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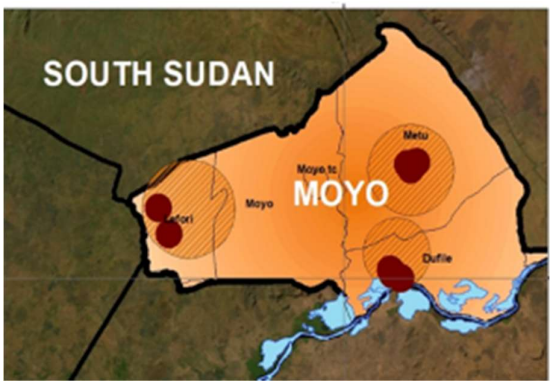
THE REPUBLIC OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

ENVIRONMENTAL SOCIAL IMPACT STATEMENT FOR THE PROPOSED WATER SUPPLY SYSTEM AND SANITATION FACILITIES FOR LAROPI RURAL GROWTH CENTRE, MOYO DISTRICT

INTEGRATED WATER MANAGEMENT AND DEVELOPMENT PROJECT(IWMDP)



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DECLARATION

This Environmental and Social Impact Statement has been prepared by Urban Research and Training Consultancy EA Ltd on behalf of the Ministry of Water and Environment (MW&E)

Preparation of this report has been undertaken following the National Environment Act (NEA), 2019, National Environment (Impact Assessment) Regulations, 2020; Environmental Impact Assessment Guidelines for water resources related projects, 2011 as well as abiding by the World Bank's OP 4.01 Environmental Assessment.

Urban Research and Training Consultancy EA Ltd and the Ministry of Water and Environment accept No responsibility or legal liability arising from the unauthorized use by third parties of data or professional opinions herein contained.

ESIA TEAM

We, the undersigned certify that this Environmental and Social Impact Assessment for the water and sanitation system for Laropi Rural Growth Centre, Moyo District has been conducted and compiled under our direction and supervision.

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GLOSSARY

Adaptation: adjustment in natural or human systems to a new or changing environment, to mitigate or avoid negative impacts. Climate change adaptation refers to anticipating the negative impacts of climate change and taking well-planned, early action to prevent or minimize the damage they can cause; or anticipating the positive impacts and taking advantage of opportunities that may arise.

Baseline: a description of pre-development or current environmental (including social and economic) conditions in a defined area.

Climate change: long-term changes in climate conditions, i.e., changes in the mean and/or the variability of a climate property such as precipitation, temperature or wind force. These changes persist for an extended period, typically a decade or longer. With climate change, disaster risks can change in terms of scale, scope, frequency and intensity.

Environment: encompasses environmental (natural and physical environment), social (people, culture, health, heritage, aesthetics, amenity) and economic aspects, as well as the relationships between these different aspects.

Environmental assessment: a term that covers both assessment processes referred to in this document, i.e., environmental impact assessment (ESIA)

Environmental hazard: an event or action that has the potential to cause significant impacts on a community, society or ecosystem. Environmental hazards can be natural (e.g., flood, earthquake, drought, landslide), human-induced (e.g., oil spill) or technological (e.g., infrastructure failure) in origin. They are not impacting (or disasters) in themselves but have the potential to cause them.

Environmental and social impact assessment (ESIA): a two-way process for identifying and managing – (1) a development's impacts on the environment, and (2) the impacts of the environment on development, i.e., the impacts arising from environmental hazards and environmental change processes, including climate change. ESIA also incorporates risk assessment; an evaluation of the consequences, probability and significance of identified impacts, to help guide environmental management.

Environmental and social impact assessment report (ESIA report) or environmental Social impact statement (ESIS): a detailed document that describes a proposed development project; the likely impact the development will have on the environment; the likely impact the environment will have on the development; the consequences and significance of those impacts; and ways to modify, mitigate and/or manage different aspects of the development to avoid or lessen negative impacts and enhance positive impacts.

Exposure: people, property and/or ecosystems that are present in hazard zones and hence subject to loss, disruption, damage or degradation.

Impact: a negative or positive change in the environment as a result of an action, activity or event. Refers to the impact of a project on the environment, as well as the impact of the environment on a project due to an environmental hazard or environmental change process (including climate change). Examples of negative impacts include environmental degradation, loss of life or injury, property or infrastructure damage and social unrest. Examples of positive impacts include environmental recovery and restoration, increased food security, property or infrastructure improvements, and growth in local job opportunities.

Practitioner: a participant in the environmental assessment process e.g. government officer; consultant; scientific or technical expert; community member or stakeholder.

Proponent: an individual, company or government ministry/department/agency planning to undertake development.

Resilience/resilient: the ability of a community or system (human or environmental) to sustain itself; to respond to and recover from extreme events and disturbances; and to use extreme events and disturbances as an opportunity for renewal and positive transformation.

Risk: a measure of the consequences and probability (likelihood) of an impact. Risks arise from the interaction between environmental hazards and vulnerability.

Scoping means a process of determining the extent and details of the environmental and social impact study;

Stakeholder: any person, organization, institution or business who has interests in, or is affected by a development issue or activity. Includes local community members and customary land/resource owners.

Vulnerability: the sensitivity of a development, community or ecosystem to damage and loss resulting from a hazardous event or disturbance.

LIST OF ACRONYMS

CAO	Chief Administrative Officers
CBOs	Community Based Organization
CGV	Chief Government Valuer
DWO	District Water Officer
DWRM	Directorate of Water Resources Management
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FSMF	Faecal Sludge Management Facility
GIS	Geographic Information System
GoU	Government of Uganda
HC	Health Center
IDA	International Development Agency
IWMDP	Integrated Water Management Development Project
LC	Local Council
MIS	Management Information System
MWE	Ministry of Water and Environment
NEMA	National Environment and Management Authority
NGO	Non-Governmental Organization
NUWS	Northern Umbrella of Water and Sanitation
NWSC	National Water and Sewerage Corporation
OPM	Office of Prime Minister
OVI	Objective Verifiable Indicators
P/S	Primary School
PAP	Project Affected Person
PC	Performance Contract
PIU	Project Implementation Unit
RAP	Resettlement Action Plan
RDC	Resident District Commissioner
RGC	Rural Growth Centers
RIT	Resettlement Implementation Teams
S/C	Sub-County
SDGs	Sustainable Development Goals

SPP	Source Protection Plan
SWP	Source Water Protection
ToR	Terms of Reference
UNHCR	United Nations High Commissioner for Refugees
WMZ	Water Management Zone
WSPs	Waste Stabilization Ponds
WTW	Water Treatment Works.

EXECUTIVE SUMMARY

Introduction

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.

To address the water supply gap in Arua and Moyo, 5 solar powered water supply systems, 18 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 provided for the preparation of the Environmental Social Impact Assessment (ESIA), Water Source Protection (WSP) and Resettlement Action Plan (RAP)

Project Location and Description

The proposed Laropi Water supply, Faecal sludge Treatment Plant and sanitation facilities will be located in Laropi RGC within Laropi town council and Laropi sub-county, Moyo District. The project area is bordered by Metu sub-county to the North and Moyo town council and Itula sub-county to the West, Difule sub-county to the East and Pacara and Dzaipi sub-counties in Adjumani district to the South. The RGC is located at the shores of the White Nile and can be accessed using a ferry across the river Nile from Umi landing site in Adjumani district and by road, it is located approximately 25km south of Moyo District Local Government Offices along the Moyo-Yumbe road.

Policy, Legal and Institutional Framework and International Obligations

The Environmental and Social Impact Assessment (ESIA) for the Laropi proposed water supply and sanitation system acknowledges the potential ecological and social impacts across pre-construction, construction, and post-construction phases of the project. It underscores the importance of adherence to existing legal frameworks, policies, and institutional structures governing environmental and social aspects.

Policy Framework

A comprehensive review of national policies and plans relevant to the Environmental and Social Impact Assessment (ESIA) for the proposed water supply system and sanitation facilities at Laropi RGC, Moyo District has been conducted. These policies include the National Water Policy, National Environment Management Policy, National Policy on Conservation & Management of Wetlands Resources, National Environmental Health Policy, Land Policy, Gender Equality and Social Protection Policies, National Policy on Elimination of Gender-Based Violence, National Policy for Older Persons, National Policy on Disability, National Orphans and Other Vulnerable Children's Policy, National Youth Policy,

Uganda National Culture Policy, National Child Labour Policy, and National HIV/AIDS Policy. These policies emphasize the integration of environmental, social, and gender considerations into development projects, ensuring compliance with legal frameworks and promoting sustainability throughout the project lifecycle.

Legal Framework and Regulations

The IWMDP (Integrated Water Management and Development Project) in Uganda operates within a comprehensive legal framework encompassing various acts, regulations, and guidelines. The Constitution of Uganda (1995) establishes the fundamental right to a clean and healthy environment, guiding all environmental laws. Other key legislations include the Water Act (1998), National Environment Act (2019) provide the foundation for water resource management and environmental protection. Additionally, regulations like the Environment (Impact Assessment) Regulations (2020) and the National Environment (Waste Management) Regulations (2020) offer detailed procedures for conducting environmental assessments and managing waste responsibly. These laws and regulations cover diverse aspects including water resource management, waste disposal, noise pollution control, and forest conservation, ensuring that the IWMDP conforms to legal requirements while prioritizing environmental sustainability and public health.

National, Regional and District Documents

The IWMDP (Integrated Water Management and Development Project) aligns with Uganda's Vision 2040 and the National Development Plan (NDPIII) by contributing to the transformation of the country into a competitive upper-middle-income nation with improved access to social services and sustainable economic growth. To proceed with the project, various permits and licenses are required, including an ESIA certificate from NEMA, a Workplace Registration Certificate, a License to handle and store hazardous waste, Water Abstraction Rights from the Directorate of Water Resources and Management, a Road cutting permit from UNRA and the Moyo District Local Government, and Development Planning Permission from the Moyo District/Local Government. These permits ensure compliance with environmental, labor, and infrastructure regulations, facilitating the project's implementation and contributing to national development goals.

Relevant World Bank Obligations

The IWMDP project adheres to World Bank Operational Policies, particularly OP 4.01, 4.04, 4.11, 4.12, and 4.36, which address environmental assessment, natural habitat protection, involuntary resettlement, physical cultural resources, and forests respectively. The project is classified under Category B, requiring an ESIA/ESMP due to its site-specific impacts, with specific attention to mitigating adverse effects on natural habitats, cultural resources, and potential resettlement. Additionally, the project aligns with the World Bank Group Environmental, Health, and Safety Guidelines for water and sanitation projects, ensuring the management of environmental, health, and safety risks through hazard identification, risk assessment, engineering controls, community engagement, and emergency preparedness, thereby enhancing overall project sustainability and compliance with international standards.

Institutional Arrangements

Several institutions are relevant to the proposed water supply and sanitation project, including the National Environmental Management Authority (NEMA), responsible for overseeing environmental and social impact assessments (ESIAs) and compliance with regulations, the Ministry of Water and

Environment (MWE) for policy formulation and project implementation, the National Forestry Authority (NFA) for forest management and conservation, and the Ministry of Gender, Labour & Social Development (MGLSD) for occupational safety inspection during construction. Additionally, the Moyo District Local Government (MoDLG) plays a direct role in water resource management and project supervision within its jurisdiction. The Department of Museums and Monuments (DMM) oversees cultural heritage preservation, the Department of Petroleum Supply (DPS) monitors petroleum operations for safety and environmental protection, and the Ministry of Lands, Housing and Urban Development (MoLHUD) provides policy direction and standards related to land, housing, and urban development, including valuation.

Analysis of Alternatives

During the planning phase of the water supply and sanitation project, various alternatives were meticulously analyzed to ensure the selection of the most efficient and sustainable option. Considerations encompassed water source intake sites, alternative water sources, project capacity, water treatment technology, source of power, and the possibility of a no-project alternative. Surface water sources were initially explored but found to be more costly compared to groundwater sources. Faecal sludge treatment alternatives were evaluated and the best site option close to the white Nile. On-site sanitation systems comprising septic tanks and Ventilated Improved Pit Latrines were found to be efficient. Given their ease to construct and manage, onsite sanitation systems are highly recommended for the Laropi water supply and sanitation project.

Environmental and Social Baseline

The environmental and physical baseline assessment conducted for the project area in Moyo district reveals significant insights into various aspects.

The climate of Moyo district is tropical with moderate rainfall and temperature. The district experiences extreme seasonal variation in monthly rainfall. On average the district receives about (1,267mm) of annual rainfall with a distinct dry period that begins from December to February. November and March have moderate rainfall. The annual mean average high temperature in Moyo is (35oC) with the lowest being (18oC)

The topography is marked by low plains, rolling hills along the Nile River, and plateaus with flat-topped hills rising at 900m above sea level rising to a series of hills and peaks. The highest peak is Mt. Otze at 1500m above sea level. The geology of the area is covered by Neogene alluvial and rift sediments within Moyo District

The most prominent water bodies within the project area are white Nile, which flows from Lake Albert northwards towards the Mediterranean Sea, Water quality, vibration levels, noise, particulate matter, and air quality assessments were conducted, indicating generally acceptable levels with some potential impacts from construction activities.

The socioeconomic analysis of the proposed solar-powered water supply system in the Laropi RGC indicates that a total of 218 households were sampled from the intended beneficiaries of the project and were interviewed. The study undertaken indicated that the average household size was between 5-6 persons per household. The 2014 population census revealed that the population of Laropi stood at 9,834 (4,978 males and 4,856 females) from the total population of 95,951 (47,175 males and 48,776 females) of Moyo district. By 2019, it was projected that Laropi would have a population of 10,861 people (5,559 males and 5,302 females).

A number of the community members relied on boreholes, protected springs, communal taps and unprotected sources. Statistics indicate that Laropi accesses safe water at 95%, with a functionality rate of 93%.

It wis indicated that 95% of the population within Laropi RGC used toilet facilities within the households in the compound, while 5% never had toilet facilities but shared the toilets with neighbors or relatives. The common toilet facilities within the project area are mainly traditional pit latrines which are affected by the high-water table levels. Laropi RGC currently has no central piped sewerage facilities. The population in the Centre is mainly served by privately owned pit latrines. There are some public toilets in the project area at the Laropi daily market with 2-stance VIP toilets with 2 showering stances for the men and women. There is a waste dump site at Laropi market but it is being poorly managed because the rubbish is dumped outside the collection area

Laropi RGC is accessible via Atiak-Laropi road through the White Nile using a ferry at the Umi Landing site in the Adjumani district., and from Moyo Town along Moyo-Yumbe road. Laropi is well connected. Education institutions were identified in the project with most of them Government aided. Laropi RGC is connected to the national electricity grid and it was observed that households and businesses within the RGC are connected to the grid, but solar is also used throughout the project area for lighting. Health services are accessed at Laropi Health Centre III. The 2021 fact sheet on HIV and AIDS, in Moyo district had a prevalence of 2.5% compared to a 5.4 % national prevalence among adults (between 15-49 years).

Gender issues, including gender-based violence (GBV) and violence against children (VAC), pose significant challenges in the project area. Gender imbalances persist in agriculture, where women lack ownership and decision-making power over productive assets, exacerbating their vulnerability. Women only have access but the decisions on what to produce on the land and in what quantities remain the domains of men. It is estimated that 86% of the workforce in agriculture are women, however, they do not control proceeds. Gender-based violence is reported to be occurring within the communities being experienced especially among women. It is reported that the main cause of GBV within the community stems from the sharing of agricultural proceeds.

Violence against children in Uganda is widespread and occurs in a range of settings. Many children are routinely exposed to physical, sexual and emotional violence in their homes, schools, communities, places of work and other settings. Notably, much of the violence against children remains normalized and socially condoned. Among the reported VAC abuses include; early marriages, defilement, neglect of the children, child Labour thus the proposed water supply project should put measures in place to prevent child rights abuse, especially during the construction phase.

Stakeholder Engagement and Disclosure

The project emphasizes the importance of public and stakeholder consultation, adhering to both national legislation and international regulations such as the Water Act CAP 157 and the World Bank OP 4.01. Consultations were conducted extensively with various stakeholders and community groups to ensure transparency, involvement, and understanding of potential impacts. The Stakeholder Engagement Plan was diligently implemented, including tasks such as stakeholder identification, consultations at different levels of governance, socioeconomic baseline studies, and summarizing inputs for project design and impact management. Methods employed ranged from formal meetings and key informant interviews to community meetings and focus group discussions, allowing for a comprehensive understanding of stakeholders' concerns and expectations.

The consultation process focused on achieving goals such as managing risks, addressing public concerns, improving decision-making, and building understanding among stakeholders. Stakeholder identification and mapping were meticulous, ensuring the inclusion of individuals, groups, and communities directly impacted by the project. Various engagement methods were employed, tailored to the type of information needed and the number of participants involved. Notable engagements included meetings with district and town council, community consultations, and focus group discussions with specific demographic groups like women.

Impact Identification and Mitigation / Enhancement measures

Evaluation of environmental and social impacts, along with proposed mitigation and enhancement measures, is crucial for the successful implementation of the water supply and sanitation project for Laropi Rural Growth Centre. The assessment identified a number of negative impacts including impacts at pre construction, construction, operation and decommissioning stages of the project. Mitigation and enhancement measures were highlighted at all the stages of the project.

The preconstruction phase included both positive and negative impacts such as Loss of Vegetation cover and crops, Disturbance of Terrestrial Fauna, Alteration of the Landscape and visual amenity, Contamination of Soil and the Wetland, High Expectations of the Local Communities Concerning Jobs, Extortion from prospective job seekers, Discrimination of the job seekers and the community with mitigation measures proposed for the negative impacts

Construction phase included both positive and negative impacts such as Vegetation clearance and damage to crops, Temporary loss of habitat within the construction sites, vibration Noise and Vibration disturbance, Disturbance of both human beings, plant processes and fauna by dust generated, Disturbance and mortality of terrestrial fauna, Pollution by solid wastes, Introduction of alien plant species, Construction wastes and debris, Fugitive dust and other emissions, Noise from trucks and associated equipment, Alteration of the visual amenity of the project area, Soil erosion and sedimentation of the River, Land take, Disruption of traffic, Disruption of businesses and Economic displacement/Loss, Damage to properties along the water pipeline route/ Physical Instruments, Influx of immigrants the mitigation measures of the above mentioned negative impacts have mitigation measures proposed while the positive impacts such as Employment opportunities, Increased Revenue Generation by the Government, Multiplier effect of earnings on the local economy with enhancement measures proposed for the same.

The operation phase highlighted a few negative impacts Loss of vegetation cover during maintenance activities, Generation of Anaerobic Conditions, Aquatic Weeds and Deterioration of Effluent Quality, Foul Odour, Pollution resulting from poor management of hazardous wastes and Chemicals, Community health risks, Limited or poor skills in managing the water supply lines and taps, Accidental raptures and breakdown in the water supply system, Disturbance and interruption of commercial and social activities, Physical hazards, Confined space risks, Electrical hazards, Noise and vibration exposure , Occupational Health and Public Health Concerns, Effect on-farm yield and soils by poorly treated faecal sludge cake thus the negative impacts highlighted have been evaluated and mitigation measured proposed while the positive impacts include Improved and increased access to safe and clean water, Boost the local economy, Water Access and Tariffs, Improved sanitation and hygiene, Employment Opportunities, Reduced distances to water sources, Benefits from Capacity Building, Improved Service Delivery by the Operators with enhancement measures proposed for each of the positive impacts highlighted.

The decommissioning phase of the project, two main impacts are considered: change of use and end of life situations. In both cases, the decommissioning process involves demolition of structures and restoration of affected land to a natural condition through landscaping and vegetation planting. Debris resulting from demolition will be disposed of properly, and safety measures will be implemented, including the provision of personal protective equipment for workers. Overall, adherence to safety guidelines and precautions is essential during the decommissioning process to ensure a safe and environmentally responsible transition.

Environmental and Social Management and Monitoring Plan (ESMMP)

Environmental and Social Management Plan (ESMP) provides the framework for the management and mitigation of impacts anticipated from the proposed project in Laropi RGC (water and sanitation area). The ESMP outlines the mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate or compensate for adverse environmental and social impacts, or to enhance the project's beneficial impacts. To minimize adverse impacts of the project mitigation measures, responsibilities, period of impact management, resources required and estimated costs are proposed.

The monitoring plan will enable the managers of the project to compare the monitored data against the baseline data collected during the ESIA study. This will help in assessing the effectiveness of the proposed mitigation measures and protection of the environment based on standards used at the national and where necessary at the international level. It will also help redress emerging issues that were not foreseen during ESIA studies. ESMP monitoring tools such as checklists, atmospheric monitoring equipment for example noise meter, atmospheric particulate meter matter measuring meter, gaseous emission testing meter, and water quality testing. The total cost of implementing the ESMP monitoring measures is estimated to be Ugx 534,000,000/=. It is important to note that monitoring will be conducted at all project sites.

The institutional capacity and implementation arrangements for the Environmental and Social Management Plan (ESMP) involve several key stakeholders and their respective roles. The implementing agency, IWMDP and MW&E, possesses internal expertise in environmental management, social safeguards, and related fields, with trained personnel responsible for ESMP implementation and reporting. capacity building workshops will be conducted for key personnel involved in the project. These workshops will cover essential areas such as ESMMP requirements, occupational health and safety, environmental assessment, gender transformative approaches, and water source protection. Furthermore, strict reporting procedures will be established to document and address any environmental or social incidents during both the construction and operation phases. This includes incident identification, documentation, notification to relevant authorities, immediate response plans, periodic reporting, and analysis of lessons learned to prevent future incidents.

Additionally, environmental and social incidents during the construction and operation of the water supply system and sanitation facilities, including spills, accidents / incidents, soil erosion problems, noise complaints, and other issues shall be documented and reported using a structured procedure. This procedure shall comprise of steps that include incident identification, incident documentation, notification to relevant personnel, immediate response, formal reporting, adherence to defined response times (ranging from immediate to within 24-48hours), periodic reporting and documentation of lessons learnt from each incident.

The Grievance Management and Redress (GRM) system outlined in the document is designed to address both internal and external concerns related to project operations. It establishes structured mechanisms for receiving, documenting, addressing, and closing grievances from various stakeholders, including employees, community members, and contractors. Internal grievances primarily focus on issues such as labor rights, health and safety, and fair treatment of workers, while external grievances encompass concerns related to community impact, environmental pollution, and social disruption caused by the project. The GRM involves the establishment of dedicated committees at different levels, from village to district, each with defined roles and responsibilities in receiving, assessing, and resolving complaints. The process involves thorough documentation, timely response, and escalation to higher levels when necessary, ensuring transparency, fairness, and accountability throughout the grievance handling process. Additionally, the system emphasizes stakeholder engagement, training, and continuous monitoring and evaluation to improve the effectiveness of grievance resolution and maintain trust between project stakeholders and implementing agencies.

Conclusion

The Environmental Social Impact Statement (ESIS) has presented a comprehensive assessment of the social, physical and biological conditions of the Laropi RGC. The ESIS has further indicated that there will be limited negative impacts that will affect the Environment and Social parameters for Laropi RGC thus the mitigation measures proposed should be able to mitigate the negative impacts and enhance the positive impacts thus the need to implement the project in Laropi RGC.

1. INTRODUCTION

1.1 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) of the IWMDP is to improve access to water supply and sanitation services, improve 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 Centres 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 Arua and Moyo, 5 solar powered water supply systems, 18 toilets and 1 faecal sludge treatment facility 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 provided 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.
Under the IWMDP, funds have been provided for Environmental and Social Impact Assessment (ESIA), Resettlement Action Plan (RAP) and Source Protection Plans (SPP).

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 Laropi 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 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 guidance and approval for the proposed project in Laropi RGC.

1.2 Current water supply and sanitation situation in Moyo District

1.2.1 Water Supply status

As highlighted in the Moyo District Development Plan (2021-2025), the communities in the district rely on deep wells, shallow wells, gravity flow schemes, pump piped system, seasonal small-scale rain water harvesting scheme (institutional) and protected springs for their domestic water needs. The district safe water coverage stands at 66% and functionality of water sources stands at 81.7%. 4% of the population in the district does not have access to safe water and 18.3% of the safe water points constructed are non-functional.

In areas where there is insufficient access to safe water sources, most of the population in the district turns to other options, such as unprotected wells, streams, and rivers, which can pose health risks to those who consume the water. In places where communities do have access to a protected water source, households typically pay a fixed monthly fee of up to 1,000 Uganda Shillings. However, in regions without protected water sources, individuals rely on purchasing water from vendors, paying anywhere from 1,000 to 5,000 Uganda Shillings for a 20-liter jerry can of water.

1.2.2 Sanitation facilities

According to Moyo District Development Plan (2021-2025), the latrine coverage stands at 95.8% in the district. However, it is noted that the provision of hand washing facilities and their utilization in the district after toilet visit improved by 29% (56% in 2015 to 85% in 2019).

1.2.3 Existing Water Supply and Sanitation Situation in the Project Area

1.2.3.1 Water Supply in the RGC

There is an existing water supply system within Laropi town council that was constructed in 2003 by Ambitious construction co. ltd but its operation has greatly deteriorated as the residents claim they spend up to two (2) months without water supply. Most of the residents have now resorted to depending on boreholes and untreated water from the White Nile as their source of water supply for their everyday water needs which has led to the increased spread of waterborne diseases in the community as reported by Laropi sub-county senior assistant secretary. The system is managed by Northern Umbrella who are charging a rate of 1500/= per cubic meter.

1.2.3.2 Sanitation in the RGC

Laropi RGC currently has no central piped sewerage facilities. The population in the centre is mainly served by privately owned pit latrines. There are some public toilets in the project area at the Laropi daily market with newly built 2-stance VIP toilets with 2 showering stances for the men and women. The Laropi landing site currently has no public toilets as the ones that were recently constructed got submerged when the water levels of the river Nile increased causing the river to burst its banks which rendered them unsafe to use. There is a waste dump site at Laropi market but it is being poorly managed because the rubbish is just dumped outside the collection area.

1.3 Feasibility Study

There is an existing water supply system within Laropi town council that was constructed in 2003 through WSDF-North but its operation has greatly deteriorated as the residents claim they spend up to two (2) months without water supply and most of the residents have now resorted to depending on boreholes and untreated water from the White Nile as their source of water supply for their everyday water needs which has led to increased spread of waterborne diseases in the community.

However, to meet the current water supply needs of Laropi RGC, the feasibility study recommended One borehole, DWD89698 (91 m3/h) located in Pakoma West village, Laropi parish, Laropi Sub-County was sited, drilled for use as a production well in the project area. The yield of the boreholes is of adequate capacity to meet the projected water demand for the proposed piped water supply system for Laropi RGC. At the intake sites, there will be a pump house and a chemical dosing house at each site. 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 in Laropi T/C, Utono Cell from where water will be distributed by gravity to the project area.

1.4 Project Location

This Chapter identifies the location and extent of the proposed Laropi Water Supply and Sanitation project area and provides a description of various project components and arrangements for the provision of services to and of the area. The project is located at Laropi Town Council within the district of Moyo.

Laropi RGC is located in areas of Laropi town council and Laropi sub-county, Moyo District. The project area is bordered by Metu sub-county to the North and Moyo town council and Itula sub-county to the West, Difule sub-county to the East and Pacara and Dzaipi sub-counties in Adjumani district to the South. The RGC is located at the shores of the White Nile and can be accessed using a ferry across the river Nile from Umi landing site in Adjumani district and by road, it is located approximately 25km south of Moyo District Local Government Offices along the Moyo-Yumbe road. The coordinates of the RGC are, 368964.53 m E, 393602.60 m N. The Arial view of the project area is given in Figure 1-1 below.

The water source area is located within a modified environment with a maize gardens and open fields surrounding the site, Faecal sludge site is located in an open field area surrounded by a few brick laying activities and open grazing of livestock animals such as goats and cows and the reservoir site is located on top of a hill with scattered natural trees and bush cover.

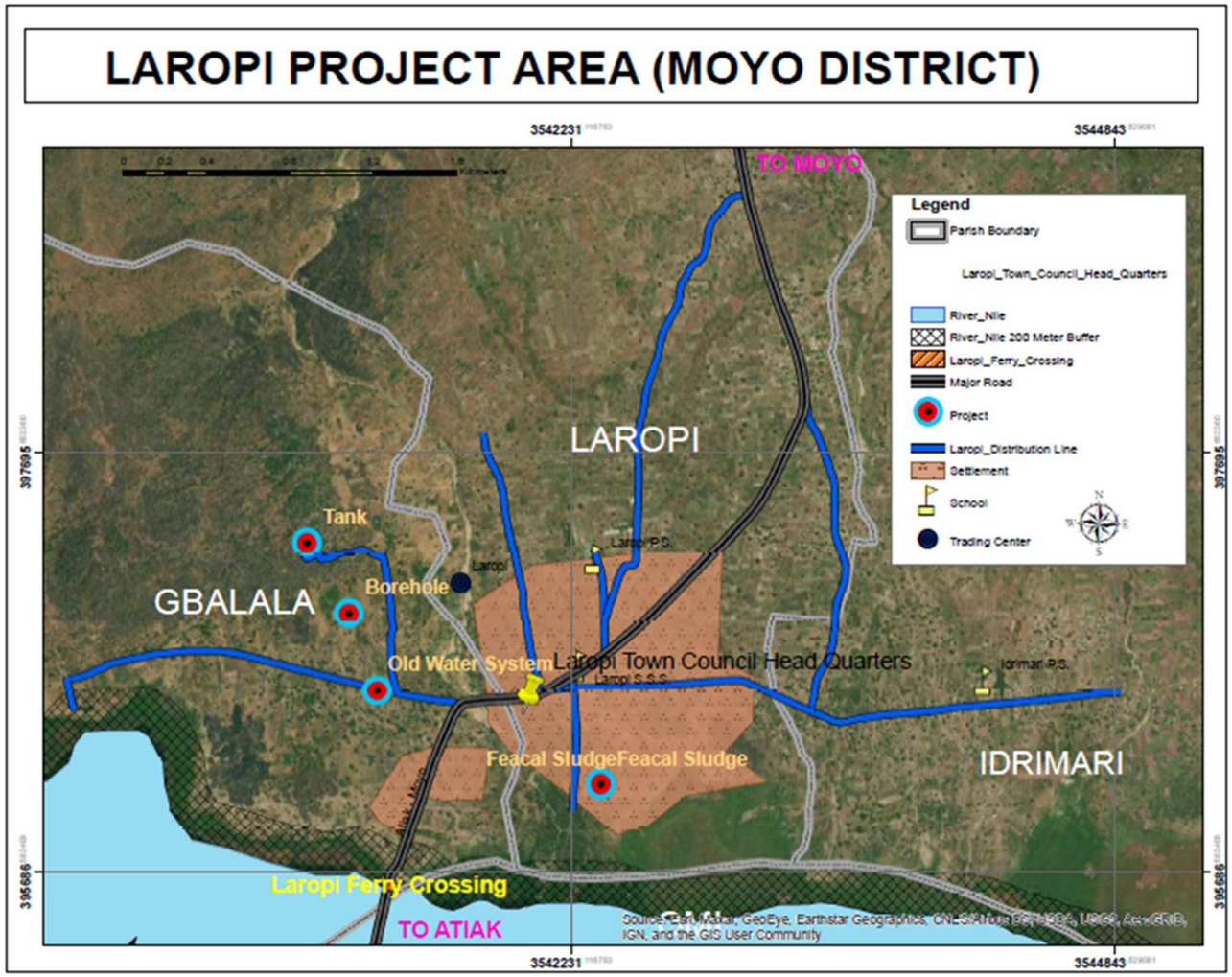


Figure 1-1:Project Location Map for Laropi Town Council.

1.4.1 Administrative Structure

Laropi RGC is located in the parishes of Laropi, Gbalala, Panyanga and Idrimari. The town is where most of the commercial activities take place and consists mainly of shops, a ferry landing site, a daily and weekly market, a police station and schools.

The RGC project area will comprise the core villages of Pakoma, logubu South, Ubbi South, ubbi North, Edre, Pachoro, pajaru, Olia, Patere, Kidhi, Adhi, Paubu, Pakonira West and Gbalala East. Figure 1-2 overleaf shows the location of these villages within the sub-county.

Figure 1-2: Laropi Rural Growth Centre Administrative Structure

1.5 Project Justification

In Moyo 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.

The environmental problems as far as the freshwater resources of Moyo are concerned are the issues of accessibility, quality and unequal distribution. Though significant strides have been recorded recently, the water supply situation in Moyo district is not satisfactory.

There are also critical challenges (Moyo District Development Plan 2020/2021 – 2024/2025), faced with access to water in the district including:

- Low piped water coverage,
- Poor maintenance of boreholes and other safe water sources,
- Lack of water quality testing laboratory,
- Drying of open water sources,
- Floods leading to contamination of water sources,
- Heavy rain falls and flood have resulted into collapse of latrines,
- Mountainous and hilly terrain led to soil erosion leading to siltation of water sources,
- Reduced underground aquifers especially in water stressed areas of Lefori and Metu
- Poor soil textures resulting into latrine collapses,
- High costs of water facilities and latrines,
- Poor hand washing behaviors,
- Poor functionality of water management committees and weak enforcement of sanitation standards.

1.6 The Developer Contact Details

The details of the developer conducting this ESIA and the consultant are given below:

Table 1-1: Contact details of the project developer

DEFINITION	DETAILS
Client (Project proponent)	The Permanent Secretary, Ministry of Water and Environment of Uganda
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 Government of Uganda

1.7 Project Investment Cost

The cost estimate for the proposed works for Laropi RGC piped water supply and sanitation system is 9,071,008,059 (Nine Billion Seventy-One Million Eight Thousand Fifty-Nine Shillings)

1.8 The Need for the Environmental and Social Impact Assessment (ESIA)

The implementation of the Laropi Rural Growth Centre piped water supply and sanitation Project necessitates an Environmental and Social Impact Study due to its anticipated environmental and social consequences. Additionally, the project falls within the scope of projects listed under the Fifth Schedule of the National Environment Act No. 5 of 2019, as amended, which mandates Environmental and Social Impact Assessment (ESIA). Section 19 (3) of the National Environment Act No. 5 of 2019, as amended, requires ESIA for projects or policies related to water resources, water supply, and sanitation facilities that may have significant environmental impacts. This ensures that any adverse effects can be identified, minimized, or mitigated according to the mitigation hierarchy.

In total, the project has triggered compliance with five (5) World Bank Operational Policies, including Environmental Assessment (OP/BP/GP 4.01), Natural Habitat (OP 4.04), Physical Cultural Resources (OP 4.11), Involuntary Resettlement (OP/BP 4.12), and Forest (OP 4.36). Furthermore, adherence to 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, is required for safeguard implementation. The ESIA has been crafted in alignment with both national and World Bank safeguards policies and frameworks.

Upon conducting an environmental and social screening of the proposed project activities, it has been categorized as Environmental Assessment (EA) Category B. This classification is attributed to the localized, site-specific, and small to moderate negative impacts expected from the project. There are no foreseen large-scale, significant, or irreversible impacts, and the project's location does not encompass environmentally sensitive areas. Moreover, its associated impacts can be effectively mitigated using standard mitigation measures.

1.9 Purpose of the Environmental and Social Impact Assessment

Section 110 (1) of the National Environment Act, 2019 outlines the purpose of environmental and social assessments, which is to evaluate environmental and social impacts, risks or other concerns of a given project or activity, taking into account the environmental principles set out in section 5(2).
The development of the water supply and sanitation system is anticipated to have significant positive and negative impacts on the bio-physical and social environment, and thus the need to evaluate them so that appropriate safeguards are proposed to eliminate and/or minimize the negative and maximize the positive ones. The main purpose, therefore, is to evaluate the project components, activities and facilities and determine whether the project it can proceed without unacceptable environmental and social impacts. This will be achieved by identifying any potentially significant risks to the environment and community associated with the proposed project and evaluating and suggesting the corresponding safeguards or prevention/mitigation measures.

The project seeks to enhance environmental and social sustainability through the protection of people's lives and health, the economic basis of their livelihood and their ecological, social and cultural environment as well as the sustainable use of natural resources. Development projects, such as water

and sanitation infrastructure construction, can have a significant impact on the environment and local communities. Its therefore essential to ensure that these projects are conducted in an environmentally a d socially sustainable manner in essence considering the long-term impacts of a project such as energy efficiency measures can significantly reduce the carbon footprint of a project and contribute towards maintaining a healthy climate. Social sustainability involves taking into account local communities' interests and participation including the involvement of vulnerable groups like children, the elderly or persons with disabilities during the project's planning and implementation phase.

The output of the study is an Environmental and Social Impact Assessment (ESIA) report that includes a detailed Environmental and Social Management Plan (ESMP) with the necessary mitigation measures. The ESIA has established modalities of implementing the construction works in line with the National Environmental and Social policies, regulations and laws, and the World Bank Environmental and Social Standards (ESS).
The specific objectives of the study include: -

(i) Establish the environment and social baseline of the project site area as basis for assessing project impacts;

(ii) Carry out review of national policy, legal, regulatory and institutional framework for the project, and provide a summary of important policies, legislation, regulations and guidelines that are applicable to the proposed water supply system and sanitation project for Laropi Rural Growth Centre;

(iii) Identify the international framework triggered by the project such as World Banks' Safeguard Policies/ guidelines and conventions and treaties;

(iv) To identify all likely positive and negative environmental and social impacts due to the proposed water supply system and sanitation project for Laropi Rural Growth Centre, Laropi Town Council, Moyo District;

(v) Develop an Environmental and Social Management (& Monitoring) Plan (ESMP) detailing mitigation measures for addressing the identified potential negative environmental and social impacts of the proposed water supply system and sanitation project and monitoring requirements; and

(vi) Inform detailed designs of the proposed water supply system and sanitation project activities to ensure they have strong consideration of environment and social concerns.

1.10 Structure of the Report

The ESIS has been organized into the following chapters:
Chapter 1: ***Introduction*** - The chapter provides the project background, describes existing water infrastructure, the proposed water supply and sanitation improvements and project extents, the rationale of the project, justification of the project and methodology for the ESIA study.
Chapter 2: ***Methodology and Approach to ESIA Study-*** The chapter describes the methods and approaches undertaken to determine the baseline and analyse the different impacts and propose the mitigation and enhancement measures of the project
Chapter 3: ***Project Description*** - The chapter describes the main project activities by phase, equipment and materials to be used during construction and the environmental considerations.
Chapter 4: ***Policy, Legal and Institutional Framework*** – The chapter describes the Uganda development vision and policy and legal framework. The chapter also outlines the WB's Environmental

and Social Safeguards as well as International Conventions and Agreements. The chapter also discusses the relevant permits and licenses required for the project proponent.

Chapter 5: ***Alternative Analysis*** - The chapter reviews project alternatives based on technical aspects, pipeline routes and construction materials to be used.

Chapter 6: ***Environmental and Social Setting*** - The chapter describes the existing environmental and social conditions including physical, sanitation, biological and socioeconomic aspects.

Chapter 7: ***Public Consultation*** – The chapter introduces the process of public consultations, the objectives of the consultation and the consultation methods. The chapter also analyses the project stakeholders.

Chapter 8: ***Assessments of Environmental and Social Impacts*** - The Chapter describes the approach and methodology for impact identification. It also outlines project interactions with receptors based on the proposed project activities. Further, it discusses the overall impact assessment and determination of mitigation measures.

Chapter 9: ***Environmental and Social Management and Monitoring Plans*** – The chapter provides tabulated plans for managing and monitoring the identified impacts. It also provides a summary of costs for managing and monitoring the identified impacts due to the proposed project.

Chapter 10: ***Conclusion and Recommendations*** – The chapter provides a summary of the findings of the study as well as proposed mitigation and enhancement measures. The Chapter also outlines the recommendations to be considered during project implementation.

2. METHODOLOGY AND APPROACH TO ESIA PROCESS

2.1 General Approach

2.1.1 Overview

This chapter of the Environmental and Social Impact Statement details the approach to the ESIA phase of the proposed. Environmental and Social Assessment Process the ESIA Regulations of 2020 set out the procedures and criteria for the submission, processing, and consideration of and decisions on applications for the Certificate of Approval of projects. The ESIA process in Uganda is divided into three main phases including the scoping Phase; Environmental Impact Study (ESIS) Phase; and the Decision-Making Phase as shown in Figure 2-1below. The proposed project is currently at the Environmental and Social Impact Study (ESIS).

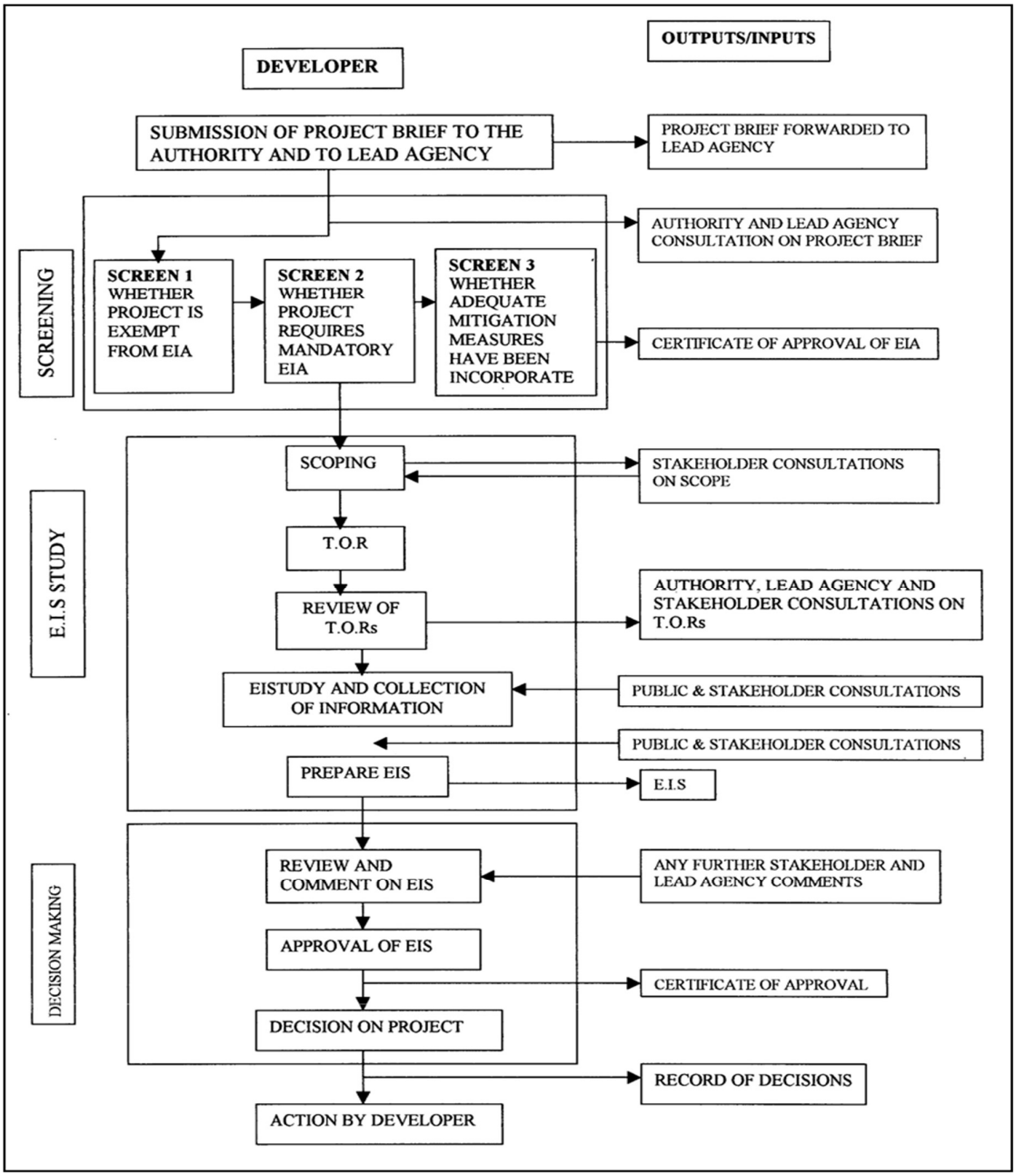


Figure 2-1: ESIA process

2.1.1.1 Review of the Relevant Literature and Institutional Framework

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. The literature review covered all relevant policies, institutional arrangements and national laws. The relevant World Bank Environment and Social Operation Policy (O.P) World Bank Group Environmental Health and Safety Guidelines (2013) as well as International Best Practices for civil works were reviewed.

Several project-related documents were obtained and reviewed and these included Feasibility study report, Design report, Moyo District Development Plan, Environmental and Social Management Framework of the IWMDP, Project Appraisal Document, Project Implementation Manual among others. Stakeholder Consultations As required by the Guidelines for EIA, key stakeholder consultative meetings were held to obtain comments and views on the proposed project. Stakeholder consultations that took place between 17th /April/2023 and 25th/July/2023

Stakeholders that were consulted include the following: Ministry of Water and Environment (MW&E), Moyo District Local Authorities, National Forest Authority(NFA), Wetlands Department (WD), Ministry of Gender, Labour and Social Development (MoGL&SD), National Environment Management Authority(NEMA), Ministry of Lands, Housing and Urban Development(MLH&UD), United National High Commissioner for Refugees (UNHCR), Directorate of Water Resources Management, technical and political leaders among others.

2.1.1.2 Determination of the Project Area of Influence (AOI)

The ESIS study defined the area of influence (AoI) where significant impacts are likely to occur to be within the radius of 500 metres for the Direct Impact Zone (DIZ) and 5 km for the Indirect Impact Zone of the water supply and sanitation project site. These ranged from much-localised construction impacts to those associated with changes to water users as a result of the project.

2.2 Specialist Studies

The studies included primary field surveys which involved sample locations for the biophysical, specialist studies, observations and stakeholder engagement that informed the ESIA assessment. The selection of focus sample locations was governed by the distribution of the planned activities and infrastructure and facilities as described by the engineering design team and the Client.

2.2.1 Air Quality Assessments

Air quality Assessments were conducted at the various proposed project sites which included; Water source, Reservoir and selected points (institutions) along the pipeline routes to ascertain the prevailing conditions prior to commencement of the project. This assessment focused on the Criteria of Air Contaminants (CAC) and Greenhouse Gases which reflect the project emissions of concern concerning environmental health. Major sources of outdoor air emissions in the project area are from vehicular traffic activities. Different air pollutants that were assessed include;

i) Particulate Matter (PM), including total suspended particulate (TSP). Inhalable particulate matter (PM10) and Sulphur dioxide (SO2);
ii) Sulphur Dioxide (SO2)
iii) Nitrogen Dioxide (NO2)
iv) Carbon Monoxide (CO)
v) Greenhouse Gases: Carbon dioxide (CO2), methane (CH4).
vi) Volatile Organic Carbon (VOC)

2.2.2 Noise/ Sound, Humidity and Temperature Assessment

Noise levels Assessments were conducted at the various proposed project sites which include; Water source, Reservoir and selected points (institutions) along the pipeline routes to ascertain the prevailing conditions prior to commencement of the project. Noise pollution contaminants are generally sound

waves that interfere with naturally occurring waves of a similar type in the same environment. However, noise pollution is defined as unwanted sound or sound that is loud or unpleasant. Sounds are considered noise pollution if they adversely affect wildlife, human activity or are capable of damaging physical structures regularly.

2.2.2.1 Sound, Humidity and Temperature Level Measurement

The sound level was measured by Precision Integrating Sound Level Meter Type: 4 in one Digital Sound Level Meter, Model CEM DT 8820 (range 35 – 130 dBA) for noise, (-20 – 750oC) for temperature, (25% - 95%) relative humidity and (0–20000 LUX) for light intensity. The meter is equipped with three frequency-weighing networks (A, B and C) that are used to estimate the response characteristic of the ear at various sound levels and frequency distribution of noise over the audible spectrum. The (A) frequency-weighing approximates the response characteristics of the ear for levels below (55dB). The (B) frequency weighing approximates the response characteristics of the ear for levels between (55 and 85) dB and the (C) frequency weighing approximates the response characteristics of the ear for levels above 85 dB. It consists of the following main features:

i. The Sensor or Microphone: The sensor is a high-precision electrode condenser microphone, which must be protected from physical abuse, dirt, oil, water or ingress of any other such substance.
ii. The Control Panel: The control panel comprises the: Recorder for the maximum level of sound, and minimum level of sound, Range selector, Auto and manual rest switches, and hold on max and min levels.
iii. The Range Selector: These switches can be used for selecting the relevant range of the sound level.

2.2.2.2 Sound Assessment Procedure

The charged sound level meter (Plate 2-1) was adjusted for slow time response. The sound levels were measured at different sites with maximum and minimum recordings taken for the particular site and respective average sound levels calculated as the final readings. Readings were taken at selected points within the project area. The noise levels were compared with the minimum and maximum noise levels shown in Table 2-1.

Table 2-1: Maximum permissible noise levels relevant to the project

Facility	**Noise limited B (A)**	
	Day	**Night**
Operation of the facility	75	65
Residential buildings	50	35
Mixed residential (with some commercial and entertainment)	55	45
Time frame: Day – 6.00a.m -10.00 pm. Night: 10.00 p.m. – 6.00 a.m. The time frame takes into consideration human activity.		

Plate 2-1: Handheld Sound Level Meter, Light Meter, Humidity Meter, and Temperature Meter (CEM DT-8820 Environment Meter)

2.2.3 Vibration Assessment

Vibration often presents a threat to human life in the project areas where it is subjected. The sources of vibration can be transport and construction equipment among others. PCE-VM 5000 vibration meter (Refer to Figure 2-3 below) was used to assess the vibration levels in the project area. Vibration Assessments were conducted at the various project sites Water source, Reservoir and selected points (institutions) along the pipeline routes to ascertain the prevailing conditions prior to commencement of the project.

The acceptable vibration levels include values of total vibration in their gross (cm/s) and relative (dB) and values of speed through the most developed in-practice frequency spectrum (> 355 Hz), which includes 6 octaves of frequency bands. Each octave band has their permissible values of the average-squared wave velocity or amplitude induced by the operating mechanisms and machinery

Figure 2-2: PCE-VM 5000 Vibration Meter: for measuring vibration

2.2.4 Water Quality Assessments

The sources of water pollutants during construction include; soil erosion, diesel and oil, other harmful chemicals, construction debris and dirt. Sample points were picked from both the boreholes and the White Nile.

A sampling bottle of 1.5 litres was used to collect the sample after which the sample was tested at National Water and Sewage Corporation (NWSC) Laboratory in Kampala for analysis. Several characteristics of water were assessed and these included; physical characteristics (temperature, colour, light, sediment suspended in the water), chemical characteristics (dissolved oxygen, acidity (pH), salinity, nutrients and other contaminants) and biological characteristics (bacteria and algae).

2.2.5 Geotechnical Survey

2.2.5.1 Trial Pits

The location and number of trial pits required for the investigation are presented in Table 2-2 showing the number and depths of each trial pit as investigated for the different Facilities. During the excavation of the trial pits, attention was given to the description and consistency of the soils encountered. Soils were identified in terms of classification, colour, grain size, consistency, and moisture content. All exploratory pits were logged by a qualified Sol geotechnics Geotechnical Engineer following BS 5930:2015 'Code of Practice for Ground Investigations', incorporating requirements of BS EN ISO 14688-1+2:2002+2003 'Geotechnical Investigation and Testing – Identification and Classification of Soil'. All the obtained information was then used to create a comprehensive trial pit log for the given location. Disturbed samples were obtained within the trial pits. The recovered samples were suitably

labelled and then placed in air-tight plastic moisture bags for detailed classification and strength testing.

The consultant carried out geotechnical investigations in the project area at the proposed site locations for the water treatment plant and reservoir site. The investigations included the following tests;

- Soil characterization in terms of classification, colour, grain size, consistency, and moisture content through excavation of the trial pits at the various sites.
- Dynamic cone penetration test (DCP) to aid in determining the allowable bearing capacity.
- Laboratory tests which included Atterberg limits, particle size distribution, direct shear strength test and chemical tests.

Results are discussed in section 6.2.3.1 and attached in appendix 5.

Table 2-2: Trial Pit depths

LOCATION	FACILITY	TRIAL PIT NO	DEPTH (M)
Laropi RGC	FSTP	TP1	2.0
		TP2	2.0
		TP3	2.0
	Reservoir Tank	TP1	Surface
	Borehole Site	TP1	2.0
		TP2	2.0
		TP3	2.0

2.2.6 Biological Environment Assessments

2.2.6.1 Vegetation surveys

Langdale-Brown et al. (1964) vegetation map was used to examine the range of vegetation types that covered the project area more than 50 years ago to account for land use changes. Site- specific vegetation descriptions and classifications were determined based on species dominance and floral features such as; grass, herb, shrub, tree and land coverage at each selected sampling site.

2.2.6.2 Floral Assessment Approaches

Sampling locations were determined based on pre-defined geo-referenced coordinates corresponding to proposed site alignments of varying dimensions. Each geo-referenced site was treated as an independent transect along which surveys were conducted to document observed plant species. Quadrats measuring 10m x 10m were placed at regular 5kilometre intervals along the transects. The borehole at Utono cell as the starting point for the transect leading to the reservoir at Utono cell Hill. From there, sampling continued along the both the transmission and distribution lines. A total of 10 sample quadrats were studied across 3 transects, with plant species recorded in each quadrat. Vegetation descriptions specific to each site were determined based on the dominance of plant species and characteristics such as herbs, shrubs, and trees along the transects.

Using this systematic method ensured a comprehensive sampling of vegetation across the project area, facilitating precise evaluation of species composition and distribution patterns in the study area. The approach guaranteed unbiased data collection, accurately representing the vegetation communities

linked with the scheme, thereby offering significant insights into biodiversity and ecological features of the intended site. Additionally, opportunistic surveys were carried out beyond the sample plots to complement the species inventory. Visual scans of areas outside the quadrants were employed to identify new species not captured through the quadrat method.

Taxonomic keys such as "Useful Trees and Shrubs for Uganda" (Katende et al., 2000) and "Field Guide to the Forest Trees of Uganda" (James & Hamilton, 2020) and expert verification were used to identify the plant specimens to species level. For species that could not be identified in the field, voucher specimens were carefully collected, pressed, and dried, and then transported to the Makerere University Herbarium for identification.

Following the comprehensive identification of flora records and determination of habitat types, an assessment of potential impacts to vegetation and flora resulting from anticipated project activities was conducted. Additionally, attention was given to the presence of invasive species within or near the project area, as well as the proximity of the study area to other ecologically sensitive features.

Plant species were assessed using the DAFOR scale where; D=Dominant, A=Abundant, F=Frequent, O=Occasional & R=Rare. Tree size classes were also determined through random sampling of selected habitats along the roads. The tree size classes ranged from (< 10cm), (10-25cm), (25-40cm), (40-55cm) and (>55cm) with size classes assigned scores of 1, 2, 3, 4 & 5 respectively Plant species of conservation concern and invasive species encountered were recorded, geo- referenced and their habitats noted. Photographic records of the vegetation types and ecologically sensitive features were taken. Ecologically sensitive features were noted, and their geographical coordinates were taken. Photographic records of the vegetation types/ habitats were taken.

2.2.6.3 Mammals (Small, medium and Large Mammals) Survey methods

Mammal surveys were conducted for both terrestrial and aquatic species during May 2023 and July 2023. Surveys were conducted within Natural and semi-natural areas including rocky habitats of the project area of influence

Large and medium-sized mammal surveys involved sighting of physical signs (faecal, prints, bones etc.) of mammal presence and actual mammal sightings especially ungulates and carnivores at both the proposed sites (Faecal sludge, borehole, reservoir and selected points along the pipeline routes. Opportunistic data on the occurrence of smaller carnivores (genets and mongoose) was also collected based on sightings, spoors/prints or faecal material.

The bat surveys were conducted at the survey locations identified in the reconnaissance survey. Bats were surveyed using acoustic techniques. Acoustic techniques were employed at the survey locations using an SM2 Bat detector.

Small mammal surveys (rodents and shrews) concentrated on non-lethal trapping methods to count and characterize as much as possible the population structure of the different species along the project area.

2.2.6.4 Birds Survey Methods

For bird surveys Transects and Timed-Point Counts Method were used (Pomeroy, D., 1992, as recommended by Nature Uganda based on the British Trust for Ornithology (BTO) method. Timed Point Count involved records of all birds that were seen and heard from a Point Count Station for a set period. While for transects, the observers walked along the proposed Road alignment, stopping as necessary to use binoculars, and all birds seen or heard are recorded.

Opportunistic surveys were conducted at Laropi to establish the ornithological picture of the project area.

2.2.6.5 Herptiles Survey Methods

Both reptiles and amphibians were surveyed using Visual Encounter Surveys (VES) as recommended by (Zweifel, 1955). VES was conducted by observers walking through a designated area for a prescribed period visually and systematically searching for animals. Other methods, such as; Acoustic (sound recordings) survey method, Dip netting in aquatic habitats and interviews with communities

The VES was conducted within 200metre radius around pre-geo-referenced points chosen basing on the different types of habitats represented in the project area including wetlands, woodlands and farmlands / gardens.

2.2.7 Socio-Economic Assessment Study

The design of the socio-economic study was cross-sectional involving both quantitative and qualitative methods of data collection and analysis. The quantitative (primary data) was collected from the potential users or beneficiary of the project. The qualitative methods were used in order to cater for parts of the study area that require in depth understanding and also for the purpose of data triangulation, and used qualitative data collection approaches including the key informants' interviews (KII), Focus group discussions (FGDs), community meetings among others.

Secondary data from past reports from accredited sources like the feasibility studies, Uganda Bureau of Statistics (UBOS) office including the latest household income and expenditure survey and population and housing census. Study Design

A cross-sectional descriptive method of data collection and analysis was employed. The main quantitative data collection method used was the individual structured questionnaire. Several variables were assessed within the questionnaire which were clustered under major themes that included; household income, expenditure, access to water, health services, social networks, food and nutrition energy sources, housing conditions, vulnerability and land ownership among others. The population for the quantitative aspect of the study included heads of household or other responsible adult household members. The qualitative approach was used to gather information from local government leaders at national, district and sub-county levels, adult (male and female) community members as well as anybody that was identified to be relevant for the study. Selection of the Sample Size for the Quantitative data

The study population was randomly selected from household's beneficiary households (or project area within the direct and zone indirect zone of impact/influence from Laropi Town Council and Laropi Sub County. The sampled beneficiary villages included; Pakoma, logubu South, Ubbi South, Ubbi North, Edre, Pachoro, pajaru, Olia, Patere, Kidhi, Adhi, Paubu, Pakonira West and Gbalala East. Household heads were selected as the major respondents in this survey since they have sufficient and required information. In cases where the Household (HH) heads were absent other responsible adult household members were selected.

To determine the sample size for the study, the formula that was provided by Yamane Taro in the book: - "Statistics, An Introductory Analysis, 2nd Ed., New York: Harper and Row" (1967), was used

$$n = \frac{N}{1 + N\,(e)^{2}}$$

A non-response rate of 3% was applied to cater for respondents that would fail completely to give an answer to a specific question. Finally, a sample size of 218 households with 5% margin of error at 95% confidence level was determined with consultation of local leader. The sample size consists of 20% of total households (1092) in the 9 villages. The obtained sample size was proportionately distributed according to the total number of households per village and respondents were randomly selected for interviews.

The study was done by a team of trained research assistants that administered the questionnaires using kobo collect (on phones) within the selected villages. Household heads were selected as the major respondents in this survey since they have sufficient and required information. In cases where the Household (HH) heads were absent other responsible adult household members were selected including the spouse and older children.

2.2.7.1 Sampling procedure for Qualitative data collection

Purposive sampling was used to select participants with relevant information for this study. The sample at the district level included; Chief Administrative Officers, LCV Chairperson, District Natural Resources Officers, District Environment Officers, District Community Development Officers, District Land Officers, District Engineers, District Physical Planners and District Water Officers. The sub-county sample included: Sub- County Chiefs, Community Development Officers, LC III Chairpersons and area council representatives of beneficiary areas of the project. These were targeted as key informants, and the sometime would be engaged in a formal meeting at the different administrative levels.

Community meetings and FGDSs were also purposively organized to disclose the project to the beneficiary communities.

2.2.7.2 Methods of data collection

The following methods were used during data collection. Including;

a) Key Informant Interviews

Interviews were conducted to gather information from local government leaders at the National, District, Sub- County levels and community. The sample at the district level included; Chief Administrative Officers, LCV Chairperson, District Natural Resources Officers, District Environment Officers, District Community Development Officers, District Land Officers, District Engineers, District Physical Planners and District Water Officers. This information was further supplemented and summarized in a tabulated form covering: Traditional Leaders/ cultural, Local government representatives Health workers (at Clinic), Educationalists (at schools), UNHCR, NGOs active in the area

b) Focus Group Discussions

This technique involved a small group of respondents (usually 6-10 respondents) who were interviewed together in a common location. The interviewers led the discussions and ensured that every person had an opportunity to respond. Focus group discussions allowed a deeper examination of complex issues than other forms of survey research. Focus group discussions were held with the Laropi growth centre.

c) Informal Discussions

The ESIA team held discussions with project-affected persons to try to explore and compare their respective perceptions of the proposed project.

d) Photography and Direct Observation

This was used to capture scenarios important to the study that can sometimes best be explained through visual effects. For example, the quality of life of project-affected persons can be explained by visually showing the kind of shelter in which they live. The observation was used by the sociologist to determine observable variations such as facial expressions

e) House Hold Surveys

Quantitative methods were used to capture the quantifiable socio-economic aspects within the households and community. Some of the aspects considered included the demographics of the respondents, livelihood aspects asset acquisition and management, general wellbeing in terms of health, access to social services, waste management, energy access and utilization, among others. The qualitative methods were used to understand collecting voices/ perceptions, concerns, fears, and expectations regarding compensation and gender-related issues such as Gender Based Violence that might impact households and the community and to illuminate the complexities which influence the socio-economic phenomena within the community as well as understanding the community perspectives towards resettlement, among others

2.2.7.3 Data quality control measures

The sociologist coordinated and supervised the entire process of the socio-economic survey by guiding the data collection process. Recruitment and selection of the research assistants (RAs) was done emphasizing minimum academic qualifications, experience, socio-cultural compatibility and gender balance.

The Research Assistants were recruited targeting social scientists with knowledge and experience of socio-economic and behavioural studies using both qualitative and quantitative methods as well as ability to speak the local language. The sociologist, research assistants met frequently to review the day's field performance, compare notes and to plan for the next day. This was aimed at enhancing reliability and consistency of the collected data.

2.2.7.4 Data analysis

Quantitative data entry and analysis was done using Microsoft excel software. Qualitative data was assembled and typed into a Microsoft Word processing program. The data was then subjected to analysis according to themes generated based on content. Content thematic approach as well as classifying responses into meaningful categories was done so as to bring out essential patterns which have been used in making inferences. The qualitative analysis largely followed the questions and themes of the study within the checklist.

2.2.7.5 Ethical considerations

Permission to conduct the ESIA in the respective district and lower local governments was sought from relevant district, sub county and community leaders. All participants in the study were informed that participation in the study was voluntary and all information collected would be used to inform the planning process of the proposed water project.

2.2.8 Physical Cultural Resources Surveys

2.2.8.1 Paleontological and Archaeological Surveys

The survey inspected archaeological records such as artefacts, eco-facts and features for example stone and bone tools, metallurgical implements, potsherds and others, bones, skeletons and storage pits, fireplaces (hearths), house foundations or even rock paintings and engravings on cave walls or boulders (Humphreys, 1986); To determine the cultural history of the area, test pit excavations were carried out. With pre-field information, only one test pit was done.

2.2.8.2 Ethnographic Surveys

The ethnographic survey for the water and sanitation project in Laropi RGC, Moyo District utilized a combination of qualitative methods to explore the socio-cultural context surrounding water and sanitation practices within the project area. Household interviews probed into local customs, beliefs, and challenges regarding water usage, while key informant interviews provided insights into traditional water management practices and community governance structures. Focus group discussions facilitated diverse perspectives on government interventions and cultural beliefs surrounding water and sanitation. Participant observation was employed to understand the daily life routines, documenting rituals and social dynamics related to water sources. Mapping exercises were used to aid in visualizing community perceptions and spatial inequalities, informing the design of culturally sensitive development interventions that addressed the unique needs of the community. Among those consulted were District leaders, cultural and religious leaders.

2.3 Institutional and Capacity Assessment

The key success of the development was based on designing an appropriate institutional structure for all stakeholders. This was to boost confidence to all concerned that the methods of communication, delivery of all related activities and identifiable key players' roles and responsibilities would ensure the successful implementation of the project. Key issues that were assessed in the ESIA included:

i. Review existing organizational structures for development and make recommendations.

ii. Identify and recommend roles and duties of relevant stakeholders including community participation.

iii. Identifications of recommendations needed for implementation and enforcement of improved standards and better practices.

2.4 Impact Description and Assessment

The ESIA Consultant compiled chapters in the ESIS of the water and sanitation projects which quantified the scale of environmental and social disturbance that was likely to result from the proposed water and sanitation projects' pre-construction, construction activities, operation and decommissioning activities assessed their significance against defined significance criteria and develop practical mitigation measures that would be adopted to minimize those impacts.

The Contractor should carry out a similar procedure to assess the environmental and social risk of accidental events. The prediction and evaluation of both direct and indirect impacts were undertaken to identify any potential adverse effects on all identified sites of archaeological/cultural heritage interest within the project area. A detailed description of the works and all available plans have been included, to illustrate the nature and degree of potential impacts.

Assessment of value involved consideration of how far the site(s) contribute to an understanding of the past, through their individual or group qualities, either directly or potentially. These are professional judgements, but they are also guided by legislation, national policies, acknowledged standards, designations, criteria and priorities.

The assessment involved reference to cultural heritage guidance which recommends the adoption of six ratings for value concerning archaeology and cultural heritage: very high, high, medium, low, negligible and unknown. Enhancement Measures for Positive Impacts

Enhancement refers to the deliberate attempts taken in the design and subsequent phases of the project to ensure the success of a wider range of direct and indirect positive outcomes to communities and/or the biophysical environment. This can be in the form of opportunities for social and community development, improved health and wellbeing, improved biodiversity, restored ecosystems and landscape character, and protected and respected cultural heritage.

The project shall strive to enhance the positive impacts envisaged. The proponent shall support the implementation of the ESMP at the construction and operation phases of the project. The proponent shall improve the experience of its customers through better water supply and sanitation services and expansion of coverage area. The contractor shall maximize the utilization of local Labour for construction activities to enhance the socio-economic status of the local communities.

The pre-construction, construction and operation phases of the proposed water supply and sanitation project are anticipated to have potentially significant impacts on the communities and biophysical environment. Whereas positive impacts should be enhanced, negative impacts should be mitigated or eliminated. During the establishment of impact significance, several impact parameters were evaluated using the matrix method. The impact parameters that were assessed include; Type, Timing, extent, certainty, duration, magnitude and receptor sensitivity. Table 2 3defines to assessed impact parameters.

Table 2-3: Definition of Impact Parameters Assessed

Timing	Time frame (phase) at which an impact occurs within a project area
Duration	The period of persistence of an impact on receiving environment
Extent	Area of occurrence/influence by the impact on the subject environment
Magnitude	The strength of the impact on the environment
Certainty	The likelihood of the occurrence of an impact
Significance	The overall change brought in the environment
	Level of change in the receptor environment

2.4.1 Methodology for Evaluating Impact Significance

Assessment is made of potential positive and negative environmental and social impacts of the proposed project. A combination of two criteria has been used to determine the environmental significance of predicted impacts: the severity of the potential impact of the project component and the likelihood of the impact (Table 2-4).

Table 2-4: Criteria for determining the significance of the potential impacts

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate
	High	Minor	Moderate	Major	Major

A standard rating scale was defined and used to assess and quantify potential impacts. The significance of impacts was based on impact magnitudes and the sensitivity and value of the receiving (receptors) environment. The assessment of impacts was based on criteria for compliance, ecosystem and socio-economic aspects, with each being assigned a score of 'high', 'medium' or 'low' significance (Refer to 2-5 below).

The impact assessment took the effect of mitigation measures into account, and was therefore conducted in two stages:

1. Potential negative impacts assessed without taking any mitigation measures into account, and;
2. Reassessing the impacts taking into account mitigation measures.

Table 2-5: Criteria for Impact Assessment

KEY: H = High, M=Medium, L=Low

Criteria	Significance Definition	
Compliance	Continuous non-compliance with regulations.	**H**
	Potential for non-compliance with regulations.	**M**
	In compliance at all times, or no regulations apply.	**L**
Ecosystem	Disturbance of >10% of the bio-geographic population of animal species in areas of importance for their breeding, feeding or other parts of the life cycle with no expectation of recovery within 5 years (or 2 generations for long-lived animal species), Impairment of the function of 2 hectares or more of an area of critical importance to the life cycle of endangered species, or of 100 hectares or more in other areas, with no expectation of recovery within 5 years. Impairment of forest ecosystem with no expectation of recovery within 20 years. Effect contrary to the objectives of management plans for internationally or nationally protected populations, habitats or sites with no expectation of recovery within 5 years. Environmental changes give rise to issues of public or international concern. Impacts that harm human health, or damage a site of historic, cultural or archaeological value.	**H**
	Disturbance of populations of species in areas of importance for their breeding, feeding or other parts of their breeding, feeding or other parts of the life cycle with the expectation of recovery within 1-5 years. Impairment of the function of 2 hectares or more in an area of critical importance to the life cycle of endangered species, or of 100 hectares or more in other areas, with no expectation of recovery within 1-5 years. Impairment of Forest ecosystem with the expectation of recovery beginning within 10 years. Effect contrary to the objectives of management plans for internationally or nationally protected populations,	**M**

Criteria	Significance Definition	
	habitats or sites with the expectation of recovery within 1-5 years. Effects are unlikely to harm human health or damage a site of historic or archaeological value.	
	Impaired function of a forest ecosystem with the expectation of recovery within 5 years. Ecosystem change is within the range of natural variation, but may be detectable; or ecosystem change that is unlikely to be noticed; or change resulting in positive, desirable or beneficial effects on an ecosystem.	**L**
Socio-Economic	Damage to social, cultural or economic activity considerably beyond the programme's lifetime. Long-term or life-threatening health effects. Activity raises issues of public concern, may affect human health or may damage a site of cultural importance.	**H**
	This may adversely affect the economic and social well-being of residents for the duration of the programme. May cause short-term interference with business. Raises issues of limited public concern. Minor damage to the site with cultural importance.	**M**
	Beneficial changes to the well-being of residents. Negative effect within existing fluctuation of the society or economy.	**L**

2.4.2 Criteria for Rating Impact Significance

The overall significance of a particular impact was determined based on the following criteria:

- ✓ **Overall high score**; one or more 'high' score(s) for one of the key criteria or two or more 'high' scores for the other criteria;
- ✓ **Overall medium score**; only one 'high' score for one of the non-key criteria, or one or more 'medium' score(s), but no 'high' score(s); and
- ✓ **Overall low score**; one or more 'low' score(s), but no 'medium' or 'high' score(s).

Please note the following about the impact assessment: -

- Impacts were assessed for the construction, operational and decommissioning phases of the proposed development.
- The impact assessment included both biological, physical, socio-economic and occupational health and safety impacts.

3. PROJECT DESCRIPTION OF THE PROPOSED WATER SUPPLY AND SANITATION INFRASTRUCTURE

3.1 Introduction

To address the water supply gap in Laropi RGC, solar powered piped water supply system with ground water source, elevated water storage steel tank and distribution pipes capable of meeting the daily drinking water needs, as the pressure may permit.

3.2 Major Project Infrastructure Components

The geographical coordinates of the major project infrastructure are contained in Table 3-1 below:

Table 3-1: Project Infrastructure Coordinates

No	Name	District	Sub County	Village	Latitude	Longitude
1	Borehole	Moyo	Laropi T/C	Utono Cell	3.563317	31.810853
2	Faecal Sludge	Moyo	Laropi T/C	Central Cell	3.555965	31.82171
3	Old Water System	Moyo	Laropi T/C	Utono Cell	3.559989	31.812073
4	Tank	Moyo	Laropi T/C	Utono Cell	3.563322	31.810859

The proposed Laropi water system is located within the Laropi town council a few kilometers away from River Nile and the Laropi Ferry Landing site.

3.3 Land requirements for the water and sanitation Infrastructure Components

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 3 m along the pipelines is anticipated. Working corridors will be restored after completion of work, 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 Laropi WSS have been estimated at **5.70 acres**. However, the project case scenario is that the treated water transmission main and primary distribution network will follow road reserve**.** 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

Table 3-2 below.

Table 3-2: Land requirements for the proposed water and sanitation project

Scheme	Component	Dimensions (m)		AREA		
		Length	Width	m^2	Acres	Hectares
Laropi	Borehole/Water Treatment Plant	100	80	8000	1.97	0.79
	Reservoir	11	9	88	0.02	0.01
	FSTP	150	100	15,000	3.70	1.49
	Total			23,088	5.70	2.30
Land requirements for the raw water mains, transmission and primary distribution assuming a width of 3 meters						
Scheme	**Component**	**Details**			**Length (m)**	
Laropi	Transmission Pipe 1 from Borehole 1 to the Proposed Reservoir	3-meter width easement corridor			2,100	
	Distribution Pipe	3-meter width easement corridor			18,200	
	Total				**20,300**	
Grand total land requirements for all infrastructure (acres)						

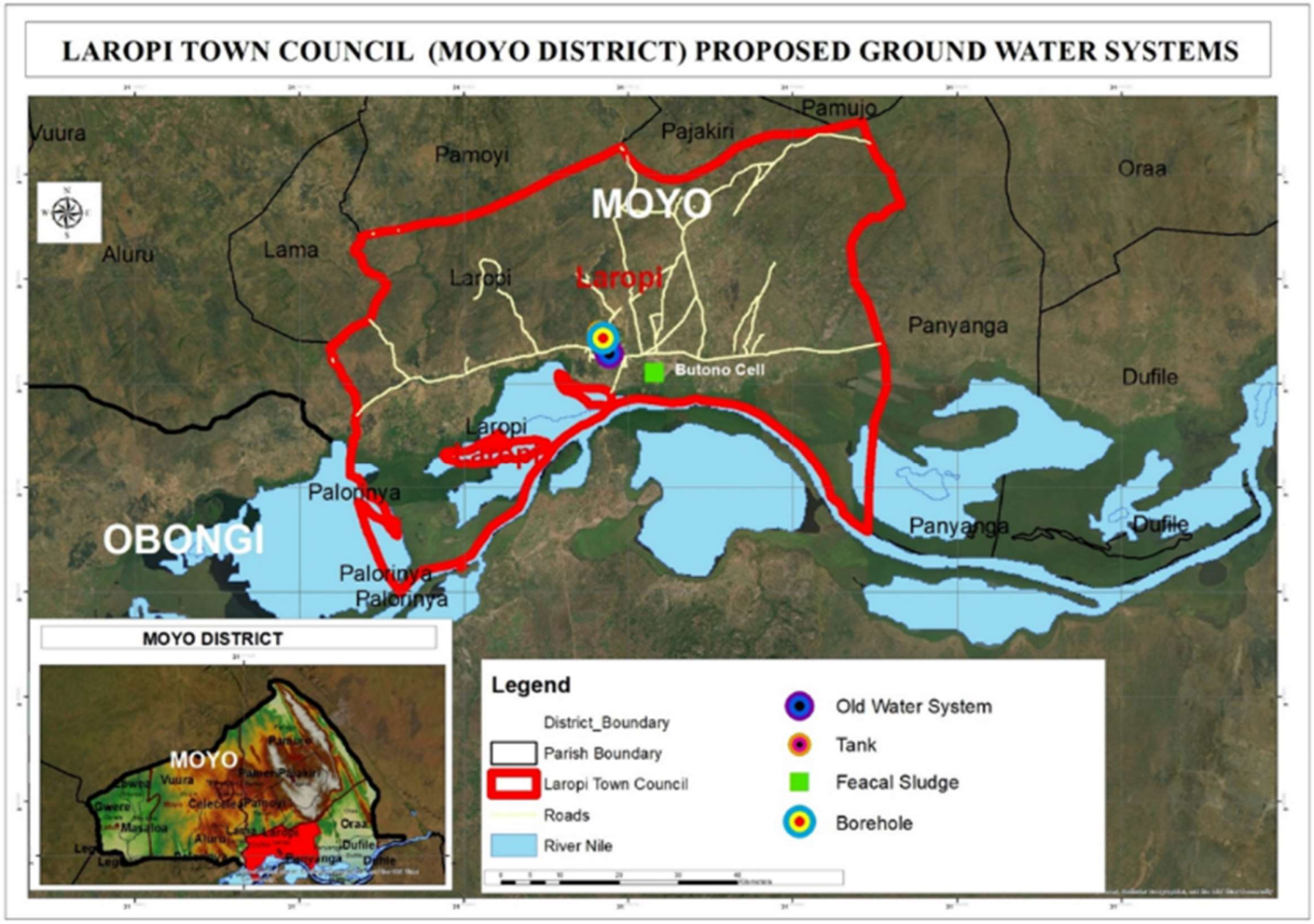


Figure 3-1: Location of Proposed Laropi Water System

3.4 Water supply System

Laropi 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 Utono Cell borehole and pumping it into the reservoir elevated at Utono Cell from where it will be distributed to different points. The borehole will be equipped with a two submersible pumps of 70m3/h at 21m of head and 7.5m3/h at 37m head.
The land is under customary land ownership. The water source is surrounded by agricultural activities and there is a need to open a 2.21 km access road to the site.

One borehole, BH DWD89698 located in Utono Cell, Laropi T/C was sited, drilled and recommended for use as a production well in the project alongside the existing borehole. The existing borehole currently serving Lefori water supply system will also be adopted into the new system to supplement the supply of borehole DWD89709. The quality of the water in the test pumped well as included in the report displayed satisfactory results passing all the national standards for portable water requirements for water consumption.

The development approach consists of boreholes, BH DWD89698 located in Utono Cell, Laropi T/C, and BH-2 currently supplying Laropi water supply scheme as the sources to supply Laropi RGC are the proposed sources of water for Laropi RGC water supply system.

- Construction of 1No new borehole pumping house
- Supply and Installation of 2No. submersible pumps of 70m3/h at 21m of head and 7.5m3/h at 37m head.
- Supply and lay of 20m DN125 DI PN10 and 500m DN50 DI PN10 of transmission mains from the boreholes to the water treatment plant adjacent to borehole DWD89698.
- Construction of a 962.3 m3/day water treatment plant.
- Supply and Installation of 1No. clear water surface pump of 78.5m3/h at 141m of head.
- Supply and lay of 800m DN150 DI PN16 of transmission mains from the water treatment plant to the reservoir tank.
- Construction of a new 296m3 storage reservoir on 2m dwarf walls.
- Supply and lay 18.2km of distribution network for the Laropi area.

Table 3-3: Coordinates for Laropi RGC Proposed Water Source/ Borehole

FID	Name	District	Sub County	Village	Latitude	Longitude
1	***Water source/Borehole***	Moyo	Laropi T/C	Utono Cell	3.563317	31.810853

Figure 3-2: The proposed site for Laropi Water Source in Utono Cell

Production well for water supply and site for the water reservoir (Idijo Hill) in the background

The existing access road to the water source and reservoir will need to be improved

Figure 3-3: Proposed Laropi RGC Water Source/Borehole

3.4.1 Water Reservoir/ Tank

The land is under customary land ownership. The land is on top of a hill and green field with no activities being carried out. There will be a need to open up an access road to the site.

Table 3-4: Coordinates for Laropi RGC Proposed Water Reservoir/ Tank

FID	Name	District	Sub County	Village	Latitude	Longitude
2	Tank	Moyo	Laropi T/C	Utono Cell	3.563322	31.810859

Figure 3-4: Laropi RGC Proposed Water Reservoir/ Tank

3.4.2 Faecal Sludge

The land is under customary land ownership. The land is a green field with no activities being undertaken. The surrounding areas have some bricklaying, some agriculture and settlements.

Table 3-5: Coordinates for Laropi RGC Proposed Faecal Sludge

FID	Name	District	Sub County	Village	Latitude	Longitude
1	Faecal Sludge	Moyo	Laropi T/C	Central Cell	3.555965	31.82171

Figure 3-5: Laropi RGC Proposed Faecal Sludge

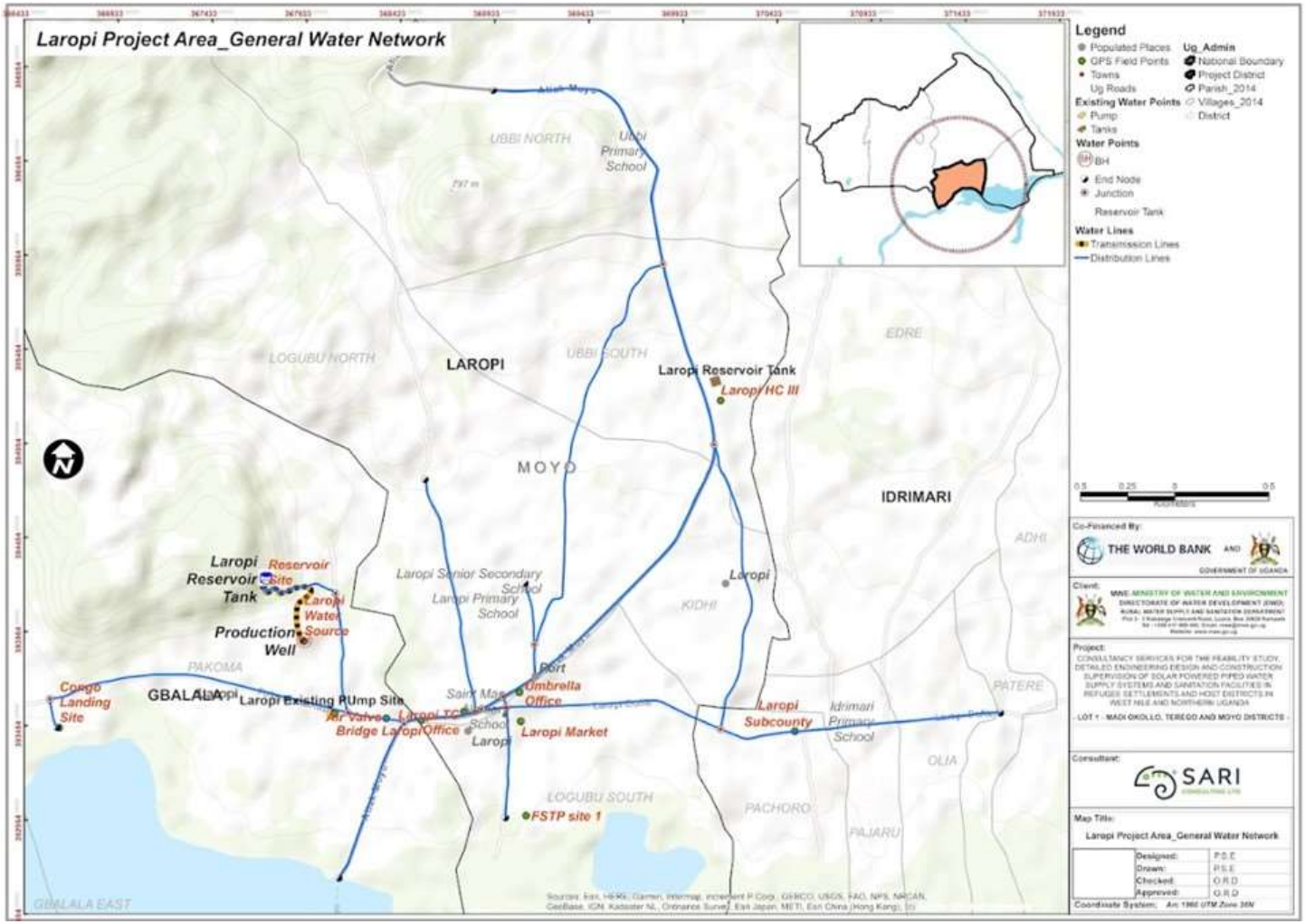


Figure 3-6: Proposed Water Supply System Schematics

3.5 Detailed Design of the Treatment Plant

The capacity of the treatment works is 962.5m^3/d (77.5m^3/hr) inclusive of 5% plant use and is sized for the maximum day. The plant will operate for 12 hours per day in the ultimate year of 2045. The water treatment plant is located in Utono Cell in Laropi town council and will be about 20 meters from BH DWD 89698 which will be pumping water directly to the treatment plant. The proposed layout of the water supply system is shown in Figure 3-6 below.

3.6 Borehole Pump and Raw Water Transmission Mains

The borehole riser mains will be OD63 HDPE PN10 30m long and DN125 DI PN10 20m long for the umbrella existing borehole in Laropi BH-227700 and BH-89698 respectively while the raw water transmission mains will be OD63 HDPE PN10 500m long and DN125 DI PN10 20m long respectively. The mains will have capacities to deliver 6m^3/hr and 18m^3/hr for BH 77388 and BH-77389 respectively.

3.7 Project Design Horizon and Criteria Water Supply and Sanitation

The project design criteria horizon is of 20 years with the initial year being 2025, and the ultimate year 2045. The initial year (when the works are expected to be commissioned is 2024, with the future and ultimate years being 2040

3.7.1 Design Criteria - Water Supply

The design criteria and standards for the water supply system are as follows:

a) A design horizon of 20 years with the initial year being 2025, and the ultimate year 2045.
b) To allow for increased demands during the dry season, a maximum day peak factor of 1.3 has been proposed. The Transient Population is allowed for within this maximum day factor.
c) To accommodate the peak hourly flow in the major distribution mains from the reservoir(s) to the project area, a peak hour factor of 2.0 will be considered.
d) To limit water hammer effects, the maximum flow velocities in the pipes will be maintained within the range of 0.75 -2.5 m/s. For water pumping mains the flow velocities at the optimum pipe diameter shall apply.
e) The pressures in the distribution system will, as far as possible, be kept below PN10 and above PN 1.0.
f) Non-Revenue Water (NRW) / Un-accounted for Water (UfW) has been taken as 20%.
g) It is proposed to size the storage at 30% of the maximum day's demand.
h) The distribution system is assumed to operate 24 hours per day. The pumping stations will however operate for a maximum of 16 h/d.
i) The water quality to be met is the Uganda Drinking Water Standard (US - 201: 2007).

3.7.2 Design Criteria - Sanitation

3.7.2.1 On-Site Sanitation

The options for appropriate on-site sanitation are given in Table 3-6 below.

Table 3-6: On-Site Sanitation Options

No.	On-Site Sanitation System	Household Water Service Level	Water required for Operation (l/c/d)	Operation & Maintenance
1	Simple Pit Latrine (Unlined)	Yard Tap / Stand Post	Nil	Cleaning only
2	VIP Latrine (Lined)	Yard Tap / Stand Post	nil	Cleaning only
3	Twin-Pit VIP (Lined)	Yard Tap / Stand Post	nil	Changing and emptying the pit every two years
4	Latrine with Vault	Yard Tap / Stand Post	nil	Periodic tank emptying-similar to the cesspit
5	Eco-San (Dehydrating Type)	Yard Tap / Stand Post	nil	Removal of faeces and Urine regularly
6	Pour-Flush	Yard Tap / Stand Post	5-25	Cleaning only
7	Twin-Pit Pour Flush	Yard Tap / Stand Post	20-30	Changing and emptying every 2 yrs.
8	Cesspit*	House Connection / Yard Tap	5-40	Periodic tank emptying – more frequent than for septic tanks
9	On-Site Septic Tank*	House Connection / Yard Tap	5-40	Periodic tank emptying
Source: Previous Studies				

3.8 Detailed Design – Water Supply

The water supply system be designed for the ultimate year 2045 which has a maximum day demand of 955 m^3/day which has been based on to design of the system.

The development approach consists of borehole BH DWD89698 and existing BH-2 currently supplying the Laropi water supply scheme as the sources to supply Laropi RGC contains the following aspects:

a) Construction of 1No new borehole pumping house
b) Supply and Installation of 2No. submersible pumps of 60m^3/h at 21m of head and 7.5m^3/h at 46m head.
c) Supply and lay off 20m DN125 DI PN10 and 500m DN50 DI PN10 of transmission mains from the boreholes to the water sump adjacent to borehole DWD89698.
d) Construction of a 39m^3 sump.
e) Supply and Installation of 1No. the clearwater surface pump of 65.6m^3/h at 113m of the head.
f) Supply and lay off 800m DN150 DI PN16 of transmission mains from the water sump to the reservoir tank.
g) Construction of a new 296m^3 storage reservoir on a 10m steel tower.
h) Supply and lay 18.2km of distribution network for the Laropi area.
i) Making new Consumer Connections.
j) Solar power augmented with HEP power is recommended for powering the system.

The capacity of the treatment works is 962.5m^3/d (77.5m^3/hr) inclusive of 5% plant use and is sized for the maximum day. The plant will operate for 12 hours per day in the ultimate year of 2045. The water treatment plant is located in Pakoma village, Gbalala parish Laropi sub-county and will be about 20 meters from BH DWD 89698 which will be pumping water directly to the treatment plant.

3.8.1 Borehole Pump and Raw Water Transmission Mains

The details of the calculation for the design of the borehole pumps and the main sizing are summarized in Table 3-7 below.

Table 3-7: Raw Water Pump Details

Borehole Number	**BH1-89698**	**BH2-DWD** 227700
	Pakoma Village	**Pakoma Village**
Test Pump Yield (m^3/hr)	**70.00**	**7.5**
Borehole Yield to be Used (m^3/hr)	**70.00**	**7.50**
Hours of Pumping (hr)	13.0	7.0
Efficiency Pump (%)	60.0%	60.0%
Efficiency Motor (%)	80.0%	80.0%
Total Daily Delivery (m^3/day)	910	53
Pumping Main Section No. 01 (From Pump Installation Point to Ground Level at Borehole)		
Ground Level at Borehole (m AMSL)	639.850	638.54
Dynamic Water Level in Borehole (m DWL)	16.500	20.000
Cwh	140	140
Pipe Details	**DN125 DI PN10**	**OD63 HDPE PN10**
Pipe Diameter ND (mm)	125.00	55.40
Pipe Diameter ND (m)	0.125	0.055
Flow in Pipe (m^3/hr)	70.000	7.500
Flow in Pipe (m^3/s)	0.019	0.002
Velocity (m/s)	1.58	0.86
Pump Installation Depth (Length of Pipe) Section No. 01 (m)	**20.00**	**30.00**
Friction Loss (m)	0.38	0.48
Fittings losses - 10% (m)	0.04	0.05
Total Head loss in Section 01 (m)	**0.4**	**0.5**
Pumping Main Section No. 02 (From Ground Level at Borehole to Inlet Level at WTP)		
Inlet Level at WTP, (m AMSL)	643.160	643.160
Ground Level at Borehole (m AMSL)	639.850	638.540
Static Lift (m)	**3.310**	**4.620**
Cwh	120	120
Pipe Details	**DN125 DI PN10**	**OD63 HDPE PN10**
Pipe Diameter ND (mm)	125.00	55.40
Pipe Diameter ND (m)	0.125	0.055
Flow through pipe section 02 (m^3/hr)	70.000	7.500
Flow through pipe section 02 (m^3/s)	0.019	0.002
Velocity (m/s)	1.58	0.86
Chainage at Reservoir	0+020	0+500
Chainage at Borehole	0+000	0+000
Length of Pipe Section No. 02 (m)	**20.00**	**500.00**
Friction Loss (m)	0.51	10.75
Fittings losses - 10% (m)	0.05	1.07
Total Headloss in Section 02 (m)	**0.6**	**12**
Total Pumping Head from Borehole to WTP		
Total Static Head from Borehole Installation to WTP	20	25
Total Headloss from Borehole Installation Point to WTP	1	12

Total Pumping Head from Borehole to WTP	**21**	**37**
Total Length of Transmission		
DN125 DI PN10	20	
DN125 DI PN10	20	
OD63 HDPE PN10		500
OD63 HDPE PN10		30
Source: Project estimates.		

It should be noted that as seen from Table 3-6 above that the maximum borehole yield capacities of BH DWD 89698 (91m^3/h) supposed to supply Laropi RGC water supply system are not going to be fully exploited because the 6" casings used in the drilling of the borehole will not allow use of pipes with an outside diameter bigger than 160mm hence extracting water at a rate more than 60m^3/hr. will lead to high pipe velocities above the safe standards, this will lead to too much friction on the pipe walls and faster deterioration of the pipe hence making operation and maintenance of the system hard. The borehole will have a pump and riser main with the following characteristics:

The flow of 70m^3/h at 21m head for newly drilled well DWD89698 of 91m^3/h maximum yield; borehole riser pipe of DN125 DI PN10, 20m long; and pumping main of DN125 DI PN10, 20m long up to the WTP.

a) The existing pump house at BH 27700 supplying the existing Laropi water supply system will not be removed but will only have the riser mains and submersible pump with the related accessories replaced to be able to satisfy the new demand. The pump house will contain the associated pipework, fittings and electrical switch gear for that borehole. The layout and section of the pump house are illustrated in Figure 3-6 and Figure 3-7 below and in drawing number MWE/LAR/1.1.0 series.

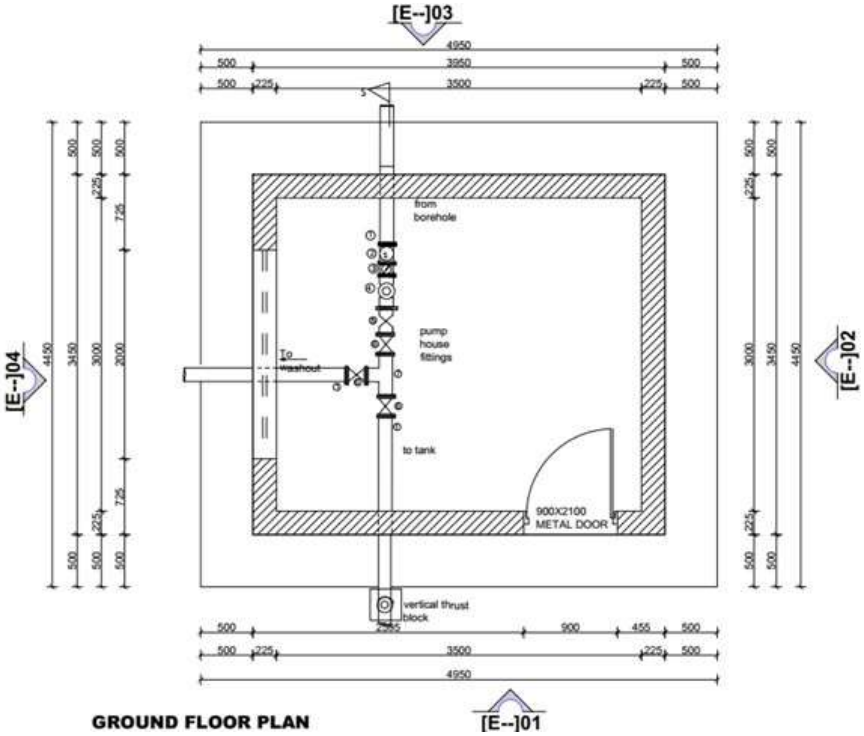


Figure 3-7: Borehole Pump House Plan Layout

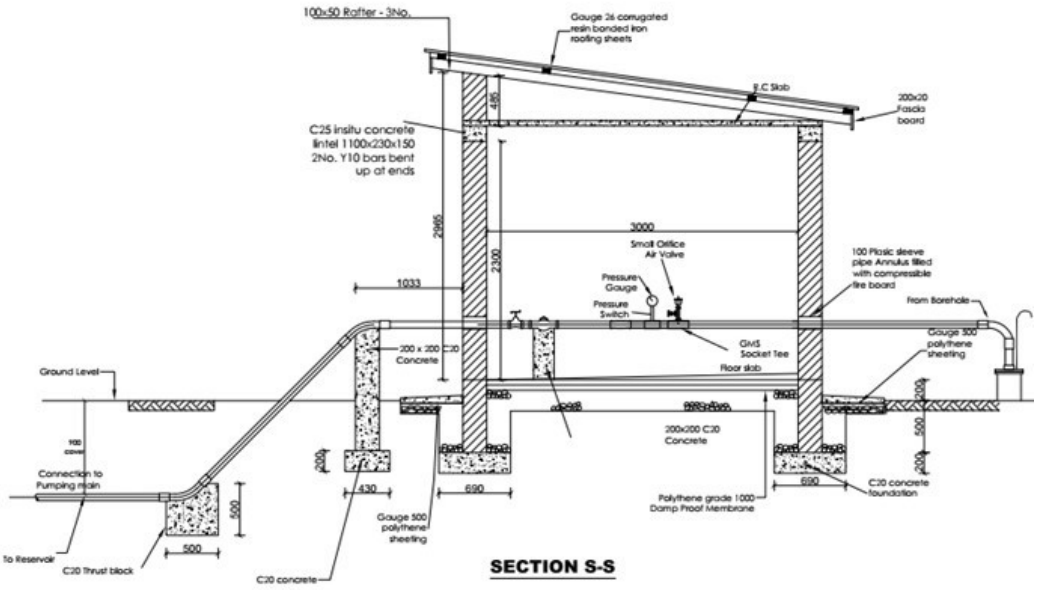


Figure 3-8: Borehole Pump House Section

3.8.2 Choice of Treatment Process

The water quality test results from the national water quality reference laboratory in Entebbe show an Iron amount over the minimum required as shown in Table 3-8 below. Design calculations for the water treatment plant and water quality results of the certificates of analysis can be found in Appendix 4.

Table 3-8: Water Quality Test Results

Parameter	Unit	National Standard for un-treated portable water (EAS12:2018)	DWD89698
pH	-	5.5-9.5	7.1
Electrical Conductivity (EC)	µS/cm	2500	1567
Total dissolved Solids (TDS)	mg/L	1500	1096.9
Colour: Apparent	PtCo	50	187
Turbidity	NTU	25	15
Total Alkalinity	mg/L	-	920
Calcium hardness: as $CaCO_3$	mg/L	600	245
Magnesium hardness: as $CaCO_3$	mg/L	600	190
Total Hardness: as $CaCO_3$	mg/L	600	435
Magnesium as Mg_{2+}	mg/L	100	45.6
Sodium	mg/L	200	235
Potassium	mg/L	50	10
Bicarbonates	mg/L	-	1122
Fluoride-F	mg/L	1.5	0.94
Chloride: Cl^-	mg/L	250	9.5
Calcium: Ca^{2+}	mg/L	150	11.2
Iron: Total	mg/L	0.3	1.05
Nitrates: N	mg/L	10	3.23
Nitrites: N	mg/L	0.9	0.001
Ammonia as N	mg/L	0.5	0.05
Phosphates as P	mg/L	0.7	0.05
Sulphate: SO^2_{-4}	mg/L	400	2.7

As stated in the feasibility study report, a treatment process considering Aeration, Sedimentation, Rapid Gravity Filtration, and Chlorination as shown in Figure 3-8 below has been adopted.

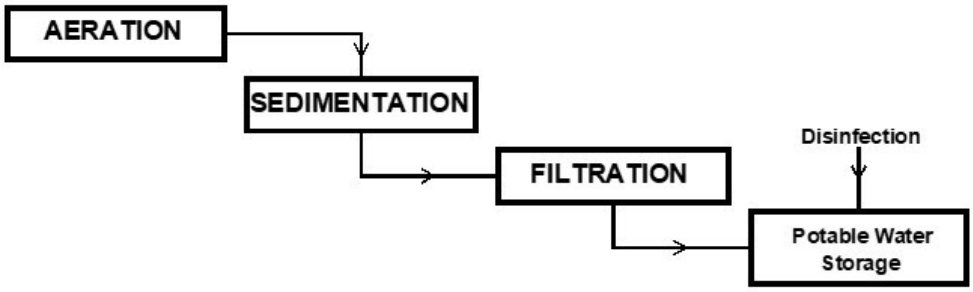
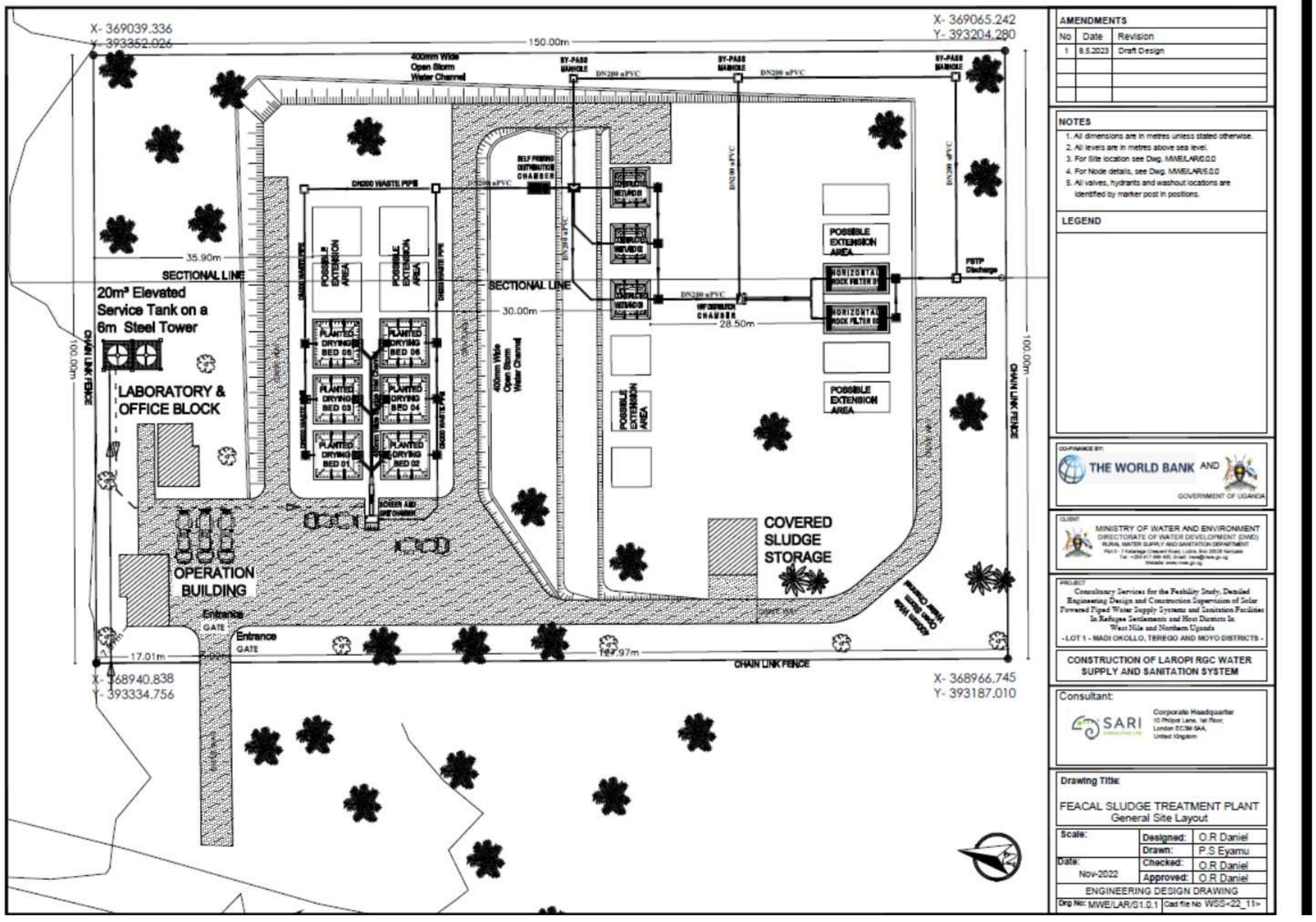


Figure 3-9: Treatment Process Schematic



AMENDMENTS		
No	Date	Revision
1	8.5.2023	Draft Design

NOTES

1. All dimensions are in metres unless stated otherwise.
2. All levels are in metres above sea level.
3. For Site location see Dwg. MWE/LAR/0.0.0
4. For Node details, see Dwg. MWE/LAR/S.0.0
5. All valves, hydrants and washout locations are identified by marker post in positions.

LEGEND

CO-FINANCE BY: THE WORLD BANK AND GOVERNMENT OF UGANDA

CLIENT: MINISTRY OF WATER AND ENVIRONMENT
DIRECTORATE OF WATER DEVELOPMENT (DWD)
RURAL WATER SUPPLY AND SANITATION DEPARTMENT

PROJECT: Consultancy Services for the 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
- LOT 1 - MADI OKOLLO, TEREGO AND MOYO DISTRICTS -

CONSTRUCTION OF LAROPI RGC WATER SUPPLY AND SANITATION SYSTEM

Consultant: SARI — Corporate Headquarter, 10 Philpot Lane, 1st Floor, London EC3M 8AA, United Kingdom

Drawing Title:

FEACAL SLUDGE TREATMENT PLANT
General Site Layout

Scale:	Designed:	O.R Daniel
	Drawn:	P.S Eyamu
Date: Nov-2022	Checked:	O.R Daniel
	Approved:	O.R Daniel

ENGINEERING DESIGN DRAWING

Drg No: MWE/LAR/G1.0.1 | Cad file No: WSS<22_11>

Figure 3-10: Laropi WTP Site Layout

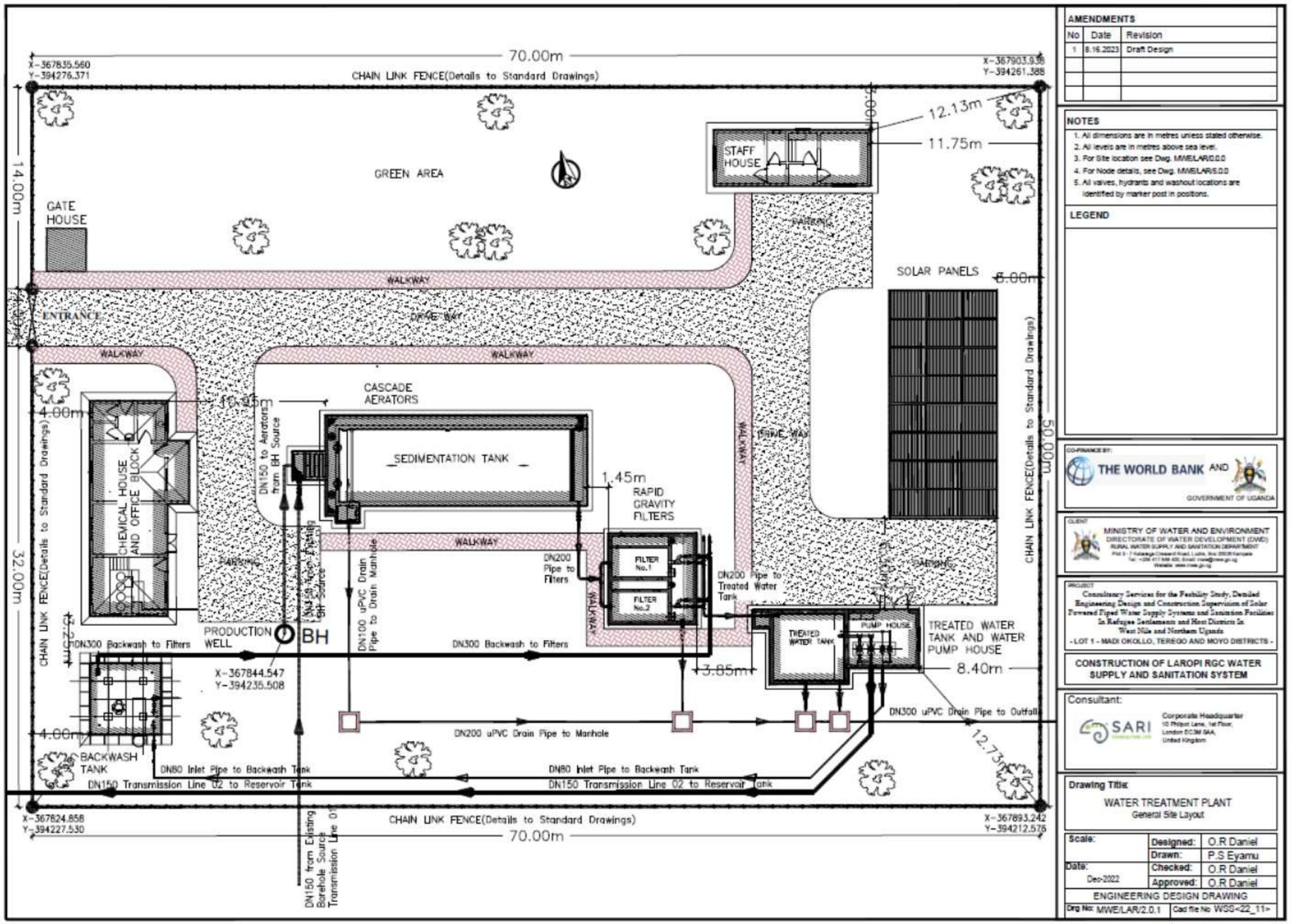


Figure 3-11: Laropi WTP Hydraulic Grade line

Figure 3-12: Laropi WTP Location

3.8.3 Chlorine Dosing Units in Chemical House

Two mixing PVC plastic tanks of 0.25m^3 capacity will be provided to operate on a duty/standby basis. The tanks shall have a freeboard of at least 200mm and shall be provided with valves on the inlet, outlet and drain; as well as overflow pipe work. Fresh water supply shall be obtained from the Backwash tank. The chemical house will also have a Chlorine storage room following the drawing MWE/LAR/2.4.0 series. The plan layout for the chemical house is shown in Figure 3-12 below.

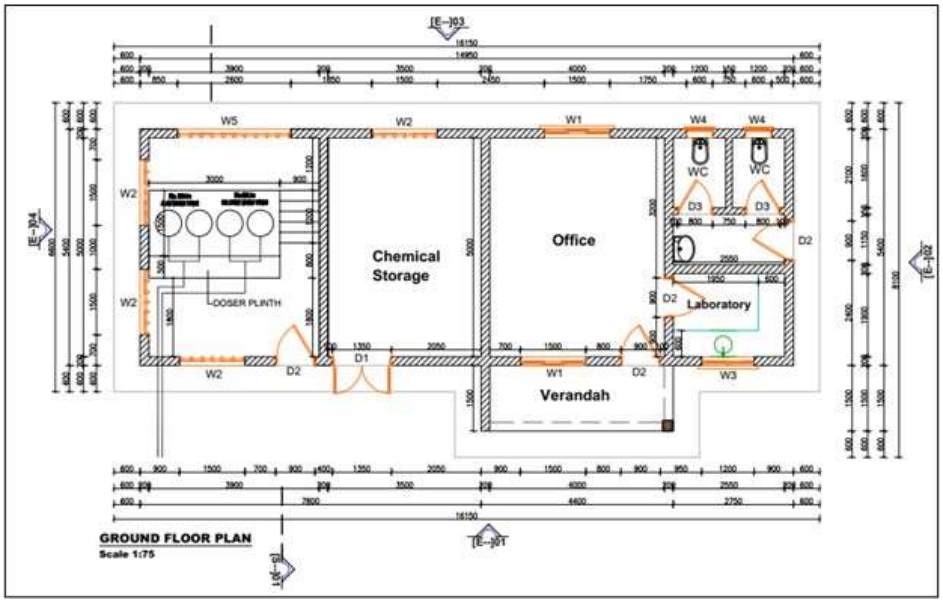


Figure 3-13:Chemical House and Site Office Plan Layout

Calcium Hypochlorite will be used for disinfection. This will be dosed directly into the clear water tank to ensure rapid mixing of the water and disinfectant. Two manual dozers shall be installed in the chemical house to dose the chlorine. The chlorine stock solution strength will be 1.0%. With a maximum daily dosage of 1.3kg, the mixing tank shall be adequate for full-day use in the ultimate year, 2045. The hypochlorite dosage rate will be 0.23/min. All the chemical mixing tanks will be provided with the following: -

i. Make up water sufficient to fill up each tank in 30 minutes, overflow, discharge and drain pipework and valves
ii. A level indicator in each tank

The chemical dozers will be simple gravity dozers. Two units will be provided for chlorine dosing. They will operate on a duty/standby basis.

3.8.4 Distribution Network

The Treated Water Transmission Mains of distance 3.84km and 18.2km distribution network was designed for those areas with defined access roads but the possibility of extending it was catered for since the project area is expected to expand. Consequently, the smallest size of pipe chosen is OD 50 HDPE. Pipes smaller than this will be laid as network intensification lines.

3.8.5 Energy source for the water supply system

Since solar power is the primary energy source for the proposed Laropi water supply system, with the pump operating for 10 hours for two pumps 13hrs for new pump and 7hrs for Existing Pump compared to solar energy's 8-hour capacity, two additional power sources have been evaluated. The recommended second power source options to supplement solar energy are:

- Option 1: HEP Supplementary Option
- Option 2: Generator Power Supplementary Option

Notable Environmental and Social Benefits associated with the above options include:

(a) Option 1:

- ✓ Environmental Benefits: Utilization of hydropower minimizes greenhouse gas emissions, promoting cleaner energy generation.
- ✓ Social Benefits: Enhances energy reliability and resilience, contributing to stable water supply and sanitation services for communities.

(b) Option 2:

- ✓ Environmental Benefits: Efficient use of generator power can lead to reduced air pollution compared to traditional generators, mitigating environmental impact.
- ✓ Social Benefits: Provides a backup power solution, ensuring continuous operation of the water supply system, thus benefiting the community with uninterrupted access to clean water and sanitation services.

3.9 Detailed Design - Sanitation

3.9.1 Public and Institutional Sanitation Interventions

The proposed interventions in sanitation are centered on the construction of 1No. 6 Stance water-borne public toilet facility whose location will be determined during construction and 2No 5 stance VIP facilities in Laropi Primary School inclusive of a 4 stance VIP latrine for staff.

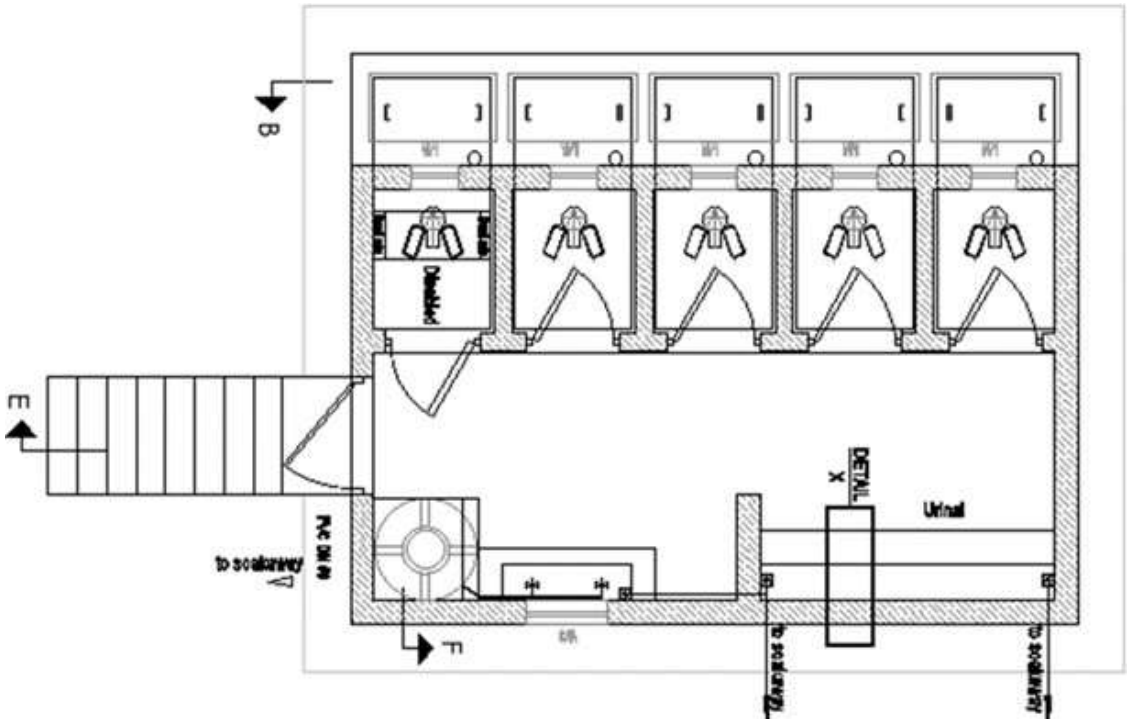


Figure 3-14: VIP School Toilet for Boys

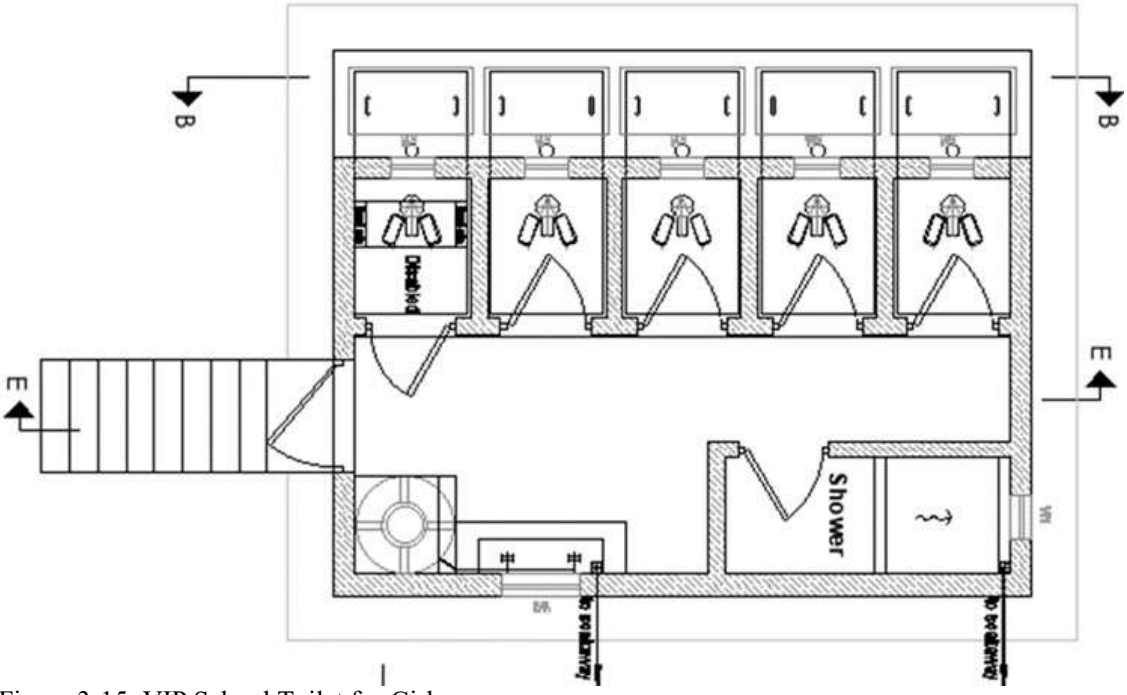


Figure 3-15: VIP School Toilet for Girls

3.9.2 Rubbish Bins

The project will provide six 240-litre rubbish bins to be placed at locations designated Laropi primary school.

3.9.3 Menstrual Management System

The preferred way to dispose of used pads is to incinerate them. Incineration is a waste treatment process that involves burning the used sanitary pads to ashes. In schools, the girls' latrine and bath shelter should have a disposal bucket so that girls don't have to move long distances or feel shy to dispose of them. The school administration should have a management system of transferring the used pads in collection buckets to the incinerator which should ideally be on the girls' wing of the school toilet. Figure 3-15 overleaf shows a simple incinerator proposed for incineration and is to be constructed in the girls' wing.

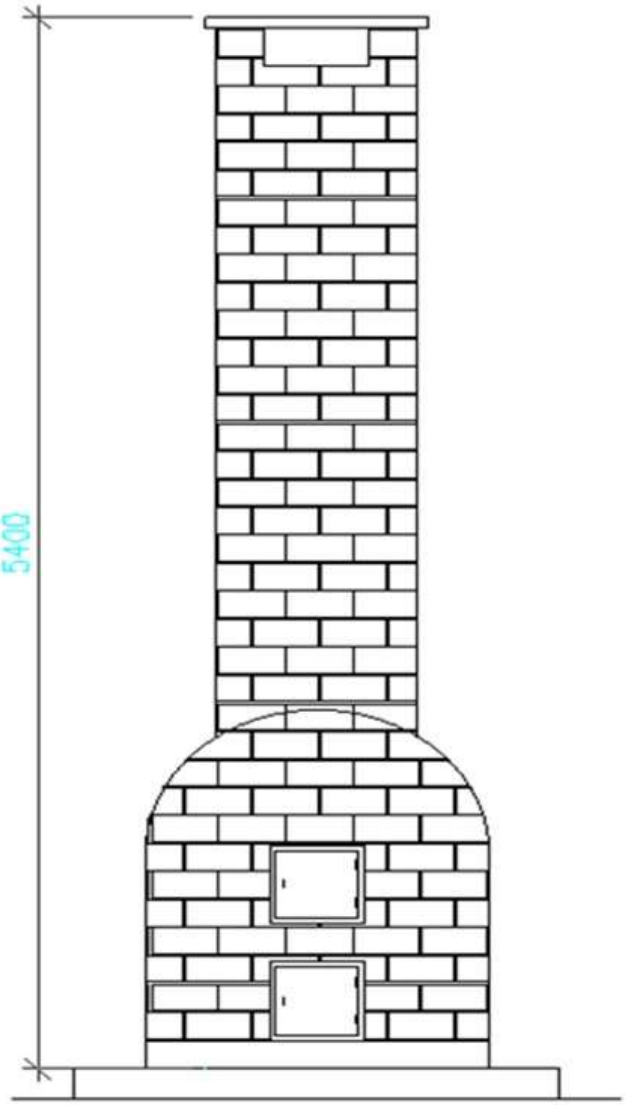


Figure 3-16: An Incinerator

3.9.4 Faecal Sludge Management Facility

3.9.4.1 Faecal Sludge Generation and Design

The quantities of Faecal sludge available for disposal and segregated according to sludge types are given in Table 3-11 below. The high-strength sludge is generated from latrines whereas the low-strength sludge from septic tanks

Table 3-9: Generated Faecal Sludge available for Disposal

Design Year	**Units**	**2045**		
Disposed sludge volumes		**Low strength**	**High strength**	**Total**
Annual sludge volume	m^3/a	644	846	**1,490**
Daily sludge volume (6 days/week)	m^3/d	2.1	2.7	**4.8**

3.9.4.2 Pre-Treatment - Screen and Grit Channel

The Faecal sludge will be dumped by the cesspool emptier into an open reinforced concrete inlet channel and will then pass through a bar screen followed by a grit removal channel and then through an open distribution channel to the planted drying beds.

The inlet channel will be 3.0m long and 0.5m wide with a base slope of $5^0/_0$; while the screen will be 0.58m long, 0.6m wide and made from 10mm bars each spaced 10 mm apart. The screen will be installed at 60^0 to the channel base. The screen and grit chamber has a total length of 3.0 m. A rectangular broad-crested weir 0.3m wide and 0.10m high will separate the screen and grit chamber from the outlet channel distribution channel. The screenings will be removed manually from the screen using a rake and placed in the adjacent 0.6m wide sieve basket for dewatering and drying. The grit, which collects behind the weir, will also be removed manually. For the cleaning of the screen and basket, piped water supply from a standpipe will be provided.

3.9.4.3 Solid/Liquid Separation - Planted Drying Beds

The FSMF will contain two rows of 3 no. beds each giving a total of 8 no. planted drying beds; consisting of 4 no. active and 2 no. spare beds.

The beds will have the following features:

- Square geometry with top rim dimensions of 8m x 8m.
- Construction of 70mm thick waterproof concrete bottom and sloping walls with concrete rims. The concrete will be cast on top of an impervious polythene lining. The bed bottom slope is 1% and the side walls are vertical.
- The bed inlet consists of waterproof concrete access stairs to the top of the substrate and large stones to help avoid erosion of the top layer of the substrate.

3.9.4.4 Treatment of the Liquid Fraction - Vertical Constructed Wetlands

The percolate drained out of the planted drying beds is collected and drained to the 3no. vertical constructed wetlands.

The vertically constructed wetlands will have the following features:

- Square geometry with top rim dimensions of 6.5m x 6.5m,
- Construction of 70mm thick waterproof concrete bottom and sloping walls with concrete rims. The concrete will be cast on top of an impervious polythene lining. The bed bottom slope is 1% and the side walls are vertical.
- The percolate inlet into the wetland will be through two DN 200 uPVC pipes feeding opposite sectors of the wetland but fed through a single inlet pipe. This is to ensure a better distribution of the percolate over the wetland surface. Pipe support systems will be installed in the wetland as well as erosion slabs at the wetland feeding points (2 no.).

3.9.4.5 Post Treatment of the Liquid Fraction - Horizontal Rock Filters

Final polishing of the percolate will be affected through 2 no. horizontal rock filters. In a horizontal rock filter, the wastewater travels through a submerged porous rock bed, where the biomass is attached to the rock.

The rock filters have dimensions of 5.0m x 10.8m x 1.1m deep. The wastewater travels horizontally through the filter; hence, the filter is lengthened. The filters will have a length-to-width ratio of 3 to prevent hydraulic shortcuts of the effluent. The depth of liquid in the filter is 700mm.

3.9.4.6 Facility Site Works

The following site works shall also be carried out on the FS management facility site:

i. Construction of plant fencing.
ii. Construction of site road works and walkways.
iii. Construction of site drainage and manholes to an outfall.
iv. Construction of facility operation building.
v. Construction of Laboratory and office block.
vi. Construction of solid waste and sludge storage area.

3.10 Planning and Design Activity Phase

3.10.1 Planning and Design Phase Overview

Construction of the water supply and sanitation project is expected to be undertaken by a contractor experienced in the type of work, who would be contractually obliged to complete the works following approved construction programs, project specifications, applicable government regulations and requirements, project permits and authorizations.

The Contractor is expected to develop construction programs which would consider factors such as critical habitat protection, ground conditions, topography, hydrology, presence of pre-existing infrastructure and weather conditions.

Within the regulatory framework, the selection of detailed construction methodologies and plants for the works would be the responsibility of the contractor. As such, a detailed approach in terms of the construction methodology cannot be defined at this stage. The sequencing of the construction activities and the direction of construction would also be at the contractors' discretion.

Before the commencement of the construction program, the construction contractor would develop method statements for the works to be performed. These documents would incorporate the reasonable requirements of landowners/occupiers and agencies such as NEMA, MoWE, NFA and other regulatory authorities in Uganda, and the mitigation measures that will be outlined in this ESIA.

3.10.2 Pre-Construction Works

All planned pre-construction activities would be undertaken within demarcated areas based on the design and the construction contractor's method statements. The source of water intake is the identified groundwater and associated facilities. Transmission pipelines construction would also be on a strip of land known as the 'working width', which would generally be 3m wide

Before construction begins on the pipelines, the routes would be surveyed and marked to establish precise alignment. The pipeline routes would be expected, as far as practicable, to avoid and/or minimize direct impacts on private property and known resources. Where it is unavoidable compensation will be done.

3.10.3 Access Roads

Access to work areas is not expected to be a challenge as these are mostly along existing roads. However, an access road measuring 1km to the intake sites and reservoirs would be enlarged and obstacles cleared to give adequate and safe access for equipment, materials and personnel to the construction site and permanent works.

3.10.4 Materials and Equipment Transport

The materials required for the construction will include may encompass pipes and fittings for the distribution network, concrete and steel for the construction of storage tanks and pump houses, geotextiles for filtration and drainage purposes, electrical components for the pump systems, and construction aggregates for building foundations and structures for the faecal sludge treatment Plant. Additionally, materials such as valves, meters, and water treatment chemicals shall be required for ensuring the functionality and reliability of the water supply system. The equipment required will include excavators, concrete mixers, water pumps, poker vibrators, trucks among others.

3.10.5 Temporary Construction Facilities.

Temporary facilities comprise storage yards, project offices and construction camps. The location and number of sites would be determined by the construction contractor and agreed upon with the Project Management Team.

The construction contractor would be required to assess the environmental/social sensitivity of the site(s) before their approval for adoption. Potential sites for construction and storage yards would be identified based upon but not limited to the following criteria:

i. Sufficient ground for pipe storage to meet anticipated quantities;
ii. Reasonable road access/egress; and
iii. Proximity and access to construction sites
iv. Environmental and social aspects

3.11 Construction Phase

3.11.1 Construction Procedures (Recruitment, Earthworks, Clearing, Grubbing and Material Excavation and Transportation)

The initial activity associated with construction is the final surveying and setting out or staking of the plinth areas, pipeline Right of Way (ROW) and any additional temporary workspaces. This may include flagging to indicate the construction workspace boundaries. Environmental compliance personnel would participate in the preconstruction identification (e.g., flagging) of environmental resources to be protected during the construction process. Examples of such resources include:

i. Identified ecological resources (e.g., tree or plant specimens to be protected) especially within and around River Nile; and Watercourses, setbacks/buffer zones, and wetlands

ii. Recruiting of workers (about 40 -70 un-skilled, 10 -30 semi-skilled and skilled) in the project area The projected approximate total number of employees on the project is 110 people during the construction phase. At the operational phase the number is estimated between 15-20 people for maintenance purposes during recruitment, the Contractor shall prioritize local
iii. labour as well as give priority to qualified women who will apply for jobs.

3.11.2 Gender Mainstreaming and Responsibility to other vulnerable groups

Gender mainstreaming within all operations of the contractor during construction activities will be undertaken. The purpose of the mainstreaming process will be to address injustice and imbalances among women, the elderly and the sick in the IWMDP /MW&E water and sanitation development project. The actions of this plan will seek to guarantee fair and equitable access to employment opportunities by women and other vulnerable groups and improve access and safety to homes and social facilities for vulnerable people in the course of construction works. The Contractor will be required to implement affirmative action for qualified women during the recruitment of skilled and unskilled labour. The following measures will be pursued:

i. Design a gender policy
ii. Implement Affirmative Action in job allocation to water and sanitation facilities construction workers whereby women will be given priority for the tasks they do best, based on their capabilities.
iii. The workplace environment including tools and fixtures will be gender friendly.
iv. Construction labour will be inducted on sexual harassment
v. Separate water- borne toilets for men and women to be constructed for all project workers, a similar arrangement will be made for work sites
vi. Children below 18 years will not be recruited, where age cannot be ascertained, a Letter from LCs shall be requested.

3.11.3 Managing Community Relations

These projects are intended to benefit the immediate neighbouring communities. Construction operations will be designed in such a way to positively benefit people in these communities. The project will work towards a harmonious relationship with all groups of people in the communities. The following actions will be actively followed to enhance social relations with all groups within the communities.

i. Employ local Labour from the project area
ii. The construction contractor will undertake community sensitisation forums in communities surrounding the institutes
iii. The contractor shall put out job adverts in the public and encourage qualified men and women to apply.
iv. Employ affirmative action where qualified women are given preference.
v. An information office will be commissioned within the project area
vi. Regular interface with Local Community Leaders will be maintained and spearheaded by the Environmental Management Team.

3.11.4 Stakeholder Participation Plan during project implementation

During project implementation activities, different key stakeholders must continue actively participating in the project. These Multi-Stakeholder Engagement Plans are important due to the following reasons:

i. Produce solutions to complex situations;
ii. Keep the public aware of the ongoing construction activities; and
iii. Collect possible complaints from the affected persons and produce possible solutions

iv. Promote participation in decision-making.

All the stakeholders that participated in the consultation stage shall be maintained during both construction and operation such that continuous monitoring among other reasons is achieved.

3.11.5 Environmental Sustainability measures and adaptation strategies

The environmental sustainability measures and adaptation strategies integrated into the project include; tree planting along the finished sections, retaining most existing trees as much as possible, building resilient pavement and drainage structures and encouraging communities to undertake reafforestation and restoration of degraded ecosystems. Construction Methods for the Transmission and Distribution Water Lines

i. Surface Preparation and Grading

The pipeline routes will also need to be cleared of any obstacles in some areas to permit the safe installation of the pipelines. Clearance work will be undertaken using hand tools and earth-moving equipment.

To ensure that the pipeline ROW is properly reinstated to allow the re-growth of vegetation, the topsoil and subsoil will be removed and stored separately and back filled after trenching.

ii. Trenching

Trenching will be dug to a depth that allows pipeline installation with a minimum of 0.6m of cover from the top of the pipe to the pre-existing ground surface. On average trench depth will be between 1.5 - 2m, while the width will vary from a minimum of 600mm to a maximum of 1.5m. The presence of sub-surface structures (such as other pipelines) and surface features (such as hills, and rivers) may require deeper installation of the pipeline in some areas.

3.11.6 Pipeline Testing and Commissioning

The pipelines will be subjected to hydrostatic pressure testing to prove the strength and integrity of the pipeline system. 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.

3.11.6.1 Steel Structures

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

3.11.6.2 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.

3.11.6.3 Masonry

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

3.11.6.4 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.

3.11.6.5 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.

3.11.7 Reinstatement and Erosion Control

Before the commencement of the construction program, the Contractor would develop project-specific Reinstatement Plans based on the project Reinstatement Specification. The project-initiated access roads, pipeline ROW and all other project areas would be re-instated following the Reinstatement Plans on completion of the works. The contractor would also be required to incorporate reinstatement measures in his method statements for each critical element of the construction program.

3.11.8 Site Clean-Up

Before the demobilization of construction personnel and equipment, clean-up activities would be conducted following environmental standards and industry best practices. Clean-up activities would consist of the removal and/or disposal of temporary buildings, equipment, tools, and excess material brought onsite or generated during the construction and commissioning program.

3.12 Operational Phase

The main activities that will be undertaken during project operations include:

i. Abstraction of water from groundwater source site location;
ii. Treatment and transmission of water to storage tanks;
iii. Distribution of water to consumers; and
iv. Maintenance of the water supply infrastructure

3.12.1 Water Abstraction

The Laropi solar-powered water supply and sanitation system for Laropi Rural Growth Centre will involves the abstraction of ground water from two boreholes located at utono cell using solar energy. water from a groundwater source at the boreholes (with a pumphouse, solar panels) at utoni cell.

3.12.2 Treatment and storage of water

The raw water sourced from the boreholes at Utono cell will be subjected to the treatment processes that involves as coagulation, flocculation, sedimentation, and filtration to remove impurities and ensure water quality meets regulatory standards. Following treatment, the clarified water is pumped using conventional pumps and transmitted to the storage tank at a Hill, in Utono Cell,

This storage tank of capacity 296 cubic meters will serve as a reservoir, ensuring a continuous and reliable water supply. The transmission system, consisting of a network of pipes, conveys treated water from the storage tank to various distribution points, including homes, trading centers, and institutional facilities with Laropi Town council.

3.12.3 Water Distribution and Consumption

After undergoing treatment and transmission processes, water will be distributed through a network of pipes to various designated locations within the community. The community will access water through individual household connections as well as public stand posts. Institutions will also be able to connect to the network.

3.12.4 Faecal sludge Treatment Plant

The Faecal sludge will be dumped by the cesspool emptier into an open reinforced concrete inlet channel and will then pass through a bar screen followed by a grit removal channel and then through an open distribution channel to the planted drying beds. The FSMF will contain two rows of 3 no. beds

each giving a total of 8 no. planted drying beds; consisting of 4 no. active and 2 no. spare beds. The percolate drained out of the planted drying beds is collected and drained to the 3no. vertical constructed wetlands. Final polishing of the percolate will be affected through 2 no. horizontal rock filters. In a horizontal rock filter, the wastewater travels through a submerged porous rock bed, where the biomass is attached to the rock.

3.13 Project Decommissioning and Abandonment Plans

The National (Environmental and Social Impact Assessment) Regulations 2020, provide for outlining of activities that shall be undertaken during the project construction, operation and decommissioning phases. Further, the environmental management plan shall detail project activities, impacts, mitigation measures, schedule, costs, responsibilities and commitments proposed to minimize environmental and social impacts of activities, including monitoring and environmental audits during the implementation and decommissioning phases of a project. Decommissioning and abandonment plan for the water supply infrastructure would entail:

i. Removal of all surface installations;
ii. Abandonment or demolition of buildings and structures at intakes, pumping stations and storage tank sites;
iii. Disconnection of pipelines from the supply of water, and abandonment in place or removal where abandonment causes a risk to the environment; and
iv. Re-vegetation of the sites consistent with the terrain features and other prevailing conditions.

An ESIA Would be prepared before implementation of this plan, to assess and minimize potential environmental and social impacts arising from the decommissioning and abandonment operations.

3.14 Expected Inputs and Output

The following are the expected inputs and outputs.

Table 3-10: Inputs and outputs

Phase	Inputs	Outputs
Pre-construction (Site clearance)	Fossil fuels for running machinery/ equipment; human Labour	Biomass from cleared vegetation; exhaust emissions dust, noise and vibrations
Construction	Fossil fuels for running machinery/equipment; water; raw materials such as rock, ballast, sand, cement, gravel, iron/steel bars, steel and HDPE pipes, masonry blocks, etc.	Exhaust emissions; material spoils (wastes); dust, noise and vibrations; construction wastewater
Operation	Routine maintenance/ repairs; various consumables chemicals for treatment of water	Sludge from the water treatment process and other ordinary wastes
Decommissioning	Fossil fuels for running machinery/ equipment	Solid waste/ rubble; exhaust emissions; dust, noise and vibrations

4. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 National Policies and Plans

4.1.1 National Water Policy, 1994

Developed against the backdrop of the Water Action Plan (1995) and the Water Statute (1995), the National Water Policy highlighted the key challenges and issues faced by the sector at the time, that still endure presently, and the principles required to ensure sustainable management of the national water resources.

Relevance: The redevelopment project activities should therefore conform to this policy through:

a) Control pollution and promotion of the safe storage, treatment and disposal of waste, which could pollute local water sources and impact public health;
b) Promotion of rational use of water; and
c) Promotion of orderly development and use of water resources for purposes other than domestic including industrial and commercial use.

4.1.2 Draft National Environment Management Policy, 2014

The overall policy goal of the Policy is sustainable development which maintains and promotes environmental quality and resource productivity for socio-economic transformation to promote sustainable economic and social development, mindful of the needs of future generations. Under the key principles, it's stated there in that full environmental and social costs and Benefits foregone as a result of environmental damage or degradation should be incorporated in public and private sector planning and minimized where possible.

The policy calls for the integration of environmental concerns into development policies, plans and projects at national, district and local levels, using ESIA as one of the vital tools. Thus, the policy requires that projects or policies likely to have significant adverse environmental and social impacts undertake an ESIA before their implementation. This ESIA has been carried out in full compliance with the provisions of this policy and has ensured that aspects of environmental and social sustainability are integrated into the project cycle. This is also reaffirmed in the National Environment Act, 2019 which makes ESIA a requirement for eligible projects.

Relevance: At the national policy level, environment and development are interrelated and this policy requires that environmental aspects are considered in all development projects. This is also reaffirmed in the National Environment Act, 2019 which makes ESIA a requirement for eligible projects like water supply and sanitation.

4.1.3 National Policy on Conservation & Management of Wetlands Resources (1995)

The National Wetlands Policy has five overarching goals. These are; (a) to establish the principles by which wetland resources can be optimally used now and in the future; (b) to end practices which reduce wetland productivity; (c) to maintain the biological diversity of natural or semi-natural wetlands; (d) to maintain wetland functions and values; (e) to integrate wetland concerns into the planning and decision making of other sectors.

Relevance: At the national policy level, environment and development are interrelated and this policy requires that environmental aspects are considered in all development projects. Within the project sites, there are wetlands which should not be adversely affected by the project. This is also reaffirmed in the

National Environment Act, 2019 which makes ESIA a requirement for eligible projects like water supply and sanitation.

4.1.4 National Environmental Health Policy, 2005

The main objective of this policy is to create an enabling environment for the achievement and maintenance of healthy living conditions in rural and urban areas. It actively promotes and supports the adoption of national sanitation, ensuring that an environmental health community at the the national and local government level is suitably skilled and equipped to meet current environmental health challenges.

Relevance: Significant adverse sanitation challenges to the disposal of waste and pollutants hence the requirement for observation of this policy

4.1.5 Land Policy, 2013

The Policy is in tandem with the provisions of Uganda's Constitution which empowers the Central and Local Governments to acquire land in public interest provided the acquisition is necessary for public use or is in the interest of defense, public safety, public order, public morality or public health and is subject to prompt payment of a fair and adequate compensation, before the taking of possession or acquisition of the property.

Relevance: Construction of Laropi Town Council water and sanitation will require the acquisition of land from landowners. Following the provisions of this policy, a resettlement action plan will provide measures to ensure the affected landowners are compensated.

4.1.6 Gender Equality and Social Protection Policies (2007)

The overall objective of this Policy is to strengthen the contribution of development projects to poverty eradication by providing an enabling environment where women and men participate in and benefit from developments in the different sub-sectors equitably. The purpose of the Policy is to institutionalize a gender perspective in all institutions and their operational and regulatory frameworks. The specific objectives of the Gender Policy are to:

- Promote gender-responsive sub-sector policies, programs and plans;
- Promote gender-responsive service delivery; Enhance equality of opportunities between women/girls and men/boys in the sub-sector;
- Commit adequate resources to gender-responsive activities in the sub-sector; and
- Strengthen capacities of sub-sector institutions, partners and service providers to mainstream gender.

Relevance: To enhance the employment opportunities of women and the vulnerable, the contractor of the redevelopment project will be required to prepare a Labour policy, which will include an equal opportunities employment policy, a sexual harassment policy with gender-sensitive working facilities at the construction sites and finished infrastructural developments.

4.1.7 National Policy on Elimination of Gender-Based Violence, 2016

The policy seeks to promote, prevent and respond and end impunity of gender-based violation in the country. The highest prevalence of gender-based violence is among women aged between 15 and 45; and generally, involves sexual violence.

Relevance: The proposed project shall have a specific policy on eliminating gender-based violence throughout the project phases. In addition, the project will be required to work with community members, police, teachers, parents and all stakeholders to specifically address gender issues.

4.1.8 National Policy for Older Persons, 2009

The policy seeks to achieve equal treatment, social inclusion and empowerment of older persons. The values of the policy are:

a) Equity. Fairness, fair play, impartiality and justice in the distribution of benefits and responsibilities in society.
b) Respect. Views, opinions and rights of older persons will be upheld while they are also expected to exhibit a high sense of self-respect. Commitment. The willingness to work hard and give all the energy and time to meet the vision.
c) Accountability. All stakeholders are expected to fulfil their obligations towards one another.
d) Equality. All older persons will be accorded the same opportunity and rights as other individuals

Relevance: All project-affected persons above 65 years shall be incorporated into the compensation process and shall be treated with equity and respect.

4.1.9 National Policy on Disability, 2006

The vision of the policy is a society where people with disabilities (PWDs) fully participate in all spheres of development. The mission is to provide a framework for the empowerment of PWDs in the development process.

Relevance: The project shall ensure the participation of PWDs in the planning, implementation, monitoring and evaluation of all the project phases.

4.1.10 National Orphans and Other Vulnerable Children's Policy, 2004

The vision of the policy is a society where all orphans and other vulnerable children live to their full potential and their rights and aspirations are fulfilled. The mission of the policy is to provide a framework for the enjoyment of the rights and fulfilment of responsibilities of orphans and other vulnerable children.
The policy objectives are:

a) To ensure that the legal, policy, and institutional framework for child protection is developed and strengthened at all levels.
b) To ensure that orphans, vulnerable children and their families access basic essential services package. National Orphans and another vulnerable children Policy
c) To ensure that resources for interventions that benefit orphans and other vulnerable children are mobilized and efficiently utilized. and
d) To ensure that the capacity of duty-bearers for orphans and other vulnerable children to provide essential services is enhanced.

4.1.11 National Youth Policy, 2001

The goal is to provide an appropriate framework for enabling youth to develop social, economic, cultural and political skills to enhance their participation in the overall development process and improve their quality of life.
The objectives of the policy are;

a) To initiate, strengthen and streamline all programmes and services targeting the youth.
b) To promote social and economic empowerment of the youth.
c) To build capacity and provide relevant training and information to the stakeholders.
d) To promote growth in the development of youth through actions that protect empower and prepare them for adulthood.
e) To provide psycho-social support and other services to youth in conflict situations, difficult circumstances and disadvantaged groups.
f) To increase youth involvement in decision-making, leadership, community-based and other development programs.

4.1.12 Uganda National Culture Policy, 2006

The Policy provides a framework for the promotion of culture for development and complies with international and regional instruments on culture. The core principles underlying the Policy are; Promoting Unity in Diversity, respecting one another's culture, ensuring social inclusion (Children, youth, women, PWDs, elderly, People living with HIV/AIDS and indigenous minorities), promoting cultural change, promoting environmental protection and strengthening partnerships.

Relevance: The project shall ensure harmony with efforts to promote and enhance the contribution of culture to community empowerment.

4.1.13 National Child Labour Policy, 2007

The overall objective of the policy is to guide and promote sustainable actions aimed at the progressive elimination of child Labour starting with the worst forms. The vision of the policy is a society free of exploitative child Labour in which all working children enjoy their right to childhood, education, dignity and the full development of their potential.

Relevance: The project shall actively participate in efforts to eliminate child labour during pre-construction, construction and post-construction

4.1.14 National HIV/AIDS Policy, 1992

The current effort to combat HIV / AIDS is characterized by a policy of openness by the Ugandan Government and this has been emulated by civil society, political and social institutions and workplaces. The Ministry of Health, together with the Ministry of Gender, Labour and Social Development, encourage employers to develop in-house HIV / AIDS policies, provide awareness and prevention measures to workers and avoid discriminating against workers living with or affected by HIV / AIDS.
This policy provides the overall policy framework for the national HIV/AIDS response. It also recognizes special groups which include migrant workers and acknowledges the existence of commercial sex workers. It also recommends the need to identify strategies to address migrant workers because of the challenges posed by their mobility and vulnerability to HIV/AIDS. It anticipates that during the implementation of the different phases of the project, there will be some migrant Labour into the project area that will result in interaction and may pose a danger of HIV/AIDS spread.

Role of employer

a) Formulation of an HIV / AIDS policy around the principle of non-discrimination, equality, confidentiality, care and support for the project;
b) Develop an equitable set of policies that are communicated to all staff and properly implemented, including protection of the rights at work and protection against any discrimination at work;

c) Develop a step-by-step action plan taking on all the legal, ethical, social and economic aspects;
d) Identify the factors that influence HIV / AIDS transmission in terms of organizational, structure/activities, examine existing workplace practices and policies; establish the real and/or potential impact of HIV / AIDS on the company and its workforce;
e) Ensure that induction programs for new workers include training on HIV / AIDS;
f) Initiate and develop HIV / AIDS prevention and care programs, designed not only to protect the infected workforce but also to take into account the rights and problems of those living with HIV / AIDS;
g) Provide and maintain as far as is practicable, a working environment that is safe and without risk to the health of its workers, including occupational transmission of HIV;
h) Ensure that the rights of workers concerning HIV / AIDS and the remedies that are available in the event of a breach of such rights, become integrated into existing grievance procedures
i) Responsible for the implementation of this policy; and
j) Mainstream HIV / AIDS activities into the workplace policies and programs.

Relevance: This policy provides measures which can be used to reduce the impact of the spread of HIV/AIDS during all phases of the IWMDP

4.2 National Acts and Regulations

4.2.1 Constitution of Uganda 1995

The constitution Provides for the roles and functions of different stakeholders in the development, use, management, protection etc. of the country's water resources and the environment.
The Fourth chapter specifically includes the right to a clean and healthy environment as one of the fundamental human rights and freedoms for every Ugandan.

Relevance: The constitution is the cardinal law in Uganda upon which all environmental laws and regulations are founded. All environmental impact actions of the IWMDP are therefore meant to conform to the broader objectives of the Constitution which requires a healthy environment for all citizenry.

4.2.2 Water Action Plan (1995)

The Water Action Plan consisted of several documents, which detailed approaches to revamping water resources management. Actions identified included improvement in water resources monitoring, impact assessment and supervision through a permit system; and the development of a decentralized institutional framework for water resources management.

Relevance: An Act that will enable the project to be consistent with the approaches in water resource monitoring

4.2.3 The Water Act (1998)

Contains regulations on water resources, water supply, sewerage and waste discharge and sets out the relationships, roles and responsibilities of different institutions in the operation and management of water supplies and sanitation systems.

Relevance: This is a guiding Act that governs water resources and this defines the relations with different institutions related to water and sanitation.

4.2.4 National Water & Sewerage Corporation (1995)

The overall objective of this legislation is to make provision for the operations of the National Water and Sewerage Corporation (NWSC) in alignment with the Water Act 1998 and other social, economic and environmental policies. The Act gives water and sewerage authority status to the NWSC.

Relevance: There is a possibility in the future to be managed by NWSC.

4.2.5 Traffic Act, 2002

The Traffic Act 2002 consolidates laws relating to traffic on all public roads. The Act also prohibits encroachment on and damage to roads including road reserves.

Relevance: During the construction phase of the project, temporary road signs shall be installed following an approved traffic management plan. Upon completion of the project, appropriate road furniture including traffic signage shall be installed and the right of way protected from encroachment.

4.2.6 Local Government Act (1997)

Local governments are mandated to hold in trust for the people and to protect natural lakes, rivers, wetlands and forest reserves. Local governments also have an oversight role regarding the performance of persons employed by the government to provide services and monitor the provision of government services and the implementation of projects in their areas.

Relevance: This empowers the Local governments to play an oversight role and also ensure that they protect the source of intakes and water source protection

4.2.7 Land Act (1998)

Part III of the act stipulates that a land owner or occupier has a responsibility to manage and utilize the land following various acts including the National Environment and the Water Act.
Relevance: This Act will guide any procedures regarding land issues that may arise due to the IWMDP.

4.2.8 National Forestry and Tree Planting Act, 2003

The National Forestry and Tree Planting Act, 2003 serves as a legal instrument to guide sustainable forestry practices in Uganda. It promotes the responsible use of forest resources, the involvement of local communities, and the conservation of biodiversity, contributing to the long-term environmental and socio-economic well-being of the country.

Relevance: The access road and water storage reservoir are to be established during both the construction and operations of the water storage facility.

4.2.9 National Environment Act (2019)

The Act is to repeal, replace and reform the law relating to environmental management in Uganda. Its purpose is to; (a)provide for the management of the environment for sustainable development, (b)continue the National Environment Management Authority as a coordinating, monitoring, regulatory and supervisory body for all activities relating to the environment (c)provide for emerging environmental issues including climate change, the management of hazardous chemicals and biodiversity offsets (d)provide for strategic environmental assessment (e)address environmental concerns arising out of petroleum activities and midstream operations, to provide for the management of plastics and plastic products (f)establish the Environmental Protection Force (g)provide for enhanced penalties for offences under the Act (h)provide for procedural and administrative matters.

Relevance: The Act provides for environmental and compliance monitoring, laboratory analysis, environmental audits, inspections, environmental restoration orders, environmental improvement notices and environmental compliance agreements. NEMA will therefore be responsible for the review, and approval of the scoping report and ESIA, monitoring the construction and operation of the water supply and sanitation.

4.2.10 Safety and Health Act 2006

The Act consolidates, harmonizes and updates the law to occupational safety and health, repeals the Factories Act, Cap 220 and provides for connected matters.

Relevance: This Act will be especially relevant for the redevelopment of the RGC water supply and sanitation project for OHS of construction works and subsequently, operation and maintenance activities. The policy will also be relevant in mitigation measures that protect the public from health and safety impacts of construction and operation activities within the redevelopment of the IWMDP.

4.2.11 Refugee Act, 2006

The Act is to make new provisions for matters relating to refugees, in line with the 1951 Convention relating to the status of refugees and other international obligations of Uganda relating to the status of refugees; to establish an Office of Refugees; to repeal the Control of Alien Refugees Act, Cap. 62; and to provide for other related matters

Relevance: The project area is in refugee hosting districts and therefore the international obligations for water provisions will be followed.

4.2.12 Land Acquisition Act, 1965

The Land Act provides that the District Land Boards (DLB) should set compensation rates every year. At the district level, these are determined by a committee of technical officers including the commercial officer, district engineer, physical planner, a representative of the Chief Government Valuer etc., chaired by the Chief Administrative Officer (CAO). The committee sets rates after consultation and consideration of the prevailing market rates. The rates set by the committee are scrutinized and approved by the District Land Board. For the RAP exercise, the Moyo District Rates established for the 2020/21 financial year will be applied.

Relevance: The Land Acquisition Act is an Act to make provision for the compulsory acquisition of land for public purposes and matters incidental thereto and connected therewith.

4.2.13 Physical Planning Act 2010 as Amended 2020

The act establishes district and urban physical planning committees; to provide for the making and approval of physical development plans the applications for development permission; and related matters.

Relevance: The entire country was declared a planning area hence local authorities have jurisdiction over areas in and around the proposed project and therefore have regulatory control to ensure that this project conforms to local physical planning requirements and approvals.

4.2.14 Traditional Ruler's Act, Cap 247

Under the Reinstitution of Traditional Rulers statute of 1993, confirmed by the constitution of Uganda in 1995, kings and chiefdoms were given the right to own their cultural property.

Relevance: In the area of the project, chiefs are recognized, and they are the custodians of cultural sites and traditional belief systems hence key stakeholders in that regard.

4.2.15 Employment Act, 2006

Employment Act, 2006 repeals Employment Act (Cap 219) enacted in 2000. This Act is the principal legislation that seeks to harmonize relationships between employees and employers, protect workers' interests and welfare and safeguard their occupational health and safety through:

a) Prohibiting forced Labour, discrimination and sexual harassment at workplaces (Part II; Part IV).
b) Providing for Labour inspection by the relevant ministry (Part III).
c) Stipulating rights and duties in employment (weekly rest, working hours, annual leave, maternity and paternity leaves, sick pay, etc. (Part VI).
d) Continuity of employment (continuous service, seasonal employment, etc. (Part VIII). This Act is relevant to the project both during the construction and during the operational phase.

Relevance: The Act will govern the Labour type and conditions under which a person is hired for the redevelopment of the old taxi park project. It prohibits Child Labour (a condition the contractor of the IWMDP must comply with) as well as guides on work rights during the post-construction phase. This act will guide relations between employees and employers.

4.3 Guidelines and Regulations for Environmental Considerations in Uganda

4.3.1 Environment (Impact Assessment) Regulations, 2020

They provide elaborate details on how ESIA should be carried out, by whom, for which projects and what details must be included in the ESIA study. The details include the preparation of Project briefs, Environmental Impact Statements, the Review process for the ESIA and the approval process of the ESIA by the Executive Director of NEMA.

4.3.2 The National Environment (Audit) Regulations, 2020

The subject of the regulation under section (12) is to guide Environmental compliance audit (1), which states that the developer of a project or activity listed in Schedule 3 to these Regulations shall carry out an environmental compliance audit, (3) The environmental compliance audit referred to in sub-regulation (1) shall be undertaken annually unless otherwise required by the Authority, (4) states that the developer shall ensure that an environmental compliance audit is undertaken by an environmental audit team of persons duly certified and registered following the National Environment (Conduct and Certification of Environmental Practitioners) Regulations, 2003. It also emphasizes that where the audit findings indicate non-compliance, the developer shall submit an audit corrective action plan as part of the environmental compliance audit report. Under section (23), the regulation guides the developers on the establishment of environment management system, under (1) to establish, maintain and implement an environment management system in accordance with section 49 of the Act, which includes (2) (a) an environmental management policy and goals, reflecting a commitment by the developer of the project or activity to implement the environment management system and to communicate it to all employees; (b) the environmental management and monitoring plan provided for under section 122 (3) of the Act and the National Environment (Environmental and Social Assessment) Regulations, 2020; (c) structures and assignment of responsibilities for the implementation of the environment management system, including appointment of persons responsible for its implementation and coordination; (d) mechanisms for developing capabilities and support systems necessary to achieve the objectives of the

environment management system, including training, awareness and competences of employees; (e) objectives, targets, procedures and practices for mitigating environmental and social impacts or risks associated with the project or activity and for securing compliance with legal requirements; (f) a system of keeping and managing information and records; and (g) mechanisms for reporting, monitoring and evaluating the performance of the environment management system to ensure the suitability, adequacy and effectiveness of the system.

During the project implementation and operation, the act stipulates clear roles of the developer:

a) A developer shall periodically review the environment management system and demonstrate continuous improvement in the environmental performance of the project or activity.
b) The developer shall make available to all employees the relevant parts of the documented environmental management system for reference in the execution of work.
c) The developer shall ensure that a copy of the environmental management policy is displayed in a conspicuous place at the project or activity site to which it applies.
d) The developer shall make the documented environment management system available to the Authority or lead agency, upon request.

Relevance: The regulation will guide the periodic evaluation used to determine how well the project is performing in conserving the environment and its resources and conforming to the requirements of the Act, these Regulations and any other applicable law since the project is listed under schedule 5 which require Environmental Compliance Audit.

4.3.3 Water Resources Regulations, 1998

The regulations apply to motorized water abstraction from boreholes or surface water sources or diverting, impounding or using more than 400 cubic meters of water within 24 hours. Part II, Regulation 3 requires a water permit for the operation of a motorized water pump from a borehole or waterway. Under Regulation 6, an application for a permit may be granted on conditions of the projected availability of water in the area, existing and projected quality of water in the area and any adverse effect that the facility may cause among other considerations.

Relevance: This is critical concerning the source of water intake and the IWMDP will be abstracted from groundwater sources.

4.3.4 The Water Supply Regulations, 1999

The Water Supply Regulations, 1999 manage the water supply works including:

a) Permits requirements and procedures for water supply works by authority or connection to the land owner (Division 1, clauses 4 to 6);
b) Application, examination and approval of Water supply plan (Division 2, clauses 7 to 11);
c) Cost of works, security deposit, an inspection of works and plenty for violation (Division 2, clauses 12 to 18);
d) Metering system and charging rates (Part III, clauses 19 to 21).

Relevance: These will guide the entire water supply exercise, especially during the operation and construction phases of the IWMDP

4.3.5 National Environment Regulations (Soil Management), 2001

Regulation 3 sets out the purpose of these Regulations which is, as specified under sub-regulation (a) to establish and prescribe minimum soil quality standards to maintain, restore and enhance the inherent productivity of the soil in the long term.

4.3.6 National Environment (Hilly and Mountainous Area Management) Regulations, 2000

The objectives of these regulations are to facilitate sustainable utilization and conservation of resources in hilly and mountainous areas by the government and for the benefit of the local communities; promote the integration of wise use of resources in mountainous and hilly areas into the local and national management of natural resources for socio-economic development for the present and future generations.

4.3.7 National Environment (Noise Standards and Control Regulations) 2003

These Regulations have adequate provisions to regulate noise pollution in any environment, including construction establishments. (Under sections 23 and 107 of the National Act) these regulations are aimed at ensuring the maintenance of a healthy environment for all people of Uganda, the tranquillity of their surroundings and their psychological well-being by regulating noise levels from a facility or activity to which a person may be expected and the provision for control of noise and for mitigating measures for the reduction of noise.

Part III Section 8 (1) requires machinery operators, to use the best practicable means to ensure that the emission of noise does not exceed the permissible noise levels. The regulations require that persons to be exposed to occupational noise exceeding 85 DBA for 8 hours should be provided with requisite ear protection.

Table 4-1: Regulatory Noise Limits

Facility	**Noise limits dB (A) (Leq)**	
	Day*	**Night***
Construction sites	60	50
Mixed residential (with some commercial and entertainment)	55	45
*Time frame: Day 6.00 a.m. -10.00 p.m.; Night 10.00 p.m. - 6.00 a.m.		

Source: The National Environment (Noise Standards and Control) Regulations, 2003.

The Act also allows a person or entity expecting to generate noise above regulatory limits to apply to the NEMA for a license to emit noise above the permissible levels.

Relevance: In the context of the IWMDP, the noise regulations guide construction and operations phases as follows:

a) The maximum noise levels from a facility in the general environment specified in Column 1 of Part I of the First Schedule to which a person may be exposed shall not exceed the level specified in Column 2 of that Part for the time specified that, Part.
b) The maximum noise levels of continuous or intermittent noise from a facility or a workshop, to which a person may be exposed shall not exceed the level specified in Column 1 of Part II of the First Schedule, for the time specified in Columns 2 and 3 of that Part.

c) The maximum noise level from impact or impulsive noise to which a person may be exposed shall be as specified in column 1 of Part III of the First Schedule for the permitted number of impulses or impacts emitted per day specified in Column 2 of that Part.
d) The maximum noise level from a construction site to which a person in a facility specified in Column 1 of Part IV of the First Schedule may be exposed.

4.3.8 National Environment (Wetlands, Riverbanks and Lake-Shore Management) Regulations, No.3 of S.I No. 2/2000

Provisions of the ESIA under these regulations are contained in Part IV. These provide that a developer desiring to put up a project which may have a significant impact on a wetland riverbank or lakeshore is required to carry out an ESIA; The developer shall carry out annual audits and monitoring of such activities that may impact the environment and submit reports to the Executive Director and the Lead Agency; the Executive Director shall require that a wetland, riverbank or lakeshore which has been degraded be allowed to regenerate or issue an environmental restoration order.

4.3.9 The National Environment (Waste Management) Regulations, S.I. No. 49 of 2020

These regulations require waste disposal in a way that would not contaminate water, soil, and air or impact public health. The regulations aim to prevent and regulate the discharge of waste into air, water and land requires establishing a system of waste planning and management. These Regulations apply (a) to all waste classified, characterized and categorized under Schedule 2, Schedule 3 and Schedule 4 to these Regulations; (b) to the generation, collection, transportation, storage, treatment and disposal of waste; (c) to transboundary movement of waste; and (d) to all waste management facilities. It states in subsection (2) that for the avoidance of doubt, sub-regulation (1) shall not apply to petroleum waste regulated under the Petroleum (Waste Management) Regulations, 2019.
In section 4, it emphasizes Compliance with environmental principles as follows: A person who generates waste, a waste handler or a product steward shall, in compliance with the environmental principles set out in section 5 of the Act—

a) Apply measures in the management of waste to prevent harm to human health and ensure the safety of human beings;
b) Apply measures in the management of waste to prevent pollution, harm to biological diversity and contamination of the wider environment by waste;
c) Use the best available technologies and best environmental practices to manage waste; and
d) Ensure resource efficiency—

- By the application of the waste management hierarchy and the control or minimization of the generation of waste to the greatest extent possible;
- By promoting proper cyclical use of resources; and
- By ensuring proper disposal of circulate resources not put into cyclical use.

Relevance: These regulations apply to both construction and operation phases of the IWMDP Waste should be managed in a way such as to avoid environmental and public health impacts. It regulates the activities relating to the collection, transportation (waste haulage), storage, treatment and disposal of waste, including the management of waste at source and during decommissioning of waste management facilities

4.3.10 The National Environment (Standards for Discharge of Effluent into Water or Land) Regulations, 2020

These regulations require that a permit is acquired before a developer discharges wastewater into water bodies or on land. Maximum permissible levels for the discharge of waste have been provided under Schedules 2, 3 and 4 of these regulations as shown in Tables 4-2 and 4-3.

Table 4-2: Standards for general chemicals and micro-biological discharge

No.	Parameter or Pollutant	Unit	Maximum Permissible Limit
1	Temperature increase	oC	≤5
2	Odour		Not detectable
3	Colour	TCU	50
4	pH	Units	5.0-8.5
5	Electrical Conductivity	µS/cm	1000
6	Total Dissolved Solids	mg/L	750
7	Total Suspended Solids	mg/L	50
8	Biological Oxygen Demand	mg/L	50
9	Chemical Oxygen Demand	mg/L	70
10	Cyanide (Free)	mg/L	0.1
11	Cyanide (AD)	mg/L	0.5
12	Cyanide (Total)	mg/L	0.1
13	Nitrogen (Total)	mg/L	10
14	Nitrogen (Ammonia)	mg/L	10
15	Nitrogen (Nitrates)	mg/L	10
16	Total Kjeldahl Nitrogen	mg/L	10
17	Phosphorus (Total)	mg/L	5
18	Sulphates	mg/L	500
19	Chlorides	mg/L	250
20	Chlorine (Residual)	mg/L	0.2
21	Total Coliforms	CFU/100ml	400
22	Fluorides	mg/L	2
23	Sulphides	mg/L	1
24	Urea	mg/L	1

Table 4-3: Standards for inorganic substances effluent discharge Effluent requirements are for direct discharge into surface water, land or sewer

No.	Parameter or Pollutant	Unit	Maximum Permissible Limit
1	Aluminium	mg/L	0.5
2	Antimony	mg/L	0.5
3	Arsenic	mg/L	0.1
4	Barium	mg/L	10
5	Beryllium	mg/L	0.1
6	Cadmium	mg/L	0.01
7	Calcium	mg/L	100
8	Chromium (Hexavalent)	mg/L	0.05
9	Chromium (Total)	mg/L	0.5
10	Cobalt	mg/L	0.1
11	Copper	mg/L	0.5
12	Iron (Total)	mg/L	3.5
13	Lead	mg/L	0.1

Pollutant	Averaging Time	2005 AQGs	2021 AQGs
$PM_{2.5}$, µg/m³	Annual	10	5
	24-hour[a]	25	15
PM_{10}, µg/m³	Annual	20	15
	24-hour[a]	50	45
O_3, µg/m³	Peak season[b]	-	60
	8-hour[a]	100	100
NO_2, µg/m³	Annual	40	10
	24-hour[a]	-	25
SO_2, µg/m³	24-hour[a]	20	40
CO, mg/m³	24-hour[a]	-	4

Figure 4-1: Air Quality (WHO).

Mgmicrograma 99th percentile (i.e., 3–4 exceedance days per year). b Average of daily maximum 8-hour mean O3 concentration in the six consecutive months with the highest six-month running- average O3 concentration. Note: Annual and peak season is long-term exposure, while 24-hour and 8-hour is short-term exposure.

Relevance: These regulations apply to both construction and operation-phase of the IWMDP Air pollution which should be managed in a way such as to avoid environmental and public health impacts.

4.3.11 The National Forestry and Tree Planting Regulations, S.I. No. 57 of 2016

The National Forestry and Tree Planting Regulations, 2016 serve as a crucial component of the legal framework for forest management and conservation in Uganda. They provide detailed guidance on various aspects of forestry practices, tree planting, permits, and enforcement, contributing to the sustainable use and protection of forest resources and biodiversity.

Relevance: These regulations apply to both construction and operation-phase of the IWMDP tree cover which should be protected/managed in a way such as to avoid environmental degradation/depletion of tree cover.

4.4 National, Regional and District Documents

4.4.1 Uganda's Vision 2040

The Uganda Vision 2040 aims at transforming Uganda from its present Least Developed Country (LDC) status to a competitive and upper-middle-income status by 2040. The vision is centred on harnessing opportunities, improving competitiveness and strengthening the fundamentals for the transformation of Uganda as a nation. Uganda's Vision is to have "A transformed Ugandan society from a peasant to a modern and prosperous country within 30 years", from 2010. This involves changing from a predominantly low-income to a competitive upper-middle-income country within 30 years. Uganda has abundant land and natural resources that provide numerous opportunities, which can foster faster socioeconomic.

Relevance: The construction of the water supply and sanitation project is an opportunity to achieve Vision 2040 through water infrastructural development.

4.4.2 National Development Plan (NDPIII)

This National Development Plan (NDP) is the third in a series of six NDPs that will guide the nation in delivering the aspirations articulated in Uganda Vision 2040, which includes improved access and quality of social services. Accordingly, there are several outstanding challenges identified, including inadequate functionality of health facilities and rising cases of non-communicable diseases.

NDPIII builds on the previous NDPs to fast-track-realization of results, and a programmatic approach to planning is adopted access to clean and safe water by everyone is one of the most important achievements that NDPIII aims to achieve. It has been designed with 18 flagship programmes including The Natural Resources, Environment, Climate Change, Land and Water Management Programme is the Programme to which the Water and Environment Sector contributes. The Programme has been designed to stop, reduce and reverse environmental degradation and the adverse effects of climate change as well as improve the utilization of natural resources for sustainable economic growth and livelihood security. In 2021, the MWE is coordinating the production of a sector performance report as a Programme report.

Relevance: NDP III recognizes the importance of the development of water and sanitation to national economic development. The project will be key in improving the related local economic development within the IWMDP districts

4.5 Permits and Licenses Required by Project Proponent

Table 4-4: Permits and Licenses

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 them 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 Rights	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,	Road Traffic Act (1998)	UNRA and Moyo District Local Government	Construction Contractor

Regulations/ Standards/ Approvals	Description	Reference	Issuing Institution	Applicant
	this shall require a permit from the Roads Authority			
Development Planning Permission	The project is within the jurisdiction of the Moyo District Councils, which will require to approve the designs and the plans for the proposed water supply infrastructure	Physical Planning Act 2010 as Amended 2020	Moyo District/ Local Government	Developer

4.6 Relevant World Bank Obligations

4.6.1 World Bank Environmental Operational Policies

World Bank's Operational Policies 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 5 below summarizes safeguards policies that were triggered by the project

Table 4-5: World Bank Operational Policies

OP 4.01	Environmental Assessment	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. 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	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 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	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, WTP and water storage tanks.
OP 4.11	Physical Cultural Resources	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 EMP are measures to mitigate impacts on cultural properties. When RAP studies are carried out, any physical cultural resources in the water transmission corridor will be enumerated as structures and all affected PAPs will be compensated for such structures to ensure that they are relocated following the cultural norms of the affected people and society. So far in this ESIA no PCRs like graves or shrines have been found above ground along the project corridor. However, with excavations chance finds of archaeological/paleontological value may be found. Hence a chance finds procedure has been developed for this project;
OP 4.36	Forests	The objective of this policy is to assist borrowers to harness the potential of forests to reduce poverty sustainably, integrate forests effectively into sustainable economic development, and protect vital local and global environmental services. Although no forest will be affected, the project will put in place measures that enhance the tree cover in the project area in line with the National forestry and tree planting guidelines.
	World Bank Policy on Access to Information (July 1, 2010)	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, Municipal and Local council leaders, and communities among others during the consultation process and the information is accessible.

4.6.2 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) Favoring 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.

4.7 Institutional Arrangements

Some of the institutions relevant to the proposed project include:

4.7.1 National Environmental Management Authority (NEMA)

NEMA is under the Ministry of Water and Environment (MWE) but has a cross-sectoral mandate to oversee the conduct of EIAs through the issuance of guidelines, regulations and registration of practitioners. It reviews and approves environmental impact statements in consultation with any relevant lead agencies.

NEMA works with District, Environment Officers and local environment committees at local government levels who also undertake inspection, monitoring and enforcement compliance on its

behalf. In Government ministries, NEMA works with Environmental Liaison Units to ensure the incorporation of environmental issues in their activities, policies and programs.

4.7.2 Ministry of Water and Environment (MWE)

This project is being implemented by MWE, which will undertake the policy formulation, quality assurance, coordination, monitoring and evaluation of Safe and Clean water coverage in Uganda.

4.7.3 National Forestry Authority (NFA)

The National Forestry Authority plays a pivotal role in implementing Uganda's forestry policies and contributing to the country's environmental and socio-economic well-being through responsible forest management and conservation.

4.7.4 Ministry of Gender, Labour & Social Development (MGLSD)

This ministry sets policy direction and monitoring functions related to labour, gender and general social development. Its OHS Department in the ministry is responsible for inspection and mentoring of occupational safety in workplaces and this could be during project construction

4.7.5 Moyo District Local Government (MoDLG)

These local governments through the district water officers provide are directly in charge of water resources and the provision of clean and safe water to the community members. The project will be directly supervised by the district local government in the area of jurisdiction. Key offices in these administrative areas that are relevant to the project include; the Water officer, Environment/Natural Resources Directorate/Department, Directorate/ Department of Physical Planning/Lands, Community Development Office Health Directorate/Department, Local council administration (LCI) within the project areas.

4.7.6 Department of Museums and Monuments (DMM)

The Department of Museums and Monuments (DMM) in the Ministry of Tourism, Wildlife and Antiquities (MTWA) is the technical department mandated to oversee the implementation of the Historical Monuments Act Cap 46 of 1968. The Act mandates the Department to collect, document and preserve cultural relics that have value to the community, nation and international community. Under Sections 10 & 11 of the Historical Monuments Act, Conservators of Antiquities are mandated to maintain and inspect preserved or protected objects.

4.7.7 The Department of Petroleum Supply (DPS)

The Department of Petroleum Supply (DPS) is mandated under the Petroleum Supply Act 2003 to supervise and monitor the importation, exportation, transportation, processing, supply, storage, distribution and marketing of petroleum products. The Department ensures public safety and protection of public health and the environment in all petroleum operations and installations.

4.7.8 Ministry of Lands, Housing and Urban Development (MoLHUD)

The Ministry of Lands, Housing and Urban Development, is a cabinet-level government ministry of Uganda. It is responsible for "policy direction, national standards and coordination of all matters concerning lands, housing and urban development. The ministry shall be responsible for valuation.

5. ALTERNATIVE ANALYSIS

This ESIA considered analysis of the various feasible alternatives of the project under different scenarios to identify and describe the potential feasible alternatives that would allow the project to reach its objectives. This section provides different options which were considered during the feasibility, screening and scoping stages of the ESIA. The best alternative (Proposed Project Option) is the one that has minimum negative environmental and social impacts, is cost-effective and allows the objective of the project to be met. Several alternatives were analyzed and these included alternative water sources, source of power, routes for the pipeline, "no project alternative" among others.

5.1 Alternative Sources

5.1.1 Surface Water Sources

Apart from the White Nile, there is no surface water body in the vicinity of the project area that could serve as a water source for the proposed project. Getting water from the White Nile would not be cost effective given the cost of installation of Bulk transfer and the cost of treatment of the raw surface water. This option was therefore ruled out on the basis of unviability.

5.1.2 Groundwater

A Production borehole, DWD89698 located in Pakoma West village, Laropi parish, Laropi Sub- County was sited, drilled and recommended for use as a production well with a yield of 91m3/h. The water from this well is of good quality and sufficient to serve as a water source for the Laropi Water Supply and sanitation system alongside the existing borehole within the project area currently supplying water to the existing Laropi water supply scheme to be rehabilitated.

5.1.3 Source of Power

In the initial phases of the project, the new Borehole (DWD89698) will be the water source and will require a pumping regime of 13 hours per day in order to meet the water demand of 648 cubic metres per day in 2025. Th proposed power source is solar. However, solar power is available for a maximum of 8 hours per day. Therefore, a hybrid system of Hydro Electric Power (8hrs) and solar (8hrs) is proposed for BH1-89698 and BH2-227700 since solar power can only be provided to a maximum of 8 hours in a day.

5.1.4 No Project Alternative

This alternative assumes the status quo is maintained with no development of the proposed water supply and sanitation project. This would avoid a realization of the impacts concomitant to the development and operation of a water supply and sanitation system.

However, this would deny the communities the benefit of having access to safe water and improved sanitation thereby condemning them to rampant outbreaks of water borne diseases and other socio-economic challenges like loss of productive time, high school drop outrates, increased incidences of GBV and VAC among others. IWMDP

5.2 Alternative Routes of the Pipeline

Spatial analysis and field surveys were carried out to identify the alternative alignment of water pipelines in the project area. Although the proposed pipelines are mostly planned to be placed along public land such as road reserves, the initial pipe route was reviewed and alternative pipe routes were suggested to ensure that the pipe network does not heavily cross private property which might result in

involuntary resettlement whilst still supporting the water supply and sanitation system. The existing piped system will be upgraded and integrated with the proposed piping system

5.3 Alternative Access to Water Sources.

The water source is located close to existing roads, alternative access road 1 is shorter approximately 206 meters off the main existing road and would be the ideal access route with minimal clearing of vegetation cover and destruction of property, while access road 2 is longer 356metres off the main existing road and traverses existing households and gardens. Thus Access Road 1 is the preferred option.

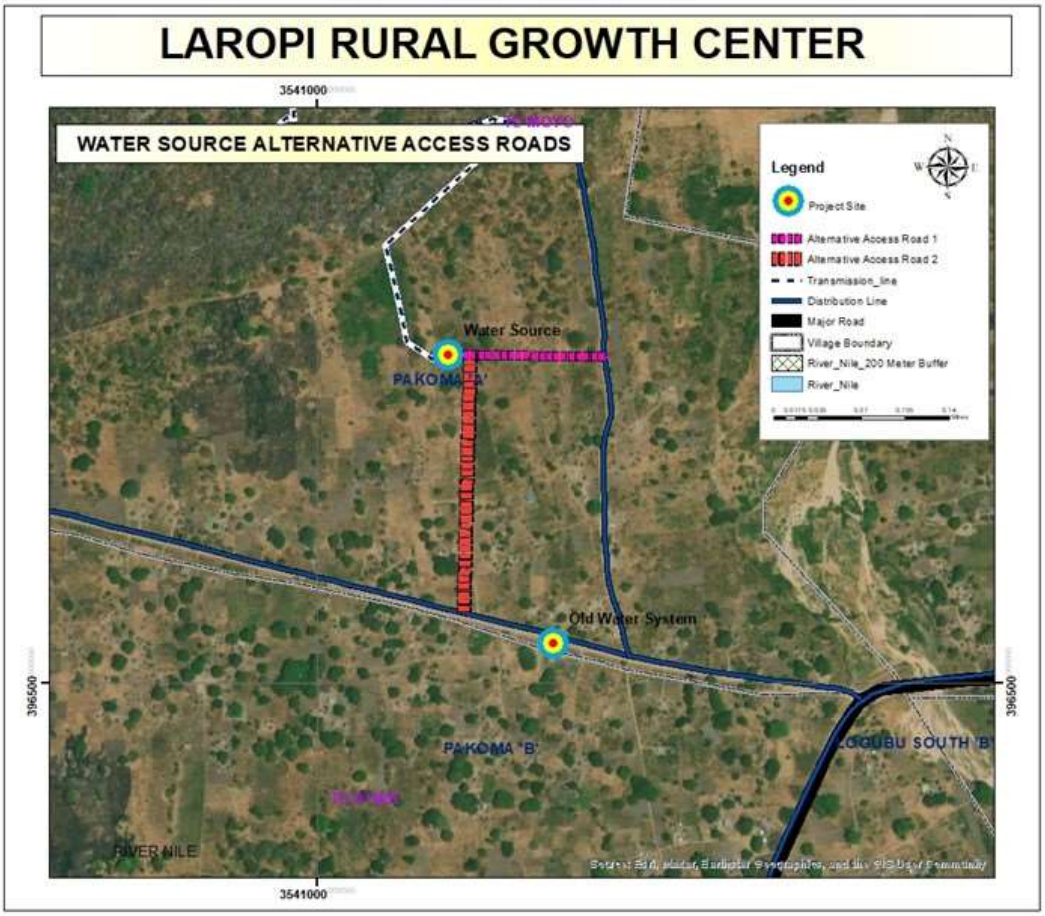


Figure 5-1: Alternative Access to Water Source.

5.4 Alternative Access to Water Reservoir

The water reservoir is located close to the water source though at the highest point and would require blasting of rock to create an access road, alternative access road 1 is Longer at 1.7km from the main Moyo Laropi road and would be the ideal access route with minimal clearing and destruction of property, while access road two is Shorter with 0.77km from the main road and traverses existing households and gardens. Thus Access Road 1 is the preferred option.

Figure 5-2: Alternative Access to Water Reservoir

5.5 Sanitation Options

The Laropi water supply and sanitation system includes a sanitation component for households and institutions Both onsite and offsite systems have been evaluated as shown below:

5.5.1 Central Sewerage System

The Central Sewerage system is an offsite treatment system. The Central sewerage system requires that adequate waste water should be generated to drive the excreta down the sewers. A sewage generation rate of 5m³ d/ha4 is considered the lowest rate at which a central sewerage system can properly function. This requires functional water house connections with in-house sanitary facilities. For towns with existing water supply systems, an indication of sewage generation is the existence of Septic Tanks. From the sampled households in the project area, few households had access to a flush toilet, and all public toilets were VIP. This means that a centralized sewerage system is not suitable for the sanitation intervention. The high investment and associated infrastructure rules out such a system, its efficiency notwithstanding.

5.5.2 On-Site Sanitation Systems

On-site sanitation systems comprising septic tanks and Ventilated Improved Pit Latrines are efficient systems that can serve rural populations. However, onsite systems can be progressively upgraded with time to connect them to central sewerage systems. Given their ease to construct and manage, improved

pit latrines and septic tanks are highly recommended for the Laropi scheme, with economic development, as the town develops, they could be easily upgraded. The ESIA proposed that the implementation of onsite sanitation systems be implemented as follows:

a) Septic tank system for the medium-income group i.e., households with water connections,
b) Improved pit latrines for low-income groups i.e., households with yard taps and those who use public stand posts.
c) Development of a faecal sludge treatment Plant

Given the low-cost implications, nature of RGC settlement patterns, environmental and social realities, on-site sanitation systems have been adopted for this project.

5.6 Alternative Siting for Faecal Sludge Treatment Facility

Two wastewater management facilities site alternatives were identified namely Site 1 and Site 2. Site 1 is upstream of Site 2 and closer to the market

Two faecal sludge sites have been proposed for the construction of the Laropi FSMF. Both sites are located in Moyo District with the 1st located in Pakoma village, Gbalala Parish in Laropi town council (Site 1) and the other in Logubu village, Laropi parish, Laropi sub-county (Site 2).

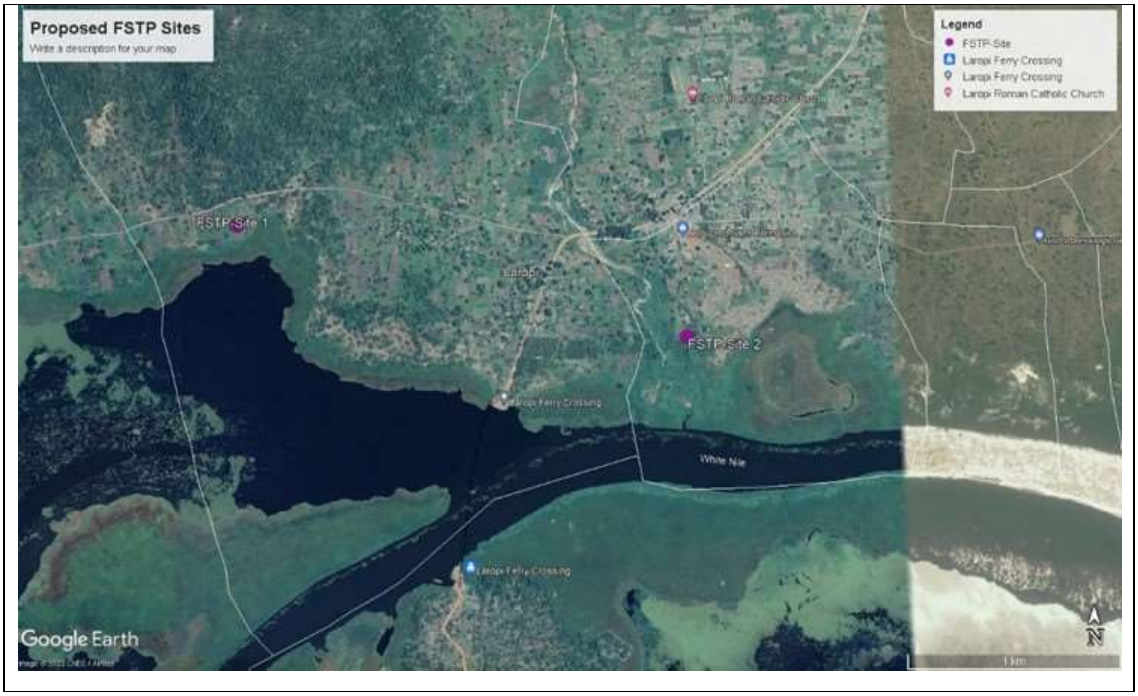


Figure 5-3: Faecal Sludge Alternative Sites

Site 1 is located nearly at the edge of the project benefiting the town of Laropi using the 25km radius of the coverage circle (yellow circle) hence making it an easy depository area for sludge collected throughout the project towns. However, Site 2 in Logubu South is located in a more central position in the project area in Laropi sub-county which when the 25km radius circle of coverage was drawn (blue circle) also includes most of the project area plus some areas in Moyo town council, Metu sub-county, Otce sub-county, Lefori sub-county and also parts of Adjumani district. Since these two sites are about 2.5km from each other, they have very similar areas of supply.

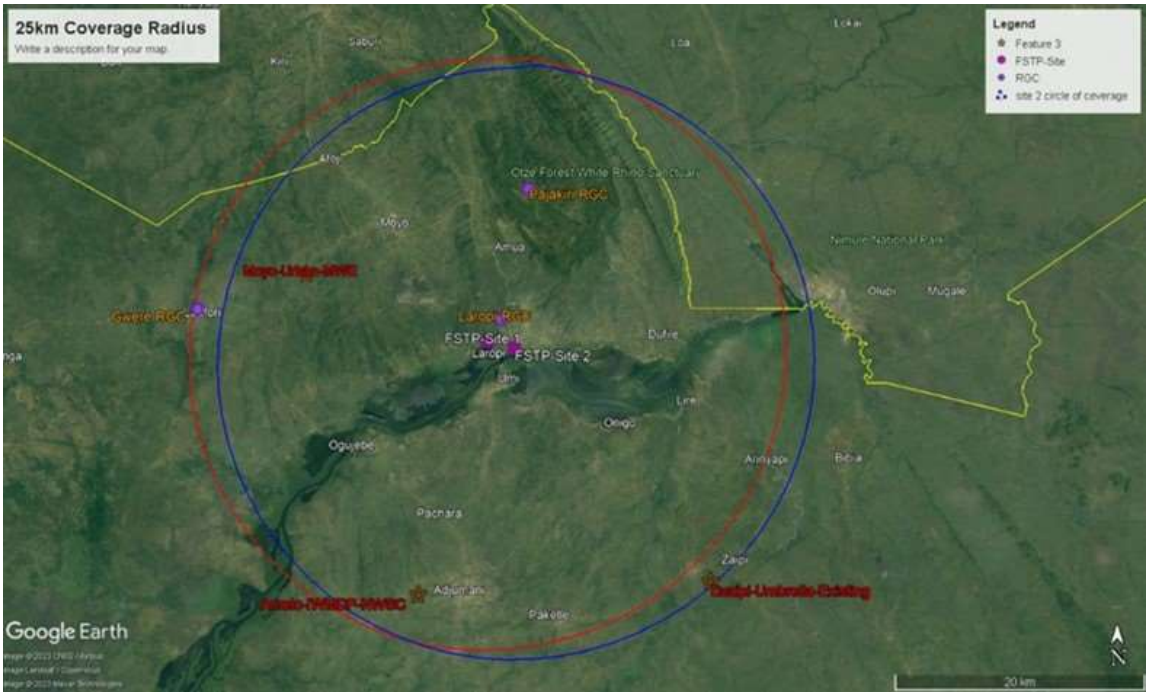


Figure 5-4: Site Coverage Radius

5.6.1.1 Accessibility

Site 1 can be accessed about 150 meters off the Laropi-Obongi gravel road while Site 2 can be accessed by a gravel 1km road off the Laropi-Moyo main road at a branch off within Laropi trading centre.

5.6.1.2 Surface Area

The essential conditions to consider are "surface area should be not less than (4acres)". Both sites are large enough to accommodate the faecal sludge treatment facility. The design and sizing of the treatment units and site layout will be the basis of selecting the adequate land size required for the faecal sludge treatment facility

5.6.1.3 Topography

The essential conditions to consider are "no risk of flooding". The selected site should not be threatened by flooding or soil erosion. For site 1, the layouts and slopes are suitable for gravity flow through the proposed FSMF but Site 2 has a relatively flat topography that will require some backfilling and pumping of sludge during operations of the FSTP. Drainage of the rest of the sites should not be an issue due to the slope of the sites. Additionally, soil erosion should not be a problem due to the gentle slope of the sites.

5.6.1.4 Suitability Criteria

Susceptibility to flooding: this is very significant because if a Faecal sludge treatment facility is located within a flood-prone area, water pollution during flooding would result in serious health issues in the area. Therefore, areas of medium to high flood susceptibility were assigned the lowest rank during Analytic Hierarchy Process (AHP).

Slope factor: this determines the cost of levelling the field and land value during project implementation. In this regard, flat areas were ranked high during modelling than steep slope areas.

Distance: A distance of 250m was considered most appropriate as stipulated by NEMA regulations of Lakeshore and River bank buffer zones of River Nile.
Population: This is essential as treatment facilities in crowded areas may not be accepted by the people, and it needs additional precautions and expenses. In this regard, areas with low to moderate populations were considered to have a high rank, as it is not preferred to install a treatment plant facility in crowded areas.

Out of the two proposed sites (Site 1 and Site 2), the most suitable site is Site 1. The strength of using Site 1 is that its network passes through the central/commercial area of Laropi Town which is more planned than the network for Site 2. As such, Site 1 provides an option that is close to urban development in the planned area as compared to the unplanned area through which Site 2 lies. Furthermore, Site 1 is located in a flat area hence low costs of levelling during construction; relatively far from flood-prone areas; at least 100 m away from surrounding settlement/built-up area; and along 200m riparian.

5.7 Wastewater Management Alternatives

Several options exist for the management of wastewater (Faecal sludge) in the project area. The common options that are suitable for developing countries include Ventilated Improved Pit Latrines, waste stabilization ponds, individual septic tanks and communal anaerobic baffled reactors as detailed in Table 5-1 below.

Table 5-1: Comparison of Wastewater Management Options

No	Technology	Advantages	Disadvantages
1.	Ventilated improved pit latrines	• Flies and odour are significantly reduced • Long service life • High reduction of BOD • Low sludge production: the sludge is stabilized • Moderate area requirement (can be built underground) (Compared to non-ventilated pits) • Can be built and repaired with locally available materials • Low (but variable) capital costs depending on materials and pit depth • Small land area required	• Low reduction in BOD and pathogens with treatment and/or appropriate discharge possible contamination of groundwater • Costs to empty may be significant compared to capital costs • Sludge requires secondary treatment and/or appropriate discharge
2.	Faecal sludge treatment	• Resistant to organic and hydraulic shock loads • High reduction of solids, BOD and pathogens • High nutrient removal if combined with aquaculture • Low operating costs • No electrical energy is required • No real problems with insects or odours if designed and maintained correctly	• Requires a large land area • High capital costs depending on the price of land • Requires expert design and construction • Sludge requires proper removal and treatment

3.	Individual septic tanks	• Simple and robust technology • No electrical energy is required • Low operating costs • Long service life • Small land area required (can be built underground)	• Low reduction in pathogens, solids and organics • Regular desludging must be ensured • Effluent and sludge require further treatment and/or appropriate discharge
4.	Communal Anaerobic Baffled Reactor	• Resistant to organic and hydraulic shock loads • No electrical energy is required • Low operating costs	• Requires expert design and construction • Low reduction of pathogens and nutrients • Effluent and sludge require further

The project proposes to use faecal sludge treatment facilities based on their resistance to organic and hydraulic shock loads, high reduction of pollutants (solids, organics, nutrients and pathogens), low operating costs, low electrical energy requirements and no real problems with insects or odors if designed and maintained correctly.

6. ENVIRONMENT AND SOCIAL BASELINE

6.1 Overview

Preliminary biophysical and socio-economic baseline primary data has been undertaken for each project specific and an overview of each site has been elaborated per specific district. The environmental baseline data has further been benched marked using secondary available data for the project area of influence (Direct and indirect) further specific site primary data will be undertaken during the detailed ESIA phase.

6.2 Environmental and Physical Baseline

6.2.1 Climate

According to MDLoG 2022, the climate of Moyo district is tropical with moderate rainfall and temperature. The district experiences extreme seasonal variation in monthly rainfall. On average the district receives about 1,267mm of annual rainfall with a distinct dry period that begins from December to February. November and March have moderate rainfall. The two major peaks in rainfall occur in April (short rainy season) and between August and October (major rainy season). Areas along the Nile receive lesser rain (860mm) than the rest of the district.

The highest temperature recorded in the district was 450C from January to February and the lowest 29 0C from August to October. The area has a humidity of over 80% in most months which reduces to below 50% during dry seasons especially in December to February.

6.2.1.1 Temperatures

According to weather spark.com, the annual mean average high temperature in Moyo is 35ºC with the lowest being 18ºC as shown in Figure 6.1 below.

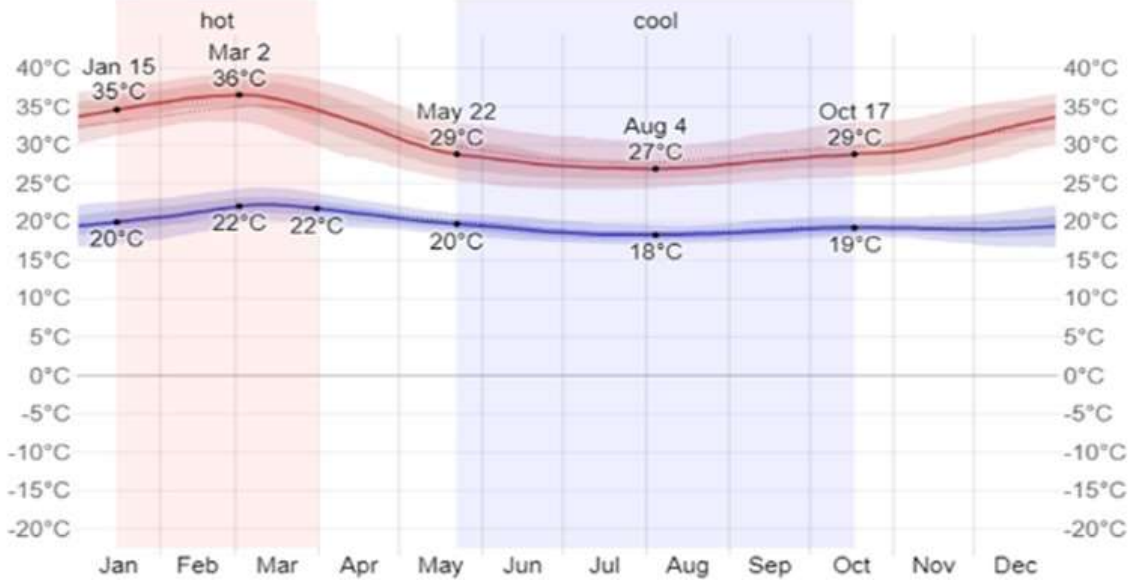


Figure 6-1: Average High and Low Temperatures for Moyo District

Moyo experiences extreme seasonal variation in monthly rainfall. The rainy period of the year lasts for 10 months, from February 13 to December 21, with a sliding 31-day rainfall of at least 13 millimetres. The month with the most rain in Moyo is August, with an average rainfall of 151 millimetres. The

rainless period of the year lasts for 1.7 months, from December 21 to February 13. The month with the least rain in Moyo is January, with an average rainfall of 7 millimetres as seen in Figure 6-2 below.

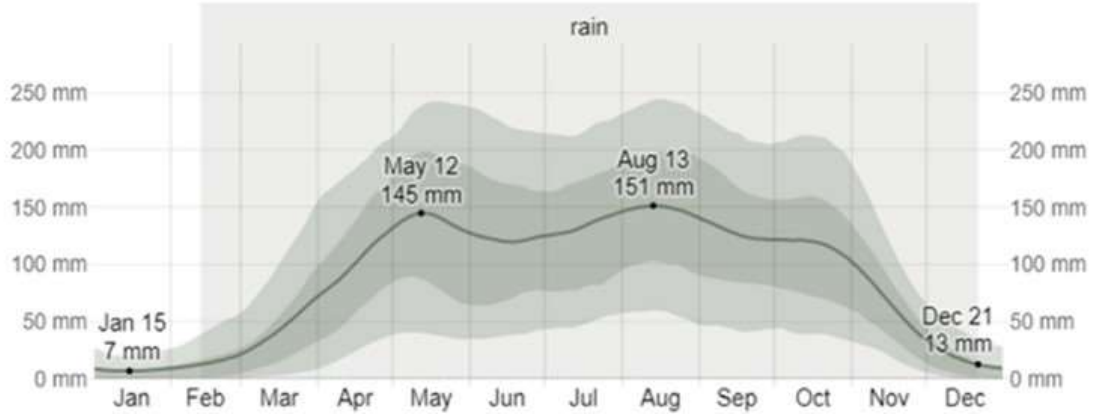


Figure 6-2: Average Monthly Rainfall for Moyo District

6.2.1.2 Sun

The length of the day in Moyo does not vary substantially over the year, staying within 20 minutes of 12 hours throughout. In 2023, the shortest day is December 22, with 11 hours, 55 minutes of daylight; the longest day is June 21, with 12 hours, 20 minutes of daylight. as seen in Figure 6.3 below.

Figure 6-3: Hours of Daylight and Twilight

The earliest sunrise is at 6:36 AM on October 27, and the latest sunrise is 31 minutes later at 7:07 AM on February 5. The earliest sunset is at 6:35 PM on November 7, and the latest sunset is 33 minutes later at 7:08 PM on July 20 as seen in Figure 6.4. below. Daylight saving time (DST) is not observed in Moyo during 2023.

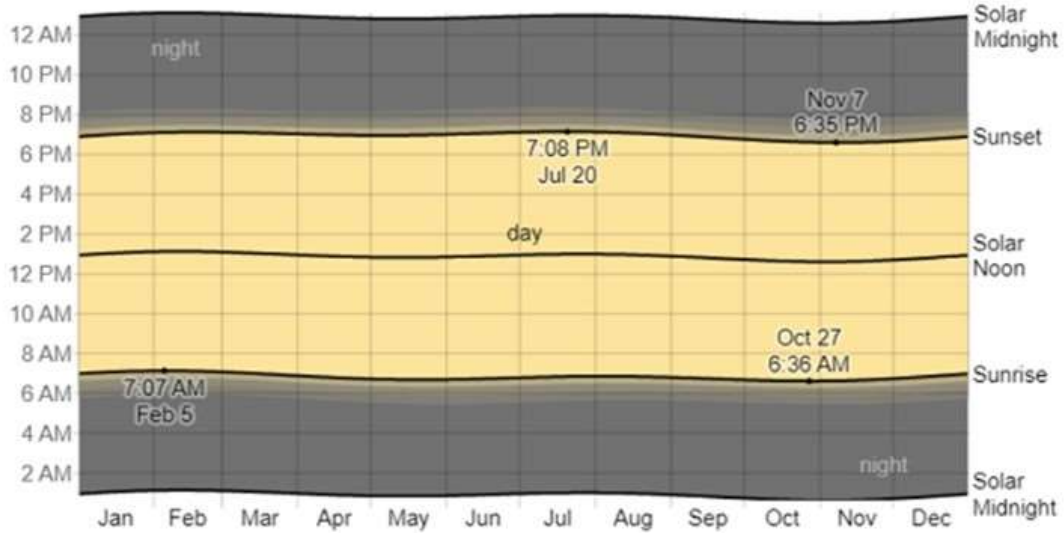


Figure 6-4: Sunrise and Sun Set with Twilight

The solar day over the year 2023. From bottom to top, the black lines are the previous solar midnight, sunrise, solar noon, sunset, and the next solar midnight. The day, twilights (civil, nautical, and astronomical), and night are indicated by the colour bands from yellow to grey.

6.2.1.3 Humidity

Moyo experiences extreme seasonal variation in the perceived humidity. The muggier period of the year lasts for 8.5 months, from March 24 to December 9, during which time the comfort level is muggy, oppressive, or miserable at least 21% of the time. The month with the muggiest days in Moyo is October, with 24.6 days that are muggy or worse. The month with the fewest muggy days in Moyo is January, with 0.8 days that are muggy or worse as seen in Figure 6-5 below.

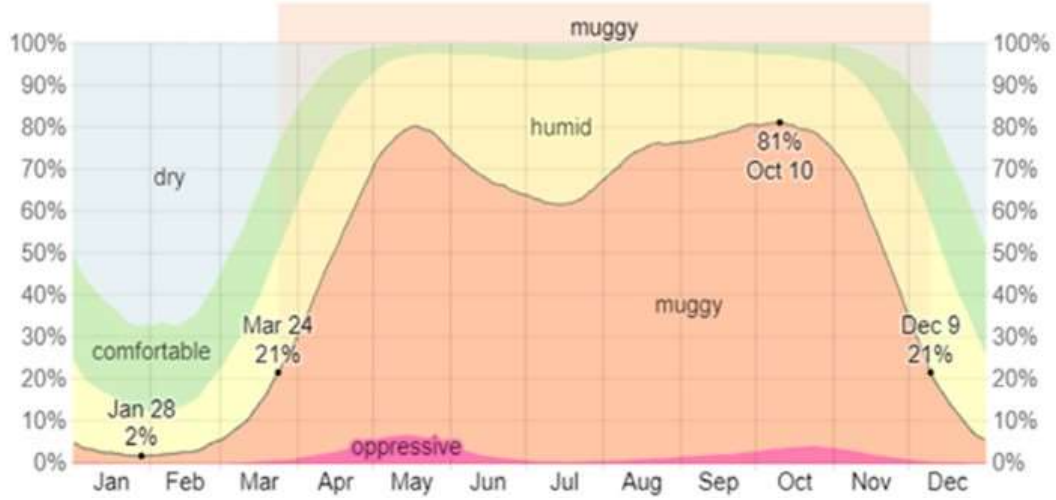


Figure 6-5: Humidity for Moyo District

6.2.1.4 Solar Energy

The average daily incident shortwave solar energy experiences some seasonal variation over the year. The brighter period of the year lasts for 2.0 months, from January 20 to March 19, with an average daily incident shortwave energy per square meter above 6.1 kWh. The brightest month of the year in Moyo

is February, with an average of 6.3 kWh. The darker period of the year lasts for 2.9 months, from May 10 to August 5, with an average daily incident shortwave energy per square meter below 5.3 kWh. The darkest month of the year in Moyo is June, with an average of 5.0 kWh. Figure 6:5 below best illustrates the solar energy trend in Moyo district.

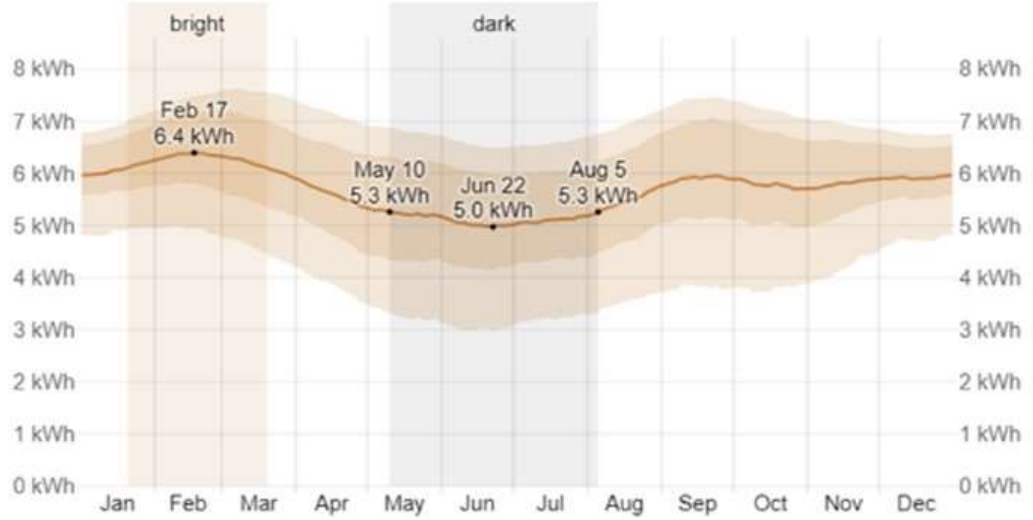


Figure 6-6: Average Incident Shortwave Solar Energy for Moyo

6.2.1.5 The most frequent climate change impacts in the project area

a) Domestic water shortage

Climate change is disrupting weather patterns, leading to extreme weather events, unpredictable water availability, exacerbating water scarcity and contaminating water supplies. Such impacts have drastically affected the quantity and quality of water needed by communities in Laropi areas. Several water sources especially shallow wells and spring wells in the area have either dried up due to the dry season or contaminated by livestock. Some of the available community boreholes are also broken down and require repair.

b) Food shortages

Increases in average temperatures, changes in rainfall patterns and total annual rainfall amounts are the most critical climate change issues in Uganda. Unpredictable rainfall patterns have resulted in changing growing seasons and reduced water availability. This has several knock-on effects. Many Ugandans depend on rain-fed agriculture and less rain means less food availability, accessibility and utilization. With a majority depending on agriculture for jobs, it affects income levels too.

c) Disruption of transport services due to severe flooding along the Nile

Flooding disrupts the only existing route connectivity along the river Nile, connecting Adjumani in Northern Uganda to Moyo in West Nile, through Laropi-Umi Ferry crossing. This comes as a result of the destruction of ferry docking sites hence limiting ferry operations.

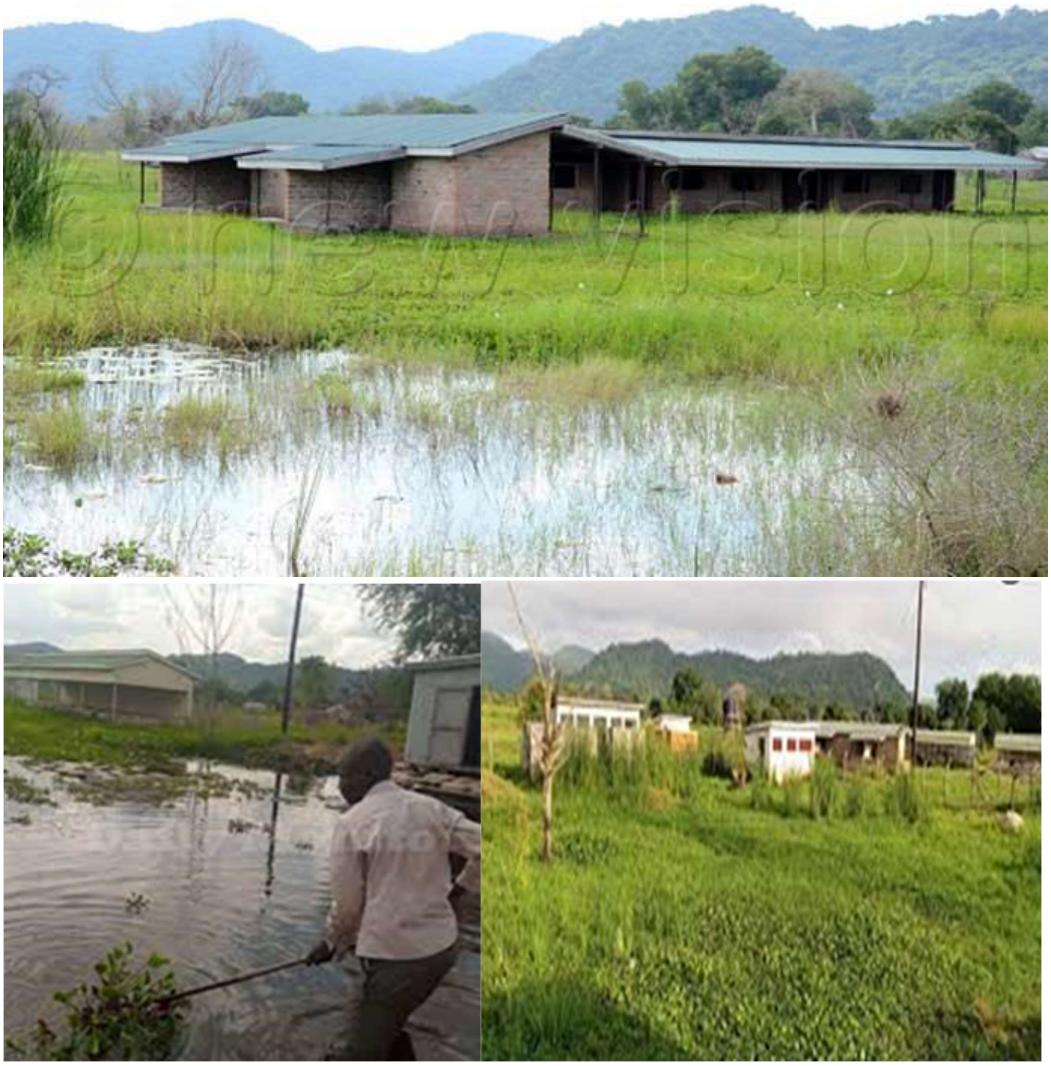


Figure 6-7: Flooding in Laropi RGC

6.2.2 Topography

Moyo district's topography is characterized by low planes and rolling hills along the Nile River, at 900m above sea level rising to a series of hills and peaks. The highest peak is Mt. Otze at 1500m above sea level. The Nile River bank raises sharply upwards producing a landscape characterized by plateaus, and flat-topped hills, inter sparse with deep valleys and giving rise to steep slopes. Drainage occurs towards the Nile, through a series of rivers, which are seasonal and mainly supplied by rainwater (MDLoG 2022).

6.2.3 Geology

Most of Uganda is underlain by Precambrian rocks though not all various facies have been exhaustively mapped and stratigraphically correlated. The Neogene alluvial and rift sediments cover Moyo District as shown in 6-6 below.

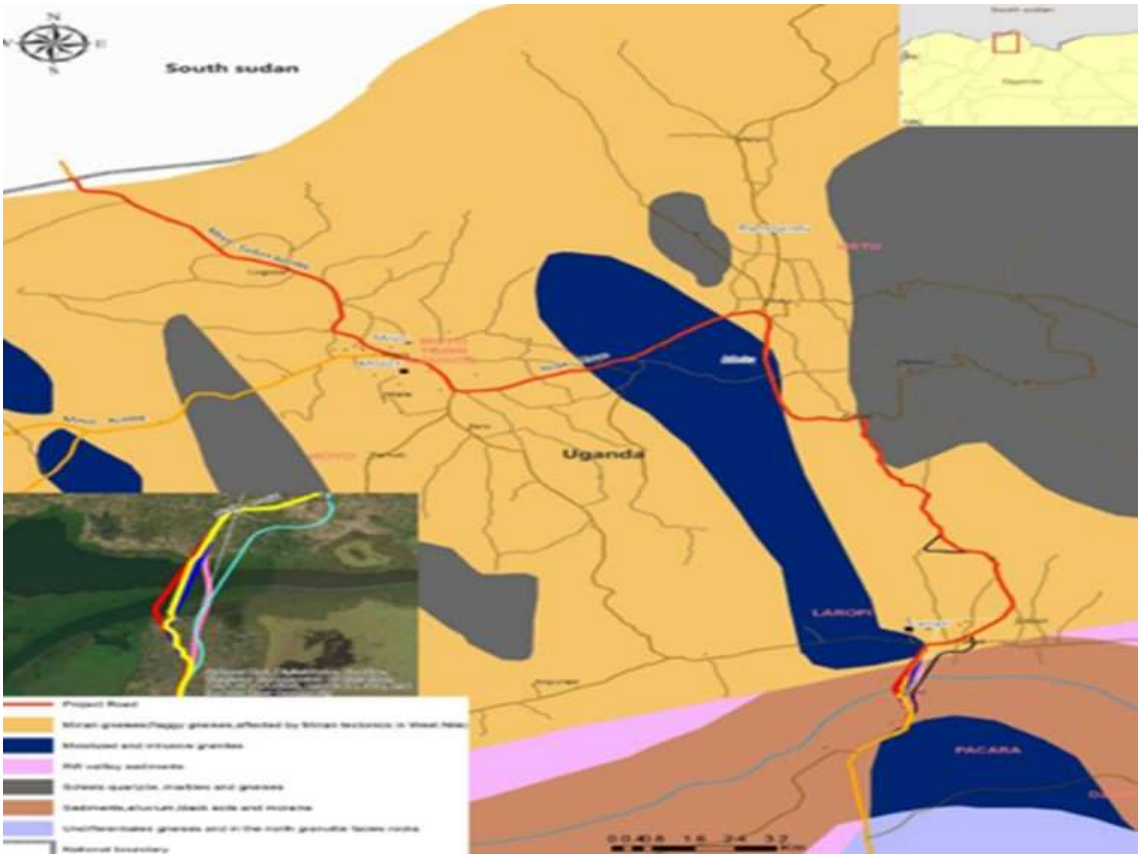


Figure 6-8: Geology of the project area (Source: UNRA Survey Department, 2022)

6.2.3.1 Geotechnical Assessment of Sites

During the Geo-technical Investigation, 3 trial pits (TP 1, TP 2 and TP 3) for the borehole, Faecal Sludge Treatment plant and reservoir were excavated to a depth of 2 meters each and the soils were all found to be clayey sand and the other meters (LL- Liquid Limit, PL – Plastic Limit, PI – Plasticity Index, LS – Linear Shrinkage and NMC - Natural Moisture Content) as shown in Figure 6-8 and Figure 6-9 below.

Project: Soil Investigation for the Detailed Engineering Design and Construction Supervision of Solar Powered Piped Water Supply Systems and Sanitation Facilities in Refugee Settlement and Host Districts in West Nile and Northern Uganda. Lot 1 Madi Okollo, Terego and Moyo Districts

Client: Ministry of Water and Environment

Summary of laboratory test results from Trial pit samples

Location	TP No	Depth (m)	Soil Description	% passing the given standard sieves														LL	PL	PI	LS	NMC	USCS soil Classification
				50.0 mm	37.5 mm	20.0 mm	10.0 mm	6.3 mm	5.00 mm	2.00 mm	1.18 mm	0.60 mm	0.425 mm	0.30 mm	0.212 mm	0.150 mm	0.075 mm	%	%	%	%	%	
Laropi FSTP Site	TP1	2.0	Clayey SAND	100	100	100	100	100	100	99	98	92	85	77	65	54	37	48	24	24	12	16	SC
	TP2	2.0	Clayey SAND	100	100	100	100	100	98	96	94	90	85	78	67	51	32	48	27	21	11	19	SC
	TP3	2.0	Clayey SAND	100	100	100	100	100	100	98	97	93	88	81	70	61	47	45	23	23	10	21	SC
Laropi Borehole Site	TP1	2.0	Sandy CLAY	100	100	100	100	100	100	100	99	92	84	76	69	65	56	30	19	12	8	17	CL
	TP2	2.0	Sandy CLAY	100	100	100	100	100	100	100	98	92	85	78	71	66	58	31	18	13	8	20	CL
	TP3	2.0	Sandy CLAY	100	100	100	100	100	100	100	98	91	83	76	68	64	58	30	17	13	7	16	CL

Figure 6-9: Summary of laboratory results of test samples from Trial Pits

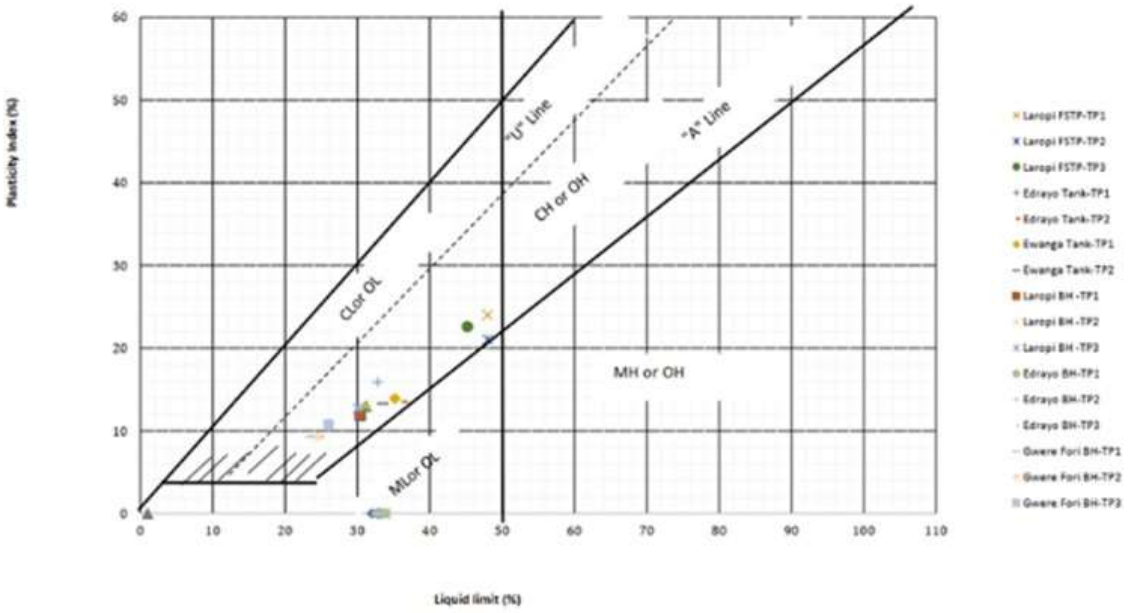


Figure 6-10: Summary of Plasticity Index Results

For the detailed Geo-technical Investigation Results, the report is attached in Appendix 5 of this ESIS.

6.2.3.2 Soils

Moyo district soils are generally considered moderately fertile with shallow soil depths of 30cm and easily nutrient weathered and leached. The commonest soil types in the district include Leptosols varying from dark grey to dark which is slightly acidic and mainly derived from granite, gneissic and sedimentary rocks. They occur on gently undulating hilly topography in the sub-counties of Metu and Moyo sub-counties and parts of Dufile, Laropi. Vertisols with black/dark clays prone to cracking, sticky, muddy and easily waterlogged and good for cotton growing with yellowish and sandy-loam

texture mainly found in Laropi and Moyo sub-counties. Alluvial deposit soils are rich in organic matter and plant materials, very deep soils and good for agricultural production found mainly in Dufile, Laropi and parts of Lefori sub-counties and Ferruginous soils are fairly young soil containing weatherable materials, require moderate rainfall for productive agriculture mainly in Moyo, Metu and Lefori sub-counties (MDLoG 2022).

6.2.4 Seismic Hazard Assessment

The distribution of earthquakes in Uganda and neighbouring countries recovers that the seismicity occurs mainly in two zones East and West of Uganda. Thus, three activity zones are assumed, which are Zone 1 covering the Western Branch of the EARS and Zone 2 covering the Eastern Branch. Zone 3 is assumed to be less seismically active. Uganda Seismic Standard (US 319.2003) however indicates that the project site is located within seismic zone 2, which leads to a seismic zoning factor Z = 0.8. Thus, the following PGA can be estimated from their basic response spectrum PGA = 0.8x0.08 g = 0.08 g = 0.63 m/s².

6.2.5 Vegetation

The landscape setting of the project area is defined by a modified landscape with extensive subsistence croplands, bushland/grassland fallow mosaics, built-up area and plantation agriculture; and transition natural vegetation within the hilly rocky grounds. In general, the natural vegetation cover within the project area had been reduced by human presence leaving small patches of natural transitional vegetation amidst vast degraded habitats. Most of the dry lands and small water courses comprised settlements, with a dense network of tree cover especially *Milicia excelsa, Mangifera indica, Azadirachta indica, Senna siamea, Tectona grandis, Vitellaria paradoxa, Khaya senegalinsis, Ficus spp* and other trees. Plantation agriculture is characterized by *Tectona grandis* woodlots. Most of the tree cover is within homesteads.

The most dominant woody species were *Milicia exclesa, Tectona grandis, Vitellaria paradoxa, Khaya senegalensis, Afzeria africana, Azadirachta indica, Combretum collinum, Combretum molle, Viex doniana, Pserospermum, Acacia hoockii, Albizia grandibracteata, Sclerocarya birrea, Gardenia terniflora, Maytenus senegalensis, Harrisonia abyssinica, Philenoptera laxiflora and Ziziphus pubescens, Cajanus cajan* and *Manihot esculenta*. The most dominant herbacous plant species within the project area were *Hyparrhenia fillipendula, Hyperthelia dissoluta, Panicum maximum, Chloris gayana, Cynodon dactylon, Imperata cylindrica, zea mays, Brachiaria brizantha, Pennisetum polystarchion*, and *Eragrostis spp*. Thus there are no species of conservation concern of flora within the project areas.

6.2.5.1 Plant species Reserved under National Forestry and Tree Planting Regulation 2016

Like the threatened species there were quite several plant species within the project area. Table 6-1; provides a list of plant species listed under Schedule 8 of the national forestry and tree planting regulation 2016 as reserved/protected species. One requires a permit from NFA or the district forest office as provided in schedule 9 of the same forestry and tree planting regulation 2016. These species are usually harvested for poles, timber and fuel wood due to the high-quality timber and poles they produce. Some of these species are threatened and listed under the IUCN red list, therefore require protection against any form of destruction due to their economic value and increased threats from humans given their high-quality value. The list of these protected plants is given in Table 6.1. below

Table 6-1: Plant species found on site which are listed under Schedule 8 of the national forest and tree planting regulation 2016 as reserved tree species

Family	Species	Growth Form	IUCN 2020	MTWA 2018
Anacardiaceae	Mangifera indica	Tree	DD	NA
Fabaceae	Dalbergia melanoxylon	Tree	NT	VU
Fabaceae	Delonix baccal	Tree	NT	NA
Fabaceae	Tamarindus indica	Tree	LC	VU
Fabaceae	Albizia coriaria	Tree	LC	NA
Fabaceae	Albizia grandibracteata	Tree	LC	NA
Malvaceae	Gossypium hirsutum	Shrub	VU	NA
Meliaceae	Afzelia africana	Tree	VU	EN
Meliaceae	Khaya senegalensis	Tree	VU	EN
Moraceae	Milicia excelsa	Tree	NT	EN
Moraceae	Ficus glumosa	Tree	NA	NA
Moraceae	Ficus platyphylla	Tree	NA	NA
Moraceae	Ficus sur	Tree	NA	NA
Moraceae	Ficus sycomorus	Tree	NA	NA
Moraceae	Ficus natalensis	Tree	LC	NA
Sapotaceae	Vitellaria paradoxa	Tree	VU	EN

6.2.6 Mammals in the Project Area

6.2.6.1 Mammal species diversity

A total of 26 mammal species belonging to 6 Orders and 15 families were recorded within the project area (Table 6.2). The Order Rodentia was the most abundant Order associated with 7 species; followed by Chiroptera (6 species)). The success of this group (Rodentia) is in part attributed to its adaptability to new food sources and habitats. The project area was subjected to long-term disturbances most especially cultivation and the few remaining semi-natural habitats have been incubated by traditional massive cattle grazing of the prevailing societies. Currently, only a handful of native generalist species tend to dominate, while habitat and dietary specialists and migratory species became locally extinct (White & Burgin 2004; Tait et al. 2005). Mammal communities often respond rapidly to changes in habitat structure (Kincaid et al. 1983) and respond quickly to disturbance (Clark et al. 1989), sufficiently mobile to disperse to suitable sites and leave unsuitable sites, yet they are dependent on resources from a reasonably definitive localized area.

6.2.6.2 Reptile Diversity

A total of 10 reptile species were recorded, belonging to 8 families and 7 genera. These species belonged to 2 Orders namely; Serpentes, and Sauria of class Reptilia (Table 6-2). Order Sauria was the most dominant with genus Trachylepis presenting 3 species, according to Harold (1992), most lizards have well-developed limbs; the head is normally held high off the ground, and they are agile predators. This increases their colonization success, unlike the limbless Serpentes. According to (Gerlach, 2005) many Trachylepis species are generalists with a wide ecological tolerance, although there are several more specialized species. Though some of the encountered species were not yet evaluated by IUCN, those that have been evaluated were of least concern.

Table 6-2: Reptiles Recorded within the Project Area

No.	Order	Family	Species	Common Name	IUCN
1	Sauria	Agamidae	*Agama agama*	Rainbow Agama	LC

No.	Order	Family	Species	Common Name	IUCN
2	Sauria	Chamaeleonidae	*Chamaeleo gracilis*	Gracile Chameleon	NE
3	Sauria	Gekkonidae	*Hemidactylus brookii*	Brook's House Gecko	LC
4	Sauria	Gekkonidae	*Hemidactylus mabouia*	Tropical House Gecko	LC
5	Sauria	Scincidae	*Trachylepis maculilabris*	Speckle-lipped Skink	LC
6	Sauria	Scincidae	*Trachylepis Quinquetaeniata*		LC
7	Sauria	Gerrhosauridae	*Gerrhosaurus major*	Tawny Plated-lizard	LC
8	Sauria	Scincidae	*Trachylepis striata*	Common Striped Skink	LC
9	Sauria	Varanidae	*Varanus niloticus*	Nile Monitor	NE
10	Serpentes	Elapidae	*Naja melanoleuca*	Forest Cobra	LC

Figure 6-11: Agama-agama, the most abundant species in the project area

6.2.6.3 Distribution of Reptiles within the project area

Different reptile species are affected contrarily as a response to specific habitat modifications (Irwin et al. 2010). This was witnessed within the project area as the distribution of this taxon varied with land use changes, vegetation structure, soil types and the prevailing ecological conditions. Most of the key habitats that were influencing the distribution of reptile fauna within the project area included:

a) Rocky surfaces throughout the project area.

Almost all encountered reptile species were associated with rocks that are spread throughout the project area. However, most species that were encountered on rocks included; *Trachylepis Quinquedentate, Trachylepis striata, Trachylepis maculilabris* and *Agama agama*. These were distributed all over the project area irrespective of the land use changes and the degree of anthropogenic disturbances because they are generalist species.

b) Rocky surfaces within woodlands and grasslands

Gerrhosaurus major was associated with rocks away from farmlands and disturbed areas. It was mainly distributed along the rocky slopes within thickets, short grass and scattered trees in the lower side of the project area. This part of the project area is semi-natural only subjected to mild cattle grazing.

6.2.6.4 Amphibian Diversity

From this study, a total of only 8 amphibian species were recorded, belonging to Order Anura, 5 families and 7 genera (Table 6.3). This is relatively a low amphibian diversity considering the biodiversity potential of the project area; this could be attributed to the extremely dry conditions that limit amphibian activity along the river. All the encountered amphibian species were of least concern regarding the IUCN Redlist of species. Most frogs were confined along rivers and wetlands, these included; *Amietia angolensis* and *Hoplobatrachus* occipitalis. The family *Hyperolidae* had the highest number of species due to the Cyperus properties of streams.

Table 6-3: Amphibians reordered in the project area ad their various conservation status categories

Order	Family	Species	Common Name	IUCN
Anura	Hyperoliidae	*Afrixalus fulvovittatus*	Banded Banana Frog	LC
Anura	Pyxicephalidae	*Amietia angolensis*	Angola River Frog	LC
Anura	Bufonidae	*Amietophrynus regularis*	Common African toad	LC
Anura	Dicroglossidae	*Hoplobatrachus occipitalis*	Crowned bullfrog	LC
Anura	Hyperoliidae	*Hyperolius acuticeps*		LC
Anura	Hyperoliidae	*Hyperolius cinnamomeoventris*	Cinnamon-bellied Reed Frog	LC
Anura	Ranidae	*Ptychadena anchietae*	Ridged Grass Frog	LC
Anura	Ranidae	*Ptychadena mascareniensis*	Mascarene Grass Frog	LC

6.2.7 Bird Diversity

6.2.7.1 Distribution of Birds within the project area

Most of the encountered birds within the project area were Grassland specialists. This is because the project area is generally described as a savannah grassland habitat. This was followed by the tree species due to the existing woodlands within the project area. Some of the birds were forest Generalists and specialists because the project area is near some of the few remaining forests around Laropi areas, such ecosystems in combination with the remaining woodlands, and riverine vegetation along the River Nile greatly influenced the avifauna composition. The most dominant Bird species recorded were; *Pycnonotus barbatus* (Common Bulbul), *Pied Crow, Rupel's Long, Tailed Starling* and *Robin-Chat.*

6.2.7.2 Conservation Status of the Encountered Avifauna

All the identified avifauna was of Least Concern (LC) concerning the IUCN Red List of species. This is because they are disturbance-tolerant species and their populations are not threatened in any way. However, the local people in the project locality consider birds so delicious and they normally hunt them for source.

6.2.8 Hydrology

The most prominent water bodies within the project area are White Nile, which flows from Lake Albert northwards towards the Mediterranean Sea. A lot of seasonal rivers and flood plains are within Laropi Rural Growth Centre. The area is generally a flat plateau running into seasonal streams and swamps nearby which form the water collection points. There are several boreholes being used as collection points within Laropi town council and sub county. Ground water has been taped mainly in form of boreholes.

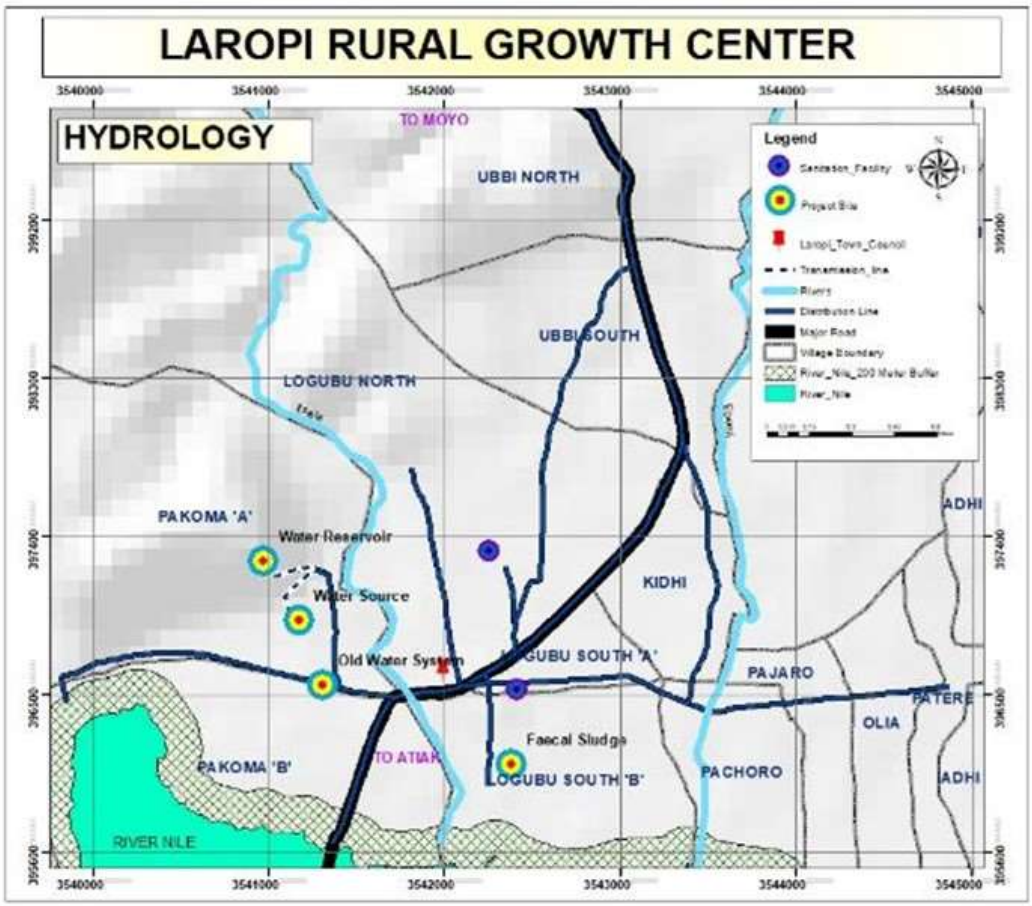


Figure 6-12: Hydrology Map of Laropi Project Area

6.2.9 Water Quality

6.2.9.1 Surface Waters

The surface water flows for these rivers correspond to the general rainfall pattern with almost peak river discharges corresponding to the peak rainfall pattern. Peak river outflows are experienced during the first rainy season between June and October. Though wetlands are an important part of an ecosystem and provide buffers for area rivers, many wetland ecosystems in the project area are seasonal flood plains and have already been encroached on for agricultural purposes.

6.2.9.2 Physical -Chemical Properties

Groundwater potential in the project area, whose recharge is mainly from rainfall, varies with location and degree of development. Compared to the National Ground Water Resource, Uganda as a whole has a good potential for groundwater resources. Groundwater quality from the laboratory analytical results was generally of acceptable quality and less impacted by pollution (Appendix 4).

6.2.10 Vibration Level Assessment

Vibration is the mechanical oscillations of an object about an equilibrium point. Vibration effects are dependent on the intensity of the oscillations and the nature of the structure or object in which it is transmitted. Such vibrations can affect both physical structures and human health depending on proximity to the source. In the United Kingdom, the Control of Vibration at Work Regulations 2005 specify daily exposure levels as follows;

- For hand-arm vibration (HAV), the daily ELV is 5 m/s² and the daily EAV is 2.5 m/s².
- For whole-body vibration (WBV), the daily ELV is 1.15 m/s² and the daily EAV is 0.5 m/s².

vibration assessment was taken at selected sampling points in July 2023 and readings are detailed in Table 6-4.

Table 6-4: Readings for Vibration: Acceleration (m/s²) taken in July 2023

S/N	LOCATION	Vibration Acceleration (m/s2)	(EASTING)(36N)	NORTHING) (36N)
1	Laropi Health Centre Iii	0.00	370076	395046
2	Laropi Town Council	0.00	368996	393639
3.	Laropi Ferry Operating Station	0.00	368160	392678

From Table 6-4 above, it is indicated that sampled points had readings being less than the equipment detection limit at 0 as the minimum level for acceleration for this respective equipment. Some construction activities are likely to present risks associated with vibration, especially compacting and material excavations. Measures shall be devised to protect the workers most susceptible to vibration by providing appropriate PPE. Continuous monitoring will also be undertaken against these baseline conditions.

6.2.11 Noise

Noise measurements taken in the selected sampled points are tabulated in Table 6.2; indicating that, the average daytime readings per location is 39.78 dB(A) with the minimum and maximum sound levels as 57.8 dB(A) and 29.2 dB(A) respectively. Due to the limited activity in the proposed project area, the majority 77.8% (n=18) of sampled points had their average sound levels below a daytime threshold level of 55 dB(A) for mixed locations with commercial and residential activities. Construction activities are associated with noise generation and will increase the noise levels within the project area.

Unregulated or uncontrolled 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.

Table 6-5: Measurements of Noise level, dB(A) taken in July 2023

S/N	LOCATION	Noise, dB(A))	(EASTING)(36N)	NORTHING) (36N)
1.	Laropi Health Centre III	29.20	370076	395046
2.	Laropi Town Council	31.05	368996	393639
4	Laropi Ferry Operating Station	46.50	368160	392678

6.2.12 Particulate Matter Assessment

The project area has low particulate matter of respirable granule sizes and none was detected exceeding the standard as set by WHO. Construction and operational activities usually generate Particulate matter of granule sizes PM10 and PM2.5 that may get logged into the respiratory tract once inhaled. During this baseline assessment, average particles in a cubic volume of air were detected through filter sizes of

0.3 µm filter, 0.5 µm filter and 5 µm filter and the results of their concentration levels are presented below

Table 6-6: Readings for Particulate matter measured

S/N	Location	0.3 µm Filter	0.5 µm Filter	5 µm Filter	(Easting)	(Northing)
1	Laropi Health Centre Iii	9.10E+07	6.56E+07	1.69E+07	370076	395046
2	Laropi Town Council	6.41E+07	2.11E+07	5.24E+05	368996	393639
3	Laropi Ferry Operating Station			46.50	368160	392678

6.2.13 Air Quality Assessment

All sampled sites indicated that the levels of Hydrogen Sulfide, Nitrogen Dioxide and Methane were less than the detection limit at 0 as the minimum level for this equipment (Table 6.4). However, though levels of Carbon dioxide were detected, none were above the PEL. This is attributed to the limited number of potential sources within the project. It is anticipated that the gaseous emission levels.

Table 6-7: Baseline air quality conducted in July 2023

		NO_2	H_2S	CO	CO2	VOCS	CH4
S/N	LOCATION	ppm					% VOL
1.	Laropi Health Centre LCIII	0	0	0	513.00	0	0
2.	Laropi Town Council	0	0	0	518.00	0	0
3.	Laropi Ferry Operating Station	0	0	0	508.00	0	0

6.3 Socio-Economic and Cultural Baseline

This chapter presents a description of the socioeconomic characteristics of the proposed solar-powered water supply System project in the Laropi RGC. Baseline descriptions have been formed through a combination of primary survey data, secondary data and stakeholder consultation. Baseline descriptions of demographic characteristics, access to infrastructure and social services, including available healthcare, education services and prevalent, land tenure, transport, economic activity, and gender, in the project area are essential to understanding project-affected communities, possible benefits to recipient communities and potential challenges and impacts during project implementation. A total of 218 households were sampled from the intended beneficiaries of the project and were interviewed using an individual structured household questionnaire administered to the head of the household.

6.3.1 Population and Demographic Characteristics

The 2014 population census revealed that the population of Laropi stood at 9,834 (4,978 males and 4,856 females) from the total population of 95,951 (47,175 males and 48,776 females) of Moyo district. By 2019, it was projected that Laropi would have a population of 10,861 people (5,559 males and 5,302 females)[1]. The 2020[2] population projection indicated 11,000 (5,600 males and 5,400 females) by 01/07/2020 with a population density of 140.5 Sq. Km, with an annual population change of 2.3%[3].

Like all the Ugandan demographic characteristics, the population structure indicates that the young population (0-14 years) is broad and largely dependent on the middle-aged group. The broad base implies that most of the country's population is young which is indicative of high fertility and mortality

[1] Source: Moyo District Development Plan 202o/2021-2024/2025.
[2] The 2020 projection does not consider the population increase by refugees from neighboring countries like South Sudan.
[3] Source: https://www.citypopulation.de/en/uganda/northern/admin/moyo/SC0308__laropi/

rates. This kind of pyramid is consistent with the age-sex composition of many other developing countries.

6.3.1.1 Household Size

It is reported that Moyo district has an average household size of 5.1 persons, with a total fertility rate of 5.6[4] children per woman lower than the national fertility rate of 6.2 children per woman. The study undertaken indicated that the average household size was between 5-6 persons per household which is almost the sam as the national average household size that stands at 5 persons. It's should also be noted that the average household size is lager in rural areas standing at 5 persons compared to urban areas that stands at 4 persons per households, and West Nil region stands at 4.5 persons.

6.3.2 Water Household Supply Source

The study established that the households were using more than one source of water for domestic use, as it was hard to solely depend on one source of water supply due to the inefficiency of the respective water source and the quality of water. A number of the community members relied on boreholes, protected springs, communal taps and unprotected sources. Statistics indicate that Laropi accesses safe water at 95%, with a functionality rate of 93%[5].

Figure 6-13: Borehole for the Community at Idijo Village

Figure 6-14: Existing Water Supply System

6.3.3 Sanitation

The study[6] undertaken indicated that about 95% of the population within the Laropi RGC toilet facilities was used within the households in the compound, while 5% never had toilet facilities but shared the toilets with neighbors or relatives. The common toilet facilities within the project area are mainly traditional pit latrines which are affected by the high-water table levels. Laropi RGC currently has no central piped sewerage facilities. The population in the Centre is mainly served by privately owned pit latrines. There are some public toilets in the project area at the Laropi daily market with 2-stance VIP toilets with 2 showering stances for the men and women. The Laropi landing site currently has no public

[4] Source: Moyo District Development Plan 202o/2021-2024/2025
[5] Source: Moyo District Development Plan
[6] Source: Final Feasibility Study Report (Laropi RGC) May 2023

toilets as the ones that were recently constructed got submerged when the water levels of the river Nile increased causing the river to burst its banks which rendered them unsafe to use.

Due to the increasing challenges of sanitation due to the increasing population in the Laropi RGC, it was proposed to have a faecal sludge treatment facility to manage the faecal waste.

Figure 6-15: A proposed Area for the Feacal Sludge Facility

6.3.4 Solid Waste Management

There is a waste dump site at Laropi market but it is being poorly managed because the rubbish is just dumped outside the collection area, and the Laropi Town Council cannot dispose of the waste. The household waste is mainly burnt within the household compound. The study indicated that the main type of garbage generated in the household, and 63% reported Polythene bags/plastic battles followed by 24% for food residues followed by waste paper and cooking materials with 10% and 7% respectively. About 5% of the households reported that they have primary garbage storage in their households compared to 95% that reported they don't have garbage storage in their homes. The picture below shows the existing solid wate disposal facility at Laropi Market.

Figure 6-16: Disposal Area for Laropi Market

6.3.5 Transport and Accessibility

An effective transportation network is very important as it allows access to food, healthcare, educational opportunities, and employment. As such, efficient and affordable transportation is an important driver of economic growth in both rural and urban areas and helps ensure that people can obtain services and participate in public life.

Laropi RGC is accessible via Atiak-Laropi road through the White Nile using a ferry at the Umi Landing site in the Adjumani district., and from Moyo Town along Moyo-Yumbe road. Laropi is well connected to the Moyo District Local governments and communities via the available roads being maintained by UNRA, District, Sub County as well as community roads.

All the roads within the Town Council and Sub County are gravel roads but are relatively well maintained by the local governments, and UNRA. There is an ongoing Laropi -Yumbe upgrading project by UNRA. The major transport means for the public are mainly motorcycles, and by foot to access the RGC for the various service

Figure 6-17: Laropi Ferry

Figure 6-18: Gravel Road within Laropi GRC

6.3.6 Settlements and Housing Modalities

The structures within the project are both permanent and temporally structures. Although there are linear and more permanent structures within the RGC, several community members are living within homesteads. The settlements are also linear, as the communities want to access services near the roads and also establish businesses along the roads.

Figure 6-19: Settlements in Laropi RGC

6.3.7 Education services

Education is a critical issue that affects nearly every aspect of human life and socio-economic development planning, and knowledge of the level of education among stakeholders is imperative as it guides the method and frequency of engagement before and during project implementation.

Several education institutions were identified in the project and including the following; St. Mary's Nursery and Primary School, Laropi Primary School, Idrimari Primary School, Ubbi Primary School, Gbalala Primary School, Nile Parents School and Laropi Seed Secondary School. Most of the primary schools are government aided and the communities can easily access the schools given that they are under the Universal Primary Education (UPE) program.

6.3.8 Health Services

Health is an important component of human capital because ill-health results in loss of earning opportunities and perpetuation of poverty hence the need to have quick and easy access to health care services. In the project area, the health services are accessed at Laropi Health Centre III.

6.3.8.1 HIV/ AIDS in the Project Area

According to the Uganda HIV/AIDs country progress report July 2016-June 2017, Uganda made great strides in reducing HIV incidence, HIV-related mortality, infant HIV infection and HIV prevalence where the National HIV/AIDS Strategic Plan (NSP) targets were surpassed. The Uganda Population HIV Impact Assessment (UPHIA) results revealed that the country made significant progress in reducing the HIV prevalence from 7.3% in 2011 to 6% in 2017. More still according to the UNAIDS

report, 1,400,000 people are living with HIV and AIDS in Uganda of which 84% know their HIV-positive status and 72% of people living with HIV were on treatment.

HIV in Uganda disproportionally affects women: of the 1, 300, 000 adults living with HIV, 770, 000 (59.23%) were women. New HIV infections among young women aged 15–24 years were more than double those among young men: 14,000 new infections among young women, compared to 5000 among young men. HIV treatment was higher among women than men, however, with 79% of adult women living with HIV on treatment, compared to 63% of adult men (UNAIDS 2018).

According to the 2021 fact sheet on HIV and AIDS, Moyo district had a prevalence of 2.5% compared to a 5.4 %[7] national prevalence among adults (between 15-49 years)[8]. Some of the factors that may increase the prevalence of HIV/AIDS in Laropi RGC, is that the project area is the centre of several sub counties including Laropi, Metu in Moyo and those across the river Nile. Also, Laropi is the gateway into Moyo district via the ferry, fishing communities, and a centre of trading activities among others.

6.3.9 Energy

Laropi RGC is connected to the national electricity grid and it was observed that households and businesses within the RGC are connected to the grid, but solar is also used throughout the project area for lighting. The limited grid connections are due to the high connection expenses and the monthly tariffs.

Concerning the energy for cooking, the majority of households use firewood and the minority use charcoal. With the increasing demand for energy by the increasing population is likely to affect the environment by depletion of the forest/green cover.

Figure 6-20: Powerlines in Laropi RGC

6.3.10 Land Tenure System and Access

The land has been recognized as a driver of economic progress and a factor in achieving food security. The 1998 Land Act provides a legal framework for the various land tenure, ownership and management of land; amendment and consolidation of the law relating to tenure, and other associated or incidental

[7] Source: https://uac.go.ug/media/attachments/2021/09/13/final-2021-hiv-aids-factsheet.pdf
[8] Segregated prevalence for females is 6.8% and men is 3.9% taking an average of 5.4%

matters. The project is under the customary type of tenure headed by heads. Land is a vital resource and livelihood asset for all women and men because, in Uganda, most people depend on agriculture to earn a living. And the major economic activity depended on the majority of the community members.

6.3.11 Socio-Economic Activities

The main socio-economic activity undertaken within the project areas is farming with over 73%[9] of the households engaged in agriculture. Other economic activities include; trading, fishing and other small general merchandise businesses along the roads among others. The town council plays a major role in the business sector as far as the location of operation, the quality of the premises and the licensing of the business units are concerned. Laropi Central market is the hub of business for the Laropi town council, the weekly market attracts a large number of people from different parts of Moyo district thus the need to enhance sanitation facilities at the market.

Although the project area is an urban area, the main economic activity is agriculture which supports the community as a source of livelihood and a source of food. The main crops include maize, ground nuts, sorghum, sweet potatoes, cassava and animal rearing. Animals include pigs, cattle, goats and poultry. It should also be emphasized that the majority of rural population are independent workers as opposed to their urban counter parts[10].

Figure 6-21: Tilled land ready for sowing

Figure 6-22: Grain grinding machine accessible to the community members for value chain

6.3.12 Telecommunication

Mobile telecommunications have eased the burden of communication significantly in Uganda since the communications sector was opened to private operator participation. All the major mobile telephone operators (MTN and Airtel) have services within the project both for internet, message and voice services.

Other means of communication available include; post office systems, radio and Television. Numerous radio and television stations can be used to transfer and disseminate information about the project. It also provided an avenue of communication during the consultative process of the project. The telecommunication networks also provide banking and money transfer services locally referred to as “mobile money”.

[9] Source: Final Feasibility Study Report (Laropi RGC) May 2023
[10] The Uganda National Household Survey (2019/2020)

Socio-economic data revealed that the dominant source from which people get information is the use of mobile phones. During implementation, the identified communication channel should be prioritized for mobilization and continuous stakeholder engagements in a language well understood by the community members.

6.3.13 Institutions

Several institutions in the project are likely to benefit from the water supply system. Among these include the administrative units, markets, landing sites, religious institutions, education, transport and security institutions that have an impact and are beneficiaries of the proposed project. The table below indicated the existing institutions.

Table 6-8: Institutions in the Project Area

Type of Intuitions	Name of Institutions	Ownership Status
Administrative	Laropi Town Council Headquarters	Local Government
	Laropi Sub County Headquarters	Local Government
Market	Laropi Main MarketMarket (Weekly) and Market (Daily)	Community/Local Government
	Idrimari Market Shade	Community/Local Government
Landing Site	Laropi Landing Site	Government
	Congo Landing Site	Government
Utilities	Laropi Water Office	MWE
Religious	Catholic Churches	Community
	Protestant Church	Community
	Mosque	Community
Education Institution	St. Mary's Nursery and Primary School	Government
	Laropi Seed Secondary School	Government
	Laropi Primary School	Government
	Idrimari Primary school	Government
	Ubbi Primary School	Government
	Gbalala Primary School	Government
	Nile Parents School	Private
	Homing Dove International Nursery/Primary School	Private
Health	Laropi HC III	Government
	Gbalala Health centre II	Government
Security	Police Post	Government

6.3.14 Gender Issues

Although there has been deliberate effort at both the international and National levels to promote gender equality and to empower women, there has been some glaring gender gaps that have remained. Amid persistent gender inequality, the project district intends to achieve gender equality and women's empowerment as an integral part of Uganda's Socio-economic development. The National Development Plan observes that discrimination against women in Uganda results from traditional rules and practices

that explicitly exclude women or give preference to men, which serves as a key constraint on women's empowerment and economic progress

Gender imbalances continue within Laropi RGC in productive activities such as agriculture and in terms of ownership and access to productive assets. Women neither own nor control land in the project area.. Women only have access but the decisions on what to produce on the land and in what quantities remain the domains of men. It is estimated that 86% of the workforce in agriculture are women, however, they do not control proceeds of neither whatever is produced nor what they sell in the market. This limits their ability to move beyond subsistence agriculture.

Therefore, there is need to outline gender inequalities at the micro level with regard to aspects such as women's insecure access to land, limited decision-making power over resource use, family planning, health and education, access to education by the girl child and limited access to financial resources and skills development among others. There is a glaring omission in relation to women's work burden, often spent in the private sector, which often goes unrecognized and unrewarded. This therefor call for the enforcement of the existing policies that would enhance women involvement in the operation and maintenance of such water systems and their sustainability within the communities under the water and sanitation gender strategy 2018-2022. There is alos to undertake the affirmative action to involve women (at least 30%) on all water and sanitation committees, involving women of the water and sanitation project from the inception stage, and building their capacities in the management of the water supply systems.

6.3.14.1 Gender-Based Violence (GBV)

Domestic violence in Uganda is a problem as it is in many parts of Africa. There is a deep cultural belief in Uganda that it is socially acceptable to resort to brute force to resolve family disputes. Therefore, it is pertinent to interrogate gender-based violence-related issues and devise possible measures to mitigate them before, during and after the implementation of the road project. Gender-based violence is reported to be occurring within the communities being experienced especially among women. It is reported that the main cause of GBV within the community stems from the sharing of agricultural proceeds that are mainly produced by women. Other causes include general poverty within the household, and cultural values among others.

With above findings, in order to mitigate the vice, the contractor especially during the implementation phase, the project should consider conducting regular sensitizations and awareness creation on domestic violence (DV) and sexual gender-based violence (SGBV) and the related referral pathways/service centers. These sensitizations should target men to act as change ambassadors to champion the SGBV/DV fight and should as well have targeted awareness creation sessions for women and girls since they are the most prone. The sensitization messages could include promoting good relationships and improved communication skills amongst couples on top of positive parenthood. These should also emphasize SGBV/DV standards in the contractors' codes of conduct, which should be disclosed in both English and the local language (Madi) and be widely publicized to all workers and community members in the project area. In addition, the contractors should develop and popularize and accessible grievance redress mechanisms for contractor's workers and the community to report such cases with ease bearing in mind women representation on the grievance redress committee to enable women to feel free while narrating their issues.

As well, referral pathways and support systems should be established for workers and community members throughout the project by coordinating with the various DV/SGBV service providers like medical/health workers, CBOs, CSOs including GBV shelter staff, legal aid service providers, community counselors, VHTS, CDOs, and probation officers. There should be deliberate measures to ensure that the resettlement action plan (RAP) considers gender dynamics, including GBV at household and community levels, especially during data capture, to guide the RAP implementation regarding compensation payments. Most importantly, the project should develop a social management plan to include aspects of SGBV/DV as a serious human rights issue that needs to be closely monitored and mitigated since no human rights abuses can be offset.

Furthermore, the project should promote social mobilization, advocacy, and behavioral change communication by conducting awareness campaigns and working towards upholding laws enacted against harmful religious, traditional/cultural practices and beliefs that promote SGBV/DV. The project implementers should note that violence prevention requires everyone to work together deliberately to remove sources of harm and inequality and heal victims.

6.3.14.2 Violence against Children (VAC)

Violence against children in Uganda is widespread and occurs in a range of settings. Many children are routinely exposed to physical, sexual and emotional violence in their homes, schools, communities, places of work and other settings. Notably, much of the violence against children remains normalized and socially condoned. Among the reported VAC abuses include; early marriages, defilement, neglect of the children, child Labour especially getting involved in the fishing activities on the River Nile, denial of education due to poverty, and sending children to markets among others.

Therefore, the project will need a concerted effort to ensure that this risk is minimized especially during the construction phase. One of the respondents had this to say, “Most the boys in this area know and are involved in the fishing activities to supplement incomes for the households. Which has led many children to drop out of school despite the Universal Primary school (UPE).

Figure 6-23: Young Boy from fishing at River Nile at Laropi Landing Site

Therefore, the proposed water supply project should put measures in place to prevent child rights abuse, especially during the construction phase. The contractors should place a child protection policy/code of conduct to ensure that no child is employed during the construction works (given that boys in the project area drop-out of school to earn quick money from causal workss) and that zero child rights cases of abuse are recorded.

In addition, implementing the Stakeholder Engagement Plan (SEP) should have a section on community mobilization and sensitization on child rights and child protection through different approaches such as community meetings and drama or IEC materials. The communication messages in the SEP should also be deliberate on creating awareness about VAC and alternative referral pathways where survivors or victims can report cases of child rights abuses. The project should consider critical actors in the referral pathways, including local councils; Police at all levels; Health workers; Probation Officers; Community Development Officers CDOs), community leaders (traditional/religious), court, legal aid clinics staff, and psychological support center staff. Other actors could include children's homes with attendant service providers like medical/health workers, Community-Based Organizations (CBOS), Civil Society Organizations (CSOs), and community counselors. This would reinforce prompt response to cases of child rights abuses and derail the abusers from perpetrating the vice.

6.3.14.3 HIV/AIDS

The study assessed the existing HIV/AIDS situation in the project area to adequately safeguard the populace from the risks of the spread of the disease, especially during the construction phase of the water supply infrastructure. The project is expected to cause an influx of community labor during construction. If not well managed, it could endanger the lives of the workers and the local communities through illicit transactional sex that will increase the spread of HIV/AIDS. The study established limited cases of HIV/AIDS cases, which was mainly due to the cultural safeguarding and cohesion of the communities, and the fact that the information about HIV/AIDS is extensively shared on the different platforms like at the health centers, community meeting, churches, radios among others.

7. STAKE HOLDER ENGAGEMENT AND CONSULTATION

7.1 Overview

This Chapter describes the process and activities in the public consultation that were undertaken to ensure that the relevant stakeholders and the public are informed about the project and are involved in the identification of key issues and impacts of the proposed IWMDP Water Supply and Sanitation Project.

Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholder engagement and public consultation are integral aspects of successful decision-making in the ESIA process and implementation of projects, plans and programmes. It is central to all other aspects of environmental and social performance. It is the basis for building strong, constructive, and responsive relationships that are essential for the successful management of a project's environmental and social impacts). The key focus of meaningful consultations is equity and inclusivity, i.e., ensuring that all groups (including those that are disadvantaged or vulnerable) are embraced within the consultation process on equal terms and that all groups are given the capacity to express their views with the knowledge that these views will be properly considered.

Poor stakeholder relations present risks to the successful implementation of projects, while constructive engagements offer benefits of improved risk management and better outcomes on the ground. The process of engagement presupposes that the relevant stakeholders and interested public have access to timely and accurate information on the environment and the proposed development and are therefore able to offer informed views on the proposals.
Public consultation also forms a useful component for gathering, understanding and establishing the likely impacts of projects, determining community and individual preferences and selecting alternatives.

The stakeholder engagement strategy should be scaled relative to the risks and impacts a project is likely to create. For the proposed IWDMP water supply and sanitation Project, stakeholder engagement mainly focused on project information disclosure, communication on project construction and operation impacts and mitigation measures, and collection of stakeholder comments and recommendations.

7.2 Stakeholder Analysis

Based on the stakeholder mapping the level of significance was analysed. The significance and the associated level of engagement are indicated in Table 7-1. The significance levels ranged from low to very high.

Table 7-1: Ranking of Significance of Stakeholders

	Stakeholder group	Impact/Interest	Significance	Level of engagement
1.	Ministry of Water and Environment (MOWE)	High – MOWE is the proponent and the implementer of the project. MOWE have a direct interest in the future of the project.	High	Inform collaborate, and consult.
2.	Nation Forest Authority (NFA)	High-NFA –In charge of monitoring and supervision of all activities within the NFA where the water reservoirs shall be located	High	Inform, collaborate, and consult.

	Stakeholder group	Impact/Interest	Significance	Level of engagement
2.	Uganda National Road Authority (UNRA)	High – UNRA mandate is to develop and maintain national roads. The proposed transmission line will run within the UNRA road reserve. Therefore, UNRA is an important decision-maker and influencer in the ESIA process.	High	Inform, collaborate, and consult.
4.	Community Leaders and Elected officials	High - Political leaders are very influential and can influence the water supply implementation at the National, and local levels.	High	Inform, collaborate, consult and empower.
5.	Landowners at the booster station and Storage reservoir	High–The land owners at the booster station and reservoirs will experience a direct impact (across many impact categories) and will be interested in participating in the engagement processes during the life of the project	High	Inform, collaborate, consult and empower.
6	Residents	Medium to High – The local community will experience direct and indirect impacts (across many impact categories) and will be interested in participating in engagement processes during the life of the project. Depending on the location and the environmental conditions and social impact will range from Medium to High.	Medium to High	Inform, collaborate, consult and empower.
7	Adjacent communities (including vulnerable groups);	Medium to High–The adjacent community will experience direct and indirect impacts (across many impact categories) and will be interested in participating in engagement processes during the life of the project. Depending on the location and the environmental conditions impact will range from Medium to High.	Medium to High	Inform, collaborate, consult and empower.

7.3 Stakeholder Engagement Plan

The Stakeholder Engagement Plan was implemented successfully, as indicated in

Table 7-2 below.

Table 7-2: Stakeholder Engagement Plan that was implemented

Component	NO	Tasks	Status
Stakeholder identification	1	Desktop research, team expertise and discussions held during the Reconnaissance Field Visit provided adequate information to identify key stakeholders.	Completed
	2	A Stakeholder List was compiled and categorized the names, positions, organizations and contact details of all stakeholders.	Completed
	3	Further meetings were held with key stakeholders and through such, further assisted in identifying names, organizations and contact details for stakeholders.	Completed
Stakeholder consultations	4	Preliminary designs and documentation were compiled and presented to facilitate consultative meetings with stakeholders.	Completed
	5	Stakeholder meetings were scheduled formally and included key informant interviews, meetings with key, and informal discussions. Letters of introduction from MoWE were presented to stakeholders.	Completed
	6	Consultations were also conducted at the local level	Completed
	7	All the views of all meetings and other stakeholder inputs were documented, as well as attendance registers kept of all stakeholders contributing to the assessment.	Completed
Socioeconomic Baseline study	8	National and District level socioeconomic data was sourced from available data sources	Completed
	9	Qualitative socio-economic data were collected at the proposed site within the Project area, to provide representative data for the assessment.	Completed
	10	Socio-economic data was analyzed and compiled, as presented in the ESIA report.	Completed
Summary of inputs	11	All inputs gathered from stakeholders were summarized, for input into project design and the management of both positive and negative impacts.	Completed

7.4 Stakeholder Identification and mapping

Any person or organization that could potentially be impacted by the project or has the power to influence it is considered a stakeholder. To develop an effective stakeholder involvement programme, it is necessary to determine exactly who the stakeholders are based on their roles, influence, objectives and priorities specific to the project. The ESIA team formulated a stakeholder matrix and identified key stakeholders who were engaged during the study. A stakeholder engagement plan was drafted and populated with additional stakeholders during the ESIA study. The study targeted individuals, groups/institutions and communities that have a stake in the priority water project. Thus, only such entities as identified in the stakeholder analysis were selected to participate in the consultation process. When identifying and prioritizing stakeholders, the following aspects were considered:

- Who could be adversely affected by environmental and social impacts?
- Who are the most vulnerable among the potentially impacted, and are special engagement efforts necessary?
- Which stakeholders can best assist with the early scoping of concerns and impacts?
- Who strongly supports or opposes the changes that the project will bring and why?

❖ Who is it critical to engage with first, and why? (IFC 2007) Stakeholders were then identified:

7.5 Categories of Stakeholder

The stakeholder categories and sub-categories identified are presented in Table 7-3 below

Table 7-3: Categorisation of Stakeholders

Component	Stakeholder Category	Stakeholder	Stakeholder Interest/Mandate	Engagement Method
ESIA	**Funder**	**World Bank**	- Observance and appropriate implementation of the Bank's Safeguards Operational Policies - Project funding and implementation support.	- Written reports
	National level	**Ministry of Lands Housing and Urban Development (MoLHUD)**	- Approval of consultant's valuation reports	- Written reports - Formal meetings
		Ministry of Gender, Labour and Social Development (MoGLSD)	- Observance of human rights and protection of vulnerable groups. - Promotion of occupational and community health and safety of workers and communities. - Approval of social safeguards - Approval of permits like workplace permits, OHS - Monitoring of social safeguards.	- Written reports - Formal meetings
		Ministry of Water and Environment (MWE)	- Has the overall mandate of monitoring, assessing and regulating water resources. - Monitoring and guiding the use of wetlands for sustainability and other water bodies within the project areas. - Approves Water abstraction permits - Ensures implementation and monitoring of project activities.	- Written reports - Formal meetings - Presentations - Training workshops - Field visits - Interviews
		NEMA	- The main regulator of the environmental aspects of all projects. - Issues permits and approvals - Handles all matters related to environmental protection. - Overall clearance of ESIA and other project briefs about the project facilities.	- Written reports

Component	Stakeholder Category	Stakeholder	Stakeholder Interest/Mandate	Engagement Method
			- Ensures monitoring and supervision of the ESIA's compliance.	
	Local Government (Moyo District)	District: - Chief Administrative Officer (CAO) - District Environmental Officer (DEO) - District Water Officer (DWO) - District Health Officer (DHO) - District Probation and Welfare Officer (DPWO) - District Community Development Officer (DCDO) - District Engineer (DE) - District Natural Resources Officers (DNROs) - District Forestry Officer (DFO) - District Chairperson - In charge Family and Child Protection Unit, Uganda Police Force.	- Support in the mobilization and engagement of community/beneficiary stakeholders. - Support in project implementation through monitoring and supervision. - Ensuring the security of the project teams - Offer technical guidance in the review of the ESIA reports.	- Written reports - Formal meetings - Presentations - Training workshops - Field visits - Interviews
	Local Governments (Laropi Town Council)	**Town Council:** - Local Council III Chairpersons. - Parish Chiefs/Ward agents.	- Participate in making decisions that may affect the project. - Participate in project supervision - Support during identification of the location for the water and sanitation facilities. - Mandated to oversee all the construction activities - Monitor the Environmental, Social, Health and safety aspects.	- Written reports - Formal meetings - Presentations - Training workshops - Field visits - Interviews

Component	Stakeholder Category	Stakeholder	Stakeholder Interest/Mandate	Engagement Method
	Parishes and villages (Panyanga Parish)	**Local councils:** - Local Council I Chairpersons and/or members of the executive - Local Council II Chairpersons and/or members of the executive.	- Support in community mobilization, engagement and building consensus on key project issues - Participate in the planning, implementation and operation of the project. - Sensitization of the communities about government projects.	- Meetings - Field visits - Interviews
	Community groups	- Project affected persons - Landlord - Tenants - Business community - PWDs - Men - Youth - Women and - Elderly.	- Participate in project meetings and activities. - Provide land for the project. - Participate in the ESIA - Participate in livelihood restoration interventions.	- Meetings - Field visits - Interviews - Focus group discussions - Surveys

7.6 Methodology for Stakeholder Engagement

Stakeholder engagements for this project involved a variety of strategies. Depending on two key presumptions -0the type of information needed and the number of participants in the data-gathering process—these were adopted. These methods were used to inform the development of an appropriate water supply system within this proposed project area. Here are the methods that guided the stakeholder engagement process

The following methods were used to conduct consultations:

7.6.1 Formal meetings with the stakeholders

The project had inception meetings where stakeholders both at the District Headquarters and Laropi town council were consulted during the project start-up meeting to inform all the stakeholders about the project. MWE officials introduced the Consulting team to the CAO, LCV and relevant officers at both the district and respective Town Council and the Sub- Counties, to inform them about the project, its objective, the intended activities, the project extent, and the related studies to be undertaken, including the RAP, WSP and ESIA, water-related studies, source of water among others. The main object was to solicit, potential impacts and possible mitigation measures and also solicit initial community responses. The stakeholders were able to express comments and queries during this meeting as seen in the minutes under **Appendix.**

7.6.2 Key Informants Interviews

Key informant interviews (KIIs) were held with individuals who were assumed to have specific information related to the project. Some of these were pre-set while others were identified during the interactions with other stakeholders through a snowball type of sampling. Some such stakeholders included; The CAOs office in Moyo, the District Environmental and Physical Planners office, CDO, the Environmentalist, Mayor and Ward Administrators. among others

7.6.3 Community Meetings

An introductory session that served as the first chance to inform the project's stakeholders of the initiative was open to all participants. MWE officials led the consultant for the introduction meeting to inform all parties involved in the project on its objectives, planned activities, scope, and pertinent studies that will be carried out, such as the RAP and ESIA, water-related studies, water source studies, and other studies

7.6.4 Focus group Discussions

Different groups of people were consulted during the study to solicit specific information. Among the groups include the women and men to understand attitude, knowledge and perceptions the issues that may affect the project.

7.6.5 Key Stakeholder Engagements

Prior preparatory meetings and continuous stakeholder engagement were held with the Ministry of Water and Environment Officials.

7.6.5.1 Stakeholder Engagement at Moyo District

An introductory meeting was held with the Moyo District chief administrative officer to inform the district technical team of the ongoing project activities within their area of jurisdiction. This engagement was a two-way process as information was not only disseminated from the project team but also received from the district team. Furthermore, the engagement aimed to obtain any views on the best approach to undertake while carrying out community engagements and site visits. In-depth discussions with different technical personnel to understand their different viewpoints on the project. In-depth discussions were also held with the District Natural Resource Officer, the District staff surveyor and the NFA forest supervisor. The meetings were intended to address any concerns raised, improve transparency and accountability, and take into consideration any challenges raised as to aid decision making

	
Introductory meeting to Moyo District with MWE officials	Meeting with the Moyo District CAO

	
In-depth Discussion with the District Natural Resources officer and District Suryevor	Consultation with NFA Forest Supervisor

Plate 7-1: Pictorial of District Stakeholder Consultations

The following is a summary of the issues raised at the public meetings:

7.6.5.2 Public Engagement Findings from Laropi RGC Stakeholders Consultations

During these consultations, the ESIA team presented and explained the aim of the meeting which was to; Provide background information about the proposed water supply and sanitation project.

Table 7-4: Comments, Concerns, and Remarks from the Stakeholder Consultations

Project Related Issues	
Concern Raised	**Response**
How will the new project be operated alongside the existing water facilities that are under Northern Umbrella?	Assessment of existing water schemes to be done to evaluate their effectiveness and sustainability and integrated with the new scheme.
Some areas are not covered in the proposed development, are there any plans to include those areas?	MW&E will consider new areas as time progresses
Are aspiring customers supposed to bear the costs of buying laterals (pipes) that connect them from the water main?	No, the project provides all-inclusive service once payment by the client has been made.
Water kiosk owners are supposed to sell water and collect money, will that not expose them to danger as they might be robbed?	The security concerns are noted. The Kiosk operators will be trained on cash management to avoid possible risks and as well security options will be considered with the community.
Why is Umbrella North not providing water through a prepaid meter (card)	Northern Umbrella North is always considering options for making its service better. These options will be considered.
During the implementation of the existing Water Project, some areas are in proximity to the proposed water project but were not served can those areas be accommodated?	It has been included in the scope of the project.
Social Issues	
Concern Raised	**Response**

When it comes to issues of employment, can there be transparency to avoid conflict?	The comment is noted. the contractor will be given guidelines to work under, which will include collaboration with the community leaders i.e. the LC 1 to avoid unnecessary conflict.
General Issues	
Concern Raised	**Response**
Concerning the proposed water supply is there a monitoring mechanism to ensure that access roads are rehabilitated and the environment is left in a better state	IWMDP embraces an environmentally friendly approach in executing its projects to minimize environmental degradation.
The current system water supply is very unreliable and this has at times left the population to pay very high costs of 1000shs for a 20 litter jerrican	The comment is noted, and the matter will be addressed by the current design the water source is sufficient to supply quality, and cleanliness and reliability are major factors for the success of the IWMDP.
What is going to happen to the existing water schemes pipelines as they are small in diameter?	The project will ensure that bigger pipes are put in place and these are being addressed in the design. Any further outstanding issues will be investigated and attended to.

a) Gather feedback and identify stakeholders' interest
b) Address social, technical and environmental issues

Stakeholders were allowed to ask questions and the following concerns were raised and addressed. This has been recorded.

Figure 7-1: Laropi Town Council Introductory Meeting and Community Stakeholder Engagement General

7.7 Public Consultations Summary Out Comes

The community in the project area is receptive to the water and sanitation project since they currently suffer water shortages, though they also noted that water for production should be planned alongside the domestic water supply project. They have high expectations about employment opportunities during construction works, and it would be advisable for the appointed contractor to employ as many locals as possible. Their key concern is paying for water bills during operation by Umbrella North. Potential environmental degradation from pollution incidences and loss of vegetation is also a significant community concern, which will be addressed through the Project's Environmental and Social Management Plan (ESMP). The details of the consultation meetings (Refer to **Appendix 9**)

7.7.1 Compensation for crops and other assets

All assets to be affected will be compensated for according to the laws of Uganda and World Bank environmental safeguards OP 4.01 before the commencement of the project. The assets will be valued to determine how much they should be compensated for. The valuation will be based on the full replacement value of the assets.

7.7.2 Land Acquisition and Resettlement

The project will try to be implemented within existing road reserves. For pipeline routes, people will be allowed to grow their crops and install temporary hawker stalls, but these assets will not be compensated for again. However, where the land required is private or customary, acquisition through negotiation and engagement will be applied.

7.7.3 Access to Water

The project target targets Laropi Town Council and surrounding areas. As much as it is practicable, all the people within the project area are expected to benefit from the improved water supply and sanitation services.

7.7.4 Gender-Based Violence and SEAH

There will be sensitisation of the communities and project workers on the prevention of GBV/SEAH. Grievance redress mechanisms for reporting and resolving grievances will be developed and implemented.

7.7.5 Conservation and Protection of Water Source Protection.

The project will implement activities to improve forest cover in the water catchment area.

7.7.6 Employment Issues

All contractors should ensure that some of the workers are employed from within the project area. All work-related disputes will be handled by the District Labour office and Town Council office.

7.7.7 Water Connection Procedure

People who are willing to be connected to the water supply will apply for a connection as per NRWB standard procedure and pay the connection fees. However, the connection procedure for Communal Water Points and the free new water connection policy are slightly different.

7.7.8 Relationship between Umbrella North and MW&E

The areas under the project implementation have been gazetted as areas of supply for Umbrella North. However, a working arrangement between NRWB and WUA will be established to facilitate handover and also to make sure that the WUA doesn't phase out.

7.7.9 School Sanitation

The schools to benefit from the improved pit latrines have been identified through the district consultations with the relevant department of education, community development and health.

7.7.9.1 Sustainability of Sanitation/ Toilet Facilities

The project will construct toilet facilities at selected primary schools, and the operations of the facilities will be handled by the school's administration.

7.7.10 Operation of Communal Water Points

The communal water points will be operated by the communities themselves through the communal water points committee or Water Users Association

7.7.11 Grievance Redress Mechanism

The grievance redress mechanism will be implemented through Grievance Redress Committees which will be formed specifically for the water project. Where there are existing GRM committees they will be strengthened through training. For areas where there are no established committees, these will be established and trained.

7.7.12 Project Commencement and Duration

The project is expected to commence in December 2023 and is expected to be implemented in 18 months.

7.7.13 Water Connection Subsidy for Government Institutions

There will be no subsidy for Government institutions. This is because connection subsidies aim to support low-income and vulnerable communities to promote access to safe water.

7.7.14 Project Negative Impacts Mitigation Measures

The project will prepare an Environmental and Social Impact Management Plan (ESMP) to mitigate the negative impacts of the project activities.

7.7.15 Payment and Water Tariff System

Communities were told that water shall not be free, and to use different tariff customer categories for communal water points.

7.7.16 Water connection modalities

Water connection shall be paid for water connection based on the distance to connection main line.

7.7.17 Integration of IWMDP and Working framework with Umbrella North

IWMDP is exploring different working arrangements including extending them to Umbrella North

7.7.18 Alternative Sources of Electricity

IWMDP shall install a solar power system to generate power where critical infrastructure shall be installed.

7.7.19 Stakeholders Vandalism of pipes and theft of project material

Communities wanted to know measures the project has put in place to avoid cases of vandalism and theft of materials; and will deploy guards to different projects site to protect project material

7.7.20 Water Supply -Sewage Contamination.

The main water pipes shall be installed on different sides of the road, and at different trench depths, where water supply shall be on top sewer line where possible.

7.7.21 Fear of Smell in the Surrounding Areas

On smell and odour fears, the faecal sludge facility shall have well-trained personnel to properly manage the facility to avoid cases of treatment failure; it shall also promote the planting of trees in surrounding areas to aid in air purification and re-circulation, despite installing an air monitoring system. The selected site is also not in the path of wind direction.

7.7.22 Pit Latrine Designs

The project shall promote the construction of VIPs which are good for emptying when full. IWMDP noted the need to take care of pipelines to avoid pollution and contamination.

7.7.23 The Facility Fencing

The site has provision for the construction of cement blocks perimeter fence to control theft.

7.7.24 Air pollution

On air pollution, smell and odours, the facility shall also promote the planting of trees in surrounding areas to aid in air purification and re-circulation.

Table 7-5: Summary of Issues Raised

Date of Engagement	Designation	Comments	Response
20th April 2023	**The Chief Administrative Officer**	✓ The district pledged support to the project ✓ She highlighted that they had been involved as a district and were taken to the location of the project facilities, and the District Water officer is the focal person. ✓ Expressed the need to expedite the project. ✓ Requested for more interventions of the water projects within the district.	✓ Noted MWE took note
20th April 2023	**District Natural Resource officer**	✓ He stated he is available for any assistance required from him ✓ He also provided details of the Moyo District's Five-year development plan so that information can be extracted from it. ✓ He advised the project team to have some consultations with NFA officials	✓ Noted
20th April 2023	**District Staff Surveyor**	✓ He stated that some engagements have been done with the communities and they were very receptive ✓ He also stated that he will provide details on the opened roads so that integration can be done and alternative accesses to the sites can be identified	✓ Noted
20th July 2023	**The NFA Forest Supervisor**	✓ He advised the consultancy to officially write to the NFA executive director regarding this project as the water tank is located on the forest reserve ✓ He stated that one of the strategies that can be used in water source protection is planting trees along the water source	✓ Noted ✓ The strategy will be considered

20th April 2023	**Moyo District Officials (Physical Planner, Environmentalist and Planner)**	✓ The Physical Plan for Laropi is available having been available up to 2015. It was revised in 2019, and given a life span of 10 years (2029). Laropi and Lefori have development plans but its hard to implement them. It is only 15% of the physical development plan that is implemented. ✓ The physical plan for Lefori, was designed in 2023, to run for 10 years, till 2033. ✓ The Development Plan and strategic environmental report for Moyo are available. ✓ There are no ESIAs for the existing water supply systems in the district. ✓ There are no environmental ordinances in place. ✓ There is no development control, like permitting for construction, especially within the towns. ✓ The Road department has to open up the planned roads but does not have resources.	✓ It will used be during the development of the ESIA Noted Noted Noted Noted Noted
	Laropi Town Council and Sub County Officials	✓ Pledged the support of the project. ✓ Confirmed that water is a a problem and there is need for immediate inter vention. ✓ Need for the project to consider exte nding the supply of water to Panyang a Parish ✓ The community affected by the project facilities expect compensation	✓ Noted ✓ MWE intervention ✓ The extension of the w ater to other areas will be considered as the w ater supply is availabl e. ✓ Noted by MWE
17th April 2023	**Laropi Farmers and Leadership of Laropi Town Council and Laropi Sub County**	✓ Due to the Population increase there is need to increase the amount of wat er pumped and supplied to the comm unity. ✓ The water supply in very irregular, a s most of the time it is unavailable. ✓ Water should be extended to Laropi Sub County ✓ The project should be expedited.	✓ It was noted by the pr oject team. ✓ It was the reason why the project was consid ered to supplement th e existing system. ✓ It was noted. ✓ It was being considere d to be expedited.
17th April 2023	**Local Community Engagement**	✓ How long will it take for the water to reach the different areas ✓ The project has different stages that h ave to be undertaken. ✓ Not all areas are covered by the proje ct such as Panyanga ✓ Will the proposed project integrate p hysical planning ✓ Different teams have been in the area	✓ However, these studie s have to be finalized s o that the water can be provided ✓ This is the starting poi nt however further ext ensions can be done ✓ A shapefile of the lan d use plan for Laropi t

		however no feedback has been provided	own council has been picked from the district to ensure that integration is done ✓ Different reports have been produced and are available for review
20/07/2023	**Local Community Engagement** **Faecal Sludge**	✓ The provision of water has long been awaited in the area? When will it be fully installed ✓ Will all community members have access to the water ✓ Is there an aspect of drilling boreholes for the people who cannot afford piped water ✓ Will the affected persons be involved in the project ✓ What is the entire project cost ✓ How much is the fee for individual connection comment	✓ The project is at design stage and the distribution has not been determined yet. There is another team that is coming to handle land acquisition ✓ Water is a common good in that its access all community members will have access to it. ✓ The project does not have a provision for borehole provision ✓ A team of surveyors is coming to follow up and determine the exact project affected persons ✓ The project amount is a lump sum ✓ The fee will be determined by the water user committees

8. EVALUATION OF ENVIRONMENTAL AND SOCIAL IMPACTS / RISK AND MITIGATION / ENHANCEMENT MEASURES FOR THE IDENTIFIED IMPACTS

8.1 Introduction

This chapter identifies and evaluates significant environmental and social consequences of the construction and operation phases of the proposed water supply system and sanitation project for Laropi Rural Growth Centre. While positive impacts should be enhanced, the proposed mitigation measures should be implemented as suggested to minimize or eliminate the predicted negative environmental and social impacts.

8.2 Assumptions and Limitations

The following assumptions, uncertainties and gaps in knowledge are implicit in the study which information formed the basis of part of the impact assessment: -

Social and Environmental Impacts

Assumptions

- No great social changes will take place in the proposed project area between data collection and the submission of this report; and

Limitations

- Secondary data sources, including statistical data, are limited;

In addition to the assumptions and limitations listed above, it is important to note that the identification of socio-economic impacts differs from identifying environmental impacts in the following ways:

- Social impacts are not always objectively measurable and often need to be inferred rather than measured. A combination of insight into social processes in general and a thorough knowledge of the communities under study are important to draw valid inferences.
- Social impacts are often clustered and interdependent rather than separable.
- Communities are dynamic and in a continual process of change, which is not easily predictable. The proposed piped water supply system and sanitation project is but one factor contributing to this change. It is often difficult to identify if an impact is attributable to the development, to factors beyond, or a combination of both.
- The positive or negative nature of an impact is often value-based – some might view a particular impact as positive and others as negative.
- Social impacts are often unavoidable and difficult to mitigate and as such, mitigation strategies should be regarded as strategies to manage change, rather than as means to avoid an impact. Successful management of a potentially negative impact may change the impact into a positive impact.

8.3 Pre-construction phase (Biological Impacts)

8.3.1 Impact 1: Loss of Vegetation cover and crops

Impact Evaluation: During the topographic and geological surveys of the project areas especially the location of the water reservoir, access roads (to both the borehole and reservoir) and the faecal sludge plant, cutting of trees along the access roads to both the borehole and reservoir and clearance of vegetation and crops will be necessary. The proposed sites for the Laropi RGC water and sanitation system (borehole, reservoir, access roads, pipeline routes) because the proposed sites have

both trees, vegetation and both annual and perennial crops planted by the landowners. If this impact is not well managed, it may result in conflicts with the locals. This impact will result in the interruption of natural vegetation and cultivated crops for the community. This is a negative impact that is short-term and reversible.

Impact severity: Duration of the impacts is short term but the likelihood of occurring is ***Temporary*** and severity on vegetation and crops ***High***. Therefore, impact significance is ***Minor***

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Vegetation cover
- Local Communities

Overall assessment without Mitigation: Negative and HIGH

Mitigation Measures:

a) During site clearance, vegetation removal shall only be restricted to only necessary areas for carrying out studies;

b) Manual cutting of branches shall be encouraged especially when carrying out surveying;

c) All the destroyed economic trees and crops shall be recorded and included in the valuation report for purposes of compensation; and

d) Vegetation clearance shall be carried out in the presence of the property owners and the local leadership.

Overall assessment with Mitigation: Negative and LOW

8.3.2 Impact 2: Disturbance of Terrestrial Fauna

Impact Evaluation: This impact will be caused by human presence and activity when carrying out the topographic and geological surveys on the proposed Laropi RGC water and sanitation project (water supply system and sanitation facility) faecal sludge plant. While surveying, the survey team will likely remove vegetation at both the borehole, reservoir, access roads to both the borehole, reservoir and faecal sludge plant, and use of vehicles and/or machinery may affect the fauna resident at the proposed project sites. This impact will lead to the interruption of modified fauna habitats from the heavy vehicular movements when drilling boreholes and carrying out surveys. This is a negative impact that is short-term and reversible.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***High*** and severity on Fauna is ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

a) Fauna and Natural Habitats

b) Local Communities

Overall assessment without mitigation: Negative and Moderate

Mitigation Measures

a) During site clearance, vegetation removal shall be restricted to only necessary areas;

b) Manual clearance of vegetation shall be encouraged to ensure that terrestrial fauna is largely protected; and

c) The use of machinery in areas which harbor fauna like wetlands shall be encouraged.

Overall assessment with Mitigation: Negative and LOW

8.4 Pre-construction phase (Physical Impacts)

8.4.1 Impact 1: Alteration of the Landscape and visual amenity

Impact Evaluation: When surveying the proposed area for the project components for both the water supply system (borehole, reservoir and access roads) and faecal sludge plant, manual cutting of some trees and crops might be necessary to get a wide view when surveying. This impact may be more pronounced at the faecal sludge treatment plant. This will cause minimal visual changes in the landscape.

This is a negative impact that is short-term and reversible.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***High*** and severity on Fauna is ***Low***. Therefore, impact significance is ***Minor***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***

	High	Minor	Moderate	Major	Major

Impact receptors

a) *Project Workers*

b) *Local Communities at Laropi RGC*

Overall assessment without Mitigation: Negative and HIGH

a) ***Mitigation Measures:***During site clearance vegetation clearance shall be minimized in as much as possible by considering the use of existing cleared areas or areas without crops and trees;
b) The clearance of both tree branches, crops and shrubs at the proposed sites for the borehole, reservoir, access roads and the faecal sludge management facility shall be done manually; and
c) Prior to site clearance, an inventory of all the destroyed vegetation (crops and trees) shall be documented/recorded so that they can be included in the project valuation.

Overall assessment with Mitigation: Negative and Negligible

8.4.2 Impact 2: Contamination of Soil and the Wetland

Impact Evaluation: During surveying the proposed water and sanitation facilities (water supply system and faecal sludge site at Laropi Town Council, samples of the sub-soil will be taken for the soil profile survey. If the sample holes are left open, they may be contaminated by upper substrate waste. The soil cleared for purposes of soil surveys may get into the wetland causing contamination of the wetland close to the faecal sludge site (bordering the river Nile) which may lead to the loss of ecosystems especially in the active wetland of the proposed Laropi RGC Faecal Sludge Treatment Plant (FSTP). Open pits left after excavation could contaminate soils by foreign objects such as polythene bags thus contaminating the soils. This is a negative impact that is reversible.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***Medium*** and severity on soil and wetland is ***Medium***. Therefore, impact significance is Minor-***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

a) Local Communities at Laropi RGC

Overall assessment without Mitigation: Negative and Minor Moderate

a) ***Mitigation Measures***During site surveying particularly excavation of trial pits on the proposed sites for both the pump house, reservoir and the faecal sludge plant, consideration shall be made to prevent soil contamination;

b) After each exploration hole for the sites, the hole shall be capped after surveying; and
c) During surveying, soils excavated from the exploration holes shall be left beside the holes to ensure that the soils don't erode into the neighborhood /wetland.

Overall assessment with Mitigation: Negative and LOW

8.5 Pre-construction phase (Socio-Economic Impacts)

8.5.1 Impact 1: High Expectations of the Local Communities Concerning Jobs

Impact Evaluation: There are within the local population, expectations about job creation. Indeed, during the design and survey process, the project will create employment opportunities, especially in areas neighboring the proposed borehole, water supply system, water reservoir, and Faecal sludge Treatment plant. The jobs will be limited due to the short-term nature of the survey and design period. The jobs created at this stage will be limited to a few individuals as the activities involved are few such as clearing the way to sites, digging of pits for Geotechnical investigations among others. This is a Positive impact.

Impact severity: The duration of the impacts is Temporary but the likelihood of occurring is Low and severity is Low. Therefore, impact significance is Negligible.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible***	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate
	High	Minor	Moderate	Major	Major

Impact receptors

- Local Communities at Laropi Town Centre
- Project Workers

Overall assessment without Enhancement: Positive and Negligible

<u>Enhancement Measures</u>

- ✓ The hiring requirements must be clear, properly publicized before the start of the recruitment process and respected by the design team. For a better impact on the communities, this process shall be conducted with the involvement of local leaders;
- ✓ In the event there are local expectations for employment that cannot be met by the project, the limited availability of places shall be made known to the interested parties through local authorities; and
- ✓ The principles and procedures for hiring shall, as far as possible, give priority to the hiring of skilled local workers.

Significance Rating with an enhancement: Positive and MEDIUM.

8.5.2 Impact 2: Extortion from prospective job seekers

Impact Evaluation: Extortion during recruitment given the high competition for jobs can significantly impede the successful construction of the proposed water and sanitation project at Laropi RGC. It should be noted that this extortion can breed resentment and mistrust within the community, potentially leading to social unrest and opposition to the project. This is a negative impact.

Impact severity: The duration of the impact is Temporary but the likelihood of occurring is High and the severity on the local communities and project workers is Medium. Therefore, impact significance is Moderate.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Local Communities at Laropi Town Centre
- Project Workers

Overall Assessment without Mitigation: Negative and Moderate

Mitigation Measures:

a) MWE and the contractor should foster strong community engagement to build trust and support, reducing the likelihood of extortion attempts and garnering community resistance against such activities;

b) MWE and the contractor should collaborate with local authorities, community leaders, and law enforcement agencies to identify and address extortion threats promptly;

c) MWE and the contractor should conduct thorough risk assessments to identify potential extortion vulnerabilities and develop proactive strategies to mitigate risks; and

d) MWE and the contractor should provide training and awareness programs for project staff and community members on recognizing and reporting extortion attempts.

8.5.3 Impact 3: Discrimination of the job seekers and the community

Impact Evaluation: Discrimination can manifest in various forms during the construction of water and sanitation project at Laropi RGC, impacting project implementation and community relations. This discrimination can manifest itself in different forms that range from unequal access to project benefits, with certain groups marginalized or excluded from participation or resource allocation; exploitation of certain groups, such as migrant workers or minority populations, in labor recruitment and compensation; exclusion of certain groups (i.e women and the disabled) from decision-making processes related to project planning, design, and management; failure to consider local customs, traditions, and social norms in project implementation could also lead to cultural discrimination and

resistance from the community; and language barriers may impede effective communication and participation among diverse community members, exacerbating feelings of exclusion and discrimination. This is a negative impact.

Impact severity: The duration of the impact is Temporary but the likelihood of occurring is High and the severity on the local communities and project workers is Medium. Therefore, impact significance is Moderate.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Local Communities at Laropi Town Centre
- Project Workers

Overall Assessment without Mitigation: Negative and Moderate

Mitigation Measures:

The appointed contractor should do the following:

a) Ensure inclusive planning processes that actively involve diverse community stakeholders, including women, minority groups, and marginalized populations, in decision-making and resource allocation;
b) Develop and enforce anti-discrimination policies and codes of conduct for project staff and sub-contractors, emphasizing equal treatment and respect for all individuals;
c) Provide training on diversity, equity, and inclusion for project staff, contractors, and community leaders to raise awareness and sensitivity to discrimination issues;
d) Empower marginalized groups through capacity-building initiatives, such as skills training, leadership development, and access to educational opportunities;
e) Conduct cultural assessments and engage local community members to ensure project designs and implementation strategies align with cultural norms and values;
f) Provide language support, such as translation services or multilingual materials, to overcome language barriers and facilitate effective communication with diverse community members;
g) Establish mechanisms for monitoring and reporting discrimination incidents, with clear channels for community feedback and grievance redressal; and
h) Collaborate with local NGOs, civil society organizations, and human rights advocates to address discrimination issues and promote social justice within the project context.

8.6 Construction phase (Biological Impacts)

8.6.1 Impact 1: Vegetation clearance and damage to crops

Impact Evaluation: Much as the proposed water supply system (both borehole, access roads and reservoir), sanitation facilities, the transmission and distribution lines will traverse through the road reserves, vegetation clearance and damage to crops at these sites and along the routes where the proposed water transmission and distribution lines will traverse will result into some degree of vegetation loss. Interruption of natural vegetation and cultivated crops for the community. This is a negative impact that is short-term and reversible.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***High*** and severity on vegetation and crops ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Vegetation cover
- Local Communities

Overall assessment without mitigation: Negative and MEDIUM

Mitigation measures

a) Trees shall be marked out before cutting, and documented;
b) Tree planting shall be done at selected sites within the project area to compensate for cut trees;
c) The contractor shall limit vegetation clearance and damage to crops to only the area where the water supply and distribution lines will be laid;
d) The contractor shall ensure that an integrated vegetation management approach is adopted; and
e) Vegetation clearance and destruction of crops shall be minimised to acceptable levels that allow the regeneration of vegetation so that the right of ways are not completely stripped of cover which could accelerate soil erosion.

Overall assessment with mitigation: Negative and LOW

8.6.2 Impact 2: Temporary loss of habitat within the construction sites

Impact Evaluation: The construction phase of the borehole, pump house, access roads, reservoir and faecal sludge plant will involve the use of heavy machines and vehicles and an increase in the circulation of people. Stockpile areas for storage of construction materials, storage of sewer pipes, parking of trucks and construction machines etc. and work camps have to be installed.

Vegetation will be cleared for opening or upgrading the local access route to the proposed site. This will disturb the fauna and flora and cause temporary loss of habitat and component fauna and flora species within the construction site. There is likely to be temporary fragmentation of the habitat and damage to adjacent habitats and individual fauna and floral species due to the incursion of machinery/personnel into nearby sites not directly required for construction purposes. Interruption of natural fauna habitats from the heavy vehicular movements during the construction activities. This is a negative impact that is reversible.

Impact severity: The likelihood of the impact occurring is ***High***. Duration of the impact will be medium-term since Habitat loss is permanent. severity of this impact is ***Medium*** resulting in a ***Moderate*** overall significance level.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Fauna and Natural Habitats
- Local Communities

Overall assessment without mitigation: Negative and MEDIUM

Mitigation Measures:

a) The project access roads especially in relation to Laropi RGC water and sanitation project components shall be selected limiting passage through the steep terrain to the reservoir, avoiding sensitive areas and minimizing erosion;
b) Unless of benefit to local communities, temporary access roads leading to both the borehole, reservoir and faecal sludge management site shall be removed when no longer needed and shall be reinstated;
c) Selection of a temporary site for the worker's camp and materials stockpiles shall ensure that avoidance of natural areas is observed to minimize the impact on fauna and flora. The selected sites (workers' camp and materials stockpile sites) shall be approved by NEMA;
d) All personnel shall be briefed on the fragile ecosystems (hill slopes for the reservoir and the wetland for the faecal sludge facility);
e) After construction and use of materials stockpiles, reinstatement of the disturbed sites shall be enforced to maintain habitat continuity as far as is practicable; and
f) At the commencement of works, the working width shall be delineated where it passes through environmentally sensitive areas.

Overall assessment with mitigation: Negative and LOW

8.6.3 Impact 3: vibration Noise and Vibration disturbance

Impact Evaluation: The construction phase will involve the use of heavy machines and vehicles. Noise and vibration are generated by excavators, bulldozers, concrete mixers and transport vehicles. (with noise levels ranging from 70dB(A) to over 120 db(A). In human beings ((workers on the sites and neighbouring homesteads), noise can cause annoyance, stress, and disturbance, particularly in residential or quiet areas. Prolonged exposure to this noise can affect concentration, productivity, and overall well-being, disrupting sleep patterns and exacerbating existing health issues like hypertension. Furthermore, it can impair communication and social interaction, impacting the ability to concentrate and hold conversations.

Additionally increase in noise levels and vibration is likely to mainly affect the fauna at the proposed water and sanitation facilities (borehole, access roads, water reservoir and Faecal sludge treatment plant) because of the presence of an active wetland close to the faecal sludge facility. The faecal sludge facility site is reported to have some ecosystems, habitats and birds. Small animals, soil micro-organisms and birds are very sensitive to noise and vibration and often get killed or relocate to other areas. Impacts related to noise are more evident during the night disturbing animals which have a nocturnal living habit for feeding and roaming. However, construction activities will be restricted to daytime what could affect e.g. birds that have their breeding within the project area. This is a negative impact that is reversible.

Impact severity: The likelihood of the impact occurring is ***High***. Duration of the impact will be Short-term since construction activities will run the period of construction. severity of this impact is ***Medium*** resulting in a ***Moderate*** overall significance level.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Fauna
- Local Communities

Overall assessment without mitigation: Negative and MEDIUM

Mitigation Measures

a) Restrict construction activities and operation of Construction machines to daylight, when most wildlife is active and can react to noise;
b) Ensure that machinery is limited to only necessary activities; and
c) Construction machinery shall be properly maintained to ensure that noise and vibration levels are limited.

Overall assessment with mitigation: Negative and LOW

8.6.4 Impact 4: Disturbance of both human beings, plant processes and fauna by dust generated

Impact Evaluation: The construction activities will cause some dust emissions. These emissions will create short-term adverse impacts on the immediate environment. Dust can have significant impact on human health. Through the inhalation of airborne dust particles which can lead to respiratory problems such as coughing, wheezing, and shortness of breath, particularly for individuals with pre-existing conditions like asthma or bronchitis. Fine dust particles can penetrate deep into the lungs, causing inflammation and increasing the risk of respiratory infections. Additionally, exposure to construction dust may irritate the eyes, nose, and throat, leading to discomfort and allergic reactions. Prolonged exposure to high levels of dust can also contribute to long-term health issues such as chronic obstructive pulmonary disease (COPD) and cardiovascular problems.

During the transportation of construction materials to the project site, dust will be generated, especially along the access roads and at soil stockpiles, particularly during windy or stormy weather conditions. This dust, primarily composed of particulate matter like PM10 and PM25, may cause inconvenience to local residents and road users, including project workers. However, the rural nature of the project area, with its abundant vegetation, helps mitigate dust exposure by trapping particles, and low traffic volumes further reduce fugitive dust levels.

The main sources of gaseous emissions during construction are expected to be from vehicle and equipment operation, including cranes, excavators, trucks, and roller compactor machines. These emissions, including CO2, NO2, SO2, volatile organic compounds, and BTEX, predominantly result from diesel-powered engines. While these emissions are temporary and subject to factors like activity intensity and wind conditions, they are expected to have minimal, short-term effects on local air quality, remaining well below ambient air quality standards.

The dust can interfere with plant photosynthesis, evapotranspiration and other processes and will disturb the fauna temporarily, causing respiratory and visual disruption as well. Dust emission will also decrease the quality of forage quality of herbivorous animal species in the area. This is a negative impact that is reversible.

Impact severity: The likelihood of the impact occurring is ***High***. Duration of the impact will be Short-term since construction activities will run the period of construction. severity of this impact is ***Medium*** resulting in a ***Moderate*** overall significance level.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- • Human beings (workers and neighbouring communities)
- Fauna

- Vegetation Cover

Overall assessment without mitigation: Negative and MEDIUM

Mitigation Measures

As part of the dust, particulate matter, emissions control, the contractor shall undertake the following measures:

a) Maintain damp surfaces on the access road during construction by regularly watering with dedicated trucks or sprinklers, ensuring a sufficient water supply and appropriate equipment are available at all times;

b) Cover all truckloads entering or leaving the site to minimize dust along community roads;

c) Clear land systematically, limiting clearing to required areas to minimize exposed and disturbed areas;

d) Shield construction material stockpiles from wind using tarpaulins or by dropping them at low heights away from residential areas, monitoring their location and condition;

e) Conduct risk assessments for all vehicle movements, with drivers briefed on health, safety, and environmental concerns, enforcing speed limits of 40km/h for light vehicles and 30km/h for heavy vehicles on community roads;

f) Create community awareness and sensitization programs before construction to inform residents of potential nuisances and what to expect, establish a grievance mechanism for addressing community grievances;

g) Maintain construction equipment in good condition, regularly servicing them to ensure efficiency and minimize exhaust emissions, discouraging open burning of waste, fitting vehicles and machinery with appropriate exhaust systems, and avoiding unnecessary idling to reduce emissions;

Implement journey management to minimize unnecessary trips for construction activities;***Overall assessment with mitigation: Negative and LOW***

8.6.5 Impact 5: Disturbance and mortality of terrestrial fauna

Impact Evaluation: By clearance of vegetation breeding and feeding and hiding habitats for animals will be affected especially in the wetland close to the river Nile. In addition, terrestrial fauna (small mammals and reptiles) may also be killed. Sound and vibration during the construction phase are also likely to disturb the terrestrial fauna. Any use of light, if construction takes place during the night will attract fauna to the construction site and increase the chances of being hurt. Disturbance of and Mortality of Fauna will increase during the construction due to heavy machinery and movement of project workers. This is a negative impact that is reversible.

Impact severity: The likelihood of the impact occurring is ***High***. Duration of the impact will be Temporary since construction activities will run the period of construction. severity of this impact is ***Medium*** resulting in a ***Moderate*** overall significance level.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Fauna

Overall assessment without mitigation: Negative and MEDIUM

Mitigation Measures:

a) Construction activities shall be restricted to day time hours (8:00 am – 5:00 pm);
b) Before site clearance and digging, inspections for any terrestrial fauna shall be carried out;
c) Any trench left overnight shall be protected with a net fence to block fauna from being trapped inside;
d) Capture and release fauna away from the direct influence zone (including species trapped in the trenches); and

Overall assessment with mitigation: Negative and LOW

8.6.6 Impact 7: Pollution by solid wastes

Impact Evaluation: Solid waste from construction activities and worker's domestic waste can also have negative impacts on the environment, especially if it gets into the environment. Main waste in the project area is domestic waste. During construction, the issue of waste will be minimal except remnants of construction material which will include top soil /Murram, timber pieces and some remnants of metallic pieces. Other will be in the form of empty cement bags, timber off cuts, solvents, and used oils from machinery, among others. Also, worth noting will be domestic waste such as sewage and food packaging which if not properly handled could turn out to be a sanitation hazard.

Impact severity: The non-hazardous material waste will likely place a significant impact on the environment. Construction activities and practices that fail to control risks to the environment can cause damage to ecosystems. They can also disrupt fauna habitats and result in contamination of land and groundwater as well as the nearby wetland close to the faecal sludge site. The risks to the environment are particularly high when work is undertaken on highlands mostly where the water reservoir will be located. making the severity of the impact ***High***. With guidelines for the proper management of construction waste construction, the likelihood of impact occurrence may be ***Low***. This makes the overall ***Moderate*** significance of the impact.

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate
	High	Minor	Moderate***	Major	Major

Impact receptors:

- Fauna
- Local Communities
- Project workers
- Streams

Overall assessment without Mitigation: Negative and HIGH

Mitigation Measures

a) Environmental awareness shall be provided to the contractor's employees on how to manage solid wastes;
b) The contractor shall prepare and implement the Solid Waste Management Plan (SWMP);
c) The contractor shall provide the proper containers for the disposal of solid wastes; and
d) The contractor shall contract a licensed waste handler to collect regularly and dispose properly of the solid wastes.

Overall assessment with mitigation: Negative and LOW

8.6.7 Impact 8: Introduction of alien plant species

Impact Evaluation: Restoration activities aimed at reseeding the disturbed area along the construction sites (faecal sludge area, borehole pumphouse, access roads and reservoir) water transmission and distribution lines where excavations will have been done might result in the introduction of invasive plant species or a succession of alien species in the affected area. Additionally, the inadvertent spread of alien invasive species by workers and contaminated construction equipment can occur through the transportation of contaminated soil, seeds, or plant material attached to vehicles, machinery, or footwear, facilitating the establishment of invasive species in new areas. Furthermore, disturbed habitats and construction activities create opportunities for the colonization of invasive species, further exacerbating their spread and disrupting native ecosystems. Invasive species affects some of the indigenous species within the project area thus affecting the stabilization of the existing ecosystems. This is a negative impact that is reversible.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***High*** and severity on ecosystem is ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Project area
- The construction sites;

Overall assessment without mitigation: Negative and MEDIUM

Mitigation measure

a) Ensure that the disturbed areas are reseeded with native plant species.
b) Implement strict cleaning protocols for vehicles, machinery, and equipment to remove soil, seeds, and plant material before entering or leaving construction sites;
c) Conduct regular inspections of construction areas to identify and remove any invasive plant species or propagules;

d) Use native plant species in landscaping and restoration efforts to minimize the risk of introducing invasive species;
e) Provide training and awareness programs for construction workers to recognize and prevent the spread of invasive species;
f) Establish buffer zones and barriers around construction sites to prevent the unintentional movement of invasive species into adjacent areas;
g) Monitor construction sites regularly for signs of invasive species establishment and take immediate action to control and eradicate them; and
h) Collaborate with local environmental agencies and experts to develop and implement invasive species management plans tailored to the specific construction site and surrounding ecosystems.

Overall assessment with mitigation: Negative and LOW

8.7 Construction phase (Physical Impacts)

8.7.1 Impact 1: Construction wastes and debris

Impact Evaluation: Debris from the excavation works for the access roads to both the proposed faecal sludge area, borehole and reservoir, the laying of the pipeline underground, and construction of the pump house and the water reservoir will result in the accumulation of soil stockpiles at and along the proposed water supply system (including the structures, roads and pipeline routes). Other solid waste will include: food residues, metal scraps, bottles, plastics, polythene sheets, wood pallets, papers and other parking materials), construction wastes such as rejects/offcuts of bricks, steel reinforcement, nails, iron sheets and timber among others. Equally will also be the vegetation that will be cleared while clearing both the water system components (borehole, reservoir and route for the water supply pipeline.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***High*** and severity is ***High***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Project Area.
- Streams,
- Local Communities

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

The contractor shall adhere to the following mitigation hierarchy for solid waste management:

a) Source Reduction:

(i) Minimize food waste by implementing efficient storage and portion control practices.

(ii) Reduce packaging waste by opting for products with minimal packaging or using reusable containers.

(iii) Implement measures to reduce construction waste by accurately estimating material needs and avoiding overordering.

b) Reuse:

(i) Encourage workers to reuse metal scraps, bottles, and plastics for other purposes on-site or donate them to local recycling centers.

(ii) Repurpose wood pallets and polythene sheets for temporary structures or as protective barriers.

c) Recycling:

(i) Set up designated recycling stations on-site for separating and collecting recyclable materials such as plastics, papers, metal scraps, and glass bottles.

(ii) Partner with local recycling facilities to ensure proper disposal and recycling of construction wastes like bricks, steel reinforcement, and timber.

d) Recovery:

(i) Implement composting systems to manage food residues and organic waste, converting them into nutrient-rich compost for landscaping or agricultural use.

(ii) Explore options for recovering energy from non-recyclable waste through waste-to-energy technologies.

e) Disposal:

(i) Ensure proper segregation and containment of non-recyclable and hazardous wastes to prevent environmental contamination.

(ii) Contract with licensed waste management companies to dispose-off hazardous materials such as paints, solvents, and chemical residues in accordance with regulations.

f) Education and Awareness:

(i) Provide training to workers on waste segregation, recycling practices, and the importance of minimizing waste generation.

Overall assessment with mitigation: Negative and LOW

8.7.2 Impact 2: Fugitive dust and other emissions

Impact Evaluation: The excavated soil stockpiles along the access roads, construction sites faecal sludge plant and proposed water pipeline route if left uncovered during the dry season will be exposed to agents of wind erosion which will result in dust along the project area. Dust entrainments on construction vehicles frequenting the area could also be a health nuisance in the area. Exhaust emissions from equipment like compactors and construction vehicles could also temporarily alter the air quality in the area.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***High*** and severity is ***High***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor

	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Project Workers
- Local Communities

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) The contractor shall ensure that the soil stockpiles from the excavations are covered/wetted during the dry season to minimize fugitive dust as a result of wind erosion;
b) The contractor shall ensure that excavated sections are back filled as soon as possible to minimize the effect of fugitive dust; and
c) The contractor shall ensure that construction vehicles and associated machinery undergo routine periodic maintenance.

Overall assessment with mitigation: Negative and LOW

8.7.3 Impact 3: Noise from trucks and associated equipment

Impact Evaluation: The operation of construction machinery like compactors and construction equipment (vibrators, compactors or compressors) and vehicles at the construction sites (borehole, access roads and reservoir), sanitation facilities and along the proposed water supply pipeline will result in noise being generated which could prove to be a nuisance. If the noise levels are not controlled, the noise could cause discomfort and unrest to some of the sensitive receptors in the area and the neighboring residents where the excavation works will be undertaken.

Impact severity: The likelihood of the impact occurring is ***High***. Duration of the impact will be Short-term since construction activities will run the period of construction. severity of this impact is ***Medium*** resulting in a ***Moderate*** overall significance level.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Project workers
- Local Communities

Overall assessment without mitigation: Negative and MEDIUM

Mitigation measures

a) The contractor shall create awareness among the communities among which the proposed water supply system, (borehole, access roads and reservoir), faecal sludge plant, sanitation

facilities and pipeline routes will traverse to win their cooperation during the construction phase;

b) The contractor shall ensure that excavation and backfilling of the affected areas are done in the shortest possible time to minimize the effect of construction noise;
c) The contractor shall ensure that most construction equipment and trucks (compactors and vehicles) are fitted with silencers;
d) The contractor shall limit the number of vehicles and journey hours travelled by the construction vehicles in noise-sensitive areas like schools and health facilities among others; and
e) The contractor shall ensure that all construction vehicles and machinery undergo routine periodic maintenance.

Overall assessment with mitigation: Negative and LOW

8.7.4 Impact 4: Alteration of the visual amenity of the project area

Impact Evaluation: The construction works for the faecal sludge plant, borehole and pumphouse, access roads, reservoir and laying of pipelines for both the transmission and distribution lines may harm the aesthetics of the surroundings such as the soil stockpiles from the faecal sludge plant area, pipeline trenches that will be dumped along the trenches for the pipelines.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***High*** and severity is ***Medium***. Therefore, impact significance is ***Minor***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Project Workers
- Local Communities at Laropi RGC

Overall assessment without mitigation: Negative and MEDIUM

Mitigation measures

a) The contractor shall always conserve vegetation around construction sites to serve as visual shields; and
b) The contractor shall ensure that restoring construction sites (buried trenches) are restored immediately upon completion of works.

Overall assessment with mitigation: Negative and LOW

8.7.5 Impact 5: Soil erosion and sedimentation of the River Nile

Impact Evaluation: The excavation and construction activities that includes the construction of both the faecal sludge plant, pumphouse, reservoir, access roads and the laying of the water pipes will result in soil erosion and sedimentation of water channels in the project area and also silting of drainage channels along the access roads in the project area where the proposed pipelines will traverse in the event of a down pour. This sedimentation could alter the turbidity of the water at the nearby River Nile, within the streams and channels resultantly affecting the aquatic fauna in these water bodies.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***High*** and severity on soil is ***High***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Local Communities at Laropi RGC

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) The contractor shall ensure that soil stockpiles are covered to minimize the effect of runoff attributed to rainfall;
b) The contractor shall ensure that the excavated areas are compacted and re-vegetated as soon as possible to reduce the risk of increased erosion; and
c) Site restoration shall be done along the proposed faecal sludge facility, access roads, pumphouse, reservoir, and pipeline routes as well as reseeding the affected areas and appropriate landscaping activities.

Overall assessment with mitigation: Negative and LOW

8.8 Construction phase (Socio-Economic Impacts)

8.8.1 Impact 1: Employment opportunities

Impact Evaluation: The construction activities for the proposed water and sanitation project (water transmission, distribution line and the faecal sludge treatment plant) for Laropi RGC will create several jobs for the project key among these will include: - Construction vehicle drivers, casual workers, plumbers, project supervisors and construction engineers among others. This impact is Positive and Medium.

Overall assessment without enhancement: Positive and MEDIUM

Enhancement measures

a) MWE and the contractor shall ensure that the bulk of the construction workforce is recruited openly and transparently, especially the casual workers.

Overall assessment with an enhancement: Positive and HIGH

8.8.2 Impact 2: Land take

Impact Evaluation: The excavation/earthworks for the proposed water and sanitation system (including the faecal sludge plant, borehole, access roads pump house, solar system, pipeline and water reservoir) and access roads to both the faecal plant, borehole and reservoir for Laropi RGC will manifest into some land take. The land take will comprise of faecal sludge plant (75m x50m, borehole, solar systems and pump house sitting on 30mx30m and a water reservoir (overhead tank – 30mx30m). The pipeline will take approximately 18.2 kilometers for the underground transmission and distribution lines which will require cooperation from the affected parties especially the homesteads, landowners and owners of business premises along the route where the pipe lines will traverse.

Impact severity: The likelihood of the impact occurring is ***High***. Duration of the impact will be medium-term since property loss is permanent. Since compensation will be provided to replace the affected structures, severity of this impact is ***High*** resulting in a ***Moderate*** overall significance level.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) MWE, District Local Government and other affected stakeholders (particularly the landowners) shall enter into agreements for the acquisition of the sites (borehole, reservoir, faecal sludge area and Right Way (ROW)) for both the faecal sludge treatment plant, transmission line, the access roads to both the borehole and reservoir and monetary compensation shall be provided accordingly;
b) The proposed route for the water transmission and distribution lines might require consent from both UNRA, the District Local Government and the land owners where the pipelines will traverse to acquire the right of way for the pipes while the homestead connections will need the corporation of the homestead owners; and
c) Minimise the project footprint to the required land for both the faecal sludge treatment plant (75mx50m), borehole, reservoir (each of approximately 30x30m) and pipeline of approximately 18.2 kilometers where the water supply pipelines will be laid.

Overall assessment with mitigation: Negative and LOW

8.8.3 Impact 3: Disruption of traffic

Impact Evaluation: The excavation for the installation of the pipes for the water transmission and distribution lines within Laropi RGC including the associated trading Centres will result in disruption

and diversion of traffic flow along the roads within the project area and as such will eventually culminate into lost travel time for most road users along the affected sections.

Impact severity: The likelihood of the impact occurring is ***High***. Duration of the impact will be Temporary. severity of this impact is ***High*** resulting in a ***Major*** overall significance level.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Local Communities at Laropi RGC
- Road Users.
- Project Workers

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) The contractor shall ensure that the excavation work is done with minimal disturbance to the road sections where the water pipeline will traverse;
b) The contractor shall work closely with the Uganda Police Traffic department to ensure minimal traffic disruptions for road users along these sections;
c) The contractor shall consult Uganda National Roads Authority (UNRA) and the District Local Government before the commencement of road excavation works on the project area roads; and
d) The contractor shall display appropriate traffic warning signage (e.g. ‘‘Slowdown construction work ahead’’ and ‘‘Traffic Diversion ahead’’) along the roads.

Overall assessment with mitigation: Negative and LOW

8.8.4 Impact 4: Disruption of businesses and Economic displacement/Loss

Impact Evaluation: The excavation of some sections where the water pipelines will be laid will to a certain extent disrupt the operations of business activities along the routes in the project area. Although the construction activities will be temporary, people’s incomes will be greatly affected thus significantly affecting their livelihoods.

Impact severity: The likelihood of the impact occurring is ***Medium***. Duration of the impact will be Temporary. severity of this impact is ***High*** resulting in a ***Negligible-Minor*** overall significance level.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of	**Negligible**	Negligible	Negligible	Negligible	Negligible

	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Local Business Community

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) The contractor shall ensure that the excavated sections are back filled and restored as soon as possible to ensure businesses affected resume operations with minimal disturbance; and
b) MWE and the contractor shall work closely with the local leaders and business owners to ensure that the construction activities are executed as soon as possible.

Overall assessment with mitigation: Negative and LOW

8.8.5 Impact 5: Damage to properties along the water pipeline route/ Physical Instruments

Impact Evaluation: The excavation for laying the pipelines for the water supply system will result in destruction/ damage to properties along the route where the transmission and distribution lines will traverse. The damage to these properties and utilities will significantly affect the provision of services to the project area and also result in financial losses or incurring of repair costs to these utility providers. The area is partly covered by business premises in the area and community access roads managed by Moyo District Local Government.

Impact severity: The likelihood of the impact occurring is ***High***. Duration of the impact will be Temporary. severity of this impact is ***Medium*** resulting in a ***Minor*** overall significance level.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Local Business Community

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) MWE and the contractor shall carryout wide consultations with Moyo District Local Government and property owners after surveying the routes for the water transmission and distribution lines to minimize the damage/ financial losses attributed to the damage that might arise from the excavation of the trenches for laying the pipelines;

b) Layout plans for the proposed transmission and distribution lines shall be displayed at Laropi Town Council Offices and also distributed to the area local leaders / concerned stakeholders for their guidance before construction activities; and

c) The excavation works for the water transmission and distribution lines shall minimize their footprint on the project area by limiting the excavations areas with minimal property damage and:

d) MWE and the contractor shall have in place grievance management channels for physical and economic displacement that shall include: hotline number, email address, suggestion boxes, community meetings, liaison officers to address any concerns associated with physical displacement or damage to property.

Overall assessment with mitigation: Negative and LOW

8.8.6 Impact 6: Increased Revenue Generation by the Government

Impact Evaluation: The project will contribute to the national kitty. The contractor will pay Value Added Tax (V.A.T) on purchasing materials for the project. Construction workers will also pay income tax from their earnings while working on the project.

Enhancement measures

a) Uganda Revenue Authority shall be vigilant to both the contractors and workers and follow up on the necessary tax payments to those involved in the project.

Overall assessment without enhancement: Positive and LOW

8.8.7 Impact 7: Multiplier effect of earnings on the local economy

Impact Evaluation: Since the bulk of the construction workforce is expected to be recruited from within the project area – Laropi RGC or will spend most of the time with the area during the construction activities, it is anticipated that they will spend most of their earnings within the area. These expenses from mainly the purchase of food, and payment of rent among others will resultantly boost the local economy as a result of these workers spending part of their earnings in the area. It should be noted that the construction phase will be temporary.

Overall assessment without enhancement: Positive and MEDIUM

Enhancement measures

a) MWE and the contractor shall ensure that the bulk of the construction workforce is recruited openly and transparently, especially the casual workers.

Overall assessment with an enhancement: Positive and HIGH

8.8.8 Impact 8: Influx of immigrants

Impact Evaluation: The construction activities for the proposed water and sanitation project (faecal sludge treatment plant, transmission and distribution lines) will result in an influx of workers to the area in search of employment on the project. The influx of immigrants will also result in the breakdown of the moral fabric of the community as well as the increase in the spread of communicable and sexually transmitted diseases.

Impact severity: Duration of the impacts is Temporary especially during construction but the likelihood of occurring is ***High*** and severity is ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Laropi Town Council

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) The contractor in consultation with the local authorities shall ensure that most of the construction workforce is recruited within the project area, especially for the semi/unskilled tasks;
b) The local authorities shall help the contractor in the screening of the prospective construction workforce if they are to be recruited from within the project area;
c) Before the recruitment of construction workers, the contractor shall consult the local leadership to ensure that the employment opportunities are evenly spread out;
d) The contractor shall develop a workplace HIV/AIDS policy that addresses the construction workers' sexual behavior;
e) Sensitization and awareness workshops shall be held to create awareness among the construction workforce to minimize the spread of sexually transmitted infections (STI); and.
f) The contractor shall ensure that there is an adequate supply of contraceptives, especially condoms for the construction workers.

Overall assessment with mitigation: Negative and LOW

8.9 Construction phase (Health and Safety Impacts)

8.9.1 Impact 1: Poor sanitation in the project area

Impact Evaluation: The influx of construction workers along the route where the proposed water transmission and distribution lines will traverse and the faecal sludge treatment plant will result in the deterioration of sanitation and hygiene in the project area This might be attributed to the poor disposal of both domestic waste and absence of sanitation facilities for the construction workers which could result into the spread of diseases like dysentery, cholera among others.

Impact severity: Duration of the impacts is Temporary especially during construction but the likelihood of occurring is ***high*** and severity is ***High***. Therefore, impact significance is ***Major***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of	**Negligible**	Negligible	Negligible	Negligible	Negligible

	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Laropi Town Council
- Project workers
- Local community

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) The contractor shall ensure that there is a portable toilet facility for the workers to avoid the indiscriminate disposal of excreta in the project area;
b) A portable water supply (water tank) shall be provided to the construction workers; and
c) Sanitation and hygiene shall be part of the Environment, Health and Safety toolbox talk for the construction workers.

Overall assessment with mitigation: Negative and LOW

8.9.2 Impact 2: Construction accidents

Impact Evaluation: The construction activities of the proposed water supply system and sanitation facilities will result into incidents, these incidents s might result into the following.

a) **Excavation Accidents:** Incidents involving workers getting injured by heavy equipment, collapsing trenches, or falling debris during excavation and trenching activities;
b) **Falls from Heights:** Accidents occurring due to falls from elevated work platforms, ladders, or unstable scaffolding while installing water supply structures or sanitation facilities;
c) **Electrical Incidents:** Electric shocks or electrocutions resulting from improper handling of electrical equipment or contact with overhead power lines during construction activities.
d) **Machinery Accidents**: Injuries caused by malfunctioning machinery, caught-in or caught-between accidents, or improper operation of construction equipment such as excavators, bulldozers, or cranes.
e) **Structural Collapse**: Accidents related to the collapse of partially constructed water tanks, reservoirs, or sanitation structures due to inadequate support, poor construction materials, or structural defects;
f) **Confined Space Incidents**: Incidents occurring when workers enter confined spaces such as underground pipelines or storage tanks without proper ventilation, monitoring, or safety precautions;
g) **Struck-By Accidents**: Workers being struck by falling objects, moving vehicles, or construction materials while working on-site;
h) **Chemical Exposure**: Incidents involving exposure to hazardous chemicals, construction materials, or wastewater during handling, mixing, or storage activities;
i) **Traffic Accidents**: Collisions or injuries involving construction vehicles, trucks, or pedestrians on access roads or construction sites;
j) **Health Hazards**: Occupational illnesses or injuries resulting from exposure to dust, noise, vibrations, or biological hazards such as contaminated water or sewage;
k) **Heat Stress**: Workers experiencing heat-related illnesses or exhaustion due to high temperatures and humidity during construction activities in rural areas;

l) **Ergonomic Injuries**: Musculoskeletal injuries or strains caused by repetitive tasks, heavy lifting, or awkward postures during construction and installation work;
m) **Environmental Incidents**: Spills, leaks, or releases of construction materials, fuels, or chemicals that may impact local water sources, soil quality, or wildlife habitats;
n) **Community Concerns**: Complaints or conflicts arising from construction-related noise, dust, traffic congestion, or disruptions to local communities and residents; and
o) **Security Risks**: Incidents related to theft, vandalism, or sabotage of construction equipment, materials, or infrastructure components in rural areas with limited security measures.

Impact severity: Duration of the impacts is Permanent especially on the victim and the likelihood of occurring is ***high*** and severity is ***High***. Therefore, impact significance is ***Major***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Project workers
- Local community

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

(a) Excavation Accidents: Ensure proper training for workers on excavation safety protocols, use shoring and trench boxes for trench stability, conduct regular inspections of excavation sites, and implement a permit-to-work system;
(b) Falls from Heights: Provide fall protection equipment like harnesses and guardrails, conduct regular inspections of scaffolding and work platforms, and enforce strict adherence to safe work-at-height procedures;
(c) Electrical Incidents: Implement lockout/tagout procedures for electrical work, conduct regular inspections of electrical equipment, provide adequate training on electrical safety, and maintain a safe distance from overhead power lines;
(d) Machinery Accidents: Conduct regular maintenance and inspections of machinery, provide comprehensive training for equipment operators, establish clear operating procedures, and enforce strict safety protocols;
(e) Structural Collapse: Ensure proper engineering design and supervision of construction activities, conduct regular structural inspections, use high-quality construction materials, and provide adequate bracing and support during construction;
(f) Confined Space Incidents: Implement a permit-to-enter system for confined spaces, conduct atmospheric testing and monitoring, provide proper ventilation and lighting, and ensure workers are trained in confined space rescue procedures;

(g) **Struck-By Accidents:** Implement strict traffic management plans, designate pedestrian walkways separate from vehicle routes, use warning signs and barriers, and provide high-visibility clothing for workers;
(h) **Chemical Exposure:** Implement proper hazardous chemical handling procedures, provide personal protective equipment (PPE) such as gloves and respirators, conduct regular chemical risk assessments, and ensure proper storage and labeling of hazardous substances;
(i) **Traffic Accidents:** Implement traffic management plans, designate vehicle parking areas away from work zones, provide adequate lighting and signage, and conduct regular vehicle safety inspections;
(j) **Health Hazards:** Provide PPE such as respirators and ear protection, conduct regular health monitoring of workers, implement dust control measures, and provide adequate rest and hydration breaks;
(k) **Heat Stress:** Provide shaded rest areas, encourage frequent hydration, schedule work during cooler times of the day, and provide cooling measures such as fans;
(l) **Ergonomic Injuries:** Implement proper ergonomic workstation design, provide ergonomic training for workers, rotate tasks to minimize repetitive motions, and encourage proper lifting techniques;
(m) **Environmental Incidents:** Implement spill prevention and response plans, conduct regular inspections of storage areas, use environmentally-friendly construction materials, and establish erosion control measures;
(n) **Community Concerns:** Engage with local communities through regular communication and consultation, address community grievances promptly, implement dust and noise control measures, and minimize construction-related disruptions; and
(o) **Security Risks:** Implement security measures such as fencing and surveillance cameras, conduct background checks on workers, secure construction equipment and materials, and engage with local law enforcement for support.

Overall assessment with mitigation: Negative and LOW

8.9.3 Impact 3: Community health and Safety

Impact Evaluation: Safety problems at the construction sites may arise from earthworks, civil works, excavations, transportation and movement of manually executed works expected to dominate the pipeline laying will take a longer construction time leading to prolonged safety risks such as falling into trenches or the excavated pit.

The construction of water supply and sanitation systems (Faecal Sludge treatment plant) for Laropi RGC presents various community health and safety issues. These include risks of injuries and accidents to workers and community members due to excavation activities, falls from heights, and machinery accidents. Additionally, the handling of hazardous chemicals and exposure to construction-related pollutants may pose health risks to both workers and nearby residents. Poor sanitation practices during construction, such as open defecation or inadequate waste management, can lead to environmental contamination and the spread of diseases. Moreover, the influx of construction workers and increased traffic in the area may result in congestion, noise pollution, and road safety concerns for local residents. Drowning occasioned by open pits and trenches could also be one of the health and safety issues to be considered in the project and mitigation measures proposed for adoption.

Impact severity: Duration of the impacts is Permanent especially on the victim and the likelihood of occurring is ***high*** and severity is ***High***. Therefore, impact significance is ***Major***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Project workers
- Local community

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) **Implement strict safety protocols:** Enforce safety measures such as wearing personal protective equipment (PPE), conducting regular safety briefings, and implementing proper signage and barricades to prevent accidents during excavation, construction, and traffic management activities;

b) **Provide comprehensive training:** Offer training sessions for workers on safety procedures, hazard recognition, and emergency response protocols to ensure they are equipped to handle potential risks effectively;

c) **Use safer construction materials:** Choose construction materials with low toxicity and environmental impact to minimize exposure to hazardous chemicals and pollutants during handling and installation;

d) **Promote proper sanitation practices:** Educate workers and community members on the importance of maintaining good sanitation practices during construction, including proper waste disposal, hygiene, and sanitation facilities to prevent environmental contamination and the spread of diseases;

e) **Monitor air and water quality:** Regularly monitor air and water quality in and around the construction site to identify and address any pollution or contamination issues promptly.

f) **Minimize traffic impacts:** Implement traffic management plans to minimize congestion, control vehicle speeds, and ensure the safety of both construction workers and local residents. This may include designated parking areas, traffic diversions, and speed limits.

g) **Engage with the community:** Maintain open communication with local residents to address their concerns, provide updates on construction activities, and solicit feedback on health and safety issues; and

h) **Safety issues. Backfilling:** Open trenches and borrow pits will be backfilled to guard against drowning in the project area.

Overall assessment with mitigation: Negative and LOW

8.10 Operation / Implementation phase (Biological Impacts)

8.10.1 Impact 1: Loss of vegetation cover during maintenance activities

Impact Evaluation: There might be a need to conduct some repairs or maintenance. In principle, the impacts caused by such maintenance activities will likely cause the loss of some vegetation at the faecal sludge plant, borehole, reservoir and along the pipelines, and access to the roads. These maintenance activities during operation will take place very seldom.

Impact severity: Duration of the impacts is Temporary especially and the likelihood of occurring is ***High*** and severity is ***Low***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Flora
- Local community

Overall assessment without mitigation: Negative and LOW

Mitigation Measures

a) If needed, during the pipeline maintenance, vegetation shall be removed manually; and
b) All temporary access roads (not in use) shall be rehabilitated to promote the recovery of vegetation.

Overall assessment with mitigation: Negative and LOW

8.10.2 Impact 2: Generation of Anaerobic Conditions

Impact Evaluation: During the operation of the sewerage/ faecal sludge treatment plants, there is the likelihood of generation of anaerobic conditions in sewer pipes and stormwater flooding of basements and leakage of sewer pipes.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***High*** and severity is ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Project Workers
- Local Communities

Overall assessment without mitigation: Negative and MEDIUM

Mitigation Measure

a) Proper maintenance of the sewer system shall be ensured during operation.

Overall assessment with mitigation: Negative and LOW

8.10.3 Impact 3: Aquatic Weeds and Deterioration of Effluent Quality

Impact Evaluation: During operation, there is likely to be a proliferation of aquatic weeds in ponds and a deterioration of effluent quality by decaying aquatic weeds.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***Medium*** and severity is ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Flora
- Water in the faecal sludge plant

Overall assessment without mitigation: Negative and MEDIUM

Mitigation Measure

a) Manual clearance of ponds for aquatic weeds shall be undertaken periodically, if necessary.

Overall assessment with mitigation: Negative and LOW

8.10.4 Impact 4: Foul Odour

Impact Evaluation: There is likely to be a foul odour coming from the dumping of faecal matter in the dumping points at the faecal sludge management plant when transporting faecal wastes and poor maintenance of disposal sites and public toilets. The concern is mainly on the neighborhoods of the faecal disposal sites and public toilets. But there is also the issue of odour when transporting wastes along the access roads. If the nuisance is not well handled it may make the area inhabitable. The smell is one of the major issues because most people don't prefer staying close to a faecal treatment plant.

Impact severity: Duration of the impacts is Temporary and the likelihood of occurring is ***High*** and severity is ***High***. Therefore, impact significance is ***Major***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Local community.
- Project Workers

Significance Rating without Mitigation: Negative and High

Mitigation Measures:

a) Proper in-house management shall be employed especially when dumping the wastes. This shall be achieved with proper aeration in the dumping units;
b) Trees shall be planted along the faecal sludge dumping points; and
c) Periodic maintenance and monitoring of the air quality shall be carried out along the access roads to ensure that the sewer vehicles are properly maintained.

Significance Rating with Mitigation: Negative and Low

8.11 Operation / Implementation phase (Physical Impacts)

8.11.1 Impact 1: Pollution resulting from poor management of hazardous wastes and Chemicals

Impact Evaluation: Wastes attributed to operations and maintenance of the solar-powered borehole will be generated with most of them being hazardous and potential pollutants and these shall be mainly the used solar battery sets from battery banks at the pump house.

Additionally, workers involved in water treatment and distribution for Laropi RGC may encounter chemicals used for disinfection and treatment, leading to risks of chemical burns, respiratory issues, or skin irritation.

Impact severity: Duration of the impacts is Temporary and the likelihood of occurring is ***High*** and severity is ***High***. Therefore, impact significance is ***Major***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Flora

- Local community.
- Project Workers

Overall assessment without mitigation: Negative and HIGH

Mitigation Measures:

a) Hazardous wastes shall be well contained on-site and taken away by licensed hazardous waste collectors; and
b) The appointed service provider – sub-contractor (s) shall be obliged to take their waste away with them after completion of their respective assignments at the pump house.
c) Ensure that workers handling hazardous chemicals receive comprehensive training on their safe use, storage, handling, and disposal procedures;
d) Provide appropriate personal protective equipment (PPE) such as gloves, goggles, respirators, and protective clothing to workers to minimize direct contact or exposure to hazardous chemicals;
e) Implement proper ventilation systems and engineering controls in chemical storage and handling areas to minimize the buildup of chemical fumes or vapors and reduce the risk of inhalation exposure;
f) Store hazardous chemicals in designated areas with adequate containment measures to prevent spills, leaks, or accidental releases into the environment;
g) Conduct regular inspections and maintenance of chemical storage and handling equipment to identify and address any potential hazards or defects promptly;
h) Establish emergency response protocols and provide training to workers on how to respond effectively to chemical spills, leaks, or exposure incidents; and
i) Maintain accurate records of chemical inventories, usage, and disposal activities to ensure compliance with relevant regulations and facilitate emergency response and monitoring efforts.

Overall assessment with mitigation: Negative and LOW

8.11.2 Impact 2: Community health risks

Impact Evaluation: Improper operation or maintenance of water supply and Faecal Sludge Plant system for Laropi RGC may lead to waterborne diseases, contamination of drinking water sources, or environmental pollution, posing risks to public health and community well-being.
Impact severity: The duration of the impacts is permanent and the likelihood of occurring is ***High*** and severity is ***High***. Therefore, impact significance is ***Major***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate
	High	Minor	Moderate	Major	Major ***

Impact receptors:

✓ Project Workers; and

- ✓ Communities in Laropi RGC

Overall assessment without mitigation: Negative and HIGH

Mitigation Measures

The water supply system operator shall undertake the following measures:

(a) Implement regular monitoring and testing of water quality to ensure compliance with safety standards and early detection of contamination;
(b) Establish proper operation and maintenance procedures for water treatment and distribution infrastructure, including routine inspections, repairs, and cleaning;
(c) Provide training and capacity-building for water supply operators on safe handling of chemicals, equipment operation, and emergency response protocols;
(d) Encourage community participation in water management and hygiene promotion activities to raise awareness of health risks and promote safe water practices;
(e) Ensure adequate funding and resources for the sustainable operation and maintenance of water supply and sanitation facilities;
(f) Collaborate with local health authorities and environmental agencies to develop contingency plans and response strategies for waterborne disease outbreaks or environmental emergencies;
(g) Conduct regular community engagement and feedback mechanisms to address concerns, gather input, and foster community ownership of water supply and sanitation systems; and
(h) Promote environmental stewardship and pollution prevention measures, such as proper waste disposal, erosion control, and habitat conservation, to safeguard water sources and ecosystems.

Overall assessment with mitigation: Negative and LOW

8.12 Operation / Implementation phase (Socio-Economic Impacts)

8.12.1 Impact 1: Improved and increased access to safe and clean water

Impact Evaluation: The new pump house for Laropi RGC coupled with the water transmission and distribution lines will go a long way in increasing the safe water supply to the villages of Laropi Town Council and the environs of Laropi Town Council to meet the ever-growing safe and clean water demands by the increasing population and commercial activities that need the clean and safe water for their use.

Residents of Laropi RGC and the environs will benefit from an improved source of water and sanitation. The incidence of diseases that occur as a result of using raw water from shallow wells, streams and unprotected springs will reduce. The stabilized water supply will also result in improved hygiene and sanitation practices.

Overall assessment without enhancement: Positive and MEDIUM

Enhancement measures

a) MWE/ NUWS and the Water User Groups (WUGs) within Laropi RGC shall ensure that the water transmission and distribution lines within Laropi RGC are implemented and maintained to provide clean, safe and reliable water to the communities.

Overall assessment with an enhancement: Positive and HIGH

8.12.2 Impact 2: Boost the local economy

Impact Evaluation: The successful installation of the borehole and the associated water supply system for Laropi RGC will bridge the water deficit experienced by the communities of Laropi Town

Council coupled with the increased demand for clean, safe and reliable water within the project area. The reliable water supply to the area will have a significant multiplier effect as a result of creating an ideal environment for water vending at the water Public Stand Points (PSPs), and individual taps in the communities which provide employment opportunities and incomes to some of the residents of the area as well as contributing to the overall development.

There will be a short-term increase in economic activity around the project areas. The construction labour force will require food and other items bought from the retail shop outlets. The stabilized supply of water will spur the sprouting of local businesses such as eateries; additionally, the time saved from fetching water will be used for other productive economic activities.

Overall assessment without enhancement: Positive and MEDIUM

Enhancement measures

a) MWE/ NUWS shall ensure that there is an adequate and reliable water supply from the new water transmission and distribution infrastructure that meets the high water demands in the area.

Overall assessment with an enhancement: Positive and HIGH

8.12.3 Impact 3: Water Access and Tariffs

Impact Evaluation: The introduction of public standpipes in the selected villages within Laropi RGC shall provide a clean reliable water supply to the community but with limited awareness among the communities, the public perception of paying for water provided at the public standpoints and connections at some of the homesteads by NUWS is likely to create negative publicity and a sense of entitlement to the water supply extended to the villages if not sensitized and fair tariffs for the water charged since most of the population largely relies on boreholes and shallow wells for their domestic water needs.

Impact severity: Duration of the impacts is Temporary and the likelihood of occurring is ***High*** and severity is ***High***. Therefore, impact significance is ***Major***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Local community within Laropi Town Council.

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) MWE / NUWS and the contractor in collaboration with Moyo District Local Government and Laropi Town Council shall develop and implement a communication system about water use and associated costs. Community members shall also be sensitized about the need to pay

operational and maintenance costs associated with a water supply and that water supplied by the operator is of good quality;

b) The low-income earners shall be sensitized on water demand management and use of water sparingly, preferably, using treated water for food preparation and drinking; and then water from other sources (rainwater harvesting, springs, boreholes, shallow wells) for other purposes such as laundry;

c) MWE / NUWS and the local Water User Groups (WUGs) shall set the water charges for a unit volume of water based on the economic status of the area so that even low-income earners can access water; and

d) MWE / NUWS and the local Water User Groups shall make charges for a unit volume of water known to the public for example by displaying the costs on the noticeboard of the Town Council offices so that they avoid being overcharged by unscrupulous staff. This shall be in addition to sensitization of the local communities on how to read the meters

Overall assessment with mitigation: Negative and LOW

8.12.4 Impact 4: Limited or poor skills in managing the water supply lines and taps

Impact Evaluation: This will lead to poor operation and maintenance as well as deterioration of infrastructure and accidents due to a lack of enough technical expertise and knowledge in safety requirements for equipment/machinery operation.

Impact severity: Duration of the impacts is Permanent and the likelihood of occurring is ***High*** and severity is ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Local community.

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) MWE / NUWS shall ensure that trained NUWS staff participate in the Operational and Maintenance (O&M) form community committees to be trained in routine O&M procedures for some of the hitches and glitches associated with the maintenance and operation of water supply and distribution lines in the area.

Overall assessment with mitigation: Negative and LOW

8.12.5 Impact 5: Improved sanitation and hygiene

Impact Evaluation: The increased access to clean, reliable and safe water in Laropi RGC and the sanitation facilities at Ayaa Primary School will improve the health and sanitation in the area as a result of residents accessing the clean and safe water and additional toilet facilities at the school.

Overall assessment without enhancement: Positive and MEDIUM

Enhancement measures

a) The prices levied on water supply and sanitation facilities shall be rational and realistic based on the economy of Laropi RGC. This will enable people to access these services at a reasonable price which they can afford.

Overall assessment with an enhancement: Positive and HIGH

8.12.6 Impact 6: Accidental raptures and breakdown in the water supply system

Impact Evaluation: Accidental ruptures and structural degradation of both the transmission and distribution pipelines that may accrue from ageing and poor maintenance, accompanied by low pressure in the pipes may allow the intrusion of potentially polluted groundwater into the drinking water distribution system. Ruptured pipes may also cause flooding and if the water stagnates, this may pose a risk of water-borne diseases.

Impact severity: Duration of the impacts is Temporary and the likelihood of occurring is ***Medium*** and severity is ***High***. Therefore, impact significance is Minor-***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Local community

Overall assessment without mitigation: Negative and MEDIUM

Mitigation measures

a) MWE/NUWS shall ensure that trained members of the Water User Groups / Committees participate in the Operational and Maintenance (O&M) form community committees to be trained in routine O&M procedures for some of the hitches and glitches associated with the maintenance and operation of water transmission and distribution lines in the area.

Overall assessment with mitigation: Negative and LOW

8.12.7 Impact 7: Employment Opportunities

Impact Evaluation: When the water transmission and distribution lines are commissioned, several business opportunities will be created particularly water vending after the setting up of the open water stand taps in the various trading Centres and identified communities for the provision of reliable, clean and safe water.

The proposed project will provide short-term and long-term employment opportunities (120 -140 people) to the local community. The construction phase will provide short-term opportunities for casual work and semi-skilled Labour. During the operational phase, long-term employment opportunities will also be created which will generate income and improve the living standards of the local population and its environs.

Overall assessment without enhancement: Positive and LOW

Enhancement measures

a) MWE / NUWS shall ensure that the public standpipes are located in strategic and commercially viable points (trading Centres, communities with high population and demand safe and clean water); and
b) MWE / NUWS in conjunction with the Water User Groups (WUG) shall appoint/select credible and dependable water vendors who will provide water to the community at fair and affordable rates.

Overall assessment with enhancement: Positive and MEDIUM

8.12.8 Impact 8: Disturbance and interruption of commercial and social activities

Impact Evaluation: During the maintenance of the water transmission and distribution lines, some properties/facilities are likely to be damaged most especially as a result of excavations, floods and demolition of structures/properties above the pipeline that is to be repaired in the event of any breakdown / need to overhaul the pipelines.

Impact severity: Duration of the impacts is Short-term and the likelihood of occurring is ***Medium*** and severity is ***High***. Therefore, impact significance is ***Major***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Local community

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

a) In case of any water transmission or distribution line maintenance activities, that might interrupt public traffic, adequate communication shall be made before such activities;
b) Any social, public or private facility damaged during maintenance works shall be repaired or compensated as soon as possible;
c) Project staff shall be cautioned against bad behavior and follow a professional code of conduct. All staff shall be advised to respect local cultures and values; and

d) Any staff who fails to behave in a way that is socially accepted shall be subjected to disciplinary action according to the project's Grievance Redress Mechanism (GRM).

Overall assessment with mitigation: Negative and LOW

8.12.9 Impact 9: Reduced distances to water sources

Impact Evaluation: With the intensification of water transmission and distribution lines within the selected villages in Laropi RGC within Laropi Town Council, the additional public standpoints and household connections will reduce the distances to water sources (less than 500 meters) and eventually improve productivity among the community residents, reduced domestic violence, increased school enrolment respectively. The reduced domestic violence will be experienced since women are largely responsible for collecting water from the distant boreholes and wells and the increased school enrolment as a result of the new public water standpipes/household connections reducing the distance and time spent fetching water.

Overall assessment without enhancement: Positive and Low

Enhancement measures

a) MWE / NUWS shall ensure that all the public standpipes and household connections are accessible to most the community members; and
b) MWE / NUWS and the water User Groups (WUGs) shall ensure that the prices charged for units of water for domestic use are fair and equitable to the low-income earners in the area.

Overall assessment with enhancement: Positive and Medium

8.12.10 Impact 10: Benefits from Capacity Building

Impact Evaluation: The knowledge of members of the community on various issues will be improved during the project. Occupational health, safety and environmental training and awareness will be extended to workers both during the construction and operational phases of the projects (including site laborers, skilled, semi-skilled and casual, site management and maintenance teams). This will be of great benefit to all workers.
A total of 280 people especially women will receive training in appropriate urban water supply and sanitation and source protection.

Overall assessment without enhancement: Positive and LOW

Enhancement measures

a) MWE shall ensure that trained NUWS staff participate in the Operational and Maintenance (O&M) form community committees to be trained in routine O&M procedures for some of the hitches and glitches associated with the maintenance and operation of water supply and sanitation infrastructure in the area.

Overall assessment with enhancement: Positive and MEDIUM

8.12.11 Impact 11: Improved Service Delivery by the Operators

Impact Evaluation: The revenues generated from water supply fees by the respective operating organizations will provide capital to the organization to improve existing water supply and sanitation infrastructure. This will enable the organization to expand its areas of coverage and improve its customer experience. This will contribute to improvement in the level of satisfaction of citizens to the service delivery.

Overall assessment without enhancement: Positive and LOW

Enhancement Measures

a) MWE and the NUWS shall ensure that both the new water supply and sanitation infrastructure within Laropi RGC is implemented and maintained to provide clean, safe and reliable water to the communities.

Overall assessment with enhancement: Positive and MEDIUM

8.13 Operation / Implementation phase (Health and Safety Impacts)

8.13.1 Impact 1: Physical hazards

Impact Evaluation: Operating and maintaining water supply infrastructure for Laropi RGC, such as pumps, valves, and pipelines, may expose workers to risks of falls, crush injuries, or entanglement in machinery if safety protocols are not followed.

Impact severity: The duration of the impacts is permanent and the likelihood of occurring is ***High*** and severity is ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- ✓ Local community.
- ✓ Project Workers

Overall assessment without mitigation: Negative and HIGH

Mitigation Measures

The water supply system operator shall undertake the following measures:

(a) Implement proper machine guarding measures to prevent workers from coming into contact with moving parts or hazardous machinery components;

(b) Provide adequate training and supervision to workers operating and maintaining water supply infrastructure, emphasizing safe work practices and procedures;

(c) Conduct regular equipment inspections and maintenance to identify and address any potential hazards or defects before they cause harm;

(d) Establish clear communication protocols and emergency procedures to facilitate prompt response to incidents or accidents involving machinery or equipment;
(e) Ensure that workers wear appropriate personal protective equipment (PPE) such as hard hats, gloves, and safety footwear to reduce the risk of injuries from falls, crushes, or entanglements;
(f) Implement a permit-to-work system for high-risk activities involving machinery or equipment, requiring formal authorization and risk assessment before work can commence.
(g) Provide adequate lighting and visibility in work areas to enhance safety and minimize the risk of accidents or injuries related to poor visibility or obscured hazards; and
(h) Encourage workers to report any unsafe conditions or near misses promptly, fostering a culture of safety awareness and continuous improvement in hazard mitigation efforts.

Overall assessment with mitigation: Negative and LOW

8.13.2 Impact 2: Confined space risks

Impact Evaluation: Workers entering confined spaces, such as storage tanks or underground pipelines, may face hazards like poor ventilation, toxic gases, or physical entrapment, leading to risks of suffocation, asphyxiation, or injury.

Impact severity: The duration of the impacts is permanent and the likelihood of occurring is ***High*** and severity is ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- ✓ Project workers

Overall assessment without mitigation: Negative and HIGH

Mitigation Measures

The water supply system operator shall undertake the following measures:

(a) Conduct thorough risk assessments and hazard evaluations before allowing workers to enter confined spaces, identifying potential hazards and implementing appropriate controls to mitigate risks;
(b) Implement a permit-to-work system for confined space entry, requiring proper authorization, training, and supervision for all personnel involved in confined space activities;
(c) Ensure adequate ventilation systems are in place to maintain safe air quality within confined spaces, with provisions for monitoring gas levels and rapid evacuation in case of emergencies;

(d) Provide workers with appropriate personal protective equipment (PPE) such as respiratory protection, harnesses, and lifelines to prevent falls and facilitate rescue operations if necessary;
(e) Implement confined space entry procedures that include comprehensive training, pre-entry checks, continuous monitoring, and effective communication protocols among team members;
(f) Establish emergency response plans and procedures for confined space incidents, including rescue protocols, communication methods, and medical assistance arrangements;
(g) Conduct regular inspections and maintenance of confined spaces and associated equipment to ensure compliance with safety standards and prevent potential hazards from arising; and
(h) Provide workers with specialized training on confined space entry and rescue techniques, emphasizing the importance of following established procedures and maintaining constant vigilance for signs of danger.

Overall assessment with mitigation: Negative and LOW

8.13.3 Impact 3: Electrical hazards

Impact Evaluation: Workers involved in electrical maintenance or repair of water supply infrastructure for Laropi RGC will encounter risks of electric shocks, burns, or electrocution if safety precautions are neglected.

Impact severity: The duration of the impacts is permanent and the likelihood of occurring is ***High*** and severity is ***High***. Therefore, impact significance is ***Major***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate
	High	Minor	Moderate	Major	Major ***

Impact receptors:

- ✓ Project Workers

Overall assessment without mitigation: Negative and HIGH

Mitigation Measures

The water supply system operator shall undertake the following measures:

(a) Ensure that workers involved in electrical maintenance or repair receive comprehensive training on electrical safety protocols, including proper lockout/tagout procedures and personal protective equipment (PPE) usage;
(b) Conduct regular inspections and testing of electrical equipment and infrastructure to identify and address potential hazards or defects proactively;
(c) Implement clear signage, markings, and barriers to delineate hazardous electrical areas and prevent unauthorized access by untrained personnel;
(d) Provide adequate supervision and oversight during electrical maintenance activities to ensure compliance with safety regulations and procedures;

(e) Equip workers with insulated tools and equipment designed for electrical work to minimize the risk of electric shock or short-circuiting;
(f) Establish emergency response protocols and procedures for addressing electrical accidents or incidents promptly and effectively;
(g) Conduct periodic safety audits and reviews to evaluate the effectiveness of electrical safety measures and identify opportunities for continuous improvement; and
(h) Foster a safety-conscious work culture through ongoing training, communication, and recognition of employees' contributions to maintaining a safe working environment.

Overall assessment with mitigation: Negative and LOW

8.13.4 Impact 4: Noise and vibration exposure

Impact Evaluation: Operating machinery or equipment, such as pumps or generators at the water treatment plant for Laropi RGC, can expose workers to high levels of noise and vibration, potentially causing hearing loss, fatigue, or other health issues if not properly managed.

Impact severity: The duration of the impacts is permanent and the likelihood of occurring is ***High*** and severity is ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- ✓ Project Workers

Overall assessment without mitigation: Negative and MEDIUM

Mitigation Measures

The water supply system operator shall undertake the following measures:

(a) Implement regular inspection and maintenance schedules for water supply and sanitation infrastructure to identify and address potential issues promptly;
(b) Provide training and capacity-building for local operators on proper operation and maintenance procedures, including water quality testing and treatment techniques; and
(c) Invest in sustainable infrastructure upgrades and improvements to enhance the resilience and reliability of the water supply and sanitation system over the long term.

Overall assessment with mitigation: Negative and LOW

8.13.5 Impact 5: Occupational Health and Public Health Concerns

Impact Evaluation: Health and safety at the proposed Faecal sludge treatment plant sites are considered primarily in terms of potential exposure to pathogens and accident occurrences to workers and members of the local population during operation.

There is likely to be health and risk of pathogens for potential users of the wetland by liquid effluent discharge from the faecal sludge plant. This may lead to the transmission of waterborne diseases and vector-transmitted diseases if the faecal sludge treatment/sewer is not well handled. FSTPs are potentially dangerous work environments unless proper precautionary measures are implemented.

Impact severity: Duration of the impacts is Temporary and the likelihood of occurring is ***High*** and severity is ***High***. Therefore, impact significance is ***Major***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors:

- Local community.
- Project Workers

Overall assessment without mitigation: Negative and HIGH

Mitigation Measures

a) Health and safety regulations shall be imposed on all workers. Safety regulations include; first aid kits, protective clothing such as uniforms, gloves and helmets, in addition to regulations concerning the storage and use of hazardous material. Furthermore, the FSTP site shall be kept clean to prevent sanitation failures and workers should not be allowed to exceed working hours;

b) To prevent accidents, members of the public shall not be allowed to access the faecal treatment plant at any time, especially after working hours. This is ensured by proper site closure, fencing, and securing the site using a night guard;

c) No cattle grazing or irrigation shall be allowed to use water from the ponds/ wetlands created for purification;

d) Fencing of 100m from the wetland from the discharge point and provision of the disinfecting facility shall be considered if found necessary;

e) Vector control program, i.e. fish & frogs feeding on insect larvae shall be instituted at the plant; and

f) For the use of insecticides, environmentally best practices shall be used, e.g. *bacillus thuringiensis* (bacterial toxin)

Overall assessment without mitigation: Negative and LOW

8.13.6 Impact 6: Effect on-farm yield and soils by poorly treated faecal sludge cake

Impact Evaluation: If the faecal sludge is not properly treated, it may harm the farm production of those farmers who apply the cake to their farm yields. It may also affect the soil fertility of the gardens. Additionally, the farmers handling the faecal sludge cake may get health effects because of handling sludge which is not well treated.

Impact severity: Duration of the impacts is Temporary but the likelihood of occurring is ***Medium*** and severity is ***Medium***. Therefore, impact significance is ***Moderate***.

Impact significance

		Likelihood of impact			
		None	**Low**	**Medium**	**High**
Severity of impact	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Negligible-Minor	Minor
	Medium	Negligible	Minor	Minor-Moderate	Moderate***
	High	Minor	Moderate	Major	Major

Impact receptors

- Flora
- Soils
- Local community

Overall assessment without mitigation: Negative and MEDIUM

Mitigation Measures

a) Proper treatment of the faecal sludge shall be ensured before selling it as manure to the farmers; and

b) Farmers shall be advised to use protective gear when applying manure to their farms/gardens.

Overall assessment with mitigation: Negative and LOW

8.14 Decommissioning Phase Impacts

Decommissioning of the proposed project will become necessary when the project completes its life cycle or when there is a change of use. In a situation where the Sanitation system facilities complete their lifecycle, the decommissioning process will typically involve the demolition of the buildings, clearing of the site and reclaiming or restoring the affected land into a natural condition.

8.14.1 Impact 1: Change of use situation

In a situation where there is a change of use, decommissioning process may entail structure alterations and/or relocation of Sanitation system facilities. Upon demolition of some of the sanitation structures, the affected land will need to be reclaimed or restored to a natural condition through landscaping and planting of vegetation.

8.14.2 Impact 2: End-of-life situation

In a situation where the faecal sludge structures have completed their useful life, the decommissioning process will entail the removal of the sanitation system facility buildings/structures. Site clearing of the site and reclaiming or restoring the affected land into a natural condition will then follow.

Restoration of the affected land may involve the filling in of the open pits and grading the land to its natural contours, then planting appropriate tree species and undercover vegetation to hold the soil in place and to prevent flooding. Planting of trees, however, may not be necessary if the site is immediately taken over for another development.

During decommissioning, the debris resulting from the demolition will either be transported by a licensed waste transporter for dumping at an approved site or used as the base material for new construction work. The demolition process will entail the removal of permanent materials using crowbars and hammers, breaking of walling and reinforced slabs using sledgehammers and/or jackhammers, which utilize compressed air and lowering of materials from high to low levels. Some of the exercises may entail working at a high level and all the necessary health and safety measures will need to be implemented including the provision of personal protective equipment such as safety harnesses, helmets, gloves, respirators, safety shoes, coveralls, goggles and ear protectors.

Generally, the developer will need to follow the necessary safety guidelines and precautions during the demolition process.

Table 8-1: Decommissioning Plan for Laropi Faecal Sludge Management Facility

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Monitoring Means	Time Frame	Cost (UGX)
Demolition waste management					
Demolition waste	✓ Use of an integrated solid waste management system i.e. through a hierarchy of options: Source reduction; ✓ Recycling; Reuse; Sanitary landfilling.	Project Manager and Contractor	Inspection and Observation	One-off	To be determined
	✓ All structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible.	Project Manager and Contractor	Inspection and Observation	One-off	-
	✓ All foundations must be removed and recycled, reused or disposed of at a licensed disposal site.	Project Manager and Contractor	Inspection and Observation	One-off	-
	✓ Where recycling/reuse is not possible, the materials should be taken to a licensed waste disposal site.	Project Manager and Contractor	Inspection and Observation	One-off	-
Rehabilitation of project site					
Vegetation disturbance	Implement an appropriate re-vegetation programme to restore the site to its original status.	Project Manager and Contractor	Observation	One-off	-
	✓ Consider the use of indigenous plant species in re-vegetation.	Project Manager and Contractor	Observation	One-off	-
Minimization of occupational health and safety impacts					
Occupational Health and Safety	✓ Adherence to the Occupational Health and Safety Rules and Regulations stipulated in the	Health and Safety Manager	Inspection, Meeting and Observation	Throughout decommissioning period	To be determined

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Monitoring Means	Time Frame	Cost (UGX)
	Occupational Health and Safety Act, 2006.				
	✓ Provision of appropriate personal protective equipment as well as ensuring a safe and healthy environment for demolition workers	Proponent	Inspection and Observation	Throughout decommissioning period	To be determined
	✓ Mitigate demolition workers' accidents by enforcing adherence to safety procedures and preparing contingency plans for accident response.	Health and Safety Manager	Meeting and Observation	Throughout decommissioning period	To be determined
Minimization of demolition noise and vibration					
Noise and vibration	✓ Sensitize demolition vehicle drivers and machinery operators to switch off the engines of vehicles or machinery not being used.	Project Manager and Contractor	Meeting	Throughout demolition period	No added cost

9. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

9.1 Introduction

An Environmental and Social Management Plan (ESMP) provides the framework for the management and mitigation of impacts anticipated from the IWMDP proposed project in Laropi RGC (water and sanitation area). This ESMP has been prepared following national and international requirements.

The environmental management and monitoring plan aims to bring the project into compliance with applicable national environmental and social legal requirements and World Bank Safeguards policies and procedures.

The ESMP outlines the mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate or compensate for adverse environmental and social impacts, or to enhance the project's beneficial impacts.

Further, the plan also provides indicators for monitoring impact management and mitigation, roles and responsibilities as required by the National Environmental Management Authority (NEMA)

9.2 Environmental and Social Management Plan (ESMP)

To minimise adverse impacts of the project mitigation measures, responsibilities, period of impact management, resources required and estimated costs are proposed in Table 9-1 and the total cost of implementing the ESMP.

The monitoring plan will enable the managers of the project to compare the monitored data against the baseline data collected during the ESIA study. This will help in assessing the effectiveness of the proposed mitigation measures and protection of the environment based on standards used at the national and where necessary at the international level.

It will also help redress emerging issues that were not foreseen during ESIA studies. ESMP monitoring tools such as checklists, atmospheric monitoring equipment for example noise meter, atmospheric particulate meter matter measuring meter, gaseous emission testing meter, and water quality testing.

It shall also use subsidiary management plans developed for the project such as RAP, Health and Safety Management plan, Pollution Control and Prevention Plan and Stakeholder Engagement Plan. The monitoring plans shall monitor the project focusing on the following areas among others:

a) The bio-physical alteration, landscape change and vegetation maintenance
b) Pollution control and prevention
c) Waste management
d) RAP implementation
e) Occupation Health and Safety
f) Sexual Harassment, Exploitation and Child Abuse
g) Project Social Fabric disturbance
h) Community Employment engagement and gender inclusivity
i) Physical culture resource
j) Public Disclosure Plan
k) Workforce training

The project ESMP monitoring can be grouped into two categories: internal monitoring and evaluation, and external monitoring and audits. The internal ESMP monitoring involves the contractor's self-verification programmes and IWMDP/MW&E validation and compliance assessment. The internal monitoring will ensure regular reporting, which will be monthly, bi-annual, and annual reports and immediate (24-48 hours) reporting of serious and severe incidents. The external monitoring shall be done by external stakeholders such as Moyo District Local Government, Ministry of Lands, Housing and Urban Development, NEMA and World Bank among others in the form of inspection and compliance audits.

Table 9-1 below presents the environmental and social management monitoring plan for the project. The total cost of implementing the ESMP monitoring measures is estimated to be **Ugx 534,000,000/=.** It is important to note that monitoring will be conducted at all project sites.

Table 9-1: Environmental Social Impact Management and Monitoring plan for all project phases

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
Pre-Construction Phase	Loss of vegetation cover and crops	Minimal vegetation loss	a) Site Clearance to be limited to strictly areas of study. b) Pruning of branches to be adhered to during study surveying; c) Affected vegetation to be recorded and included in the valuation report for purposes of compensation; and d) Vegetation clearance shall be carried out in the presence of the property owners and the local leadership. e) Engagement with the local landowners during the process to gain access roads to the sites	Proportion of land take for the water and sanitation facilities, Faecal sludge.	Ugx 110,000,000/=	Contractor and Moyo District Local Government and Laropi Town Council	Resettlement Action Plan
	Contamination of Soil	Prevention of soil contamination	a) During site surveying particularly the excavation of trial pits on the proposed sites for the water and sanitation project (borehole, Reservoir and Faecal sludge Treatment Plant), consideration shall be made to prevent soil contamination; b) After each exploration hole for the sites, the holes shall be capped after surveying; and c) During surveying, soils excavated from the exploration holes shall be left beside the holes to ensure that the soils don't erode into the neighbouring local stream /wetland and the White Nile.	Siltation and contamination levels of water sources	Nil	The Contractor and Moyo District and Laropi Town Council	None

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
	High Expectations of the Local Communities Concerning Jobs	Number of jobs offered to the locals' project area	a) Employment requirements should properly be publicized and local leadership involved before the start of the recruitment process and respected by the design team. b) In the event there are local expectations for employment that cannot be met by the project, the limited availability of places shall be made known to the interested parties through local authorities; and c) The principles and procedures for hiring shall, as far as possible, give priority to the hiring of skilled local workers.	Proportion of local to be employed on the project	Nil	The Contractor and Moyo District and Laropi Town Council	None
Construction Phase	Employment opportunities	Number of workers recruited from the project area	a) Ministry of Water and Environment, MDLoG and the contractor shall ensure that the bulk of construction workforce is recruited in an open and transparent manner especially the casual workers.	Proportion of local people employed by the contractor	Nil	The Contractor and Moyo District and Laropi Town Council	None
	Land take	Amount of land take for the water supply system (Pump house, Reservoir, pipelines, Faecal Sludge Treatment	a) The proposed route for the water distribution pipeline might require consent from both UNRA, MDLoG District Local Government, Laropi Town council and the land owners where the pipeline will traverse to acquire the right of way for the pipe while the homestead connections will need the	Compensation of project affected persons in case of any land take	Ugx 55,000,000/=	The Contractor and Moyo District and Laropi Town Council	Resettlement Action Plan

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
		Plant Area and Sanitary Facilities.)	corporation of the homestead owners; and b) Minimise the project footprint to the required land for the water abstraction point, reservoir and approximately 18.2km where the water distribution pipeline will be laid, the Faecal sludge treatment Plant.				
	Construction debris and wastes	Proper handling of waste	a) Ensure that the excavation and backfilling along the line is minimised to the required length and depth at which the cables will be laid; b) Vegetation clearance along the pipeline route shall be limited to the designated width of the water supply system pipe alignment; c) All plumbing waste including water pipe offcuts shall be taken to the contractor's project stores / basecamp for proper handling; d) Wastes generated at the workers accommodation camp shall be segregated according to the various waste streams; and e) The contractor shall ensure that the cleared debris is backfilled to the excavated route where possible and disposed if it can't be backfilled	Waste management practices on site and types of waste generated	Ugx 20,000,000/=	The Contractor and Moyo District and Laropi Town Council	Waste Management Plan

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
	Vegetation clearance and damage to crops	Vegetation clearance kept to a minimum during pipeline construction and Faecal Sludge Treatment Plant area	a) The contractor shall limit vegetation clearance and damage to crops to only the area where the water supply and distribution lines will be laid and where the faecal Sludge treatment Plant will be constructed; b) The contractor shall ensure that an integrated vegetation management approach is adopted; and c) Vegetation clearance and destruction of crops shall be minimised to acceptable levels that allow regeneration of vegetation so that the way leaves are not completely stripped of cover which could accelerate soil erosion and siltation at the White Nile. d) Plant trees and grass around the project sites	Some vegetation left intact and any restoration done using indigenous species only	Ugx 20,000,000/=	The Contractor and Moyo District and Laropi Town Council	Restoration Plan and Tree Planting
	Disruption of traffic	Minimal Traffic interference	a) The contractor shall ensure that the excavation work is done with minimal disturbance to the road sections where the underground cable will traverse; b) The contractor shall work closely with the Uganda Police Traffic department to ensure minimal traffic disruptions for road users along these sections; c) The contractor shall consult Uganda National Roads Authority	Traffic well managed during the pipeline construction. Traffic will also be managed along the road where Faecal sludge treatment Plant will be construction as	Ugx 25,000,000/=	MWE, the appointed Contractor and Laropi Town council, Traffic Police Department	Construction traffic management plan

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
			(UNRA) prior to commencement of road excavation works in the project roads; and d) The contractor shall display appropriate traffic warning signage (e.g. "Slowdown construction work ahead" and "Traffic Diversion ahead") along the road.	there will be movement of trucks for materials to the plant site.			
	Disruption of business	Minimal disruption of business	a) The contractor shall ensure that the excavated sections are back filled and restored as soon as possible to ensure businesses affected resume operations with minimal disturbance; and b) MWE, Moyo District Local Government, Laropi Town Council and the contractor shall work closely with the local leaders and business owners to ensure that the construction activities are executed as soon as possible.	Economic livelihoods affected by the construction works	Ugx 20,000,000/=	MWE, the contractor, Moyo District Local Government and Laropi Town Council	Livelihood Restoration
	Construction accidents	Less traffic and any related accidents	a) Environment, Health and Safety (EHS) measures shall be part of the induction training for the construction workers; b) Appropriate Personal Protective Equipment (PPE) (e.g. Overalls, Hard hats, Helmets, and Gloves etc) shall be provided to all workers and enforce its use by the construction workers. at all times;	Number of construction vehicles, traffic counter measures, and traffic incidents/accidents reported	Ugx 35,000,000/=	MWE, Moyo District Local Government, Contractor, Laropi Town Council and the Traffic Police Department	Construction traffic management plan

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
			c) All near misses, incidents and accidents shall be recorded in an incident register; and d) Adequate emergency response measures (e.g. fully stocked first aid kit and a serviced fire suppression system) shall be readily available on site and supplemented with trained personnel in emergency response.				
	Damage to properties along the Distribution pipeline	Minimal destruction of properties along the pipeline routes	a) MWE and the contractor shall carryout wide consultations with NUWS and property owners after surveying the routes for the water distribution lines to minimise the damage/ financial losses attributed to the damage that might arise from the excavation of the trenches for laying the pipelines; b) Layout plans for the proposed line shall be displayed at the Town Council Headquarters and also distributed to the area local leaders / concerned stakeholders for their guidance prior to construction activities; and c) The excavation works for the water supply and distribution pipelines shall minimise their foot print on the project area by limiting the excavations to the areas with minimal damage to property.	Complaints registered and number of properties affected by the construction works for the pipeline.	Ugx 25,000,000/=	MWE, Moyo District Local Government, contractor and Laropi town Council.	Livelihood Restoration

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
	Community Health and safety	Less community safety concerns attributed to the pipeline construction.	a) The contractor shall ensure that work sites (especially excavation works), especially in the night have proper protection with clear marking of safety borders and signals and fence off all dangerous areas; b) The contractor with the help of the area local leaders shall inform the project affected communities about the construction program in advance; c) The contractor shall ensure that access to restricted work sites (including those with operation mechanical and electric equipment) to persons with permits; and d) The contractor shall prepare and implement appropriate traffic plans with the help of local police when (partial) closure of roads is required.	Number of community safety concerns, safety control measures, and safety incidents/accidents reported.	Ugx 55,000,000/=	MWE, Moyo District Local Government, Laropi Town council, Contractor and Area Local Leaders	Environmental Health and Safety Trainings / Sensitisation
	Sexual Exploitation, Abuse and Harassment	Control Sexual Related Exploitation and abuse	a) Conduct training for contractors and their workers on labour and Gender Based Violence laws b) Include GBV/SEAH requirements in the bid documents c) Integrate measures for prevention and handling Gender Based Violence (GBV) and SEAH in the C- ESMP	Complaints registered and handled within the relevant Laws	Ugx 20,000,000/=	MW&E and Laropi Town Council and Contractor and Area Local Leaders	Sensitisation and Training of Workers.

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
			d) All workers should sign a code of conduct which include specific clauses on GBV/SEAH prevention e) Include GBV/SEAH prevention in the induction programme f) Conduct awareness-raising to neighbouring communities regarding SEAH and reporting mechanism g) Including receiving handling channel of SEAH allegations within the GRM and training responsible GRC members on handling the allegations				
	Noise and vibration around construction sites	Control of Noise levels and vibration within construction areas keeping the below the required levels	a) Servicing of vehicles and plants b) Rescheduling of work to daytime c) Provide earplugs to workers d) Sensitizing communities	Number of registered complaints on Noise and Cracks within the structures of the neighbouring Communities	Ugx 10,000,000/=	MW&E and Laropi Town Council and Contractor and Area Local Leaders	None
	Vandalism and theft of project infrastructure including Equipment and Machinery	Less vandalism and maximum protection of project equipment and machinery	a) Sensitize communities on the importance of safeguarding water infrastructure b) Provide adequate security in project sites c) Fencing equipment stores d) Empowering community police	Appropriate use of equipment and low incidences of vandalism	Ugx 8,000,000/=	MW&E and Laropi Town Council Uganda Police and Contractor	None
Operation Phase	Improved and increased access	Wider Coverage of	a) MWE, NUWS and the Water User Groups (WUGs) shall ensure that the new water supply and	Number of stand taps and length of pipeline extended.	Nil	MWE, NUWS and Laropi Town Council	Promotion and Awareness campaigns held

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
	to safe and clean water	clean water supply	distribution system within Laropi Town Council is implemented and maintained to provide clean, safe and reliable water to the communities.	Number of households supplied by the Water supply project		Local Area Leadership	
	Improved and Sanitation and Handling of Faecal Matter	Better handling and disposal of faecal Matter within Laropi Town council and wider area	a) MWE and Laropi Town council shall ensure that the Faecal sludge Treatment Plant is well maintained and serviced to provide sanitation services to the communities of Laropi.	Number of Households depositing Faecal Matter to the treatment Plant.	Nil	MWE and Laropi Town Council Local Area Leadership	Promotion and Awareness campaigns held
	Boost to local economy	Increased business opportunities	a) MWE, NUWS, Moyo District Local Government and Laropi Town Council shall ensure that there is adequate and reliable water supply from the new added water supply and distribution infrastructure that meets the high water demands in the area.	Number of public stand taps operating in the area.	Nil	MWE, NUWS and Moyo District Local Government and Laropi RGC / Area Local Leadership	None
	Water access, Water tariffs and Faecal Sludge Treatment Plant Tariffs.	Affordable water tariffs for the communities and Increased number of households connected / accessing the water supply system.	a) MWE, NUWS and Moyo District Local Government, Laropi town council shall develop and implement a communication system about water use, and Faecal treatment plant service use and associated costs. Community members shall also be sensitized about the need to pay operational and maintenance costs associated with water supply and that water	Number of public stand taps constructed / Number of consumers accessing safe and clean water. Number of consumers utilising the faecal	Ugx 15,000,000/=	MWE, NUWS and Moyo District Local Government and Laropi Town Council Area WUGs	Communication Strategy and Sensitizations held

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
		Affordable Faecal Sludge Treatment Plant Tariffs and increased n8umber of households utilising services of Faecal Sludge Treatment Plant	supplied by the operator is of good quality; b) The low-income earners shall be sensitised on water demand management and use of water sparingly, preferably, use treated water for food preparation and drinking. c) NUWS and the local Water User Groups (WUGs) shall set the water charges for a unit volume of water based on the economic status of the area so that even low-income earners can access water; and d) The community shall be sensitized on the need to development of septic tanks and the need to empty the faecal matter at the faecal treatment Plant.	sludge treatment Plant			
	Employment opportunities	Increased number of public stand taps operated by the operators / vendors Number of private	a) MWE and NUWS shall ensure that the public stand taps are located in strategic and commercially viable points (trading centres, communities with high population and demand safe and clean water); b) MWE/ NUWS in conjunction with the Water User Groups (WUG) shall appoint / select credible and	Number of functional public stand taps; Number of water vendors operating public stand taps. Increased number of waters borne	Nil	MWE, NUWS and Area WUGs	None

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
		empties' within Laropi Town council area	dependable water vendors who will provide water to the community at fair and affordable rates. c) Laropi Town council shall license private empties within the town council	toilets within Laropi RGC			
	Disturbance and interruption of commercial and social activities	Minimal disruption and interruption of businesses a	a) In case of any project maintenance activities, that might interrupt public traffic, adequate communication shall be made prior to such activities; b) Any social, public or private facility damaged during maintenance works shall be repaired or compensated as soon as possible; c) Project staff shall be cautioned against bad behaviour and follow professional code of conduct. All staff shall be advised to respect local cultures and values; and d) Any staff who fails to behave in a way that is socially accepted shall be subjected to disciplinary action	Limited disruption of businesses	Ugx 20,000,000/=	MWE/NUWS and Area WUGs	None
	Reduced distances to water sources	Minimal distances to the water taps	a) MWE, NUWS and Moyo District Local Government, Laropi Town Council shall ensure that all the public stand taps, household	Increased number of stand taps, connected	Nil	MWE, NUWS and Area WUGs	None

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
			connections are accessible to most the community members; and b) MWE, NUWS and the water User Groups (WUGs) shall ensure that the prices charged for units of water for domestic use are fair and equitable to the low-income earners in the area.	households in the area;			
	Reduced use of Pit Latrines within Laropi RGC	Improved sanitation and faecal Matter handling within Laropi RGC	a) MWE, NUWS and Moyo District Local Government, Laropi Town Council shall ensure maximum sensitisation on the use of better methods of sanitation	Improved sanitation within Laropi RGC	Ugx 15,000,000/=	MWE, Moyo district and Laropi Town council	Community Sensitisation
Decommissioning Phase	Construction waste Rubble	Clean and Restored site	a) Use material to backfill the borrow pits, quarry sites and gullies b) Reuse the waste for other purposes such as construction such as road maintenance	Number of cleared sites	Ugx 20,000,000/=	MWE, NUWS and Moyo District Local Government, Laropi Town council	Restoration Plan
	Dust emission	Dust levels complying with National Standards	a) Employ dust suppression measures like the application of water	Number of times dust suppression measures are applied per day	Ugx 20,000,000/=	MWE and Operator	Air Quality Monitoring
	Pollution due to improper disposal of solar	Proper handling of E-waste such as solar panels, computers among others	a) Follow guidelines for disposal and pollution control management plan for this project	Number of cases of unsafe disposal of E-Wastes such as batteries and other solar accessories	Ugx 20,000,000/=	MWE and Operator	Waste Management Plan

Phase	Impact	Desired Outcomes/Objectives	Management Commitment	Performance Indicators/Targets of Acceptance Criteria/Auditable Management Actions	Costs	Responsibility	Capacity Building and Training Requirements
	Noise and vibration around decommissioned sites	Noise and Vibration levels complying with National Standards	a) Servicing of vehicles and plants b) Rescheduling of work to daytime	Noise and vibration levels	Ugx 13,000,000/=	MWE and Operator	Seismometer, Noise meter
	Pollution of Surface and groundwater	Water quality complying with standards	a) Monitor the water quality regularly b) Develop standard procedures for maintenance works	Pollutants according to local and international standards	Ugx 8,000,000/=	MWE and Operator	Water quality measuring equipment
Total					**534,000,000**		

9.3 INSTITUTIONAL CAPACITY AND IMPLEMENTATION ARRANGEMENT OF ESMP

9.3.1 Implementing Stakeholders and Roles Implementing Agency

The Ministry, has experience in implementation of similar projects requiring an ESIA and implementation of ESMP. The projects have strengthened MW&E's internal capacity to implement ESMPs and ensure compliance with national and financier safeguard requirements. Ministry has personnel trained in Environmental Management, Social Safeguards, Water Resources Management, and Environmental Health which has enabled MW&E to successfully implement the past projects.
The MW&E currently has the following experts who have participated in the project design and planning phase including preparation of the ESIA and RAP. The staff will also be being responsible for the implementation of the ESMP.

i. Environmental and Social Safeguard Specialist
ii. Environmental and Social Safeguard Officers
iii. Community Mobilization and Gender Expert
iv. Health and Safety officer

In addition to implementation of the ESMP, the team will also be responsible for monitoring, reviewing and reporting different aspects of the ESMP to the different stakeholders. The Environmental and Social Safeguard Specialist will play the oversight role in be responsible for overall implementation, and preparation of reports on ESMP. The reports on ESMP implementation performance will be submitted quarterly to MW&E, World Bank.

The successful implementation of the project ESMP shall require seamless interaction and coordination from different stakeholders involved in the project including, Ministry, Stakeholder Engineering Consultant, Contractor, Supervising Engineering Consultant.

The Engineering consultant is responsible for reviewing designs and supervising the contractor. S/he will ensure that the designs and works being implemented by contractors comply with E & S requirements. The consultant shall therefore have an Environmental and Social Safeguard Specialist within their team.

9.3.2 Contractor

The project construction activities shall be carried out by a contractor. The contractor shall be responsible for most ESMP implementation. The contractor shall recruit Environmental Specialist, Sociologist, Health and Safety Officer to ensure the implementation and monitoring of Environmental, Health and Safety measures on daily a basis.

9.3.3 Capacity building

MWE will organize capacity building workshops for key personnel that will be part of ESMMP implementation. Particular trainings will be organized on ESMMP implementation requirements for the proposed water supply system and sanitation facility in Laropi RGC under the Integrated Water Management Development Project. It will also be a requirement for the contractor's workers (Safeguards Team) to undergo induction in the Environmental and Social safeguards at the start of the construction of the water supply system and sanitation facility in Laropi RGC. Site meetings and trainings will be strengthened and the Supervising Consultant will ensure that timely meetings and capacities of the contractor workers (with main emphasis on the safeguards Team) are enhanced to implement the ESMMP.

Capacity building is one of the critical elements for the successful and efficient implementation of ESMP.

9.4 Reporting Requirements

To document and report environmental and social incidents during the construction and operation of the water supply system and sanitation facilities, including spills, accidents / incidents, soil erosion problems, noise complaints, and other issues, the following procedures shall be followed:

1. **Incident Identification:** Contractors' staff are trained to recognize and report any environmental or social incident immediately upon discovery. This includes using predefined criteria for identifying incidents.
2. **Incident Documentation:** Once an incident is identified, it is documented in detail. This documentation shall include the date, time, location, description of the incident, potential causes, and any immediate actions taken to mitigate or address the situation.
3. **Notification:** Relevant project personnel, such as environmental, social and safety officers, shall be notified promptly about the incident. Depending on the severity and nature of the incident, regulatory authorities and emergency services may also be notified as required by law.
4. **Response:** An immediate response plan is activated to address the incident. This may include containment and cleanup procedures for spills, addressing soil erosion issues, implementing noise control measures, or taking any other necessary actions to mitigate the incident's impact.
5. **Reporting:** The incident shall be formally reported to the project's management team and, if required, to regulatory authorities. The report shall include all relevant details, actions taken, and any follow-up measures planned.
6. **Response Times:** Response times are defined in the project's emergency response plan, specifying how quickly each type of incident should be reported and acted upon. These response times are based on the severity of the incident and its potential impact.
7. **Periodic Reporting:** The project's environmental and social monitoring and reporting plan includes provisions for periodic reporting to regulatory authorities, project stakeholders, and the public. This reporting includes updates on incident investigations, mitigation measures, and overall project compliance with environmental and social requirements.
8. **Lessons Learned:** After the incident is resolved, a debriefing shall be conducted to analyze the incident's causes and responses, identify lessons learned, and update procedures to prevent similar incidents in the future.

Table 9-2: Incident types reported using the Environmental and Social Incident Response Process

SN.	Reportable Incident	Environmental and Social Incident Response Process (ESIRP)	Required response time
1.	Fatalities and Serious Injuries:	Any incident resulting in a fatality or serious injury must be reported through the RE to the Ministry of Water and Environment (MWE), the World Bank, and the National Environment Management Authority (NEMA) or Department of Occupational Safety and Health (DOSH).	immediately (within 24-48 hours)
2.	Environmental Spills:	Spills of hazardous materials or substances that may impact the environment, water bodies, or surrounding ecosystems must be reported through the RE to MWE, the World Bank, and NEMA.	within 24-48 hours
3.	Structural Failures:	Incidents involving the failure or collapse of structures such as retaining walls, embankments, or equipment that pose a risk to safety or the environment must be reported through the MWE, the World Bank, and NEMA/DOSH.	immediately

SN.	Reportable Incident	Environmental and Social Incident Response Process (ESIRP)	Required response time
4.	Equipment Accidents:	Accidents involving heavy equipment, machinery, or vehicles that result in significant damage or pose safety risks must be reported through the RE to MWE, the World Bank, and NEMA/DOSH.	within 24-48 hours
5.	Erosion and Sedimentation Issues:	Significant erosion, sedimentation, or changes in water flow patterns that may impact water quality or the stability of the mining site must be reported through the RE to MWE, the World Bank, and NEMA.	within 24-48 hours
6.	Community Complaints and Grievances:	Any serious complaints or grievances from local communities related to the sand mining activities that could have environmental or social implications must be reported to MWE, the World Bank, and NEMA/DOSH.	
7.	Adverse Impact on Biodiversity:	Incidents resulting in the adverse impact on local flora and fauna, including endangered species, must be reported through the RE to MWE, the World Bank, and NEMA.	within 24-48 hours
8.	Water Quality Violations:	Violations of water quality standards or parameters set by regulatory authorities must be reported through the RE to MWE, the World Bank, and NEMA.	Immediately
9.	Community Health and Safety Concerns:	Incidents posing risks to the health and safety of local communities, such as dust or noise pollution, must be reported through the RE to MWE, the World Bank, and NEMA/DOSH.	within 24-48 hours
10.	Security Breaches:	Breaches of security leading to unauthorized access to the water transmission and distribution lines and supply installations or criminal activities that may affect the project must be reported through the RE to relevant authorities, including MWE, the World Bank, and local law enforcement.	Immediately
11.	Non-Compliance with Regulatory Requirements:	Any non-compliance with regulatory requirements, permits, or environmental management plans must be reported through the RE to MWE, the World Bank, and NEMA/DOSH.	within 24-48 hours
12.	Violence on the basis of SOGI	The threat or use of physical force that injures or abuses a person, or damages or destroys property, and that is motivated in whole or in part by the victim's real or perceived sexual orientation, gender identity, gender expression, or sex characteristics.	within 24-48 hours
13.	Discrimination on the basis of SOGI	Discrimination means creating a distinction, exclusion, or restriction which has the purpose or effect of impairing or excluding a person based on their real or perceived sexual orientation, gender identity, gender expression, or sex characteristics from being on an equal basis with others.	within 24-48 hours
14.	Sexual Exploitation	Any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another. In Bank financed operations/projects, sexual exploitation occurs when access to or benefit from a Bank financed Goods, Works, Non-consulting Services or Consulting Services is used to extract sexual gain.	within 24-48 hours
15.	Sexual Abuse	Actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions. In Bank financed operations/projects, sexual abuse occurs when a project related worker (contractor staff, subcontractor staff, supervising engineer) uses force or unequal power vis a vis a community member or colleague to perpetrate or threat to perpetrate an unwanted sexual act.	within 24-48 hours
16.	Sexual Harassment	Any unwelcome sexual advance, request for sexual favor, verbal or physical conduct or gesture of a sexual nature, or any other behavior	within 24-48 hours

SN.	Reportable Incident	Environmental and Social Incident Response Process (ESIRP)	Required response time
		of a sexual nature that might reasonably be expected or be perceived to cause offence or humiliation to another, when such conduct interferes with work, is made a condition of employment, or creates an intimidating, hostile or offensive work environment. In Bank financed operations/projects, sexual harassment occurs within the context of a subcontractor or contractor and relates to employees of the company experiencing unwelcome sexual advances or requests for sexual favor or acts of a sexual nature that are offensive and humiliating among the same company's employees.	
17.	Other	Any other incident or accident that may have a significant adverse effect on the environment, the affected communities, the public, or the workers, irrespective of whether harm had occurred on that occasion. Any repeated non-compliance or recurrent minor incidents which suggest systematic failures that the task team deems needing the attention of Bank management.	within 24-48 hours

Source: (extracted from Annex 1 of ESIRT March 2023

From the foregoing, it is crucial for Ministry of Water and Environment and the appointed contractor for the proposed water supply system and sanitation facilities to establish a clear reporting protocol and ensure that all personnel are trained to recognize and promptly report incidents according to the specified timelines.

Additionally, monthly reporting of the implementation of the ESMP will be made to the supervising Engineer and external Environmental and Social Compliance Audits shall be done annually and reports submitted to NEMA and other stakeholders (including the client Ministry of Water and Environment and Moyo District Local Government).

9.5 Grievance Redress Mechanism (GRM)

Grievance redressal is a critical component of effective ESMP implementation. The purpose of GRM is to provide a forum for the internal and external stakeholders to voice their concerns, queries and issues with the project. Such a mechanism would provide the stakeholders with one project personnel or one channel through which their queries will be channelled and will ensure timely responses to each query.

This will allow for trust to be built amongst the stakeholders and prevent the culmination of small issues into major community unrest. The GRM will be accessible and understandable for all stakeholders in the project and the entire project life. The GRM will be communicated to all relevant stakeholders and will also apply to any contractor that will occupy and/or use land during the construction and operations phase.

WBG standards require Grievance Mechanisms to provide a structured way of receiving and resolving grievances. Complaints should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities and is at no cost and without retribution. The mechanism should be appropriate to the scale of impacts and risks presented by a project and beneficial for both the company and stakeholders. The mechanism must not impede access to other judicial or administrative remedies.

This section contains the following:

- Grievance definition and categories and GRM principles;
- The process of receiving, documenting, addressing and closing grievances.

9.5.1 Grievance Definition and Categories

As stated earlier, a grievance is a concern or complaint raised by an individual or a group within communities affected by company operations. Both concerns and complaints can result from either real or perceived impacts of a company's operations and may be filed in the same manner and handled with the same procedure.

Grievances may take the form of specific complaints for actual damages or injury, general concerns about project activities, incidents and impacts or perceived impacts. Based on the understanding of the project area and the stakeholders, an indicative list of the types of grievances have been identified for the project, as can be seen below: -

Internal Grievances: Grievances from Employees (including both direct and indirect employees, including local workers and migrant workers through contractors):

- Complaints about the amount of wage, salary, other remuneration or benefits as per the Company's Human Resource policy;
- Timely disbursement of remuneration;
- Gender discrimination;
- Sexual harassment
- Sexual exploitation and abuse by project workers against community members
- Gender-based violence
- Issues related to worker's organization.
- Labour Accommodation
- Health and Safety issues
- Extended working hours

External Grievances: Grievances from community members:

- Issues related to sexual exploitation and abuse
- Issues related to gender-based violence at the community level
- Issues related to child labour and protection
- Issues related to transportation and traffic;
- Increase in environmental pollution;
- Impact on community health;
- Disturbances to locals due to an influx of migrant workers in the area;
- Issues arising out of sharing of employment and business opportunities;
- Concerns over the impact on local cultures and customs.

9.5.2 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 Cell/village/ parish levels, Sub-County, Town Council, District levels and MWE levels. This guideline does not propose a size fit 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. Cell/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:

- Chairperson,
- Vice Chairperson,
- Secretary,
- 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).
- 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.

9.5.3 Roles and Responsibilities of Community GMC

- Providing project information and attending to complaints that may be resolved by providing information
- Registering all grievances from the community or as referred to at different levels
- Addressing those grievances that are manageable by the committee
- Referring any grievances to higher levels for action and further follow-up.
- Escalating any unresolved grievances to appropriate levels as stated in these guidelines
- Liaising with local leaders to ensure the health, safety and security of the communities, workers and construction materials during the project implementation

9.5.4 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;

- The Resident Engineer/ Supervising Consultant (Chairperson)
- The Contractor's Contract Manager
- Sociologist for the Consultant
- Sociologist for Contractor (Secretary)
- Environmentalist for the Consultant
- Environmentalist for the Contractor
- Health and Safety Officer for the Contractor
- 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, labour-management hostility, incidences of workplace favouritism 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 Technical. 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.

9.5.5 GMC at Sub County Level

The committee will be formed at the sub-county level and its membership shall consist of;

- Local Council III (chairperson);
- The Sub County Chief,
- Community Development Officer (Secretary)
- Environment focal person
- Representatives of PAPs
- Parish Chief of the respective area where the complaint originated from.

9.5.6 GMC at Town Council

Given its extended nature of staffing and complexity, the town council grievance management committee shall include the following members;

- LC III Chairperson/ Mayor (Chairperson)
- Town Clerk
- Council Community Development Officer (Secretary)
- Environment Officer
- Physical Planner
- Representative of the PAPs

9.5.7 GMC at the District Level

At the District Level, the Grievances Management Committee shall consist of;

- LC V Chairperson (Chairman)
- Chief Administrative Officer or his/ her Representative
- District Community Development Officer (Secretary)
- Head of Natural Resources
- District Water Officer
- Representatives from the PAPs

- 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.

9.5.8 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, District, MWE and other mandated agencies.

a) 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
- The secretary seeks clarification of the specified details of the complaint
- A complaint is registered into the complaints register provided by MWE
- 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

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.

b) 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.

c) Referral/ Appeals to Sub County/ Town Council Grievance Management Committees

The Contract Manager for the Contractor will refer unresolved grievances to the Sub-County and Town Council Grievance Grievances Management Committee for consideration. The Sub County GMC/ Town 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 instil 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.

d) Referral/ Appeals to District Grievance Management Committees (DGMC)

If the Sub County/ Town Council 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 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.

9.5.9 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:

- 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.
- 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
- Representing the interests of workers about 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.
- Educating Workers on their rights, discipline, code of conduct, 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
- 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
- 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.
- Identifying and representing concerns of special interest groups on the project such as women, expectant and lactating mothers, workers with disabilities etc.
- 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.
- Reporting any incident(s) of violation of workers' rights, staff indiscipline and related issues to management for redress
- Keeping an adequate log and other documentation of all matters that come before the Workers' committees for better reference and effective management

9.5.10 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.

9.5.11 Flow Chart of the Grievance Management Process

The grievance management process has several interdependent steps that will be followed as summarized below;

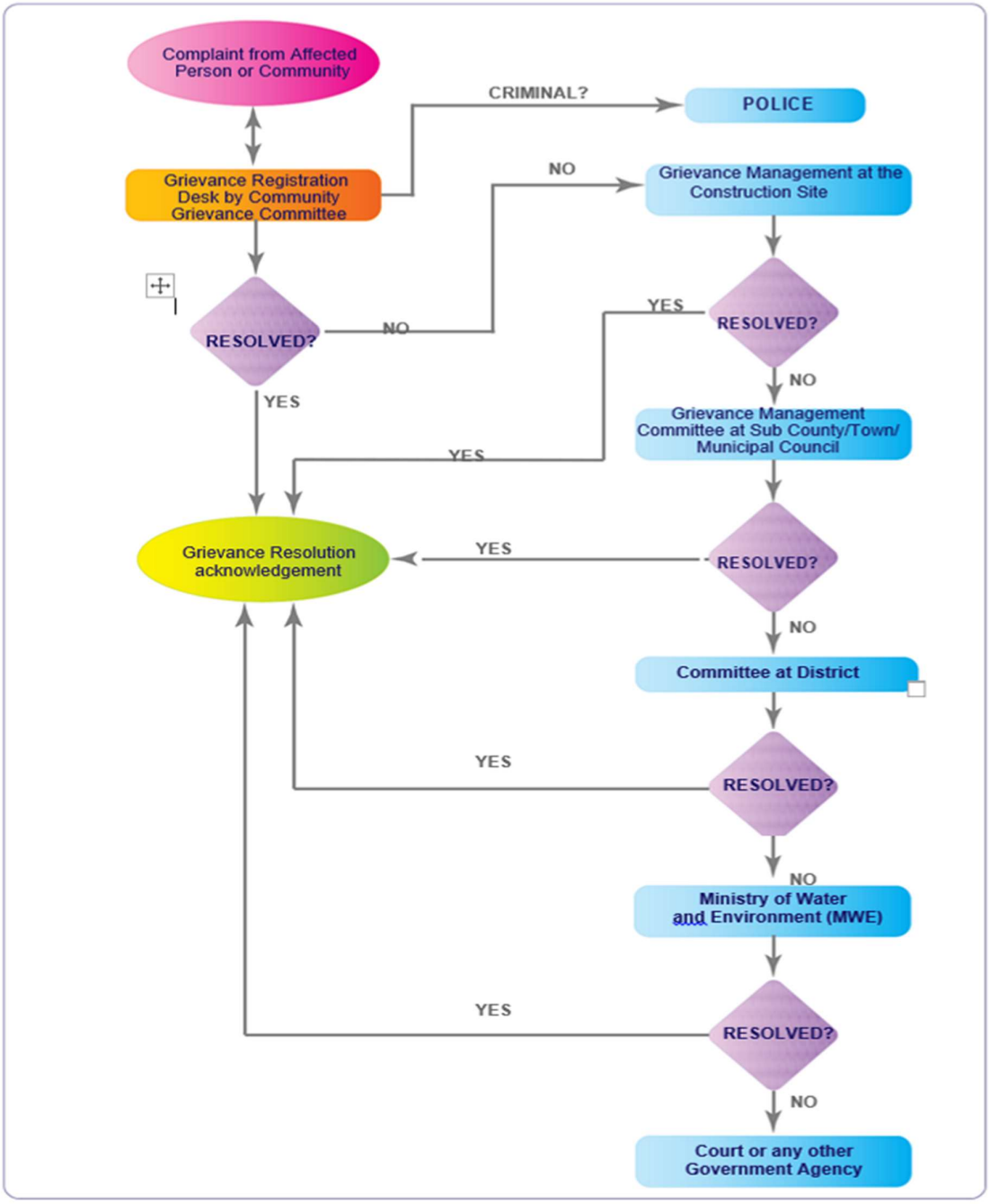


Figure 9-1: The Grievance Handling Flow for Community (MoWE)

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 the 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.

9.5.12 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.

9.5.13 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, 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 GM Committees formed
- No of the GM Committees trained

- No of grievance related community sensitizations conducted
- No committees facilitated with basic stationery, standard grievance registers, & PPEs
- No of people (M, F) sensitized
- No 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

9.5.13.1 Training of the GRCs

The GRC will be trained on the following:

- Execution of the terms of reference
- Categorization of complaints/grievances
- Referral pathway for each category of complaints/grievances
- Basic mediation, conflict resolution techniques and skills
- Communication and basic public relations skills
- The property valuation process
- Scope of the project and the associated risks
- Code of conduct for the contractor
- 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.

9.5.13.2 Facilitation of the GRCs

MoWE will provide the following to facilitate the GRC's work:

- Grievance Logbooks and related logistics;
- Orientation/training of GRCs on grievance resolution;
- Materials such as pens notebooks; and
- Branded items such as MWE T-shirts, pens, folders etc. for motivation.

9.5.13.3 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 which 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.CONCLUSIONS

10.1 Conclusion

The Environmental Social Impact Statement (ESIS) has presented a comprehensive assessment of the social, physical and biological conditions of the Laropi RGC. The ESIS has further indicated that there will be limited negative impacts that will affect the Environment and Social parameters for Laropi RGC thus the mitigation measures proposed should be able to mitigate the negative impacts and enhance the positive impacts thus the need to implement the project in Laropi RGC.

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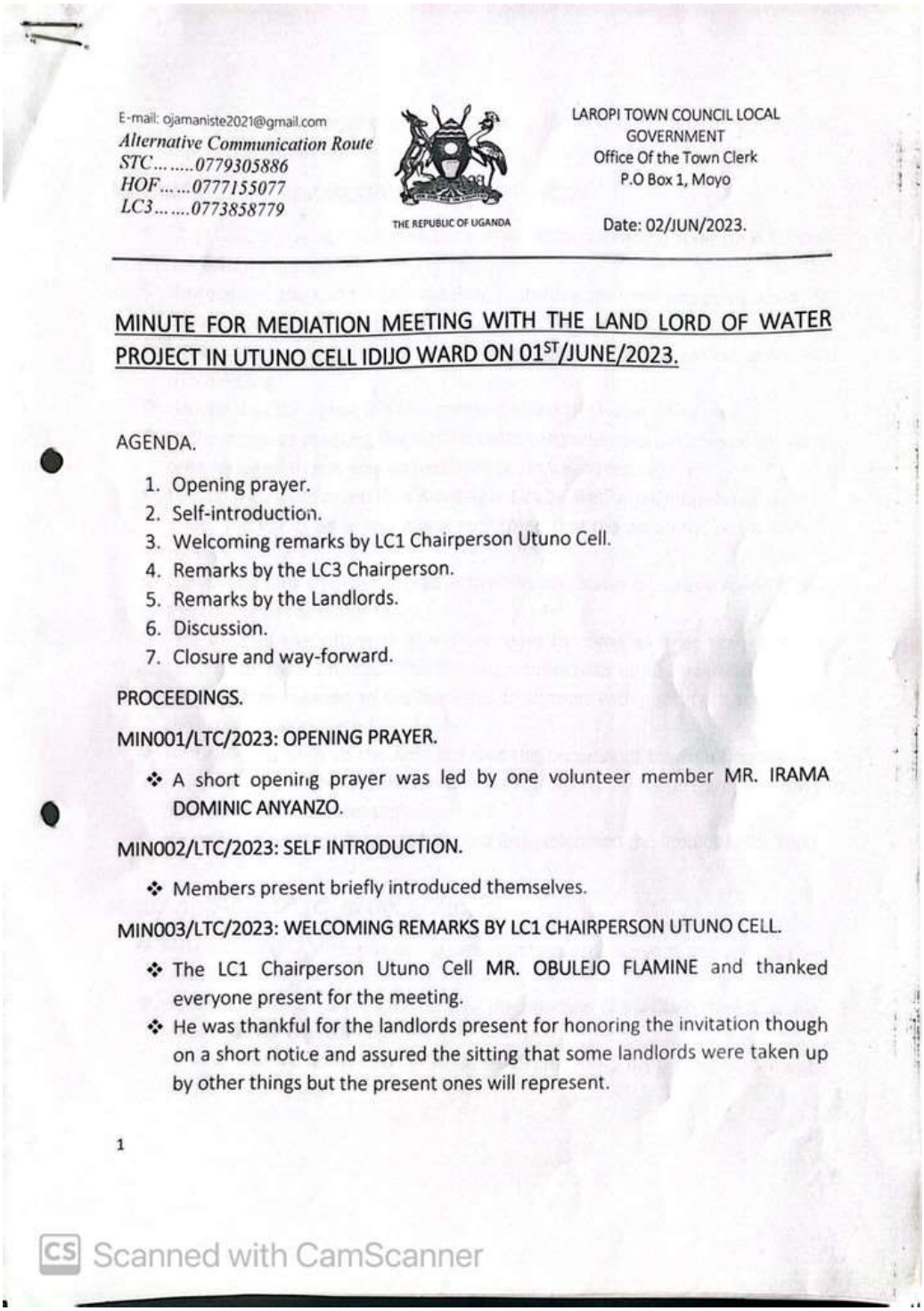
APPENDICES

Appendix 1: Land Consent forms for the Water and Sanitation System (Borehole, Reservoir and Faecal Sludge Treatment Plant) for Laropi Rural Growth Centre, Moyo District



E-mail: ojamaniste2021@gmail.com
Alternative Communication Route
STC.....0779305886
HOF.....0777155077
LC3.....0773858779

THE REPUBLIC OF UGANDA

LAROPI TOWN COUNCIL LOCAL GOVERNMENT
Office Of the Town Clerk
P.O Box 1, Moyo

Date: 02/JUN/2023.

MINUTE FOR MEDIATION MEETING WITH THE LAND LORD OF WATER PROJECT IN UTUNO CELL IDIJO WARD ON 01ST/JUNE/2023.

AGENDA.

1. Opening prayer.
2. Self-introduction.
3. Welcoming remarks by LC1 Chairperson Utuno Cell.
4. Remarks by the LC3 Chairperson.
5. Remarks by the Landlords.
6. Discussion.
7. Closure and way-forward.

PROCEEDINGS.

MIN001/LTC/2023: OPENING PRAYER.

- A short opening prayer was led by one volunteer member MR. IRAMA DOMINIC ANYANZO.

MIN002/LTC/2023: SELF INTRODUCTION.

- Members present briefly introduced themselves.

MIN003/LTC/2023: WELCOMING REMARKS BY LC1 CHAIRPERSON UTUNO CELL.

- The LC1 Chairperson Utuno Cell MR. OBULEJO FLAMINE and thanked everyone present for the meeting.
- He was thankful for the landlords present for honoring the invitation though on a short notice and assured the sitting that some landlords were taken up by other things but the present ones will represent.

1

- He welcomed everyone present assuring them that nothing is wrong and safety is guaranteed.

MIN004/LTC/2023: REMARKS BY THE LC3 CHAIRI'ERSON.

- The LC3 Chairperson honored the gathering for sacrificing their time for this important meeting.
- He received the call for this meeting yesterday and this was postponed for today because of mobilization.
- He equally thanked the Area land committee Chairperson for making it for this meeting.
- He said that this is not the first meeting about the water point area.
- In the previous meeting the District Water engineer was not sure of the land area required that is why no feedback co:ld be availed to you.
- He said they were called for a meeting in L:ra by Northern Umbrella last month about the water issue and it was confirmed that the area required is 30*30 meters.
- However a tank shall be erected at the hills which also requires a road linking the source to the water tank.
- He assured the sitting that in a few days to come another team will be conducting the pump test after the project proceeds up-to December.
- He therefore pleaded to the landlords to support with good faith to ensure the project is completed.
- He finally declared to the landlord that the purpose of the meeting was to mediate on the land acquisition process for the 30*30 meters and the road link as-well as the water tank.
- He with the fev' words begged to stop and welcomed the landlords for their in-put.

MIN005/LTC/2023: SPEECH BY LANDLORDS.

- MR.OBULEJO FLAMINE one of the Landlord thanked everyone present for the meeting.
- He however assured the gathering of the absence of his Clans men due the abrupt call for the meeting.
- He with few words welcomed MR.ADIBAKU RICHARD his brother to lament before he continues.

2

- MR.ADIBAKU RICHARD thanked everyone present but expressed his heartfelt disappointment for the short noticed meeting.
- He was disappointed by the fact that an official from Moyo District calls for an emergency meeting,this is possible for officials from the Ministry.
- He however assured the sitting that the mediation shall proceed though most of the clan members are not available.
- The LC2 Chairperson thanked the landlords for their time.
- He suggested that all roads to be opened in the Town Council are free and advocated for the mediation to be based on the 30*30 meters.
- He however informed the sitting of the conflict between MR.AHWITO and Basir family therefore there is need for conflict resolution.
- Finally after a lengthy discussion the Landlords came to conclusion that the road links and the water Tank be constructed for free.

MIN006/LTC/2023: DISCUSSION.

- The LC3 Chairperson told the sitting that in the last mediation meeting with the Landlords the landlords came up with a suggestion that they be compensated 20million upon the 30*30 meters land required.
- The LANDLORDS wanted the stand of the Town council entity.
- HON.DRICHI ROBERT suggested for 17million but the Landlords stepped in for 18million.
- The LC2 Chairperson Idijo ward suggested that if Town Council has a land they can give a plot in exchange for this one of the water project.
- MR.OBULEJO FLAMINE suggested that they should be given free water to appreciate them for offering free road links for the project.
- HON. DRICHI ROBERT suggested that the landlord should request for a tap stand or kiosk which shall be care taken by an individual citing even water has it's laws.
- LC2 Chairperson Idijo ward suggested tha. the sons of Landlords be recruited as watchmen and compound cleaners as added advantage.
- A member however consented with the idea of giving the watchmen and cleaner opportunity to the landlords but cautioned for the persons to follow instructions clearly so that incase of misconduct he can face disciplinary actions.

3

- HON. GARANG JOHN clearly stated that in the recent approved budget for the next financial year land acquisition has never surfaced therefore this will be sourced from else-where.
- MR.TIODIBAKU PATRICK suggested for Executive and Technocrats to sit down first to come up with a clear resolution on how the 18million shall be paid.
- However landlords came up with a resolution for the first installment to be 10million whereas the 8million be completed in the other installments.
- After a lengthy discussion the Chairperson LC3 welcomed MR.MAWA ALFRED the Board Director Northern Umbrella to briefly comment on the course of the project.
- MR.MAWA ALFRED thanked everyone present for the meeting.
- He thanked the LC3 Chairperson for tirelessly engaging the landlords in the process of securing the area were the project lies.
- He assured the sitting that this project is in five towns in Northern Uganda of which one is in Lango sub-region the four towns are in Westnile sub-region with two in moyo district ie Laropi Town Council and Lefori Town Council.
- He said the project will not follow the government financial year calendar but rather it will start in june with a 72hours pump test and end in December.
- He pleaded to the landlords to not let the project wasted because of compensation but rather enter an agreement with the entity on how to make their required compensation possible citing the project will help a lot.
- He was ~~greatful~~ grateful for the mediation meeting and begged to stop.

MIN007/LTC/2023: WAYFORWARD AND CLOSURE.

- The way-forwards for the meeting were as below;
- The roads linking the water source and the Tank premises were offered for free by the landlords.
- 18million was the stand of the landlords for compensating the 30*30 area.
- However first installment for the 18million be 10million and the remaining balance be cleared during other installments.
- Tap stands or water kiosk be offered for individuals to manage as a business.
- Watchmen and compound cleaners opportunity be availed to the landlords but after fulfilling the required qualifications.
- Need for Executive to sit and come-up with clear resolutions on how to pay the 18million.

4

- The LC3 Chairperson on his closing remarks thanked members present for positively turning up though on a short notice.
- He assured the sitting that with the successful mediation meeting the development of Laropi Town Council starts in Idijo citing the project will come with different development ranging from road, electricity and others.
- The Executive shall sit in the few days to come and the landlords shall be fed with the out-comes of the meeting in a two weeks-time.
- He thanked the Board director Northern Umbrella for his presentation and finally adjourned the sitting at 2:15pm.

OJAMANI STELLAH
Secretary

TIONDI LUGA DAVID
Chairperson.

5

THE REPUBLIC OF UGANDA

LAROPI TOWN COUNCIL LOCAL GOV

ATTENDANCE SHEET

01/06/2023

Activity: MEDIATION MEETING WITH THE LANDLORD OF WATER PROJECT IN UTUNO

S/No	Name	Designation	Tel: No	Signature
01	Hon. Drichi Robert	Councilor	0772845017	
02	Giondi Liga David	LCIII C/P	0773858779	
03	MASA ALFRED	Board. Umbrella	0772378176	
04	Anima Stephen	Plumber	0775235027	
05	TIODIBACU PATRICK	LC II CENTRAL	0786613626	
06	OBULEJO FLAMINE	L C I UTUNO	0787354776	
07	ANYAMA DOMINIC	LCI P/EAST	0783590135	
08	ADIBAKU RICHARD	Landlord	0777129798	
09	LIMIO ANNE	U/C person	0777608350	
10	IDRO ADIGA JUSTINE	LC II C/P	0786822209	
11	IRAMA DOMINIC	ALC C/P	0774034653	
12	MAZAPKE LAKERBUZUKA	Town Agent	0785887859	
13	Amasa wilbort Uudiko	Town Agent	0779864004	
14	OJAMANI STELLAH	TOWN AGENT	0715876258	
15	IDERE CELESTINO BESRI	LANDLORD	0781231991	
16	Garang John	Sec PROD	0776024152	

Appendix 2: NEMA Terms of Reference (TOR) Approval Letter for the ESIA for the proposed Solar powered water supply and sanitation system in Madi-Okollo, Terego and Moyo Districts

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

7th June 2023

The Permanent Secretary,
Ministry of Water and Environment,
P.O. Box 20026,
KAMPALA.

Tel: +256 414 505 942
Email: ps@mwe.go.ug

RE: REVIEW OF SCOPING REPORT AND TERMS OF REFERENCE FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED SOLAR POWERED WATER SUPPLY AND SANITATION SYSTEM IN MADI OKOLLO, TEREGO AND MOYO DISTRICTS

Reference is made to the Scoping Report and Terms of Reference **(EIATOR-10465)** for carrying out Environmental and Social Impact Assessment for the above-mentioned Water Supply and Sanitation System that was submitted to this Authority 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 TOR 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 incorporate the considerations below during the conduct of the environmental impact study and the preparation of the ESIA report.

(i) Provide a comprehensive description of the proposed Solar Powered Water Supply and Sanitation System, the specific components and associated infrastructure, and the activities that will be undertaken during both the construction and operational phases of the project and the size of the work force.

Page 1 of 3

(ii) Include in the ESIA, a hydrological investigative report in regard to the potential impacts of the project on water resources within the proposed project area, incorporate in the ESIA mitigation actions to address such impacts.

(iii) Provide a detailed description of the waste streams that will be generated from the activities of the Water Supply and Sanitation System, and the measures and equipment that will be put in place to handle such waste.

(iv) Include in the report other relevant baseline information that is project site-specific, on the soils, water, air quality and noise; as well as, clear-colored photographs depicting the current status of the project area and the neighboring environs.

(v) Provide clear, colored and well-labelled location maps/images (preferably *each covering A-3 size paper*) and accurate sets of GPS coordinates clearly indicating the site boundaries. Ensure that all GPS coordinates are provided in UTM format.

(vi) Provide a clear and legible copy of the site layout plan *(preferably on A-3 sized paper)*.

(vii) Carry out comprehensive consultations with all the relevant key stakeholders including Madi Okollo, Terego And Moyo Districts District Local Government authorities, the Directorate of Water Resources Management (DWRM), the Occupational Health and Safety Department (Ministry of Gender, Labour and Social Development and local communities particularly in regard to the potential impacts of the proposed project on water resources in the project area. The views of the stakeholders consulted should be well documented and appended to the ESIA report.

(viii) Include in the ESIA report, comprehensive analysis of alternatives/options to the selected project location, design and technology, among other aspects.

(ix) Carry out a comprehensive evaluation of the negative environmental impacts associated with the proposed project activities and the relevant mitigation measures to minimize the identified negative impacts and environmental management/monitoring plans that relate to the identified environmental impacts of the proposed project.

(x) Make reference to all the relevant provisions of applicable policies, laws, regulations, guidelines and standards, in particular, the National Environment Act, No.5 of 2019.

(xi) Append to the ESIA report authentic copies of land ownership and acquisition documents.

(xii) Indicate the actual total project (investment) cost including costs of works, machinery/equipment and land where applicable; and these should be submitted by a Certified Valuer and Valuation Certificate attached to the ESIA.

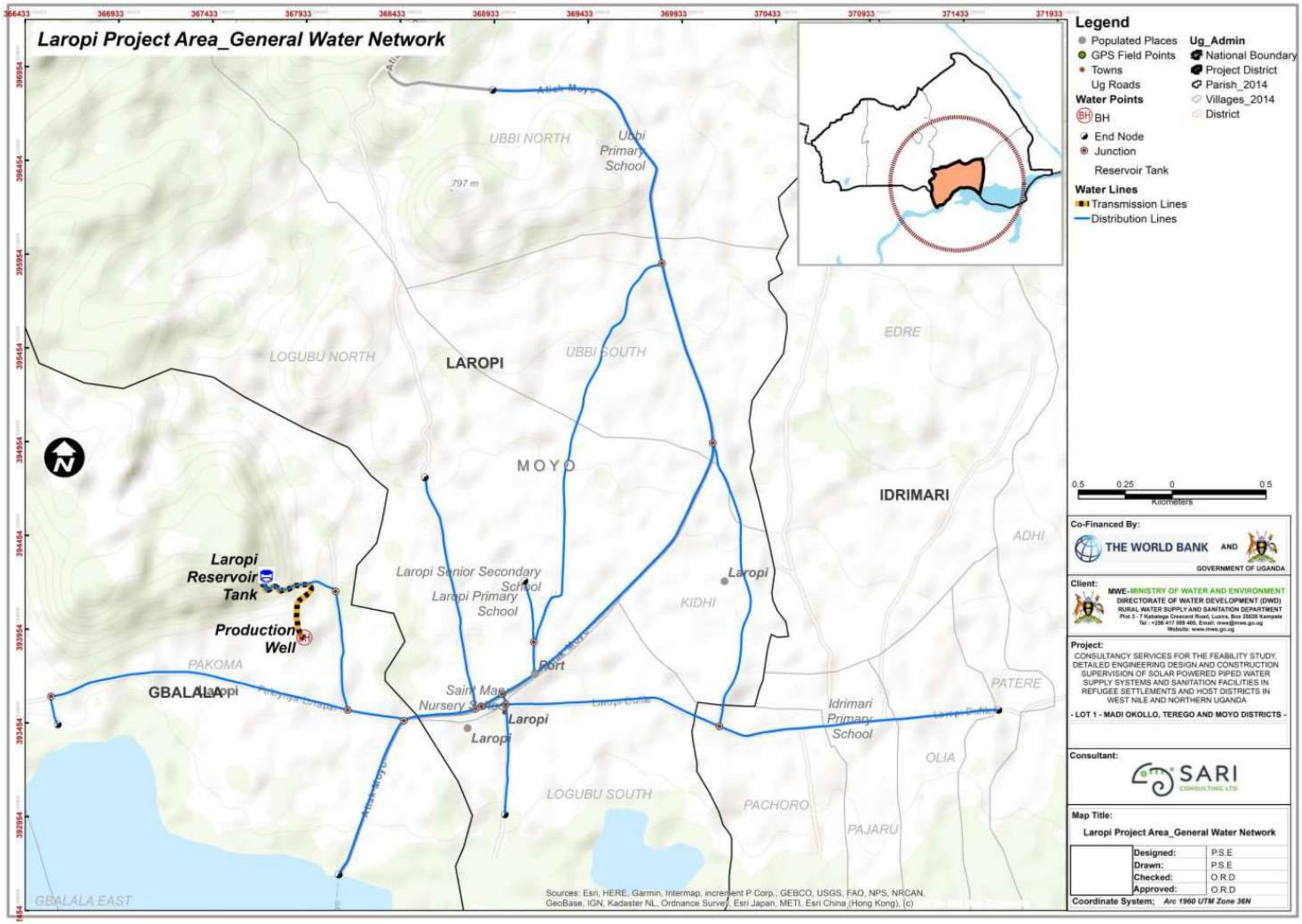
(xiii) In line with Regulation 49 (2) of the National Environment (Environmental and Social Assessment) Regulations S.I. No. 143/2020, pay a non-refundable administration fee of thirty percent (30%) of the total fees payable on submission of the Environmental and Social Impact Statement

Note that only registered EIA Practitioners including the team leader should be contracted to carry out the ESIA for the proposed project.

This is, therefore, to recommend that you proceed with carrying out the ESIA for the Solar Powered Water Supply and Sanitation System. We look forward to your cooperation and receipt of comprehensive copies of the ESIA report, for our further action.

Waiswa Arnold Ayazika
FOR: EXECUTIVE DIRECTOR

Appendix 3: Map Showing the General Area Network for the Water and Sanitation System for Laropi Rural Growth Centre, Moyo District



Appendix 4: Laropi Borehole Water Quality Results

Republic of Uganda

MINISTRY OF WATER AND ENVIRONMENT
NATIONAL WATER QUALITY REFERENCE LABORATORY - ENTEBBE

Certificate of Analysis

Client Name : URC
Client Address : Sir Apollo Kagwa Road, Kampala
Sample type and condition : Groundwater sample from Laropi borehole, Laropi sub-county, Terego district
Sampled by : Client
Date Sampled : 16th May, 2023 Date received : 16th May, 2023
Analysis Start date : 16th May, 2023 Analysis Completion date : 31st May, 2023

TEST RESULTS Ref: NWQRL23 – 04793

Source Name			Laropi	Drinking Water Standards (EAS12:2018 Maximum permisible for Natural Potable Water)
Village			Laropi	
Sub-county			Laropi	
District			Moyo	
Lab Identifier code			E23/04793	
Parameters	**Method Code**	**Units**	**Test Results**	
Color (Apparent)	TM/C-04/01	PtCo	187	50
Turbidity	TM/C-03/01	NTU	15	25
pH	TM/C-01/01	pHunits	7.1	5.5-9.5
Electrical Conductivity	TM/C-02/01	µS/cm	1567	2500
Total dissolved solids	TM/C-02/02	mg/L	1096.9	1500
Total Hardness as CaCO3	TM/C-06/01	mg/L	435	600
Calcium hardness as CaCO3	TM/C-06/01	mg/L	245	600
Magnesium hardness as CaCO3	TM/C-06/01	mg/L	190	600
Calcium	TM/C-06/01	mg/L	98	150
Magnesium	TM/C-06/01	mg/L	45.6	100
Sodium	TM/IO-03/01	mg/L	235	200
Potasium	TM/IO-03/01	mg/L	10	50
Total Alkalinity	TM/C-05/01	mg/L	920	_
Bicarbonates	TM/C-05/01	mg/L	1122	_
Flourides	TM/IO-01/01	mg/L	0.94	1.5
Sulphates	TM/IO-01/01	mg/L	2.7	400
Chlorides	TM/IO-01/01	mg/L	9.5	250
Nitrates as N	TM/IO-01/01	mg/L	3.23	10
Nitrites as N	TM/IO-01/01	mg/L	<0.001	0.9
Ammonium as N	TM/IO-01/01	mg/L	0.05	0.5
Phosphates as P	TM/IO-01/01	mg/L	0.05	0.7
Total Iron	TM/C-08/01	mg/L	1.05	0.3

Note:
1. *This certificate shall not be reproduced without approval of the Laboratory.*
2. ***Test result from sub-contracted Laboratory.*
3. *Analysis site is National Water Quality Reference Laboratory-Entebbe (NWQRL)*
4. The NWQRL is managed under the ISO 17025 Laboratory Quality Management System

Disclaimer
- These results relate to the sample as received and tested
- Details of the sample with respect to source and representativeness is the responsibility of the client.
- This certificate of analysis does not substitute certification of a business or product by the relevant authority

Checked by:
Technical signatory

LABORATORY MANAGER
NWQRL 31 MAY 2023 NWQRL
NATIONAL WATER QUALITY REFERENCE LABORATORY -ENTEBBE

Water Quality Management Department
Directorate of Water Resources Management
Waterquality.laboratory@mwe.go.ug
Plot 17, John Babiha Road, Entebbe
Tel: 041-321342

Page 1 of 1

Issued by
Initials:

PRINCIPAL ANALYST LABORATORIES
★ 31 MAY 2023 ★
NATIONAL WATER QUALITY REFERENCE LABORATORY – ENTEBBE
Sign: .....

Appendix 5: Geotechnical Investigation Report / Results for Laropi Rural Growth Centre – Water and Sanitation System

Appendix 5 (a): Results for Laropi Borehole

Solgeotechnics

FIELD SOIL PROFILES

Project:	Soil Investigation For Detailed Engineering Design and Construction Supervision of Solar Powered Piped Water Supply Systems and Sanitation Facilities In Refugee Settlement and Host Districts In West Nile and Northern Uganda. Lot 1 Madi Okollo, Terego And Moyo Districts		
Client:	Ministry of Water and Environment		
Location	Laropi BH		
Trial pit No	TP1	Depth of Trial pit	2.0m
Field work date:	11-06-23		

Depth	Soil Profile	Soil Description	Colour Photo of Soil Profile
0.00		Soft moist darkish grey sandy organic CLAY	
0.40		Firm to stiff blackish moist sandy CLAY	
2.00			

ANNEX B-11

Solgeotechnics

FIELD SOIL PROFILES

Project:	Soil Investigation For Detailed Engineering Design and Construction Supervision of Solar Powered Piped Water Supply Systems and Sanitation Facilities in Refugee Settlement and Host Districts in West Nile and Northern Uganda. Lot 1 Madi Okollo, Terego And Moyo Districts		
Client:	Ministry of Water and Environment		
Location	Laropi BH		
Trial pit No	TP2	Depth of Trial pit	2.0m
Field work date:	11-06-23		

Depth	Soil Profile	Soil Description	Colour Photo of Soil Profile
0.00		Soft moist darkish grey sandy organic CLAY	
0.15		Firm to stiff blackish moist sandy CLAY	
2.00			

ANNEX B-12

Solgeotechnics

FIELD SOIL PROFILES

Project:	Soil Investigation For Detailed Engineering Design and Construction Supervision of Solar Powered Piped Water Supply Systems and Sanitation Facilities in Refugee Settlement and Host Districts in West Nile and Northern Uganda. Lot 1 Madi Okollo, Terego And Moyo Districts		
Client:	Ministry of Water and Environment		
Location	Laropi BH		
Trial pit No	TP3	**Depth of Trial pit**	2.0m
Field work date:	11-06-23		

Depth	Soil Profile	Soil Description	Colour Photo of Soil Profile
0.00		Soft moist darkish grey sandy organic CLAY	
0.15		Firm to stiff blackish moist sandy CLAY	
2.00			

ANNEX B-13

Appendix 5 (b): Results for Laropi Water Reservoir (Tank site)

Solgeotechnics

FIELD SOIL PROFILES

Project:	Soil Investigation for the Detailed Engineering Design and Construction Supervision of Solar Powered Piped Water Supply Systems and Sanitation Facilities in Refugee Settlement and Host Districts in West Nile and Northern Uganda. Lot 1 Madi Okollo, Terego and Moyo Districts		
Client:	Ministry of Water and Environment		
Location	Laropi Tank Site		
Trial pit No	TP1		
Field work date:	10-05-23		

Depth	Soil Profile	Soil Description	Colour Photo of Soil Profile
0.00		Brownish grey coarse grained slightly weathered very strong GRANITE Rock	 
Undefined			

ANNEX B-14

Appendix 5 (c): Results for Laropi Faecal Sludge Treatment Plant

Solgeotechnics

FIELD SOIL PROFILES

Project:	Soil Investigation for the Detailed Engineering Design and Construction Supervision of Solar Powered Piped Water Supply Systems and Sanitation Facilities in Refugee Settlement and Host Districts in West Nile and Northern Uganda. Lot 1 Madi Okollo, Terego and Moyo Districts		
Client:	Ministry of Water and Environment		
Location	Laropi Treament Plant		
Trial pit No	1	**Depth of Trial pit**	2.0m
Field work date:	10-05-23		

Depth	Soil Profile	Soil Description	Colour Photo of Soil Profile
0.00 – 0.30		Firm moist darkish grey sandy CLAY	
0.30 – 2.00		Dense moist greyish clayey SAND	

ANNEX B-8

Solgeotechnics

FIELD SOIL PROFILES

Project:	Soil Investigation for the Detailed Engineering Design and Construction Supervision of Solar Powered Piped Water Supply Systems and Sanitation Facilities in Refugee Settlement and Host Districts in West Nile and Northern Uganda. Lot 1 Madi Okollo, Terego and Moyo Districts		
Client:	Ministry of Water and Environment		
Location	Laropi Treament Plant		
Trial pit No	2	**Depth of Trial pit**	2.0m
Field work date:	10-05-23		

Depth	Soil Profile	Soil Description	Colour Photo of Soil Profile
0.00		Firm moist darkish grey sandy CLAY	
0.35		Dense moist greyish clayey SAND	
2.00			

ANNEX B-9

FIELD SOIL PROFILES

Project:	Soil Investigation for the Detailed Engineering Design and Construction Supervision of Solar Powered Piped Water Supply Systems and Sanitation Facilities in Refugee Settlement and Host Districts in West Nile and Northern Uganda. Lot 1 Madi Okollo, Terego and Moyo Districts		
Client:	Ministry of Water and Environment		
Location	Laropi Treament Plant		
Trial pit No	3	Depth of Trial pit	2.0m
Field work data:	10-05-23	Water Table	1.8m

Depth	Soil Profile	Soil Description	Colour Photo of Soil Profile
0.00		Firm moist darkish grey sandy CLAY	
0.40		Dense moist greyish clayey SAND	
2.00			

ANNEX B-10

Appendix 6: Summary of Public Consultation

Project Name	**CONSULTANCY SERVICES TO UNDERTAKE 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 ARUA AND MOYO DISTRICTS.**
Subject	Inception and Consultative Meeting with Laropi Town Council and Laropi Sub County
Stakeholder	The leadership and Farmers of Laropi Town Council
Date	17th April 2023
Time	04:00 pm- 04:40 pm
Members Present	1. The leadership and Farmers of Laropi Town Council 2. URTC 3. MWE
Agenda	1. Self-Introduction 2. Brief from the Mayor Laropi Town Council 3. Remarks from the Team leader-URTC 4. Response for the Mayor and the Chairman III Laropi Sub County 5. Closure

MINUTES	AGENDA ITEM	DISCUSSION
Min 01	**Self-Introductions.**	• The members present introduced themselves by name, and designation for easy identification.
	Brief from the Mayor Laropi Town Council	• The mayor informed participants about the project that included; o provision of clean and safe water to the communities and also to supplement the existing water system for Laropi Town Council and Laropi sub-county. o Some facilities had been identified by the design team that include the water source, the reservoir, the access road, and the proposed area for the faecal sludge management. o He introduced the team Leader who gave some details about the project.
Min 03	Remarks from the Team leader-URTC	• The team leader informed the Leadership that URTC will undertake the ESIA, RAP, and SPP of the Larop Water and sanitation project, and URTC will undertake capacity building of the staff by working with them during this project.

MINUTES	AGENDA ITEM	DISCUSSION
		• URTC also needed to understand the communities and take a quick understanding of the assignment. • He informed that meeting the initial team to undertake a reconnaissance is small but during detailed study, the team will be bigger to undertake all the detailed studies. • He indicated that the negative impacts will be minimized; • Requested support from the local leaders as the schedule is tight.
Min 04	**Discussion**	• The population is increasing and there is a need to increase the amount of water pumped for the population and extension of the line to the Laropi Sub County. • Sometimes people are not able to get water for 3 years, as it is generally off. • The pipe water is not available most of the time. • Extend water to Laropi Sub-County • The project should be expedited.

Project Name	**CONSULTANCY SERVICES TO UNDERTAKE 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 ARUA AND MOYO DISTRICTS.**
Subject	Inception and Consultative Meeting with Laropi Town Council and Laropi Sub County
Stakeholder	The leadership of Laropi Town Council and Laropi Sub County
Date	17th April 2023
Time	03:05 pm- 04:30 pm
Members Present	1. **Mayor Laropi Town Council Community member** 2. **URTC** 3. **MWE**

Project Name	**CONSULTANCY SERVICES TO UNDERTAKE 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 ARUA AND MOYO DISTRICTS.**
Agenda	1. Self-Introduction 2. Brief from the MWE 3. Remarks from the Team leader-URTC 4. Response for the Mayor and the Chairman III Laropi Sub County 5. Closure

MINUTES	AGENDA ITEM	DISCUSSION
Min 01	**Self-Introductions.**	• The members present introduced themselves by name, and designation for easy identification.
Min 02	**Brief from the MWE**	• The Project Engineer informed the meeting about the objective of the project- the provision of clean and safe water to the communities and also to supplement the existing water system for Laropi Town Council and Laropi sub-county. • Several facilities had been identified by the design team that includes the water source, the reservoir, the access road, and the proposed area for the faecal sludge management. • The Project Manager introduce the team from URTC that will undertake the ESIA, Project Briefs, RAP and SPP for the 5 RGCs that were earmarked to benefit from the project.
Min 03	Remarks from the Team leader-URTC	• The team leader informed the Leadership that URTC will undertake the ESIA, RAP, and SPP of the Laropi Water and sanitation project, and URTC will undertake capability building of the staff by working with them during this project. • URTC also needed to understand the communities and take a quick understanding of the assignment. • He informed that meeting the initial team to undertake a reconnaissance is small but during detailed study, the team will be bigger to undertake all the detailed studies.

MINUTES	AGENDA ITEM	DISCUSSION
		• He indicated that the negative impacts will be minimized; • Requested support from the local leaders as the schedule is tight.
Min 04	**Response from the Mayor Laropi Town Council and Chairman Laropi Sub County**	• Indicated that water is a real problem and needs intervention the problem • Pledged to support the project. • Proposed that some other areas like Panyanga need to be considered under the project. • Indicated that the people affected by the proposed water facilities expected compensation.
Min 5	**Closure**	• The meeting was closed and the team went for the site inspection- designed water facilities.

Project Name	**CONSULTANCY SERVICES TO UNDERTAKE 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 ARUA AND MOYO DISTRICTS.**
Subject	Inception and Consultative Meeting at Moyo District
Stakeholder	MOYO DISTRICT
Date	20th April 2023
Time	12:30 pm-1:00 pm
Members Present	**1. Moyo District Officers (Physical Planner, Environmentalist and Planner)** **2. URTC Consultants** 3. **MWE Officials**
Agenda	1. Self-Introduction 2. Brief from the MWE 3. Remarks from the Team leader-URTC 4. Discussion

MINUTES	AGENDA ITEM	DISCUSSION
Min 01	**Self-Introductions.**	• The members present introduced themselves by name, and designation for easy identification.
Min 02	**Brief from the MWE**	• The Project Engineer informed the meeting about the objective of the project- the provision of clean and safe water to the communities Several facilities had been identified by the design team that includes; the water source, the reservoir, the access road And targeted communities • The Project Manager introduce the team from URTC that will undertake the ESIA, Project Briefs, RAP and SPP for the 5 RGCs that were earmarked to benefit from the project, and three of the water systems were in Moyo
Min 03	Remarks from the Team leader-URTC	• The team leader informed the Leadership that URTC will undertake the ESIA, RAP, and SPP of the Water and sanitation project, and URTC will undertake capacity building of the staff by working with them during this project. • URTC also needed to understand the communities and take a quick understanding of the assignment. • He informed that meeting the initial team to undertake a reconnaissance is small but during detailed study, the team will be bigger to undertake all the detailed studies. • He indicated that the negative impacts will be minimized; • Requested support from the local leaders as the schedule is tight.
Min 04	**Discussion**	• The Physical Plan for Laropi is available having been available up to 20 2015. It was revised in 2019, and given a life span of 10 years (2029) • The physical plan for Lefori was designed in 2023, to run for 10 years, till 1233. • The Development Plan and strategic environmental report for Moyo are available. • There are no ESIAs for the existing water supply systems. • There are no environmental ordinances in place.

MINUTES	AGENDA ITEM	DISCUSSION
		• Laropi and Lefori have development plans but it's hard to implement them. • It is only 15% of the physical development plan that is implemented. • There is development control, like permitting for construction, especially within the towns. • The Road Department has to open up roads.

URBAN RESEARCH AND TRAINING CONSULTANCY E.A LIMITED		REPUBLIC OF UGANDA MINISTRY OF WATER AND ENVIRONMENT WORLD BANK

MINUTES FOR THE STAKEHOLDER ENGAGEMENT MEETING HELD IN LAROPI TOWN COUNCIL MOYO DISTRICT
(JULY 2023)

AGENDA

1) Opening prayer
2) Self-introductions
3) Welcoming remarks
4) Presentation from the consultancy
5) Reactions and Discussions
6) Closing remarks

Min No.	ITEM	ACTION
Min 1	**Opening prayer** The meeting commenced at 10:30 am with an opening prayer led by one of the community members	ALL
Min 2	**Self-introductions** Self-introductions were made in clusters by all participants in the meeting. Central ward had 3 participants, idrmani parish had 4 participants, ebeni sub-county had 6 participants panyanga had 3 participants	ALL

Min 3	**<u>Welcoming remarks from the LCI Chairperson</u>** • Welcomed all members present for the meeting • He emphasized that the project is very important and encouraged all community members to fully participate in any activities involved • He stated that the project has been long awaited since drilling of the water sources was done already • He called upon the community members to be positive about the project	ALL
Min 4	**Presentation from the consultancy** 4a) **Communication from the team leader** • He welcomed all members present for the meeting • He introduced the different experts on the project team • He stated that this activity was a follow-up on the meetings that were held in April and that it is an important aspect of the project • He stated that this stage has two components that are Environment and social impact assessment and water source protection • He presented the project catchment area and also detailed both the transmission and distribution lines • He highlighted the major areas that are to benefit from the project • He urged members to present any comments challenges and major critical issues that may have an impact on the project 4b) **Communication with the sociologist Expert** • She stated that the project has two sites of utmost importance that is the water source and the water reservoir • She stated that where these two points are located are of vital importance to the project with a plot size of a 30by 30meter area requirement • She. Stated that the transmission line that will be the major distribution line from the source to the reservoir cannot be tapped on	ALL

	• However there is a minor distribution line that will be used to service the community • She highlighted the fact that the distribution lines will be traversed along the road and in some scenarios through people's land • A one-meter space requirement is needed for the distribution line which will be utilized however they will be buried underground • She stated that the provision of safe water is the major priority and that everyone should ensure that water is not contaminated • She urged members not to undertake any risky activities around the water source and reservoirs. Therefore no toilet facilities, animal rearing open dumping can be done around these sites • Furthermore, watershed committees will also be catered to fully implement aspects of water source protection • She urged members not to damage the pipelines • She also hinted at the fact that the water is not free and that all households connected to it will be required to pay a fee that will be used to maintain the different Facilities • Also, public standpipes will be provided for community access • Another team composed of surveyors and valuers will also be coming to the different sits	
Min 5	**<u>Reactions and Discussions</u>** **Acen grace** How long will it take for the water to reach the different areas The project has different stages that have to be undertaken. Comment However, these studies have to be finalized so that water can be provided **Alice sara** She highlight that she's from panyanga and she had not seen it on the map Not all areas are covered by the project. comment This is the starting point however further extensions can be done **John Gara**	ALL

	Will the proposed project integrate physical planning comment A shapefile of the land use plan for Laropi town council has been picked from the district to ensure that integration is done **Micheal** Different teams have been in the area however no feedback has been provided comment Different reports have been produced and are available for review	
Min 6	The meeting was adjourned at 12:10	ALL

URBAN RESEARCH AND TRAINING CONSULTANCY E.A LIMITED		**REPUBLIC OF UGANDA MINISTRY OF WATER AND ENVIRONMENT WORLD BANK**
MINUTES FOR THE STAKEHOLDER ENGAGEMENT WITH THE COMMUNITY MEMBERS NEAR THE FAECAL SLUDGE IN CHARA CELL, CENTRAL WARD LAROPI TOWN COUNCIL (JULY 2023)		

AGENDA

1) Opening prayer
2) Self-introductions
3) Welcoming remarks
4) Presentation from the consultancy
5) Reactions and Discussions
6) Closing remarks

Min No.	ITEM	ACTION
Min 1	**Opening prayer** The meeting commenced at 1:30 pm with an opening prayer led by one of the community members	ALL
Min 2	**Self-introductions** Self-introductions were made by all participants in the meeting.	ALL

Min 3	**Welcoming remarks from the Parish Chief** • Welcomed all members present for the meeting • He emphasized that the project is very important and encouraged all community members to fully participate in any activities involved • He called upon the community members to be positive about the project	ALL
Min 4	**Presentation from the consultancy** • she welcomed all members present for the meeting • she introduced the different experts on the project team • she stated that this activity was a follow-up on the meetings that were held in April and that it is an important aspect of the project • she stated that this stage has two components that are Environment and social impact assessment and water source protection • she presented the project catchment area and also detailed both the transmission and distribution lines • she highlighted the major areas that are to benefit from the project • she urged members to present any comments challenges and major critical issues that may have an impact on the project • She stated that the project has two sites of utmost importance that is the water source and the water reservoir • She stated that where these two points are located are of vital importance to the project with a plot size of a 30by 30meter area requirement • She. Stated that the transmission line that will be the major distribution line from the source to the reservoir cannot be tapped on • However, there is a minor distribution line that will be used to service the community • She highlighted the fact that the distribution lines will be traversed along the road and in some scenarios through people's land • A one-meter space requirement is needed for the distribution line which will be utilized however they will be buried underground	ALL

	• She stated that the provision of safe water is the major priority and that everyone should ensure that water is not contaminated • She urged members not to undertake any risky activities around the water source and reservoirs. Therefore no toilet facilities, animal rearing open dumping can be done around these sites • Furthermore, watershed committees will also be catered to fully implement aspects of water source protection • She urged members not to damage the pipelines • She also hinted at the fact that the water is not free and that all households connected to it will be required to pay a fee that will be used to maintain the different Facilities • Also, public standpipes will be provided for community access • Another team composed of surveyors and valuers will also be coming to the different sits • She detailed different aspects of the faecal sludge including its location, access, impact on the community, transfer of waste, construction, and lagoon treatment.	
Min 5	**Reactions and Discussions** **Wanda Thomas** The provision of water has long been awaited in the area. When will it be fully installed? He further raised a concern that the landlord refused him to extend the pipeline in his area He also inquired if it will be possible to drill boreholes for the people who cannot afford piped water Comment The project is at the design stage and the distribution has not been determined yet. There is another team that is coming to handle land acquisition Water is a common good its access should not be blocked by anyone The project does not have a provision for a borehole provision **Elwanga James** Will the affected persons be involved in the project A team of surveyors is coming to follow up and determine the exact project-affected persons	ALL

	Herbert What is the entire project cost How much is the fee for an individual connection comment The project amount is a lump sum The fee will be determined by the water user committees	
Min 6	The meeting was adjourned at 3:00 pm	ALL

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MINUTES FOR THE STAKEHOLDER ENGAGEMENT MEETING HELD AT MOYO DISTRICT WITH THE DISTRICT OFFICIALS AND NFA (JULY 2023)

AGENDA

1) Opening prayer
2) Self-introductions
3) Welcoming remarks
4) Presentation from the consultancy
5) Reactions and Discussions
6) Closing remarks

Min No.	**Item**	**Action**
Min 1	**Opening prayer** The meeting commenced at 9:30 pm with an opening prayer led by Ms Namugenyi Betty	ALL
Min 2	**Self-introductions** Self-introductions were made by all participants in the meeting.	ALL
Min 3	**Welcoming remarks from the CAO** • She welcomed all members present for the meeting • she emphasized that the project is very important and called upon the different officials to work together with the consultancy	ALL
Min 4	**Presentation from the consultancy** • He welcomed all members present for the meeting • He introduced the different experts on the project team	ALL

	• He stated that this activity was a follow-up on the meetings that were held in April and that it is an important aspect of the project • He stated that this stage has two components that are Environment and social impact assessment and water source protection • He presented the different projects sites in Moyo which are in Pajakiri, Gwere Lefori and Laropi • He highlighted in briefed the different officials on the activity scope stating that this phase covers aspects of developing water source protection plans, environmental and social impact assessment plans for the different sites • He also elaborated on the aspect of the faecal sludge and the provision of sanitation facilities • He encouraged the district officials to avail aby secondary data that could be useful to the project.	
Min 5	**<u>Reactions and Discussions</u>** **The district natural resource officer** He stated that there is a district forest management plan He highlighted that he has a concern with the faecal sludge since it's located close to the R. Nile He further highlighted that the area is prone to flooding and therefore flood plain analysis should be done He stated that a lagoon with constant treatment needs to be considered ***The District Staff Surveyor*** He stated that some engagements have been done with the communities in Laropi tc regarding physical planning and they were very receptive. He also stated that he will provide the physical development plan so that it can be cross-referenced with the project ***The NFA Forest Super Visor*** He stated that one of the strategies that can be used in water source protection is planting trees along the water source He advised the consultancy to officially write to the NFA executive director regarding this project as the water tank in Gwere is located on the forest reserve	ALL
Min 6	The meeting was adjourned at 1:30 pm	ALL

Appendix 7: Stakeholder Consultation List for Laropi RGC

Laropi

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CONSULTANCY SERVICES TO UNDERTAKE ENVIRONMENTAL 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 REFUGEE AND HOSTING COMMUNITIES OF ARUA (TEREGO, MADI OKOLLO) AND MOYO DISTRICTS

CONSULTATION LIST

NO	NAME	POSITION	CONTACT
1	DRAMWI CEASAR	LCIII C/P LAROPI S/C	0774636877
2	GIONDI LUGA DAVID	LCIII C/P LAROPI T/C	0773858779
3	ACHELU EMMANUEL	MWE - ENGINEER	0788601380
4	BIGORE ISAAC	MWE - EHO	0782461227
5	LWEBUGA JOSEPH MUSISI	MWE - Sociologist	0758574467
6	KAZOOBA Dominic	URTC	0774389919
7	Esther Kawuma	URTC Sociologist	0772426834
8	NZEAPKE INNOCENT	MEMBER	0779420020
9	IZAKARE DOMINIC	member	0775159131
10	Vunya Isaac Boston	Member	0776590252
11	ACIDRI Henry	Member	[illegible] 446 50
12	IZAMA MARTINE DRANI	LC1 C/P PACHORO	0772241460
13	AMADRA VIC JACOB	LC1 SEC	0781620016
14	ANYIDI FAVOUR	MEMBER	0763162995
15	Unzimai Samuel	" "	0781407573
16	MAWADRI ISAAC	LC.II	0784382498
17	TIONDI JOHN BOSCO	Pastor	0773797929
18	MOLUBI NORBERT	TEACHER	0774589666
19	NYANDA BEN ILA	FARMER	0752168266

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NO	NAME	POSITION	CONTACT
20	OBULETO PATRICK	FARMER	0763882986
21	MAWADRI PATRICK	FARMER	–
22	AMAKU FLORES	FARMER	–
23	Obule Joe flaming	L.C.I Utuno Cell	0787354776
24			
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CONSULTATION LIST

NO	NAME	POSITION	CONTACT
1	MUNDUA JOSEPHINE	member	0764659273
2	MUNGUCIH FLORENCE	member	0774768713
3	MUNDUA GLORIA	"	0783967880
4	DIPIO EVALINE	"	0789052217
5	BAITI FRANCESKA	member	0774836118
6	ENDREO FAIMA	member	0784434654
7	ABIO ALICE	"	
8	DRAKAMUTE LUCY	"	0758718645
9	DIPIO HELLEN	"	-

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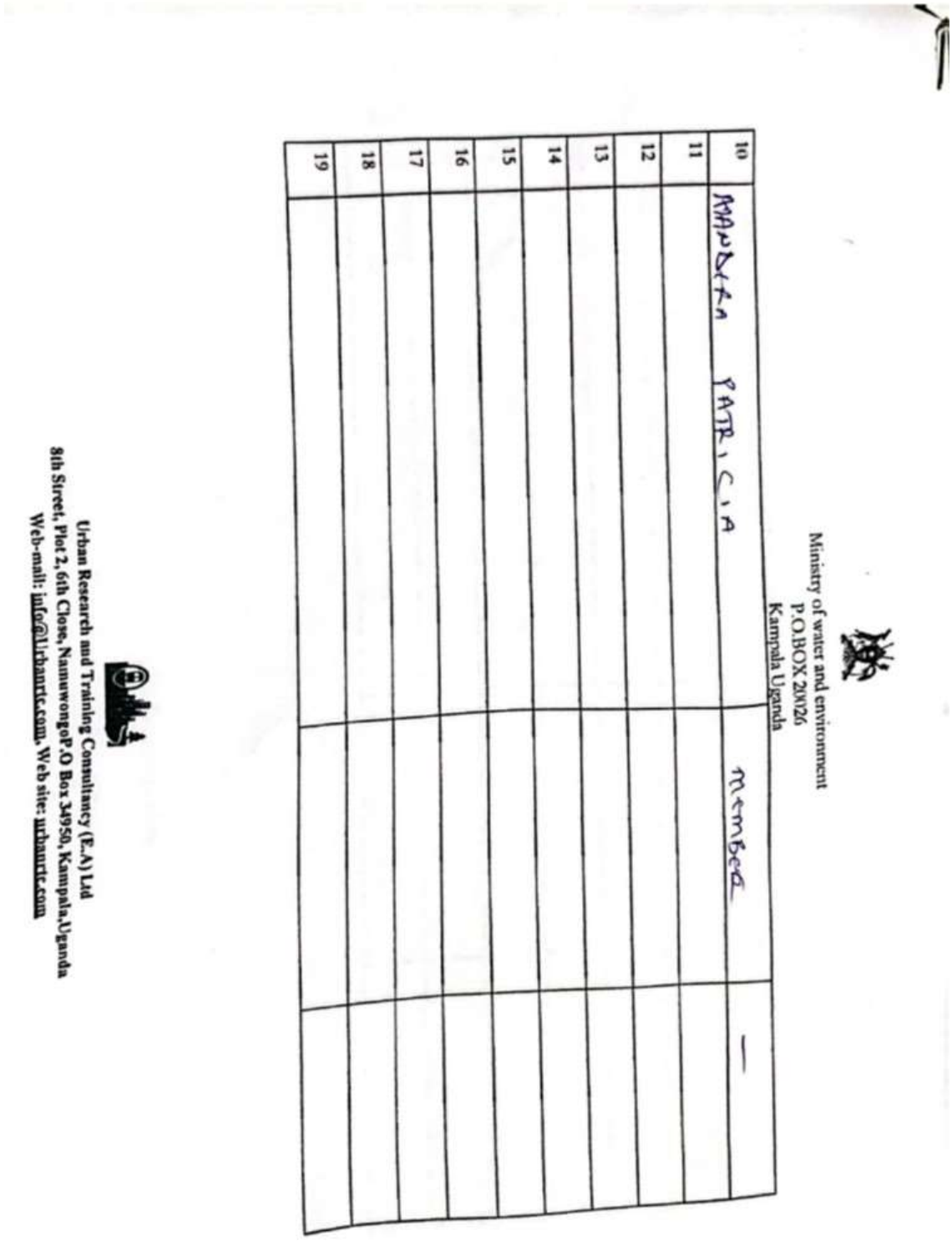

10	MAPUTA PATRICIA	Member	—
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Laropi clc and tlc stakeholder Engagement.

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CONSULTATION LIST

NO	NAME	POSITION	CONTACT
1	DAVID SCOVIA	Member	
2	AN200 grace	membr	
3	Chandia Grace	member	0786070384
4	Kaneza JULE	member	0771572762
5	MADIA HELEN	Member	0773266778
6	Mociaiku BEATRICE	Member	
7	KOJO JACKLINE	member	0763818241
8	KOJOKI DOREEN	member	0741398729
9	Jesky FASKA	member	-

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10	ULEA JACKLINE	Member	0781614733
11	DROPIA IRENE	member	077606891
12	ASPEA ALICE	Chair member	——
13	ANZOA SANTA	member	0762727250
14	DULIA DOROTHY	member	0770653640
15	CHANDIA AGNES	member	0785292769
16	MGBELE FRANCIS	MEMBER	0779772829
17	KOMBENYITI MICHAEL.	SEC LC1 CHALA / SEC LAROPI TOWN B'NESS COM	0773 048 624
18	Amaman Constantino	Elder	——
19	Garap John	SEC PROD	0775 025 152

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NO	NAME	POSITION	CONTACT
20	Drichi Robert	Councilor Central ward	0772845017
21	AMAZA CHOMBE	MEMBER	0773636011
22	OBULEJO MAXSON	MEMBER	0760927539
23	OPERI FRANCO	MEMBER	0788193912
24	MADRAA NOAH	MEMBER	0788738963
25	RALEO SCOVIA OJJA	MEMBER	0775756516

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CONSULTATION LIST

NO	NAME	POSITION	CONTACT
1	KOMBENJITI MICHAEL	LC1 SEC CHALLA	0773048624.
2	MALIAMUNGU GODFREY.	CHALLA CELL	—
3	TABAN MANSURU	CENTRAL CELL	—
4	Bunia Betty	CENTRAL · CELL	0787017172
5			
6			
7			
8			
9			

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Appendix 8: Pictorial Album of the Consultations

Stakeholder consultation meeting photos at Moyo District Headquarters

Courtesy call to the new CAO Ms. Jesca Ongetertho, July, 2023

MWE Staff, Consultant Team paying a courtesy call to CAO – Moyo District (Mr. Fred Semwogerere)

Consultant meeting with Moyo District Technical Staff

Stakeholder consultation meeting photos at Laropi Town Council Headquarters and the proposed sites for both the Production well and the Faecal sludge plant

Meeting with Laropi Town Council LCIII Chairman

MWE staff and Consultant Team at Laropi Town Council Headquarters

Community meeting at Laropi Town Council Headquarters

MWE staff, Consultant and Laropi Town Council staff Inspecting the Proposed Production well for Laropi RGC