB KATO	Nkerfce	ESIA practitioner	0772147762	[signature]
12.	OSBERT NUWAHEREZA	Interface	Landuse expert	0775104708	[signature]

COMMUNITY SENSITIZATION MEETINGS

DISTRICT: YUMBE
SUB-COUNTY: BIDI
PARISH:
VILLAGE:

DATE: 5th/JULY/2023
TIME: 10:30 AM - 1:30 PM
VENUE: LOMUNGA TRAINING CENTER

No.	Name	Organization	Designation	Telephone contact/Email	Signature
1.	KOYO SAHABAN	MEDIA	—	0783407256	
2.	BAKOLE [illegible]	LOMUNGA	—	0784352258	
3.	SIDA FARIDA	LOMUNGA	—		
4.	ALUNGARU SAFINA	LOMUNGA		—	
5.	KADOGO MUSURA	LOMUNGA	—	0779902218	
6.	WADI SAUDA	"	—	0777204359	
7.	ABIJO AWA	LOMUNGA	—	—	
8.	KADARA MUSA	LOMUNGA	—	—	
9.	JIMA ADRMARI	"	—	—	
10.	SAUDA PASULU	LOMUNGA	—	0777518458	
11.	AGUA KALISUMU	LOMUNGA	—		
12.	TIKO KEMISA	MEDIA	—	—	

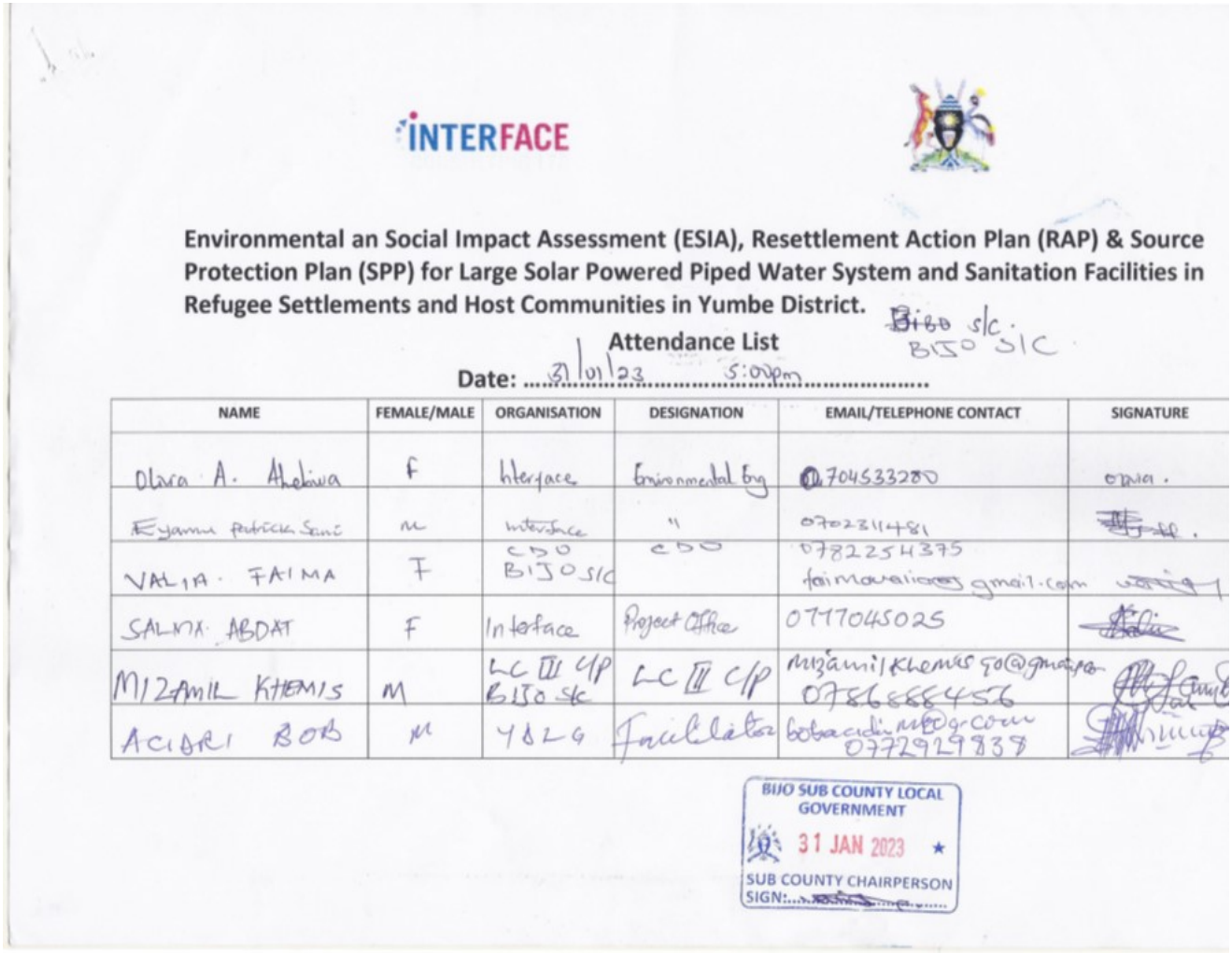
Appendix 4 (h): Consultation meetings for communities and Bijo Sub-County Officials

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)/ ENVIRONMENTAL AND SOCIAL PROJECT BRIEF, RESETTLEMENT ACTION PLAN (RAP) AND SOURCE PROTECTION PLANS (SPP) FOR LARGE SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN YUMBE DISTRICT **Consultation meeting with Bijo residents and officials in Bijo Sub-County**		
MEETING DATE:	31st January 2023	
START TIME: **END TIME:**	5:00 pm 6:00 pm	
VEUNE:	Kirilo Village	
MEMBERS PRESENT:	**Interface Consulting Ltd** 1. Salma Abdat 2. Olivia Ashaba Ahebwa 3. Patrick Eyamu Sani **Bijo residents and officials** 1. Bob Acidiri- Guide facilitator 2. Valia Faima- CDO Bijo Sub- County 3. Mizamil Khemis- LCIII Chairperson Bijo Sub- County 4. Kalisum Baku- Bijo resident 5. Ramula Swaib- Bijo resident 6. Siraj Asuma- Secretary LCI	
AGENDA	– Welcome – Introductions – Introduction of the consultant – Concerns raised/Recommendations	
	DISCUSSION	**RESPONSE**
M/01	**Welcome Remarks**	
	Members were welcomed to the meeting	
M/02	**Introductions**	

	All members present for the meeting introduced themselves	
M/03	**Introduction of the consultant to Bijo residents**	
	The consultant made a summary of the installation of the solar-powered piped water system and sanitation facilities in the refugee settlements and host communities. She introduced Interface Consulting Ltd as the consultant who will undertake the ESIA, RAP and SPP of the water systems.	
M/05	**Concerns raised/Recommendations**	
	Village residents: 1. During dry seasons, most of the boreholes are dry. The women have to walk long distances to fetch water. They wake up at 3 a.m. and return at noon. The Queues at the boreholes are very long and the water pressure is low. This has paused as a problem for breastfeeding mothers since they leave their babies unattended during this period. 2. The long queues at these boreholes are also a cause for gender-based violence. The men beat their wives implying that they are loitering during this time instead of being home. 3. During the wet season, there are some season unprotected wells that the locals use. They also collect water from streams which is unsanitary. The animals feed on this water, and people urinate in it and wash from it. Because of this, waterborne diseases are very common in the rainy seasons.	Noted
	Water User Committee 1. The water user committee collects 1000 Ugx from each household that uses the boreholes. Unfortunately, the committee is not able to collect these fees every month, leaving it with little money to make small repairs. 2. The committee mentioned that the boreholes are overused since there are only a few that function among villages. Each borehole can serve up to 1,500 people in one day. 3. The committee sensitizes the villages about sanitation and hygiene, although no one enforces these practices. Because of water scarcity, it is hard to have hand washing facilities in homes.	Noted
	The LC III Chairman 1. Most of the households have sanitation facilities but during the rainy seasons, these facilities break down. The community however has a policy in place where they inspect all households to see that they have existing and	Noted

	functioning facilities. 2. The sub-county houses around 29 refugees who are in protection camps. 3. The subcounty is very water-stressed and during the dry seasons, 3 villages share one borehole.	

Appendix 4 (i): Attendance list



INTERFACE

Environmental an Social Impact Assessment (ESIA), Resettlement Action Plan (RAP) & Source Protection Plan (SPP) for Large Solar Powered Piped Water System and Sanitation Facilities in Refugee Settlements and Host Communities in Yumbe District.

Bibo s/c. BIJO S/C

Attendance List

Date: 31/01/23 5:00pm

NAME	FEMALE/MALE	ORGANISATION	DESIGNATION	EMAIL/TELEPHONE CONTACT	SIGNATURE
Olara A. Akolowa	F	Interface	Environmental Eng	0704533280	
Eyamu Patrick Sam	M	Interface	"	0702311481	
VALIA FAIMA	F	CDO BIJO S/C	CDO	0782254375 faimavaliaco@gmail.com	
SALMA ABDAT	F	Interface	Project Office	0777045025	
MIZAMIL KHEMIS	M	LC III C/P BIJO SC	LC III C/P	mizamilkhemis90@gmail.com 0786664456	
ACIDRI BOB	M	YDLG	Facilitator	bobacidri@gmail.com 0772929838	

BIJO SUB COUNTY LOCAL GOVERNMENT
31 JAN 2023
SUB COUNTY CHAIRPERSON
SIGN:

INTERFACE

Environmental an Social Impact Assessment (ESIA), Resettlement Action Plan (RAP) & So Protection Plan (SPP) for Large Solar Powered Piped Water System and Sanitation Facilitie Refugee Settlements and Host Communities in Yumbe District.

Attendance List

Date: 31st/01/2023

NAME	FEMALE/MALE	ORGANISATION	DESIGNATION	EMAIL/TELEPHONE CONTACT	SIGNAT
BAZO KALISUM	F		PEASANT	0761434385	
RAMULA SWAIB	F		1	0778851663	
SUMBUA SIFFA	F		1	0771258881	
CHANDIRU ZAINAB	F		1	—	
ZUMURA AMAMA	F		1	—	
SIFFA SWAIBU	F		1	0778851663	

BIJO SUB COUNTY LOCAL GOVERNMENT
31 JAN 2023
SUB COUNTY CHAIRPERSON
SIGN:

INTERFACE

Environmental an Social Impact Assessment (ESIA), Resettlement Action Plan (RAP) & S Protection Plan (SPP) for Large Solar Powered Piped Water System and Sanitation Facil Refugee Settlements and Host Communities in Yumbe District.

Attendance List

Date: 31ST/01/2023

NAME	FEMALE/MALE	ORGANISATION	DESIGNATION	EMAIL/TELEPHONE CONTACT	SIG
SUMBYA RUKIA	F		PEASANT	—	
CHANDIRU ZAINAB	F		11	—	
SIASA ROMULO	F		VHT	0773765635	
NEVER ZABIRU	F		PEASANT	—	
NADIA HOPE	F		11	—	
HADRI SALAM	F		11	0783252824	

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31 JAN 2023
SUB COUNTY CHAIRPER SIGN:

INTERFACE

Environmental an Social Impact Assessment (ESIA), Resettlement Action Plan (RAP) &
Protection Plan (SPP) for Large Solar Powered Piped Water System and Sanitation Fa
Refugee Settlements and Host Communities in Yumbe District.

Attendance List

Date: 31st/01/2023

NAME	FEMALE/MALE	ORGANISATION	DESIGNATION	EMAIL/TELEPHONE CONTACT	
BINTI ZAMURADA	F		PEASANT	0780301684	B
SAKILA RASUL	F		11	—	
BASHIR KASIM	M		1	—	
ASUMA SIRAJ	M		SECRETARY LCI	0786509393	
IJAGA JAMAL	M		PEASANT	0770775522	
SHAMBU OMAR	M		11	0778851663	

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Attendance List

Date: 31/01/23 5:00pm

NAME	FEMALE/MALE	ORGANISATION	DESIGNATION	EMAIL/TELEPHONE CONTACT	SIG
ICHILE MANSUR	MALE		PEASANT	0783252824	
KIAKU RASUL	MALE		IMAM	0774612413	
RALAK ZUBAIR	MALE			0781224148	
ACHIGA ISMAIL	MALE			0781344074	
BASHIR SWAIL	MALE			0754433600	
AZIGA SAMAD	MALE			—	

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INTERFACE

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Protection Plan (SPP) for Large Solar Powered Piped Water System and Sanitatio
Refugee Settlements and Host Communities in Yumbe District.**

Attendance List

Date: 31st/01/2023

NAME	FEMALE/MALE	ORGANISATION	DESIGNATION	EMAIL/TELEPHONE CONTACT
RAZAK AKAJA	MALE		PEPPIN	0760148587
SIRIBA AZIZI	MALE		1	0774706699
RASHID TABAN	MALE		1	—
MAMBU SARIFU	MALE		1	0780016 84
AMBUKU ABINAH	MALE		1	0787340766
~~HA~~ MAWA TAIR	MALE		1	—

INTERFACE

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Protection Plan (SPP) for Large Solar Powered Piped Water System and Sanitation Fac
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Attendance List

Date: 31st/01/2023

NAME	FEMALE/MALE	ORGANISATION	DESIGNATION	EMAIL/TELEPHONE CONTACT	S
GUMA HAKIM	MALE		HHT	0783613564	
UNGULE JAMES	MALE		PEASANT	0780989379	
HAMGA ZUBAIR	MALE		11	0781550421	
ALIGA ZUBAIR	MALE		LC I	0771207753	
GUMA MUDASIR	MALE		PEASANT		
ATISUGA ALI	MALE		LCI	0774332902	

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Attendance List

Date: 31st/01/2023

NAME	FEMALE/MALE	ORGANISATION	DESIGNATION	EMAIL/TELEPHONE CONTACT
HUSEN TABAN	M		PEASANT	0783642094
IDRAW AISHA	F		"	—
CHANDIR ZULAIKA	F		—	—
ANIFA RASUL	F		"	0785649706
RAMULA NADIA	F		"	—
AJIKO TAFUMA	F		"	—

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Appendix 5: Social Assessment Tools

Focus Group Discussion Guide for Baseline Survey of IWMDP – ESIA for Lomunga, Lobe & Goboro Rural Growth Centres

Facilitator's welcome, introduction and instructions to participants

Welcome and thank you for volunteering to take part in this focus group. You have been asked to participate as your point of view is important. I realize you are busy and I appreciate your time.

Introduction: This focus group discussion is designed to assess your current thoughts and feelings regarding the Integrated Water Management and Development Project (IWMDP) to selected Rural Growth Centres in Yumbe District as refugee hosting communities to improve their water supply and sanitation system. The focus group discussion will take no more than two hours.

Anonymity: I would like to assure you that the discussion will be anonymous. The information collected from this discussion will be kept safely by the Consultants. The transcribed notes of the focus group will contain no information that would allow individual subjects to be linked to specific statements. You should try to answer and comment as accurately and truthfully as possible.

Ground rules

- There are no right or wrong answers
- You do not have to speak in any particular order
- When you do have something to say, please do so. It is important that I obtain the views of each one of you.

Capture the Shared experience:

Guiding questions

1. What kind of visitors do you observe whenever there is an ongoing development project such as a road? (*Probe for the influx of Commercial Sex Workers, job seekers…. food vendors...etc.)* For each category of visitors, what is their impact on the road project works and or on the communities/families?
2. What kind of businesses/activities boom with such development projects in the area? (e.*g. Bars/alcohol and drug abuse, commercial sex workers…etc.)* what impacts do such activities have on the communities, families, project workers, etc?

Access to Public Services and Resources

3. Do women in this community have the same degree of access as men to safe water, sanitation facilities, education, health services, etc.? *probe briefly on the differences, more importantly why*, probe for the vulnerable women, men and children, etc.
4. Who in the community makes decisions on the allocation of common resources (land, market stalls, shops, etc.)?
5. Can women and other vulnerable groups own land within the catchment area?
6. Differences in men/women accessing and controlling resources? *Probe for why there are differences.*

Women and land ownership

7. What are the main differences in ownership and control over land between men and women and other social groups?
8. How could you describe women's ownership, access and control over resources such as land, livestock, market stalls, shops, etc in this area?

Economic Information

9. What type of work do men and women primarily do in your community, what are the similarities and differences and why? Are there trends of men doing work traditionally done by women and vice-versa?
10. What types of assets (i.e., land, livestock, farming tools, houses, rental property, motorcycles, bicycles, radios, etc) Which specific assets do men and women have access and control? Why? *Probe for differences between different types of women, e.g., young, old, married, unmarried, formally employed, etc.*
11. Do men and women have the same access to financial services, including credit? Probe, why and possible differences in access to formal/informal sources and trends in the last 5 years.
12. What is the trend in the last 5 years in terms of women's access to assets?

Gender roles

13. What roles do women and men play in this community? Probe for the triple roles of production, reproduction and community work. How do these roles constrain women's participation in other activities?
14. Who is responsible for fetching water for the households? What challenges do they face when fetching water?
15. Please describe the level of work of women in this community. Probe into how much burden and hardship women have with household responsibilities, income generating and other activities.
16. Does the community have mechanisms (customs, laws, practices) in place that support women's rights? What about children's rights, PWDs, Older persons, PLWH, COVID-19 patients/affected persons…

Access to water and sanitation facilities

17. What are the main sources of water in this community?
18. Are the water sources accessible to all? What challenges do you have with the existing sources of water in this community?
19. Do the existing water sources have functional management committees? To what extent are the existing water user committees functional?
20. Are women and youth part of the water user committees? What roles do they play?
21. Who is involved in fetching water are the household level?
22. In case a new water supply system is introduced in the community, are you willing to pay for it? Probe for why if not willing to pay.
23. Does the community have public toilets? If

Decision-making

24. How are decisions taken at home? Probe whether women are involved in making decisions and what decisions they make including fetching water, seeking medical treatment; education, taking out loans, disposing of household property, attending community meetings, etc?)? By men? Why? *Probe for reasons/details*

    a. Under what circumstances do women make decisions normally made by men? Are there consequences that women face when this happens? Describe. How does the community perceive this?

    b. Under what circumstances do men make decisions normally made by women? *probe*

    c. Are there decisions that you only want your spouse to make? Why?

<u>Gender-based violence</u> (Data will be collected from the Uganda Police in the respective Municipalities, from the Women leaders and CDOs).

25. Do women in this community experience any forms of violence? How does the community view violence against women? *Probe to understand the issues, forms, prevalence, and impact, probe for men, children (girls and boys)*

    a. How is this violence dealt with in the community, and why in these ways?

    b. What are the trends over the last 5 years on Gender-based violence? (increased, decreased, no change). Why?

26. How is the situation of HIV/AIDS in this community? (*Use the KAP…Are people aware, what are the attitudes, and how do they behave? Probe for men, women, and youth, and impacts to the project and communities* ***(HMIS data will be collected from the Referral hospital and HCIV)***

27. **Apart from HIV/AIDS, what other pandemic diseases are known to the communities?** How is the pandemic transmitted? What measures are in place to mitigate the spread of the pandemic? What are the people's attitudes towards the pandemic ***<u>{</u>****<u>*engage as above using KAP approach; Probe for impacts to the project and communities)*</u>*

28. How does the community get information concerning pandemic outbreaks such as COVID-19 and HIV/AIDS?

IWMDP: TOPIC GUIDE FOR KEY INFORMANT INTERVIEWS FOR LEADERS AT SUB-COUNTY/TOWN COUNCIL LEVELS FOR SELECTED RGCs

Introduction TO IWMDP ESIA

Good morning / Good afternoon Sir / Madam,
My name is ……..……..., I am part of the survey team from Interface Consult Ltd. We are conducting an environmental and social impact assessmentss for the Yumbe Water Supply and Sanitation System for rural growth centres hosting the project under the IWMDP. This assessment involves talking to potentially affected community members from the selected RGCs. The information collected will be confidential and will help the Consultants to prepare an Environmental and Social Impact Assessment ESIA). Therefore, the purpose of my visit here is to request your time so that we can have a short discussion and complete a household information form. If you agree, I will be asking you some questions and recording your answers. The discussion will take about 45 minutes.

PERCEPTIONS, EXPECTATIONS AND LIKELY IMPACTS

- What have you heard about the Yumbe Water Supply and Sanitation System?
    - From who?
- How do you think people can be involved in the activities of the Yumbe Water Supply and Sanitation System? Probe for men and women.
- How do you expect to benefit from the project activities? Probe for men and women.
    - What do you want the project to do for you? What can you do for the project for you to benefit?
    - How can we maximize benefits to the community?
    - Do you envisage any conflict on this water supply system that may hamper their construction?
    - In your opinion how can these conflicts be mitigated?
- What are the likely negative impacts that may arise from the project activities in relation to the following during the construction and operational phases of the project?
    - Probe for land acquisition for the property

- The influx of external workers and other social groups
- Employment opportunities
- Vulnerability
- HIV/AIDS
- Marriage breakdown
- Child labour
- Restriction on land use
- Gender-based violence/domestic violence
- Violence against children
- Security
- Health and safety issues
- Environmental risks and concerns

- How can we mitigate against them? Probe for men and women.
  - Who are the people and institutions the project can work with to mitigate the negative impacts?

PHYSICAL CULTURAL PROPERTY

- What physical cultural properties exist within the selected project sites that may be affected by the project? *Make a list with proper locations*
- How can we avoid or mitigate against this? (*How can the property be protected from the project impacts?) Indicate the mitigation measure for each physical cultural property mentioned above.*

MENTION ANY OTHER IMPORTANT CONCERNS/ISSUES THAT THE IWMDP SHOULD CONSIDER.

- To get some lessons from previous development projects in the area (e.g. a campsite for the contractors, security issues (*to collect data from Uganda Police)*, social issues such as commercial sex workers, alcohol and drug abuse, HIV/AIDS mitigation measures, etc.