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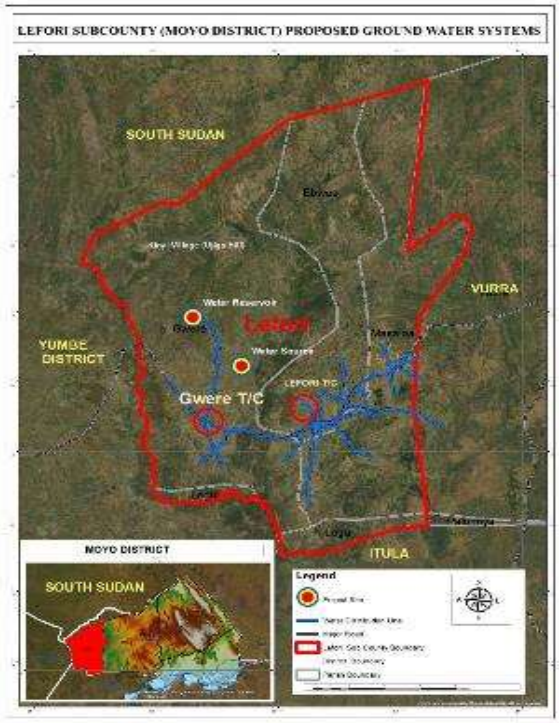
THE REPUBLIC OF UGANDA

THE REPUBLIC OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

ENVIRONMENTAL SOCIAL IMPACT STATEMENT FOR THE PROPOSED WATER SUPPLY SYSTEM AND SANITATION FACILITIES FOR GWERE 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 Gwere 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.

Disaster: severe, adverse disruption to the normal functioning of a community, society or ecosystem due to hazardous events interacting with vulnerable social and/or ecological conditions, which causes widespread human, material, economic or environmental losses.

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
DDP	District Development Plan
DWO	District Water Officer
DWRM	Directorate of Water Resources Management
ESIA	Environmental and Social Impact Assessment
ESIS	Environmental and Social Impact Statement
ESMP	Environmental and Social Management Plan
FGDs	Focused Group Discussions
GIS	Geographic Information System
GoU	Government of Uganda
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
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
O&M	Operation and Maintenance
OPM	Office of Prime Minister
P/S	Primary School
PAP	Project Affected Person
PC	Performance Contract
PIU	Project Implementation Unit
PSP	Public Stand Post
PST	Public Stand Taps

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
WB	World Bank
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 – ensurinhealthy 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 Gwere Water supply and sanitation system will be located in Gwere Rural Growth Centre in Lefori sub-county of Moyo district. It will serve the villages of Meria, Gwere East 'A', Gwere West 'A', Cinyi, Munu East, Nyainga, Coloa 'A', Abiriwaido, Diri, Lea 'A' , Lea 'B', Masaloa West, Masaloa East 'B', Maringu West, Kibira 'A', Kibira 'B', Ebwea 'A', Maringu East 'A', Maringu East 'B', Lojili 'B', Lojili 'A', Cohwe and Abiricaku. The proposed water supply and sanitation system will have a borehole source of yield 100m^3/hr located in Cinyi Village, Gwere Parish, Lefori Sub-County. Other components will include a pump house and a chemical dosing house located at the borehole site; a transmission pipe of 2.9km, a reservoir tank of located at Ujiga hill from where water will be distributed by gravity through a 43.9km pipeline to the project area 17 villages in 4 parishes of Gwere, Ebewa, Coloa and Masaloa within Lefori Sub County.

Policy, Legal and Institutional Framework and International Obligations

The Environmental and Social Impact Assessment (ESIA) for the Gwere 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 Gwere 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 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 than compared to groundwater. Moreover, the use of solar power as the primary energy source was complemented by alternative power options such as hydroelectric power to ensure uninterrupted operation. The project's capacity was determined based on population projections and water consumption rates to meet future demand effectively. The no-project alternative was dismissed due to the necessity of improved water supply and sanitation for public health and socioeconomic development.

Regarding access to water sources and the water reservoir, alternative routes were evaluated to minimize environmental impact and acquisition of land while ensuring operational efficiency. Similarly, sanitation options underwent comprehensive analysis, including on-site sanitation methods like decentralized sewage systems and ecological sanitation toilets, as well as off-site sanitation systems like conventional sewerage.

On-site sanitation systems comprising septic tanks and Ventilated Improved Pit Latrines were found to be efficient systems where sewerage networks are not feasible given the population density and settlement patterns. Given their ease to construct and manage, onsite sanitation systems are highly recommended for the Gwere 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 the district is characterized by tropical conditions with moderate rainfall (1,267mm) and temperatures (ranging between 45^0C in the months of January and February to 29 ^{0}C in the months of August to October), experiencing extreme seasonal variations. Climate change poses a significant threat, with projected increases in temperature and

changes in rainfall patterns, impacting water availability and agriculture, which are vital for the local economy and livelihoods.

The topography is marked by low plains, rolling hills along the Nile River, and plateaus with flat-topped hills, while the geology comprises Neogene alluvial and rift sediments. Soil types range from moderately fertile to alluvial deposits, influencing agricultural practices. The area supports diverse vegetation and fauna, including vulnerable species like *Afzelia africana*, while hydrology is primarily influenced by the Albert Nile and local wetlands. 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 Gwere RGC indicates that out of 372 surveyed households, 68% are headed by males and 32% by females, with an average household size of 5-6 people. The majority of respondents are aged between 20-50, mostly married, and have low education levels, with 75% having only primary education. Agriculture serves as the main income source for 77% of the community, followed by other sources like businesses and casual work. Monthly household incomes range from 0-500,000 Uganda shillings, with 30% earning between 100,000-500,000. Water supply primarily relies on boreholes and protected springs, with 68% using multiple sources, and water collection, mainly conducted by adult females, takes varying time frames. Although water user committees exist, inconsistent operation and maintenance payments affect functionality.

The socio-economic analysis of the proposed Gwere RGC solar-powered water supply system indicates that 98% of the population has access to privately-owned toilet facilities, with 96% utilizing traditional pit latrines predominantly. However, only 15% of households have handwashing facilities, highlighting a need for improved hygiene practices. Regarding solid waste management, only 6% of households have designated garbage disposal sites, with polythene bags and plastic bottles being the most common types of waste generated. In terms of energy, solar power constitutes 98% of lighting energy, while firewood remains the primary cooking fuel, posing environmental concerns. Land tenure is predominantly under customary ownership, with 98% of households occupying family land, and the education sector faces challenges, with high illiteracy rates and limited access to primary education completion. Health services are primarily accessed through health centers, with HIV/AIDS prevalence being a concern, especially given the area's proximity to regions with higher prevalence rates. Overall, while physical cultural resources are present, the proposed water supply system is not expected to directly affect them.

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. Domestic violence is a pressing concern, often stemming from disputes over agricultural proceeds and exacerbated by long queues at water sources. To address these issues, the project should prioritize sensitization on GBV and DV, targeting both men and women, and establish accessible grievance redress mechanisms. Additionally, measures to prevent child rights abuses, such as defilement and denial of education, must be integrated into the project's Stakeholder Engagement Plan. Efforts to mitigate the spread of HIV/AIDS during the influx of community labor during construction are also crucial. While an existing grievance mechanism exists within the local government, the project will

institute dedicated committees to address workers' and community grievances, guided by established Grievance Management Guidelines.

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 sub-county officials, community consultations, and focus group discussions with specific demographic groups like women. Stakeholder concerns and feedback were carefully documented and considered in project planning and implementation, highlighting the project's commitment to transparency, accountability, and community involvement throughout the ESIA process.

Impact Identification and Mitigation / Enhancement measures

The 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 Gwere Rural Growth Centre. Through a comprehensive assessment, potential negative consequences such as loss of vegetation cover, disturbance of terrestrial fauna, alteration of landscape, and contamination of soil have been identified. However, with strategic mitigation measures in place, these impacts can be minimized, ensuring that the overall effect on the environment and local communities remains low. Measures such as restricted vegetation clearance, manual clearance of vegetation to protect fauna, and proper soil contamination prevention during surveying demonstrate a proactive approach to addressing these concerns, resulting in an overall assessment of negative impacts as low.

Furthermore, the project is anticipated to bring positive socio-economic impacts, including job creation opportunities, particularly in areas neighboring the project sites. While these employment opportunities may be limited during the pre-construction phase, clear hiring requirements and involvement of local leaders can ensure fair and transparent recruitment processes. By managing local expectations and prioritizing the hiring of skilled local workers, the project can enhance its positive impact on the community. With these enhancement measures in place, the project's overall assessment reflects a positive outcome with moderate significance, emphasizing the importance of a balanced approach towards environmental conservation and socio-economic development.

During the construction phase of the proposed water supply system, several negative impacts on biological aspects are identified. These include vegetation clearance and damage to crops, temporary loss of habitat, disturbance of human beings and fauna by noise and vibration, pollution by solid wastes, disturbance and mortality of terrestrial fauna, and the introduction of alien plant species. While these impacts are mostly short-term and reversible, they present moderate significance levels. Mitigation measures such as marking trees before cutting, limiting vegetation clearance to necessary areas, restricting construction activities to daytime, implementing waste management plans, and ensuring the use of native plant species for restoration efforts are proposed to mitigate these impacts, ultimately reducing their severity to low levels.

Additionally during the construction phase, various physical impacts are anticipated, including the accumulation of construction and rehabilitation waste, fugitive dust emissions, noise pollution from machinery and vehicles, alteration of visual amenities, and soil erosion leading to sedimentation in water channels. These impacts have been assessed as moderate without mitigation but can be reduced to a low level with appropriate measures. These measures include waste management strategies, covering soil stockpiles to minimize dust, routine maintenance of machinery to reduce noise, conservation of vegetation for visual screening, and implementing erosion control measures such as compacting and re-vegetating excavated areas. Overall, the implementation of these mitigation measures will mitigate the negative impacts of the construction phase, resulting in a low overall assessment of impact severity.

Several socio-economic impacts associated proposed water supply and sanitation project in Gwere RGC and Lefori town center, were identified and evaluated. These included positive effects such as employment opportunities generated by the construction activities, contributing to increased revenue generation for the government, and boosting the local economy through the multiplier effect of earnings. However, negative impacts were also noted, including land take, disruption of traffic and businesses, damage to properties along the pipeline route, influx of immigrants, poor sanitation, and health and safety concerns. Mitigation measures were proposed to address these negative impacts, including transparent recruitment processes, agreements for land acquisition, traffic management plans, restoration of affected areas, and implementing safety protocols to minimize accidents and health risks. Overall, with effective mitigation measures, the socio-economic impacts of the construction phase were assessed as generally positive, albeit with some remaining challenges to address.

In terms of health and safety impacts during the construction phase, various risks were identified, including poor sanitation, construction accidents, and community health and safety concerns. These risks could lead to injuries, illnesses, and fatalities among workers and community members, as well as environmental contamination and the spread of diseases. Mitigation measures such as strict safety protocols, comprehensive training, use of safer construction materials, promotion of proper sanitation practices, and community engagement were proposed to address these risks. With the implementation of these measures, the health and safety impacts of the construction phase were assessed as negative but manageable, with the potential to mitigate risks and ensure the well-being of both workers and local communities throughout the project implementation.

During the operation and implementation phase of the project, several biological, physical, socio-economic, and health and safety impacts were identified. These include the loss of vegetation cover during maintenance activities, pollution from poor management of hazardous wastes, community health

risks, improved and increased access to safe and clean water, boost to the local economy, potential negative impacts on water access and tariffs, limited skills in managing water supply lines, and various health and safety hazards for workers.

Mitigation measures have been proposed to address these impacts, such as manual removal of vegetation during maintenance, proper containment and disposal of hazardous wastes, regular monitoring of water quality, community engagement and awareness programs, training for water supply operators, implementation of safety protocols for workers, and enhancement of infrastructure for improved service delivery and reduced environmental risks.

Overall, with the implementation of these mitigation measures, the project's impacts are assessed to be largely manageable, with negative impacts reduced to low or moderate levels. The project is expected to have positive outcomes including increased access to clean water, economic opportunities, improved sanitation and hygiene, reduced distances to water sources, capacity building for community members, and enhanced service delivery by operators. However, ongoing monitoring and adherence to safety protocols will be essential to ensure the project's long-term sustainability and minimize any potential adverse effects.

During 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)

The Environmental and Social Management Plan (ESMP) for the IWMDP project in Gwere/Lefori RGC aims to mitigate and manage anticipated impacts in accordance with national and international requirements, including World Bank Safeguard policies. It outlines measures to prevent, minimize, mitigate, or compensate for adverse environmental and social impacts, as well as enhance beneficial impacts. Monitoring tools such as checklists and equipment will be utilized to assess the effectiveness of mitigation measures and address unforeseen issues. Internal monitoring by the contractor and external monitoring by stakeholders like Moyo District Local Government and NEMA will ensure compliance through regular reporting and audits. The estimated cost of implementing the ESMP monitoring measures is Ugx 462,563,707/=, covering 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. Coordination among stakeholders, including the World Bank, government agencies like NEMA and the Ministry of Lands, Housing and Urban Development, district authorities, engineering consultants, contractors, and local community representatives, is crucial. The implementing agency ensures ESMP integration into procurement documents, oversees contractor compliance, addresses grievances swiftly, conducts inspections, and reports to relevant authorities. The

supervising engineering consultant reviews designs and monitors contractor compliance with environmental and social requirements. Contractors are responsible for implementing most aspects of the ESMP, including daily monitoring by designated Environment, Health, and Safety Officers. The Ministry of Lands oversees Resettlement Action Plan (RAP) implementation and compensation processes, while local government and sub-county teams participate in project monitoring to ensure stakeholder engagement and ESMP appraisal. NEMA plays a regulatory role, ensuring adherence to ESIA and ESMP conditions through inspections and enforcement actions as needed.

To ensure the successful implementation of the Environmental and Social Management Plan (ESMP) for the water supply system and sanitation facilities in Gwere RGC, 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.

Monthly reporting on ESMP implementation progress will be submitted to the supervising engineer, with annual external Environmental and Social Compliance Audits conducted and reports provided to regulatory bodies and stakeholders, including the Ministry of Water and Environment and Moyo District Local Government. It is imperative for both the Ministry and the appointed contractor to establish clear reporting protocols and ensure that all personnel are adequately trained to recognize and report incidents within specified timelines. This proactive approach aims to mitigate risks, uphold environmental and social standards, and promote the efficient and responsible execution of the water supply and sanitation project in Gwere RGC.

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

In a nutshell, the Environmental Social Impact Statement (ESIS) for the Gwere Water Supply and Sanitation area indicates that while there may be some limited negative environmental and social implications, the overall socio-economic benefits to the community, coupled with proposed mitigation measures, outweigh these concerns, and therefore the implementation of the project shouldnot be stayed.

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 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 provided for the preparation of the Environmental Social Impact Assessment (ESIA), Water Source Protection (WSP) and Resettlement Action Plan (RAP).

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 Gwere 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 Gwere 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 utilisation in the district after toilet visit improved by 29% (56% in 2015 to 85% in 2019).

1.2.3 Existing water and sanitation situation in Gwere Rural Growth Centre

Gwere Rural Growth Centre (RGC) faces challenges in water supply, relying on boreholes and streams for daily water needs, as there is no established water supply system within the area. Sanitation facilities in Gwere RGC are also inadequate, lacking central piped sewerage systems. The population primarily depends on privately owned pit latrines and institutional toilets, with some facilities in a deteriorated condition. Solid waste management is a concern, as the trading centre lacks a designated waste dump site, leading to household-level waste collection and indiscriminate disposal within the centre.

1.3 Feasibility Study

There is an existing water supply system within Lefori town council that was constructed in 2014 through WSDF-North but its efficiency has reduced as some of the water kiosks that were constructed no longer receive water and for those that do, it comes occasionally and most of the residents have now resorted to depending on boreholes within the project area for their everyday water needs which involves walking long distances to fetch water.

However, to meet the current water supply needs of Gwere RGC, the feasibility study recommended one borehole (Cinyi drilled in 2021 with sustainable yields of 100m^3/hr). The borehole is located in Lefori Sub-County, Gwere Parish, Cinyi Village. The yield of the boreholes is of adequate capacity to meet the projected water demand for the proposed piped water supply system for Gwere 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 Cinyi at Ujiga hill from where water will be distributed by gravity to the project area 17 villages in 4 parishes of Gwere, Ebewa, Coloa and Masaloa within Lefori Sub County.

1.4 Project Location

The project is situated in Lefori Sub County, Moyo District, with Yumbe District to the West, Itula Sub County to the South, and South Sudan to the North. Gwere RGC water system is located in Lefori Sub County. This system will have Lefori Town Council as a beneficiary. The water source and water reservoir are located with Cinyi village within Lefori Sub County. The reservoir will be stationed at Ujiga hill.. The water source is located in a farmland of cassava garden and shea nut trees.
Additionally, the RGC is located along Moyo-Yumbe road and lies along 3°35'6.03"N, 31°33'15.65"E and 3°35'8.16"N, 31°33'11.57"E. The Arial view of the project area is given in **Error! Reference source not found.** below.
, is undergoing infrastructure development for water supply and sanitation.

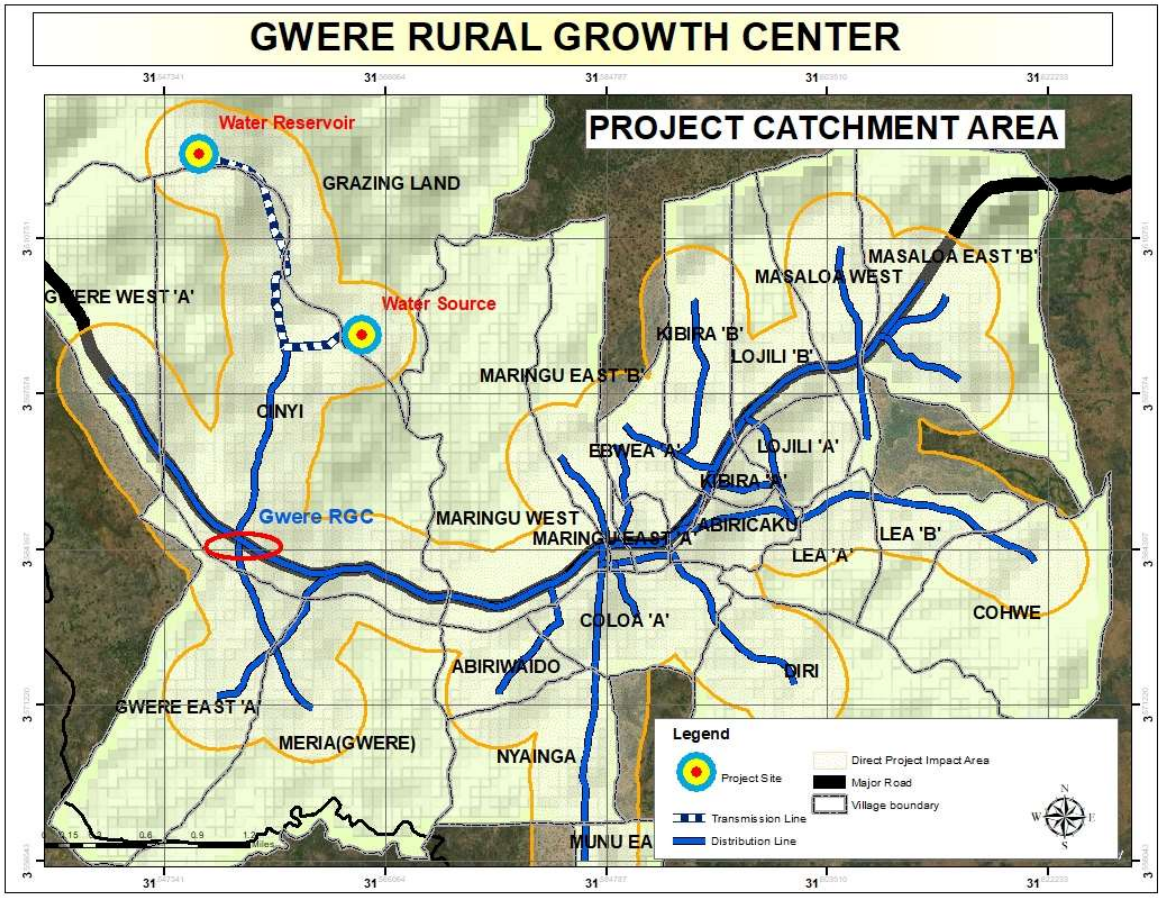

Figure 1-1: Project location Map for Gwere RGC

1.4.1 Administrative Structure

Gwere RGC is located in Gwere parish in Lefori Sub County. The center is currently headed by the Senior Assistant Secretary popularly known as the sub-county chairman. The town is where most of the commercial activities take place and consists mainly of shops, a daily market, churches and schools.

The Gwere RGC project area comprises the core villages of Meria, Gwere East 'A', Gwere West 'A', Cinyi, Munu East, Nyainga, Coloa 'A', Abiriwaido, Diri, Lea 'A' , Lea 'B', Masaloa West, Masaloa East 'B', Maringu West, Kibira 'A', Kibira 'B', Ebwea 'A', Maringu East 'A', Maringu East 'B', Lojili 'B', Lojili

'A', Cohwe and Abiricaku. **Error! Reference source not found.** below shows the location of these villages within the sub-county.

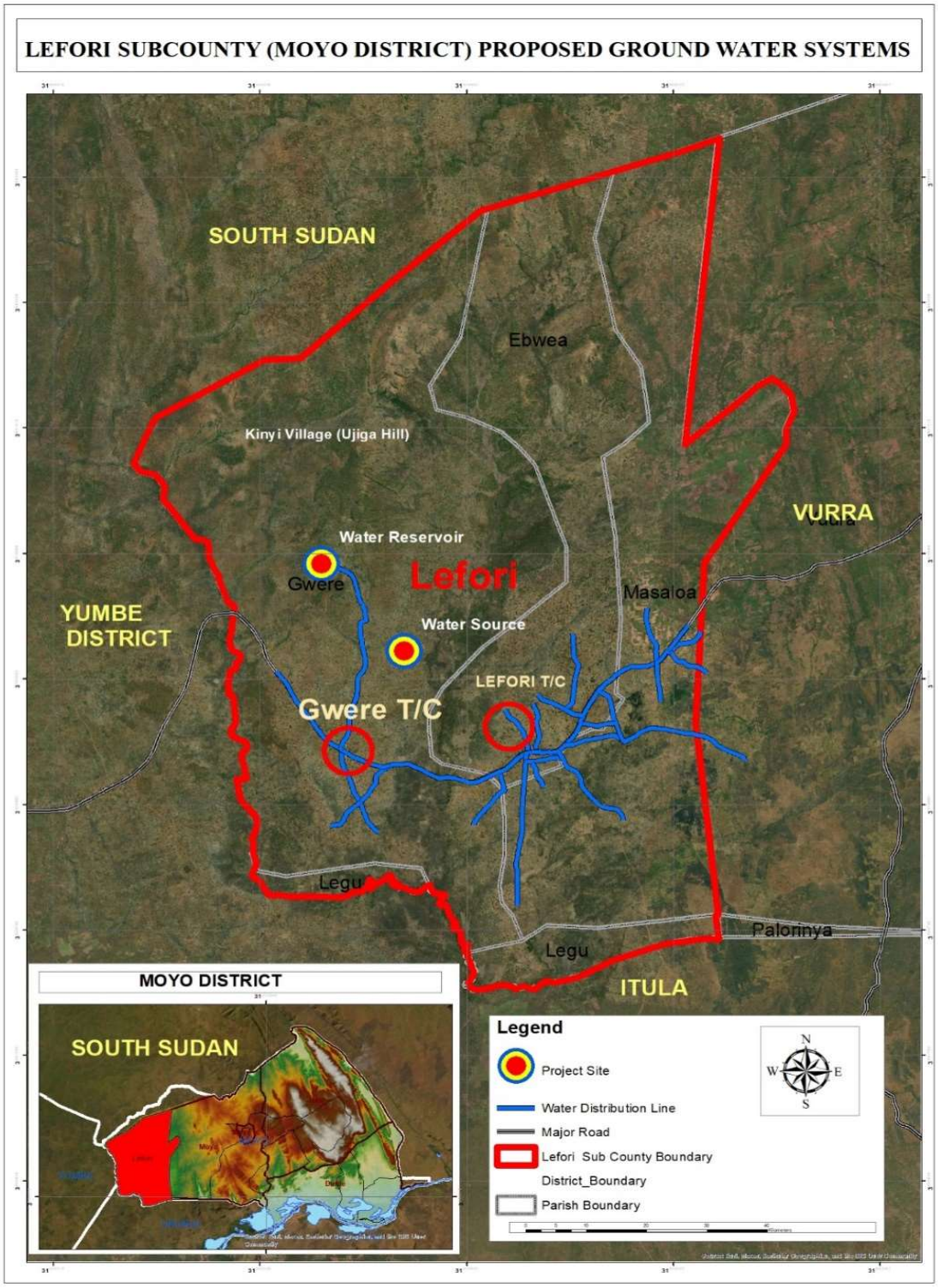

Figure 1-2: Gwere Rural Growth Centre

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 behaviours,
- 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 Gwere RGC piped water supply and sanitation system is UGX 8,376,592,698/= (Eight Billion Three Hundred and Seventy Six Million Five Hundred Ninety Two Thousand Six Hundred Ninety Eight Uganda Shillings Only).

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

The implementation of the Gwere 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 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 and 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 Gwere 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 Gwere Rural Growth Centre, Lefori Subcounty, 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 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 ESIAPROCESS

2.1 General Approach

2.1.1 Overview

This chapter of the Environmental and Social Impact Statement details the approach to the ESIA of the proposed project as per the NEMA approved TOR detailed in appendix 2.

2.1.2 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) as illustrated in Figure 2-1 below.

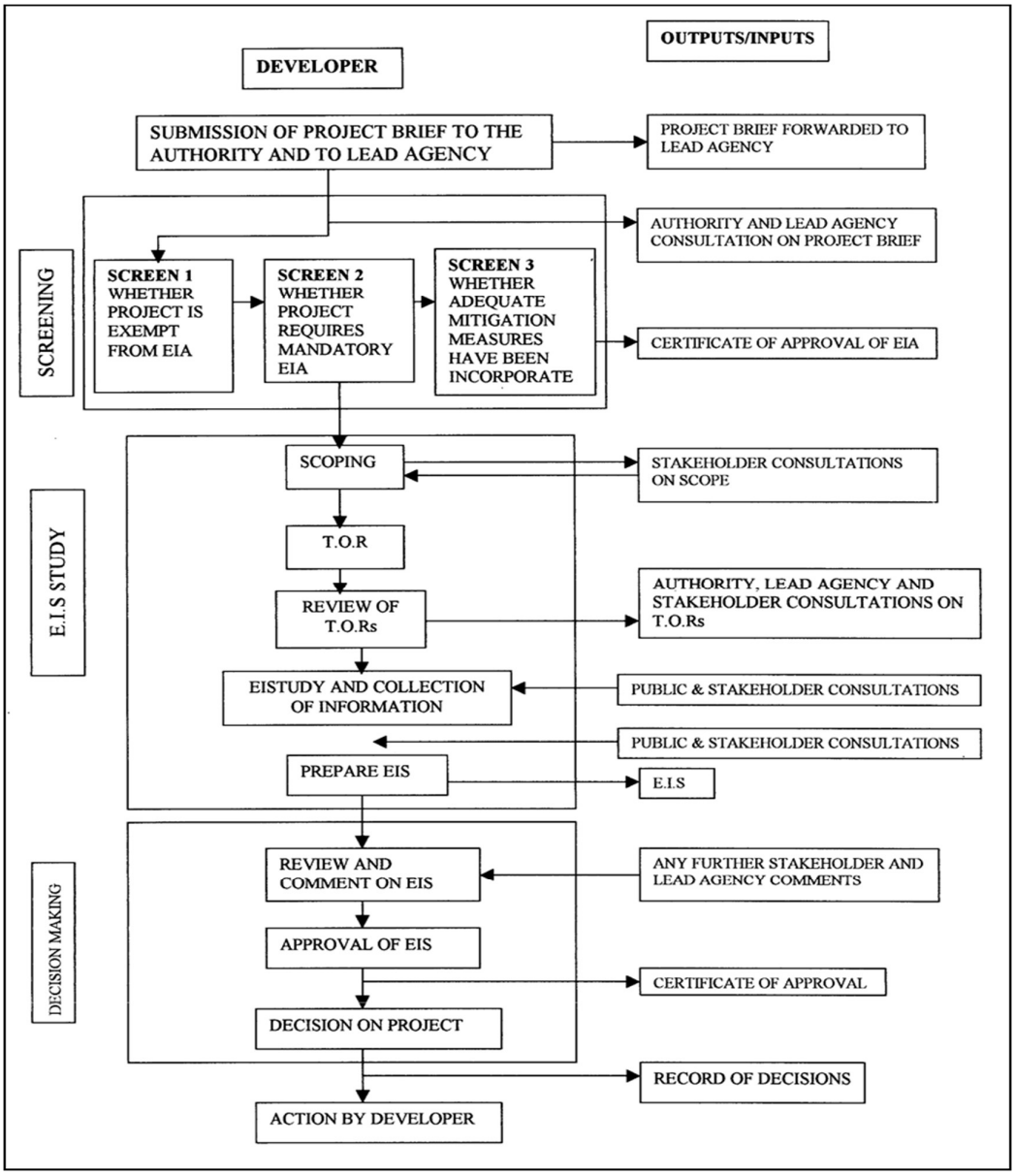

Figure 2-1: ESIA process

2.1.3 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 relevantWorld 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.

2.1.4 Several project-related documents were obtained and reviewed. These included the design report, feasibility study 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 July 2023

Stakeholders that were consulted include the following: Ministry of Water and Environment (MWE), Moyo District Local Government, 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 Nations HighCommission for Refugees (UNHCR), Directorate of Water Resources Management, technical and political leaders among others.

2.1.5 Determination of the Project Area of Influence (AOI)

The ESIStudy 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 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, Reservior 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 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;

- Particulate Matter (PM), including total suspended particulate (TSP). Inhalable particulate matter (PM10) and Sulphur dioxide (SO2);
- Sulphur Dioxide (SO2)
- Nitrogen Dioxide (NO2)
- Carbon Monoxide (CO)
- Greenhouse Gases: Carbon dioxide (CO2), methane (CH4).
- 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, Reservior 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, or 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:

- 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.
- 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.
- 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 (in Figure 2-2 below) 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) (Leq)**	
	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.		

Figure 2-2: 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, Reservior 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 2-3: 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.

A water sample was obtained from the proposed water source (borehole) to ascertain the prevailing conditions prior to commencement of the project. A sampling bottle of 1.5 litres was used to collect the sample after which the sample was tested at the National Water and Sewage Corpoartion (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 Results are discussed in section 6.2.4 and attached in appendix 6.

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 Solgeotechnics 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 6.2.4 and attached in appendix 6.

Table 2-2: Trial Pit depths

LOCATION	FACILITY	TRIAL PIT NO	DEPTH (M)
Gwere (Lafori Sub County)	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 Cinyi Village served as the starting point for the transect leading to the reservoir at Ujiga 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 (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., 1992Timed Point Count involved records of all birds that were seen and heard from a Point Count Station for a set period. For transects, the observers walked along the proposed pipeline alignment, stopping as necessary to use binoculars, and all birds seen or heard were recorded.

Opportunistic surveys were conducted within Gwere RGC (specifically the borehole and Reservoir sites) 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.

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.

Other methods, such as the acoustic (sound recordings) survey method, Dip netting in aquatic habitats and interviews with communities

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 useers 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 kie informants interviews, Focus group discussions, community meetings among others..

This involved the review of secondary data from past reports from accredited sources like the Feasibility Study Report, Uganda Bureau of Statistics (UBOS) office. These reports including the latest household income and expenditure survey and population and housing census.

2.2.7.1 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 wasidentified to be relevant for the study.

2.2.7.2 Selection of the Sample Size for the Quantitative data

The study population was randomly selected from the beneficiary households within the project area (or project area) from both Lefori Sub County and Lefori Town Council in Moyo District. The sampled beneficiaries included; Gwere East, Gwere West, Cinyi, Meria, Mariangu West, Mariangu East, Ebwea, Kibira, Abiricaku, Lojili, Coloa West, Coloa East, Nyainga, Diri, Lea, Masaloa West and Masaloa East.

A total of 372 Households were sampled from both the local governments (Lefori Sub County and Lefori Town Council). and respondents were selected according to the population density in a given village or town center. The study was done by a team of trained research assistants that administered the questionnaires using kobocollect (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.

2.2.7.3 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 sametime would be engaged in a formal meeting at the different administrative levels.

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

2.2.7.4 Methods of data collection

The following methods were used during data collection.

(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 Gwere RGC.

(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 Violence that might impact households and the community and to illuminate the complexities that influence the socio-economic phenomena within the community as well as understanding the community perspectives towards resettlement, among others.

2.2.7.5 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 behavioral 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.

2.2.7.6 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.

2.2.7.7 Ethical considerations

Permission to conduct the ESIA in the respective district and lower 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 Gwere 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 were 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, and 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:

- Review existing organizational structures for development and make recommendations.
- Identify and recommend roles and duties of relevant stakeholders including community participation.
- 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 for the water and sanitation project which quantified the scale of environmental and social disturbance that was likely to result from the proposed water and sanitation project's pre-construction, construction, 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 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 involves 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 maximise the utilisation 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 2-3 defines 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 the 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 Table 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, 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.	**M**
	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**

Criteria	Significance Definition	
	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 and operational phases of the proposed development.
- The impact assessment included both direct and indirect impacts.

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

3.1 Introduction

To address the water supply gap in Lefori Sub- County, 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 **Error! Reference source not found.** below:

Table 3-1: Project Infrastructure Coordinates

No	Name	District	Sub County	Village	Latitude	Longitude
1	Borehole	Moyo	Lefori S/C	Chinyi Village	3.602561	31.564039
2	Tank	Moyo	Lefori S/C	Chinyi Village (Ujiga Hill)	3.616721	31.558269
3	Toilets	Moyo	Lefori S/C	Chinyi Village (Market Area)	3.584403	31.55264

Gwere RGC is located in Lefori Sub-County Moyo district. The proposed water reservoir for Gwere water system is located in Ujiga Hill in Cinyi Village while the water source is located in Cinyi Village as shown in **Error! Reference source not found.** above in Section 1.

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, and repossessed by the respective owners. Although MWE and the design consultant do not anticipate land take for pipelines, it's better to assume that land take will be mandatory for the entire water transmission/distribution pipeline. Total land requirements for the Gwere WSS have been estimated at **2.12 acres**. However, the project case scenario is that the treated water transmission primary distribution network will follow a 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 the **Error! Reference source not found.** below.

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

Scheme	**Component**	**Dimensions (m)**		**AREA**		
		Length	**Width**	**m^2**	**Acres**	**Hectares**
Gwere	Borehole/Water Treatment Plant	100	80	8000	1.97	0.79
	Reservoir	25	25	625	0.15	0.06
	Total			8,625	2.12	0.85
Land requirements for the raw water mains, transmission and primary distribution assuming a width of 3 meters						
Scheme	**Component**		**Details**		**Length (m)**	
Gwere	Transmission Pipe 1 from Borehole 1 to the Proposed Reservoir		A 3-meter width easement corridor		2,900	
	Distribution Pipe		A 3-meter width easement corridor		43,900	
	Total				**46,800**	
Total land requirements for all infrastructure (acres)						

3.4 Water supply System

Gwere 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 Cinyi borehole and pumping it into the reservoir elevated at Ujiga hill from where it will be distributed to different points. The borehole will be equipped with a submersible vertical pump of capacity suitable to abstract water equivalent to the safe yield.Water Source/Borehole

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, DWD89709 (80 m^3/h) located in Cinyi village, Gwere parish, Lefori Sub-County was sited, drilled and recommended for use as a production well in the project. 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 Two boreholes, DWD89709 (80 m3/h) located in Cinyi village, Gwere parish, Lefori sub-county and borehole BH-2 (6m3/h) in Nyainga village, Coloa parish, Lefori town council that is currently supplying Lefori water supply system are the proposed sources of water for Gwere RGC water supply system.:

- Construction of 1No new borehole pumping houses
- Supply and Installation of 2No. submersible pumps
- A Treatment plant of Capacity 960m3/d to remove the iron in BH DWD 89709
- Raw Water Pumping Main to the adjacent Water Treatment Plant
- Combined treated pumping main from the WTP to the new reservoir tank.
- Construction of a new 222 m3 storage reservoir.
- Construction of a distribution network for the project area.
- Making new Consumer Connections

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

FID	Name	District	Sub County	Village	Latitude	Longitude
1	Water Source	Moyo	Lefori S/C	Cinyi Village	3.602561	31.564039

Figure 3-1: The proposed site for Gwere Water Source in Cinyi Village

Existing access to the water source at Chinyi Village

Figure 3-2: Existing access to the Proposed Gwere RGC Water Source/Borehole

3.4.1 Water Reservoir/ Tank

The land is in Cinyi Village in Lefori sub-county. 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 Gwere RGC Proposed Water Reservoir/ Tank

FID	Name	District	Sub County	Village	Latitude	Longitude
1	Tank	Moyo	Lefori Sub County	Chinyi Village	3.616721	31.55827

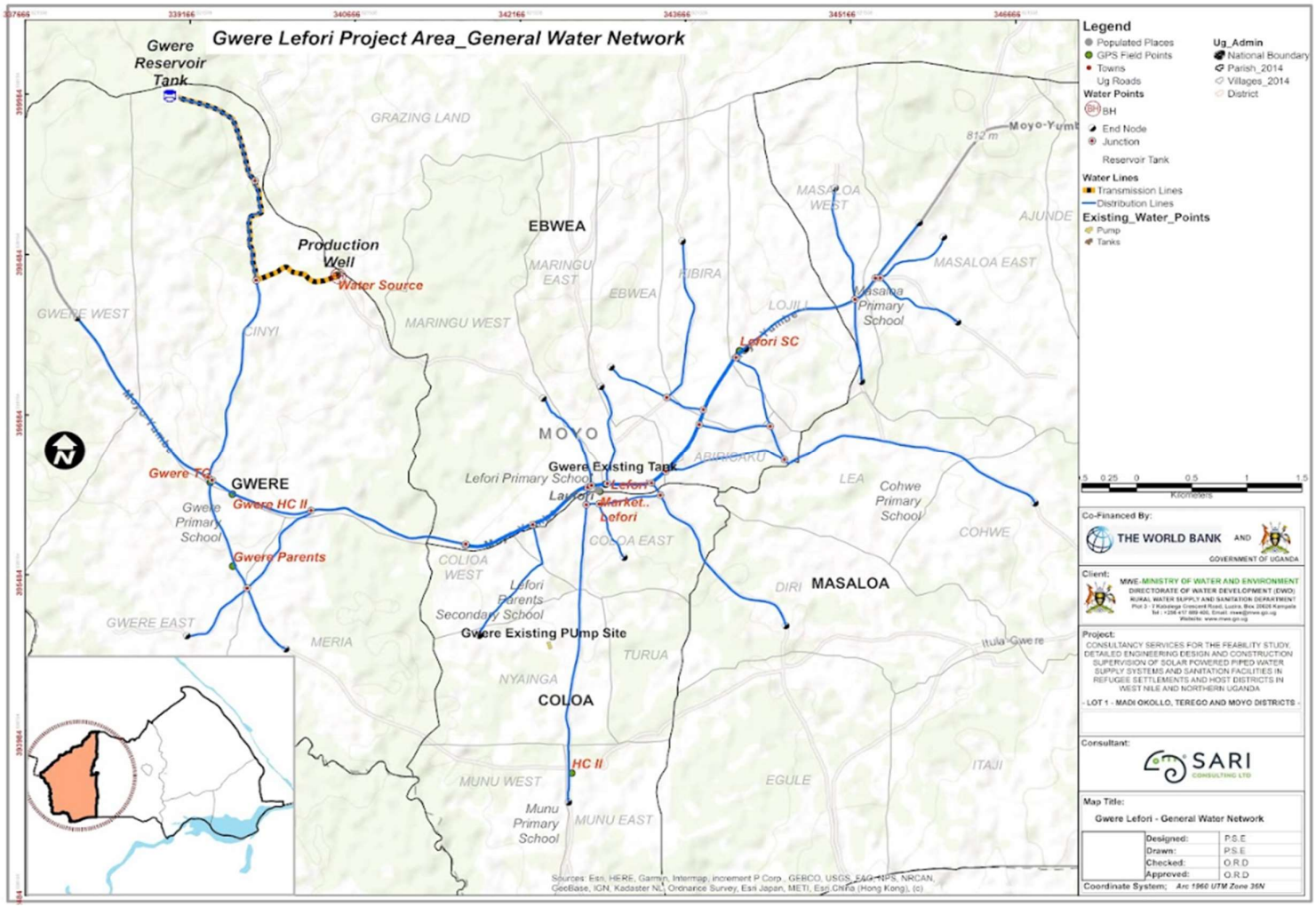

Figure 3-3: Proposed Gwere RGC Water Supply System Schematics

3.4.2 Water Treatment Plant Design Criteria

The Design Criteria for the Treatment Processes are as below:

3.4.2.1 Pre-Chlorination/ Aeration

- To prevent algal growth in raw water,
- For the destruction of some taste/odour-producing compounds,
- For the oxidation of iron, manganese and hydrogen sulphide,
- To aid coagulation.
- Dosage: 1 to 5 mg/l depending on the degree of pollution

3.4.2.2 Sedimentation

Aim: Aeration promotes the formation of iron (iii) which is a brownish precipitate which will require removal. During sedimentation, the particles formed during aeration and any other colour-causing particles are subjected to settlement on the floor of the sedimentation tank.

3.4.2.3 Filtration

a) To separate suspended and colloidal impurities in water.
b) To produce sparkling and aesthetically attractive water free from producing organisms.

3.4.3 Design Criteria – Sanitation

3.4.3.1 Sanitation Needs

Human waste consists of two basic elements – excreta and sullage. Excreta has a high solid content and is highly infected with pathogenic organisms. Sullage is wastewater from kitchens, baths, wash tubs, etc. and has a lower pathogenic content. Both excreta and sullage require satisfactory treatment and disposal.

The type of sanitation facilities will depend on the level of service for water supply as follows:

a) High water consumption (e.g., house connections) – waterborne sanitation in the form of septic tank systems or central sewerage.
b) Low water consumption (e.g., yard tap or stand tap users) – non-water borne on-site sanitation facilities.

Water Borne Sanitation

Wastewater is closely related to the water consumption. To calculate potential wastewater flows, factors are applied to the water consumption. The following factors in Table 3-5 have been adopted.

Table 3-5: Sanitation Technology Options

No.	Description of Water Consumer Category	Waste Water Production	Possible Wastewater Disposal
1	House Connection (YT1)	80%	Waterborne
2	Yard Tap (YT II)	20%	Usually, Non-Water borne
3	Public Stand Post (SP)	0%	Non-Water borne
4	Part-Time Users (NS)	0%	Normally Non-Water borne
5	Institutional (Inst)	85%	Waterborne

8	Commercial/Industrial (Com/Ind)	90%	Waterborne
Source: Previous Studies- Sanitation Strategy and Master Plan for Kampala City			

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 cesspit
5	Eco-San (Dehydrating Type)	Yard Tap / Stand Post	nil	Removal of faeces and Urine on a regular basis
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				

3.5 Detailed Design of the Treatment Plant

The capacity of the treatment works is 960m^3/d (60m3/hr) inclusive of 5% plant use and is sized for the maximum day. The plant will operate for 16 hours per day in the ultimate year of 2045. The water treatment plant is located in Cinyi village, Gwere parish Lefori sub-county and will be about 20 meters from BH DWD 89709 which will be pumping water directly to the treatment plant.

3.5.1 Choice of Treatment Process

The water quality test results from the national water quality reference laboratory in Entebbe show an Iron amount above the minimum required as shown in Table 3-9 below. As stated in the feasibility study report, a treatment process considering Aeration, Sedimentation, Rapid Gravity Filtration, and Chlorination as shown in Figure 3-4 below has been adopted.

Table 3-7: Water Quality Test Failed Parameters

Parameter	Unit	National Standard for un-treated portable water (EAS12:2018)	DWD89709
Colour: Apparent	PtCo	50	174
Turbidity	NTU	25	28
Iron: Total	mg/L	0.3	0.3

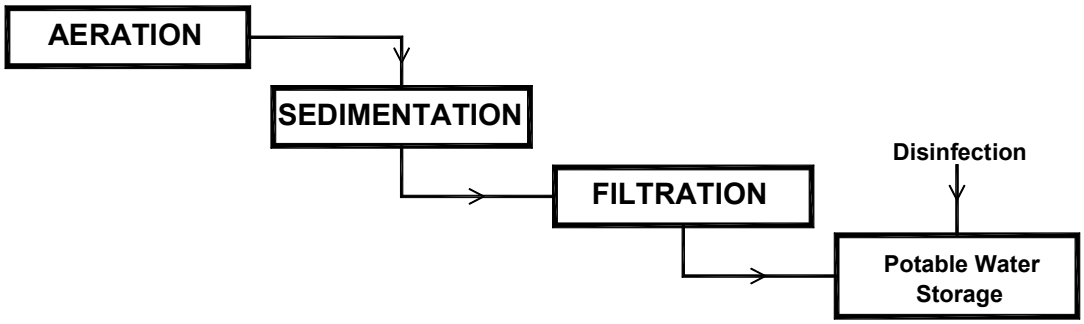

Figure 3-4: Treatment Process Schematic

The Figure below elaborates on the site layout for the water treatment plant in Gwere RGC

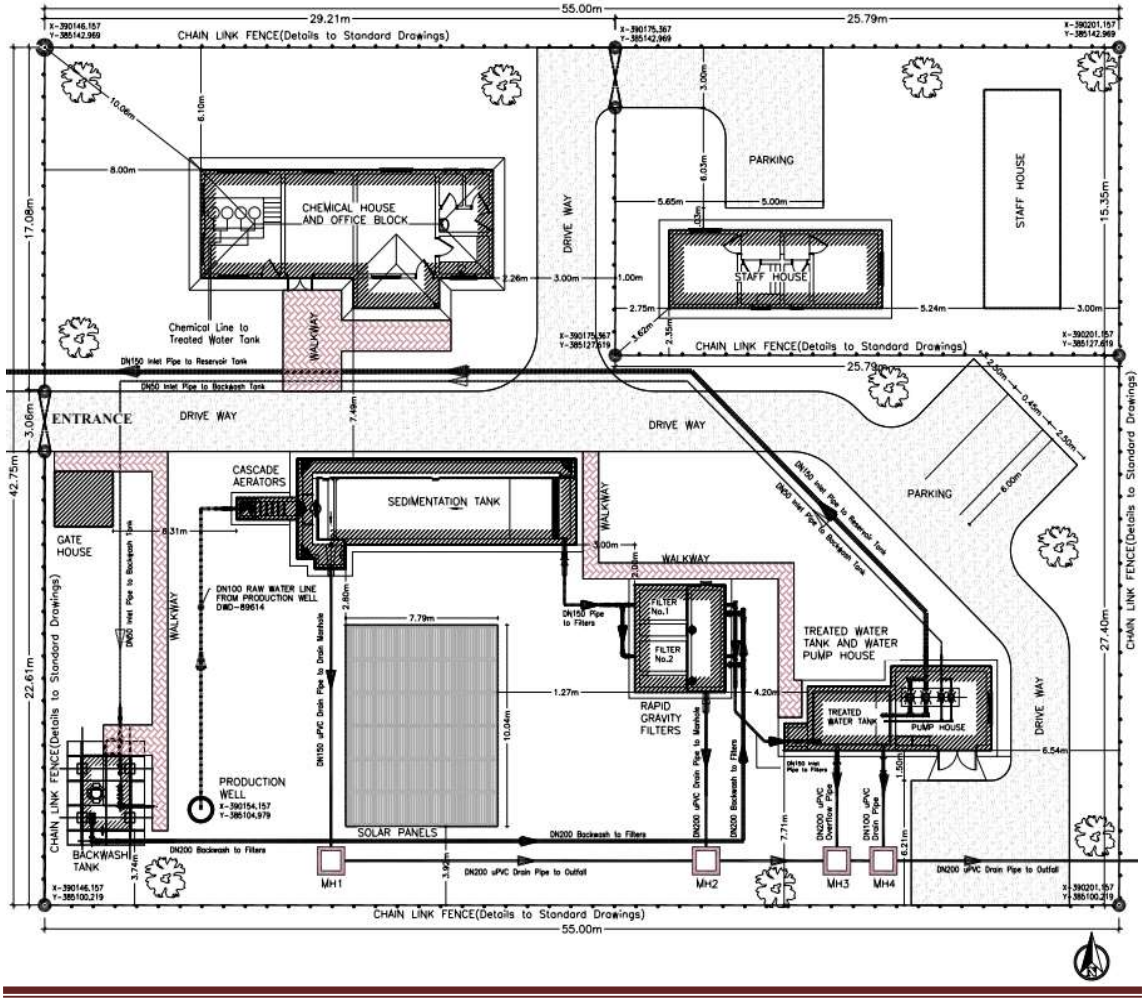

Figure 3-5: Gwere RGC WTP Site Layout

3.5.2 Aerators Structure

To keep O&M costs down (especially energy costs), aeration will be by hydraulic means, not mechanical means. It will be affected by cascading water over multiple tray steps in a reinforced concrete aerator. The aerator receives the raw water via a central DN 150 pipe into the inlet chamber from where it cascades and weirs over the multiple tray steps thereby absorbing atmospheric oxygen

3.5.3 Sedimentation Tank

From the aerator structure, the water flows to the sedimentation tank which will be 1No rectangular tank of the horizontal flow type with design parameters. The tank has been sized for full flow and will result in a surface loading rate of 1.0 $m^3/hr./m^2$. This is well within the usually acceptable range of 1-1.56 $m^3/hr./m^2$.

3.5.4 Rapid Gravity Filters

3.5.4.1 Filtration

From the sedimentation tank, the water is gravity-fed to the filter plant. The filter contains a sand layer with grain sizes between 0.7 and 1.2mm. Underneath the filter sand is a gravel layer as a supporting material. The gravel (25cm to 30cm) helps to distribute the water above the filter bottom.

The water flows through the filter cell from top to bottom. The filtered water is collected underneath the filter bottom and then transferred via the clear water pipe to the treated water tank. While the filter is operated, dirt is retained by the filter sand, increasing the resistance in the filter material. To overcome the loss in pressure, the water level above the filter sand rises. As soon as the water level has reached a certain height (around 2m), filter washing is required.

3.5.5 Chlorine Dosing Units in Chemical House

Two mixing PVC plastic tanks of $0.5m^3$ 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. The plan layout for the chemical house is shown in Figure 3.6 below.

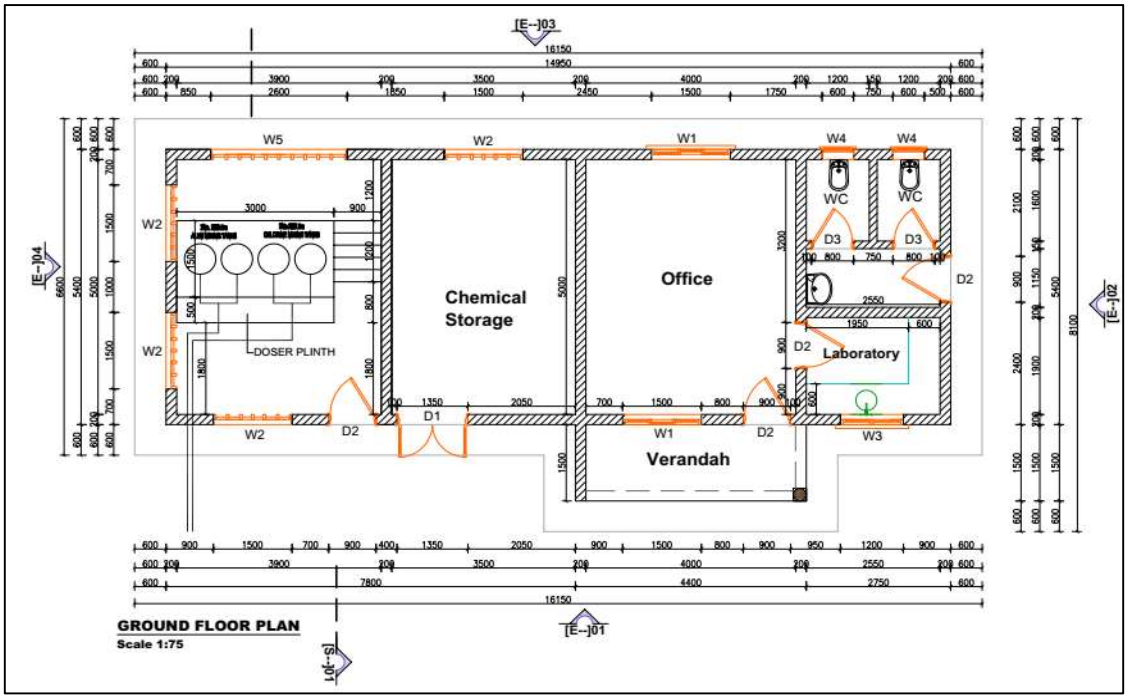

Figure 3-6: Chemical House and Site Office Plan Layout.

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 3.8kg, the mixing tank shall be adequate for full-day use in the ultimate year, 2045. The hypochlorite dosage rate will be 0.63/min. All the chemical mixing tanks will be provided with the following: -

- Makeup water is sufficient to fill up each tank in 30 minutes, overflow, discharge and drain pipework and valves.
- 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.

3.5.6 Clear Water Tank and Pump Station

3.5.6.1 Chlorination

Disinfection by chlorination of the water is meant to leave a residual of 0.3-0.5 mg/l at the furthest ends of the network, which is more than 5 km away from the treatment plant.

3.5.6.2 Water Tank

A clear water tank has been provided and will be 5.4 m long, 4 m wide and 3.78 m deep. The clear water tank will have two compartments as follows:

- Inlet pipework chamber –
- Chlorinated water storage –

The tank is in reinforced concrete. The tank also serves as a suction reservoir for back-treated water pumping (chlorinated water storage). The inlet of the tank will be DN150, overflow DN200, the outlet will be DN100, and the drain will be DN 50 and will be provided with internal access ladders made of

galvanised still for each of the compartments. Roof vents of diameter not less than DN50 shall be provided.

3.5.6.3 Treated Water Pumping Station

There is one pumping station which is conjoined with the clear water tank at BH 89614. It shall house the following:

- 2 No. High Lift clear water pumps (1No. duty and 1No. standby)
- Switchgear and controls
- All associated pipe works.
- Floor drainage channels and cable ducts.

3.5.6.4 Workshop and Stores

A Workshop/store building will have three rooms as follows:

- Workshop & Office 32.5 m2 floor space
- Chlorine store - 19.5 m2 floor space
- General store - 17.5 m2 floor space

Vehicular access will be provided to facilitate the repair of equipment especially pumps, storage of materials/pipes/fittings/equipment, and operation of the Plant.

3.5.6.5 Operators Residence

One semi-detached type C house with a combined floor area of 79m2 will be constructed in the Plant compound to house the operators of the Plant and Intake. Each house will contain a single Bedroom, a Sitting/Dining Room, a Kitchen, and a Bathroom/Water Borne Toilet. The houses will be fenced off from the Plant to keep non-official staff, especially children, away from the works. Water supply will be provided from the Backwash tank, electricity from the mains and a common septic tank with the Administrative Building will be constructed to collect the sewage/waste water from the residences

3.5.6.6 Water Treatment Plant Site Works

Besides the above components of the treatment process, the following auxiliary works will be considered:

- Construction of a fence and installation of 2 No. Double leaf access gates for both the plant and staff quarter entrances.
- Supply and Installation of a 75kVA 11kV/433 V oil-filled 3-Phase Transformer with associated cabling to the nearby Overhead Three-Phase line, Site Lights, and Houses.
- Supply and Installation of 117 No. monocrystalline PV Solar panels rated at 280pW 12 Volts DC, including PV solar panel support structure.
- Supply and Installation of Site Lighting.
- Supply and Installation of Surge Suppression Equipment.
- Construction of site drainage including the backwash drainage line to an outfall.
- Construction of Site Road Works and Walkways.
- Construction of auxiliary buildings including a workshop and stores, attendant's accommodation, Water Office

The site layout drawing for the treatment plant will be done following the drawing as shown in Figure 3-9.

3.5.6.7 Treated Water Transmission Mains

The treated water transmission main will be DN150 DI PN10 delivering water from the treatment plant at BH – 89709 to the reservoir at a distance of 2.92 km. The main will have the capacity to deliver 35m^3/hr. Disinfection Facilities

Final disinfection of the treated water from the boreholes at the treatment plant will be affected by the installation of chemical dozers at the chemical house to feed into the contact tank at BH 89709 and an online dozing chemical house for water from the existing borehole in Lefori Town Council.

The chemical storage, mixing and dosing will be performed at the borehole source site in a separate room at the top of the sump. A set of two DOSATRON inline proportional chemical dozers to dose chlorine solution from the mixing tanks directly into the pumping mains and in response to a pressure differential, a device shall be installed in the pumping main.

3.5.7 Storage Reservoir

The storage capacity for the reservoir has been computed as 30% of the MDD of 997m^3/day in the ultimate year 2045. The required storage capacity for the system is 299m3 while the mass curve analysis gives a volume of 337m^3 and hence 337m^3 has been chosen as the required storage for Gwere RGC reservoir.

The site works at the reservoir consists of the following:

- The general earthworks,
- The site pipework,
- The site drainage,
- Miscellaneous works.

The outlet from the main reservoir shall be fitted with new bulk flow meters.

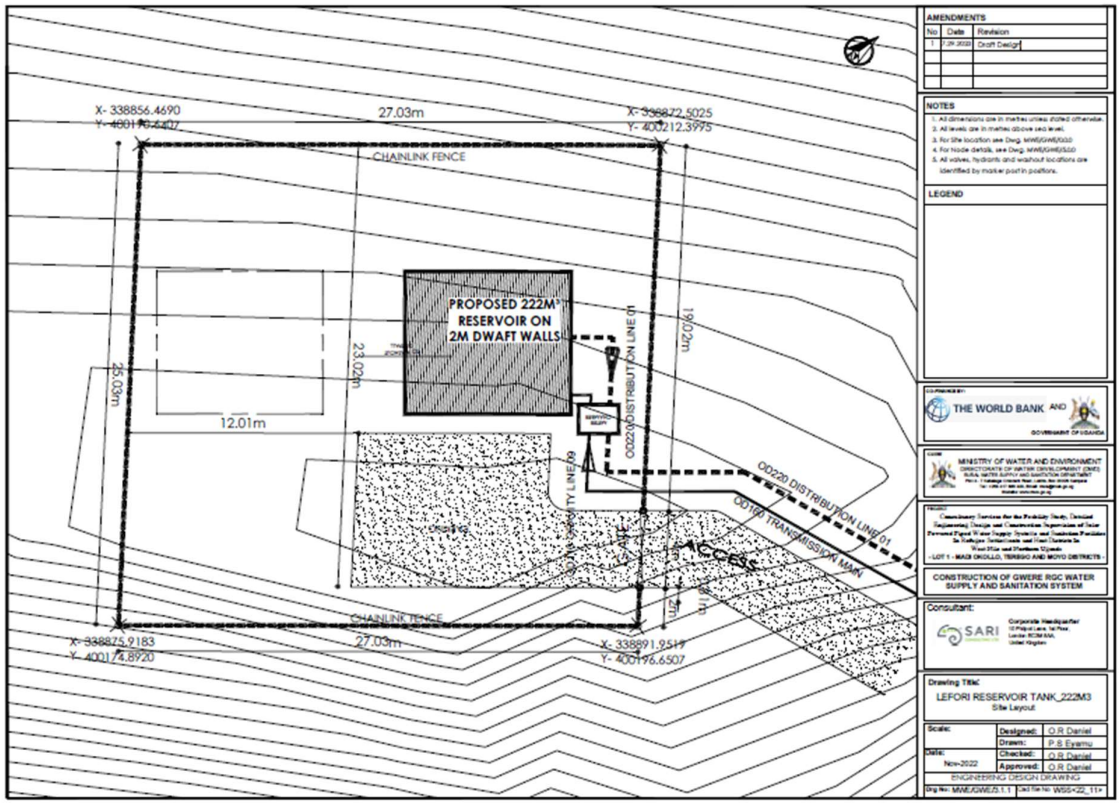

Figure 3-7: Water Reservoir Site Layout

There already exists a 100m^3 tank in Lefori supplying the existing scheme hence the actual required storage volume for Gwere RGC is 237m^3. However, a tank of 222 m^3 has been adopted because the 237 m^3 does not exist on the market and it will be placed on 2m high concrete dwarf walls located at coordinates 338981.00 m E and 400010.00 m N.

3.5.7.1 Distribution Network

The 43.9 km 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.

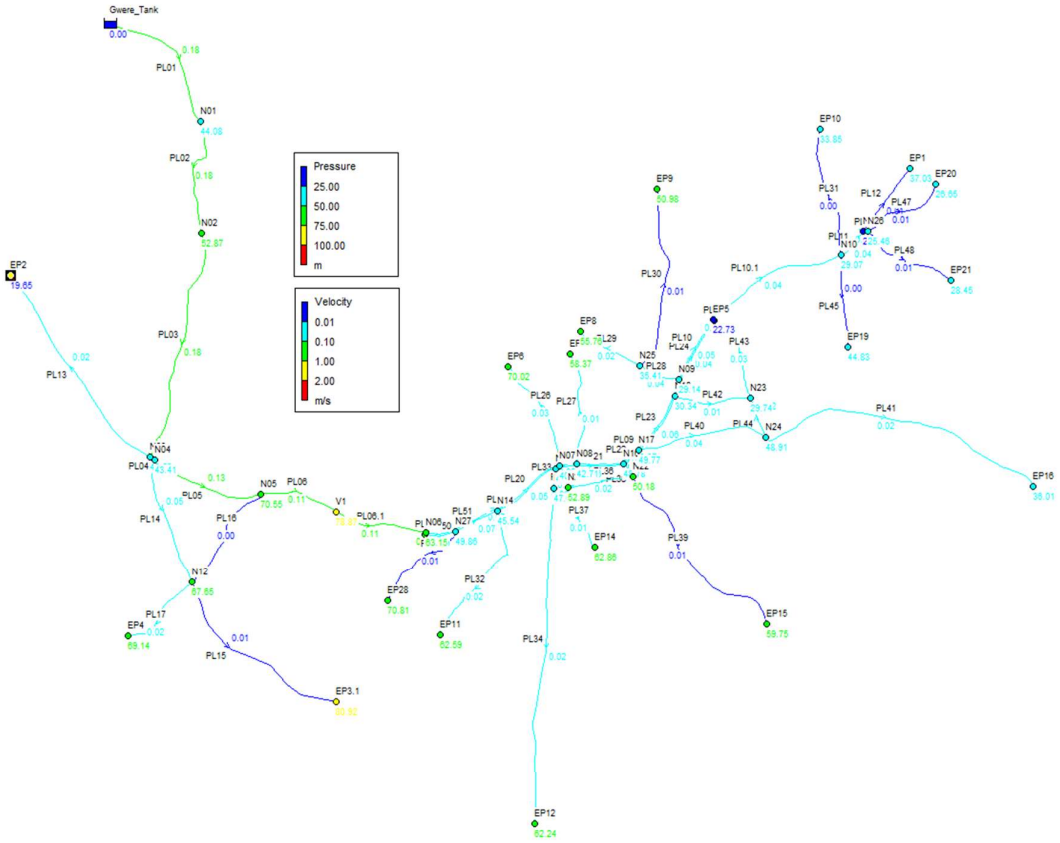

Figure 3-8: Gwere RGC System Distribution Network Model

3.5.7.2 Service Connections

The location of the service pipes will not be known until applications for connections are received. At this stage, only an estimate of the sizes, quantities and costs can be given. Based on the population to be served at the tariff of USh 59/20 litres, the total number of connections required in the ultimate 2045 has been estimated as in Table 3-8 below.

Table 3-8: Population per Category Criteria

Category	Population Served	Source of Criteria
Yard Tap 1 (YT1)	5 persons per household	Maximum Number- DWD Water Manual 2013
Yard Tap 2 (YT2)	2 Households per yard tap	
Standpipes	150 persons Per Standpipe	

3.5.7.3 Water Office

The project will have a water office block whose plan layout is shown in Figure 3-9 below located within the core of the project area. This shall house the offices for managing the system and will cover an area of 113m^2.

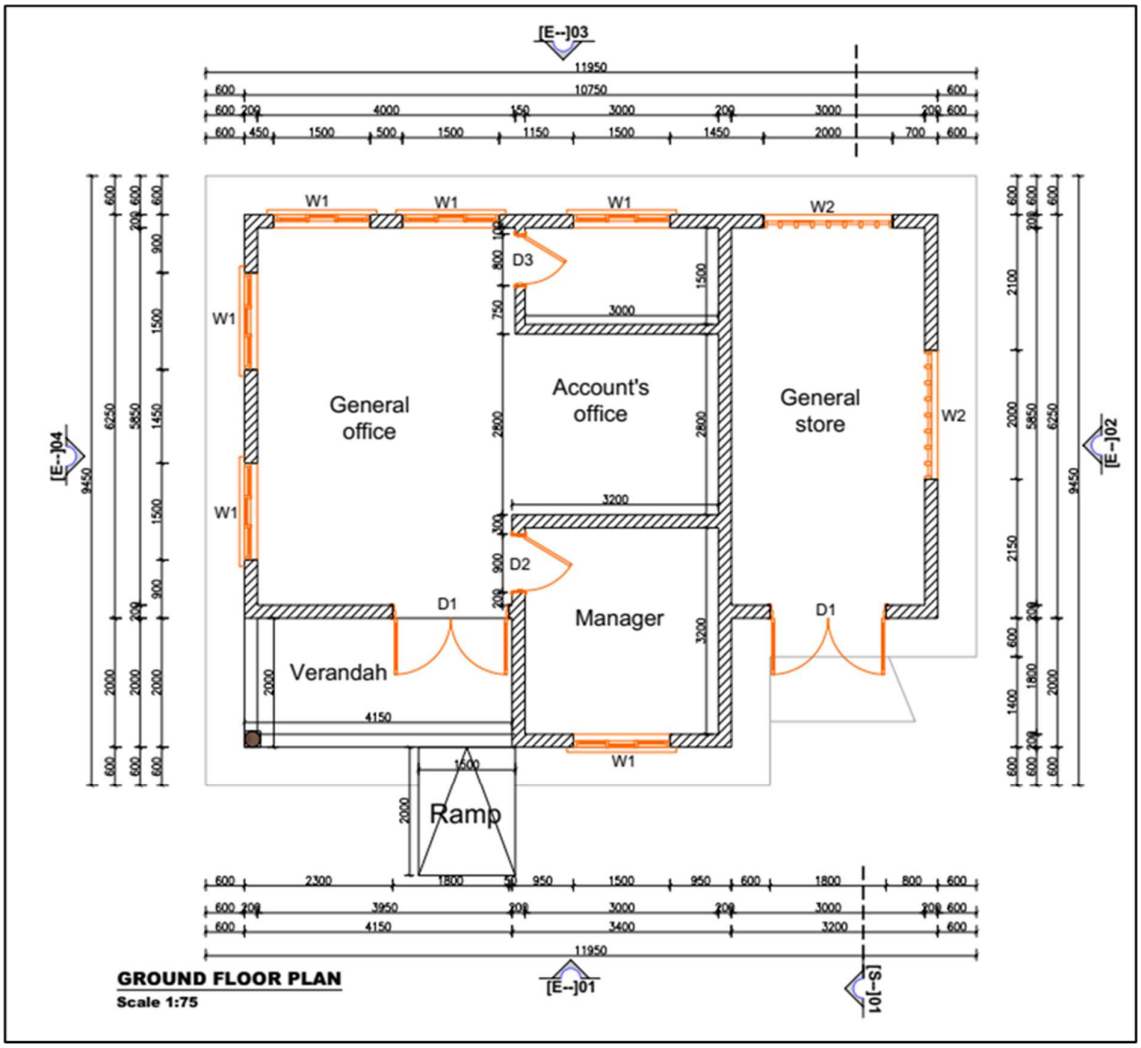

Figure 3-9: Water Office Plan Layout

3.5.7.4 Search and Replace Process for Overhauling the Existing Water Supply System

The search and replace exercise will involve the systematic replacement of existing pipelines (about 8km of distribution mains) with new pipes and the rehabilitation of about 50No. of the existing consumer connections within the existing Laropi system. Before commencing the process, a thorough assessment of the existing water supply infrastructure will be conducted to identify critical areas for replacement and prioritize the phasing plan. High-quality and durable materials will be selected for the new pipelines, and precise installation techniques should be employed to ensure leak-free connections. Additionally, a consumer survey helps identify individual connection needs, enabling prompt repairs or upgrades where necessary. Throughout the execution, close monitoring will be maintained to adhere to the project schedule and budget, ultimately resulting in an upgraded, efficient, and reliable water supply system that meets the community's growing demands while minimizing disruptions to the existing service.

3.5.8 Energy source for the water supply system

Since solar power is the primary energy source for the proposed Gwere water supply system, with the pump operating for 16 hours 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 associalted 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.

3.6 Detailed Design - Sanitation

3.6.1 Public and Institutional Sanitation Interventions

The proposed interventions in sanitation are centre on the construction of 1No. 4 Stance VIP public toilet facility at Munu Health Centre II during construction

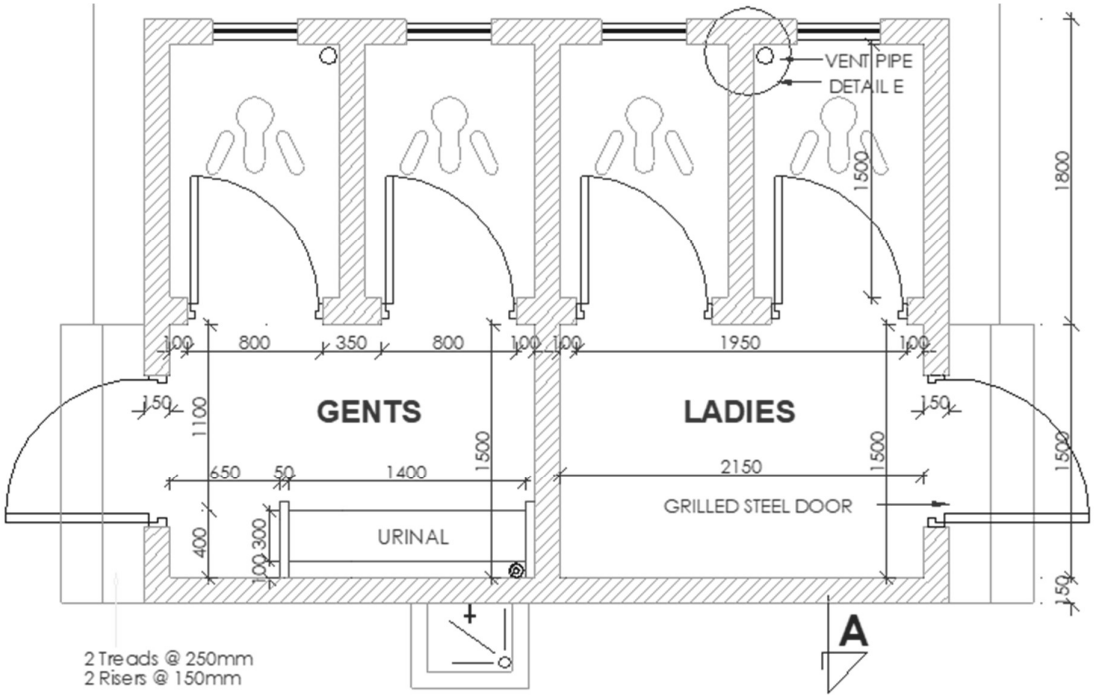

Figure 3-10: VIP Toilet for Health Centre

Currently, there is a public toilet facility within the project area at Lefori Market. It is proposed to construct 1No. 6 Stance waterborne toilets to be located in Gwere RGC preferably at a public place whose location will be decided during construction by the local authorities

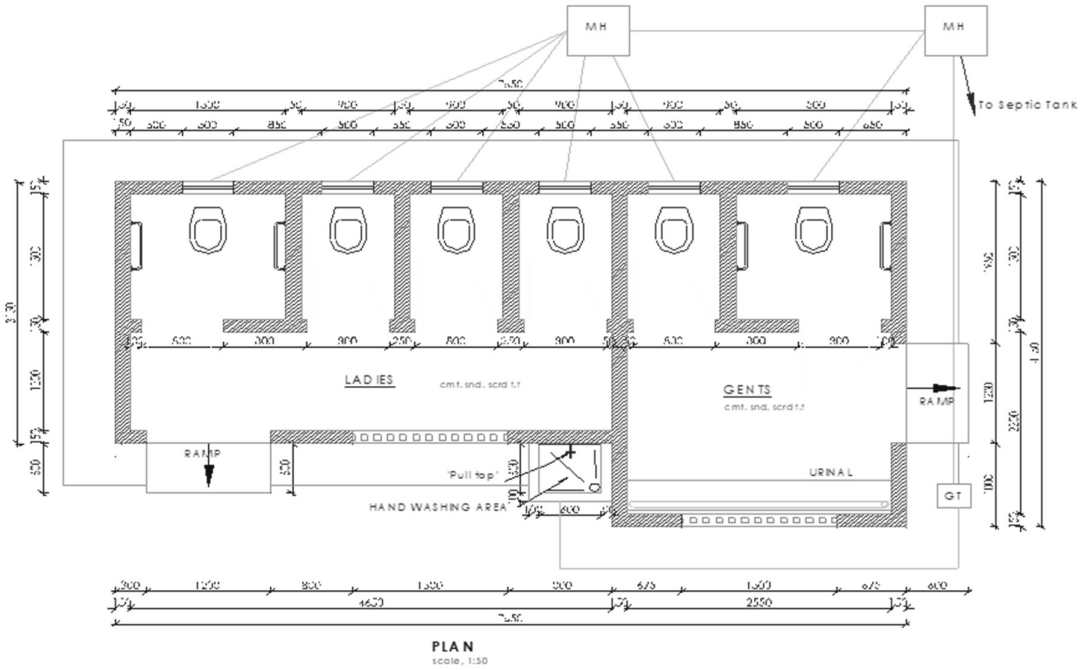

Figure 3-11: Layout of Proposed Public Toilet

5 STANCE Single Vault VIP Design (Scale 1:50)

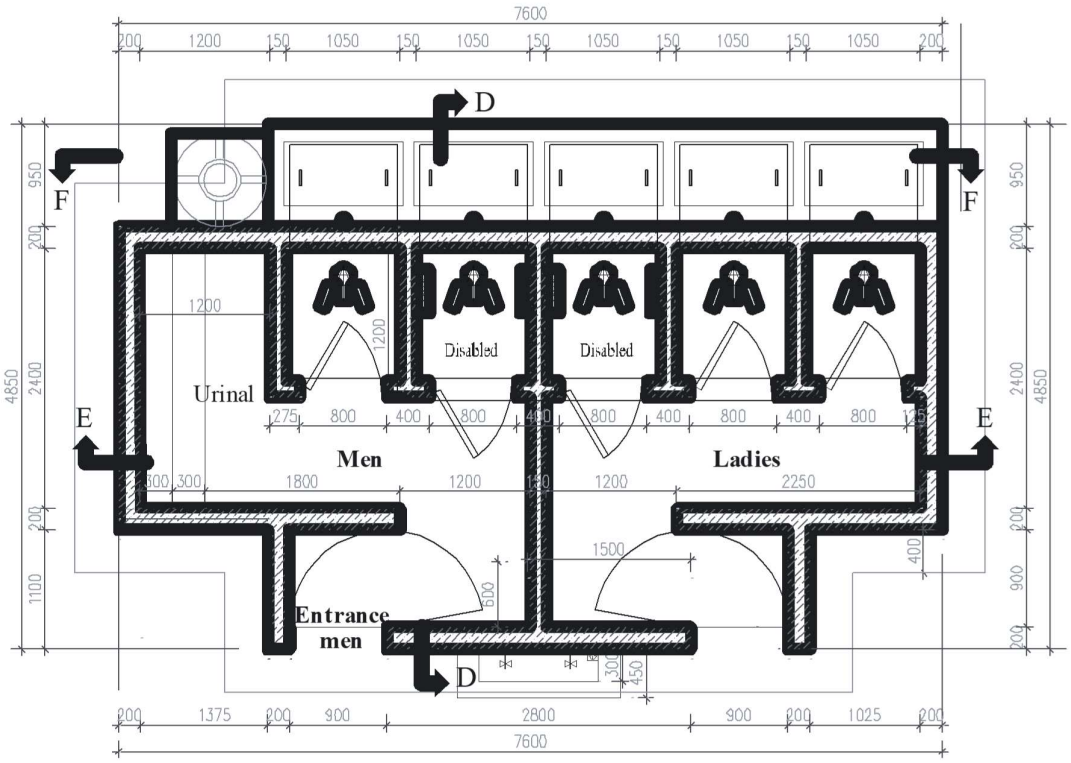

Figure 3-12: Proposed 5 Stance VIP public toilet

3.6.2 Operation and Maintenance of the Proposed Toilets

The public toilet can only be properly maintained when the users are paying a fee set by the local authorities. This can be in the form of;

- A monthly fee is charged to the residents within the locality of the public toilet who would wish to use it, while the non-residents pay any fee for every time, they use the toilet or,
- A standard user fee is charged for using the toilet at any one time.

3.6.3 Faecal Sludge Disposal

When the sanitation facilities are filled up, they have to be emptied and faecal sludge disposed of. This sludge is to be disposed of somewhere according to the Ministry of Water and Environment (National Faecal Sludge Assessment for Small Towns, 2013). The Ministry proposed that faecal sludge treatment plants should be constructed in selected towns within the country. Currently, there is an FSTP under WSDF-N going to be constructed for Moyo town council and it will be located within a 10km radius of Lefori sub county hence faecal sludge generated from Gwere can be deposited there.

3.6.4 Solid Waste Management

Since waste bins have been provided in the beneficiary schools, the local authorities should provide areas where solid waste sites can be located to ensure the proper disposal and treatment of solid waste without destroying the environment.

3.7 Planning and Design Activity Phase

3.7.1 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 that 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.

3.7.2 Pre-Construction Works

All the planned 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 pipeline 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.

3.7.3 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 2.21 km to the intake site and reservoirs would be enlarged to 3 metres and obstacles cleared to give adequate and safe access for equipment, materials and personnel to the construction site and permanent works.

3.7.4 Materials and Equipment Transport

The materials required for the construction will include 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. 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.

An important aspect of the construction process is the transportation of materials and equipment from their sources to construction areas, dedicated storage areas and construction yards. Transportation will be accomplished through the use of the existing road infrastructure in the project areas.

3.7.5 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

3.8 Construction Phase

3.8.1 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:

- Identified ecological resources (e.g., tree or plant specimens to be protected) especially within watercourses, setbacks/buffer zones, and wetlands
- 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
- labour as well as give priority to qualified women who will apply for jobs.

3.8.2 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:

- Design a gender policy
- 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.
- The workplace environment including tools and fixtures will be gender friendly.
- Construction labour will be inducted on sexual harassment
- Separate water- borne toilets for men and women to be constructed for all project workers, a similar arrangement will be made for work sites
- Children below 18 years will not be recruited, where age cannot be ascertained, a Letter from LCs shall be requested.

3.8.3 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.

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

3.8.4 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:

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

3.8.5 Environmental Sustainability measures and adaptation strategies

3.8.6 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. sConstruction 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 removeand stored separately and back filled after trenching.

ii. Trenching

Trenching will be done 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.

3.8.7 Pipeline Testing and Commissioning

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

3.8.7.2 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.

3.8.7.3 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.

3.8.7.4 Masonry

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

3.8.7.5 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.

3.8.7.6 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.

3.8.8 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.

3.8.9 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.

3.9 Operational Phase

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

- Abstraction of water from groundwater source site location;
- Treatment and transmission of water to storage tanks;
- Water distribution and supply

3.9.1 Water Abstraction

The Gwerewater supply and sanitation system tre will involve abstraction of ground water from a borehole located at Cinyi Village using solar energy. water from a groundwater source at the borehole (with a pumphouse, solar panels) at Cinyi Village,

3.9.2 Treatment and storage of water

The raw water sourced from the borehole at Cinyi Village will besubjected 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 Ujiga Hill, Cinyi Village, Lefori Sub County. This storage tank of capacity 222 cubic metres 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 Lefori Sub County.

3.9.3 Water Distribution and Consumption

After treatment 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. Intsitutions will also be able to connect to the network.

3.10 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.

3.11 Expected Inputs and Output

The following are the expected inputs and outputs.

Table 3-9: 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 that 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 and ensures that an environmental health community at 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 defence, 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 Gwere RGC water and sanitation facilities will require the acquisition of land from landowners. Following the provisions of this policy, the 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 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 that 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 The Rivers Act (1907)

Although a very old and in many areas outdated piece of legislation The Rivers Act (1907) is important in IWRM terms for several reasons including dredging and the licensing of activities.

4.2.6 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.

4.2.7 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

4.2.8 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.

4.2.9 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.

4.2.10 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.

4.2.11 Occupational 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.

4.2.12 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.

4.2.13 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.

4.2.14 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.

4.2.15 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.

4.2.16 Employment Act, 2006

Employment Act, 2006 repeals the 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 Statement, and 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 that 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.
Section 4, 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 circulative resources not put into cyclical use.

Relevance: These regulations apply to both the 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 Table 4-2 and Table 4-3.

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

No.	Parameter or Pollutant	Unit	Maximum Permissible Limit
1	Temperature increase	°C	≤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
$PM_{2.5}$, $\mu g/m^3$	Annual	10	5
	24-hour[a]	25	15
PM_{10}, $\mu g/m^3$	Annual	20	15
	24-hour[a]	50	45
O_3, $\mu g/m^3$	Peak season[b]	-	60
	8-hour[a]	100	100
NO_2, $\mu g/m^3$	Annual	40	10
	24-hour[a]	-	25
SO_2, $\mu g/m^3$	24-hour[a]	20	40
CO, mg/m^3	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 the construction and operation phases 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 the 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 their	National Environment Act, 2019	National Environment Management Authority (NEMA)	Construction contractor

Regulations/ Standards/ Approvals	Description	Reference	Issuing Institution	Applicant
	production line/ processes need to acquire a license for handling and storage of hazardous waste			
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, this shall require a permit from the Roads Authority	Road Traffic Act (1998)	UNRA and Moyo District Local Government	Construction Contractor
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 The Operational Policies provide a basis on which the World Bank screens proposed projects to determine the appropriate extent and type of Environmental Assessment to be undertaken. The Bank classifies proposed projects as Class A, B, C or F1 depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. The categorization of projects is based on an assessment of their likely environmental and social impacts. Below is a brief description of the different categories:

- **Category A Project:** which may have potentially significant adverse social or environmental impacts that are diverse, irreversible, or unprecedented;
- **Category B** Project**:** may have potentially limited adverse social or environmental impacts that are few, generally site-specific, largely reversible, and readily addressed through mitigation measures;
- **Category C** Project: likely to have minimal or no adverse social or environmental impacts, including certain financial intermediary projects with minimal or no adverse risks; and

- **Category FI Project**: Assigned to business activities undertaken by Financial Intermediaries or through delivery mechanisms involving financial intermediation. The table below summarizes safeguards policies that were triggered by the project.

Table 4-5 below summarizes safeguards policies that were triggered by the project

Table 4-5: World Bank Operational Policies

OP No.	World Bank Safeguards Operational Policies triggered by the project	Key Provisions and Relevance
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 in harnessing the potential of forests to reduce poverty sustainably, integrate forests effectively into sustainable economic development, and protect vital local and global environmental services. The proposed water reservoir is to be sited within a local forest reserve ontop of Ujiga hill and as such, 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) Favouring strategies that eliminate the cause of the hazard at its source;
(f) Incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences;
(g) Preparing workers and nearby communities to respond to accidents;
(h) Improving EHS performance through a combination of ongoing monitoring of facility performance and effective accountability.

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

(i) Infrastructure and Equipment Safety
(ii) Hazardous Materials Safety
(iii) Environmental and Natural Resource Issues;
(iv) Community safety and exposure to project-related risks
(v) 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 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 that were consider 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 analysised and these included alternative water sources, source of power, routes for the pipeline, "no project alternative" among others.

5.1 sAlternative Sources

5.1.1 Surface Water Sources

5.1.2 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 distance of over 40 kilometres between the project area and the River Nile; and the cost of treatment of the raw surface water. This option was therefore ruled out on the basis of unvilability. Groundwater

A production well (DWD 89709) was drilled in Cinyi village, Gwere Parish, Lefori sub-county with a yield of 60 cubic metres per hour. The water from this well is of good quality and suffieicnt to serve as a water source for the Gwere Water Supply and sanitation system.

There is an existing water supply system whose source is a borehole of yield 6cubic metres located at Nyainga village, serving Lefori town. Using this same borehole as the water source for the Gwere Water supply and sanitation system is not possible because of the insufficient water resource that can not meet the demand for the project area.

In order to meet the ultimate year demand of 997 cubic per day in 2045, the proposed project will have to combine water from both boreholes. Initially the new borehole (DWD 89709) will serve as the water source for Gwere Water supply and sanitation system.

5.1.3 Source of Power

5.1.4 In the initial phases of the project, the new Borehole (DWD 89709) will be the water source and will require a pumping regime of 16 hours per day in order to meet the water demand of 681 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 BH1-89709 since solar power can only be provided to a maximum of 8 hours in a day. rNo 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.

5.2 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. 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 piped system

5.3 Alternative Access Roads to Water Sources.

The water source is located in Cinyi village within Gwere RGC. Alternative access road 1 is approximately 1.9km off Moyo Yumbe road traversing an existing road, footpath and agricultural fields. The access road is currently a footpath and would require opening which would affect gardens. This access will require the acquisition of land parcels. The existing access (access road 2) is shown in Figure 5-1below

Figure 5-1: Existing footpath to the water source

While access road 2 is longer (2.1km off Moyo Yumbe Road) This access road would require the opening of the road which is planned and surveyed to be undertaken by the district Local government as reported by the Local Council III Chairman. This would traverse a green field with few gardens. The

access road would not affect any homesteads. This access road would be the preferred route to the water source as it would not require the acquisition of Land.

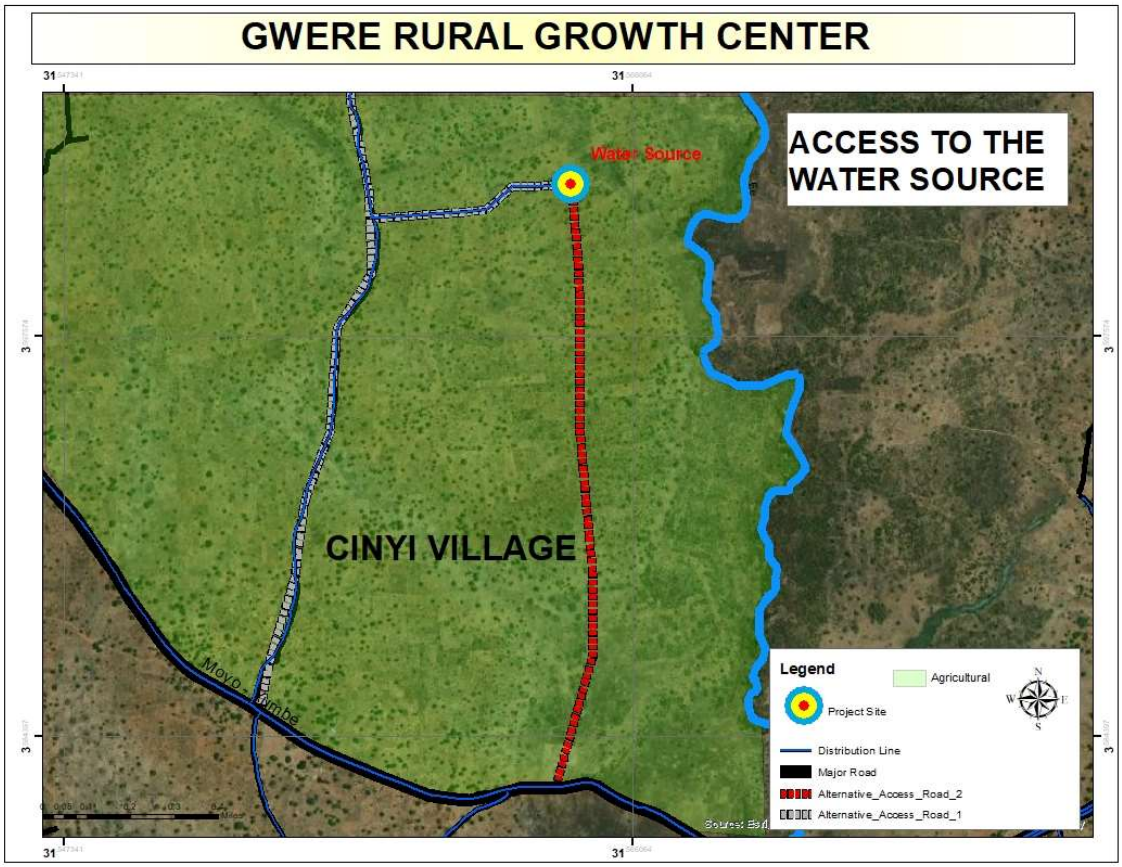

Figure 5-2: Alternative Access to Water Source.

5.4 Alternative Access routes to the Water Reservoir

The water reservoir is located at Cinyi Village on Ujiga Hill as the highest point and would require blasting of rock to create an access road, Alternative access road 1 is a longer route at 4.1 km from the main Moyo Yumbe road, the access road is mainly motorable with an existing road. The access from this road would require clearing and blasting of rock to reach the actual site. while access road 2 is a Shorter 2.21 km from the main Moyo Yumbe road and would require the acquisition of land-heavy blasting of rock. Thus Access Road 1 is the preferred option.

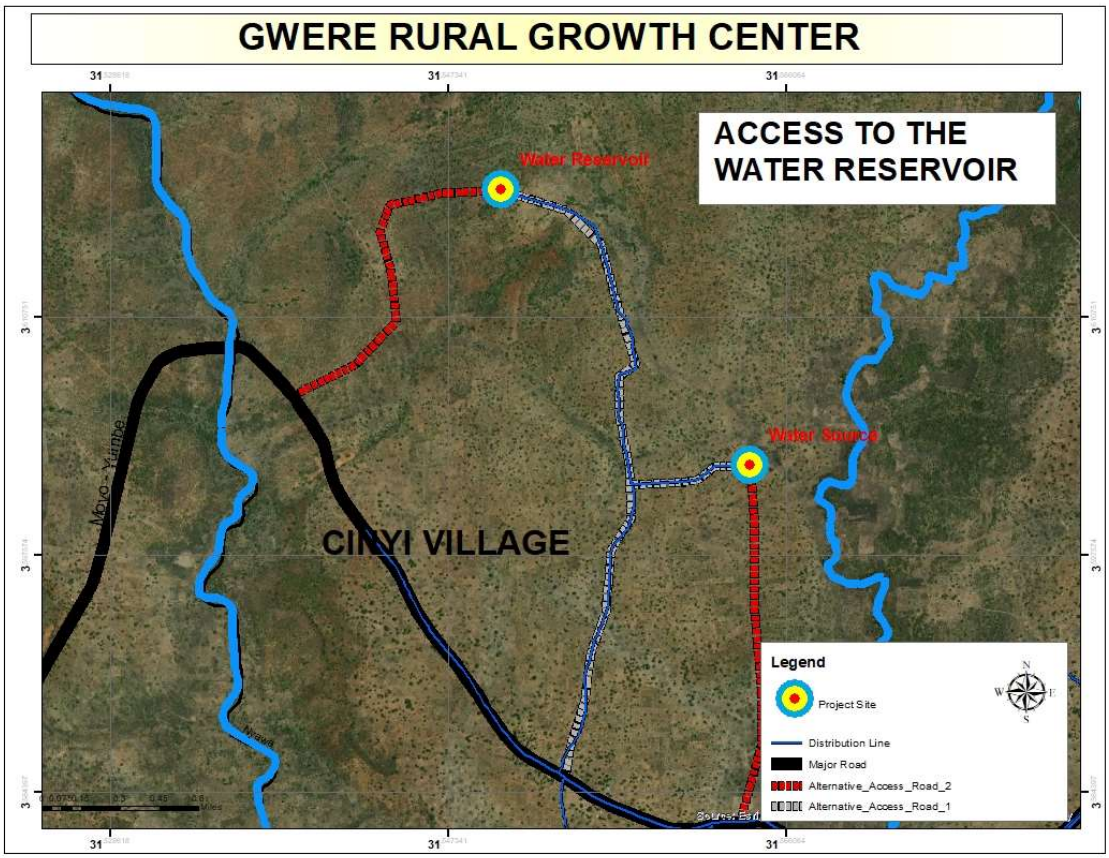

Figure 5-3: Alternative Access roads alignment to the Water Reservoir

5.5 Sanitation Options

The Gwere 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, no household 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 Gwere 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.

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

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 less rain (860mm) than the rest of the district.

The highest temperature recorded in the district was 45^{0}C from January to February and the lowest 29 ^{0}C 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 35^{0}C with the lowest being 18^{0}C as shown in Figure 6.1 below.

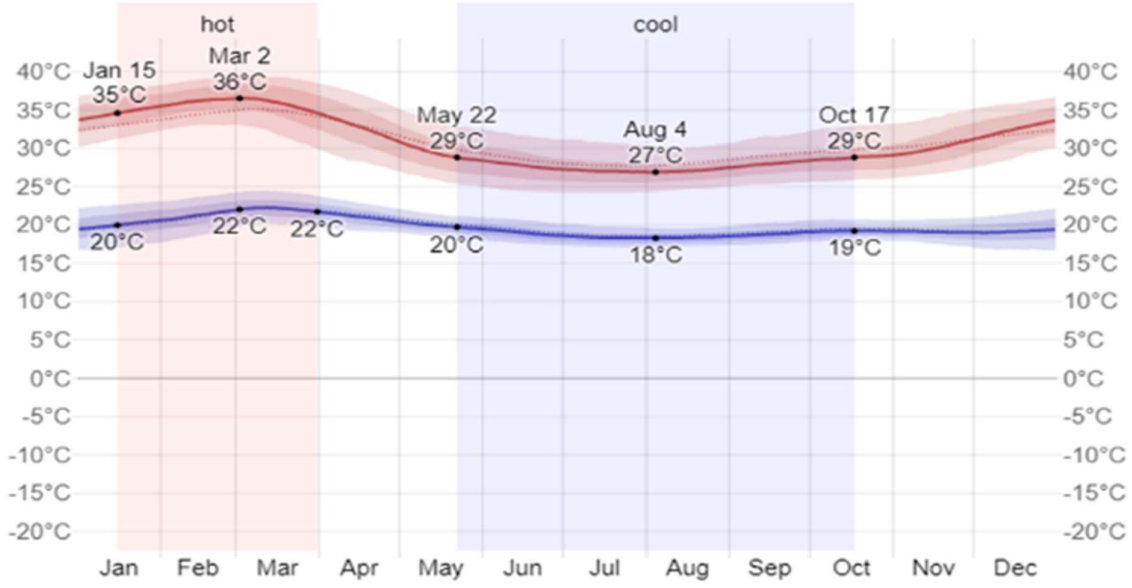

Figure 6-1: Average High and Low Temperatures for Moyo District

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.

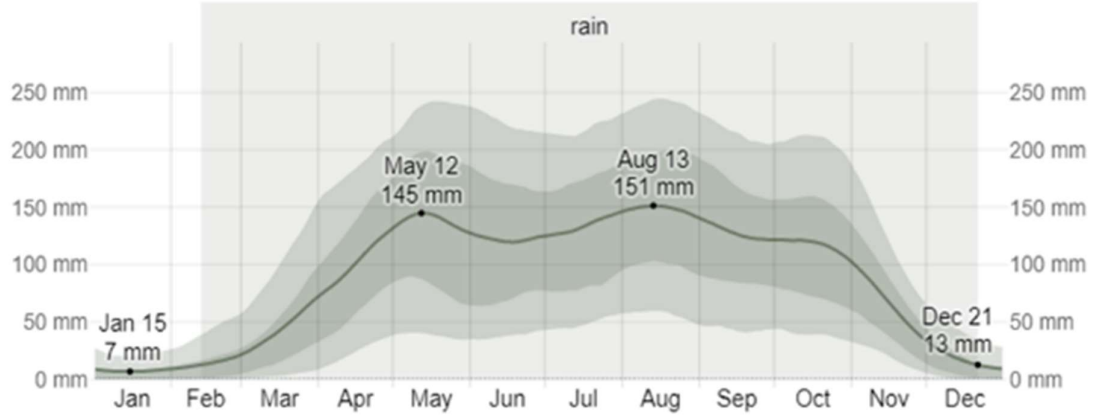

Figure 6-2: Average Monthly Rainfall for Moyo District

The field temperature surveys undertaken during the day are registered below.

Table 6-1: Temperature recordings within Project Area

Comment	Latitude	Longitude	Temperature
Gwere Trading Center	3.585024	31.55319	34.4
Gwere Proposed Toilet Facility Site	3.584403	31.55264	34.4
Bore Hole	3.590353	31.55492	33.6
Water Reservoir	3.616721	31.55827	33.9
Water Source	3.602595	31.56406	31.5
Health Center	3.560322	31.58342	28.7

Uganda like the rest of the world and more particularly the Least Developed Countries with the least capacity to adapt, is vulnerable to the negative impacts of climate change. It is a threat to its fragile ecosystems, people's livelihoods and ultimately the national economic development efforts (MWE,2021)

Models of future impacts of climate change agree on an increase of mean annual temperature of 1–3.1°C by the 2060s and 1.4–4.9°C by the 2090s. There is a broad consensus that annual rainfall will increase by about 7 to 11 per cent in the 2090s (Beyene, et al, 2010). The highest increases in rainfall will be in the "short rain" season (October to December), possibly leading to a shift in the seasonality of rainfall, with a more pronounced rain period in the autumn and the rest of the year being hotter and drier This will most likely lead to an increased lack of reliability in water availability, even if total precipitation increases.

Agriculture, which especially in the bimodal rainfall zone (McSweeney, et.al., 2010); is dependent on stable rainfall seasons, will become more difficult, with higher risks of losing harvests due to too much or too little rain. This is exacerbated by failures of traditional weather-forecasting systems and lack of access to modern ones (Hepworth & Goulden, 2008). In addition, a higher percentage of rain will fall in heavy events, and extreme events such as floods and droughts will increase in severity and frequency (Hepworth & Goulden, 2008).

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, and 55 minutes of daylight; the longest day is June 21, with 12 hours, and 20 minutes of daylight. as seen in Figure 6-3 below.

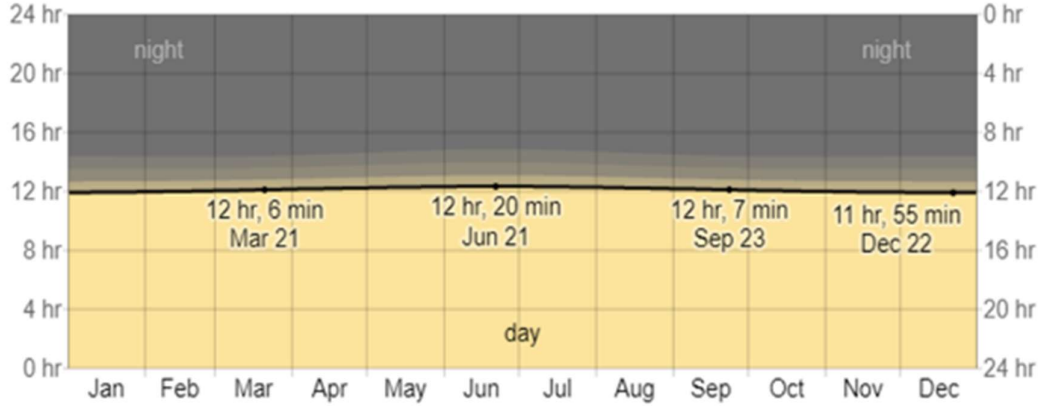

Figure 6-3: Hours of Daylight and Twilight

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.

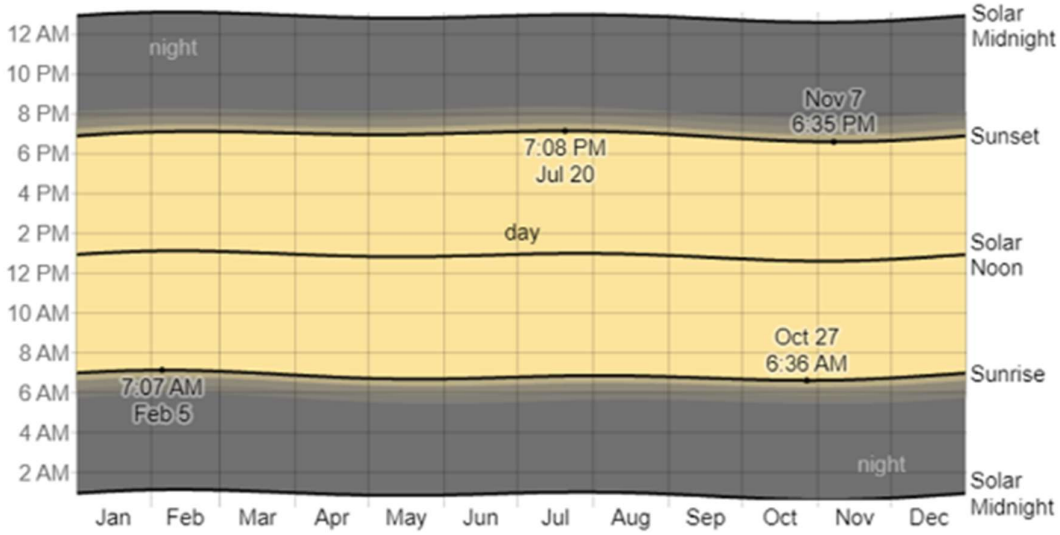

Figure 6-4: Sunrise and Sun Set with Twilight

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.

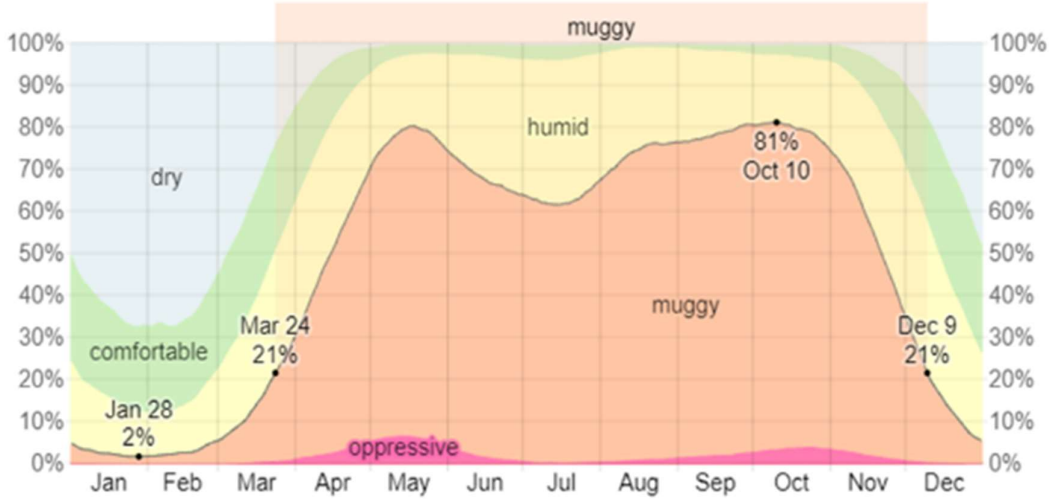

Figure 6-5: Humidity for Moyo District.

The field Humidity surveys undertaken during the day were registered below.

Table 6-2: Humidity Recordings within Project Area

Comment	Latitude	Longitude	Relative Humidity
Gwere Trading Center	3.585024	31.55319	42.1
Gwere Proposed Toilet Facility Site	3.584403	31.55264	41.1
Bore Hole	3.590353	31.55492	37.2
Water Reservoir	3.616721	31.55827	49.5
Water Source	3.602595	31.56406	77.9
Health Center	3.560322	31.58342	78.5

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 6-6 below best illustrates the solar energy trend in Moyo district.

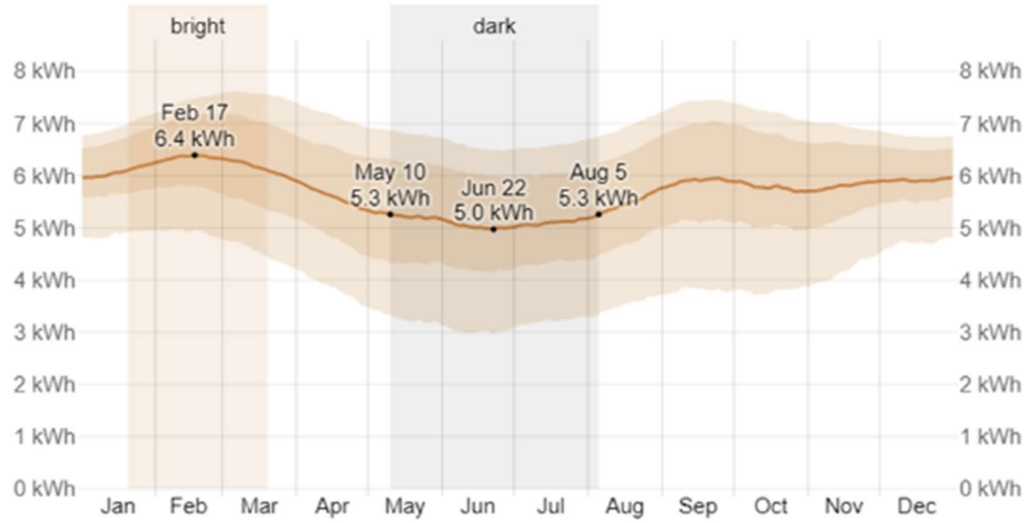

Figure 6-6: Average Incident Shortwave Solar Energy for Moyo

6.2.1.4.1 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 Gwere and Lefori 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.

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 Riverbank rises sharply upwards producing a landscape characterized by plateaus, and flat-topped hills, interspersed 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 Figure 6-7 below.

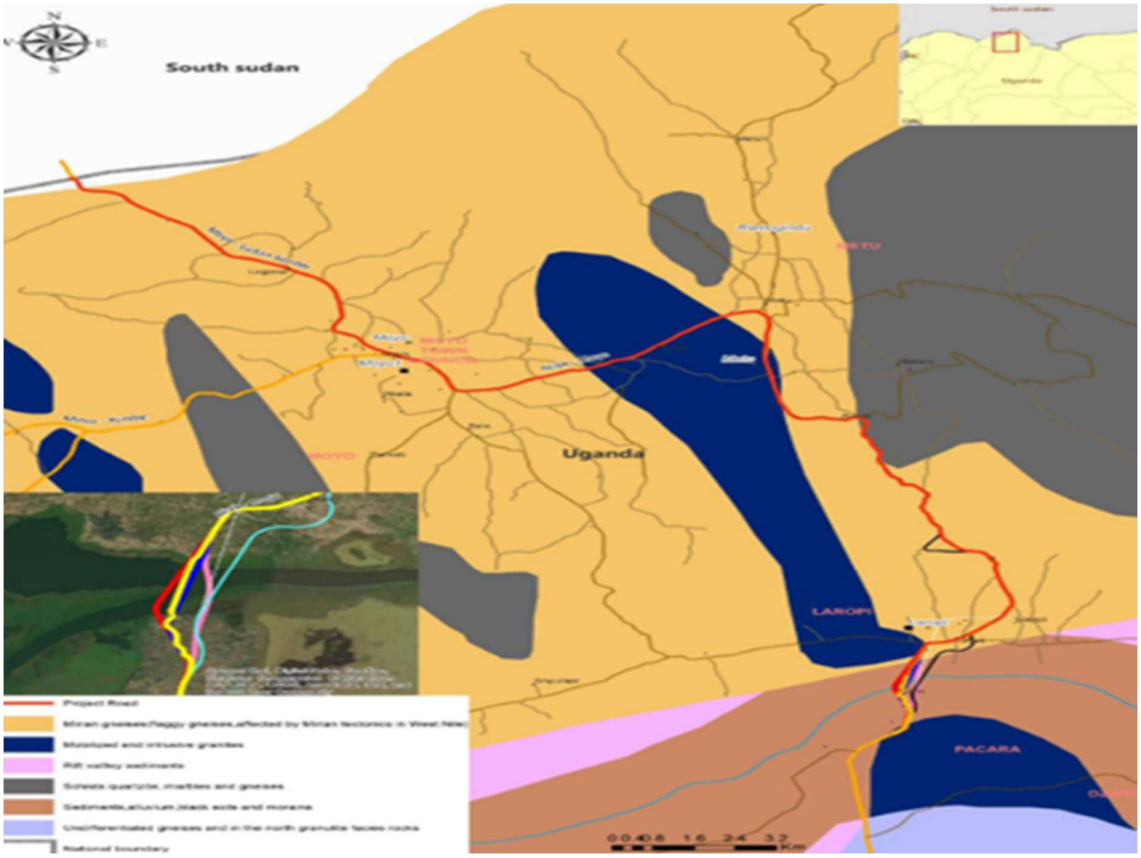

Figure 6-7: Geology of the project area (Source: UNRA Survey Department, 2022)

6.2.3.1 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 and Lefori. 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 Lefori 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 Geotechnical Assessment Results of Sites

During the Geo-technical Investigation, 3 trial pits (TP 1, TP 2 and TP 3) for the borehole were excavtated 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.

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Location	TP No	Depth (m)	Soil Description	% passing the given standard sieves														LL	PL	PI	LS	NMC	USCS soil Classification
				50.0	37.5	20.0	10.0	6.3	5.00	2.00	1.18	0.60	0.425	0.30	0.212	0.150	0.075						
				mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	%	%	%	%	%	
	TP3	2.0	Gravelly SAND	100	100	92	83	76	73	55	40	29	23	18	14	11	7	32	NP	NP	3	-	SW
Ewanga Reservoir Tank	TP1	2.0	Clayey SAND	100	100	100	100	100	100	100	98	89	78	65	51	41	32	35	21	14	8	15	SC
	TP2	2.0	Clayey SAND	100	100	100	100	100	100	100	98	88	79	67	50	38	26	34	20	13	8	9	SC
Gwere Fori Borehole Site	TP1	2.0	Clayey SAND	100	100	100	100	100	100	98	96	85	76	64	48	37	23	23	14	9	6	-	SC
	TP2	2.0	Clayey SAND	100	100	100	100	100	100	96	94	83	73	60	45	34	22	25	15	9	7	-	SC
	TP3	2.0	Clayey SAND	100	100	100	100	100	100	98	96	84	75	62	47	34	20	26	15	11	6	-	SC

Figure 6-8: Summary of laboratory results of test samples from Trial Pits

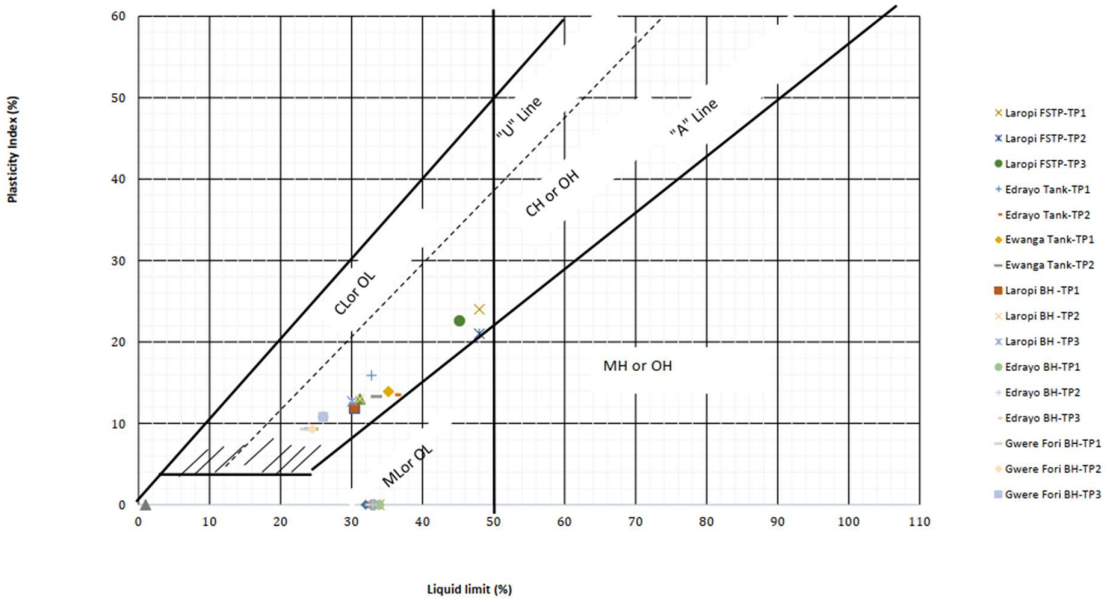

Figure 6-9: Summary of Plasticity Index Results

For the detailed Geo-technical Investigation Results, the report is attached in Appendix 6 of this ESIS.

6.2.5 Vegetation

Vegetation within the area can be a savanna mosaic of bushlands and thickets graduating into extensive woodlands in Moyo and existing land cover/land use zones are a reflection of continuous or intermittent cultivation of mainly annual crops. Extensive fallow lands occupy the immediate zones of the water source. The vegetation is classified into Woodland grasslands, bushland/thickets, riverine swamps and post-cultivation vegetation where woodlots have been established. Sample sites were drawn at different sites and the following species were recorded. *Acacia hockii, Acacia polyacantha, Acacia senegal var. rostrate, Afzelia Africana, Annona senegalensis, Bambusa bambos, Borassus aethiopum, Cola gigantean, Combretum adenogonium, Combretum collinum, Combretum molle, Eucalyptus grandis, Ficus species, Flueggea virosa, Gmelina arborea, Grewia mollis, Grewia trichocarpa, Hyparrhenia rufa, Khaya anthotheca, Lonchocarpus capassa, Lophira alata, Maytenus senegalensis, Morus lacteal,*

Piliostigma thonningii, Psidium guajava, Rhus natalensis, Sarcocephalus latifolius, Schefflera volkensii, Senna siamea, Tamarindus indica, Vitellaria paradoxa.
In Uganda, *Afzelia africana* is categorized as "Vulnerable" on the IUCN Red List of Threatened Species. However, based on the IUCN Red List of Threatened Species 2018, none of the recorded species are of conservation concern, they are all recorded as of least concern (LC).

6.2.6 Fauna in Project Area

6.2.6.1 Butterfly

The four (4) butterflies' families are Papilionidae, Pieridae, Lycaenidae, and Nymphalidae. Nymphalidae is the most diverse family represented within the project area. This project area looks like an open habitat because of the settlements and cultivation, and about 50% of the species were recorded in an open habitat setting. The most common species include *Papilio demodocus Citrus Swallowtail, Papilio nireus Narrow Blue-banded Swallowtail, Danaus chrysippus African Queen (African Monarch), Junonia oenone Dark Blue Pansy and Neptidopsis ophione, Scalloped Sailer*.

Figure 6-10: Small Streaked *Sailer Neptis goochi* and African Queen (African Monarch) Danaus *chrysippus*

None of the butterfly species encountered during the study are listed under the IUCN Red List category of threatened species.

6.2.6.2 Reptiles

Eleven reptile species were recorded during the field study. They include Three Lizards, One skink, five snakes and two chelonians. These are represented by eight families, ten genera and eleven species.

The Black-necked Spitting Cobra *Naja nigricollis*, Boomslang Dispholidus typus, Central Africa Rock Python Python sebae, Bell's Hinged Tortoise Kinixys belliana and Helmeted Terrapin Pelomedusa subrufa, were reported by the community members the survey team interacted with. Through the colour descriptions given by the community members, the identity of the five species was arrived at. Some confessed to having killed them at one time.

The Red-Headed Rock Agama *Agama agama* and the Rainbow skink *Trachylepis margaritifer* were the most common. This is because most lizards have well-developed limbs; the head is normally held high off the ground, and they are agile predators. The Rainbow skink *Trachylepis margaritifer* was the second most common. This is because the skinks are generalists with a wide ecological tolerance

(Gerlach, 2005). The two species also take advantage of any crevices or hiding places, and this gives them wide distribution and successful colonization.

Figure 6-11: Nile Monitor Lizard *Varanus niloticus* and Red-Headed Rock *Agama Agama agama*

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

6.2.6.3 Birds

The most represented genera are Streptopelia with four species and genus Euplectes with three species. The most common species recorded in the project area include the African Palm Swift, Northern Red Bishop, Black-Headed Weaver, Common Bulbul, Piapiac, African Mourning Dove, Red-eyed Dove, Laughing Dove and Vinaceous Dove. Moyo districts are found in the Albertine Rift which is well known for its richness in biodiversity. The project area is generally modified for settlement and cultivation, resulting in an open habitat. The area supports a high proportion of species associated with open habitats and grassland. There is correspondingly a low percentage of forest-dependent species.

Figure 6-12: *Ptilostomus afer* Piapiac and Northern Red Bishop *Euplectes franciscanus*

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

6.2.6.4 Mammal species diversity

Fifteen mammal species were recorded during the survey. The species included six rodent species, three shrew species, one Bat, one mongoose and four Primate Species. These mammals were represented by 7 families, 13 genera and 15 species. The Primates were reported as present by the community within the project area. Given the level of degradation in the project area landscape especially for agricultural purposes, it is unlikely there are large mammal species in the area. Elephants used to roam in the area 60 years ago. Assessments of small mammal presence or absence in an area give a unique perspective

on the ecological importance of a given area to the more mobile larger mammals (Dickinson and Kityo 1996). The researcher's efforts in the survey of small mammals yielded nine species. The Bats were recorded at a roosting place within Town Council.

Table 6-3: Mammal Species recorded during the survey

English Name	**No. Seen/ trapped**	**IUCN Red List Status**	**National Red List Status**
Family: Muridae			
House Rat *Rattus rattus*	1	LC	LC
Family: Cricetidae			
Subfamily: Murinae			
Striped Grass Mouse **Lemniscomys*	2	LC	LC
Hinde's rock rat *Aethomys hindei*	2	LC	LC
African pygmy mouse *Mus minutoides*	2	LC	LC
Subfamily: Gerbillinae			
*Tatera valida*Savanna gerbil *Tatera*	3	LC	LC
Family: Thryonomyidae (cane rats)			
Greater cane Rat Thryonomys	Reported	LC	LC
Family: Soricidae (shrews)			
Subfamily: Crocidurinae			
Jackson's shrew *Crocidura jacksoni*	2	LC	LC
African giant shrew *Crocidura olivieri*	3	LC	LC
Ugandan lowland shrew *Crocidura*	1	LC	LC
Family: Vespertilionidae			
Vespertilioninae			
Banana pipistrelle *Neoromicia nanus*	500	LC	LC
Family: Herpestidae (mongooses)			
Marsh Mongoose *Atilex paludinosus*	1	LC	LC
Family: Cercopithecidae			
Black and White Colobus Monkey *Colobus guereza*	Reported	LC	LC
Olive Baboon *Papio anubis*	Reported	LC	LC
Red-tailed monkey *Cercopithecus*	Reported	LC	LC
Patas monkey *Erythrocebus patas*	Reported	LC	LC
Total	**15 Species**		

Conservation status: LC – Least Concern.

All the species recorded are listed as least concern by the IUCN Red List (IUCN, 2018 and the National Red List for Uganda (WCS, 2016).

6.2.7 Hydrology

The most prominent water bodies within the project area are Albert Nile, which flows from Lake Albert northwards towards the Mediterranean Sea. The area has several local wetlands – mainly Cinyi wetland , seasonal rivers and streams within Gwere 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 Lefori sub County. Ground water has been taped mainly in form of boreholes.

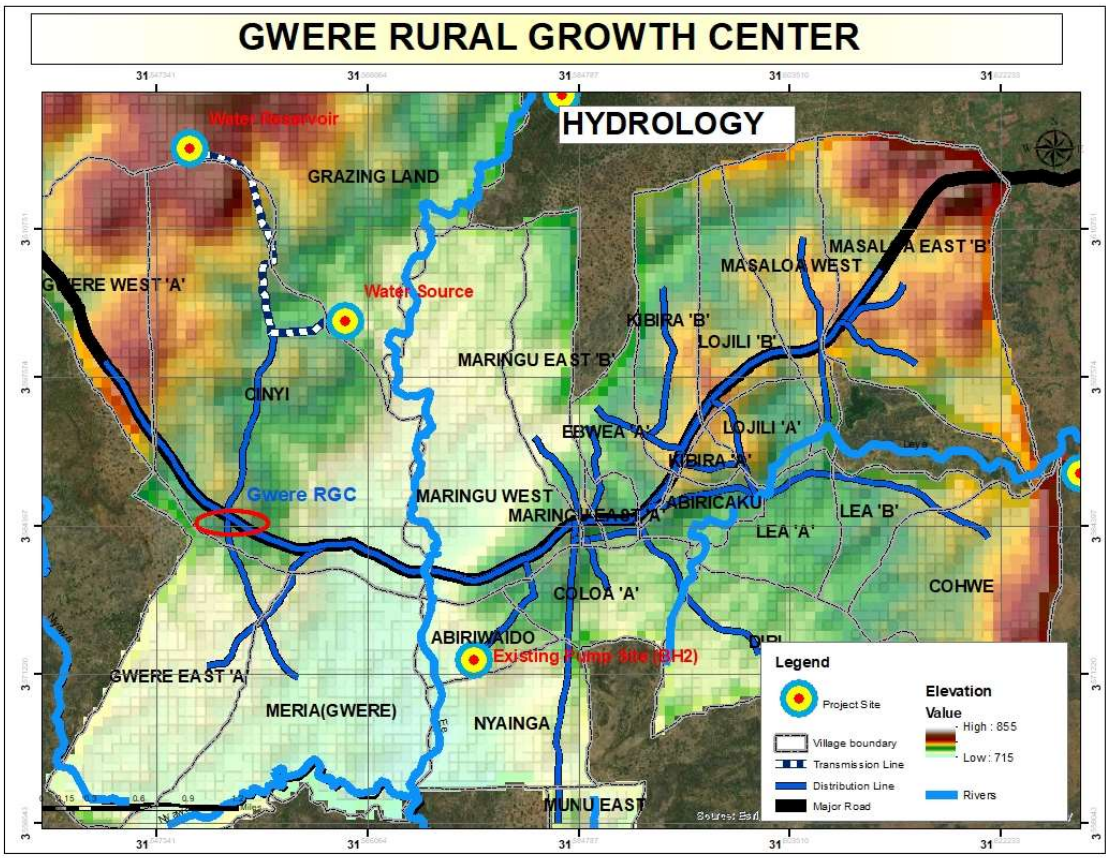

Figure 6-13: Hydrology Map of Gwere Project Area

6.2.8 Water Quality

6.2.8.1 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.

6.2.8.2 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 as attached in Appendix 3.

6.2.9 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 below.

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

Location	Vibration Acceleration (m/s²)	Latitude	Longitude
Gwere Trading Center	0.00	3.585024	31.55319
Gwere Proposed Toilet Facility Site	0.00	3.584403	31.55264
Bore Hole	0.00	3.590353	31.55492
Water Reservoir	0.00	3.616721	31.55827
Water Source	0.00	3.602595	31.56406
Health Center	0.00	3.560322	31.58342

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.

6.2.10 Noise Levels Assessment

Noise measurements taken in the selected sampled points are tabulated in Table 6.5; 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 the 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. 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

Site	Latitude	Longitude	Low	High	Noise Limit (dB(A) LEQ) (National)	Noise Limit (dB(A) LEQ) (World Bank)			
						Residential, Institutional, Educational (Daytime)	Residential, Institutional, Educational (Nighttime)	Industrial , Commercial (Daytime)	Industrial , Commercial (Nighttime)
World Bank Group General Environmental Health and Safety Guideline 2007 and National Environment (Noise) Regulations, 2003									
Gwere Trading Center	3.585024	31.55319	59.5	70.9	75	55	45	70	70
Gwere Proposed	3.584403	31.55264	59.5	70.9	75	55	45	70	70

Site	Latitude	Longitude	Low	High	Noise Limit (dB(A) LEQ) (National)	Noise Limit (dB(A) LEQ) (World Bank)			
						Residential, Institutional, Educational (Daytime)	Residential, Institutional, Educational (Nighttime)	Industrial , Commercial (Daytime)	Industrial , Commercial (Nighttime)
Toilet Facility Site									
Bore Hole	3.590353	31.55492	35.7	59.8	75	55	45	70	70
Water Reservoir	3.616721	31.55827	16.1	32.9	75	55	45	70	70
Water Source	3.602595	31.56406	35.7	59.8	75	55	45	70	70
Health Center	3.560322	31.58342	26.8	57.4	75	55	45	70	70

6.2.11 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 PM_{10} and $PM_{2.5}$ 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 in Table 6-6 below.

Table 6-6: Readings for Particulate matter measured

Location & Details	Latitude	Longitude	PM 2.5 (mg/m3)			PM 10 (mg/m3)		
			Min	Ave	Max	Min	Ave	Max
WHO Air Quality Guidelines (AQG), 2005								
Gwere Trading Center	3.585024	31.55319	0.005	0.010	0.039	0.014	0.056	0.438
Gwere Proposed Toilet Facility Site	3.584403	31.55264	0.003	0.011	0.115	0.004	0.024	0.647
Bore Hole	3.590353	31.55492	0.005	0.009	0.104	0.006	0.037	0.885
Water Reservoir	3.616721	31.55827	0.005	0.010	0.039	0.014	0.056	0.438

6.2.12 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 6-7). 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 will

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

S/N	LOCATION	Coordinates		NO_2	H_2S	CO	CO_2	VOCS	CH_4
		Latitude	Longitude			ppm			% VOL
WHO Air Quality Guidelines (AQG), 2005									
1.	Gwere Trading	3.585024	31.55319	0	0	0	513.00	0	0
2.	Gwere Proposed Toilet Facility Site	3.584403	31.55264	0	0	0	518.00	0	0
3.	Bore Hole	3.590353	31.55492	0	0	0	508.00	0	0
4	Water Reservoir	3.616721	31.55827	0	0	0	511.00	0	0

6.3 Socio-Economic Environment

This section presents a description of the socioeconomic characteristics of the proposed solar-powered water supply System project in the Gwere 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 372 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 Gender of the Respondents

The study targeted the household heads of the households and owners/managers of businesses that are likely to be directly and indirectly affected by the considering all the different components of the water project. A total of 372 households were interviewed with 68% being males and 32% being females.

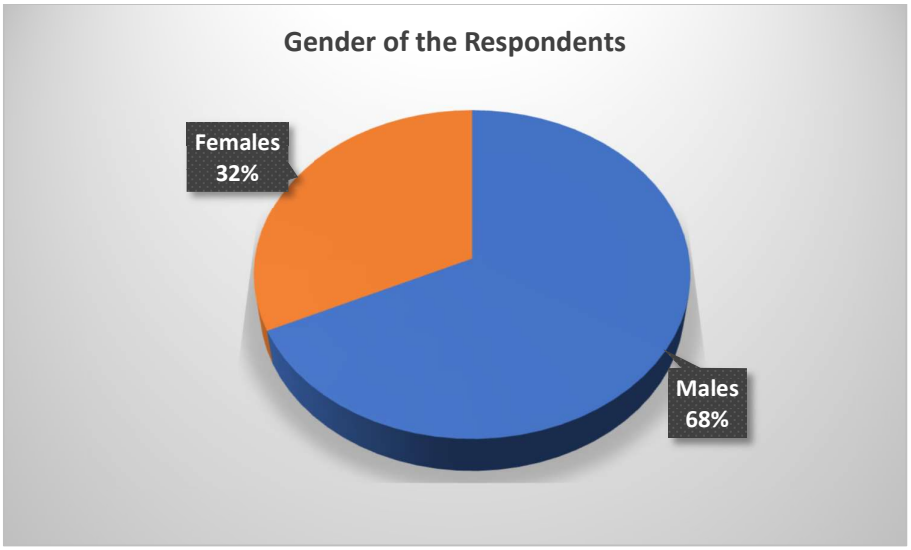

Figure 6-14: Gender of the Respondents from the Primary Data

6.3.2 Average Household Size

The study revealed that the project area has an average household size of between 5-6 persons (38%). Other households had the following; 3-4 (21%) 07-08 (20%), 01-02 (11%), 09-10 (5%), 11-12 (3%) and 13-14 (2%) as presented in table 6-8 below.

Table 6-8: House Hold Size

No	Persons	Per cent
1.	1-2	11%
2.	3-4	21%
3.	5-6	38%
4.	7-8	20%
5.	9-10	5%

No	Persons	Per cent
6.	11-12	3%
7.	13-14	2%
	Total	**100%**

The overall average persons per household was in line with what was indicated in 2014 Population and Housing Census (UBOS) of Moyo which was 5.1[1] Persons per household.

6.3.3 Age Structure

The population surveyed was of people aged 18 years and above. The significance of this age group is that it represents the largely working and productive population that has real potential for consuming water. Respondents between 20 and 30 years of age constituted 25% of the total respondents, while those in the age range of 31 to 40 were 46%. These were followed by the respondents with the age range of 41 to 50 years who were 29% as presented in the figure below.

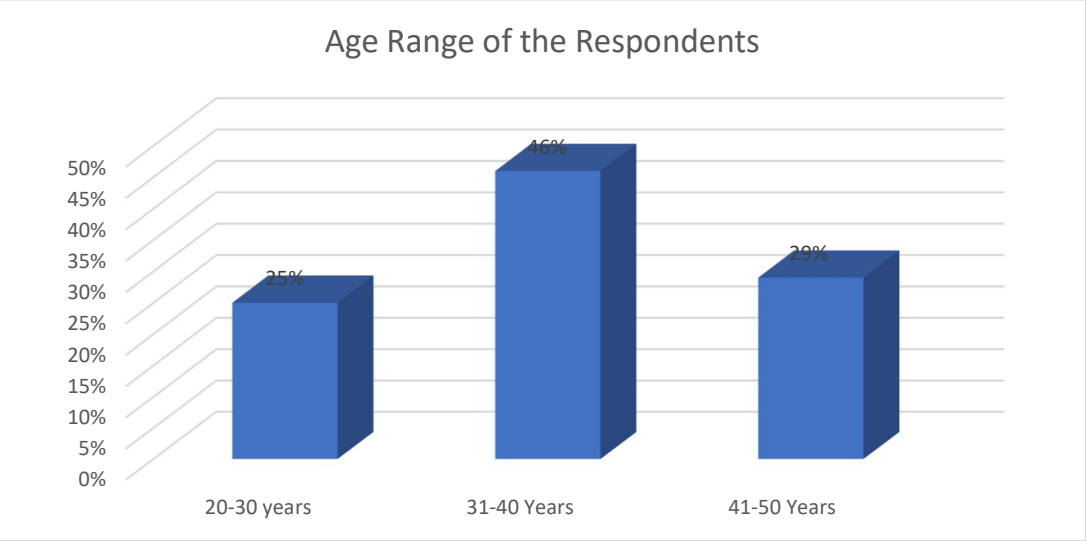

Figure 6-15: Age of the Respondents

Most of the household members are in the youthful and active population that can ably take on and sustain the water supply system through the payment of operation and maintenance costs.

6.3.4 Marital status

The findings from the survey indicated that 78% of their household heads were married. The rest were widowed (10%), single, 7%, separated or divorced 5% as presented in Figure 6-16 below. Marital status has implications on the level of demand for water especially within the households regarding water for domestic use.

[1] Moyo DDP 2020/2021-2024/2025

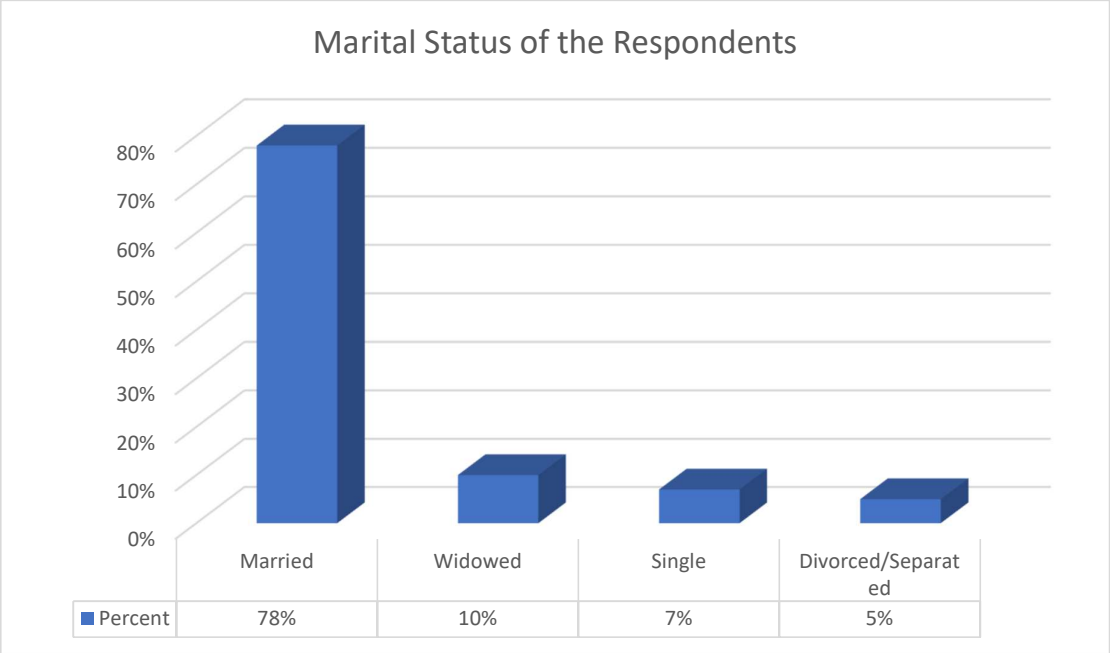

Figure 6-16: Marital status of the Respondents

6.3.5 Level of Education for the Household Heads

According to the baseline survey, the majority (75%) of the respondents /residents of the project area had attended up to the primary level of education only, 15% had "O" Level secondary education as their highest level of education whereas 10% had no formal education. This indicates that the level of education in the area was still low as the majority of residents had primary as their highest level of education. Given the semi-literate nature of the beneficiary population, project messages and IEC materials should be translated into locally used languages, and visuals are encouraged to be used then the write-up during the implementation and operation of the project for the easy understanding of the majority of the beneficiaries.

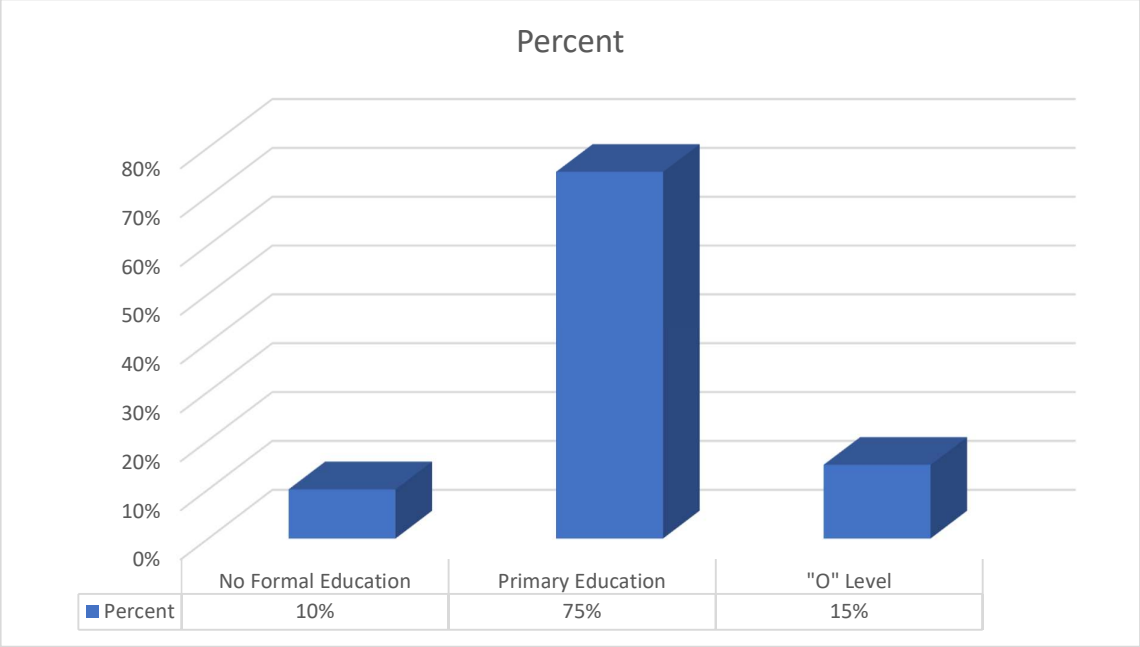

Figure 6-17: Level of Education of the respondents

6.3.6 Economic Activities

6.3.6.1 Source of Income

The study revealed that agriculture is the main source of income undertaken by over 77% of the community members within the proposed project area. Agriculture thrives on the fertile soils, and reliable rainfall. Irrigation has not yet been embraced in the project area. Apart from agriculture, other reported sources of income include, businesses (10%), casual work (8%) and remittance (5%) as presented in the Figure 6-18below. The main commercial activities within the RGC are trading (retail and wholesale trading) and subsistence agriculture.

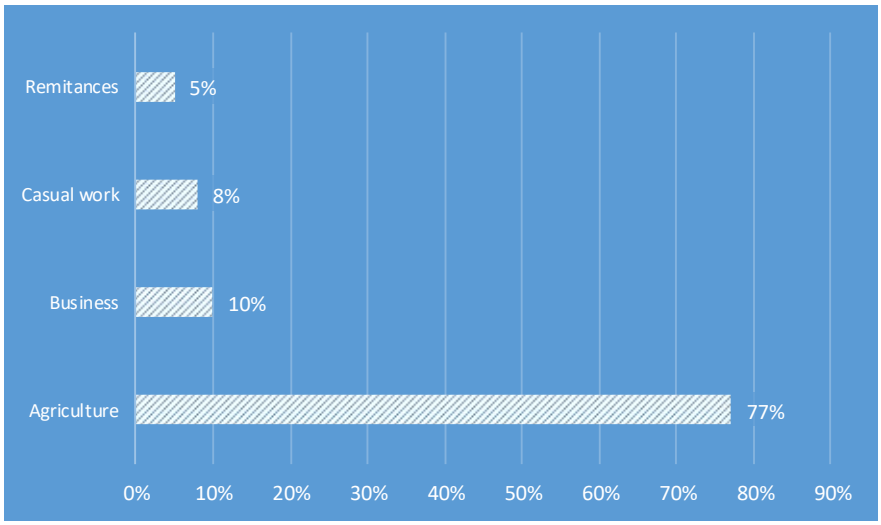

Figure 6-18: Source of Income

Agriculture is the main source of income for the beneficiary population and the main crops grown include cassava, maize, bean, and sorghum among others. Businesses are mainly undertaken within the RGCs, Lefori town Centre and Rural gowth centres along within the project area.

Figure 6-19: Women in Gwere Market

The findings above suggest that the project should be keen about the communities' crops given that it's the key livelihood from which the community thrives. The project should consider fair, timely and adequate compensation for crops affected or restoration of the livelihoods (for those affected) or especially during the construction phase of the project. The community could be co-opted to provide casual labor such as digging up trenches and laying of water supply pipes to diversify the income sources of the household members since they have limited options. The project should adopt a similar approach for skilled laborers in the beneficiary communities. Gender-sensitive local content principles should be adopted when hiring successful persons to work on the project.

6.3.6.2 Household Monthly Income

The level of income is a good measure of what households have available for consumption and saving in a given period. The study revealed that about 30% per cent reported their monthly incomes was between 100,000-500,000 Uganda shillings while those that were earning between 50,000-100,000 were about 29%, 20,000-50,000 were 25% and 0-20,000 Uganda shillings were 16% as indicated in Figure 6-20 below.

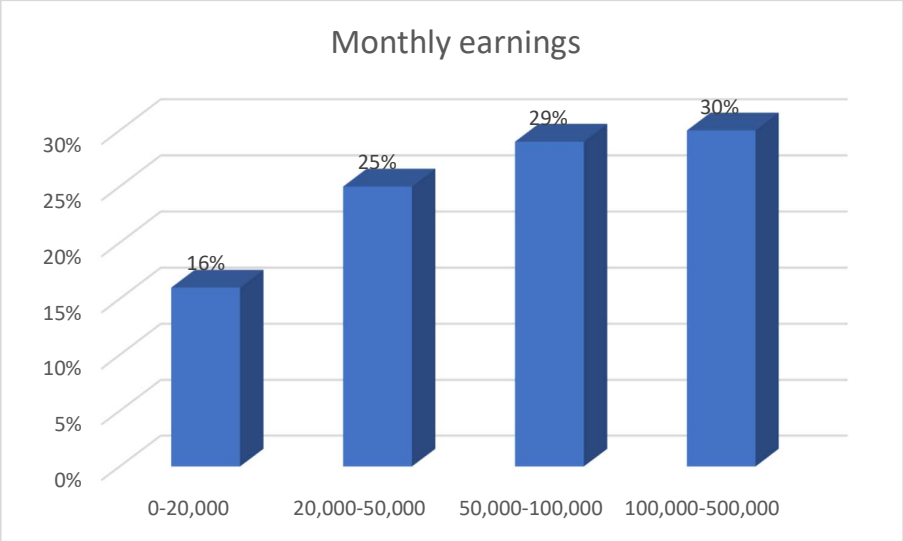

Figure 6-20: Household Income levels

The higher earnings of 30% in the range of Ugx.100,000-500,000 indicate that at least there are people who can afford to pay for water, and will help in the sustainability of the project. But also, there is a need to consider the low earners to be able to access the water supply. This will call for the installation of the Public Standpipes (PSPs) at a subsidized rate.

6.3.6.3 Household Expenditure

The respondents indicated the amount of money spent monthly by the households on the various items within the households. The majority (83%) of the respondents spend no more than 10,000/. About 4% reported their monthly expenditure to be 40,000 and above, while 8% reported expenditures ranging between UGX20,000-40,000 and 5% for those spending between 10,000-20,000. The monthly expenditure of the household was still low among the households because the majority of them were subsistence farmers who depend on seasons and face farming challenges; and fishermen who are affected by the limited market among others. The distribution of monthly expenditure is indicated in Figure 6-21 below

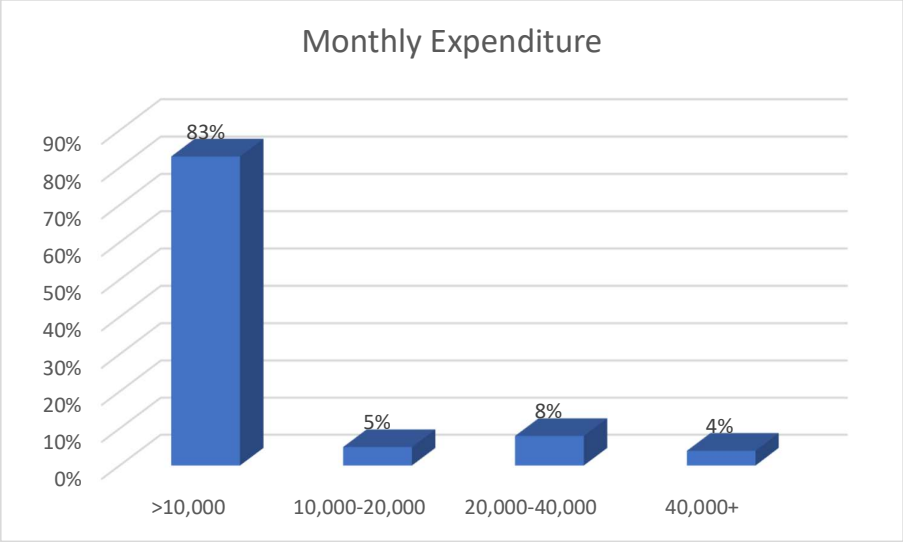

Figure 6-21: Monthly Expenditure of the Households

6.3.7 Water Supply

The Water Atlas[2] indicated that Moyo as a district has 95% of its population accessing water with 88% rural functionality, 94% of the water sources being well managed and 90% being responsive to gender; with 636 water points with over 80% of the water sources being communally shared, and majorly being deep boreholes. Statistics indicate that Lefori accesses safe water at 95%, with a functionality rate of 93%, and is majorly serviced by the deep boreholes as indicated in Table 6-9 below.

[2] Source: http://wsdb.mwe.go.ug/index.php/reports/district/25

Table 6-9: Details of the Water supply in the project area.

Sub County	Urban/Rural	Population	Popn.Served	Access	Functionality			Water Source Protection Springs			Deep BoreHoles		
					R	U	WfP	F	NF	Total	F	NF	Total
Difule	Rural	9,646	9,164	95%	83%	-	-	-	-	-	31	6	37
Moyo	Rural	22,083	20,979	95	89%	-	-	6	3	9	110	4	114
Lefori	Rural	11,084	10,530	95	96%	-	-	1	-	1	70	1	71
Laropi	Rural	8,715	8,279	95	93%	-	-	-	-	-	34	1	35
Metu	Rural	25,298	24,033	95	83%	-	-	14	8	22	40	17	57
Moyo	Urban	9,561	9,083	95	-	71%	-	1	1	2	14	6	20
	Total	86,387	82,068	95	88%	71	0%	22	12	34	318	33	351

Source: Water Atlas for Moyo District

6.3.7.1 Access to the Water 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. The majority of the households (68%) were using more than one source of water for domestic use while about 32% were using only one source of water for domestic use. About 54% of the households in the project area use boreholes as the main source of water for domestic use while using protected springs (20%) and communal taps (16%). About 10% of the households were using unprotected springs.

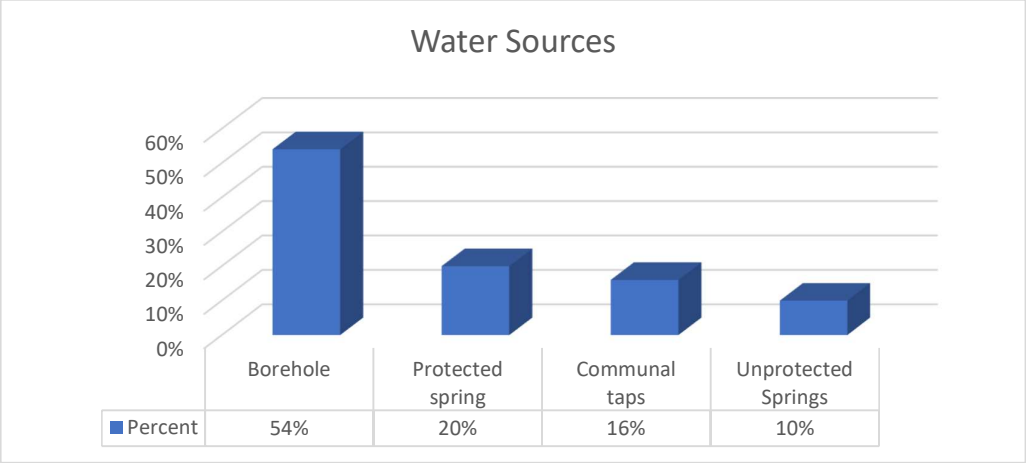

Figure 6-22: Water source in the project area

In Lefori, there is an existing piped system but has not been efficient in the provision of water to the communities. However, under this proposed water supply project, the water supply will be supplemented to boost the existing supply.

6.3.7.2 Distance to the Water Source

Results from the study indicated that about 45% of household water sources for domestic use were within 400–600-meter distance followed by 42% of the households that reported accessing water for domestic use in the distance between 200-400 meters, 0-200m (8%) and 600-800meters (5%) as presented in the Figure 6-23 below.

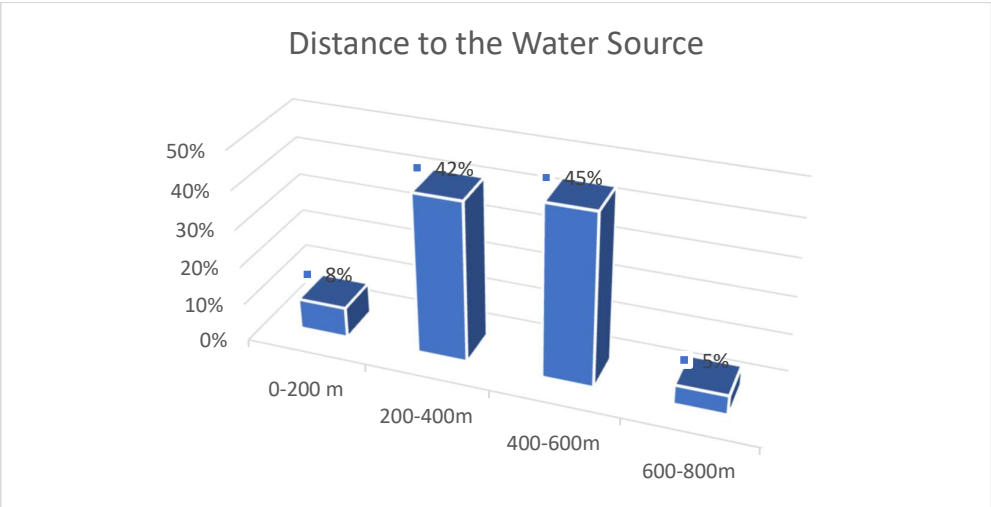

Figure 6-23: Distance to the Main Water Source

6.3.7.3 Time taken to Collect Water

Regarding the time the households would take to collect water from the source, it was revealed that about 38% reported that it would take them 30 minutes, 45 minutes (32%), 20 minutes (20%), 40 minutes (8%) and over 50 minutes (2%) as presented in Figure 6-24below.

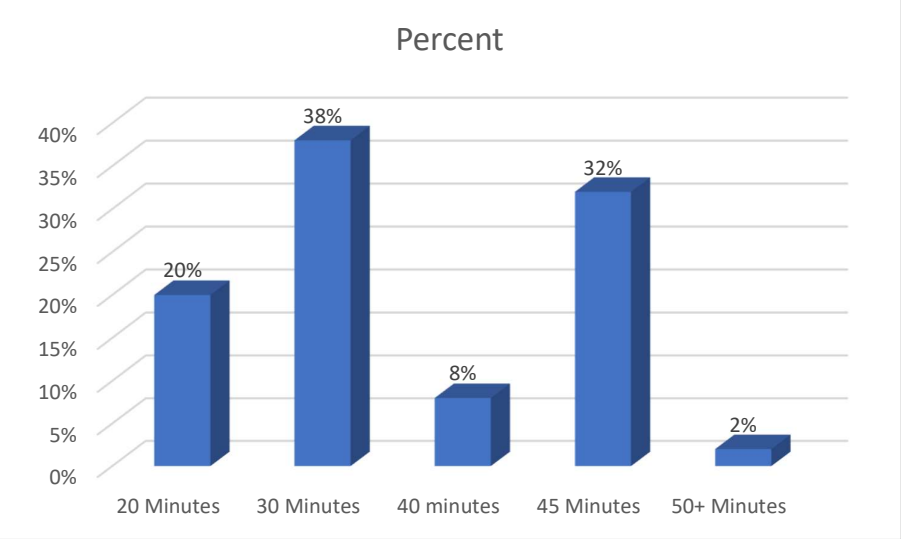

Figure 6-24: Time taken to collect Water

6.3.7.4 Who collects water?

When asked about who collects water from the water source within the household, the study revealed that it is adult females that majorly collect water (45%), adult males (20%), boys (20%) and girls (15%).

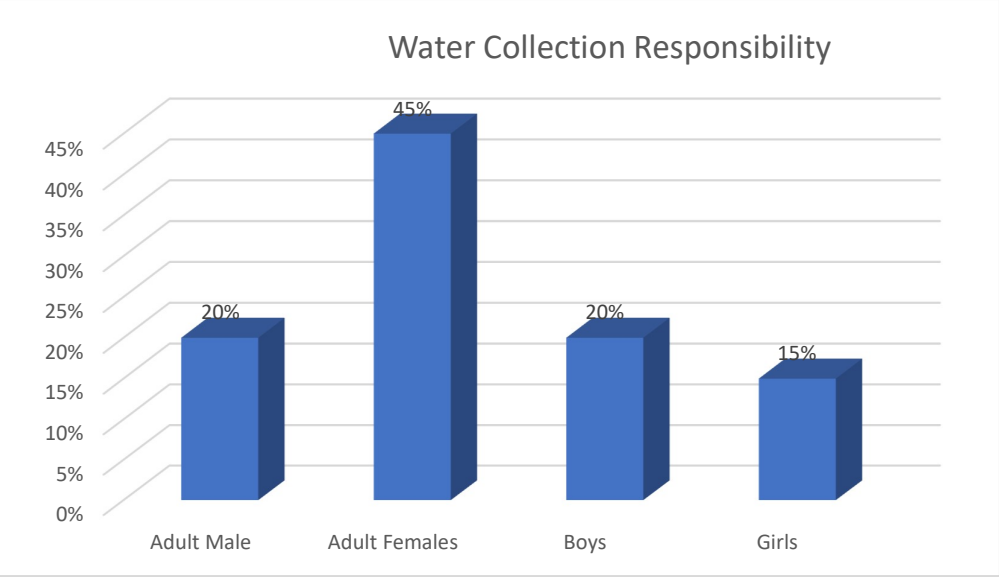

Figure 6-25: Water Collection Responsibility

Generally, all the household members collect water however it is mostly the females (adult females) that do collect water and it is well known and acceptable as the responsibility of the females within this particular community, as it is their responsibility to undertake household chores

6.3.7.5 Existence of the Water User Committee for the O&M

It was revealed that all the existing water sources have Water user committees but they are not very active. The payment of Shs.2000/= per month per household for the operation and Maintenance (O&M) of the water source by the households is not consistent as the households do not comply which affects the functionality of some of the water sources/boreholes. However, for the piped water supply system, the users (private connections) and operators make payments every month, while those who use public stands pay per jerrican.

6.3.8 Sanitation

6.3.8.1 Sanitary facility ownership

The project is mainly served by privately owned toilet facilities except in public institutions like schools and health centres. The baseline study indicated that about 98% of the population within the RGC had toilet facilities while 5% of the surveyed communities lacked toilet facilities but shared them with neighbours or relatives.

6.3.8.2 Type of sanitary facilities

Concerning the type of toilet facilities for households in the project area, about 96% of the surveyed households were using traditional pit latrines with logs (latrines with logs only without mud and wattle) while 4% of the households were using pit latrines with slab (toilets with logs and slab made mud and wattle) and were mainly in trading centres. The survey team noted that all the latrines were constructed outside the house at a distance between 100-200m from the house.

6.3.8.3 General Hygiene and privacy of the facility

Regarding the general hygiene of the facility, the survey revealed that those considered to be clean were about 75% and 25% were considered not to be unclean. The parameters considered under this variable were littering of faeces' urine and using anal cleaning material among others.

The survey further established that all the households surveyed had temporary structures with about 78% without doors. This implies that the privacy of the users of the toilets by the households is not guaranteed by the users. There need for sub-county and other related service providers related to health to continue sensitizing the community about the importance of sanitation facilities and related components.

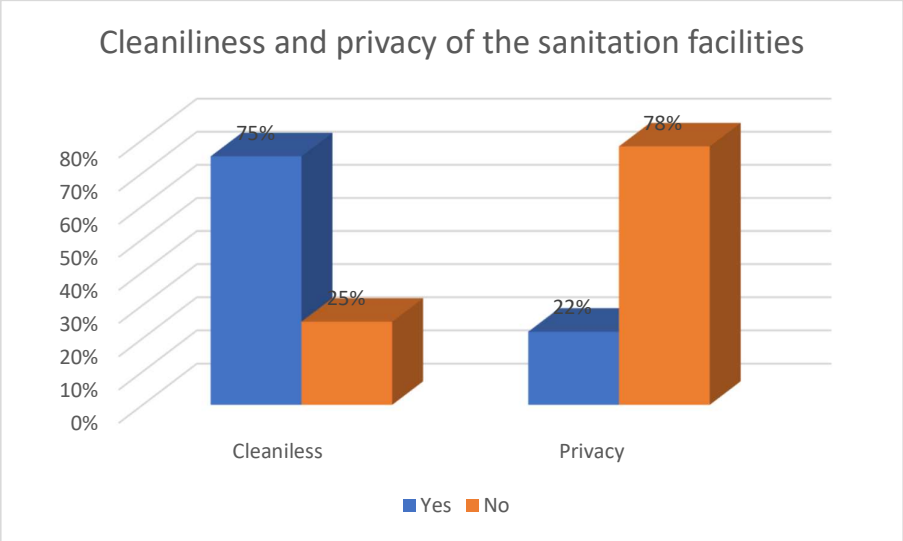

Figure 6-26: Cleanliness and Privacy of Sanitation Facilities

6.3.8.4 Hand Washing Facility

Only about 25% confirmed that they wash their hands after using the toilet which is a good practice among the households while 65% indicated that they wash their hands before eating followed by 6% reported that they wash their hands after eating and only 4% of the respondents indicated that they wash their hands before handling infants.

Regarding the hand washing facility, only 15% of the households had hand washing facilities compared to 85% that did not have a hand washing facility. When inquired about the type of hand washing facility that is there and used by the households, about 84% reported that they had a container with a tap while 16% reported that they had containers without taps. About 10% of the households had the presence of soap at the washing facility which indicates that they were practising hand washing which is a good practice by the households in the project area.

Generally, hand washing is not a common practice among households in the project area however a few households are practicing hand washing. There is a need for an intervention to increase hand washing practices among the community, and should therefore be emphasized during the implementation of the project to reduce the spread of diseases related to non-compliance with hand washing.

6.3.9 Solid Waste Management

6.3.9.1 Garbage collection Sites within the household

The project area is generally a rural area with a few designated trading centres including Gwere RGC. The survey undertaken established that households that had designated garbage disposal sites in their households were about 6% of households had garbage disposal management sites in their households while 94% reported not having garbage disposal sites.

Among those that had designated garbage collection centres collected and indiscriminately disposed of anywhere within the centre The major solid waste observed within the project area included polythene bags, plastic bottles, and waste papers, among others. There is a need to sensitize communities about solid waste management in the household and public places.

Figure 6-27: Types of waste in the community

6.3.9.2 Type of solid waste generated within the household

Regarding the type of garbage generated in the household 70% reported Polythene bags/plastic bottles followed by 23% for food residues followed by waste paper and cooking materials with 5% and 2% respectively.

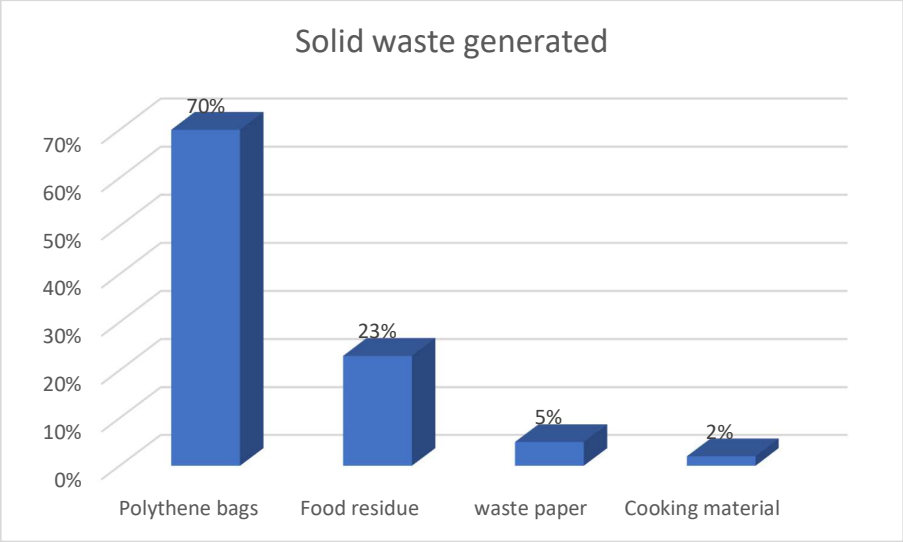

Figure 6-28: Solid Waste generated in the Project Area

About 6% of the households reported that they have primary garbage storage in their households compared to 94% that reported they don't have garbage storage in their homes. Regarding the primary garbage storage facility households had in their homes; about 78% reported to have refuse bankers, while 22% used the dust bins.

6.3.10 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.

Gwere RGC is accessible along the Moyo- Arua road main gravel road. The road to under the management of UNRA and is periodically maintained. There are other roads within the community maintained by Lefori Sub County and other community roads. The major transport means for the public are mainly motorcycles, bicycles and foot to access the RGC for the various services.

6.3.11 Settlements and Housing Modalities

6.3.11.1 Settlements

The settlement patterns in Gwere RGC were observed to be mostly nucleated and scattered patterns of settlement. This kind of settlement has been influenced by several factors including; the availability of agricultural fertile land, nearness to the source of water, social services like education, health facilities, markets, clan and family proximity to each other, the cultural and family cohesion among others. Within the outskirts of the trading centre, settlement in the project area was observed to be very sparse with mild concentration around trading centres and agricultural production areas.

6.3.11.2 Housing Typology and Ownership

The Structures within the project are both permanent and temporary. Although there are linear and more permanent structures within the RGC, there several community members living within homesteads/compounds. The homesteads are easily accessible by community roads or paths that need regular maintenance.
The housing within the trading Centres is moderately permanent with iron-roofed structures and brick walls. However, in the rural areas and outskirts of the RGC, the houses are mainly grass thatched with mixed brick and mud and wattle walls with earth floor.

The study revealed that 71% of the households were temporary, permanent (19%), and semi-permanent (10%). Furthermore, when asked about ownership of the household, about 80% of the dwelling structures were personally owned by the households while only 20% of the houses were occupied by tenants, and most of these occupied by tenants were in the RGCs.

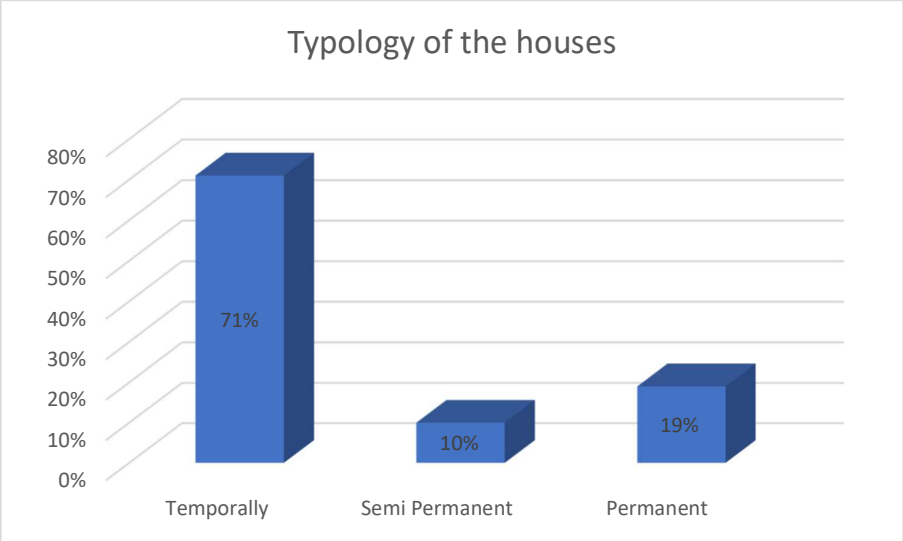

Figure 6-29: Typology of the Houses

6.3.12 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.

Among the schools within the project area include; Gwere Primary School, Lefori Seed Secondary School, Lefori Primary School, Lefori Primary School, Lefori Parents' Nursery and Primary School, Masaloa Primary School, and Cohwe Primary School as presented in Table 6-10below with their current enrolment. Some of these schools will directly and indirectly benefit from the water supply project.

Table 6-10: Education Institutions in the project area with the respective enrolment

No	Learning Institution	Location	Male	Female	Total
1.	Gwere Primary School	Gwere East Village, Gwere Parish	402	337	739
2.	Lefori Seed Secondary School	Coloa West Village, Coloa Parish	180	120	300
3.	Lefori Primary School	Maringu East Village	464	387	851
4.	Lefori Parents' Nursery and Primary School	Ebwea Village Village, Ebwea Parish	316	188	504
5.	Masaloa Primary School	Masaloa East Village	315	326	641
6.	Cohwe Primary School	Lea Village, Masaloa Parish	164	146	310

In Uganda, nearly 50% of children do not complete primary school—and the majority of families rely upon agriculture for their livelihoods. These ongoing challenges are coupled with an extremely large youth population and the largest refugee population in Africa—creating a great need for both education

and job opportunities. Absolute poverty is measured by the minimum amount of money required to meet basic needs, known as a poverty line

The available statistics further revealed that the illiteracy rate for persons aged 18 years and above stood at 28%; of which 3,058 (15.2%) are males and 9,116 (39.1%) are females. While the overall literacy rate for persons aged 10 years and above stood at 65.7% slightly below the national average of 69%. The literacy rate among the urban population is higher at 76% than the rural population at 32%. However, all these are below the national average for both urban at 88% and rural at 67%.

6.3.13 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 Lefori Health Centre III, Gwere Health Centre II and Cohwe Health Centre II, as presented in Table 6-11 below

Table 6-11: Health Institution and the Catchment Population

No	Health Center	Location	In-Patients	Out - Patients	Total
1.	Lefori Health Center III	Maringu West Village, Ebwea Parish	200	6780	6,980
2.	Gwere Health Center II	Cinvi Village, Gwere Parish	20	2500	2,520
3.	Cohwe Health Center II	Cohwe Village, Masaloa Parish	-	3943	3,943

Within the community setup, there also exists the Village Health Teams (VHT) which consists of volunteers selected by the community to assist in health-related issues. This is the Health Centre Grade I and is found at least in every village. These are members of the VHT but are specially chosen to help with giving out specific drugs at the Community level, especially for malaria and mobilizing communities for health/hygiene-related matters.

6.3.13.1 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 a 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, West Nile had a prevalence of 2.8%[3] compared to 5.4 %[4] national prevalence among adults (between 15-49 years)[5]. Some of the factors that may increase the prevalence of HIV/AIDS in the project area is the proximity to Arua (town) which has an influx of so many people from different walks of life including people from the Democratic Republic of Congo (DRC) and Southern Sudan.

6.3.14 Energy

Gwere RGC is not connected to the national electricity grid and the major source of power in the area is solar energy. Although power lines have been extended into the project area under the REA project (under Ministry of Energy and Mineral Development) power extensions to people's residences and the community at large have not yet been done but are expected to kick-start this year (2023).
The study revealed that solar contributed 98% of the lighting energy and 2% of the lighting energy was sourced from the use of kerosene.
Concerning the energy for cooking, firewood is the main source of energy (80%) within the community, and a few of the community members use charcoal (20%). Those households that use firewood revealed that the main reasons for using the firewood were because of low cost compared to the other sources and ease of access.

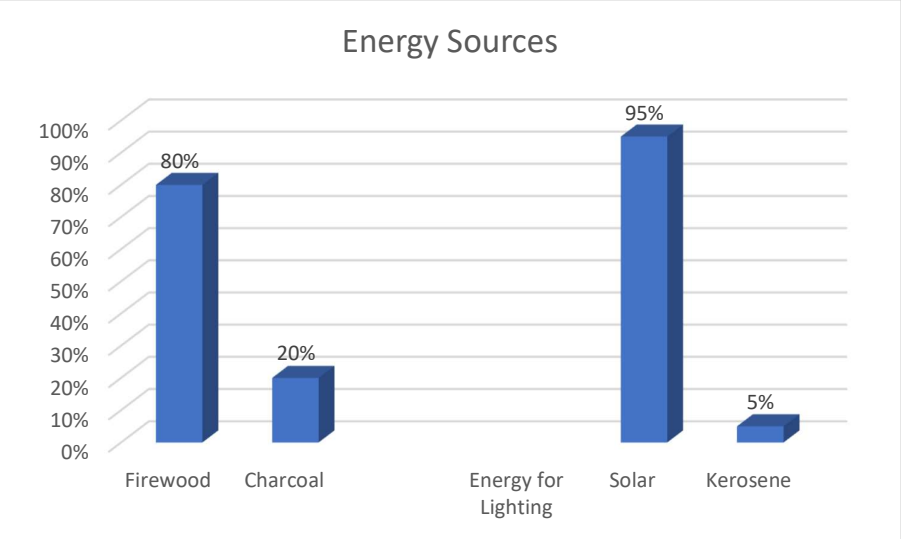

Figure 6-30: Energy sources

However, it should be noted that with the increasing demand for firewood due to the increasing population and expansion of agricultural activities, the activities are likely to have an effect on the environment by depleting the existing forests/wood lots/green cover. This therefore calls for the sensitization of the communities against this vice and coming up with alternative or energy saving innovations.

6.3.15 Land Tenure System, Access and Ownership

The land has been recognized as a driver of economic progress and a factor for achieving food security. The project area is under the customary type of tenure headed by clan heads, and land is distributed

[3] Source: https://uac.go.ug/media/attachments/2023/01/12/hiv-aids-factsheet-2022.pdf
[4] Source: https://uac.go.ug/media/attachments/2021/09/13/final-2021-hiv-aids-factsheet.pdf
[5] Segregated prevalence for females is 6.8% and men is 3.9% taking an average of 5.4%

under that arrangement, owned mainly by the males but accessed by females as a means of production to support the households.

In the project area, under the customary system, women do not own land but have access to use it through their families or household heads (husbands) and in some cases renting the land , and therefore use it as a means of production to support their families.

Regarding land ownership, the study revealed that 98% of the households were occupying family land under customary land ownership while only 2% had bought land from individuals (provided with sales agreements / concent forms) and these were mainly in trading centres and had their structures built on small plots mainly for commercial purposes.

6.3.16 Telecommunications

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 area for internet, message and voice services.

Other means of communication available are radio and Television. The communities largely use the radio which is even available on their phones, and can therefore be used to disseminate information about the project.

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 the language well understood by the community members during implementation and, operation and maintenance (O&M) phases.

6.3.17 Other Existing Institutions in the project area

The RGC has several institutions in the project that are to benefit from the water supply system. Among these include the administrative units, education, security, and health centres. All these institutions are being targeted to benefit from the proposed project. Table 6-12below indicates the existing institutions.

Table 6-12: Institution in the Project Area

Type Of Institution	Name of the Institution	Ownership
Town Council	Lefori Town Council Headquarters	Gov.
Sub-county	Lefori Sub-County Headquarters	Gov.
Market	Lefori Market	Trading centre
Market	Gwere Market	Trading centre
Security	Police	Gov
Religious Worship House	St. Peter's Catholic Chapel	Community
Religious Worship House	St. Peter's Lefori Parish	Community
Religious Worship House	St. Cecilia Cohwe Chapel	Community
Religious Worship House	Takwa Muslim Mosque	Community

6.3.18 Poverty Levels

To live in poverty is to lack the resources needed to meet basic needs. It can be measured in economic terms (income, expenditure or wealth), or using other measures including social, nutritional and cultural (or even multidimensional measures). In Uganda, 76% of Uganda's population live, and 73% of the

workforce are employed in Agriculture, yet 41 of the people live on less than $1.90 per day with only 53% of the children able to complete primary education.

According to the Moyo DDP, the poverty levels generally are high, with the total population poverty headcount for Metu/Otce Sub County being 18.2 against the average District poverty headcount which is 19.2. The child poverty child head county stands at 20 compared to 21.1 of the average district child poverty headcount, as presented in Figure 6-31below.

Sub-county	Total population poverty head count	Children poverty head count
Dufile	27.4	29.4
Laropi	21.4	24.1
Lefori	25.9	28.0
Metu	18.2	20.4
Moyo	19.2	21.2
Moyo Town Council	3.1	3.5
Total	**19.2**	**21.1**

Figure 6-31: Average District Child Poverty Head Count (Source: Moyo District Development Plan)

6.3.19 Life Expectancy

The average life expectancy in the district increased from 52.7 years in 2002 to 60.9 years in 2014 slightly below the national average of 63.7 years. Females in the district have a slightly higher life expectancy of 67.2 years as compared to their counterparts the male of 54.6 years. The infant mortality rate for the district also stood at 64 (male 87 and female 42) compared to the national level of 50 (male 54 and female 46) and under-five mortality rates for the district Moyo District Development Plan 2020/2021-2024/2025 14 stood at 98 (male 136 and female 62) as compared to the national level of 74 (male 79 and female 69).

Table 6-13: Summary of Life expectancy

Indicators	**National**			**Moyo District**		
Life expectancy	**Male**	**Females**	**Total**	**Male**	**Females**	**Total**
Infant mortality	62.8	64.5	63.7	54.6	67.2	60.9
Under 5 Mortality Rates	54	46	50	87	42	64
Literacy Rate	79	69	74	136	62	98
			69			66

6.3.20 Physical Cultural Resources (PCR)

Worship centres, graves and burial grounds were the PCR recorded in the project area. The study found that there was no physical cultural resource directly affected by the proposed Gwere Water Supply System.

6.3.21 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. Amidst 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.

The DDP of 2015 also recognizes gender as a key issue in development. Accompanying policy and strategic objectives to address the identified gender gaps are limited. Gender imbalances continue in agriculture 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 and the involvement in the sale of agricultural produce.
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 therefore calls for the enforcement of the existing policies that would enhance women involvement in the operation and manetainance of such water systems and their sustainability within the communities under the water and sanitation gender strategy 2018-2022. There is also need 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 stsge, and building their capacities in the management of the water supply systems.

6.3.21.1 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 implementation of the project. Gender-based violence is reported to be occurring within the communities being experienced within the household, especially among women.
From the FGDs undertaken , it was reported that the main cause of GBV with the community stems from the sharing of the agricultural proceeds that are mainly produced by women, delays at the water source due to the long queues and the men allege that women are engaged in extramarital affairs. Other causes include general poverty within the household, polygamy, alcoholism, cultural norms and values among others.
"….they are long queues at the borehole, where we delay, our husbands batter us claiming that we have extra marital affairs…"

With the above findings, inorder to mitigate the vice the contractor especially during the implementation phase of theproject 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 an accessible grievance redress mechanisms for contractor's workers and the community. Such cases should be reported 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.

6.3.21.2 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 reports, VAC abuses include; early marriages, defilement, neglect of the children, and denial of education due to poverty, among others. Under the infrastructural development, universally, projects must seek to promote and protect children's rights and ensure that no cases of child abuse are reported during its implementation period.
Within the project, the existing VAC abuses include defilement handled by Police, denial of education, and teenage pregnancies experienced during the COVID-19 era (2020-2021). 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 works) 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..

6.3.21.3 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 estsblished 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 centres, community meeting , churches , radios among others.

6.3.21.4 Existing Grievance Redress Mechanism

6.3.21.4.1 Introduction

There is an existing Grievance Redress Mechanism within the project community. Grievances that are civil are handled right by the LCI executive with the assistance of the clan /cultural system. In case it's not solved at that level it is escalated to the sub-county level. In case of land issues, the area land committees handle such issues and are escalated to the District Land Board

Although there is an existing grievance mechanism within the local government , the project will form and institute a workers grievance management committee that will specifically handle the workers grievances/concerns and complanints, and the community GRC that will specifically handle the community grievances and concerns as guided by the Grievance Management Guidelines (2022) by the Ministry of Water and Environment (MWE) as presented in section 9.6.

7. STAKEHOLDER ENGAGEMENT AND CONSULTATIONS

Public and stakeholder consultation is an integral part of this project. It is an inclusive and continuous process through which persons directly or indirectly affected by a project, as well as those who may have interests in a project and/or were granted the ability to influence its outcome

Meetings were held with various stakeholders and were given room to air their views/opinions on the proposed project. The Water Act CAP 157 under section 47 (d) provides for consultation with appropriate public authorities and relevant community groups in decision-making on water development projects that are bound to affect their lives. In addition, the World Bank OP 4.01: Stakeholders Management and Information Disclosure Regulations, require that the views of persons who may be affected by a proposed project be sought during the process of conducting an ESIA. Public participation is a key component of an ESIA/Project Brief and is used to integrate citizens into the environmental and development decision-making process.

Consultation with relevant stakeholders and regulators for the project shall be a continuous process from concept through development, and implementation to operational phases Stakeholder engagement is one of the core functions, that informs the ESIA processes. It is pivotal in localizing the different impacts as they exist from the affected people's point of view as well as understanding the interpretations of the different social, environmental, safety and health aspects as identified by the constituents of the project.

Stakeholder engagement has been an ongoing process since 4th April 2023 which includes stakeholder analysis and planning. The objective has been to acquire and disseminate information, identify and address legislative, community and environmental concerns and proffer appropriate mitigation options for all identified negative impacts.

Various stakeholders' meetings were conducted within the project area in Lefori Sub County and Gwere Parish between April and July 2023. Project Site Surveys and inspections were undertaken before and after the consultations to fully grasp the physical characteristics of the project sites to have grounded consultations. The meetings commenced with an engagement at Moyo District Offices and a courtesy call engagement with the Sub County Chief Administrative Officer in Lefori Sub County. After this local community meetings were held with various interest groups in Chinyi Village, Gwere Parish. These meetings were organized and coordinated with assistance from the County Administrative Officer, Assistant Health Officer, Community Development Officer and the various political heads.

7.1 Stakeholder Consultation Methodology

The methodology employed for stakeholder identification in the Gwere RGC water and sanitation project combined a comprehensive approach with inclusivity, transparency, and participatory decision-making. Through desk reviews, key informant interviews, community consultations, and stakeholder mapping workshops, a diverse range of stakeholders, including government agencies, local authorities, community organizations, NGOs, private sector entities, and affected communities, were identified and engaged. This approach ensured that a wide array of perspectives and interests were captured, promoting inclusivity, social equity, and accountability. Here under are the methods that guided the stakeholder engagement process;

7.1.1 Formal meetings with the stakeholders

The project had inception meetings where stakeholders both at the District Headquarters and Lefori Sub County 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 forpotential impacts and possible mitigation measures and also solicit initial community responses. The stakeholders were able to express their comments and queries during this meeting as seen in the minutes annexed.

7.1.2 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 CAO office in Moyo, the District Environmental and Physical Planners office, CDO, Environmentalist, the Mayor and Ward Administrators among others

7.1.3 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

7.1.4 Focus group Discussions

Different groups of people were consulted during the study to solicit specific information. Among the groups include the women to understand the issues that may affect the project

7.1.5 Key Stakeholder Engagements

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

7.2 Goals of Consultations

The primary goals of the consultation process were to:

Ensure transparency and involvement of stakeholders in assessing and managing the potential environmental and socio-economic impacts of the project;

a) Help manage risks, concerns and public expectations through ongoing dialogue with stakeholders; and
b) Improve decision-making and build understanding by actively involving key project stakeholders in two-way communication. Through this process, the implementing agencies will better understand the concerns and expectations of stakeholders, and beneficiaries and the opportunities to increase project value to the local community.

7.2.1 Objectives of Stakeholder Consultation

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

a) To provide information about the project and to obtain stakeholder information on key environmental and social baseline information in the project area;
b) To provide opportunities to stakeholders and communities to discuss their opinions and concerns respectively and get a full appreciation of their expectations
c) To solicit the stakeholders' views on the project and discuss their involvement in the various project activities;
d) To discern the attitudes of the community and their leaders towards the project so that their views and proposals are taken into consideration in the formulation of mitigation and benefit enhancement measures;
e) To identify specific interests and enhance the participation of the poor and vulnerable groups; and
f) To inform the process of developing appropriate mitigation measures as well as institutional arrangements for effective implementation of the project.

Stakeholder consultations and public participation during the ESIA process were conducted in line with the requirements of the National legislation and regulations. According to the National Environment (Environmental and Social Assessment) Regulations, 2020, Part III under the section "Procedure for Undertaking Scoping and Environmental and Social Impact Study", Sub-section 16; "Stakeholder consultation during the Environmental and Social Impact Study", stakeholder consultation is crucial during the ESIA study.

7.3 Stakeholder Engagement Plan

The Stakeholder Engagement Plan was implemented successfully, as indicated below.

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

Component	NO	Tasks	Status
	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

7.3.1 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:

7.3.2 Stakeholder Analysis

The stakeholder categories and sub-categories identified are presented in the table below

Component	Stakeholder Category	Stakeholder	Stakeholder Interest/Mandate	Engagement Method
ESIA	**Funder**	**World Bank**	- Observance and appropriate implementation of the Bank's Safeguards Operational Policies	- ESIS and RAP reports - Formal meetings

Component	Stakeholder Category	Stakeholder	Stakeholder Interest/Mandate	Engagement Method
			- Project funding and implementation support.	
	National level	**Ministry of Lands Housing and Urban Development (MoLHUD)**	- Approval of consultant's valuation reports	- Valuation 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.	- ESIS 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.	- ESIS, RAP Report, - Formal meetings - Presentations - Training workshops - Field visits - Interviews

Component	Stakeholder Category	Stakeholder	Stakeholder Interest/Mandate	Engagement Method
		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. - Ensures monitoring and supervision of the ESIA's compliance.	- ESIS reports
	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	- 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.	- ESIA Scoping Reports, ESIS and RAP reports - Formal meetings - Presentations - Training workshops - Field visits - Interviews

Component	Stakeholder Category	Stakeholder	Stakeholder Interest/Mandate	Engagement Method
		Resources Officers - (DNROs) - District Forestry Officer (DFO) - District Chairperson - In charge Family and Child Protection Unit, Uganda Police Force.		
	Local Governments **(Lefori Sub County)**	**Sub County:** - Senior Assistant Secretaries (SASs) - Agriculture and Production Officers - 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.	- ESIS and RAP reports - Formal meetings - Presentations - Training workshops - Field visits - Interviews
	Parishes and villages **(Gwere Parish and Chinyi Village)**	**Local councils:** - Local Council I Chairpersons and/or members of the executive - Local Council II Chairpersons and/or	- Support in community mobilization, engagement and building consensus on key project issues - Participate in the planning, implementation and operation of the project.	- Meetings - Field visits - Interviews

Component	Stakeholder Category	Stakeholder	Stakeholder Interest/Mandate	Engagement Method
		members of the executive.	- Sensitization of the communities about government projects.	
	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

7.4 Stakeholder Engagements

7.4.1 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 to aid decision-making.

	
Introductory meeting with MoWE officials	Meeting with the CAO
	
In-depth Discussion with the District Natural Resources officer and District Suryevor	Consultation with NFA Forest Supervisor

7.4.2 Lefori Sub County Technical Officers' engagement

Lefori Sub County hosts Gwere Parish where the project sites are located. This means that it was vital to engage the technical staff at the sub-county since they are in charge of all planning decisions taken within this area. This engagement was a two-way process as information was not only disseminated from the project team but also received from the sub-county team. The project team provided information on project progress and the steps being undertaken to ensure effective project implementation such as developing ESIAs and Water Source Protection Plans. Among the key issues discussed included; the benefits of the project, coordination and collaboration during the implementation of the project, the focal person for the project, suitability of the water source among others.

	
An engagement with the SACAO	An engagement with the health Officer

7.4.3 Lefori Town Council Stakeholder Engagement

Lefori town council hosts the old water system that is to be rehabilitated within the project. This means that it was vital to engage the technical staff at the town council since they are in charge of all planning decisions taken within this area. This engagement was a two-way process as information was not only disseminated from the project team but also received from the sub-county team. The project team provided information on project progress and the steps being undertaken to ensure effective project implementation such as developing ESIAs and Water Source Protection Plans. Among the key issues discussed included; the benefits of the project, coordination and collaboration during the implementation of the project, the focal person for the project, suitability of the water source among others.

	

7.4.4 Cinyi Village, Gwere Parish Community Consultations

A community consultative meeting was held at a market Site in Cinyi Village, Gwere Parish, Lefori Sub County. This meeting was fully represented by participants from villages directly impacted by the project. With help from the Gwere Parish Chief, key target stakeholders both directly and indirectly impacted by the project were consulted on various aspects of the project. English was used as the main medium of communication with the stakeholders. The objectives of this local community consultation were to mainly gain consensus from the community where the project sites are located, throw light on the transmission and distribution lines length and depth that will traverse the different areas and also disseminate information on water source protection to increase public confidence and awareness.


Stakeholderengagement in Cinyi Village

7.4.5 FGD with women at Lefori and Gwere

Focus Group Discussions were held with women in Lefori and Gwere Trading Centre to understand issues that concern water access, problems, water quality, source of income, Gender-based violence among others within the community. It was revealed that water is available especially in Lefori despite the existence of the piped water supply, and the water demand is too high among the communities. In the beneficiary area especially during the dry season a 20-litre jerrycan is charged about Ugx.1000/. High tariffs for piped water and high charges of 20000/ to access water at the boreholes for Operation and Maintenance purposes. Within the community, it is the responsibility of the women to collect water. The scarcity of water has increased GBV prevalence as men allege that women engage in extramarital affairs as they delay at the water source.


Women FGD at Lefori and Gwere

7.4.6 Issues and Views raised by the Stakeholders

Designation	Date and Venue	Comments	Response
The Chief Administrative Officer	20th April, 2023, Moyo District Headquarters	✓ The district pledged support to the project ✓ She highlighted that they had been involved as a district and were taken to the location of	✓ Noted MWE took note

Designation	Date and Venue	Comments	Response
		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.	
District Natural Resource officer	20th April, 2023, Moyo District Headquarters	✓ 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
District Staff Surveyor	20th April, 2023, Moyo District Headquarters	✓ 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
The NFA Forest Super Visor	✓ July, 2023, NFA Sector offices, Moyo Town Council	✓ He advised the consultancy to officially write to the NFA executive director regarding this project as the water tank is located in the forest reserve ✓ He stated that one of the strategies that can	✓ Noted ✓ The strategy will be considered

Designation	Date and Venue	Comments	Response
		be used in water source protection is planting trees along the water source	
Lefori Sub County Officials	✓ 18th April, 2023, Lefori Sub County offices	✓ He stated that the Sub County is made up of 3 parishes that is Gwere, Ebwea and Masaloa ✓ All these parishes are impacted by the project with villages such as Meria, Gwere East 'A', Gwere West 'A', Cinyi, Munu East, Nyainga, Coloa 'A', Abiriwaido, Diri, Lea 'A', Lea 'B', Masaloa West, Masaloa East 'B', Maringu West, Kibira 'A', Kibira 'B', Ebwea 'A', Maringu East 'A', Maringu East 'B', Lojili 'B', Lojili 'A', Cohwe and Abiricaku covered in the project scope ✓ The land is mainly under communal ownership ✓ The settlements within the Sub-County are Clan based	✓ Noted
Local Community Engagement	✓ 18th April, 2023, Lefori Market Ground	✓ Is there a grievance-handling committee? ✓ There are no grievance-handling committees however there was one that was created under the UNRA project ✓ Do you have water source protection committees	✓ Noted ✓

Designation	Date and Venue	Comments	Response
		✓ There are existing water user committees for the boreholes ✓ Do you have any bylaws for water source protection ✓ There is a by-law that was created to ensure that all water sources are fenced and protected ✓ Will there be connections to each household ✓ This aspect will be determined by the water user committees ✓ Will there be public standpipes ✓ They will be there and located in areas of public access	
Women FGDs	18th April, 2023, Lefori Market Ground	✓ Tariffs should be revised as they are high ✓ Water should be available all the time ✓ Need to sensitize communities over the readings ✓ Receipt given by the Umbrella organization (O&M) should indicate the name of the Umbrella organization, not the individual's name. ✓ The system should cater for all the community members that are targeted (to get water).	✓ Noted ✓ The system will be improved ✓ Noted. ✓ Noted ✓ Noted ✓ Noted

Designation	Date and Venue	Comments	Response
		✓ The project will help in reducing the GBV prevalence rate	

7.5 Public Disclosure Plan

Public Disclosure (PDP) is a key element in the engagement and essential for the collective involvement of stakeholders in the proposed development. Disclosure refers to the provision of relevant and adequate project information to enable stakeholders to understand the risks, impacts and opportunities of the project.. The dissemination of this plan shall be the responsibility of both MWE and the contractor. In the context of the proposed development, Public Disclosure aimed at:

- Generating a good understanding of the project;
- Enabling stakeholders to engage and participate in proposed project design;
- Understanding what the local community expect throughout the life of the project;
- Optimizing local benefits of the project;
- Obtaining social buy-in and acceptability for the project;
- Developing effective mitigation measures and management plan;
- Characterizing environmental, health and Socioeconomic impacts of the project

Like stakeholder identification, public disclosure is a continuous process throughout the ESIA exercise. KIIs and FGDs were utilized. Key stakeholder concerns were also identified so that they could be considered in the implementation of the project.

8. EVALUATION OF THE ENVIRONMENTAL AND SOCIAL IMPACTS 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 Gwere 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.

Limitations

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

In addition to the assumptions and limitations listed above, it is important to note that identification of socioeconomic 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 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

During the topographic and geological surveys of the project areas especially the water reservoir and water source which are remotely located, will involve cutting of natural trees, crops and grass to create access for the drilling machine at the water source, will be necessary. The proposed site for the borehole, access roads and water reservoir for Gwere RGC has both crops and vegetation which were planted by the landowners. If this impact is not well managed, it may result in conflicts with the locals.

Impact evaluation: Interruption of natural vegetation and cultivated crops for the community. This is a negative impact that is short-term and reversible.

Impact severity: The duration of the impacts is Temporary but the likelihood of occurring is high and the severity on vegetation and crops 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

- Vegetation cover
- Local Communities

Overall assessment without mitigation: Negative and Moderate

Mitigation Measures:

a) During site clearance, vegetation removal shall only be restricted to 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.
e) Engagement with the local landowners during the process to gain access roads to the sites.

Overall assessment with mitigation: Negative and LOW

8.3.2 Impact 2: Disturbance of Terrestrial Fauna

Cause of Impact

This impact will be caused by human presence and activity when carrying out the topographic and geological surveys on the proposed Gwere RGC water supply and sanitation project (borehole, access roads, pipeline and reservoir). While surveying, the survey team will likely remove vegetation and the use of vehicles and/or machinery may affect the fauna resident at the proposed project sites.

Impact evaluation: 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: The duration of the impacts is Temporary but the likelihood of occurring is high and the 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

- Fauna and Natural Habitats
- 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 harbour 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 the water and sanitation project (borehole, access roads, pipeline and reservoir), 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 project sites. This will cause minimal visual changes in the landscape. Clearing of vegetation is necessary for the wide view of the site mostly for serving and drilling the water source. This is a negative impact that is short-term and reversible.

Impact severity: The duration of the impacts is Temporary but the likelihood of occurring is high and the 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

- Project Workers
- Local Communities at Gwere RGC

Overall assessment without mitigation: Negative and Low
Mitigation Measures:

a) During site clearance vegetation clearance shall be minimized 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 water and sanitation facilities 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

Impact Evaluation: During surveying the proposed water and sanitation facilities (borehole and reservoir) for Gwere RGC, 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. Open pits left after drilling could contaminate soils with foreign objects such as polythene bags thus contaminating the soils. This is a negative impact that is reversible.

Impact severity: The duration of the impacts is Temporary but the likelihood of occurring is Medium and severity on soil 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

- Local Communities at Gwere RGC

Overall assessment without mitigation: Negative and Minor Moderate
Mitigation Measures:

a) During site surveying particularly the excavation of trial pits on the proposed sites for the water and sanitation project (borehole and reservoir), 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.

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 especially at Lefori Town Centre where there is a high population and youthful population. Indeed, during the design and survey process, the project will create employment opportunities, especially in areas neighboring the proposed water and sanitation projects. 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 and technical abilities as the activities involved are few such as clearing the way to sites, and digging 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 Gwere RGC and Lefori Town Centre
- Project Workers

Overall Assessment without Enhancement: Positive and Negligible

Enhancement Measures:

a) 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;
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.

Overall assessment with enhancement: Positive and MEDIUM

8.5.2 Impact 2: Extortion from propspective 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 Gwere 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 Gwere RGC and Lefori 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 Gwere RGC, impacting project implementation and community relations. This discriminiation 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 Gwere RGC and Lefori 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: The duration of the impacts is Temporary but the likelihood of occurring is High and the 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 minimized to acceptable levels that allow regeneration of vegetation so that the way leaves 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 site

Impact Evaluation: The construction phase of the water system 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 pipes, parking of trucks, Excavating of the old pipe system and construction machines etc. and work camps have to be installed.

Vegetation will be cleared for opening or upgrading local access routes to the proposed sites. This will disturb the fauna and flora and cause temporary loss of habitat and component fauna and floral species within the construction site as highlighted under baseline sections. 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. The 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 to the water source and blasting of an access road to the water reservoir shall be selected limiting Vegetation cover and habitat for Fauna;
b) Unless of benefit to local communities, temporary access roads leading to the construction site for the water supply and sanitation facilities shall be removed when no longer needed and the area 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 environmental sensitivities in the surrounding area, especially the natural Vegetation;
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: Noise and Vibration disturbance

Impact Evaluation: The construction phase will involve the use of heavy machines, and excavation machines for the old water system 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 humanbeings ((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, an increase in noise levels and vibration is likely to mainly affectthe humans and fauna at the proposed water and sanitation project components (borehole, access roads, pipeline routes and water reservoir) The 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 and rehabilitation of the old water system in Lefori town council will be restricted to daytime which 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. The 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 Gwere RGC
- Lefori Town Council Community

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) Restrict excavation activities to daytime with the Lefori town council.
c) ; and
d) Construction machinery should 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 and rehabilitation of Lefori Town Council's old water system 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 healththrough 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 CO_2, NO_2, SO_2, 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

Additionally, 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 negatively affect the photosynthesis of plants and 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. The 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;
h) Implement journey management to minimize unnecessary trips for construction activities;
i) and
j) If the soil removed from the sites is going to be left out for some days, cover the soil to prevent dust emission by the wind.

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 feeding and hiding habitats for animals will be affected especially around the borehole, reservoir and excavation of the old water system area as well as the access roads and pipeline routes for the Gwere RGC water supply system. In addition, terrestrial fauna (small mammals and reptiles) may also be killed. Sound and vibration during the construction and demolition to rehabilitate the old system 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. The 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 daytime 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; and
d) Capture and release fauna away from the direct influence zone (including species trapped in the trenches).

Overall assessment with Mitigation: Negative and LOW

8.6.6 TemporaryImpact 6: Pollution by solid wastes

Impact Evaluation: Solid waste from construction activities, rehabilitation of the old system at Lefori town centre/Gwere RGC and workers' domestic waste can also have negative impacts on the environment, especially if it gets into the environment. The main waste in the project area is domestic waste. During construction, the issue of waste will be minimal except for remnants of construction material which will include topsoil / Murram, timber pieces and some remnants of metallic pieces. Other will be in the form of empty cement bags, timber offcuts, 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 have 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. 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 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 (borehole pumphouse, access roads and reservoir) water transmission and distribution lines where excavations will have been done might result into 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 affect 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: The duration of the impacts is temporary but the likelihood of occurring is high and the severity on the 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 and Rehabilitation wastes and debris

Impact Evaluation: Debris from the excavation works for the access roads to both the borehole reservoir and old water system excavation of the old pipes and replacing them with the new pipes, the laying of the pipeline underground, construction of the pump house, water treatment facility and the water reservoir will result into 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 will be cleared while clearing both the water system components (borehole, reservoir and route for the water supply pipeline..

Impact severity: The duration of the impacts is Temporary but the likelihood of occurring is high and the 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 area
- ✓ Streams,
- ✓ Local Communities

Overall assessment without mitigation: Negative and MEDIUM

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.

Post signs and guidelines around the construction site to remind workers of waste management practices and encourage compliance with waste reduction measures.

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 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: The duration of the impacts is temporary but the likelihood of occurring is high and the 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 measures

a) The contractor shall ensure that the soil stockpiles from the excavations are covered/wetted during the dry season to minimize the fugitive dust as a result of wind erosion;

b) The contractor shall ensure that excavated sections are backfilled 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. The rehabilitation works will also create noise for the local business community within the Lefori town centre. 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 neighbouring residents where the excavation works will be undertaken.

Impact severity: The likelihood of the impact occurring is high. The 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), 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 is 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 both the borehole and pumphouse, water treatment plant, access roads, reservoir and laying of pipelines for both the transmission and distribution lines may have a negative impact on the aesthetics of the surroundings such as the soil stockpiles from the trenches that will be dumped along the trenches for the pipelines. In addition to that, rehabilitation of the old system will result in the digging of trenches and the demolition of old infrastructure for integration into the new proposed system.

Impact severity: The duration of the impacts is temporary but the likelihood of occurring is high and the 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 Gwere RGC
- Lefori town Centre

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 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 water channels

Impact Evaluation: The excavation and construction activities that include the construction of both the water treatment, 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 downpour. This sedimentation could alter the turbidity of the water within the streams and channels resultantly affecting the aquatic fauna in these water bodies.

Impact severity: The duration of the impacts is temporary but the likelihood of occurring is Medium and severity on soil 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 Gwere RGC
- ✓ Lefori town centre

Overall assessment without mitigation: Negative and Medium.

<u>Mitigation measures</u>

(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 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 supply, distribution lines, rehabilitation of the existing water system at Lefori town centre and sanitation facility 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.

Overall assessment without enhancement: Positive and MEDIUM

<u>Enhancement measures</u>

(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 enhancement: Positive and HIGH

8.8.2 Impact 2: Land take

Impact Evaluation: The excavation/earthworks for the proposed water supply system (including the borehole, water treatment plant, access roads, pump house, solar system, pipeline and water reservoir) and access roads to both the borehole and reservoir for Gwere RGC will manifest into some land take. The land taken will comprise the Water treatment plant, solar systems and a pump house sitting on 100x80 with the second borehole bound to undergo repairs and rehabilitation and water reservoir (overhead tank – 25mx25m) The pipeline will be buried Underground 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 pipelines will traverse.

Impact severity: The likelihood of the impact occurring is high. The duration of the impact will be medium-term since property loss is permanent. Since compensation will be provided to replace the affected structures, the 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

Overall assessment without mitigation: Negative and Medium

Mitigation measures

(a) MWE, District Local Government and other affected stakeholders (particularly the land owners) shall enter into agreements for the acquisition of the Right of Way (ROW) for both the transmission line, dig up the already existing transmission and distribution lines and replace them with new ones, 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 landowners 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) Minimize the project footprint to the required land for both the borehole, reservoir (each of approximately 25mx25m) and pipeline where the water transmission and distribution pipelines will be laid.

Overall assessment with mitigation: Negative and LOW

8.8.3 Impact 3: Disruption of traffic

Impact Evaluation: The excavation for rehabilitation of the old water system at Lefori town centre and installation of the pipes for the water transmission and distribution lines within Gwere 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. The 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 Gwere RGC
- ✓ Lefori Trading Centre
- ✓ 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 / economic displacement/ loss

Impact Evaluation: The excavation of some sections where the water pipelines will be laid and the old ones replaced at Lefori Trading Centre in Lefori Town Council 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. The duration of the impact will be Temporary. severity of this impact is Low resulting in a Negligible -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
- ✓ Lefori Town Centre community
- ✓ Gwere Trading Centre

Overall assessment without mitigation: Negative and MEDIUM

Mitigation measures

(a) The contractor shall ensure that the excavated sections are backfilled 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 Displacement

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 Medium. The duration of the impact will be Temporary. severity of this impact is Low resulting in a Negligible - 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
- ✓ Lefori Town Centre
- ✓ Gwere Town Centre

Overall assessment without mitigation: Negative and MEDIUM

Mitigation measures

a) MWE and the contractor shall carry out wide consultations with MDLG 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)

c) Layout plans for the proposed transmission and distribution lines shall be displayed at the Sub County Headquarters and also distributed to the area local leaders / concerned stakeholders for their guidance before construction activities; The excavation works for the water transmission and distribution lines shall minimize their footprint on the project area by limiting the excavations to 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.

Overall assessment without enhancement: Positive and Low

Enhancement measures

Overall assessment with enhancement: Positive and HIGH

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 – Gwere RGC and Lefori town centre 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

Overall assessment with enhancement: Positive and HIGH

8.8.8 Impact 8: Influx of immigrants

Impact Evaluation: The construction activities for the proposed water and sanitation project (toilet facilities, 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: The duration of the impacts is temporary, especially during construction but the likelihood of occurring is ***high*** and the severity is ***medium***. Therefore, the 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:

- ✓ Lefori Trading centre
- ✓ Gwere Trading Centre

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 behaviours;

(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 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

the absence of sanitation facilities for the construction workers which could result into the spread of diseases like dysentery, cholera among others.

Impact severity: The duration of the impacts is temporary, especially during construction but the likelihood of occurring is ***high*** and the 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:

- ✓ Gwere/Lefori Trading center
- ✓ 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 human extcreta in the project area;
(b) 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 and sanitation systemis envisaged to result into incidents The incidents envisaged may include the following;

- **Excavation Accidents:** Incidents involving workers getting injured by heavy equipment, collapsing trenches, or falling debris during excavation and trenching activities;
- **Falls from Heights:** Accidents occurring due to falls from elevated work platforms, ladders, or unstable scaffolding while installing water supply structures or sanitation facilities;
- **Electrical Incidents:** Electric shocks or electrocutions resulting from improper handling of electrical equipment or contact with overhead power lines during construction activities.
- **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.
- **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;

- **Confined Space Incidents:** Incidents occurring when workers enter confined spaces such as underground pipelines or storage tanks without proper ventilation, monitoring, or safety precautions;
- **Struck-By Accidents:** Workers being struck by falling objects, moving vehicles, or construction materials while working on-site;
- **Chemical Exposure:** Incidents involving exposure to hazardous chemicals, construction materials, or wastewater during handling, mixing, or storage activities;
- **Traffic Accidents:** Collisions or injuries involving construction vehicles, trucks, or pedestrians on access roads or construction sites;
- **Health Hazards:** Occupational illnesses or injuries resulting from exposure to dust, noise, vibrations, or biological hazards such as contaminated water or sewage;
- **Heat Stress:** Workers experiencing heat-related illnesses or exhaustion due to high temperatures and humidity during construction activities in rural areas;
- **Ergonomic Injuries:** Musculoskeletal injuries or strains caused by repetitive tasks, heavy lifting, or awkward postures during construction and installation work;
- **Environmental Incidents:** Spills, leaks, or releases of construction materials, fuels, or chemicals that may impact local water sources, soil quality, or wildlife habitats;
- **Community Concerns:** Complaints or conflicts arising from construction-related noise, dust, traffic congestion, or disruptions to local communities and residents; and
- **Security Risks:** Incidents related to theft, vandalism, or sabotage of construction equipment, materials, or infrastructure components in rural areas with limited security measures.

All these incidents might result in illnesses and fatalities in extreme cases which could greatly affect the construction activities.

Impact severity: The 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

The construction of water supply and sanitation systems for Gwere 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: The duration of the impacts is permanent, especially on the victim and the likelihood of occurring is ***high*** and the 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) Backfilling: Open trenches and borrow pits will be backfilled to guard against drowining 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 borehole, reservoir along the pipelines, and access to the roads. These maintenance activities during operation will take place very seldom.

Impact severity: The 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 recovery of vegetation.

Overall assessment 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 Gwere RGC may encounter chemicals used for disinfection and treatment, leading to risks of chemical burns, respiratory issues, or skin irritation.

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:

- ✓ Flora
- ✓ Local community.
- ✓ Project Workers

Overall assessment without mitigation: Negative and HIGH

Mitigation Measures:

The water supply system operator shall undertake the following measures:

(a) Hazardous wastes shall be well contained on-site and taken away by licensed hazardous waste collectors;
(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 sanitation system for Gwere 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 Gwere 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 Gwere RGC and Lefori Trading Centre coupled with the water transmission and distribution lines will go a long way in increasing the safe water supply to the villages of Gwere Village in Lefori sub-county and Lefori 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 Gwere 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 be reduced. 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 Gwere RGC and Lefori town council shall ensure that the water transmission and distribution lines within RGC and town council are implemented and maintained to provide clean, safe and reliable water to the communities.

Overall assessment with enhancement: Positive and HIGH

8.12.2 Impact 2: Boost to local economy

Impact Evaluation: The successful installation of the borehole, Water Treatment Plant and the associated water supply system for Gwere RGC will bridge the water deficit experienced by the communities of Gwere and Lefori 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 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 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 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 Gwere RGC and Lefori town council 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 stand points 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: The duration of the impacts is permanent and 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:

- Local community.

Overall assessment without mitigation: Negative and HIGH

Mitigation measures

(a) MWE / NUWS and the contractor in collaboration with Moyo District Local Government, Lefori Sub County and Lefori 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 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 at the noticeboard of the Sub-County and town council headquarters so that they avoid being overcharged by unscrupulous staff. This shall be in addition to sensitization of the local communities 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: 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.

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

The increased access to clean, reliable and safe water in Gwere RGC and the sanitation facilities at Munu Health Centre II and another at the sub-counties proposed site 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 Health centre.

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 Gwere RGC. This will enable people to access these services at a reasonable price which they can afford.

Overall assessment with 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: The duration of the impacts is Short-term 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: The duration of the impacts is Short-term and the likelihood of occurring is ***Medium*** and the 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 behaviours 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

With the intensification of water transmission and distribution lines within the selected villages in Gwere RGC within Lefori Sub County and Lefori Town Council, the additional public standpoints and household connections will reduce the distances to water sources (less than 500 metres) 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

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 labourers, skilled, semi-skilled and casual, site management and maintenance teams). This will be of great benefit to all workers.

Overall assessment without enhancement: Positive and LOW

Enhancement measures

(a) MWE / NUWS shall endeavour to disseminate appropriate skills for the respective operators/workers on the different phases of the water and sanitation project.

Overall assessment with enhancement: Positive and MEDIUM

8.12.11 Impact 11: Improved Service Delivery by the Operators

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 NUWS / water supply operator 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

✓ MWE / NUWS shall ensure that the WUGs and operators provide affordable and reliable water supply to the communities within the project area.

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 Gwere 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 Gwere 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 Gwere 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

8.14 Decommissioning Phase Impacts

8.14.1 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 demolition of the buildings, clearing of the site and reclaiming or restoring the affected land into a natural condition. Impact 1: Change of use situation

In a situation where there is a change of use, the 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 water supply system 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 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.

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 IWMDP proposed project in Gwere/ Lefori 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 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:

- The bio-physical alteration, landscape change and vegetation maintenance
- Pollution control and prevention
- Waste management
- RAP implementation
- Occupation Health and Safety
- Sexual Harassment, Exploitation and Child Abuse
- Project Social Fabric disturbance
- Community Employment engagement and gender inclusivity
- Physical culture resource
- Public Disclosure Plan
- 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 , annually 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.

Error! Reference source not found. 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 462,563,707/=. It is important to note that monitoring will be conducted at all project sites.

Table 9-1: Environmental and Social Impact management plan for all project phases

Project 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) During site clearance, vegetation removal shall only be restricted to 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. (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	Ugx 80,000,000/=	Contractor and Moyo District Local Government and Area Local Leadership	Resettlement Action Plan
	Contamination of Soil		(a) During site surveying particularly the excavation of trial pits on the proposed sites for the water and sanitation project (borehole and reservoir), 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.	Siltation and contamination levels of water sources	Nil	The Contractor and Moyo District	None
	High Expectations of the Local Communities Concerning Jobs	Number of jobs offered to the locals project area	(a) 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;	Proportion of local to be employed on the project	None	The Contractor and Moyo District	None

Project Phase	Impact	Desired Outcomes/Objectives	Management commitment	Performance Indicators/targets of acceptance criteria/Auditable management actions	Costs	Responsibility	Capacity building and training requirements
			(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.				
Construction Phase	**Employment opportunities**	Number of workers recruited from the project area	(a) MWE, 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	None	The Contractor and Moyo District	None
	Land take	Amount of land take for the water supply system (Pump house, Reservoir and pipelines)	(a) The proposed route for the water supply pipeline might require consent from both UNRA, MDLoG District Local Government 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 corporation of the homestead owners; and (b) Minimise the project footprint to the required land for the water abstraction point, reservoir and approximately 41 kilometres where the water supply pipeline will be laid.	Compensation of project affected persons in case of any land take	Ugx 55,000,000/=	The Contractor and Moyo District	Resettlement Action Plan
	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	Waste management practices on site and types of waste generated	Ugx 20,000,000/=	The Contractor and Moyo District	Waste Management Plan

Project Phase	Impact	Desired Outcomes/Objectives	Management commitment	Performance Indicators/targets of acceptance criteria/Auditable management actions	Costs	Responsibility	Capacity building and training requirements
			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				
	Vegetation clearance and damage to crops	Vegetation clearance kept to a minimum during pipeline construction	(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; (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.	Some vegetation left intact and any restoration done using indigenous species only	Ugx 45,000,000/=	The Contractor and Moyo District	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 (UNRA) prior to commencement of road excavation works in the project roads; and (d) The contractor shall display appropriate traffic warning	Traffic well managed during the pipeline construction	Ugx 25,000,000/=	MWE, the appointed Contractor and the Traffic Police Department	Construction traffic management plan

Project Phase	Impact	Desired Outcomes/Objectives	Management commitment	Performance Indicators/targets of acceptance criteria/Auditable management actions	Costs	Responsibility	Capacity building and training requirements
			signage (e.g. ‘‘Slowdown construction work ahead’’ and ‘‘Traffic Diversion ahead’’) along the road.				
	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 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 Area Local leadership	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; (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.	Number of construction vehicles, traffic counter measures, and traffic incidents/accidents reported	Ugx 35,000,000/=	MWE, Moyo District Local Government, Contractor and the Traffic Police Department	Construction traffic management plan
	Damage to properties along the supply 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 supply and distribution lines to minimise the damage/ financial losses attributed to the	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 Area Local Leaders	Livelihood Restoration

Project Phase	Impact	Desired Outcomes/Objectives	Management commitment	Performance Indicators/targets of acceptance criteria/Auditable management actions	Costs	Responsibility	Capacity building and training requirements
			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 Sub County 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.				
	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, Contractor and Area Local Leaders	Environmental Health and Safety Trainings / Sensitisation
Operational Phase	**Improved and increased access to safe and clean water**	Increased coverage of water pipes and population coverage	(a) MWE, NUWS and the Water User Groups (WUGs) shall ensure that the new water supply and distribution system within Lefori Sub County and Town	Number of stand taps and length of pipeline extended. Number of households supplied by the Water supply project	Nil	MWE, NUWS and Area Local Area Leadership	Promotion and Awareness campaigns held

Project Phase	Impact	Desired Outcomes/Objectives	Management commitment	Performance Indicators/targets of acceptance criteria/Auditable management actions	Costs	Responsibility	Capacity building and training requirements
			Council is implemented and maintained to provide clean, safe and reliable water to the communities.				
	Boost to local economy	Increased business opportunities	(a) MWE, NUWS and Moyo District Local Government 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 Gwere RGC / Area Local Leadership	
	Water access and 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 and the contractor in collaboration with Moyo District Local Government and Lefori Sub County 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 water supply and that water 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; and then water from other sources (springs, boreholes, shallow wells) for other purposes such as laundry; (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) NUWS and the local Water User Groups shall make charges for a unit volume of water known to	Number of public stand taps constructed / Number of consumers accessing safe and clean water	Ugx 10,000,000/=	MWE, NUWS and Moyo District Local Government and Area WUGs	Communication Strategy and Sensitizations held

Project Phase	Impact	Desired Outcomes/Objectives	Management commitment	Performance Indicators/targets of acceptance criteria/Auditable management actions	Costs	Responsibility	Capacity building and training requirements
			public for example by displaying the costs at the noticeboard of the Sub-county headquarters so that they avoid being overcharged by unscrupulous staff. This shall be on addition to sensitization of the local communities how to read the meters.				
	Employment opportunities	Increased number of public stand taps operated by the operators / vendors	(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 dependable water vendors who will provide water to the community at fair and affordable rates.	✓ Number of functional public stand taps; ✓ Number of water vendors operating public stand taps	Nil	MWE, NUWS and Area WUGs	
	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	
	Reduced distances to water sources	Minimal distances to the water taps	(a) MWE, NUWS and Moyo District Local Government shall ensure that all the public stand taps, household connections are	Increased number of stand taps, connected households in the area;	None	MWE, NUWS and Area WUGs	

Project Phase	Impact	Desired Outcomes/Objectives	Management commitment	Performance Indicators/targets of acceptance criteria/Auditable management actions	Costs	Responsibility	Capacity building and training requirements
			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.				
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 (c) construction such as road maintenance	Number of cleared sites	Ugx 15,000,000/=	MWE, NUWS and Moyo District Local Government	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 15,000,000/=	MWE and Operator	Air Quality Monitoring
	Pollution due to improper disposal of solar		(a) Follow guidelines for disposal and pollution control management plan for this project	Number of cases of unsafe disposal of batteries and other solar accessories	Ugx 15,000,000/=	MWE and Operator	Waste Management Plan
	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 15,000,000/=	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 12,563,707/=	MWE and Operator	Water quality measuring equipment
Total					**Ugx 462,563,707/=**		

9.3 Implementation of the ESMMP

9.3.1 Management Structure

9.3.1.1 Ministry of Water and Environment

The Ministry, has experience in implementation ofsimilar 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. the 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.

TheMW&E currently has the following experts who have participated in the project design and planning phase including the preparation of the ESIA and RAP. The staff will also be responsible for the implementation of the ESMP.

i. Environmental and Social Safeguard Specialists
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 Specialists will play the oversight role in implementation, and preparation of reports on ESMP. The reports on ESMP implementation performance will be submitted quarterly to MW&E, and the World Bank.

The successful implementation of the project ESMP shall require seamless interaction and coordination from different stakeholders involved in the project including;, MW&E, stakeholder consultant, Engineering Consultant, and the Contractor.

9.3.1.2 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.

9.3.1.3 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 an Environmental Specialist, Sociologist and Health and Safety Officer to ensure the implementation and monitoring of Environmental and Social aspects and Health and Safety measures on daily a basis.

9.4 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 Gwere 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 Gwere 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.

9.5 Capacity building is one of the critical elements for the successful and efficient implementation of ESMP. 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	within 24-48 hours

SN.	Reportable Incident	Environmental and Social Incident Response Process (ESIRP)	Required response time
		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.	
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 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.	within 24-48 hours
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).

9.6 Grievance Management and Redress

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.

9.6.1 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.

9.6.2 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 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.
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.

9.6.3 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

9.6.4 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.

9.6.5 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.

9.6.6 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

9.6.7 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.

9.6.8 Process of Handling Grievances

The following sub-section provides the procedure for receiving and hearing complaints as well as appealing against any decision from the grievance management committees at the village, construction site, sub-county/ Town Council, 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 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/ Municipal Grievance Management Committee fails to resolve the matter or if the complainant is not satisfied, the Chairperson on behalf of the GMC shall refer the matter to the District GMC. The DCDO will register the referred/ appealed case in the District Complaints Register that will be provided by MWE.

The DCDO who will also act as the Secretary to the DGMC will screen the matter referred and bring it to the attention of the LC V chairperson who will write to invite the complainant together with the respective LC I Chairperson to the DGMC within Seven (7) days. A fair hearing process will then commence at the DGMC and upon satisfaction of the resolutions/ agreement, the complainant shall sign the consent form and the grievance chairperson will officially write to the complainant with a copy to the LC III, Sub-County Chief/ Town Clerk and the contractor/ Consultant.

If the matter cannot be resolved by the DGMC, then it will be referred to the Ministry of Water and Environment. The CAO on behalf of the district will officially refer the case to the Permanent Secretary MWE with a copy to the Project Coordinator IWMDP for action within 14 days. The Complainant can also appeal to the PS MWE if s/he was not satisfied with the outcomes of the DGMC.

e) Referrals/ Appeals to MWE

Any unresolved grievances will be referred to MWE for appropriate action. The Grievance Desk (Principal Sociologist) shall work with PST to establish all necessary facts within 14 days of receipt of the complaint. A report with the recommended course of action shall be forwarded to the Project Coordinator for implementation and follow-up.

As much as possible, the Ministry team will engage the complainant at the district, sub-county or village levels to arrive at amicable solutions. Upon arriving at an agreed understanding, the complainant shall sign a consent form witnessed by the LC I Chairperson to close the grievance. If no agreement is reached at this level, the complainant shall be advised or shall decide on his/ her own to use any other lawful arrangements as may be applicable.

f) Implementation and Verification of Negotiated Corrective Actions

Agreed corrective action will be undertaken by the responsible agency/ part for example a Local government, MWE, contractor or authorized sub-contractor in close consultation with the complainant within the agreed timeframe and completed action recorded in the grievance database.

To verify satisfaction, the Grievance Committee will upon receipt of a completion report from the GO verify that corrective actions have been implemented. A signature of the complainant will be obtained on the consent form. If the complainant is not satisfied with the outcome of corrective action, additional steps may be undertaken to reach an agreement or an appeal will be lodged by the complainant.

9.6.9 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

9.6.10 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.

9.6.11 Flow Chart of the Grievance Management Process

The grievance management process has several interdependent steps that will be followed as summarized below;

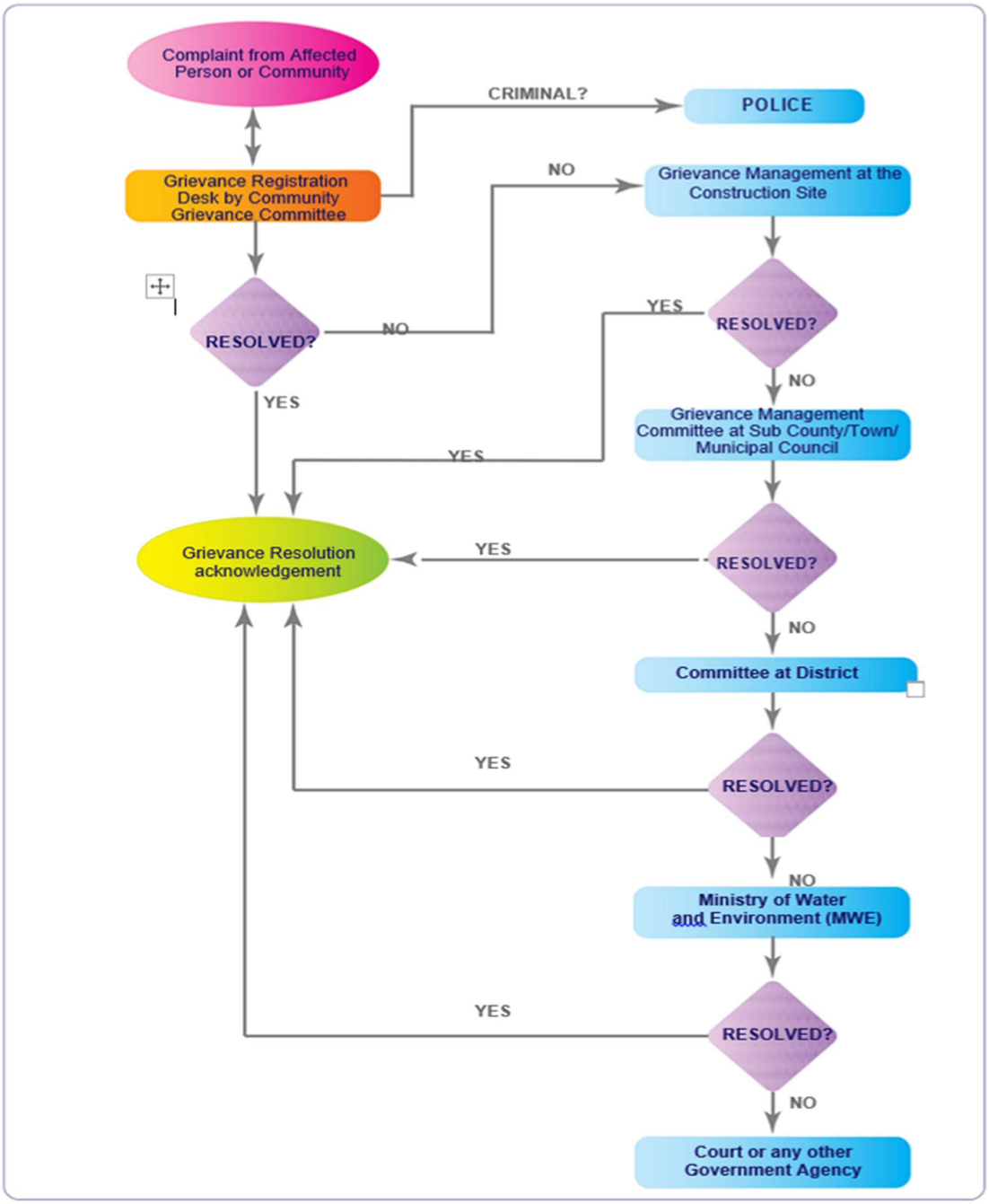

Figure 9-1: The Grievance Handling Flow for Community (MoWE)

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.

9.6.12 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.

9.6.13 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

9.6.13.1 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.

9.6.13.2 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.

9.6.13.3 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. CONCLUSION

10.1 Conclusion

In a nutshell, the Environmental Social Impact Statement (ESIS) for the Gwere Water Supply and Sanitation area indicates that while there may be some limited negative environmental and social implications, the overall socio-economic benefits to the community, coupled with proposed mitigation measures, outweigh these concerns, and therefore the implementation of the project should not be stayed.

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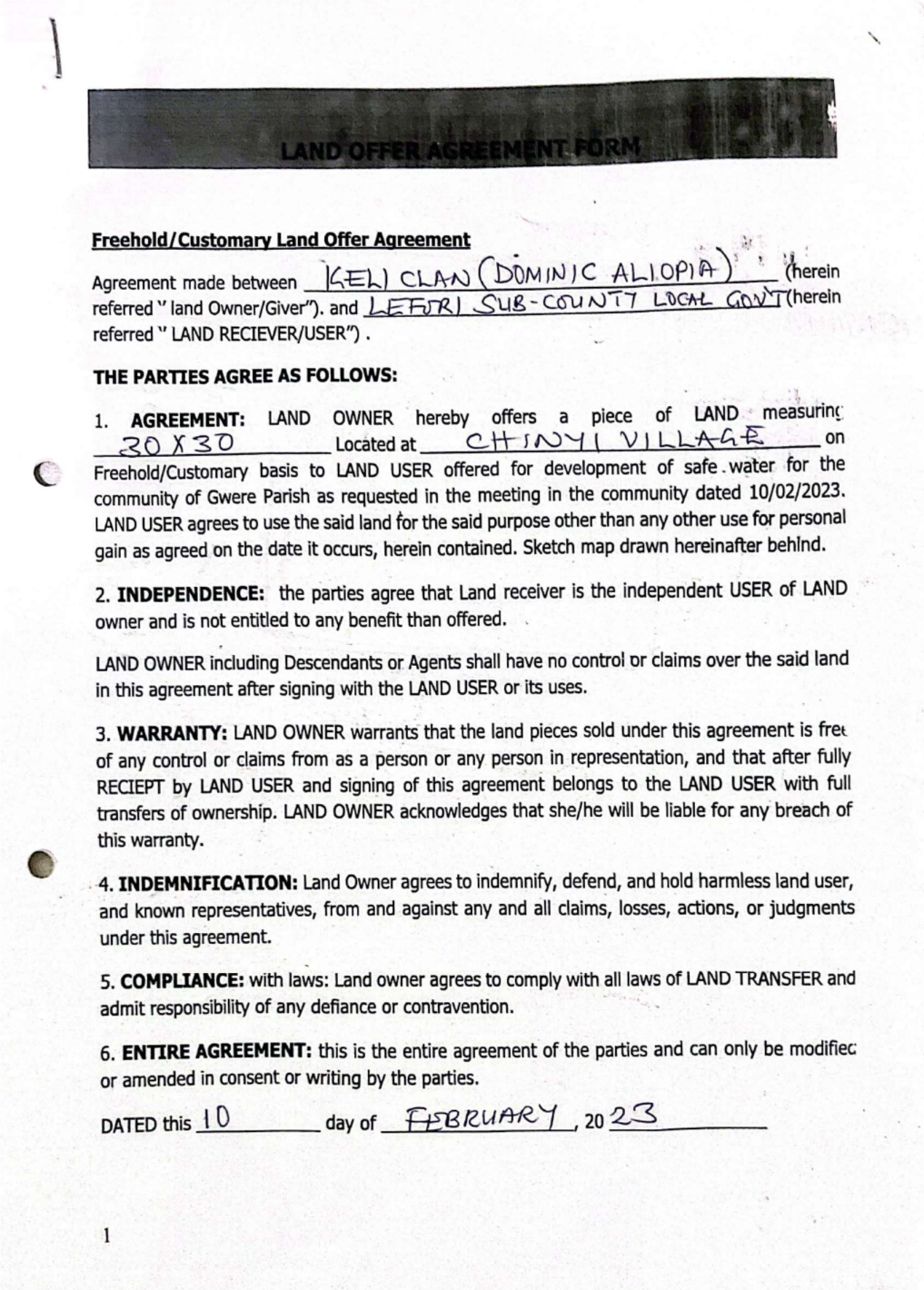
APPENDICES

Appendix 1: Land Consent forms for the Water and Sanitation System (Borehole, And Reservoir) For Gwere Rural Growth Centre, Moyo District

Appendix 1 (a): Land Consent forms for the Borehole for Gwere Rural Growth Centre, Moyo District



LAND OFFER AGREEMENT FORM

Freehold/Customary Land Offer Agreement

Agreement made between KELI CLAN (DOMINIC ALIOPIA) (herein referred " land Owner/Giver"). and LEFORI SUB-COUNTY LOCAL GOVT (herein referred " LAND RECIEVER/USER") .

THE PARTIES AGREE AS FOLLOWS:

1. **AGREEMENT:** LAND OWNER hereby offers a piece of LAND measuring 30 X 30 Located at CHINYI VILLAGE on Freehold/Customary basis to LAND USER offered for development of safe water for the community of Gwere Parish as requested in the meeting in the community dated 10/02/2023. LAND USER agrees to use the said land for the said purpose other than any other use for personal gain as agreed on the date it occurs, herein contained. Sketch map drawn hereinafter behind.

2. **INDEPENDENCE:** the parties agree that Land receiver is the independent USER of LAND owner and is not entitled to any benefit than offered.

LAND OWNER including Descendants or Agents shall have no control or claims over the said land in this agreement after signing with the LAND USER or its uses.

3. **WARRANTY:** LAND OWNER warrants that the land pieces sold under this agreement is free of any control or claims from as a person or any person in representation, and that after fully RECIEPT by LAND USER and signing of this agreement belongs to the LAND USER with full transfers of ownership. LAND OWNER acknowledges that she/he will be liable for any breach of this warranty.

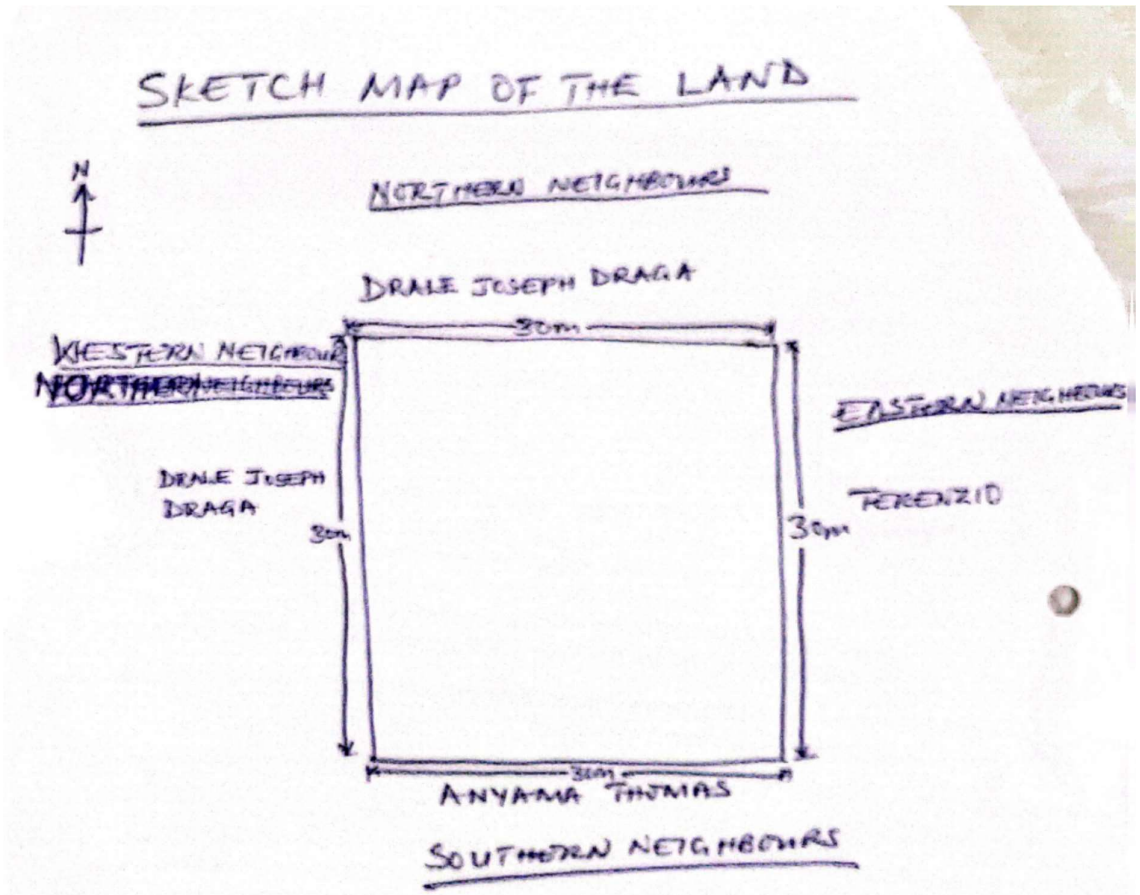
4. **INDEMNIFICATION:** Land Owner agrees to indemnify, defend, and hold harmless land user, and known representatives, from and against any and all claims, losses, actions, or judgments under this agreement.

5. **COMPLIANCE:** with laws: Land owner agrees to comply with all laws of LAND TRANSFER and admit responsibility of any defiance or contravention.

6. **ENTIRE AGREEMENT:** this is the entire agreement of the parties and can only be modified or amended in consent or writing by the parties.

DATED this 10 day of FEBRUARY, 2023

1


SKETCH MAP OF THE LAND
N
NORTHERN NEIGHBOURS
DRALE JOSEPH DRAGA
30m
WESTERN NEIGHBOUR
EASTERN NEIGHBOURS
DRALE JOSEPH DRAGA
30m
30m
TERENZIO
30m
ANYAMA THOMAS
SOUTHERN NEIGHBOURS

LAND OWNER/SELLER

DOMINIC ALWOPIA (KELI CLAN)

Sign:

ATTEST:

1. ASIO CELINA

Sign:

2. MOMPARA OLIVER

Sign:

3. ABOLI EVALINE

Sign:

4. ANYAMA THOMAS

Sign:

LAND USER/RECIEVER:

NYUMA DAVID (LEFORI S/C).

Sign:

CHAIRMAN AREA LAND COMMITTEE
DATE:
SIGN
LEFORI SUB-COUNTY

WITNESS:

ADIMARELLO MARCELINA

Sign:

LULUA CHIZARIA

Sign:

Hamuna Simon

Sign:

Tumbe DOMINIC

Sign:

LC1 CHAIRPERSON
CHINYI VILLAGE
GWERE PARISH
LEFORI SUBCOUNTY
MOYO DISTRICT
Date: 10/02/2023

LOCAL COUNCIL ONE:

Name: VUKONI AMAZON

Sign: Stamp

Village: CHINYI Parish: GWERE

Sub-county: LEFORI District: Moyo

LAND OFFER AGREEMENT FORM

Freehold/Customary Land Offer Agreement

Agreement made between KELI CLAN (ALOPIA DOMINIC) (herein referred " land Owner/Giver"). and LEFORI SUB-COUNTY (herein referred " LAND BORROWER/RECIEVER").

THE PARTIES AGREE AS FOLLOWS:

1. **AGREEMENT:** LAND OWNER hereby offers a piece of LAND measuring 30X30 Metres Located at UJUGA (CINYI VILLAGE) on Freehold/Customary basis to LAND BORROWER as an independent Offer at no cost. The LAND BORROWER agrees to use the land for its intended purpose. Sketch map drawn hereinafter behind.

2. **INDEPENDENCE:** the parties agree that Land borrower is the independent RECIEVER of LAND owner and is not entitled to any benefit than borrowed for.

LAND OWNER including Descendants or Agents shall have no control or claims over the said land in this agreement after signing with the LAND BORROWER or its uses.

3. **WARRANTY:** LAND OWNER warrants that the land pieces offered under this agreement is free of any control or claims from as a person or any person in representation, and that after fully signing of this agreement belongs to the LAND BORROWER with full transfers of ownership. LAND OWNER acknowledges that she/he will be liable for any breach of this warranty.

4. **INDEMNIFICATION:** Land Owner agrees to indemnify, defend, and hold harmless land Borrower, and known representatives, from and against any and all claims, losses, actions, or judgments under this agreement.

5. **COMPLIANCE:** with laws: Land owner agrees to comply with all laws of LAND OFFER and admit responsibility of any defiance or contravention.

6. **ENTIRE AGREEMENT:** this is the entire agreement of the parties and can only be modified or amended in consent or writing by the parties.

DATED this 21 day of APRIL, 2023

LAND OWNER/GIVER

(KELI CLAN) ALOPIA DOMINIC

Sign: _____

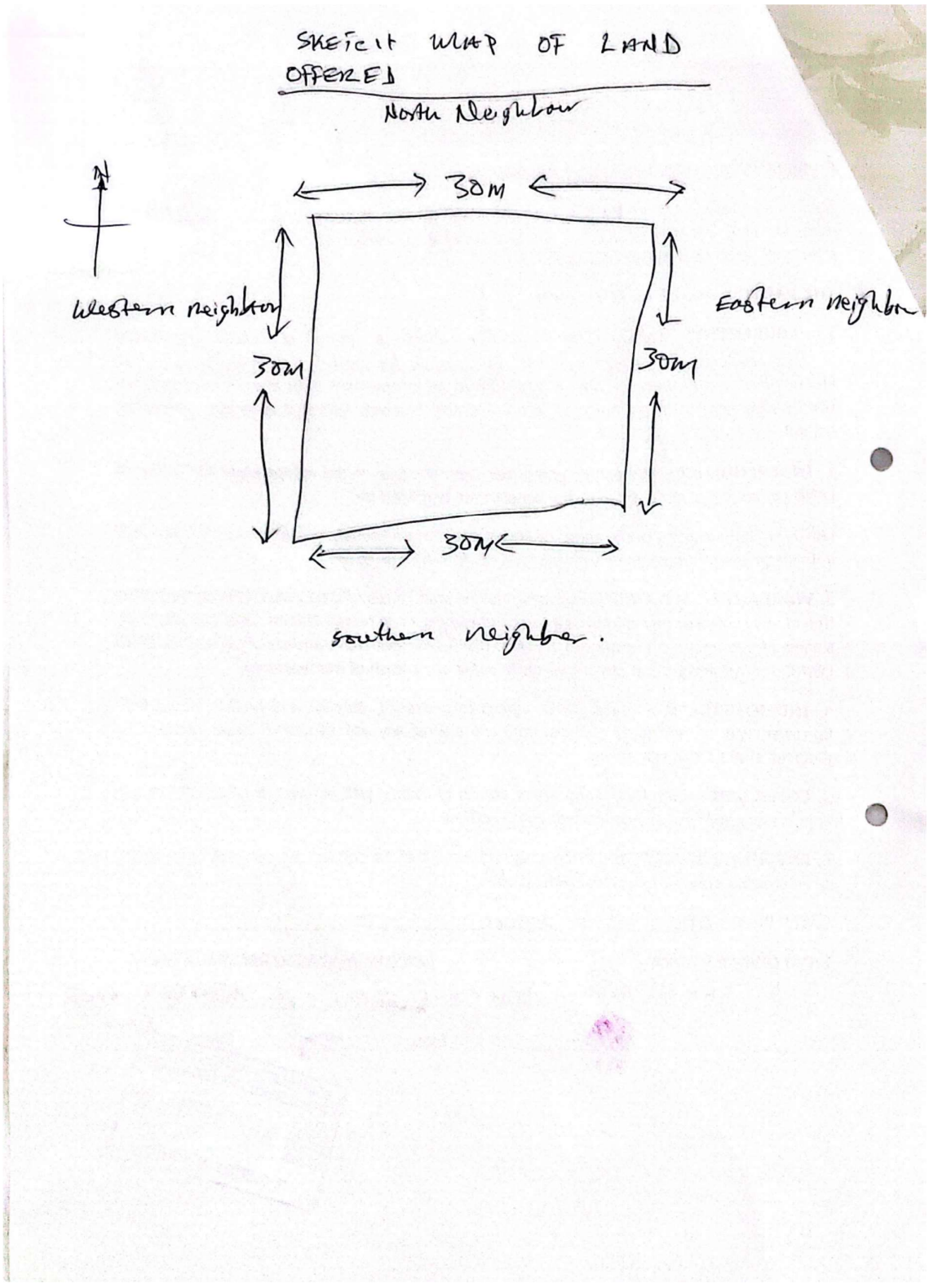
LAND BORROWER/RECIEVER (SAS)

LEFORI SC AJUGA AMEX IVU

Sign: _____ Stamp

SENIOR ASSISTANT SECRETARY
LEFORI SUB-COUNTY LOCAL GOV'T
21 APR 2023
P.O. BOX 1 MOYO, (U)

1


SKETCH MAP OF LAND OFFERED
North Neighbour
N
30M
Western neighbor
Eastern neighbor
30M
30M
30M
southern neighbor.

ATTEST:

1. PAZIANLGA MOSES

Sign: _____

2. ANYAMA THOMAS

Sign: _____

3. _____

Sign: _____

4. _____

Sign: _____

WITNESS:

_____

Sign: _____

_____

Sign: _____

_____

Sign: _____

_____

Sign: _____

LOCAL COUNCIL ONE:

Name: _____

Sign: _____ Stamp

Village: _____ Parish: _____

Sub-county: _____ District: _____

AREA LAND COMMITTEE:

Name: _____

Sign: _____ Stamp

LC III CHAIRPERSON:

Name: _____

Sign: _____ Stamp

2

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: Gwere 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 Gwere borehole, Lefori sub-county, Moyo 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 – 04791

Source Name			Gwere Borehole	**Drinking Water Standards (EAS12:2018 Maximum permisible for Natural Potable Water)**
Village			Gwere	
Sub-county			Lefori	
District			Moyo	
Lab Identifier code			**E23/04791**	
Parameters	**Method Code**	**Units**	**Test Results**	
Color (Apparent)	TM/C-04/01	PtCo	174	50
Turbidity	TM/C-03/01	NTU	28	25
pH	TM/C-01/01	pHunits	5.5	5.5-9.5
Electrical Conductivity	TM/C-02/01	µS/cm	97	2500
Total dissolved solids	TM/C-02/02	mg/L	67.9	1500
Total Hardness as CaCO3	TM/C-06/01	mg/L	44	600
Calcium hardness as CaCO3	TM/C-06/01	mg/L	28	600
Magnesium hardness as CaCO3	TM/C-06/01	mg/L	16	600
Calcium	TM/C-06/01	mg/L	11.2	150
Magnesium	TM/C-06/01	mg/L	3.84	100
Sodium	TM/IO-03/01	mg/L	10.4	200
Potasium	TM/IO-03/01	mg/L	1.2	50
Total Alkalinity	TM/C-05/01	mg/L	41	_
Bicarbonates	TM/C-05/01	mg/L	50.02	_
Flourides	TM/IO-01/01	mg/L	0.24	1.5
Sulphates	TM/IO-01/01	mg/L	2.3	400
Chlorides	TM/IO-01/01	mg/L	12	250
Nitrates as N	TM/IO-01/01	mg/L	0.25	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	0.18	0.7
Total Iron	TM/C-08/01	mg/L	0.30	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 4: Screening Form- Environmental and Social Aspects

SUBPROJECT DESCRIPTION

Description of the project and its major components.

SUBPROJECT LOCATION

Name of Locality	
Community	*Land use designation, total population and density*
Present Use & Development	
Surrounding Uses/Zoning	North: South: East: West:
Access	*Name of the roadway if direct access, description of easement from a public or private roadway*
Public Services	Water Supply: name of the district, or if private, note "private onsite well" or "shared well" Sewage: name of district or "septic system" Other: e.g., school, health clinic…

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS

The following checklist indicates the potential level of impact and is abbreviated as follows:

- Known Significance: Known significant environmental impacts.
- Potentially. Significant. and Mitigable: Potentially significant impacts that can be mitigated to less than significant levels.
- Not Significant: Impacts that are not considered significant.

GEOLOGIC PROCESSES

Will the proposal result in:	**Known Significance.**	**Potential. Significance. and Mitigation.**	**Not Significant.**
a. Exposure to or production of unstable earth conditions such as landslides, soil creep, mudslides, ground failure (including expansive, compressible, collapsible soils), or similar hazards			
b. Disruptions, displacements, compaction or over-covering of the soil by cuts, fills, or grading?			
c. Permanent changes in topography?			
d. The destruction, covering or modification of any unique geologic or physical features?			
e. Any increase in the wind or water erosion of soils, either on or off the site?			
f. Changes in deposition, erosion or siltation that may modify the channel of a river, stream, or any water body?			
g. The placement of septic disposal systems in impermeable soils with severe constraints to disposal of liquid effluent?			

Will the proposal result in:	Known Significance.	Potential. Significance. and Mitigation.	Not Significant.
h. Excessive grading on slopes of over 20%?			
J. Sand or gravel removal or loss of topsoil?			
i. Vibrations, from short-term construction or long-term operation, which may affect adjoining areas?			
J. Excessive spoils, tailings or over-burden?			

Impact Discussion:

- ***Mitigation Measures:***

WATER RESOURCES/FLOODING

Will the proposal result in:	Known Significance.	Potential. Significance. and Mitigation.	Not Significant.
a. Changes in the course or direction of water movements?			
b. Changes in percolation rates, drainage patterns or the rate and amount of surface water runoff?			
c Change in the amount of surface water in any water body?			
d. Discharge into surface waters, or alteration of surface water quality, including but not limited to temperature, dissolved oxygen, turbidity, and solids?			
e. Alterations to the course or flow of flood waters, or the need for private or public flood control projects			
f. Exposure of people or property to water-related hazards such as flooding, or accelerated runoff			
g. Alteration of the direction or rate of flow of groundwater?			
h. Change in the quantity of ground waters, either through direct additions or withdrawals?			
i. Overdraft of any groundwater basin? Or, an increase in the existing overdraft of any groundwater basin?			
j. The substantial degradation of groundwater quality			
k. Substantial reduction in the amount of water otherwise available for public water supplies?			

Impact Discussion:

Mitigation Measures:

TRANSPORTATION/CIRCULATION

Will the proposal result in:	Known Significance.	Potential. Significance. and Mitigation.	Not Significant.
a. Generation of substantial additional vehicular movement (daily, peak-hour, etc.) concerning existing traffic load and capacity of the street system?			
b. A need for private or public road maintenance, or need for new road(s)?			
c. Effects on existing parking facilities, or demand for new parking?			
d. Substantial impact on alteration of present patterns of circulation or movement of people and/or goods?			
e. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians (including short-term construction and long-term operational)?			

Impact Discussion:
Mitigation Measures:
AIR QUALITY

Will the proposal result in:	**Known Significance.**	**Potential. Significance. and Mitigation.**	**Not Significant.**
a. The generation of air pollutants, a contribution to an existing or projected air quality violation or exposure of sensitive receptors to substantial pollutants?			
b. The creation of smoke, ash or odours?			
c. Dust generation?			

Impact Discussion:
Mitigation Measures:
BIOLOGICAL RESOURCES

Will the proposal result in:	**Known Significance.**	**Potential. Significance. and Mitigation.**	**Not Significant.**
• ***FLORA***			
a. Removal or disturbance of natural vegetation?			
b. A loss or disturbance to a unique, rare or threatened plant community?			

Will the proposal result in:	Known Significance.	Potential. Significance. and Mitigation.	Not Significant.
c. A reduction in the numbers or restriction in the range of any unique, rare or threatened species of plants?			
d. A reduction in the extent, diversity, or quality of native vegetation (including bush removal for fire prevention and flood control improvements)?			
e. Introduction of herbicides, pesticides, or other factors that would change or hamper the existing habitat?			
FAUNA			
f. A reduction in the diversity or numbers of animals on site?			
g. A deterioration of existing fish or wildlife habitat?			
e. Introduction of barriers to the movement of any resident or migratory wildlife species.			
h. Introduction of any factors (light, fencing, noise, human presence and/or domestic animals) that could hinder the normal activities of wildlife			

Existing Plant and Animal Communities/Conditions:
Impact Discussion:
Mitigation Measures:
ARCHAEOLOGICAL/CULTURAL RESOURCES

Will the proposal result in:	Known Significance.	Potential. Significance. and Mitigation	Not Significant.
a. Disruption, alteration, destruction, or adverse effect on a recorded historic or archaeological site?			
b. Disruption or removal of human remains?			
c. Increased potential for vandalizing, or sabotaging archaeological resources?			
d. Ground disturbances in an area with potential cultural resource sensitivity based on the location of known historic sites?			

Impact Discussion:
Mitigation Measures:
HISTORIC AND CULTURAL RESOURCES

Will the proposal result in:	Known Significance.	Potential. Significance. and Mitigation	Not Significant.
a. Adverse physical or aesthetic impacts on a structure or property at least 50 years old and/or of historic or cultural significance to the community?			
b. Beneficial impacts to a historic resource by providing rehabilitation, protection, conservation, etc.?			

Impact Discussion:
Mitigation Measures:
LAND USE

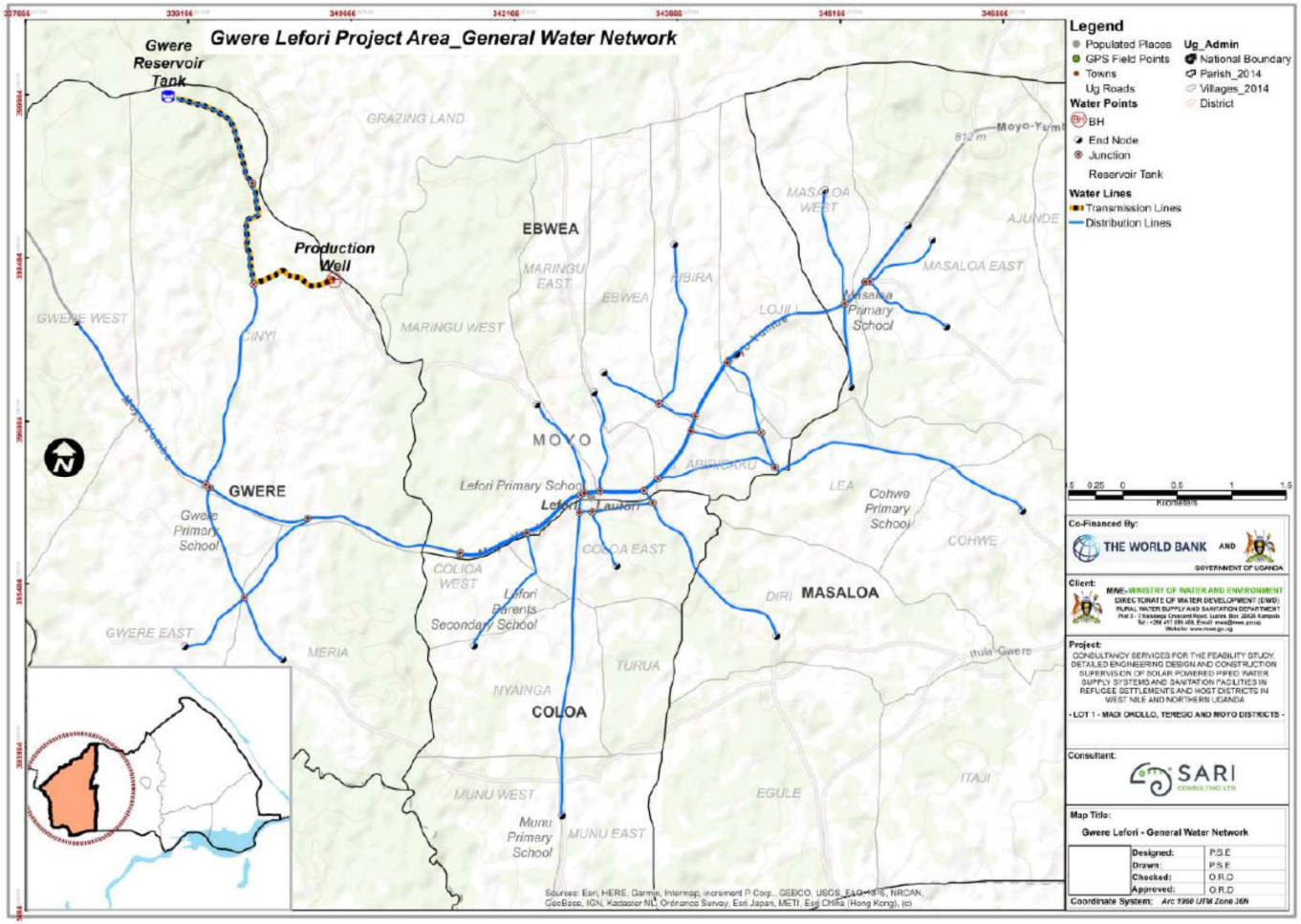
Will the proposal result in:	Known Significance.	Potential. Significance. and Mitigation	Not Significant.
a. Structures and/or land use incompatible with existing land use?			
b. The induction of substantial growth or concentration of population?			
c. The extension of sewer trunk lines or access roads with the capacity to serve new development beyond this proposed project?			
d. The conversion of prime agricultural land to non-agricultural?			
e. The loss of open space?			
f. An economic or social effect that would result in a physical change?			

Impact Discussion:
Mitigation Measures:
PUBLIC FACILITIES

GENERAL SERVICES- Will the proposal result in:	Known Significance.	Potential. Significance. and Mitigation	Not Significant.
a. A need for new health care services?			
b. Student generation exceeding school capacity and/or facilities?			
c. Additional amounts of solid waste and wastewater generation?			
d. A need for new or altered sewer system facilities (sewer lines, lift stations, etc.)?			

Impact Discussion:
Mitigation Measures:

Appendix 5: Map Showing the General Area Network for the Water and Sanitation System for Gwere Rural Growth Centre, Moyo District

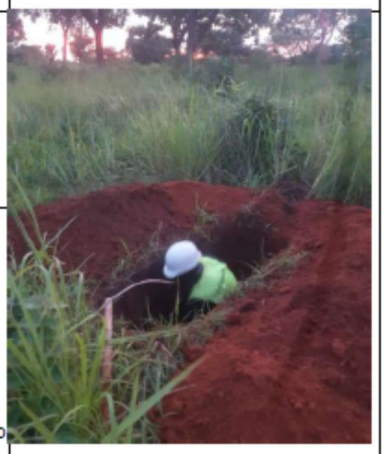


Appendix 6: Geotechnical Investigation Report / Results for Gwere Rural Growth Centre – Water and Sanitation System

Appendix 6 (a): Geotechnical Investigation Results for Gwere Water Reservoir (Tank site)

FIELD SOIL PROFILES

Project:	Soil Investigation For Detailed Engineering Design and Construction Supervision of Solar Powered Piped Water Supply Systems and Sanitation Facilties 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	Gwere 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 – 0.40		Soft moist darkish brown sandy CLAY	
0.40 – 2.00		Dense moist reddish brown clayey SAND	

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	Gwere 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 – 0.30		Soft moist darkish brown sandy CLAY	
0.30 – 2.00		Dense moist reddish brown clayey SAND	

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	Gwere 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 brown sandy CLAY	
0.30		Dense moist reddish brown clayey SAND	
2.00			

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	Gwere Tank Site		
Trial pit No	TP1		
Field work date:	05-06-23		

Depth	Soil Profile	Soil Description	Colour Photo of Soil Profile
0.00 Undefined		Brownish grey silty sandy with cobble underlain by highly weathered Conglomerate Rock	

Appendix 7: Stakeholder Consultations for the proposed Gwere Rural Growth Centre – Water and Sanitation System

Appendix 7 (a): Stakeholder Consultation Meeting Minutes and Attendance Lists for Moyo District Local Government

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 including; the water source, the reservoir, the access road And targeted communities • The Project Manager introduced 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.

MINUTES	AGENDA ITEM	DISCUSSION
		• URTC also needed to understand the communities and gain 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. • 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.

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 Lefori Sub County
Stakeholder	The Political and Technical staff of Lefori Sub County Sub County
Date	18th April 2023
Time	09:05 pm-10:30 pm
Members Present	4. **Lefori Political and Technical Staff** 5. **URTC Consultants** 6. **MWE Officials**

Agenda	5. Self-Introduction 6. Brief from the MWE 7. Remarks from the Team leader-URTC 8. 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 including the water source, the reservoir, the access road And targeted communities • The Project Manager introduced 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 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 gain 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	**Response from the Sub-County Officials**	• The County will support the project • The project is water stresses, and water should be extended to other areas. • The chairman informed the meeting that the community has consented and signed MOUs for the water source, sanitary facilities and location for PSP.

MINUTES	AGENDA ITEM	DISCUSSION
		• The reservoir was identified in the land for NFA but is yet to be confirmed.
	Discussion	• Need to confirm the land for all the facilities to facilitate the RAP studies.

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 Lefori Town Council
Stakeholder	The Political and Technical staff of Lefori Town Council
Date	20th April 2023
Time	09:05 am-10:30 am
Members Present	7. **Chair Person** 8. **URTC Consultants** 9. **MWE Officials**
Agenda	9. Self-Introduction 10. Brief from the MWE 11. Remarks from the Team leader-URTC 12. Remarks from the Chairperson.

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 including; the water source, the reservoir, the access road and targeted communities • The Project Manager introduced 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. • The project targeted Gwere, which was split into Gwere Sub County and Lefori Town Council

MINUTES	AGENDA ITEM	DISCUSSION
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 gain 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	**Remarks from the Chairperson**	• The Town Council started operating in 2021 • The township has a water supply and is managed by the Umbrella • However, the water is insufficient, and the community rarely gets water • Some refugees are self-settled settled in Abua Cell totalling between 40-50 households • The people have been sensitized especially about the pipeline, as they may be able to re-use the land after the burying of the water pipes. • Those who gave land for the water source and reservoir demanded to be given free water (with the standpipes). • The WUC 's term of office expired, therefore there is a need to elect a new committee.

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

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.**
Members Present	**10. Moyo District Officers (Physical Planner, Environmentalist and Planner)** **11. URTC Consultants** 12. **MWE Officials**
Agenda	13. Self-Introduction 14. Brief from the MWE 15. Remarks from the Team leader-URTC 16. 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 including; the water source, the reservoir, the access road And targeted communities • The Project Manager introduced 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 gain a quick understanding of the assignment. • He informed me that meeting the initial team to undertake a reconnaissance is small but during the detailed study, the team will be bigger to undertake all the detailed studies. • He indicated that the negative impacts will be minimized;

MINUTES	AGENDA ITEM	DISCUSSION
		• 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. • 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.

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10	DRICHIRU MALKA	C.in	0785440684 [illegible]
11	LOKUTO MOSES	SAS	0774734046
12	IZARUKU LEON	LC DF	0776164842
13	ENZRU	~~Lo~~ FLO	"
14	DRANIA CHRISTINE	[illegible]	0762762569.
15	ASITOLO NATALINE	[illegible]	–
16	BAYDA NIGHT	B.N	–
17	~~[illegible]~~ MAZAPWE FLOWERENCE	M.F.	0781612093
18	KETARI JANE	K.J.	–
19	KIDENI JANE LIMIO	J.L	0784036438

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21	CHANDIA ROSE	MEMBER	0775573328
22	SITIMA MARY		0760855590
23	LIMIO ANET		—
24	KANDARUKU JAMES	CHINYI	0773886262
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2	osole Badura idiriJ	mutuju	0775524540
3	IPAVU HABERI	member	0787393377
4	ERUNGA JAMIZ	CENTRAL	0762052131
5	ANZO GODFREY	CHAALA CELL	0763670831
6	YUNDRULE VINCENT	CHAALA CELL	—
7	MITEDIJEKANA APAYO	CHAALA CELL	0770628860
8	ABABIKU GLORIA	CENTRAL CELL	—
9	UZUA JOSEPHINE	CENTRAL CELL	—

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13	ABIBI FATUMA	CENTRAL CELL	0777104443
14	MARGRET KIDEO	CENTRAL CELL	—
15	CHANDIRU SUSUMAN	CENTRAL CELL	—
16	ASIO CHRISTINE	CENTRAL CELL	—
17	MAWADRI THOMAS	CENTRAL CELL	0762806574
18	DRAKADA DOMINIC	CENTRAL CELL	0780814902
19	LETIO SROVIA	CHALLA CELL	0770382453

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22	CHANDIA REBECCA	CENTRAL CELL	—
23	KAYO JD EVALINE	CENTRAL CELL	07
24	CHANDIA ELIZA	CENTRAL CELL	0
25	LEDAWO HARRIET	CENTRAL CELL	07

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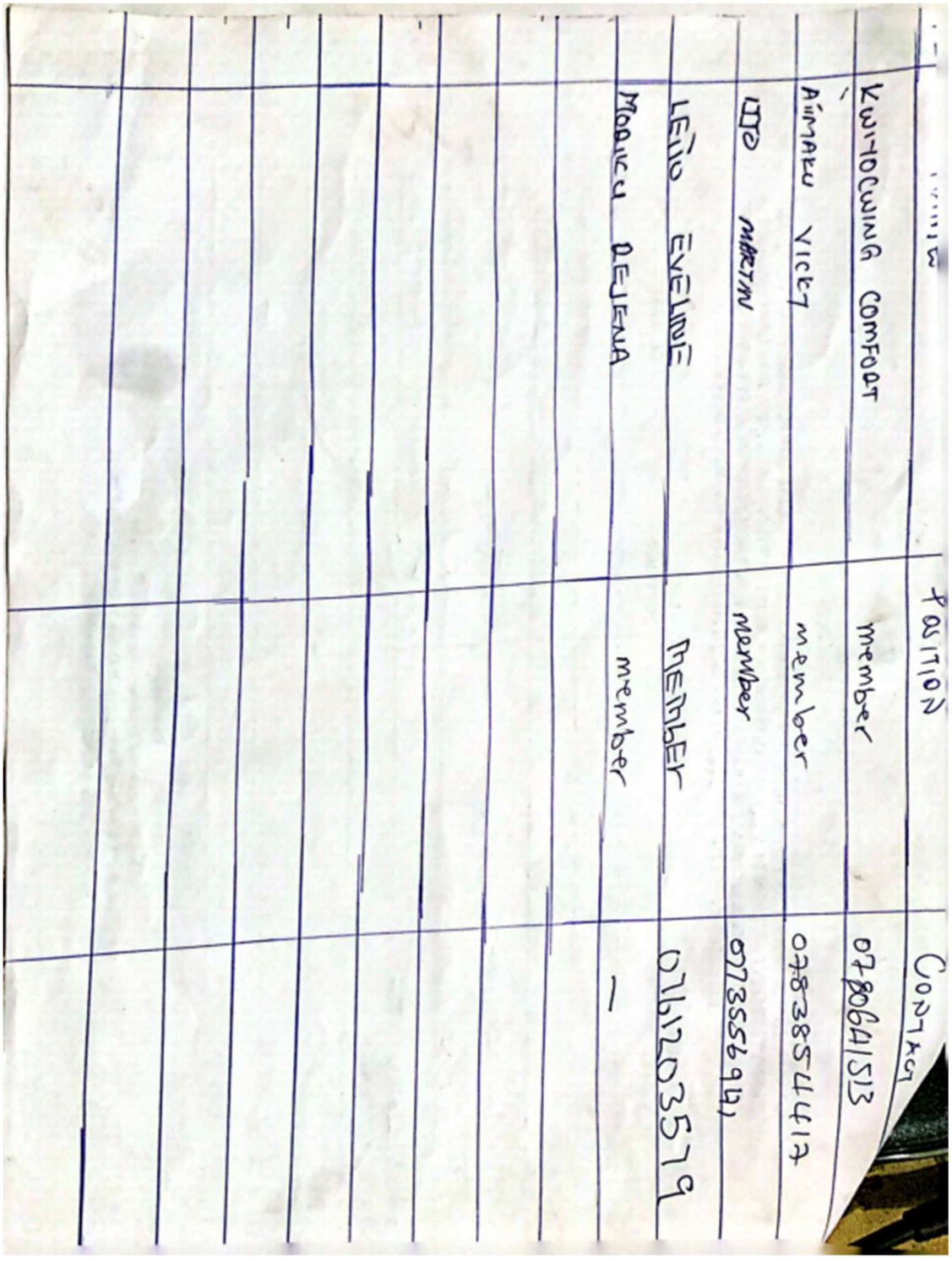

KWIHOCWINA COMFORT	member	0780641513	
AIMAKU VICKY	member	0783854417	
LITO MARTIN	member	0783556947	
LEIO EVELINE	MEMBER	0761203579	
MOSES DEJENA	member	—	

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3	AYU AYUKO SIMON	ELDER	0785291726
4	VUKONI KAMAZON	LCI CP	0779149217
5	LIMIO BETTY	WOMEN COUNCILOR	0786005247
6	MURAA GRACE KUDE	WOMEN Councelor	0789161641
7	MORIKU MARTINA	MEMBER	—
8	DRANIA RUZETA	〃	〃
9	LIMIO JANE	〃	—
10	ALIRU JIMMY ROMUBE	CDO	0772852336

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Lefori - Town Council

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CONSULTATION LIST

NO	NAME	POSITION	CONTACT
1	TIONDI DOMINIC	LCIII C/P / MAYOR	0779021957
2	VUKONI ROBERT	CDO	0782142469
3	DRAGULE ALFRED SUNNA	PWD REP.	0781160081
4	ABDUL-AZIZ FARJALLAH	DIST. PHYSICAL PLANNER	0778282772
5	LINDRIO OLGA	PRODUCTION / ENV. OFFICER	0788704531
6	APANGU MUBARAK		0789170599
7	HASSAN WASI WASI (NURU)	SALON	0789170613
8	RASHID SIRAJI		0782553769
9	AKIM Taban		0761400453
10	AKIM RASHID	—	0776414646
11	AZIKU TAIBI		0779882484
12	MALIAMUNDU AHMED	Forest C/P	0773607812
13	ARERE INNOCENT ANTIAMA		0760613219
14	AMORU ISMALI	—	0762377332
15	SIJAW RATIB	Boad Boad	0772709999
16	YEKA RATIB	Business	0789142967
17	ASOBASI SWAIB BRAN	~~LC? C/P~~ Education	0774502844
18	Chaiga Robert	LC7 C/Person	0789148969
19	ALMA ROSE		0773376804
	INAIGO TOBIAS	WC Chairperson	0772926255

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21	KUBRA AKHIM		0760527671
22	DRABO ZUBEDA		
23	Anyanzo Elias	L.C1 G. Secretary	0774007593
24	Madrama Joseph	member	0777707701
25	RATIB TABAN	member	0787989653
	BUSI JULIUS	M	0779588350

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1	ANYAMA ROBERT	Member	0787158002
2	Achile Majid Omar	Member	0772788344
3	Dragule manisur	Member	0775765019
4	ASIKU TIMA'	"	0783 42 42 94
5	IUUGO CHRISTOPHER	"	0774479965
6	EREMA JUSTINE	LCI C/P.	0789331568
7	IKUMABRU RATIR	Member	—
8	KELEMTINA ABIRIGA	member	—
9	OBU-OKOT CHARLES	Member	0780758015
10	MINZE SWADIK	"	0777270995
11	HILMAKU JOYCE	"	0782406553
12	CERERITRE ABIRIGA	member	—
13	ASUSI STEPHEN	Member	0777-499843
14	AWUA KOSIA	M.	0788354078
15			
16	ABIRIGA ISMAIL	"	0744216570
17	SHAMIRA NEVER	MEMBER	0771631444
18	DRANYUNA PASKALE	MEMBER	0788402305
19	MOKO Jusper	Member	—
	JOYECE CHAMDIYA	member	—

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Lefori S/c

Gwere East Village

Ministry of water and environment
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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

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2	MUKIKU REGINA	–	–
3	BATTO ALICE.	–	–
4	UNZIMAI PATRICK	–	–
5	HAQUNA TONO	–	0772766888
6	ONIDOHA STEPHEN	–	–
7	MAEU SAMSON	–	0779137031
8	MAIZIRA EVALINE	–	–
9	ADUNIA EVALINE	–	0785630344
10	EZARU FLORENCE	–	–
11	MAZAPKWE JANE	–	–
12	ASARA MARY	–	–
13	MAZIRA IMMACULATE	–	0788378855
14	ADRANIA RUZETA	–	0760246755
15	BUNIA EMINIA	–	–
16	VERONICA AJUA.	–	–
17	GUO NEDIA	–	0779202329
18	GIRATA AJUA	–	–
19	GIRE SCOVIN	–	0785060194

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Lefori Sub / County
Gwere East Village
(FGD) women

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21	NIURAA GRACE KIDE	–	0759161641
22	KOTO CHRISTINE	–	0782468124
23	LIMIO BETTY	–	0786005246
24	CHEKA MONICA	–	0761400776
25			

Lefori T/C FGD (women)

maringo LCI

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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	ATIMARU JOYCE	Member	
2	KEBEMETINA ABRIGA	"	0772406553
3	CEZEREIN ABRIGA	"	Nil
4	ALMA ROSE	"	Nil
5	UNZIA RAMULA	"	0773376804
6	DRABO ZUBEDA	"	0782832601
7	MORIA CELINA	"	
8	LATIA MARY	"	0789078448
9	JOYCE CANDIA	"	0773766990
10	PALIMURA ISOJO	"	
11	PALIMIRA BUNI	"	
12	JUSPIN MOWO	"	
13	LAZEA JULIET	"	
14	PITA CICICIA		
15	LENIA SAMUSA	"	
16	KUBURA AGIMU	"	0780964705
17		"	0789974196
18			0774499368
19			

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Lefori Town Council (Community Meeting)

Ministry of water and environment
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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

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2	TAGAZA NAGGO	Member	0786195510
3	ATUNGI MUBARAK	Member	0783916670
4	NYAMO Abed		0778491299
5	Alli Osuman	member	
6	RATIB TABAN	member	0787996653
7	RONGUMU Jimmy	Member	0786961172
8	Moruja Celina	member	0789078400
9	Abudu Sebi	member	0763458438
10	Latiga Mary	member	0773765990
11	ONDOGA JAMES	VCG PARTICAM	0786195881
12		member	
13	ALI DRICHI	member	0786402057
14	IPE PETER	member	0772785411
15	AGUA ZAINABO	member	0779027977
16	SUMBUA SALLA	MEMBER	0783116401
17	Palimisa Buni	member	
18	ISMAIL MASE	MEMBER	0782311822
19			

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Appendix 7 (b): Household Survey Tools used for the Water and Sanitation Project

HOUSEHOLD SURVEY QUESTIONNAIRE CENSUS QUESTIONNAIRE FOR PREPARING THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT) FOR THE PROPOSED WATER AND SANITATION PROJECT IN MOYO, TEREGO AND MADIKOLLO.

PAP Ref. No……. GPS Easting……. GPS Northings……
Date: ……/……/ 2023.

Introductory Remarks

Good morning / Good afternoon Sir / Madam,
My name is ……..……., I am part of the survey team from Ministry OF Water and Environment). We are conducting a detailed baseline Socio-Economic survey for the proposed Water Supply and Sanitation Infrastructure Project in West Nile (Moyo, Terego and MadiOkollo). This survey involves talking to potentially affected/beneficiary community members like you about their demographic characteristics, employment, Sources of livelihoods, social cultural sites, settlement patterns and your access to social services. This baseline survey is also intended to identify vulnerable groups in the project area, and assess the pre-project socio-economic conditions within the project area). The information generated from the baseline survey will be used to establish alternatives to resettlement and compensation among affected and impacted persons. It will also help MWE to prepare a Social Impact Assessments Statement and collecting bench mark information from affected and benefiting communities for purposes of monitoring their future livelihoods among other factors.
Therefore, the purpose of my visit here is to request for your time so that we can have a short discussion. If you agree, I will be asking you some questions and recording your answers. Our discussion will be confidential with responses used for the purpose mentioned above. The discussion will take about 45 minutes or maximum of one hour.

Instructions:

- ***Please only select appropriate responses.***
- ***Strictly observe multiple responses.***
- **Do not start the interview before you explain the purpose of the study *(Refer to the introduction)***
- **Respondent is supposed to be preferably head of the household. If not possible interview the spouse, or elderly children above 18 years.**
- **Pay attention to gender equality and be inclusive in your approach as you collect the data (capture everyone's voice)**
-

Are you willing to be interviewed? 1. Yes 2. No (**If No, terminate the interview**)

SECTION 1: IDENTIFICATION PARTICULARS

1.1. District	1. Moyo 2. Terego 3. MadiOkollo	***Sub Counties***	1. Otce, 2. Laropi Town Council, 3. Laropi Sub County 4. Ewanga Sub County 5. Uriama Sub County 6. Lefori Sub County
1.3. Division /Sub County		1.4. Parish/Ward	
1.5. Village/Zone		1.6.. HH Head's Name:	

1.7.Starting Time (*24 Hr Format*)		1.8. Date	……/...../.....

1.9. GPS Reading		**GPSNORTH:**	**GPSEAST**:
1.10 Water System		1. Laropi 2. Pajakiri 3. Gwere 4. Ewanga 5.Edrayo)	
SECTION 2- DEMOGRAPHIC DETAIL OF HOUSEHOLD HEAD			
2.1.	Respondent's Name		
2.2.	Sex of Respondent	Male	1.
		Female	2.
2.3.	Relationship with the Head of the Household head	Head	1
		Spouse	2
		Son	3
		Daughter	4
		Parent to the head/Spouse	5
		Sister to the HHH	6
		Brother to the HHH	7
		Other (Specify)	8
2.4	Respondent's Age	……	
2.5	Household Head Sex?	Male	1.
		Female	2.
2.6	Approximate Age of the HH head?	_____	
2.7	Marital status of Household Head?	Married /cohabiting	1.
		Divorced/separated	2.
		Widow	3.
		Widower	4.
		Single	5
		Minor/Not applicable	6
2.8	What is the tribe of the Household Head?	Basoga 2=Alur 3= Bagwere 4=Itesot 5=Bagisu 6=Bakiga 7=Lugbar 8=Baganda 9= Balamogi 10=Japadhola 11=Banyole 12=others	
2.9	What is the religion of the HH head?	Catholic	1
		Anglican	2
		Muslim	3
		Pentecostal	4
		Orthodox	5
		Seventh day Adventist	6
		Traditionalist	7
		Others (specify) _____	8
2.10		Yes	1

	Can the HH Head read or write in any language?	No	2
		Not sure	3
2.11	What is the highest level of education attained by the HH head?	No education	1
		Primary	2
		O-Level	3
		A-Level	4
		Tertiary/Diploma	5
		University	6
		Vocational	7
		FAL	8
		Other (Specify)…….	9
		Don't know	10
2.12	What is the HH head's major source of income?	Farming	1
		Casual labour i.e digging in gardens	2
		Monthly salary	3
		Trade/business/retail shop	4
		Property income/rentals	5
		Stone quarrying	6
		Brick laying	7
		Boda-boda	8
		Sand selling	9
		Market stall (Muddala)	10
		Welding/carpentry	11
		Builder	12
		Animal rearing	13
		Fishing	14
		Transfer/remittances	15
		No income source	16
		Other _____	17
2.13	Is this area your usual place of residence?	Yes. 1. No. 2	
2.14	Is this area your usual place of work?	Yes. 1. No. 2	
2.15	For how long in years have you been in this area?	_____YEARS	
2.16	How many people live with you in this/your household on a permanent basis (including yourself) **If single, recode "00". Otherwise recode number of people in household**		

2.17 How many people live with you in this/your household on a permanent basis	Male_____ Female_____ Total_____

S/R	**B13 Name Initial**	**B14. Sex** 1.Male 2.Female	**B15.Age (Approximate)**	**B16. Relationship to HH** Spouse Son/Daughter Grandchild Step child Sister/Brother Nephew/Niece Parent of Head Servant	**B17. Level of education** No education Primary O-Level A-Level Tertiary/Diploma University Vocational FAL Other (Specify). Don't know	**B18. Main occupation** No work Farming Casual labour Monthly salary Trader/business Rentals Stone quarry Brick laying Bodaboda

				Other relative Other _____		Sand selling Market stall (Muddala) Welding/Carpentry Builder Animal rearing Fishing Remittances Housewife Student Other _____
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
2.18	In case you have school age going children, do you have difficulty keeping them in school?				→ Yes. 1. No. 2 skip to 2.20	
2.19	What makes it hard for children to continue attending school? ***(Multiple responses allowed)***				1. School fees 2. Lack scholastic materials 3. Lack of Lunch 4. Lack of Uniform/clothing 5.Examination fees 6. Transport 7.Examination fees 8. Other_____	
2.20	Do you have children who dropped out of school?				→ Yes. 1. No. 2 skip to 2.22	
2.21	What are the reasons why some children dropped out of school? ***(Multiple responses allowed)***				1. Completed desired level 2. Lacked sch fees 3. Too young 4. Sickness 5. Disabled 6. School was far 7. Domestic work 8. Engaged in work 9.Orphaned 10. Early pregnancy 11. Early marriage 12. Other_____	
2.22	Do you Have any orphans below 18 years?				→ Yes. 1. No. 2 skip to 3.1	
2.23	Do you have orphans below 18 who dropped out of school before AND after the Covid lockdown?				Yes. 1. No. 2	
2.24	Of the adults in your household, how many are currently working and not working?				Number working: ……. Number not working…….	
2.25	Why are some of the adults in your household not working?				No employment Old/elderly Sickly Disability Not interested Students Other (specify)	

2.26	What is the main means of communication for members of your household?	None Fixed telephone House in the house Public Telephone cell Phones Others (specify)
2.27	Have you ever received information regarding the Proposed infrastructure projects?	Yes No**(If no go to the Next Section)**
2.28	If yes to 1.28, who provided you with the information? **Multiple responses**	LC1 Radio Friend/Relative UNRA/Its Counterparts/Consultants Contractor Others (specify)
2.29	In what form was the information provided?	Telephone call Letter Community meeting Other (Specify)
2.30	How long ago **(in months)** did you receive the information?	One month ago More than one month ago Other (specify)

SECTION 3: HOUSEHOLD INCOME AND EXPENDITURE

3.1	What is the approximate monthly income from the major income source?	**Monthly income**	Code
		Less than Shs 100,000	1
		Shs 100,000-299,000	2
		Shs 300,000-499,000	3
		Shs 500,000-699,000	4
		Shs 700,000-899,000	5
		Shs 900,000 and above	6
		Does not know income	7
		Not willing to give info.	8

3.2.	How much do you spend monthly/quarterly on the following household items in UGX?			**Amount**
	Frequency code 1=Daily 2=Weekly 3= Monthly 4=Quarterly 5=Annual		**Frequency code**	
		Health care		
		School Fees **i.e.** ***per term***		
		Transport		
		Rent		
		Electricity bills/fees		
		Fuels (.charcoal/paraffin/wood)		
		Food		
		Water bills/fees		
		Clothing		
		Airtime/data		
		Entertainment/football games/alcohol		
		GOTV/DSTV/Start-times/Azam TV		
		Others		
		No		2

SECTION 4: CROP AND LIVESTOCK PRODUCTION		
4.1	Is the household engaged in crop farming in the village?	→Yes. 1. No. 2 skip to 4.4
4.2	Which food and cash crops do you grow? Food crops *(use provided coded)*___, ___, ___, ___, ___, ___, Cash crops *(use provided codes)*___, ___, ___, ___, ___,___, **If does not grow cash crops use code 20.**	1. Banana 2. Coffee 3. Maize 4. Gnuts 5. Beans 6. Cassava 7. Sweet potatoes 8. Peas 9.Yams 10. Irish potatoes 11. Tomatoes 12. Pineapple 13. Sugarcane 14. Fruits trees 15. Vegetable 16. Vanilla 17. Pumpkin 18.Tree planting 19.Other 20. None
4.3	Do you practice improved farming practices?	Yes. 1. No. 2
4.4	Do you keep any animals/birds?	→Yes. 1. No. 2 ***Skip to 5.1***
4.5	Which animals do you keep within this village? *(Multiple responses allowed)*	Indigenous cattle 2. Exotic cattle 3. Cross breed cattle 4. Goats 5. Sheep 6. Pigs 7. Rabbits 8. Chicken 9. Ducks 10. Turkey 11. Others
4.6	What type of livestock production system do you practice?	Communal grazing 2. Tithering/rope 3. Mixed animals 4. Fenced daily 5. Zero grazing 6. Other_____
4.7	Does household graze animals within the project site?	Yes. 1. No. 2

SECTION 5: WELFARE INDICATORS				
5.1.	**Welfare indicators** Do you own any of the following items in your household? *(Enter 0 in column E1.b if the respondent does not have an item)*	Household Items	Items - E1.a	No. of items - E1.b
		Radio	1.	
		Television	2.	
		Decoder	3.	
		Cellphone	4.	
		Computer	5.	
		Solar panel	6.	
		Bicycle	7.	
		Motorcycle	8.	
		Vehicle	9.	
		Tractor	10.	
		Other: _____	11.	
5.2.	Who owns most of the household property? (in reference to responses to E1)	Husband		1.
		Wife		2.
		Both (husband & wife)		3.
		Daughter/ son		4.
		Others (specify)		5.
5.3.		Husband		1.

	Who mostly makes decisions on purchase/sale of household property?	Wife	2.
		Both (husband & wife)	3.
		Others (specify)	4.
SECTION 6: HOUSE TYPOLOGY AND LAND OWNERSHIP			
6.1	What is the nature and status of the dwelling/house structure /type**? (***observe, do not ask***)**	Temporary	1.
		Semi-permanent	2.
		Permanent	3.
6.2	Does your household own or rent this dwelling/house?	Own (*skip to F4*)	1.
		Don't own but live for free (*skip to F4*)	2.
		Renting	3.
6.3	If renting, how much do you pay per month?	UGX/month_____,	
6.4	How many rooms does your household occupy? (*exclude kitchen*)	Rooms _____,	
6.5	What is the type of house floor? ***(observe, do not ask)***	Mud floor	1.
		Cemented floor	2.
		Tiled floor	3.
		Other (specify)_____	4.
6.6	What is the type of the house wall? ***(observe, do not ask)***	Clay bricks	1.
		Burnt bricks	2.
		Mud and wattle	3.
		Poles and reeds	4.
		Cement plaster	5.
		Other	6.
6.7	What is the type of house roof ***(observe, do not ask)***	Grass thatched	1.
		Iron sheets	2.
		Tiles - ***Mategula***	3.
		Asbestos	4.
		Other (specify):_____	5.
6.8	What is the main use of your house? *(Multiple responses allowed)*	Residential	1.
		Rental/commercial	2.
		Dual purposes	3.
		Other (specify):_____	4.
SECTION 7: *Continued* LAND OWNERSHIP AND TENURE			
7.1	How did you acquire the land where the house/dwelling is seated?	Bought	1.
		Renting	2.
		Inherited	3.
		Gift	4.
		Leasing	5.
		Simply settled/squatter	6.
		Other, (specify)_____	7.

7.2	Total size of this land in acres?	*(Insert figure in acres)*_____	
7.3	Under what tenure system is your land?	Private Mailo	1.
		Kibanja - Mailo	2.
		Kabaka land	3.
		Customary	4.
		Freehold	5.
		Leasehold	6.
		Other, (Specify)…….	7.
7.4	What documents do you have to prove land occupancy/ownership?	Land title	1.
		Purchase Agreement	2.
		Tenancy Agreement	3.
		Registration receipt	4.
		Letter of Administration/ Will	5.
		Busuulu receipt	6.
		None	7.
		Other (Specify)	8.
7.5	How do you utilize your land? ***(Multiple responses allowed)***	1. Crop farming 2. Animal rearing 3. Poultry 4. Rent it out 5. Brick making 6. Tree planting 7. Commercial building 8. Construction material 9. Stone quarrying 10. Recreation 11. Business activities 12. Bee keeping 13. Fish pond 14. Cemetery/graves 15. Other_____	

SECTION 8: ENERGY FOR COOKING AND LIGHTING

8.1.	What energy is used for **cooking** ***(Multiple responses allowed)***	Firewood	1.
		Charcoal	2.
		Electricity	3.
		Kerosene	4.
		Animal dung	5.
		Briquettes	6.
		Biogas	7.
		Gas	8.
		Other	9.
8.2	What fuel/energy is used for **lighting**? ***(Multiple responses allowed)***	Tadooba	1.
		Paraffin lamp	2.
		Candle	3.
		Electricity	4.
		Solar	5.
		Dry cell lamp	6.
		Recharge lamp	7.
		Phone torch	8.
		None	9.
		Other	10.

SECTION 9: EDUCATIONAL SERVICES

9.1	What is the distance to the nearest primary school?	Less than 500ms	1.

		500m – 1Km	2.
		1 – 3 Kms	3.
		Above 3Kms	4.
9.2	What is the distance to the nearest secondary school?	Less than 500ms	1.
		500m – 1Km	2.
		1 – 3 Kms	3.
		Above 3Kms	4.
9.3	How do you rate the quality of education services offered by schools in your area?	1. Good 2.Average 3. Poor 4. Don't know 5.Not Applicable	
9.4	Is the school where your children attend day or boarding?	1. Day 2. Boarding 3.Day/boarding 4. Not Applicable	
9.5	What is the ownership of most of the schools in this community?	1. Government Aided 2. Community 3. Private 4. Religious-private 5. Other_____	
SECTION 10: HEALTH & MOBILITY			
10.1	Has any member of the household been ill in the last 6 months?	1. Yes 2. No 3. Not sure	
10.2	If yes in J1, how many by sex?	Male_____ Female_____ Total_____	
10.3	What was he/she suffering from? ***(Allow multiple responses)***	Malaria	1.
		Cough	2.
		Syphilis	3.
		HIV	4.
		Gonorrhea	5.
		Burns	6.
		Ulcers	7.
		Skin rush	8.
		Respiratory infections	9.

		Cholera	10.
		Dysentery	11.
		Typhoid	12.
		Diarrhea	13.
		Intestinal Infections/worms	14.
		Hepatitis B	15.
		Eclipsys	16.
		Hernia	17.
		Covid 19	18.
		None	19.
		Other _____	20.
10.4	What is the name of the nearest health facility?	_____	
10.5	Is the health facility actually used by the HH	Yes.1 No.2	
10.6	If No in J5, what are the reasons why some health facilities are not used by community members? (Multiple responses allowed)	1. Poor quality services 2.No drugs 3. Health centre is far 4. Medical staff not enough 5.Services expensive 6. Specialized services not available 7. High staff Absenteeism 8. Poor attitude 9. No customer care 10. Lack qualified staff 11. Other_____	
10.7	What is the level/type of the health facility?	1. HC II 2. HC III 3. HC IV 4. Hospital 5. Referral hospital 6. Private clinic 7. Drug shop 8. Don't know	
10.8	How do you rate the quality of services offered at nearest Health facility used by the household?	1. Good 2.Average 3. Poor	

10.9	What is the distance to the nearest health facility?	Less than 500 meters	1.
		500m - 1km	2.
		1 - 3kms	3.
		Above 3kms	4.
SECTION 11: WATER SUPPLY			
11.1	What is the main source of water for your household? (Only one response is allowed)	1.Piped house connection 2. Bore hole 3. Rain water harvesting 4.Protected well 5. Unprotected spring 6. River/swamp 7. Valley dam 8.Yard tap 9. Public stand tap 10. Vendor 11. Other _____	
11.2	Apart from domestic use, what else do you use the water for?	1.Brick making 2. Watering animals 3. Watering poultry 4. Watering crops 5. Brewing 6. Selling 7.Other_____	
11.3	What is the distance from your home to the water source?	1.Within compound 2.Less than 200meters, 3.201m-500 meters 4.501 to 1000 meters 5.1oo1- 1Km 6..1-3Km 7.Above 3Km	
11.4	What problems do you encounter with the water source? (Multiple responses allowed)	1. Dries up/unreliable 2. Too crowded 3. Too far 4.Expensive 5. Low flow 6. Dirty/poor quality water 7. Swampy 8. None 9. other (specify)_____	
SECTION 12: SANITATION			
12.1	Do you have a toilet/latrine? Just observe.	→Yes 1 No 2 Skip to 12.4	
12.2	What type of latrine does your household use? (Just observe if at home/site)	1.Flush toilet 2. Traditional pit latrine 3. VIP latrine 4. Shallow pits 5. ECOSAN 6. Public latrine 7. Bush 8. Other_____	
12.3	Does the toilet have a hand washing facility? (Just observe)	→Yes. 1. No. 2 Skip to 12.5	
12.4	If yes in12.3 above, is there soap? (Just observe)	Yes. 1. No. 2	
12.5	How does your household dispose of the solid waste? (Multiple responses allowed)	1. Burnt at household level 2. Collected by District/Sub-county vehicle 3. Rubbish pits 4.Scattered in garden 5. Composite pit 6. Garbage collector 7. Other_____	
SECTION 13: VULNERABILITY			
13.1	Are you (household head) chronically ill?	→Yes 1 No 2 Skip to 13.2	
13.2	What chronical illnesses are you suffering from? (Allow multiple responses)	1.Ulcers, 2. Sickle Cells, 3. Cancer (Leukemia etc), 4. Diabetes, 5. Asthma, 6. High Blood Pressure, 7. Hydrocephalous, 8. Tuberculosis, 9. HIV/Aids, 10. COVID 11. Other _____	

13.3	Do you have difficulty seeing, even with glasses?	1. No, difficulty 2. Yes, some difficulty 3. Yes, a lot of difficulty 4. Cannot do at all
13.4	Do you have difficulty hearing even with hearing aid?	1. No, difficulty 2. Yes, some difficulty 3. Yes, a lot of difficulty 4. Cannot do at all
13.5	Do you have difficulty walking or climbing steps?	1. No, difficulty 2. Yes, some difficulty 3. Yes, a lot of difficulty 4. Cannot do at all
13.6	Do you have difficulty remembering certain things?	1. No, difficulty 2. Yes, some difficulty 3. Yes, a lot of difficulty 4. Cannot do at all
13.7	Do you have difficulty with self-care such as washing, dressing or cleaning the house?	1. No, difficulty 2. Yes, some difficulty 3. Yes, a lot of difficulty 4. Cannot do at all
13.8	Using Luganda or any language, do you have difficulty communicating or being understood?	1. No, difficulty 2. Yes, some difficulty 3. Yes, a lot of difficulty 4. Cannot do at all
SECTION 14: HIV/AIDS		
14.1.	What is the prevalence of HIV/AIDS infection in this area?	1. Very low 2. Low 3. High 4. Very high 5. Don't know
14.2.	What factors are likely to contribute to the spread of HIV/AIDS in this area? (Allow multiple responses) 1. Poverty 2. Lack of information 3. Peer pressure 4. Alcohol abuse 5. Drug abuse 6. Parental neglect 7. No antenatal care service 8. No HIV service providers 9. Gender based violence 10. Prostitution 12. Early marriage 13. Rape 14. Defilement 15. Lawlessness 16. Other_____ 17. Don't know	14.3. How can HIV/AIDS be controlled or reduce avoided? (Allow multiple responses) 1. Sensitization activities 2. Prevention of GBV 3. Bylaws against prostitution 4. Promotion of ABC 5. Campaigns against drug/alcohol abuse 6. Improve antenatal care services 7. Engage HIV service providers 8. Bylaws against early marriage 9. Gender empowerment 10. Testing & counseling 11. Other (specify)_____
14.4.	What are these HIV/AIDS risky groups? 1. Adolescents 2. Poor women 3. Men 4. Contractors/workers. 5. Sex workers 6. Prostitutes 7. 8. Orphans 9. Others_____ (Multiple responses allowed)	14.5. What are the sources of information about HIV/AIDS? (Multiple responses allowed) 1.Television 2.Radio 3.Newspapers 4. Billboards 5.Posters/brochures 6. Community outreaches 7.Drama performances 8.Health facilities 9.NGO/CBO/CSO 10.Religious leaders

		11.Tranditional leaders 12.Local leaders 13.Political leaders 14.Family members 15.Friends/peers 16.Others_____
14.6.	Do you think the proposed project will have an effect on the increase of HIV prevalence in the area?	1.Yes 2. No 3. Don't know
SECTION 15: VIOLENCE AGAINST CHILDREN		
15.1.	Do you know any adolescent in your community who became pregnant or was impregnated in the last 12 months?	→Yes 1 No 2 Skip to 15.3
15.2.	If yes, who are the main perpetrators of adolescents girls pregnancy in this area?	1. Adults >35 years 2. Young adults <20 years 3. Adolescents of similar age 4. Don't know (Multiple responses)
15.3.	Do you think the proposed project in this area will expose girls to early pregnancy?	1.Yes 2. No 3. Don't know
15.4.	How could you rate the prevalence of child labour in this area?	1. None 2. Low 3. Relatively High 4. Very high 5. Don't know
15.5.	Do you think the proposed project in this area will promote child labour?	1. Yes 2. No 3. Don't know
SECTION 16: DOMESTIC & GENDER BASED VIOLENCE		
16.1	How would you rate the prevalence of domestic violence in this area?	1. None 2. Very rear 3. Relatively common 4. Rampant 5. Don't know
16.2	What are the common abuses in the community? ***(Multiple responses allowed)***	1. Women beating 2. Burning 3. Verbal abuses/insults 4. Defilement 5.Unwanted sexual touches 6. Early marriages 7. Use of women money without consent 8.Preventing women from using family land 9. Stop women from community meetings 10. Preventing women from working 11.Engaging children in work instead of school 12.Parental neglect 13.Other_____
16.3	Who are the main victims of domestic violence in the area? ***(Multiple responses allowed)***	1.Girls 2. Married women 3. Boys 4. Men 5. Children 6. Maid 7. Other _____ 8 Don't know
16.4	Who are the perpetrators of the abuses***?*** ***(Multiple responses allowed)***	1. Male spouse 2.Female spouse 3.Other relatives 4. Stranger 5.External workers 6.Community members 7.Security 8.Employer/boss 9.Local leader 10=Others_____ 11.Dont know

16.5	Where are gender based abuses or domestic violence cases resolved or reported in your community? ***(Multiple responses allowed)***	1. Relatives/friends 2. Parish chief/CDO 3. By LCI 4. Community elders 5.Traditional leader (Nabakyala) 6. Police 7. Religious leaders 8. Political councilor 9. Gombolola courts 10. Courts of law 11. Media 12. NGO 13. Don't know 14. Other_____
16.6	Do you think the proposed project may contribute to domestic violence in this area?	1.Yes 2. No 3. Don't know
SECTION 17: SECURITY SITUATION		
17.1.	How is the security situation in this area?	1.Good 2. Fair 3.Bad
17.2.	What are the common offences in this area? ***(Multiple responses allowed)***	1.Thefts 2. Defilement 3. Rape 4. Murders 5.Aggravated robbery 6. Theft of produce 7. Theft of animals 8. Child neglect 9. Assault violence 10. Others specify……. 11. None
17.3	Who is responsible for keeping law and order/conflict resolution in this community? ***(Multiple responses allowed)***	1.LCI security committee 2. Police 3. LDU 4. Elders 5. Nabakyala/senior woman 6. Gombolola/Division 7. Area councilors 8. Others……..
SECTION 18: PHYSICAL CULTURAL RESOURCES AND COMMON COMMUNITY RESOURCES		
18.1	Do you have any places/things of cultural significance in this village/area?	1. Yes 2. No 3. Don't know (***If 2 or 3 skip to U1***)
18.2	What are they? ***(Multiple responses Allowed)***	1. Grave yards 2. Shrines 3. Cultural trees 4. Worship rocky 5. Caves 6. Cultural streams/wells 7. Sacred stones 8. Medicinal plants 10.Other (specify)
18.3	Are they actually used by the community?	1. Yes. 2. No. 3. Don't know.
18.4	Are they likely to be affected by the proposed project?	1. Yes. 2. No. 3. Don't know.
18.5	If yes in 18.1 above, which one is likely to be affected? Use codes in 18.2 above.	
SECTION 19: SOCIAL SUPPORT NETWORKS		
19.1	Whom do your seek assistance from in your community? If None (code 1) skip to 20.1 ***(Multiple responses Allowed)***	1. None 2. Relatives 3. Friends 4. NGO/CBO 5. Spiritual leader 6. LCI 7.Gombolola staff 8.SACCO/Saving group 9. Other _____
19.2.	What kind of support do you get from them? ***(Multiple responses Allowed)***	1. Food 2. Financial support 3. Small loan 4. Spiritual support 5. Moral support 6. Medical care 7. Funeral support 8. Labour 9. Domestic chores 10. Farm inputs/tools 11. Information 12. None 13. Other_____
SECTION 20: INFORMATION ABOUT THE LIKELIHOOD OF IMPACT/FEARS		

20.1	What do you think will be the benefits of the project to the community? ***(Multiple responses allowed)***	1.None 2. Employment 3. Improved/new water sources 4. Improved community roads 5. Market for our goods 6. Improved security 7. Improve health services 8.Urbanization/area development 9. New skills 10. Increase in land value 11. High demand for rentals 11. Others_____
20.2	What fears do you have about the proposed infrastructure in your area? ***(Multiple responses allowed)***	1.Bad smell 2. Noise nuisance 3. Dust pollution 4. Flies nuisance 5. Birds nuisance 6. Rodents nuisance 7. High crime/drug abuse 8. More cases of theft 9.School dropouts 10. Water sources contamination 11. Destruction of roads 12. Loss of renters 11. Loss of land/property 12. Land conflicts 13. Stress animals 14. water borne disease 15.Communicable diseases 16. Increase in accidents 17. Air pollution 18. Prostitution 19.HIV/AIDS 20.STI 21. Covid 19 outbreak 22. Site scavengers 23. Loss of livelihoods/reduction in customers 24.Blocked access 25.Loss of social network 26.Others_____
20.3	At what project phase do you think these negative impacts are likely to be more experienced?	1.Pre-construction 2.Construction 3.Operational phase
20.4	On a scale of 1-3, with 1 being not major, how do you rate the negative impacts of the project on you and other people in the area?	1.Not Major 2.Major 3.Very major
20.5	Should you lose your land or means of livelihood, what challenges do you envisage in finding another place to continue life at the same level as here?	1.Being cheated by a fraudster 2.Unable to find land of equal value 3.Unable to find a place of equal value 4.Unable to find similar or better service 5.The cost of preparing land 6.High costs of building/house price 7.Cost of acquiring land title 8.Other (specify)

THANK YOU

Appendix 7 (c): Key Informant Interviews and Focused Group Discussion used during the study for the Water and Sanitation Project

KEY INFORMANT INTERVIEWS (KIIs)

General Information

1) What is your view about water supply and sanitation services in your area *(sanitation facilities – toilets, hand washing/waste disposal)*?
2) What are the main types of water sources and what are the main water uses? *Probe for access to water by both women and men- individuals, households, institutions and commercial-* categorize the users e.g. irrigation, watering animals etc **– Water Officer**
3) What are the likely impacts of the project on the current water uses?
4) What are the main types of sanitation and hygiene services in this area? Categorize sanitation coverage - household, public and institutional sanitation and by type (*this should be indicative of what category of pollution that can emerge*). **– Sanitation Officers/Water**
5) What water source threats if any need to be mitigated to achieve sustainable water quality and quantity for the beneficiary population? **– Natural Resources/Environment**

Introduce Project

1) *Are you aware of this project* "Solar Powered Water Supply and Sanitation Systems in Busoga", *which villages/sub-counties will be affected?*
2) What are your expectations of this project?
3) What do you think your role is in the upcoming project? **– Relevant District Officials**
4) In your view what difference will the planned water supply make in the lives of the population? *(Are there any specific differences for women, men and youths)*
5) What do you think are some of the benefits and threats that the project might bring?
6) What are the likely project impacts *(direct, indirect and cumulative impacts - positive and negative)* on land and water use and rights as well as income and livelihoods including any economic displacement or loss of access to natural resources and subsistence resources?
7) Do you foresee any restrictions to resources and services during construction? Which are these and what intervention do you propose?
8) What do you recommend needs to done to ensure that the schemes produce the expected outcomes?
9) How would you define success for this project?

Stakeholder Engagement

1) Has the district/Sub-county conducted any engagements about the project? Is the local population aware about the planned Water Supply and Sanitation Project? *How did they know?*
2) What is the level of involvement of the local population? – sub county
3) How best can we engage the communities in the selected RGC?

District and Sub-County - Questions

1) What other actors are involved in water and sanitation activities for collaboration so as to bring about maximum benefits to the community? Are there any other planned projects related to water and sanitation– **DCDO/Commercial Officer -District/Sub-county**
2) What is the status of land acquisition required for the project infrastructure – sanitation facilities). How best do we obtain the evidence of secured land tenure /ownership for these water supply systems -*water sources, tank sites, office*? – **SAS / District**
3) Construction projects are usually associated with several social risks. How best do you think that these should be addressed on this project? (*any risks that are unique to the project area)* – **DCDO – District**
4) What is the status of the District's GBV, VAW, VAC and sexual exploitation/Harassment? What are the main cases and key referrals? **District /Probation Officer**

5) Are there any known PCRs in the project area that should be avoided from the onset? *(sacred sites, shrines, communal graves etc)* Can you mention them where they are located? Are they functional? **– DCDO and CDO/District & Sub-county**
6) What are the likely project impacts on objects and/or areas of cultural significance?
7) What risks to water quality and quantity can arise due to this project? **– District Water Officer**
8) What can be done to improve water quality and quantity? **– District Water Officer**
9) What social and environmental risks is this project likely to pose to the community? **Natural Resources/Environment and DCDO –District & Sub-county**
10) What are the common water borne diseases in this area? Do you think the clean water will reduce spread of these diseases? **District and sub-county Health Officers**
11) What are the common land tenure systems in the area? Approximately men compared to women who own land and in which tenure system. What are the common land issues in the area? *(Land grabbing, ownership, administrator of Estate of the Late)* **SAS/CAO/Land Officer – District**
12) What is the state of security in the District? **RDC/DPC/DISO/GISO**
13) Who are the key vulnerable persons in this area? What project impacts might be specific to different categories of vulnerable persons in your area? - **DCDO/Gender Desk – District**

COMMUNITY LEVEL (FOCUS GROUP DISCUSSIONs (FGDs)

FOCUS GROUP DISCUSSION ONE

WASH services

1) What are your current types of water sources in your area? Are they functional (*e.g.3/7 boreholes are operational)*? Major uses of water?
2) Who has access and or control to these water sources *(Water Rights- communal, individuals)?*
3) Do you pay for water? How much and how often?
4) Please tell me if you would be happy to have a piped water supply source and why? Are you willing to pay for this water?
5) What are the existing sanitation and hygiene services in your area (*toilets, waste disposal, hand washing etc)*
6) What key social services in your community need the Water and Sanitation Project most?

O&M of Water Facilities

1) What are the practices that might compromise the quality and quantity of water that will come from the planned supply system? Who should be responsible to stop those stated practices?
2) How are you prepared to ensure the quality and quantity of water supply is maintained? *(O&M of facilities)*
3) Are there existing local management structures for shared water and sanitation facilities and their associated catchment? *(Composition by gender, age groups, body abilities etc)*?
4) In your view, how best can formation of Water Source Protection Committees be done (criteria, who to be considered & why)? *(Guide on gender sensitivity etc.)*
5) Grievance Redress Mechanism - Do you have any existing local conflict resolution mechanisms especially with regard to existing water sources?
6) Willingness to contribute to water user charges/fees for maintenance of water service system.
7) Security of land tenure for water supply system *Probe for:* Provision of free land for the water pipeline.

FOCUS GROUP DISCUSSION TWO

Project Awareness

1) You may have heard about the planned Water and Sanitation Project intended for your area; please tell me what you have heard. (Please indicate your source of this information as well).

2) Suggest best modes of communication during engagement and timing – *radio with most listernership, best timing.*
3) How will the planned piped water supply improve your situation as women or men both at household and public level?

Impacts of Project

1) What are your expectations of this project?
2) Construction projects are usually associated with several social risks. What such risks do you envisage? How best do you think that these should be addressed on this project *especially those related to GBV, VAW, VAC and sexual exploitation / Harrasment?*
3) Have you heard of such cases (GBV, VAW/C or SEA/H) related to water use or existing water contractors in your area?
4) Mention benefits you expect from the planned water and sanitation scheme.
5) How will you, personally, define success for this project?
6) What are the factors likely to contribute to / drivers of the trends of all the Social risks especially HIV/AIDs and or GBV/VAC/W or SEA/H?
7) Are there any hotspots for these social factors in your area? Who are more at risk of the above?
8) How can these social risks be abated- reduced, controlled or avoided? Who are the service providers for addressing the above issues within your village?
9) Do you think the proposed project will increase the risk of HIV/AIDS/ GBV/VAC/W or SEA/H? If so, why?

Social Services and Support Networks

1) What social services do you have in your area*? (Schools, hospitals, Health centres etc). Are they functional?*
2) Who are the vulnerable in your community and how do they get helped?
3) What are your social safety nets where you run to for assistance in case you need assistance & which type of assistance do you seek for?

Appendix 8: Project Cost for the construction of the proposed Gwere Rural Growth Centre – Water Supply and Sanitation System

MINISTRY OF WATER AND ENVIRONMENT

RURAL WATER SUPPLY AND SANITATION DEPARTMENT

CONSTRUCTION OF GWERE-LEFORI PIPED WATER SUPPLY AND SANITATION SYSTEMS

Engineer's Estimate

Grand Summary

Bill No	Description	Investment Costs UShs
	GENERAL	
G-1	General Items	994,922,500
G-2	Method Related Charges	44,500,000
G-3	Dayworks	6,944,200
	Sub Total 1	**1,046,366,700**
	WATER SUPPLY AND EQUIPMENT	
GWE W-1	Borehole Pump Station and Site Works	391,909,599
GWE W-2	Aerator and Sedimentation Tank	267,275,915
GWE W-3	Rapid Gravity Filters	211,706,905
GWE W-4	Clear Water Tank and Pumphouse	147,833,133
GWE W-5	Chemical House	99,217,790
GWE W-6	Backwash Tank	128,748,628
GWE W-7	Transmission Mains	286,537,963
GWE W-8	Storage Reservoir and Site Works	459,682,179
GWE W-9	Distribution Network	1,490,010,667
GWE W-10	Intensification Network and Service Connections	606,977,737
GWE W-11	Search and Replace	73,575,865
GWE W-12	Borehole Guard House	19,410,293
GWE W-13	Water Office	78,657,313
GWE ME-1	Mechanical & Electrical Works	886,055,050
GWE ME-2	Tools and Equipment	72,464,850
GWE S-1	6 Stance Waterborne Public Toilet (1No.)	60,856,300
GWE S-2	6 Stance VIP School Latrine-Boys (1No.)	35,659,329
GWE S-3	6 Stance VIP School Latrine-Girls (1No.)	36,207,579
GWE S-4	4 Stance VIP School Latrine-Staff (1No.)	8,074,380
GWE S-5	5 Stance VIP Public Toilet (1No.)	34,671,072
GWE ME-3	Electrical Works (Sanitation Facilities)	11,562,000
	Sub Total 2	**5,407,094,547**
	TOTAL 1 (Sub total 1+2)	**6,453,461,247**
	Allow for 10% contingency	645,346,125
	TOTAL 2 (Total 1+ Contingency)	**7,098,807,372**
	Allow for 18% VAT	1,277,785,327
	GRAND TOTAL	**8,376,592,698**