Republic of Uganda

Ministry of Water and Environment

ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT REPORT (ESIA)

FOR THE PIPED WATER SUPPLY SYSTEMS IN BUGOMOLWA RGC IN NTWETWE COUNTY, NKANDWA SUBCOUNTY IN KYANKWANZI DISTRICT

CONTRACT NO: MWE/CONS/20-21/00092

Prepared for:

MINISTRY OF WATER AND ENVIRONMENT,

Plot 21/28 Port Bell Road, Luzira
P.O. Box 20026 Kampala
Port Bell Rd, Kampala

By:

AIR WATER EARTH (AWE) LTD

Civil, Environmental Engineers & Project Management Consultants

M1, 27 Binayomba Road, Bugolobi
P. O. Box 22428, Kampala, UGANDA.
T: 041-4268466, Mob: 078-2580480
E: mail@awe-engineers.com
W: www.awe-engineers.com

February 2023

Project index

Project Name:	Environmental and Social Impact Assessment (ESIA), Resettlement Action Plan (RAP) and Source Protection Plans (SPPs) for large solar-powered piped water supply systems and sanitation facilities in Kikonge-Nakasero and **Bugomolwa in Kyankwanzi** district, Lubaali in Kasanda District, Kikooge in Nakasongola District, (central)
Project Ref No:	MWE/CONS/20-21/00092
Report category:	Environment and Social Impact Assessment (ESIA) Report
Component location	BUGOMOLWA RGC

Document Control

Revision #	Date	Prepared by		Reviewed by	Approved for issue by
•	11/24/2022	AO, SMJ, RN, PO, IN, DK, AM, EK		AD, IK, RM, LK, HK	Ronald Musenze - Project Director Lammeck Kajubi - Team leader
Current Version	1	Draft Report	☒	Reviewed Date: 11/24/2022	
		Final Report	☐	Issue Date	

DECLARATION OF ESIA TEAM

This Environmental and Social Impact Statement has been compiled in accordance with National Environment Act (NEA) 2019 and Regulation 18 (1) Environmental Impact Assessment (EIA) Regulations, 2020, in conformity with the National Environment (Conduct & Certification of Environmental Practitioners) Regulations, 2003, below are names of the Environmental Impact Assessors;

Eng. Dr. Lammeck KAJUBI - Team Leader and Environmental Expert
PhD. Renewable Energy (Atlantic International University, HI-USA),
Master's in business administration (Heriot-Watt, UK).
M.Sc. Eng. Environmental Engineering (University of Queensland) -Australia.
B.Sc. Eng. Biosystems & Agricultural Engineering (MUK) - Uganda
Registered Professional Engineer, ERB-Uganda (570);
NEMA Registered Environmental Practitioner (CC/EIA/04/2022) - as Team Leader

Sign:

Abel MUTYABA - Environmental and Social Safeguard Specialist
MSc in Water and Sanitation Engineering (KYU)- Uganda
B.Sc. Eng. Environmental Engineering and Management (KYU) - Uganda
NEMA Registered Environmental Practitioner (CC/EIA/259/22)
Certified Occupational Safety and Health Professional**,** (*250851/18*-OSH Academy)-USA
Graduate Member, Uganda Institution of Professional Engineers (UIPE)-GM/1977
Member, Uganda Association of Impact Assessment Practitioners (UAIA)-*2019-285*
Member, Society of Petroleum Engineers (SPE) – *5062551*

Sign:

Solomon MUDDUKAKI Jackson- Sociologist
BA Education (MUK)- Uganda
MA Social Sector Planning and Management (MUK)-Uganda
Post Graduate Diploma in management and administration. UMI
Occupation Health and Safety (Diploma) OSHA Academy-USA
NEMA Registered Environmental Practitioner (CC/EIA/288/2021)- as **Team Member**

Sign:

Consulting Team

Key Team members			
	Name	**Initial**	**Designation**
1	Ronald S. MUSENZE, PhD	RM	Civil Engineer/ Project Director
2	Eng. Dr. Lammeck KAJUBI, PhD	LK	Environmental Expert/Team Leader
3	Solomon MUDDUKAKI Jackson	SMJ	Sociologist
4	Robert NAGUYO	RN	Hydrogeologist
5	Dr. Herbert KALIBBALA	HK	Water/wastewater specialist
6	Dr. David KYADONDO	DK	RAP specialist
7	Eria Kamagero ISABIRYE	EK	Land surveyor
8	Ivan Kibuuka KIGULI	IK	Noise, Air and Vibration Specialist
Contributing team			
	Name	**Initial**	**Designation**
1	Dianah ALINAITWE	DA	Environmentalist
2	Aggrey OLUKA	OA	Environment and Natural Resources Specialist
3	Ismail BUKENYA	IB	Civil Engineer
4	Arnold Job LWANGA	AJL	Quantity surveyor
5	Proscovia NAMARA	PN	Environmental Engineer
6.	Ceasar K. WAKIIBI	CKW	Civil Engineer
7.	Denis KAMOGA	DK	Biodiversity Specialist
8.	Kenneth AGABA	AG	Water Quality Specialist
9.	Ismail MUWALUKA	IM	Sociologist
10.	Ivan NTEGE	IN	GIS Expert/Water Resources Expert
11.	Peace OLWENY	PO	Gender Expert
12.	Patience BIIRA Roset	PB	Water Resources Engineer
13.	Janet BAKO	JB	Water Resources Engineer
14.	Caroline IKILAI	CI	Sociologist
15.	Grace BALIKOOWA	GB	Sociologist
16	Veronica NAKAFEERO	VN	Environmentalist
17.	Phiona Ekiva	PE	Sociologist
18.	Abel Arinitwe	AA	Environmentalist

Client reviewers			
Name	**Title**	**Date**	**Document Revision Number**
Cate Namyalo	Senior Environmental Health Officer	22-07-2022	Draft report 1
Martha Naigaga	Senior Environmental Health Officer	15-08-2022	Draft report 1
Maurice Madra Edema	Environmental Safeguards Specialist IWMDP	22-08-2022	Draft report 1
Jonan Kayima	Social Safeguards Specialist IWMDP	16-08-2022	Draft report 1

ACRONYMS AND ABBREVIATIONS

AWE:	Air Water Earth
CAO:	Chief Administrative Officer
CDP:	Consultation Disclosure Plan
CO:	Carbon monoxide
CO_2:	Carbon dioxide
DEO:	District Environment Officers
DWD:	Directorate of Water Development
DWRM:	Directorate of Water Resources Management
EH&S:	Environmental, Health and Safety
EIS:	Environmental Impact Statement (or "EIA report")
ESIA:	Environmental & Social Impact Assessment
ESMMP:	Environmental and Social Management and Monitoring Plan
ESMP:	Environmental and Social Management Plans
GBV:	Gender Against Violence
GIS:	Geographical information system
GoU:	Government of Uganda
GRM:	Grievance Redress Mechanism
HC:	Health center (e.g. HC I, II, III, IV)
LC:	Local Council (used for various tiers of local councils e.g. LC 1, 2, 3, 4 or 5 or I, II, III, IV, V)
MGLSD:	Ministry of Gender, Labour and Social Development
MoH:	Ministry of Health
MWE:	Ministry of Water and Environment
NEMA:	National Environment Management Authority
NFA:	National Forestry Authority
NPHC:	National Population and Housing Census
NGO:	Non-Governmental Organization
NOx:	Oxides of nitrogen
OHS:	Occupational Health & Safety
OP:	Operational Procedure
PAPs:	Project Affected Persons
PB:	Project Briefs
PCR:	Physical Cultural Resources
PH:	Public Health
RoW:	Right of Way
RGCs:	Rural Growth Centers
SAC:	Subcounty chief
SOx:	oxides of Sulphur
TOR:	Terms of Reference
UBOS:	Uganda Bureau of Statistics
VAC:	Violence Against Children
VSLA:	Village Saving and Lending Association
VHT:	Village Health Team
WUCs:	Water User Committees

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

BACKGROUND AND JUSTIFICATION

The Government of Uganda received credit from the World Bank towards implementation of the Integrated Water Management and Development Project (IWMDP). The project will also contribute to the achievement of National Development Plan III objectives, Vision 2040 and Sustainable Development Goals. Under the IWMDP, funds have been provided for Environmental and Social Impact Assessment (ESIA), Resettlement Action Plan (RAP) and Source Protection Plans (SPP).

Sub component 1.2 of the IWMDP (Support to Small Towns and Rural Growth Centers) supports activities designed to improve the sustainable provision of water supply and sanitation services in small towns and RGCs in the Recipient's territory. The sub-component will be targeting construction of large solar powered water supply and sanitation systems in the districts of Buyende, Kaliro, Namayingo, Mayuge, Jinja, Namutumba and Kamuli in Eastern Uganda; Mityana, Mubende, Kassanda, **Kyankwanzi**, Nakasongola, Rakai, Lyantonde, Sembabule, and Mukono in Central Uganda; and Kagadi, Kakumiro, Kiruhura, Kazo, Kisoro, Kyegegwa, Kyenjonjo in Western Uganda.

In order to address the water supply and sanitation gap in the above districts, 32 solar powered piped water supply and sanitation systems 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 selected Rural Growth Centers.

The main project components

1. Raw water pumping main,
2. A solar pump and panels
3. Pump house,
4. Distribution network,
5. Chlorine dosing unit
6. Service connections,
7. A water office and sanitation facilities.
8. A pump motor
9. Protect other water sources
10. An elevated storage reservoir on a steel tower,
11. A production well as a water source,

M/S Air Water Earth (AWE) Ltd was contracted to prepare a detailed Environmental and Social Impact Assessment (ESIA), Water Source Protection Plan (SPP) and Resettlement Action Plan (RAP) of Piped Water Supply and Sanitation Systems of the RGC of Bugomolwa in Kyankwanzi District.

Overall Project Objective for IWMDP

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.

Specific Objective for this assignment

The specific objectives for the ESIA are:

- To study the baseline environmental and social conditions of the project areas and their surrounding and to assess how these conditions will be affected by the proposed development.
- To identify and assess the likely impacts (positive and negative) of the proposed project and to recommend feasible measures to avoid, minimize or mitigate the negative impacts.
- To develop an environmental and Social Management Plan/Mitigation plan for the identified negative impacts and an environmental monitoring plan for project implementation.
- To compile an Environmental and Social Impact Statement for submission to NEMA for consideration and approval.

Description of the project

The water supply components for this RGC will comprise of the following:

- Construction of borehole pump house, Attendants Quarters, Guardhouse and site facilities
- Installation of 40m^3/h submersible pumps powered by solar PV system
- Installation by UMEME of grid power at the borehole site
- Construction of 1.350km pumping main from boreholes to storage tanks
- Installation of 125m^3 pressed steel tanks on 10m high steel tower
- Construction of 6.758km of distribution network
- Construction of a Water Office and adjacent water borne toilet block

The source in Bugolomwa RGC is located in Kiyinikibi village, Bugolomwa Parish in Nkandwa Sub County at partial coordinates of 349518.225^{o}E 104343.019^{O}N. The water to the consumers shall be supplied by gravity through a n elevated storage reservoir located at spatial coordinate 350005.642^{o}E 104948.633^{o}N in Bugomolwa B village, Nkandwa Sub-County. A transmission pipeline has been proposed from the production well (the source) to the elevated storage reservoir traversing along the existing road 2m from end of the road and 2m from the benchmark point. A total of 4m will be acquired along the Right of Way for pipe laying up to the reservoir in Bugolomwa B village.

PROJECT LOCATION

The proposed project town locations are shown in Table ES 1. Bugomolwa RGC is located in Ntwetwe County in Nkandwa Sub County , Kyankwanzi district. The RGC is approximately 150km by road from Kampala and approximately 57 km by road from Kyankwanzi town, Bugomolwa RGC is located at partial coordinates of 349735.2^{o}E 104734.5^{O}N . 5 No. villages, namely Bugomolwa-A, Bugomolwa-B, Bugomolwa Central, Kiyinikibi and Kyanywa are proposed to be covered with potable water supply under this project. Kyankwanzi district, which is 150 km by road from Kampala. Kyankwanzi district is bordered by districts of Masindi to the north, Hoima to northwest, Nakaseke to east and Mubende to south. The project will require 20m by 20m for the source and the same dimensions for the reservoir, this land will be compensated by the project. However, the 4m that will be acquired for pipe laying along the RoW will not be compensated unless there is an item of value along the RoW.

Table ES 1: Project components and their coordinate locations

Project component	Coordinate / location	Description
Production well/ Borehole /Source	349518.225^{o}E 104343.019^{O}N	20m by 20m land take at the source to accommodate all the components of the source.
Transmission main/system	Along the existing roads	A total of 4m land take along the way leave from the source to the reservoir.
Disinfection facilities	350005.642^{o}E 104948.633^{o}N	Installation of a DOSATRON online proportional chemical dozer at the reservoir. There will be a chemical house at the reservoir.
Storage Reservoir	350005.642^{o}E 104948.633^{o}N	20m by 20m land take at the reservoir to accommodate all the components of the elevated reservoir

Justification of the ESIA study In compliance with the National Environment Act 2019, the Environmental and Social Monitoring Framework (ESMF) and the National Environment (Environmental

and Social Assessment) Regulations 2020, MWE undertook an ESIA at the proposed subproject sites and this report presents the findings. The ESIA study was conducted in consideration of the policies, legal and institutional frameworks relevant to this proposed project. Various national and international policies and laws were reviewed in relation to the proposed project activities e.g. construction and operational requirements, environmental quality, land use, public health, occupational safety, labour standards and other legal obligations. World Bank Safeguard Policies were reviewed during this detailed ESIA study to ensure that the proposed development meets Environmental and Social (E&S) requirements and some of the clauses that are likely to be triggered were identified and the corresponding mitigation and enhancement measures proposed. The laws, policies and regulations adopted in this study are presented in **Section 3**. The ESIA study was also undertaken in accordance with the National environment Act 5 Schedule 4 subsection 4 (b), a developer is required to undertake a project brief for Abstraction or utilisation of ground water of less than 1000m^3 per day. However, Ministry of Water Environment recommended a detailed ESIA study **(See Appendix I)** in order to exhaust all the impacts of the different components of the project.

Study methodology

Environmental and social conditions of the project area of influence have been collated from site investigations and literature review of the feasibility report, social economic baseline survey report, detailed engineering designs and water quality analysis reports. The ESIA baseline data collection activities included:

i) Air quality measurement;
ii) Ambient noise measurement;
iii) Water quality sampling and analysis;
iv) Stakeholder consultations;
v) Socioeconomic conditions survey

Stakeholder Consultations

A record of stakeholder consulted is presented in Table ES 2.

Table ES 2: List of key stakeholders consulted

Category	Stakeholder	Date consulted
	Ministry of Gender, Labour and Social Development (Gender Department)	19/072022
	Ministry of Gender, Labour and Social Development (Dept of Occupation Health and Safety)	19/07/2022
	Ministry of Local Government	26/07/2022
Kyankwanzi District Local Government	Environment Officer, District Health Officer and inspector, Water Officer, Community development officer, Probation Officers, Labour Officer, Gender Officer, Physical planner, Economic planner, Political leaders (LC IV), Resident District Commissioner, Uganda Police (Family and Child Protection Unit, CID, Fire, Traffic units)	23rd March 2022
Nkandwa Subcounty	SAS, Sub County CDO, Health Assistant, Sub County Environmental officer, Chairperson LCIII, Secretary for production, Councilors, Parish Chief	24th March 2022
Local Councils	Local Council chairman and the community members of;	23rd March 2022

Category	Stakeholder	Date consulted
	Bugomolwa: Community groups like VSLA, NGOs, Cultural leaders, Religious leaders, Water user committees, Project affected persons, Village health teams, and any NGOs/CSOs in the villages	

Project alternatives considered: The 'no' project option. This scenario is neither a tenable nor beneficial alternative because sustainable safe water supply is required to support socioeconomic development within Bugomolwa and the surrounding areas. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions but cannot be a means to achieving the objectives of the proposed project of supplementing the water supply; bring water closer to population concentrations and improving the livelihood of the community.

The project option: Access to safe water in Nkandwa Sub County in which Bugomolwa RGC is located is as low as 12%. Kyankwanzi has 675 domestic water points which serve a total of 153,020 people – 133,966 in rural areas. 80 water points have been non-functional for over 5 years and are considered abandoned. Kyankwanzi has 1 piped scheme this project therefore is very necessary for the project area and therefore negative impacts shall be mitigated with the utmost importance so as to ensure project sustainability. **Hydrogeology**: Drilling data obtained from the groundwater database from the Directorate of Water Resources Management under Ministry of Water showsthat the Bugomolwa RGC is underlain by Precambrian basement of undifferentiated granite rocks at the depth of about 28m onwards. Two types of semi-confined aquifers exist in the centre (a) fractures in the basement rock (from 28 m onwards) and (b) the overburden weathered regolith (< 28 m). Hence, most wells are constructed either in the regolith or fractured zones. The hard basement is about 58 m deep. The water strikes occur in both the regolith and the fractured rocks.

Topography of Kyankwanzi District: The district lies at an altitude ranging between 1,400 to 1,800 meters above sea level. The landscape and topography in general have gentle undulating hills merging into coalescent pediments. Standing at a low slope gradient, the long pediments drop into broad, flat-bottomed valleys where there is dense settlement. The district has highland areas, which are deeply incised with deep slopes. They form prominent ridges, which eventually merge into shallow depressions. Therefore, the district's landscape is grouped into two distinctive topographic zones; Undulating topography with flat bottomed valleys and dissected plateau. The topography of Kyankwanzi district can be broadly divided into two; the flat land whose vegetation can be characterized as grassland Savannah, which is interspersed with thorn and bushes (preferred by Pastoralists) and patches of arable land. Elsewhere, land is generally hilly with rugged areas (occupied by cultivators and a few herders).

Soils of Kyankwanzi District: The district is mainly covered by Petric Plinthosols (Acric), Gleyic Arenosols, and some scaters of Histosols, of as classified by FAO, followed. The Project area is mainly comprised of Petric Plinthosols (Acric).

Vegetation and Land Cover: The project area for the proposed water supply pipelines traverses through settlements and farmlands, associated with bushy vegetation cover dominated by herbaceous-weedy species and very sparsely distributed trees and shrubs that occurred at low abundances. The majority of the population is engaged in, livestock keeping, subsistence agriculture and charcoal

making hence most of the land is used as farmlands for grazing and charcoal making from the vast woodlands available in the district.

Climate: Kyankwanzi district has a tropical climate with moderate rainfall and temperature. The rainfall pattern is bimodal with two seasons and annual rainfall varying between 560 mm to 1272 mm of rain and with rainy days averaging between 90 and 130 per year. The maximum monthly rainfall in the last six years is 1383 mm. The months of March to May and September to November receive very heavy and well-distributed rains of up to 1200 mm. There are two dry seasons from June to July and December to February. This therefore provides for two-season crop farming areas, which constitute a big portion of the area mentioned. The rainfall is unreliable that most people have resorted into either drought resistant varieties or cattle keeping.

Uganda can be divided into different Agro-Ecological Zones (AEZ), Kyankwanzi district falls under the Lake Victoria Crescent Agro-ecological Zone. It serves 22 Districts of Central Uganda which include; Mubende, Mityana, Luwero, Kyankwanzi, Mukono, Kayunga, Nakasongola, Nakaseke, Masaka, Kalangala, Buikwe, Kalungu, Lwengo, Mpigi, Kampala, Bukomansimbi, Gomba, Butambala, Buvuma, Wakiso, Kiboga and Kassanda. It is the most populous region with about 10 million people.

Biodiversity of the project area

Threatened fauna species: There was NO globally or nationally Red listed species were cited in the project area (IUCN, 2022; WCS, 2016), and no restricted range plant species occurred. The project area doesn't have any flora species that requires special protection status - hence it is not subject to IUCN Red List status.

Flora: 90 plant species in 76 genera from 33 families were recorded within the project area (Appendix H) shrubs were the highest in terms of life forms, with 40 species, followed by herbs with 20 species, grasses and climbers with 11 species respectively there were no threatened flora species identified in the project area.

POTENTIAL IMPACTS IDENTIFIED

Potential environmental and social impacts of the proposed project are summarized in Table ES 3:

Table ES 3**:** Summary of predicted impacts and recommended mitigation

Positive impacts include;			
i.	Clean water supply and Employment	x.	Income to material / equipment suppliers and contractor
ii.	Improved access to water	xi.	Better Investment Options for economy benefits
iii.	Improvement of public health, hygiene and household health status	xii.	Skills and technology transfer
iv.	Improved living standard/well being	xiii.	Infrastructure Improvement
v.	Water quantity	xiv.	Benefit to local retail businesses
vi.	Communal Empowerment	xv.	Improved gender awareness
vii.	Vision and goal achievement	xvi.	Land and property compensation
viii.	Increased water and environment capital	xvii.	Impact on Education
ix.	Reduction of domestic violence		
Negative Impacts			

The following are some of the negative impacts and some of their proposed mitigation measures;

Negative impacts

- Generation of construction waste
- Vegetation and crops loss
- Generation of noise
- Increased siltation of the aquatic habitats
- Increased incidences of diseases like HIV/AIDS
- Impacts on fauna
- Increased susceptibility to soil erosion
- Increased accidents and occupational hazards
- Risk of traffic accidents and disruption of traffic flow
- Water quality and pollution
- Loss of water due to accidental cutting of pipes
- Impact on air quality
- Social misdemeanor by construction workers

Mitigation measures

- Provide PPEs such as nose masks to the workers on the construction site
- Ensure that all project equipment is serviced on a regular basis
- The contractor should provide appropriate scaffolds and work platforms to ensure safe working heights
- To avoid accidents at night due to reduced visibility, works should be limited to daytime
- Provide gender sensitive sanitary facilities (toilets and bath shelters) for use by workers.
- The contractor will conduct sensitization of the communities around the proposed project.
- Cover all material stockpiles with tarpaulins or other such suitable covering to prevent material from becoming airborne.
- Enforce vehicle speed restrictions
- Minimize vegetation clearance by clearly demarcating work areas.
- Provide environmental awareness training to all employees.
- Rehabilitate all disturbed areas
- Undertake continuous sensitization of workers on proper waste management practices. This should form part of the daily tool box talks and workers' training

The contractor should provide adequate well labelled containers for purposes of storage of the various waste streams at the camp

FREQUENCY OF MONITORING AND REPORTING

Monitoring will be undertaken throughout the project period (Table ES4) by various actors, detailed monthly monitoring reports with clear illustrations of implementation of mitigation measures will be compiled by the contractor and submitted to the supervising engineer and client. These detailed reports with evidence of compliance will be prepared and appended to summary monthly reports.

Table ES 4: Project Environmental and Social Monitoring Plan

Activity	Monitoring frequency	Responsible party	Output
Supervision and management	Daily	Contractor	Reports
Site operation	Daily	Contractor	Daily reports
	Weekly	Contractor	Reports
	Monthly	Contractor/DWRM	Reports
Quarterly and Annual monitoring reports	Quarterly / Annually	Umbrella Organization	Metering and payment records

Environmental and Social Management and Monitoring Plan (ESMMP)

The project's ESMMP indicates both management and monitoring measures to ensure that regulatory compliance can be checked and recorded during implementation, frequency, indicators and responsible

parties. During the construction phase, ESMMP implementation shall be monitored by MWE (NEMA and DWD) together with Kyankwanzi District Environment officers, community development officers and district water officers.

During the operation phase, management and monitoring will be under Water and Sanitation Facility Headquarters in Luzira Within the decentralization framework, the experience and capacity of the umbrella organization, applied directly to the management of the newly constructed supplies will increase the likelihood of sustainable commercial operations and management of the town systems in the next 5-10 years. The umbrella organization is under the urban water department of the Ministry of Water and Environment and can effectively plan and manage budgets agreed within a contract framework. It can use experience gained elsewhere in the past 5-years to extend services to rural growth centers.

CONCLUSION AND RECOMMENDTIONS

This ESIA has developed an Environmental and Social Management and Monitoring Plan (ESMMP) to guide construction works of the piped water supply and sanitation system and sourcing materials for construction. The ESMMP was based upon environmental and social baseline and identification and assessment of potential environmental and social impacts of the proposed project with a view of minimizing negative impacts prior to and during and project implementation. With implementation of mitigation actions herein proposed, potential adverse impacts of project activities will be mitigated and positive ones enhanced. The population in the project area relies on existing point safe water sources (boreholes fitted with hand pumps). The existing safe water sources are used by the entire population in the area hence the long queues at these sources throughout the day. This explains the frequent breakdowns that the boreholes endure in recent times.

Seasonal streams are another source that is utilized for domestic use by the communities. Valley dams are mostly used by the communities for provision of water for animals. The dams dry up in dry seasons and the communities lack capacity to desilt them. It is important to note that un-safe sources of water such as unprotected springs, ponds, rivers, and dams can increase exposure to water borne diseases.

Majority of the sanitation facilities are non-VIP pit latrine, and no designated stances of males and females (shared). There are public VIP pit latrines with designated stances for males separate from females at institutions such as schools and at the market. Solid waste management is carried out at household level and there are no designated solid waste disposal sites within the project area.

Therefore, the government's policy objective to supply up to 100% of the population in the rural areas with sustainable and safe water and sanitation facilities within their easy reach cannot be met with the current water schemes.

During the ESIA study, consultations were conducted with relevant stakeholders. The developer should liaise with them to ensure effective implementation of the proposed mitigation measures for the anticipated negative impacts. The ESMP has been developed for the client, contractor(s) and operator to implement. Environmental concerns will be addressed through this plan so that environmental laws and policies are compiled in accordance with the existing institutional frameworks.

However, strict control and supervision of the contractor will ensure compliance with the required mitigation measures. The environmental practitioners are of the view that the project should be implemented "as is" provided that the suggested mitigation measures are put in place.

1 INTRODUCTION

1.1 Project background

The Government of Uganda received credit from the **World Bank** towards implementation of the Integrated Water Management and Development Project (IWMDP). The project will also contribute to the achievement of National Development Plan III objectives, Vision 2040 and Sustainable Development Goals.

Component 1.1 - Support to Small Towns and Rural Growth Centers (RGCs) involves activities designed to improve the sustainable provision of water supply and sanitation services in small towns and RGCs. The sub-component is targeting to construct 25 (formerly 32) large solar powered water supply and sanitation systems in the districts of Buyende, Kaliro, Namayingo, Mayuge, Jinja, Namutumba and Kamuli in Eastern Uganda; Mityana, Mubende, Kassanda, **Kyankwanzi,** Nakasongola, Rakai, Lyantonde, Sembabule, and Mukono in Central Uganda; and Kagadi, Kakumiro, Kiruhura, Kazo, Kisoro, Kyegegwa, Kyenjonjo in Western Uganda. 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 selected RGCs.

The proposed piped water supply and sanitation systems will be constructed by the Ministry of Water and Environment (MWE) through the Rural Water and Sanitation Department which is responsible for carrying out planning and development of water supply facilities for communities or villages (LC1) with scattered population settlements of up to 1,500 and RGCs with populations between 1,500 and 5,000.

The main project components

1. Raw water pumping main,
2. A solar pump and panels
3. Pump house,
4. Distribution network,
5. Chlorine dosing unit
6. Service connections,
7. A water office and sanitation facilities.
8. A pump motor
9. Protect other water sources
10. An elevated storage reservoir on a steel tower,
11. A production well as a water source,

Under the IWMDP, funds have been provided for Environmental and Social Impact Assessment (ESIA), Resettlement Action Plan (RAP) and Source Protection Plans (SPP). M/S Air Water Earth (AWE) Ltd was contracted by MWE under the Directorate of Water Development, Rural Water and Sanitation Department to conduct a detailed ESIA of Piped Water Supply and Sanitation Systems of the RGC of Bugomolwa in Kyankwanzi District. This report has been prepared after a thorough field study and ground-truthing all the information obtained from different literature at the inception phase

The Rural WSS Objective

The ultimate purpose of the project is to improve the livelihood of the population in Bugolomwa RGC. The immediate objectives are:

- Provision of safe, adequate, reliable and accessible water supply to the town councils and the surrounding communities.
- Sanitation promotion and improvement in the supply area.

Overall Development Objective

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 *specific objectives* are:

- To study the baseline environmental and social conditions of the project areas and their

The wider project objectives to be addressed by the software activities are:

- Raising awareness on the issues of sanitation and hygiene practices
- Improving the safe disposal and management of human excreta and solid waste

surrounding and to assess how these conditions will be affected by the proposed development.

- To identify and assess the likely impacts (positive and negative) of the proposed project and to recommend feasible measures to avoid, minimize or mitigate the negative impacts.
- To develop an environmental and Social Management Plan/Mitigation plan for the identified negative impacts and an environmental monitoring plan for project implementation.
- To compile an Environmental and Social Impact Statement for submission to NEMA for consideration and approval.

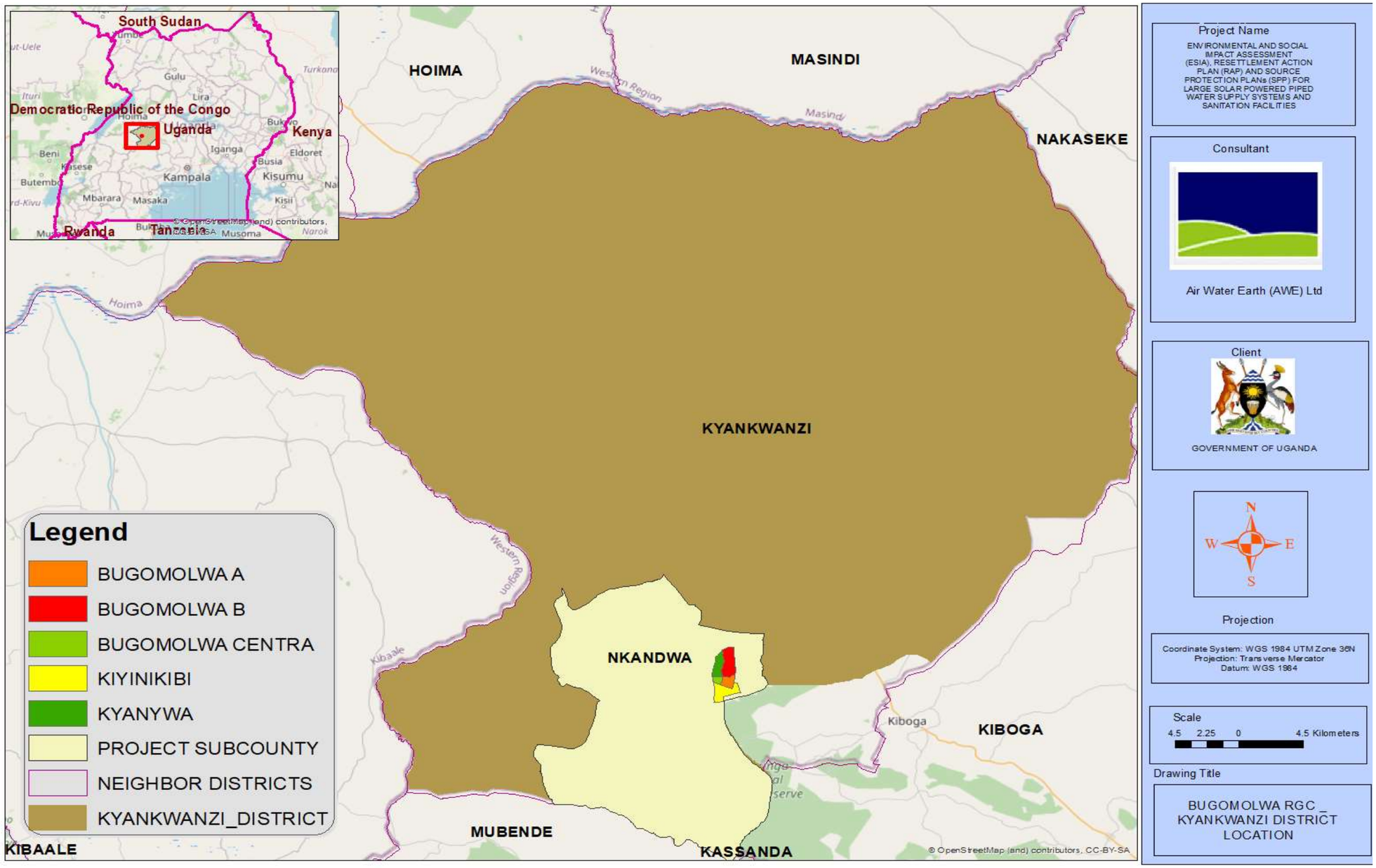


Figure 1-1: Location map of Bugomolwa (Project Area) in Kyankwanzi District

1.2 Project Developer and Funder

The project developer is Ministry of Water and Environment (MWE) and funder is World bank through International Development Agency (IDA) Cost Estimate. The capital costs in *Table* **1-1** below are based on preliminary Engineer's estimates.

The address/contact person of the Developer is presented below:

Ms. Cate Namyalo
Directorate of Water Development,
Rural Water Supply and Sanitation Department,
Headquarters, Plot 3-7, Kabalega Crescent, Luzira,
P. O. BOX 20026, Kampala, Uganda
E-mail: cnamyalo@ymail.com

Table 1-1: Summary of Project Costs

Bill No.	Description	Amount UShs
	PRELIMINARY & GENERAL ITEMS	401,329,822
	WATER SUPPLY AND EQUIPMENT	
BUG W-1	Borehole Pump Station (DWD 53781)	125,331,500
BUG W-2	Borehole Pumping Mains (DWD 53781)	86,386,000
BUG W-3	Storage Reservoir and Site Works	406,442,000
BUG W-4	Distribution Network	196,788,550
BUG W-5	Intensification Network	141,630,000
BUG W-8	Water Office	101,227,360
BUG ME-1	Mechanical & Electrical Works (DWD 53781)	368,150,000
BUG ME-2	Tools and Equipment	75,260,000
	SANITATION	
BUG S-1	7 Stance Waterborne Toilet (1No.)	81,806,880
	Sub-Total 1	**1,984,352,112**
	Allow for 10% contingency	198,435,211.18
	SUMMARY TOTAL - BUGOMOLWA	**2,182,787,323**

1.3 Land Ownership

There is one production well installed during the year 2018 at Bugomolwa B village which has been proposed to be used as a source for the project area. The land was donated by the family of the district chairperson to the sub county for the purpose of the WSS project and the proposed reservoir site is land owned by the sub county previously was used for farmers' cooperative.Photo 1-1: The drilled production well that is a proposed source in Bugomolwa RGC 0°56'28.03"N & 31°38'53.48"E36N. the land tenure systems in the area include Leasehold (including Bibanja owners) at 18%, Freehold at 49%, Customary (with certificates) at 25%, Customary (without certificate)

at 49%. Household survey data established that majority of landowners acquired land through inheritance at 37.3%, Purchased at 61.0%, Leasing at 1.7%.

1.4 Project Justification

The biggest challenge facing the water sector is how to serve the water stressed areas where the traditional rural water supply sources cannot be easily exploited coupled with depletion of cheaper water resources in some areas. The water stressed districts/ Sub-counties are lagging in coverage and require more expensive technology options, which cannot be easily implemented. The access rates in Kyankwanzi vary from 11 % in Bananywa Sub-County to 95 % in Mulagi Sub-County. Kyankwanzi has 675 domestic water points which serve a total of 153,238 people – 134,186 in rural areas. 80 water points have been non-functional for over 5 years and are considered abandoned. Kyankwanzi has 1 piped scheme.[1]

It is, therefore, important that permanent large ground water well fields are identified, developed and water transferred in bulk to the water stressed areas for multi-purpose uses. Such sources should have yields able to meet water needs for sizeable areas/ centers that have populations beyond 18,000 persons and are therefore economically viable to develop piped water supply systems. Although this approach is a high cost, it will enable equitable coverage especially in the water stressed areas.

1.5 Objectives of the ESIA

This ESIA report has been prepared following Uganda's and the World Bank's Environmental and Social requirements, sets out to identify potential environmental and social impacts of the proposed Bugomolwa RGC Water Supply and Sanitation Project, with a view of informing the final engineering design and recommending mitigation measures to be implemented during construction and operational phases of the project. The main objective was to carry out an ESIA for the proposed construction of Bugomolwa Water Supply System (WSS). These objectives are intended to ensure that development and implementation of the proposed project bears socio-environmental accountability against the national and WB regulations and environmental requirements.

Specifically, the study aimed to:

- To study the baseline environmental and social conditions of the project areas and their surrounding and to assess how these conditions will be affected by the proposed development.
- To identify and assess the likely impacts (positive and negative) of the proposed project and to recommend feasible measures to avoid, minimize or mitigate the negative impacts.
- To develop an environmental and Social Management Plan/Mitigation plan for the identified negative impacts and an environmental monitoring plan for project implementation.
- To compile an Environmental and Social Impact Statement for submission to NEMA for consideration and approval.

1.6 Scope of the Project Environmental Impact Study

This ESIA has considered the significant scale of the proposed project features and their potential impacts and as such considered its district and Sub county setting in addition to the local context. The environmental and social impact study took into account the district setting which is defined as the geographical context of Kyankwanzi District in addition to Nkandwa Subcounty. Local setting comprised of the Bugomolwa Central, A, B, Kiyinikibi and Kyanywa trading centers and the surrounding villages.

[1] http://wsdb.mwe.go.ug/index.php/reports/district/97

Review and study of the different laws, policies, regulations, and safeguards among others and their relevance to the project.

The components covered in this ESIA study include impacts due to the construction of the facility at the **water source** on both the environment and the social well-being of the people, **the reservoir** and the **transmission main**. The study also includes the different proposed mitigation measures for the different impacts identified. The study also include the development of an Environmental and social Management and Monitoring Plan that will guide the contractors during project implementation to ensure its sustainability.

1.7 ESIA Requirements

The proposed development falls under Schedule 5 of the National Environment Act No.5 of 2019, which requires mandatory ESIAs specifically under Utilization of water resources and water supply (No. 4) and abstraction or utilization of ground water (b) and support facilities (k) (i.e. ground water resources including water abstraction). The proposed intervention is in the category of projects requiring mandatory ESIA to be submitted to the Authority (NEMA) for review and clearance before construction of Bugomolwa WSS. It is in this regard that in accordance with the National Environment Act (NEA), the Scoping/Terms of Reference (ToR) were prepared and submitted to NEMA for consideration, which paved way for undertaking a full ESIA for the project. In preparing this report, particular attention was paid to the issues specified in the EIA Regulations of 2020. A copy of the approval letter of the Scoping report and TORs is attached in Annex 1. This ESIA presents information required for the protection of the environment and affected communities during the design, construction and operation stages of the proposed project. This will enable NEMA and other lead agencies take a decision on whether to approve the progress of the project in light of the identified E&S impacts or not. Specific attention was paid to the Environmental Impact Assessment Guidelines and the specific EIA guidelines for water sector for Uganda.

In compliance with World-Bank Operational Safeguards Operational Policies (OPs), The ESMF was prepared to provide guidance to the implementing agency (MWE) on the E&S screening and subsequent assessment of subprojects required during implementation such as the preparation of this ESIA, including the relevant subproject specific ESMP that must be developed in compliance with Bank safeguards policies. The RPF was prepared because the exact subproject sites were unknown at the time and provided a guiding framework to help MWE in identifying and managing potential project impacts and risks on project affected persons/communities associated with loss of land/livelihoods (physical or economic displacement/resettlement), property, cultural resources and/or restrictions on land use (RAP preparation) during project implementation. Overall, the project is likely to trigger five (5) World Bank OPs which included Environmental Assessment (OP/BP/GP 4.01), Natural Habitat (OP 4.04), Physical Cultural Resources (OP 4.11), Involuntary Resettlement (OP/BP 4.12), and Forests (OP 4.36). Safety of Dam (OP 4.37) and International Water Ways (OP 7.50) will not be triggered by the project. In addition, safeguards implementation should comply with the requirements of Investment Project Financing (IPF) and 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.

NOTE: It should be noted that this ESIA study as well as the terms of reference identified the OP's/BP that are triggered, in which ways and to what extent and that assessment was documented in this complete ESIA report.

Table 1-2: Summary of the World Bank operational policies triggered by the project

Operational policies	Likely to be triggered? Y/N
Environmental policies	
OP4.01: Environmental Assessment.	Y: Based on gravity of their potential environmental impact, World Bank categorizes projects as A, B, or C (see notes at end of table). In its *WB/OPCS Guidelines for Environmental Screening and Classification 2007* World Bank provided an indicative list of Category B projects and listed "*Rural water supply and sanitation*" as Category B projects. However, full ESIA notwithstanding, the consultant considers the project as *Category B* for the reason that it is comparable to several other water supply schemes in Uganda and impacts can be controlled/ mitigated.
OP 4.36: Forest	Y: During construction there is a likelihood of cutting down some trees however practical and mitigation measures have been discussed in chapter 6.
OP 4.04: Habitat	Y: During construction there is a likelihood of cutting down some trees which are habitats to some species however practical and mitigation measures have been discussed in chapter 6.
Social policies	
OP4.11: Physical Cultural Resources	Y: During the ESIA, studies there was not a single cultural resource that was found in the project area more so in the critical path of the whole project that is the source, Main distribution areas, the reservoir area and the known transmission area however we are giving it another chance to find during construction excavation which might expose some of these cultural resources.
OP 4.12: Involuntary Resettlement	Y / N (Subject to detailed RAP)
BP 17.50 Bank Disclosure Policy	
Notes on World Bank's environmental categorization of projects: *Category A* *Significant adverse impacts that are sensitive, diverse, or unprecedented, or that affect an area broader than the sites or facilities subject to physical works* *Conversion/alteration of natural habitats* *Significant quantities of hazardous materials* *Major resettlement* *Category B* *(Compared with Category A):* *Potential impacts less adverse and more limited, fewer, site-specific, likely reversible* *Mitigation measures can be more easily designed/implemented* *Category C* *Expected to have no adverse environmental impacts, or only minimal impacts easily and fully mitigated through routine measures*	

1.7.1 Response to NEMA approval Comments on the TORs

Table 1-3: Response to the NEMA approval Comments on the ToR

SN.	REQUIREMENTS	COMMENTS
1.	The project description should comprehensively describe all the components, activities, processes including the equipment and any chemicals to be used, how they will be used, and stored, as well as precautions to minimise impacts on human health and environment.	Described comprehensively in Chapter 3
2.	Provide adequate information on the hydrological studies for the proposed water source to ascertain its sufficiency to sustain the piped water supply to the target communities without causing significant negative impacts on the water source.	Provided for in the detailed design
3.	Make reference to the National Environment (Environment and Social Assessment) Regulations, S.I. 143/2020 and other applicable policies, laws and regulations, clearly highlighting the relevant provisions therein and measures that will be implemented to ensure compliance with the relevant environmental and social requirements.	References made in chapter 2
4.	Undertake geotechnical investigations of the different project component sites to inform the design and construction of the different components of the solar water supply and sanitation system and describe how these findings have been taken into account. Attach the report of the geotechnical studies to the ESIA report.	Provided for in the detailed design
5.	Ensure that the baseline information provided is specific to the different project sites for the various project components, covering the soils, water, air quality and noise in the project area, as well as analyses of the relevant parameters likely to be negatively impacted by the project activities. Append results of analyses from an accredited laboratory to the report.	Specific baseline information provided in chapter 5 Appendix E
6.	Ensure that the directorate of water resources management, local communities nearby/along the project area of influence and Kyankwanzi District Local Government are among the entities consulted and that the views/concerns of all the consulted entities are well documented and included in the ESIA report.	Stakeholder Views/concerns documented in chapter 8
7.	Attach to the ESIA report a well-labelled and legible copy of the proposed site lay-out (preferably covering A-3 paper size) clearly showing the location of the various project components.	Attached in chapter 3
8.	Append to ESIA report authentic copies of land acquisition / ownership documents or relevant authorisation to utilise the land for the proposed project components and activities.	
9.	Provide a detailed evaluation of alternatives/options of the water source, the project design, technologies to be used, component sites selection; and a justification for selecting the	Provided in chapter 7

SN.	REQUIREMENTS	COMMENTS
	preferred options.	
10.	Attach a legible google map and photographs (preferably coloured) clearly showing the state of the proposed project components' location and their environs to assess compatibility.	Attached in chapter 3
11.	Ensure that detailed evaluation of the potential environmental impacts, risks and residual impacts associated with the proposed project components and activities is provided.	Detailed evaluation done in chapter 6
12.	Provide detailed mitigation measures and costed environmental management and monitoring plans (preferably in table matrix format), to cater for the environment and negative impacts on human health.	Detailed mitigation measures and costed EMMPs provide in chapter 6 and 9 respectively.
13.	Provide details on the different waste streams that will be generated and the measures for safely handling and disposing of such waste so as to prevent pollution of the environment and negative impacts on human health.	Provide in Chapter 6, 6.4 (e)
14.	Indicate the estimated cost of the project evidenced by a certificate of valuation of the capital investment of the project, issued by a qualified and registered valuer as provided in schedule 5 (3f) of the National Environment (Environmental and Social Assessment) regulations, 2020	Provided in Chapter 1 table 1-1.
15.	Be mindful of any other critical environmental aspects/concerns, which may have not been initially foreseen during the preparation of the TORs and include assessment of such concerns in the ESIA report.	Addressed as required

1.8 Report Structure

This ESIA has been complied in conformity to national ESIA requirements of the National Environment Management Authority (NEMA) and Environmental Impact Assessment guidelines for water resources related projects in Uganda (MWE 2011) and benchmarked against international best-practice standards. It has therefore been presented into the following sections as shown in the Table 1-4 below;

Table 1-4: ESIA report structure

	Contents Headings	Explanatory Note
NTS	Cover page	Gives the name of the project, the client and the consultant.
i)	Declaration by ESIA team and other details	
iii)	List of Acronyms	Explains the abbreviation used in the report.
ii)	Table of contents	Directs the content to particular pages
iv)	Executive Summary	Providing a summary of the ESIA report in a non-technical manner for the purposes of disclosure to the wider public.
1	Introduction	This chapter will introduce the development and structure of the ESIA report.
2	Project Description	This chapter will be aimed at providing a concise description of the project and its geographic, ecological, social and temporal context. It will provide a site description, evolution of the Water works design, key

	Contents Headings	Explanatory Note
		components of the design, details of the construction process and operation and the changes in land use resulting from the project. Related third party facilities will also be considered.
3	Policy, Legal and Administrative Framework	This chapter will discuss the policy, legal and institutional framework within which the ESIA will be conducted. National regulations are discussed along with relevant international agreements and conventions to which Uganda is a party.
4.	Description of methodology and techniques used in assessment and analysis of project impacts.	This chapter gives an account of the methodology and techniques used in analysing the project impacts.
5	Baseline Data	This chapter will summarise the available baseline data on physical, biological and socioeconomic environment within the project area.
6.	Description/Assessments of the environmental and Social impacts of project activities.	This chapter gives a full description/assessment of the environmental and social impacts of the project activities.
7.	Analysis of Alternatives	The chapter will compare reasonable alternatives to the proposed project site, technology, design and operation in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. It will state the basis for final design selection. A no-project scenario will also be included.
8.	Stakeholder consultations	This chapter gives a summary of all the stakeholders consulted during the study and the issues, concerns, recommendations raised.
9	Environmental and Social Management Plan ,Summary of Impacts and Mitigation Measures	This section will summarise the predicted positive and negative impacts of the development, along with mitigation measures and any residual impacts that cannot be mitigated. Impacts and risks from associated facilities will be considered, as well as global, trans-boundary and cumulative impacts as appropriate. The ESMP will draw together the possible mitigation measures; group them logically into components with common themes; define the specific actions required, and timetables for implementation; identify training needs, institutional roles and responsibilities for implementation; and estimate the costs of the measures.
10	Conclusion and Recommendation	
11	Bibliography	This will contain a list for all references used during the ESIA process.
	ANNEXES	
	Terms of Reference (TOR)	The NEMA Approval of ToRs will be attached (**Appendix A**)
	Consultation Disclosure Plan (CDP)	This Plan will outline the project's approach to consultation and disclosure. It will list the stakeholders to be consulted along with the methods and timescales for engagement. **(Appendix J)**

2 DESCRIPTION OF THE PROPOSED PROJECT

2.1 Project location

Bugomolwa RGC is located in Nkandwa Sub County, Kyankwanzi district. The RGC is approximately 150 km by road from Kampala and approximately 57 km by road from Kyankwanzi town, Bugomolwa. RGC is located at partial coordinates349735.2°E 104734.5°N. The RGC is composed of 5 No villages, namely Bugomolwa-A, Bugomolwa-B, Bugomolwa Central, Kiyinikibi and Kyanwa and all of them are proposed to be covered with potable water supply under this project.

Table 2-1: Project Scope Area

Kyankwanzi district can be accessed by road from Kampala and is located approximately 150 km from Kampala. It is bordered by the districts of Masindi to the North, Hoima to Northwest, Nakaseke to East and Mubende to South.The project area covers 5 villages (Bugomolwa-A, Bugomolwa-B, Bugomolwa Central, Kiyinikibi and Kyanywa)

		VILLAGE
DISTRICT	KYANKWANZI	Bugomolwa A
COUNTY	NTWETWE	Bugomolwa B
SUB COUNTY	NKANDWA	Bugomolwa Central
PARISH	BUGOMOLWA	Kiyinikibi
		Kyanywa

2.1.1 Project components and their location

The following are the project major components, their description and their exact location

Project component	Coordinate / location	Description
Production well/ Borehole /Source	349518.225°E 104343.019°N	20m by 20m land take at the source to accommodate all the components of the source.
Transmission main/system	Along the existing roads	A total of 4m land take along the way leave from the source to the reservoir.
Disinfection facilities	350005.642°E 104948.633°N	Installation of a DOSATRON online proportional chemical dozer at the reservoir. There will be a chemical house at the reservoir.
Storage Reservoir	350005.642°E 104948.633°N	20m by 20m land take at the reservoir to accommodate all the components of the elevated reservoir

2.2 Areas to be served

The villages to be served and their population projections up to 2046 are shown in the **Error! Reference source not found.** Table 2-2.

Table 2-2: Population projections of the areas to be served

Village	Year 2018 (000)	Initial year 2022 (000)	Future Design Year-2032 (000)	Ultimate Design year-2042 (000)
	Population			
Bugomolwa – Central	207	250	400	638
Bugomolwa –A	419	506	808	1291
Bugomolwa –B	819	988	1579	2524
Kyanywa	320	387	617	986
Kiyinikibi	338	408	652	1042
	2103	**2539**	**4056**	**6481**

Source (detailed designs)

Projects populations of Initial year 2022, future year 2032 and ultimate Design Year 2042 work out 9%, 47% and 97% higher than the population of present year 2019 respectively.

Error! Reference source not found.

Table 2-3: Projected Maximum Day Water Demand

	Total Water Demand in m^3/day		
	Year 2022	**Year 2032**	**Year 2042**
Bugomolwa – Central	8.1	13.0	20.8
Bugomolwa –A	17.9	28.6	45.8
Bugomolwa –B	30.3	48.5	77.5
Kyanywa	11.7	18.7	29.90
Kiyinikibi	12.4	19.8	31.60
Total	80.5	128.64	205.53

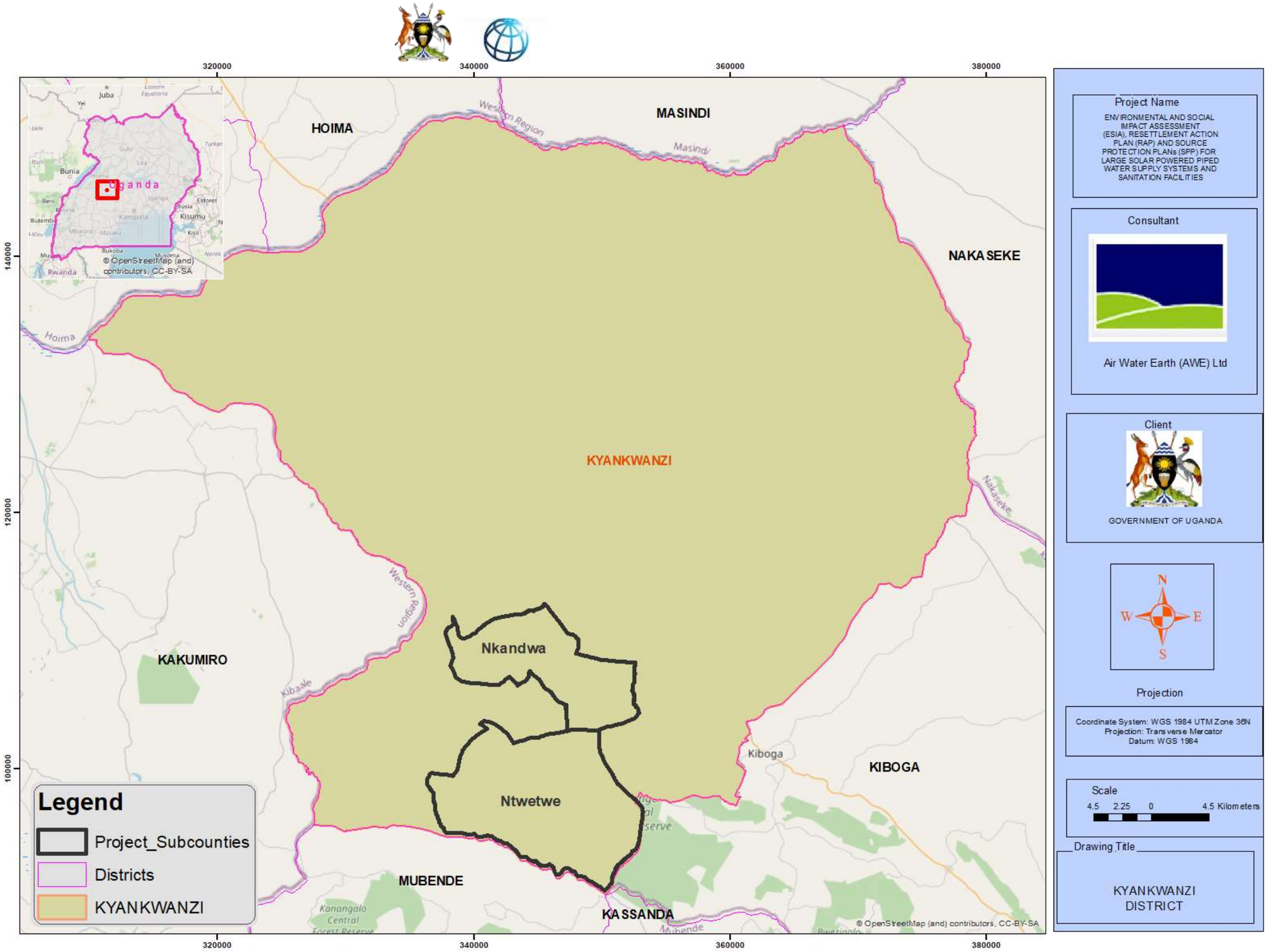


Figure 2-1: location map of Project district

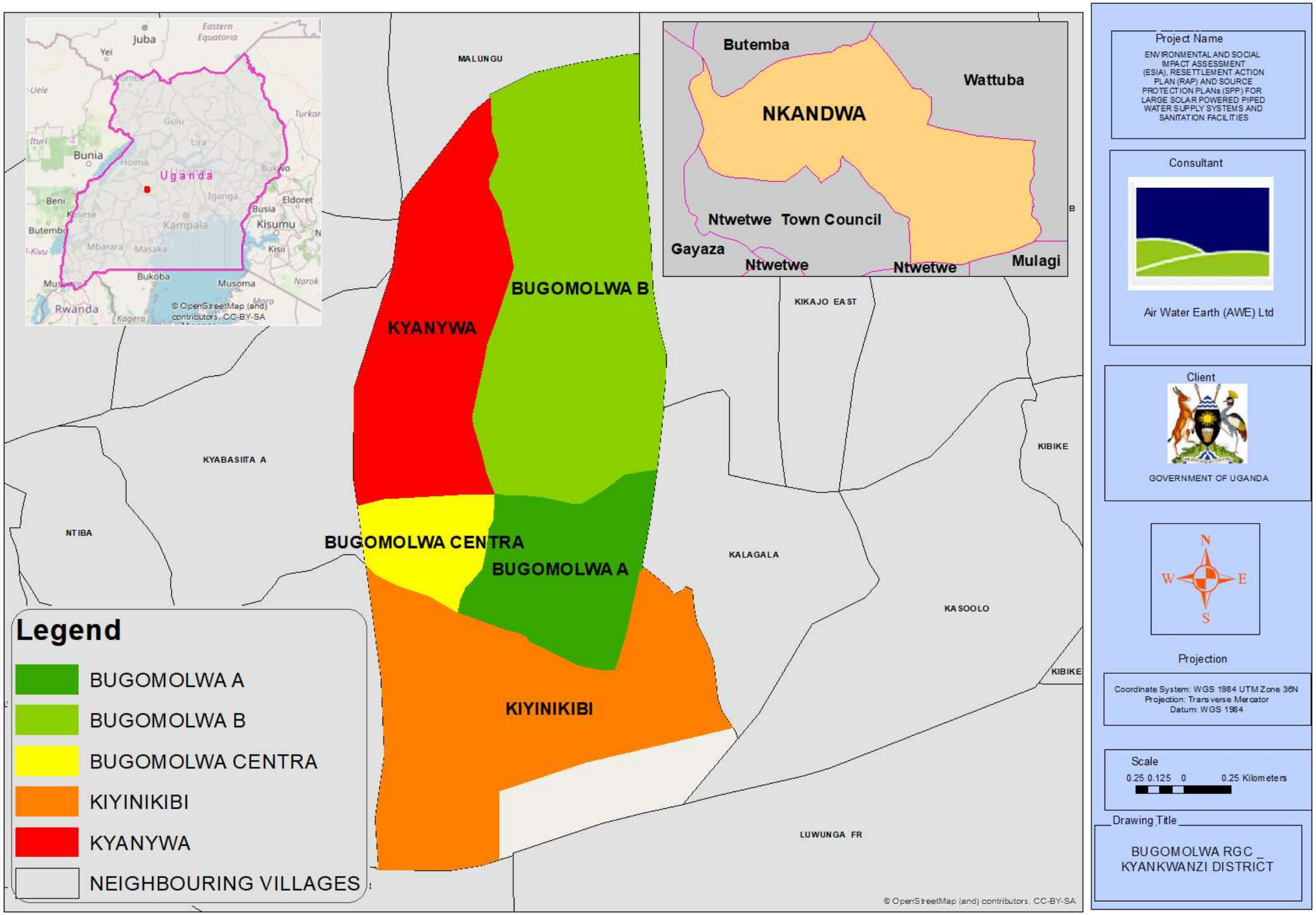


Figure 2-2: Location map of Bugomolwa RGC Supply area

2.3 Project Components Description

The water supply components for this RGC will comprise the following:

- Construction of borehole pump house, Attendants Quarters, Guardhouse and site facilities
- Installation of 40m^3/h submersible pumps powered by solar PV system
- Installation by UMEME of grid power at the borehole site
- Construction of 1.350km pumping main from boreholes to storage tanks
- Installation of 125m^3 pressed steel tanks on 10m high steel tower
- Construction of 6.758km of distribution network
- Construction of a Water Office and adjacent water borne toilet block

2.3.1 The water source

The source in Bugolomwa RGC is located in Kiyinikibi village, Bugolomwa Parish in Nkandwa Sub County at partial coordinates of 349518.225^{o}E 104343.019^{O}N. The proposed site land is owned by a family of the community that is, (Mr. Muhumuza Solomon, Isingoma Moses and Mugasa Joyce) and currently is covered in garden weeds with stalks of eggplant trees. North of the source is a banana plantation, east of the source is land covered in weeds and shrubs while the west and south is covered in maize. The source has a clear access road, which will be used during construction to transport the materials to the site. The proposed project intends to acquire 20m by 20m of the land from the source as the reference point. The owner of the land is not opposed to this as long as they are compensated fairly as shown in the RAP.

Source at Kiyinikibi in Bugolomwa

Access road to the source and Banana plantation North of the site

Maize plantation to the south

Maize and banana plantations to the west

The proposed solar powered water supply systems shall comprise of production boreholes / surface water with solar powered submersible pumps, pumping station, transmission main to storage reservoir, Pressed steel storage tanks, primary and secondary distribution systems and yard connections. The project will be supported by power (electricity) from the national grid by tapping from the already existing 3 phase power lines for each of the water supply systems where applicable to augment the solar generated power. Each scheme shall also have public sanitation facilities, a water office and other auxiliary facilities such as workers camp, waste disposal sites, material sources, storage yards etc. In addition, the project shall support water source/catchment protection activities to preserve the quantity and quality of the water at the planned water sources.

A Solar Powered Piped Water Supply Systems

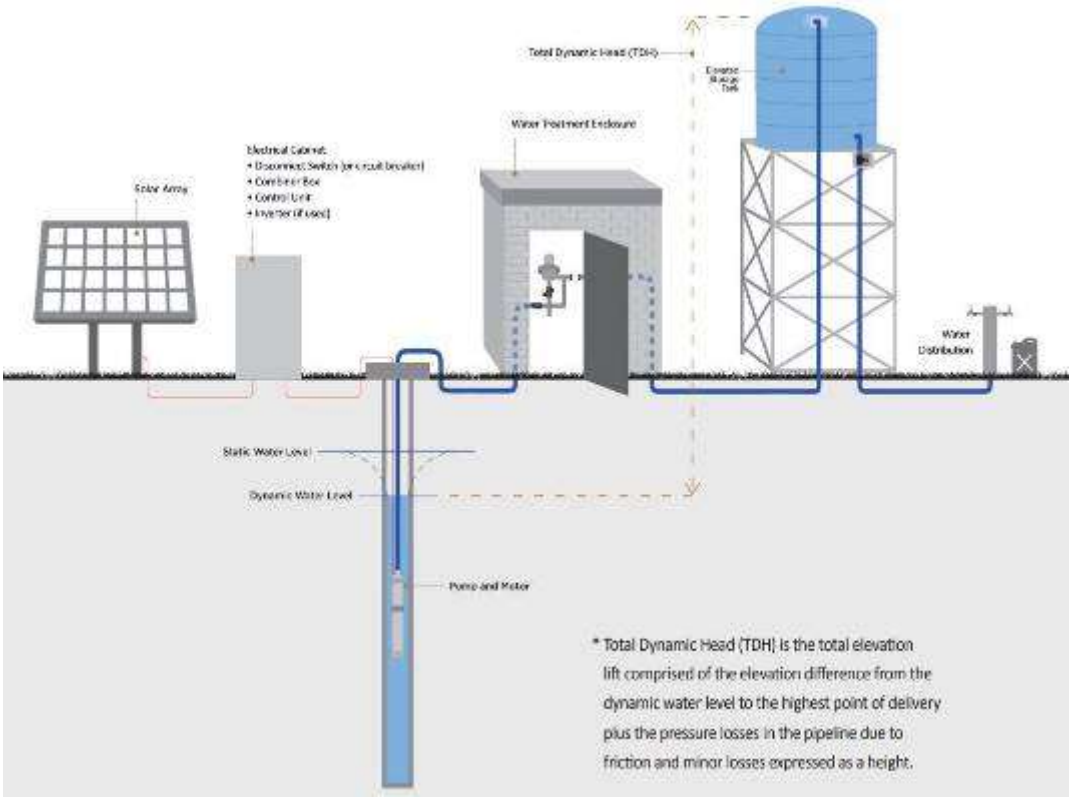


Figure 2-3: Demonstration of a typical solar powered water supply system

2.3.2 Transmission System

A transmission pipeline has been proposed from the production well (the source) to the elevated storage reservoir traversing along the existing road 2m from end of the road and 2m from the benchmark point. A total of 4m will be acquired along the Right of Way for pipe laying up to the reservoir in Bugolomwa B village. The brief description of proposed pipeline is as **Error! Reference source not found.** below:- A brief description of the proposed transmission corridor is highlighted in figure in 2-3 and 2-4):

Technical description of the transmission main and associated nature of the pipe considered a design flow of 90 m3/her, an outer diameter of a pipe measuring 110m , pipe internal length of 1000m approximately 0.97 km from the source to the reservoir and pressure rating of PN10Upvc as descried.in table 2.4 below.

Table 2-4: Borehole Transmission Mains

S.No	Nomenclature of Pipe	Design Flow m^3/hr	Outer diameter of pipe mm	Length m	Pressure Rating & Type of Pipe

1.	Production Well to Elevated Reservoir at Point A.(E-A)	90	110	1000	PN10 uPVC

Source: Detailed Designs 2021

2.3.3 Distribution Network

Distribution pipeline network proposed to be provided from the elevated reservoir to the two villages that is, Kiyinikibi and Bugolomwa B has the following details.

Abstract of pipe lengths	
Pipe Line	**Total (m)**
uPVC PN10, 110 mm	35
HDPE PN10, 90 mm	257
HDPE PN10, 75 mm	1573
HDPE PN10, 63 mm	1812
HDPE PN10, 50 mm	63
HDPE PN10, 40 mm	3011
Total	**6751**

In the distribution pipelines, sluice values, kinetic air valves, washout valves and zero velocity valve wherever required, have been proposed to be provided.

2.3.4 O&M Tools and Equipment

Part of the investment will be used to supply new O & M tools and equipment. Equipment will be supplied for the running of the Water supply. These will include; Town Water Offices Equipment, Plumbing Tools and Equipment, Workshop Equipment, Laboratory Equipment, Mechanical Tools and Equipment, Electrical Tools and Equipment, Miscellaneous Tools, Chemical Equipment and Chemicals.

2.3.5 Power Options

Initially this project was envisaged to be powered by solar power only. However as solar power is available during daytime only from 9.00 AM to 4.00 PM, the water requirement of project area at a designed supply rate can be achieved by this only for initial 10 years. So, an additional source i.e. grid electric power has been proposed to be used for the period 2032-2042. The pump set of 19m^3/hr is proposed to be provided for production well which will run for 7 hours with solar power for initial period of 10 years. This pump set with this running arrangement is capable to deliver water demand of intermediate year 2032. However, the water demand of ultimate year cannot be met with solar power only. Hence it is proposed to provide additional source i.e. electric grid power after 10 years. Pump set of same duties i.e. 19 m^3/hr discharge for production well is proposed to be provided in year 2032 which will run for 11 hours (7 hours with solar power and 4 hours with grid power) to produce water for demand of ultimate year 2042. Based on the above details of pump sets of the production wells are proposed to run/operate with solar power and electric grid power as details given below:

Table 2-5: Borehole Transmission Mains

	Operating Time							
Production Well	**Year 2022 to 2032**				**Year 2033 to 2042**			
	Duties of Pump		Running hours		Duties of Pump		Running hours	
	Discharge m^3/hr	Head M	Solar Power	Grid Power	Discharge m^3/hr	Head m	Solar Power	Grid Power

Bugomolwa at Kiyinikibi	19	100	7	-	19	100	7	4

The recommended power supply option for the operation of the pumps will be a hybrid of solar energy and hydroelectric power. The solar energy can only solely satisfy the demand over a 7hr pumping period; therefore, Hydroelectric power will be required.

2.3.6 Disinfection Facilities

Disinfection of the water from the well will be done by the installation of a DOSATRON online proportional chemical dozer at the reservoir. Disinfection will be affected prior to entry into the tank. A chemical house will be constructed adjacent to the reservoir to house the dozer and serve as a chemical storage, mixing and dosing place.

2.3.7 Network Intensification and Service Connections

The estimated quantities for network intensification lines are 6.7 km of pipe work and the start-up number of connections is estimated as 20 No. and 3 No. public stand posts.

2.3.8 Storage Reservoir

Elevated Storage Reservoir

The water to the consumers shall be supplied by gravity through a n elevated storage reservoir located at partial coordinate 350005.642^{o}E 104948.633^{o}N in Bugomolwa B village, Nkandwa Sub-County. The proposed site is owned by a local community member (Mr. Mugenyi Dan) and the permanent land take by the project will be 20m by 20m off the owner's land with reference from a bench mark point at 350005.642^{o}E 104948.633^{o}N. The reservoir also has a clear access road and is located in the trading centre surrounded by commercial buildingsThe site and the North to is covered in maize while the South and East is commercial buildings and the West is covered in banana trees and more commercial buildings on the far east. The reservoir site can be accessed through the main road as shown in the pictures below. The water to the consumers shall be supplied by gravity from an elevated water storage reservoir to the transmission pipeline. The details of the reservoir are as below.

Table 2-6: Propose reservoir details

Capacity of each Reservoir	100 m^3
Location	Bugomolwa-B (At Point-A)
Staging Height	20 m above G.L.
Full Supply Depth	3.25 m above bed level
Material of Construction	Pressed Steel

East of the reservoir site

North of the reservoir proposed site

South of the reservoir proposed site

West of the proposed site

Reservoir Site Works

The site works for all the reservoirs will consist of the following:

- General earthworks,

- Site pipe work,
- Site drainage,
- Fencing and miscellaneous works.

The outlets from all the reservoirs shall be fitted with new bulk flow meters.

2.4 PAPS (Project Affected Persons)

A "PAP" means a person who owns or occupies land, property or other assets or structures which are adversely affected by the Project, or whose livelihood, business, trade or other occupation is adversely affected as a result of the Project, and who is declared accordingly eligible to compensation or other assistance. This project has a number of PAPs for example individuals who own the land on which the reservoir and the source are located and are proposed to be located, individuals who own things of value like houses, businesses, trees or crops along the easement corridor among other things. The strip maps below show these individuals.

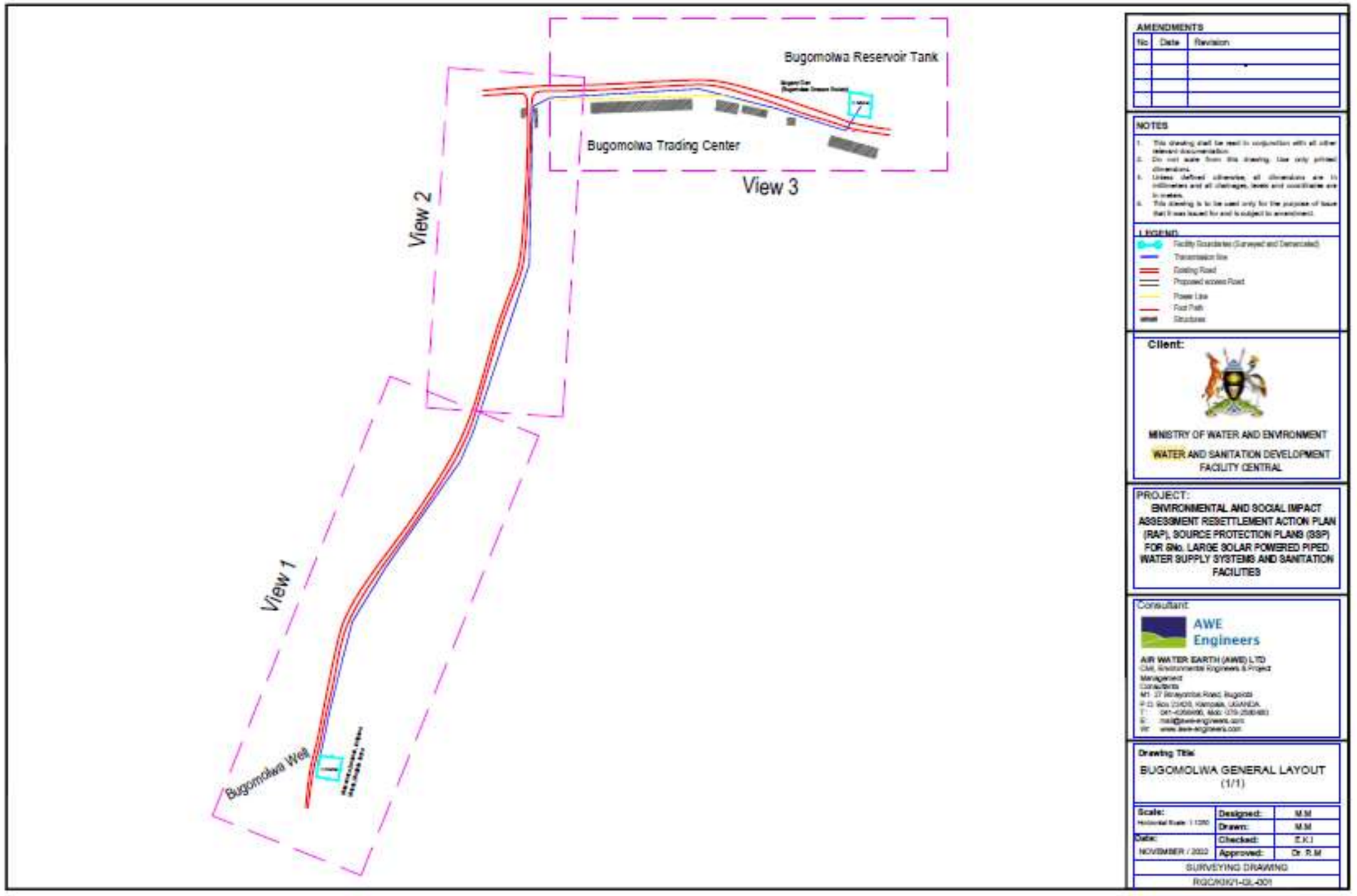


Figure 2-4: Bugomolwa strip map views 1 and 2

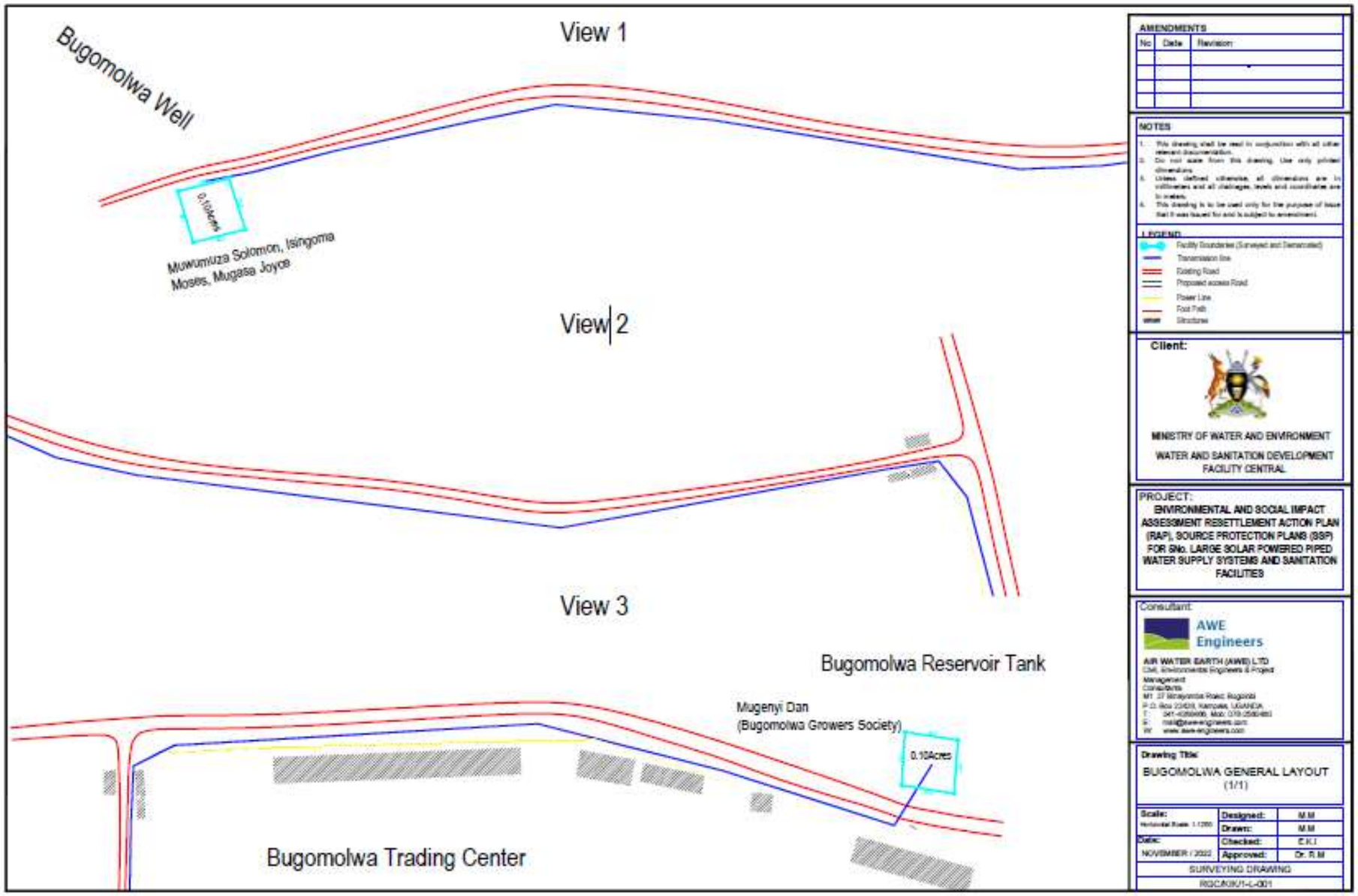


Figure 2-5: Bugomolwa strip map views 3 and 4

2.4.1 PAPS identified by the study

S/N	NAME OF PAP	NAME OF LAND OWNER	TENURE	GPS CORDINATES	LAND USE	TYPE OF DEVELOPMENT	NAME OF CROP/TREE	DESCRIPTION	QTY
1	BUGOMOLWA GROWERS SOCIETY C/O MUGENYI DAN	BUGOMOLWA GROWERS SOCIETY	MAILO	350005.642°E 104948.633°N	AGRICULTURE	NIL	NIL		
2	MUGENYI DAN	BUGOMOLWA GROWERS SOCIETY	LICENSEE	350005.642°E 104948.633°N	AGRICULTURE	NIL	BANANAS	MATURE	12
							BANANAS	AVERAGE	8
							MANGO (GRAFTED)	YOUNG GOOD	1
3	FAMILY OF THE LATE PETER KYANDA MUGASA C/O MUHUMUZA SOLOMON, ISINGOMA MOSES & MUGASA JOYCE		MAILO	349518.225°E 104343.019°N	AGRICULTURE	NIL	MUSAMBYA	YOUNG	2

The location of production well, elevated reservoir and alignment of transmission and distribution mains have been shown in the drawings below.

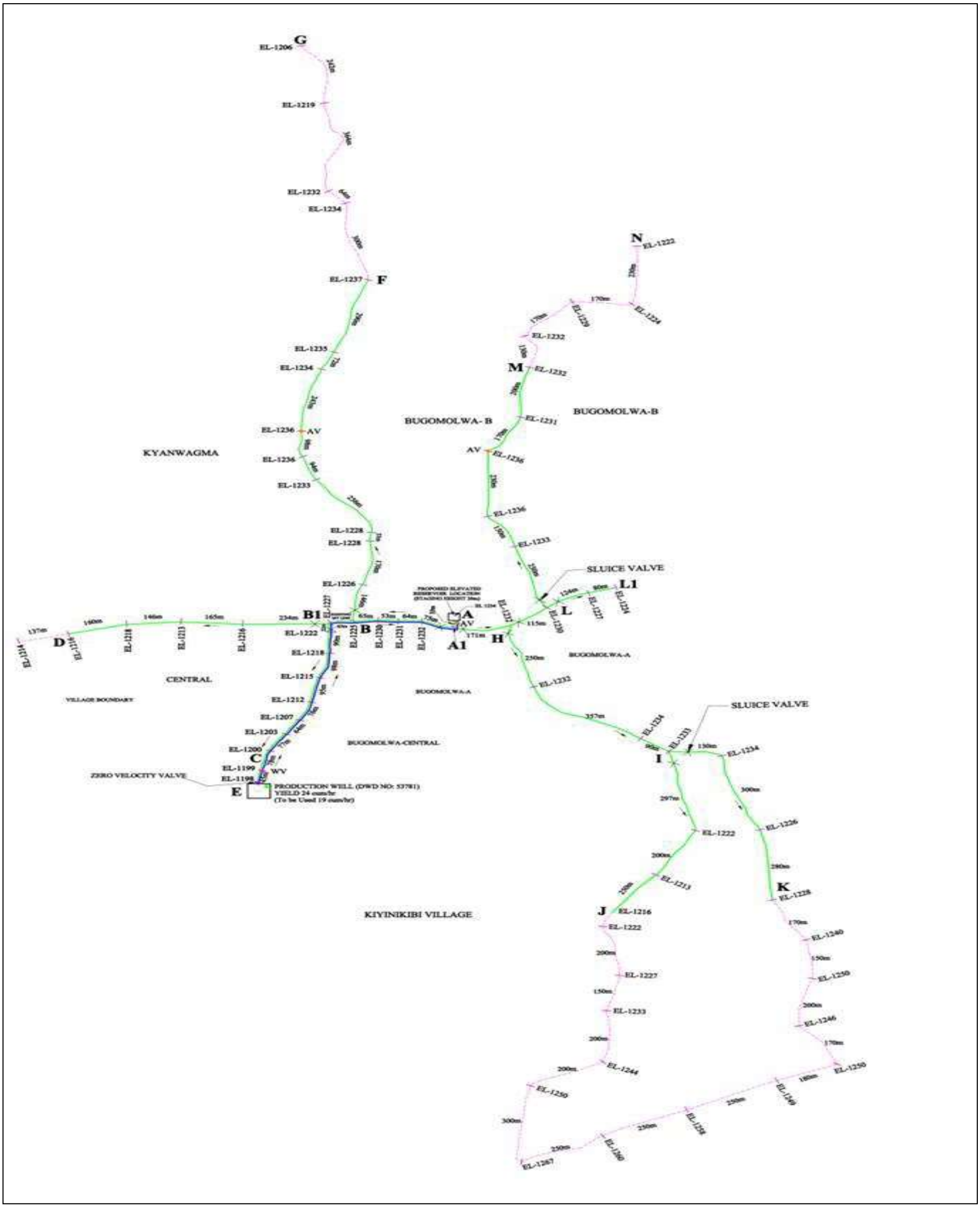


Figure 2-6: Proposed Bugomolwa Water Supply Network and location of key infrastructure facilities

2.5 Construction Activities

2.5.1 Project Phases

Mobilization Phase - This phase will involve mobilization of the construction human resource, equipment, construction materials, erection of temporary worker's camp and storage yard. The location of the project temporary camp will be agreed upon with the local leadership, landowners, and contractor.

Construction Phase - All project activities under this phase are supposed to be carried along the tracks, route, and access paths within the boundaries of the identified project sites without disturbing or obstructing the neighbors and businesses. To ensure this, the contractors will seal off the site perimeter with corrugated iron sheets or other suitable material during project implementation. In case of trenches, proper barricade must be applied to warn and protect the people of impending dangers of falling into open pits and trenches. Upon completion of preliminary activities and on-site investigations, actual construction of the project components and facilities will start which will involve:

- Setting out to demarcate rights of way, work areas, clearing limits. Access paths, detours, bypasses and protective fences or barricades should all be in place before construction begins.
- Excavation of trenches for water pipe lines;
- Trench sheeting and bracing to protect collapsible trench side walls;
- Placing concrete to bases of foundations;
- Laying of mains water pipes; and
- Backfilling, disposal of overburden and surface restoration to at least match the condition that existed prior to the water works construction.

Demobilization Phase - Demobilization phase will involve clearing of the project site of all construction and unwanted material. The disposal of any unwanted material will be done by the contractor. The waste materials may include packaging, wood, steel crates, cardboard, wrapping materials, construction debris, boxes, sacks, drums, cans and chemical containers, etc. Damaged areas will need to be restored before commissioning the project. Upon completion of the contractor's obligations, the contractor will hand over the project to MWE, the client.

Operation Phase - This will involve employment of operators both skilled and unskilled, operation of the water supply system, maintenance of the facilities put in place, etc.

2.5.2 Construction Method

The actual choice of construction method and resources will be the Contractor's responsibility as dictated by the site conditions, productivity, and construction schedule. The choice has a bearing on the cost implication. In all construction activities safety of operations is paramount. It entails carrying out of construction activities and operation of equipment by experienced personnel under supervision of experienced and qualified staff and use of well serviced construction equipment in good working condition. Safety on site will be managed by close supervision of the contractor's Health & Safety Officer and the Engineer's construction Supervision staff of the site activities about the working environment in accordance with the applicable Environment, Safety, Health and Social Safeguard Policy.

2.5.3 Plants and Equipment

Because of the nature of the construction activities that will be undertaken, a number of plants and equipment will be used to execute the assignment by the contractor or the sub-contractor(s) and these will include among the following: Graders, Vibrators /Rollers, Water Trucks, Bulldozers, Front End Loader, Vehicles, Containers, Excavators, Water Pumps, Mechanical Toolboxes, Civil Plate Compactors, Dump truck, Concrete Mixer, Crane and Compactor.

3 POLICY, LEGAL, REGULATORY, AND INSTITUTIONAL FRAMEWORK

3.1 Introduction

Key legislation governing an ESIA study in Uganda includes the National Environmental Act (NO. 5 of 2019) of the laws of Uganda and the Environmental and Social Assessment Regulations, S.I. No. 143 of 2020. The National Environmental Act established NEMA and entrusts it with the responsibility to ensure compliance with ESIA process and procedures in planning and execution of development projects. The procedures require that a project proponent prepares an ESIA report with a clear assessment of relevant potential impacts, based on Terms of Reference (ToRs) developed from a scoping exercise. This requires that the ESIA addresses potential direct and indirect socio-environmental impacts during the per-construction, construction, operation and decommissioning phases and an environmental and social management plan (ESMP) has also to be prepared.

Policies, legal and institutional framework considered relevant to this proposed project are discussed in this section. Various laws here reviewed relate to minimum acceptable construction, operational requirements, environmental quality, land use, public health, occupational safety, labour standards and international legal obligations.

3.2 Policies relevant to the Proposed Project

Table 3-1: Policy framework related to the Project

Policy	Goal	Relevancy
National Environment Management Policy, 2014	The overall policy goal is sustainable development which maintains and promotes environmental quality and resource productivity for socioeconomic transformation. The Policy provides a system of Environmental Impact Assessment (EIA) and environmental monitoring so that adverse environmental impacts can be foreseen, eliminated or mitigated.	Environment and development are interrelated, and this policy requires that environmental aspects are considered in all development projects such as the construction activities. Therefore, this ESIA study has been conducted to take into consideration any adverse social and environmental impacts of the construction activities of the proposed Bugolomwa RGC piped Water Supply and Sanitation System.
The National Water Policy, 1999	To manage and develop the water resources of Uganda in an integrated and sustainable manner, so as to secure and provide water of adequate quantity and quality for all social and economic needs of the present and future generations with the full participation of all stakeholders.	Water source protection measures have been proposed under the ESMP and full WSPP will also be prepared as part of the assignment and should be implemented to ensure safe water quality and quantity in compliance with this policy.
The National Gender Policy, 2007	Provides a framework and mandate for all stakeholders to address and implement the gender imbalances within their respective sectors.	This policy would especially apply in the recruitment process of labour, both during construction and operation phase. Men and women should have equal opportunities for available jobs. This policy

Policy	Goal	Relevancy
		also requires provision of a work environment that is safe and conducive to women, as it is for men, considering gender-dis aggregated differences and vulnerabilities.
The Occupational Health and Safety (OHS) Policy, 2006	This policy seeks to: Provide and maintain a healthy working environment; Institutionalize OHS in the power-sector policies, programs and plans; and contribute towards safeguarding the physical environment. The OHS Policy also takes into consideration the Health Sector Strategic Plan, all of which aim to improve the quality of life for all Ugandans in their living and working environment.	This policy will be especially relevant for OHS of construction crews and subsequently, operation and maintenance personnel. The policy will also have relevance in mitigation measures that protect the public from health and safety impacts because of project construction and subsequent operation and maintenance activities.
The Environmental Health Policy 2005	The policy provides a framework for the development of services and programs at National and Local Government levels that establish the environmental Health priorities.	Analysis of water quality was done at the design stage and during the pump testing where the water quality analysis report was prepared. The results of the analysis have been used and are presented under the Section on Water Quality as part of the baseline information.
The National Wetlands Policy, 1995	To promote the protection of Uganda's wetlands to sustain their ecological and socioeconomic functions. Wetlands should not be drained and converted without NEMA's approval.	This policy is especially relevant to ensure that the construction process doesn't in anyway exploit the existing wetlands and will guide any trenching through wetlands
The National Land Policy, 2013	The goal of this Policy is: "to ensure an efficient, equitable and optimal utilization and management of Uganda's land resources for poverty reduction, wealth creation and overall socioeconomic development". One of its objectives is to ensure sustainable utilization, protection and management of environmental, natural and cultural resources on land for national socioeconomic development.	By undertaking an ESIA for the proposed project, the developer is ensuring planned and environmentally friendly infrastructure development. Enhancement and mitigation measures should be implemented by the developer and the contractor(s) to ensure that all land use practices conform to land use plans and the principles of sound environmental management such as biodiversity preservation, soil and water protection, conservation, and sustainable land management.
The National Health Policy, 2010	To reduce mortality, morbidity and fertility, and the disparities therein.	Contribute to the reduction of water borne diseases thereby improving on the health of communities, especially the girl child and mothers who are mainly involved in collection of water.
Uganda National Climate Change	The overarching objective of the policy is to ensure that all stakeholders address climate change impacts and their causes through appropriate	ESIA promotes the wise use of water resources to minimize harmful effects to the environment and water resource monitoring.

Policy	Goal	Relevancy
Policy, 2015	measures, while promoting sustainable development and a green economy including integration of climate change issues into planning, decision making and investments in all sectors.	It promotes and strengthen the conservation and protection against degradation of watersheds, water catchment areas, riverbanks and water sources in order to increase their resilience to climate change impacts.
National Policy on HIV/AIDS and the World of Work, 2007.	To ensure HIV/AIDS is addressed in the workplace, the policy encourages employee awareness and education on HIV/AIDS. To protect the infected and affected persons from discrimination, employers are required to keep personal medical records confidential. Employees living with, or affected by, HIV and AIDS, and those who have any related concerns, are encouraged to contact any confidant within the organization to discuss their concerns and obtain information.	This policy is relevant to the project if implementation of proposed construction activities leads to influx into the project area by people seeking construction jobs and indulging in prostitution or irresponsible sexual fraternization associated with HIV/AIDS risk. The provisions of this policy are expected to be fulfilled by the construction contractors or their subcontractors, especially in regard to having an in-house HIV Policy, worker sensitization and provision of free condoms.
National Orphans and other vulnerable children's Policy, 2004	The goal of the Policy is full development and realization of rights of orphans and other vulnerable children. The policy provides support to vulnerable children and families such that their capacity to sustain themselves is strengthened; and provides residential care for orphans and other vulnerable children as a last resort	The project Developer (MWE/DWD) and the contractor(s) including their sub-contractor(s) will ensure that the project activities do not compromise or in any way affect the lives and livelihood of all the vulnerable groups like the orphans and children in general during the project implementation
National Equal Opportunities Policy, 2006	The National Equal Opportunities Policy provides a framework for re-dressing imbalances, which exist against marginalized groups while promoting equality and fairness for all. With a goal of: providing avenues where individuals and groups' potentials are put to maximum use by availing equal opportunities and affirmative action.	The Water supply projects come along with a lot of opportunities including service delivery, training and employment. The project will avail equal opportunities and affirmative action.
The National Child Labour Policy 2006	The policy provides an enabling environment for the prevention, protection and elimination of child labour. It is intended to establish guiding principles in Uganda's effort to eliminate child labour and priorities for government and stakeholder action. This policy is based on recognition that all human beings, adults and children, have rights. Children by virtue of their age and needs are entitled to specific rights, including education, health, survival development, protection and participation	The project management including all the contractors will ensure that all employees are above 18years and not school going students or pupils.
The Equal	An Act to make provision in relation to the Equal Opportunities	MWE, the contractor and the operator will work hand in hand with

Policy	Goal	Relevancy
Opportunities Commission Act, 2007	Commission pursuant to articles 32 (3) and 32 (4) and other relevant provisions of the Constitution; to provide for the composition and functions of the Commission; to give effect to the State's constitutional mandate to eliminate discrimination and inequalities against any individual or group of persons on the ground of sex, age, race, colour, ethnic origin, tribe, birth, creed or religion, health status, social or economic standing, political opinion or disability, and take affirmative action in favour of groups marginalized on the basis of gender, age, disability or any other reason created by history, tradition or custom for the purpose of redressing imbalances which exist against them; and to provide for other related matters.	ensure that that there is no discrimination and inequalities against any individual or group of persons on the ground of sex, age, race, colour etc. Local recruitment of workers among others will be prioritized for men, youth and women. A complaints mechanism will be put in place to ensure there is redress of registered grievances.
The National Council for Disability Act, 2003	The Act provides for the establishment of a National Council for Disability, its composition, functions and administration for the promotion of the rights of persons with disabilities set out in international conventions and legal instruments, the Constitution and other laws, and for other connected matters. Part IV provides for the establishment of lower councils for disability.	MWE and the contractor will work hand in hand with the already formulated District and Sub County Council for Disability in ensuring that the needs of the persons with disabilities are observed.
The 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: i. Equity; Fairness, fair play, impartiality and justice in the distribution of benefits and responsibilities in society. ii. Respect; Views, opinions and rights of older persons will be upheld while they are also expected to exhibit high sense of self-respect. Commitment; The willingness to work hard and give all the energy and time to meet the vision. iii. Accountability; All stakeholders are expected to fulfill their obligations towards one another iv. Equality; All older persons will be accorded same opportunity and rights as other individuals.	Persons above 65 years old are categorized as old. These should be incorporated in the compensation process where necessary and will be treated with Equity and respect; all their views will be considered regarding the execution of the project.
Uganda Vision 2040	Water Development is stated as one of the opportunities that can	The project will increase access to safe potable water thus

Policy	Goal	Relevancy
	foster the socioeconomic transformation of Uganda from a peasant to a modern and prosperous country.	contribute to improved health, sanitation, and hygiene.
National Development Plan III	The plan focuses on increasing access to safe water, sanitation and hygiene levels, functionality of water supply systems and promoting catchment based integrated water resources management during the planning process in order to achieve the middle-income status by 2025.	The project focuses on providing access to safe and clean water, increasing the functionality of the water supply systems within the Rural Growth Centre and the Sub county.
Sustainable Development Goals (SDG)	The 2030 agenda for Sustainable Development envisions a world where we reaffirm commitments regarding the human right to safe drinking water and sanitation and where there is improved hygiene.	The project will specifically support SDG 6 on ensuring clean water and sanitation is attained. This focuses on ensuring availability and sustainable management of water and sanitation for all.

3.3 Laws relevant to the Proposed Project

Table 3-2: **Legal framework related to the project**

Legal Framework	Relevancy	Requirement
The Constitution of the Republic of Uganda; 1995; amended as at 15th February 2006, Government of Uganda.	The State shall promote sustainable development and public awareness of the need to manage land, air and water resources in a balanced and sustainable manner for the present and future generations. The Constitution is the cardinal law in Uganda upon which all environmental laws and regulations are founded.	All environmental impact actions of the project are therefore meant to conform to the broader objectives of the Constitution which requires a healthy environment for all citizens. ESIA report has been prepared for NEMA's consideration before implementation of the project. Therefore, this Project will be implemented in a manner that will incorporate the appropriate safeguards for environmental and social issues, especially land take. Any land required for the implementation of the construction activities will be obtained within the confines of the law, after a Resettlement Action Plan (RAP) will be conducted where possible.
The National Environment Act No. 5 of 2019	This act provides for various strategies and tools for environment management, which also includes the ESIA for projects likely to have significant environmental impacts. The fifth Schedule section 4 (a) and (b) of the National Environment Act, No. 5 of 2019 lists projects to be considered for environmental impact assessment. Under that categorization, most water resources related projects fall	The Act governs and guides environmental management in Uganda. This ESIA is prepared to conform to the Act's requirement that projects likely to have significant environmental impact undertake an ESIA before they are implemented. ESIA report has been prepared for NEMA's consideration before implementation of the project.

Legal Framework	Relevancy	Requirement
	under two ground and surface water resources.	
The Water Act, Cap 152 and The Water Resources Regulations, 1998	Management of water resources Regulation and issuing of water use, abstraction and wastewater discharge permits; Prevention of water pollution. Managing and monitoring and regulation of water resources	Ground water abstraction permit should be obtained from DWRM before operation phase. Water analysis was done during the design stage and pump testing where a water quality analysis report was prepared. Water analysis was done under ESIA, and results (see Annex VII) compared to those obtained at design stage and national standards for portable water. The quality of treated water will be regularly monitored to ensure it meets portable water standards and these results have been used during this ESIA and results compared to those of national standards for portable water.
The Land Act, Cap 227	Section 74 (i) states that where it is necessary to execute public works on any land, an authorized undertaker shall enter into mutual agreement with occupier or owner of the land in accordance with Act.	These tenure systems will be important during resettlement planning. The extent of works designed to ensure the construction of the Bugomolwa RGC WSS will necessitate land take in the Project Area. Any land required for the implementation of this Project will be acquired in accordance with the provisions of this Act.
The Land Acquisition Act, 1965	This law elaborates on land acquisition procedures for early entry into the delineated land as compensation matters are finalized with the objective of timely Project delivery. Reference to this Act has been made while proposing strategies for addressing unreasonable speculative persons who may jeopardize Project delivery by demanding exorbitant compensation.	MWE will issue Notices of Entry at the start of RAP disclosures.
The Occupational Safety and Health Act, 2006	Provision of Occupation Health and Safety of workers and Inspection of places of works. This Act requires that employers provide and maintain safe working conditions and take measures to protect workers and the public from risks and dangers of their works, at his or her own cost (Section 13). Employers with more than 20 workers should prepare and often revise a written policy with respect to safety and health of workers (Section 14). The contractor therefore is	An ESMP has been prepared and the Contractor will ensure the workplace is registered under the Ministry of Gender, Labour and Social Development (MoGLSD) under the Department of OHS. The construction activities will require workers during the construction, and operation and maintenance phases. Therefore, the Act requires that MWE and all contractors must ensure that workers have a safe working environment at all times and that

Legal Framework	Relevancy	Requirement
	obliged to provide employers with washing facilities, First Aid, facilities for meals and safe access to workplaces	their health is not at risk as a result of the working environment.
The Workers' Compensation Act, 2000	This requires compensation to be paid to a worker injured or acquired an occupational disease or has been harmed in any way in the course of his/her work.	This Project will require workers during construction, operation and maintenance phases. Any injury or illness resulting from Project related activities will be subject to conditions of the Workers' Compensation Act. Kyankwanzi District Labour officers will also be involved in ensuring compliance of the Contractor's' with labour laws. The developer shall ensure that all contractors and sub-contractors provide personal protective equipment (PPE) to employees to minimize accidents and injuries and ensure workers safety onsite.
The Physical Planning Act, 2010	Section 37 requires an EIA permit for developments before they are implemented. It states: "Where a development application related to matters that require an environmental impact assessment, the approving authority may grant preliminary approval subject to the applicant obtaining an EIA certificate in accordance with the National Environment Act".	MWE shall use established guidelines to acquire land and compensate where possible for acquired lands, as well as safeguarding the natural environment, in line with the provisions of this Act. Where necessary RAP will be prepared for the Water transmission lines in fulfillment of the above provisions before construction activities are implemented
The Physical Planning Amendment Act, 2020	Insertion of new Section 2A in principal Act is amended by inserting immediately after section 2 the following; @A. Right to a clean and healthy environment. 1. Every Ugandan has a right to a clean and healthy environment in accordance with article 39 of the constitution. 2. Subject to subsection 1, every Ugandan has a duty to create, maintain and enhance a well-planned environment. 3. A person may, where any person, which has or is likely to breach a physical development plan or physical planning standards, threatens the right referred to in subsection 1 because of an act or omission. 4. A person proceeding under subsection 3 may file a civil suit notwithstanding that the person cannot prove that the act or	MWE commissioned this ESIA study in compliance with this Act.

Legal Framework	Relevancy	Requirement
	omission of another person has caused or is likely to cause personal harm or injury.	
The Public Health Act, Cap 281	The Public Health Act aims at avoiding pollution of environmental resources that support health and livelihoods of communities. It gives local authorities powers (Section 103) to prevent pollution of watercourses.	The disposal of waste from the proposed project will have to be appropriately managed so as to prevent risk to public health, in line with the provisions of this Act.
The Local Governments Act, Cap 243	Provides for the system of local governments based on the decentralization of district for the enforcement of environmental law.	The developer will work closely with the District Water Officer (DWO), District Natural Resources Officer (DNRO) and Sub county Community Development Officer in carrying out monitoring activities to ensure no damage onto the environment and social amenities.
Investment Code Act, Cap 92	Section 18(2) (d) of the Act requires an investor to take necessary steps to ensure that development and operation of an investment project do not cause adverse ecological and socioeconomic impacts.	MWE is the implementing agency for the project that received funding from the World Bank. This ESIA is in partial fulfillment of the requirements of this Act, since adverse ecological and socioeconomic impacts as a result of the project implementation have been identified and mitigation measures developed.
Employment Act, 2006	This Act is the principal legislation that seeks to harmonize relationships between employees and employers, protect worker's interests and welfare and safeguard their occupational health and safety through: i) Prohibiting forced labour, discrimination and sexual harassment at workplaces (Part II; Part IV). ii) Providing for labour inspection by the relevant ministry (Part III). iii) Stipulating rights and duties in employment (weekly rest, working hours, annual leave, maternity and paternity leaves, sick pay, etc. (Part VI). iv) Continuity of employment (continuous service, seasonal employment, etc. (Part VIII). This Act is relevant to both construction & operation phases.	The Act will govern labour arrangements and conditions under which persons hired by the project work. It prohibits Child labour (a condition the contractor must comply with) as well as providing guidance on work rights during the post-construction phase.
The Children's Act, Cap 59	This is an Act to reform and consolidate the law relating to children; to provide for the care, protection and maintenance of children; to make provision for children charged with offenses and for other connected purposes.	This Project will require workers during construction, operation and maintenance phases. No child should be employed under project work force requirement however, any employment or engagement of children will be done in line with the restrictions of

Legal Framework	Relevancy	Requirement
	Part II of the second schedule of this Act defines a child as a person below the age of eighteen (18) years. In the same schedule under Section 8 of this Act provides that no child shall be employed or engaged in any activity that may be harmful to his or her health, education or mental, physical or moral development.	this Act and the Employment Act to ensure that risks to children are either eliminated or reduced to as low as reasonably practicable. In addition, the contractor will confirm age of potential laborers prior to hiring through National Identity card, birth certificate or confirming with LC and community elders. Kyankwanzi District Probation Officers will provide guidance to Contractors and their employees' areas of compliance.
The Historical Monuments Act, 1967	Sub-section 12(1) requires that any portable object discovered in the course of an excavation shall be surrendered to the Minister who shall deposit it in the Museum. The Act adds that, notwithstanding provisions of the subsection, where any object is discovered in a protected site, place, or monument, the owner of the protected site, place, or monument shall be entitled to reasonable compensation.	This Act requires that any chance finds encountered during project construction shall be preserved by the Department of Monuments and Museum in the Ministry of Tourism, Wildlife and Heritage. Any chance finds objects, material or infrastructure that may be identified as falling under the category of 'archaeological pale-ontological ethnographic and traditional interests' during the Project implementation will therefore, be reported to the Department of Museums and Monuments.
The National Environment (Environmental and Social Assessment) Regulations, 2020	According to sections 15 of the Regulations, the developer of any project that has or is likely to have a significant impact on the environment is required to undertake an ESIA process after approval of the ToRs.	ESIA report has been prepared for NEMA's consideration after the approval of the Terms of References before implementation of the proposed project.
The National Environment (Waste Management) Regulations, 2020	Regulation 5 (1) stipulates that a person who generates waste, a waste handler or product steward has a duty of care and shall take measures to ensure that waste is managed in a manner that does not cause harm to human health or the environment among other provisions.	These regulations apply to both construction and operation-phase waste which should be managed in a way such as to avoid environmental and public health impact. Therefore, all the generated various types and volume of waste should be managed and conform to these regulations.
The National Environment (Noise Standards and Control) Regulations, 2000.	Part III Section 8 (1) requires facility 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 eight hours in a day should be provided with requisite hearing protection.	All construction activities should be carried out between 7am – 6pm by the Contractor as working hours. No construction activities to be carried out at Night. Noise levels should also be monitored and not to exceed 55dB as per Regulation (Mixed residential and commercial area).

<table>
<tr><th>Legal Framework</th><th>Relevancy</th><th>Requirement</th></tr>
<tr><td>The Water Resources Regulations, 1998</td><td>With regard to water abstraction, Part II: Section 3 Sub-section (1) of these regulations requires application for Water Permits by anyone who: (a) Occupies or intends to occupy any land; (b) Wishes to construct, own, occupy or control any works on or adjacent to the land referred to in regulation 10; may apply to the Director for a water permit.</td><td>Ground Water abstraction permit will be applied for and obtained by the developer from the Directorate of Water Resources Management (DWRM) before operation phase.</td></tr>
<tr><td>The National Environment (Audit) Regulations, 2020</td><td>Part III on Environmental Compliance Audit, Section 12, Sub-section (1) requires the developer of a project or activity listed in Schedule 3 to these Regulations to carry out an environmental compliance audit.</td><td>The project will involve construction and operation of water supply and sanitation facilities that have a potential to impact negatively of the environment. Therefore, MWE should conduct Environmental Audits to assess if there are impacts, to what extent and mitigate them.</td></tr>
<tr><td>Draft National Air Quality Standards, 2006</td><td>The draft national air quality standards provide Uganda's regulatory air quality standards.
<table>
<tr><th>Pollutant</th><th>Averaging time for ambient air</th><th>Standard for ambient air</th></tr>
<tr><td>Carbon dioxide (CO_2)</td><td>8 hour</td><td>9.0 ppm</td></tr>
<tr><td>Carbon monoxide (CO)</td><td>8 hour</td><td>9.0 ppm</td></tr>
<tr><td>Hydrocarbons</td><td>24 hour</td><td>5 mg m^{-3}</td></tr>
<tr><td>Nitrogen oxides (NO_x)</td><td>24 hour
1 year arithmetic mean</td><td>0.10 ppm</td></tr>
<tr><td>Smoke</td><td>Not to exceed 5 minutes in any one hour</td><td>Ringlemann scale No.2 or 40% observed at 6m or more</td></tr>
<tr><td>Soot</td><td>24 hour</td><td>500 µg Nm^{-3}</td></tr>
<tr><td>Sulphur dioxide (SO_2)</td><td>24 hour</td><td>0.15 ppm</td></tr>
<tr><td>Sulphur trioxide (SO_3)</td><td>24 hour</td><td>200 µg Nm^{-3}</td></tr>
</table>
Note: ppm = parts per million; 'N' in µg/Nm-3 connotes normal atmospheric conditions of pressure and temperature (25oC and 1 atmosphere).</td><td>These standards will apply particularly during construction of the pump station and reservoirs.</td></tr>
</table>

3.4 World Bank Safeguard Policies and Requirements

The IWMDP is assigned an **EA Category B** given that significant adverse environmental and social impacts are not expected due to the nature of the proposed activities. Following the environmental and social screening of the proposed project activities, the anticipated negative impacts will be localized, site-specific and small to moderate in scale. The project is not anticipated to generate any potential large scale, significant and/or irreversible impacts. None of the project activities will be located in environmentally sensitive areas, and all the associated impacts can be mitigated with relatively standard mitigation measures.

Overall, by their nature, location, scale & scope, including the environmental and social context where the Bugomolwa RGC WSS project will be situated, will have minimal adverse environmental and social impacts. Therefore, negative impacts are expected to be mitigated with known technology, good practices and management solutions, resulting in residual impact of minor significance. This therefore qualifies the project to be EA Category B.

The objective of the World Bank's environmental and social safeguard policies is to prevent and mitigate undue harm to people and their environment during the development process. These policies provide guidelines for bank and borrower staff in the identification, preparation, and implementation of programs and projects. Safeguard policies provide a platform for the participation of stakeholders (World Bank, 2006). The triggered safeguard policies are presented in **Section (1) Table1-2**

3.5 World Bank Policy on Disclosure of Information

The World Bank, through its Disclosure Policy BP 17.50, requires that all safeguard documents be disclosed in the respective countries as well as at the Bank's Info shop or Website prior to appraisal or for Fast Tracking Initiative prior to Signing of the Grant Agreement. The Bank recognizes the right to information and has information disclosure policies which generally contain the following elements: principles of disclosure; exceptions to disclosure; routine disclosure; and request driven disclosure. Disclosure of documents (including a summary of the project, and a summary of Environmental Assessment) should be in the local language, at a public place accessible to project-affected groups, local non-governmental organizations, and other interested persons. In-country disclosure of information is the responsibility of the borrower, in this case of the project proponent through the steering committee or the individual institutions that will be implementing a project, in this case the MWE and MWE. Disclosure at Info Shop is the responsibility of the World Bank. Documents that need to be disclosed include:

- All Safeguard mitigation plans:
- ESIAs, and/or ESMP; and
- RAP.
- Integrated Safeguards Data Sheet;

All documents should be made available to stakeholders well in advance of consultations and all public consultations should be completed and draft or final documents should be disclosed prior to the project appraisal. In addition, all final documents, including the results of the consultations should be disclosed for the record. For the present ESMF document, information disclosure was initiated with the stakeholder consultations and public meetings held in selected project sites and Ministries or Agencies. The meetings provided an opportunity for stakeholders to provide comments and useful inputs to be taken into consideration when planning and eventual implementation of the proposed project.

Since the ESMP was completed, it is proposed that the disclosure process be through continued interaction with stakeholders using contacts gathered during public meetings. A public advert shall be sent to most widely distribute and read newspapers in the country, to inform stakeholders of the availability of the ESMF document for review and comments. The MWE shall ensure the availability of the full ESMF in their Public Library and Website, including websites and offices of MWE, and participating Districts and the sub county, where the public can have access and provide any comments.

3.6 World Bank Project Classification

The proposed project is classified as Category B as per World Bank (WB) project classification. The proposed construction and operation of Bugomolwa RGC piped water supply and sanitation facilities will be restricted within the user-communities. The project will not directly affect ecosystems such wetlands, forests, grasslands and other natural resources. World Bank classifies a proposed project into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental and Social impacts as presented below inTable3-3.

Table 3-3: World Bank Project Classification

Category A	A project is classified as Environmental Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. The project impacts may affect an area broader than the sites or facilities subject to physical works. Environmental assessment for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives including the "without project" situation, and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.
Category B	A project is classified as Environmental Category B if its potential adverse environmental impacts on human populations or environmentally important areas, including wetlands, forests, grasslands, and other natural habitats, are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects. Here the project is required to develop an ESMP that outlines potential negative and positive environmental impacts and measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.
Category C	A project is classified as Environmental Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further environmental assessment is required for a Category C project.
Category FI	A project is classified as Environmental Category FI if it involves investment of Bank funds through a financial intermediary, in sub projects that may result in adverse environmental impacts.

3.7 Environmental Health and Safety Guidelines Specific to Water Supply and Sanitation Projects

The World Bank Group (WBG) Environmental Health and Safety (EHS) General Guidelines are recommended to be used by the project. This section provides an overview on how the general approach to be taken with regards to the management of EHS issues at the sub-project or project level. The WBG EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). They shall be referred to and used to guide EHS issues in specific industry sectors, and they should be used together with the safeguard policies.

These shall govern both workers' (occupational) safety and public safety. However, the application of the EHS Guidelines to existing facilities that will be rehabilitated/expanded may involve the establishment of site-specific targets, with an appropriate timetable for achieving them. The applicability of the EHS Guidelines shall be tailored to the hazards and risks established for each project on the basis of the results of an environmental assessment in which site-specific factors are taken into account. Effective management of environmental, health, and safety (EHS) issues entails the inclusion of EHS considerations into corporate- and facility-level business processes through the following steps:

- Identifying project hazards and associated risks as early as possible;
- 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;
- Understand the likelihood and magnitude of the risks;
- Prioritizing risk management strategies with the objective of achieving an overall reduction of risk to human health and the environment;
- Favoring strategies that eliminate the cause of the hazard at its source;
- Incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences;
- Preparing workers and nearby communities to respond to accidents;
- Improving EHS performance through a combination of ongoing monitoring of facility performance and effective accountability.

The following were considered when assessing the potential risks related to health, safety and security: Infrastructure and Equipment Safety; Hazardous Materials Safety; Environmental and Natural Resource Issues (such as floods/ landslides etc.); Community safety and exposure to project related risks; Emergency Preparedness and Response. The General EHS Guidelines contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors. This document should be used together with the relevant Industry Sector Guideline(s). The General EHS Guidelines (2007) relevant to this Project are summarized in Table **3-4** :

Table 3-4: World Bank General EHS Guidelines relevant to this Project

Aspect	Relevancy to the proposed project
Environmental	
Air Emissions and Ambient Air Quality This guideline applies to facilities or projects that generate emissions to air at any stage of the project life-cycle. This guideline provides an approach to the management of significant sources of emissions, including specific guidance for assessment and monitoring of impacts.	This guideline is relevant because fugitive emissions are expected during the construction phase of this Project. These guidelines will be referenced for acceptable air quality levels during Project implementation, particularly for fugitive sources.
Wastewater and Ambient Water Quality This guideline applies to projects that have either direct or indirect discharge of process wastewater, wastewater from utility operations or storm water to the environment. These guidelines are also applicable to industrial discharges to sanitary	This Project is primarily about water abstraction, treatment, supply and management. As the guidelines state, any wastewater discharge, even of uncontaminated will be managed properly before discharge. These guidelines will be referenced for principles of HSE regarding wastewater management, to improve

Aspect	Relevancy to the proposed project
sewers that discharge to the environment without any treatment. Projects with the potential to generate process wastewater, sanitary (domestic) sewage, or storm water should incorporate the necessary precautions to avoid, minimize, and control adverse impacts to human health, safety, or the environment.	efficiency and sustainability of the Project.
Waste Management These guidelines apply to projects that generate, store, or handle any quantity of waste across a range of industry sectors. Solid (non-hazardous) wastes generally include any garbage, refuse. Examples of such waste include domestic trash and garbage; inert construction / demolition materials; refuse, such as metal scrap and empty containers (except those previously used to contain hazardous materials which should, in principle, be managed as a hazardous waste); and residual waste from industrial operations, such as boiler slag, clinker, and fly ash. Hazardous waste shares the properties of a hazardous material (e.g., ignitability, corrosively, reactivity, or toxicity), or other physical, chemical, or biological characteristics that may pose a potential risk to human health or the environment if improperly managed.	This Project will produce waste during the construction period. The operation and maintenance phase also have an insignificant element of waste management since the operation will only involve the water abstraction, treatment and supply. These guidelines will be referenced for principles of HSE regarding waste management during the life of this Project.
Noise This guideline addresses impacts of noise beyond the property boundary of the facilities. Noise prevention and mitigation measures should be applied where predicted or measured noise impacts from a project facility or operations exceed the applicable noise level guideline at the most sensitive point of reception	The pump station is far away from residential areas and houses and it is not close to schools and health care institutions which are considered to be very sensitive receptors. Noise emissions shall be monitored against the WB's guidelines during construction, operation and maintenance:
Contaminated Land This guideline provides a summary of management approaches for land contamination due to anthropogenic releases of hazardous materials, wastes, or oil, including naturally occurring substances. Releases of these materials may be the result of historic or current site activities, including, but not limited to, accidents during their handling and storage, or due to their poor management or disposal. Contaminated lands may involve surficial soils or subsurface soils that, through leaching and transport, may affect groundwater, surface water, and adjacent sites.	The Contractor(s) will ensure that hazardous materials, wastes, or oil will not be discharged or released onto soils and land. All servicing and maintenance of construction vehicles such as trucks and equipment shall not be done on site.

Aspect	Relevancy to the proposed project
When contamination of land is suspected or confirmed during any project phase, the cause of the uncontrolled release should be identified and corrected to avoid further releases and associated adverse impacts	
Occupational Health and Safety	
Communication and Training This includes guidelines for OHS Training, Visitor Orientation, New task employee and contractor training, Area signage, labeling of equipment, communicate hazard codes, among others. Provisions should be made to provide OHS orientation training to all new employees to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow employees.	Supervising Consultants and Contractors for the Project will have to ensure that OHS requirements for the Project are met in line with these guidelines
Physical Hazards Physical hazards represent potential for accident or injury or illness due to repetitive exposure to mechanical action or work activity. Single exposure to physical hazards may result in a wide range of injuries, from minor and medical aid only, to disabling, catastrophic, and/or fatal. Multiple exposures over prolonged periods can result in disabling injuries of comparable significance and consequence. Sources of potential for such injury include rotating and moving equipment, noise, vibration, eye hazards, industrial vehicle driving and site traffic, ergonomics, repetitive motion, manual handling, among others.	During the construction of the Bugomolwa RGC WSS such as dredging, equipment and machinery which generate noise and vibrations will be used. These operations will be guided by these guidelines.
Personal Protective Equipment (PPE) Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems. PPE is considered to be a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection.	Supervising Consultants and Contractors for the Project will have to ensure that PPE requirements for the Project are met in line with these guidelines. PPE will be provided (as required) for eye and face protection, head protection, hearing protection, foot protection, hand protection, respiratory protection, body/leg protection
Monitoring Occupational health and safety monitoring programs should verify the effectiveness of prevention and control strategies. The selected indicators should be representative of the most significant occupational, health, and safety hazards, and the implementation of prevention and control strategies	Stringent monitoring of HSE aspects will be crucial for the successful implementation of the Project, to have risks reduced to levels that are as low as reasonably practicable.
Community Health and Safety	
Water Quality and Availability	In the project area, there's no potential for the Project to

Aspect	Relevancy to the proposed project
Groundwater and surface water represent essential sources of drinking and irrigation water in developing countries, particularly in rural areas where piped water supply may be limited or unavailable and where available resources are collected by the consumer with little or no treatment. Project activities involving wastewater discharges, water extraction, diversion or impoundment should prevent adverse impacts to the quality and availability of groundwater and surface water resources. Project activities should not compromise the availability of water for personal hygiene needs and should take account of potential future increases in demand	impact on water quality and availability. There are no other water pipes crossing or traversing near the proposed project area which could cause disruption during Project implementation to guarantee measures in line with these guidelines to be put in place.
Structural Safety of Project Infrastructure Hazards posed to the public while accessing project facilities may include: Physical trauma associated with failure of building structures; Burns and smoke inhalation from fires; Injuries suffered as a consequence of falls or contact with heavy equipment; Respiratory distress from dust, fumes, or noxious odours; Exposure to hazardous materials; Reduction of potential hazards is best accomplished during the design phase when the structural design, layout and site modifications can be adapted more easily.	This guideline will be referenced in line with the integrity of the structures and any hoarding installed. PPE will be provided to persons accessing the project facilities. For all public roads and access roads used by the construction activities, dust suppression using water will be carried out by the Contractor(s). All visitors will be inducted in EHS requirements before accessing any construction site/area. Safety signs and safe systems of work will be developed for each workstation.
Traffic Safety Traffic safety should be promoted by all project personnel during displacement to and from the workplace, and during operation of project equipment on public roads. Prevention and control of traffic related injuries and fatalities should include the adoption of safety measures that are protective of project workers and of road users, including those who are most vulnerable to road traffic accidents. Road safety initiatives proportional to the scope and nature of project activities.	Accessibility to the Bugomolwa RGC WSS is along the Kyankwanzi community roads and work at the proposed site will disrupt traffic. Delivery of materials and movement of equipment for the Project will also impact traffic. This guideline will be referenced in line with traffic safety during Project implementation
Disease Prevention Communicable diseases pose a significant public health threat worldwide. Health hazards typically associated with large development projects are those relating to poor sanitation and living conditions, sexual transmission and vector-borne infections. Communicable diseases of most concern during the construction phase due to labour mobility are sexually transmitted diseases (STDs), such as HIV/AIDS. Recognizing that no single measure is likely to be	The risk of spread of communicable and vector-borne diseases exists, particularly due to potential influx of Project workers and water impoundment in some cases, as required during construction. This guideline will be referenced in line with disease prevention in the Project communities.

Aspect	Relevancy to the proposed project
effective in the long term, successful initiatives typically involve a combination of behavioural and environmental modifications. Reducing the impact of vector-borne disease on the long-term health of workers is best accomplished through implementation of diverse interventions aimed at eliminating the factors that lead to disease.	
Emergency Preparedness and Response All projects should have an Emergency Preparedness and Response Plan that is commensurate with the risks of the facility and that includes the following basic elements: Administration (policy, purpose, distribution, definitions, etc.); Organization of emergency areas (command centers, medical stations, etc.); Roles and responsibilities; Communication systems; Emergency response procedures; Emergency resources; Training and updating; Checklists (role and action list and equipment checklist); Business Continuity and Contingency.	On any construction site, there is a potential that risks will occur. It is important to have measures in place to readily contain and respond to any risks when they occur. This guideline will be referenced in line with emergency preparedness and response.
Construction and Decommissioning	
Environment Guidelines on prevention and control of community health and safety impacts that may occur during new project development, at the end of the project life-cycle, or due to expansion or modification of existing project facilities include: Noise and vibration, soil erosion, sediment mobilization and d transport, air quality, solid waste, hazardous materials, wastewater discharges, and contaminated land.	These impacts are applicable to this Project, and will be addressed in line with these specific guidelines
Occupational Health and Safety Guidelines are provided on aspects of OHS including over-exertion, slips and falls, work in heights, struck by objects, moving machinery, dust, confined spaces and excavations, and other site hazards.	These impacts are applicable to this Project, and will be addressed in line with these specific guidelines
Community Health and Safety Projects should implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning. Risks may arise from inadvertent or intentional trespassing, including potential contact with hazardous materials, contaminated soils and other environmental media, buildings that are vacant or under construction, or excavations and structures which may pose falling	These impacts are applicable to this Project, and will be addressed in line with these specific guidelines.

Aspect	Relevancy to the proposed project
and entrapment hazards.	

3.8 Institutional Framework

Table 3-5: Institutional framework related to the project

Institution	Mandate
Ministry of Water and Environment (MWE)	MWE is responsible for policy formulation, setting standards, strategic planning, coordination, quality assurance, provision of technical assistance, and capacity building. The ministry under its Water Development directorate – DWD, is carrying out the ESIA for the proposed Bugomolwa RGC Piped Water Supply and sanitation system. The ministry also monitors and evaluates sector development programmes to keep track of their performance, efficiency and effectiveness in service delivery. The ministry has three directorates: Directorate of Water Resources Management (DWRM), Directorate of Water Development (DWD) and the Directorate of Environmental Affairs (DEA). MWE is the lead agency for water Development and construction of the Water Supply System.
Ministry of Lands, Housing and Urban Development (MoLHUD)	Through the Chief Government Valuer (CGV) in the Valuation Department, MLHUD is responsible for reviewing and approving the Valuation Reports developed as part of the RAP. The valuation report is critical in ensuring timely payment of fair and adequate compensation as well as ensure that the Project Construction and next steps commence in time.
Ministry of Tourism, Wildlife and Antiquities (MTWA)	In-charge of protecting and preserving the sites with remains of cultural or archaeological importance when identified during construction activities for conservation, preservation, restoration and salvage.
National Environmental Management Authority (NEMA)	The National Environmental Act, NO.5 of 2019 establishes NEMA as the principal agency responsible for coordination, monitoring and supervision of environmental conservation activities. NEMA is under the MWE but has a cross-sectoral mandate to oversee the conduct of ESIAs through 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 enforce compliance on its behalf. NEMA will therefore review and approve the ESIA report and through the District Environment Officer, undertake environmental monitoring during project implementation.
Directorate of Water Resources Management (DWRM)	DWRM is responsible for issuing of water abstraction and wastewater discharge permits. The primary goal of the directorate is to promote sustainable development of Uganda's water sector. The directorate is into design and implementation of water quality assessments, monitoring ground and surface water resources, laboratory and field works and ultimately water pollution control.
National Water and Sewerage Corporation (NWSC)	The National Water and Sewerage Corporation Statute establishes the NWSC with a mandate to operate and provide water and sewerage services in areas entrusted to it on a sound commercial and viable basis. NWSC operates in cities and larger towns as well as decentralization and private sector participation in small towns.
Directorate of Water Development (DWD)	Lead agency responsible for policy guidance, coordination and regulation of all water sector activities including provision of oversight and support services to the local governments and other water supply service providers. DWD has the mandate to promote the provision of clean and safe water to all persons, investigate, control, protect and manage water in Uganda for any use in accordance with the provisions of the Water Statue, 1995
Directorate of	The Wetlands Management Department (WMD) within DEA is mandated to manage

Institution	Mandate
Environmental Affairs (DEA)	wetland resources and its goal is to sustain the biophysical and socioeconomic values of wetlands in Uganda for present and future generations. Wetlands are under a lot of pressure from conversion for industrial development, agriculture, wastewater treatment facilities. WMD has an inventory of the major wetlands in country in the National Wetlands Information System (NWIS). The inventory provides an overview of wetland resource, their values, threats and possible management options.
Ministry of Gender, Labour & Social Development (MoGLSD)	MoGLSD 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 and operation of the laboratory facilities. The OHS Department in this Ministry is responsible for undertaking inspections of construction sites to ensure safe working conditions.
District Local Administration Structures	The proposed project is within the jurisdiction of Kyankwanzi District Local Government (KDLG), headed by a Local Council V (LC V) Chairman and Chief Administration Officer (CAO) who are the political head and technical head respectively. Various district offices whose functions would be relevant to the project include offices of Natural Resources/Environment, District Health Inspector, District Planner, Community Development Officer, District Director of Health Services, District Water Officer, District Engineer. Equally important are village-level local council administration (LC I and LC III). Leaders at these levels of local administration are closer to residents and therefore important in effective community mobilization, sensitization and dispute resolution given that the water supply project will serve communities. Local government structures are important for mobilizing support for the project as well as monitoring its social-environmental impacts both during construction and operation phases.

3.9 Acquisition of Requisite Permits for the Project

Implementation of the project will require the necessary permits (Table 3-6) in line with the laws of Uganda.

Table 3-6 Permits to be Acquired for Project Implementation

Permit	Acquiring Agency	Responsible Agency	Legal Framework	Reason for Permit
Project NEMA approval certificate	MWE	NEMA	National Environment Management Act 2019	Environmental and Social Impact Assessment for the Project
Water abstraction permit	MWE	MWE-DWRM	Water Act	The abstraction of water for project should be equitable and sustainable
Workplace registration	Contractor	MGLSD	The Occupational Health and Safety (OHS) Policy, 2006	To mitigate measures that protect the public from health and safety impacts as a result of project construction and subsequent operation and maintenance activities.
Waste management / handler permit or license	Contractor	NEMA	The National Environment (Waste Management) Regulations, 2020	To regulate waste handling at construction sites.

4 DESCRIPTION OF ESIA APPROACH AND METHODOLOGY

This section outlines the methodology that was used to assess the E&S baseline and to identify, predict & assess the E&S impacts of the project on each relevant environmental and social component. It also covers the methodology for the identification of mitigation and monitoring measures that was recommended to address these impacts and identification of relevant stakeholders. The methodology consists of a review of Uganda's institutional arrangements, regulations and policies. Environmental and social impacts of the proposed project will be predicted in relation to environmental and social receptors and natural resources while comparing prevailing pre-project conditions and post-project situations. The requirement for environmental impact assessment in Uganda is set out by the *National Environment Act No. 5 of 2019* and the *Environmental and Social Impact Assessment Regulations of 2020*. This process was guided by the Environmental Impact Assessment (EIA) Guidelines (NEMA, 1997) and the process is schematically presented shown below:

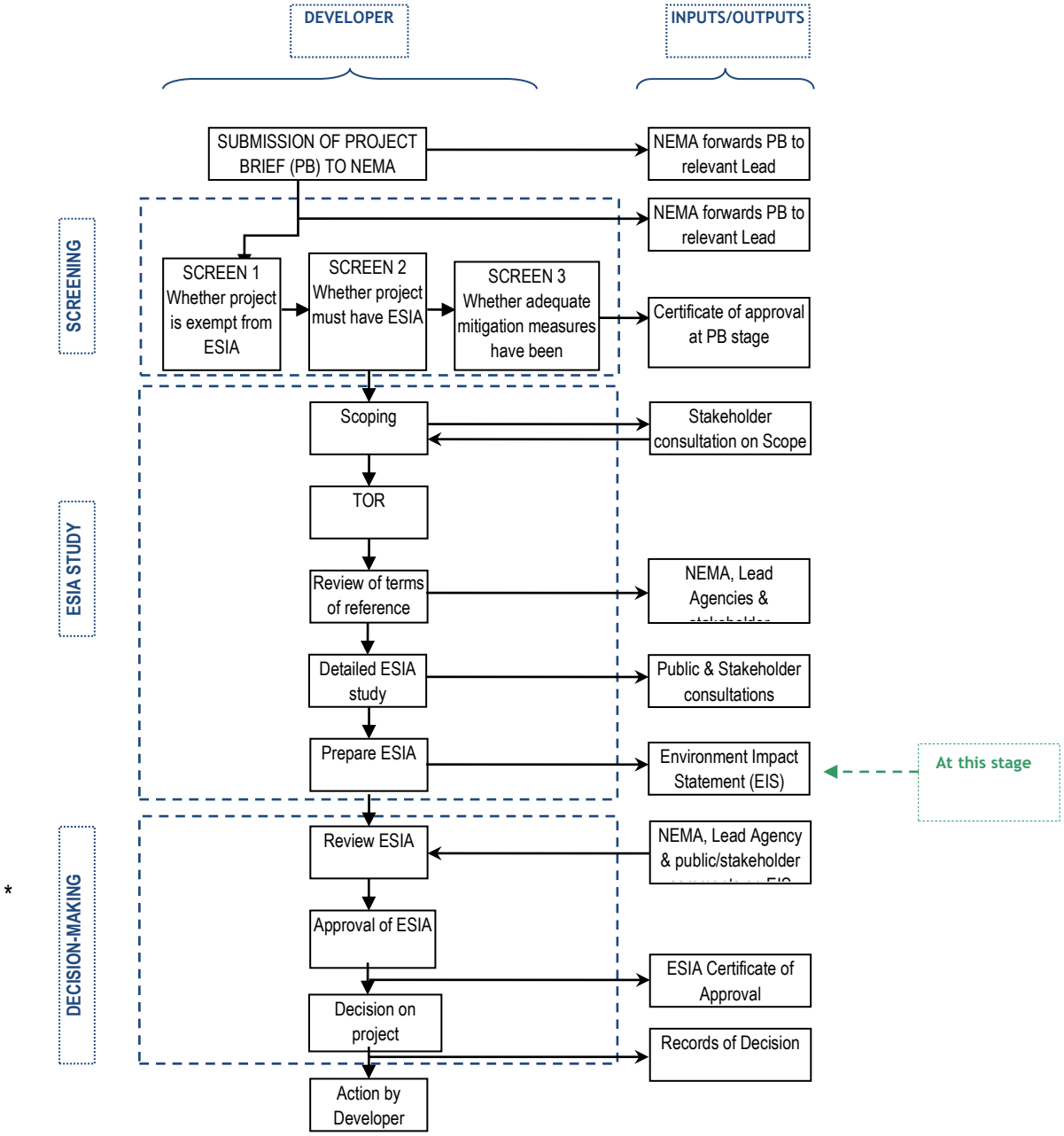
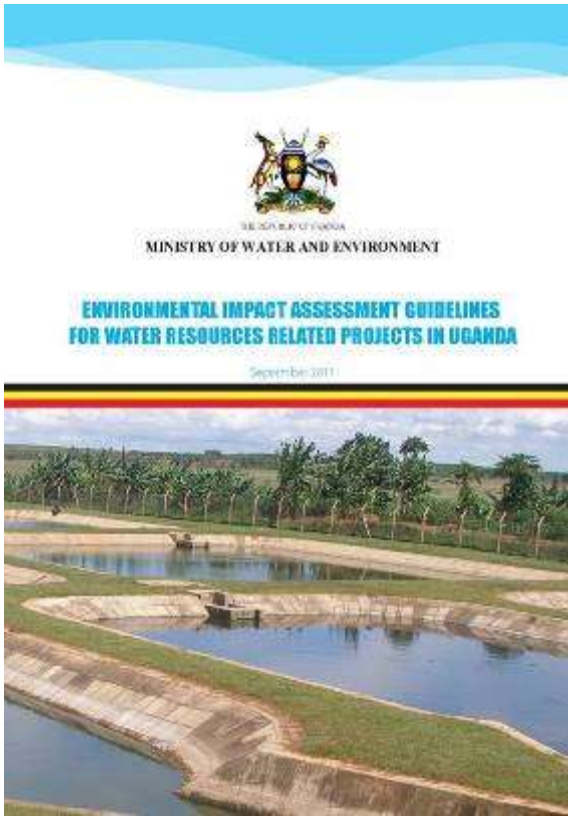


Figure 4-1: ESIA process in Uganda

Source: Appendix C (ESIA Process in Uganda) of ESIA Reference Manual, NEMA, June 2002)

4.1 Literature Review

A review of the available literature concerning the project was done, to gain an understanding of the project components, scope and extent. Review of the national laws and policies was also done to gain an understanding of the legal and administrative framework for the project. In addition, information available from previous studies such as;



i) Feasibility study report 2021 for the proposed piped water supply and sanitation system for Bugomolwa RGC.
ii) Detailed Engineering designs 2021.
iii) Water quality analysis reports 2022.
iv) Environmental Impact Assessment Guidelines for Water Resources Related Projects in Uganda 2011
v) Kyankwanzi District Development Plans.2020-2021
vi) Environment and Social Safeguards Policy – MWE-2018
vii) National Physical Planning Standards and guidelines-2011.
viii) Uganda's Environmental laws, policies, regulations and guidelines.
ix) National Environment Act 2019
x) National Development Plan II and III

4.2 Baseline Data Collection

In addition to the literature review, the environmental and social conditions of the project area of influence have been assessed by carrying out baseline surveys which were intended to provide a measure of existing environment and the socioeconomic situation against which future changes due to the project implementation that can be monitored. The baseline environment studies were to aid in developing appropriate monitoring indicators.

4.2.1 Air quality

Baseline ambient air quality was measured using a non-passive sampling method. An active sampling method was used to monitor short-term concentrations of particulates, using electronic light-scattering device (Casella Microdust Pro™ digital aerosol monitor) that monitored short-term concentrations of Total Suspended Particulates (TSP)-Figure 4-2.

an

The Casella Microdust Pro™ aerosol monitor was calibrated before use in the field by inserting a factory-supplied optical filter into its probe and allowing it to span and confirm the reading on the digital screen readout.Toxic and explosive gases (SO_2, NO, NO_2, CO_2, NH_2, H_2S, VOCs, CO, CLO_2, O_2, and Methane) were monitored using a set of three MX6 iBrid™ portable gas monitors (Figure 4-3).

The trio of MX6 iBrid™ gas monitors were calibrated before use with manufacturer-specific calibration gases. These digital gas monitors are given gases of known factory-tested concentration at a flow rate of 0.5L/min and allowed to span and automatically calibrate their sensors by following the software generated prompts at room temperature.

Spot measurements were undertaken during the field survey and measurement lasted 20 minutes at each air quality monitoring location and of which GPS coordinates were taken and maps developed. All field data was recorded using a standard data capture form. All conditions (such as vehicle traffic, human activity, motor engines running, weather) during measurements were also recorded.

Figure 4-2: Instrument used – CASELLA Micro Dust to measure dust (TSP)

Figure 4-3: MX6 iBrid™ portable gas monitors

4.2.2 Noise

Figure 4-4: CASELLA CEL-621C2/K1

Measurement of ambient noise levels was carried out using a precision integrating sound level meter (Figure 4-4), with an active range of 0-140 decibels (dB) and complying with IEC 651 and ANSI S4 standards (bearing a calibration certificate issued by a certified calibration laboratory).

A Casella CEL-621C digital noise logger (was set to record for a sample period of 30 minutes at each of the selected locations. All the measurements were slowly and impulse timely weighted. The assessment procedure involved recording; percentile parameters LAF50 and LAF90 (the noise level exceeded for 50% and 90% of the measurement period, A-weighted respectively), LAeq (A-weighted, equivalent sound level - with the same Energy content as the varying acoustic signal measured) and LAMax decibel levels. Location of the measurement points was recorded using a GPS receiver. In addition, the prevailing noise sources together with the ambient environment at each location were noted.

4.2.3 Water quality

Objectives of water quality analysis:

The key objective of the water quality analysis was to establish a baseline condition of the water quality in sources which are used with in the project area. The baseline water quality data collected serves two purposes at this stage;

- Helps understand the current condition of the water in these sources, and how the project needs to be implemented in consideration of this status quo.
- Secondly, and most importantly, it helps assess and predict the possible environmental changes that could occur, once the project activities are underway.

The baseline data will also be very crucial in the subsequent environmental auditing and monitoring studies during project execution as it will serve as a base for trend analysis of various parameters of the water quality.

Sampling Method:

A total of four water samples were collected. The samples were collected from both ground water and surface water sources in the project area. The choice of the sampling points was based on proximity to a potable water source. All the sampling locations were geo-referenced. Two sets of samples were taken from each sampling location, one for physio-chemical analysis and the other as a back-up sample. All samples were transported in a cool box (kept at 4^0C) to the laboratory on the same day of sampling before analysis on the following day.

Figure 4-5: HANNA HI 9828

In-situ water measurements were taken for three bore holes (and in the project area with exception of one bore hole (which was found out of service. The multi-parameter water quality meter (HANNA HI 9828- was used to measure the water quality. The HANNA HI 9828 was first calibrated in accordance with the manufacturer's specification to ensure an accurate representation of the water quality. Water was abstracted in a collection container and a water meter knob immersed in the water collected (sample). At each sampling location, three replicates of the sample were measured subsequently to get worthy water quality characteristics. In-situ measurements recorded from the HANNA HI 9828 meter included; concentration of dissolved oxygen, conductivity, resistivity, pH, temperature, salinity, oxidation reduction potential, atmospheric pressure and percentage of dissolved oxygen of the water sample. All in-situ water quality data was recorded using the AWE standard data capture form. Ground water samples were picked from the borehole were collected in two replicates with labelled containers, preserved and transported in a cool box with ice packs as per ISO 5667 guidelines to ensure integrity of the sampling process for analysis at Makerere Public Health and Environmental chemistry laboratory.

4.2.4 Biological Environment

a) Introduction

Species diversity has greatly changed in many areas, mainly because of alterations in the environment, for which some are naturally influenced while others are triggered by developmental activities. Plants are used as a benchmark for monitoring changes/ modifications in ecosystems (Tushabe et al., 2006), since animals all depend, directly or indirectly on plants. Other fauna relevant to the ecology of ecosystems is birds. Given the significance of birds for conservation planning and environmental assessments, there is need for a better ecological understanding of the role of avian community structure in conservation decision-making. Birds are widely used in conservation and population trends in farmlands and are one of the 15 'Quality of Life' indicators (Gregory et al., 2004). Small land birds have often been proposed as potential indicators for the presence of other unrelated taxa or as

environmental change indicators to be integrated into broader monitoring schemes. Furthermore, they are frequently included in evaluation studies for overall biodiversity conservation (Kati and Şekercioğlu, 2006). In this case, the proposed infrastructure developments will cause alterations/ damages to the existing ecosystems and the habitats. Hence it is for this reason that an ecological baseline was undertaken.

b) Objective of the study

Being that the proposed infrastructure developments may cause alterations/ damages to the existing ecosystems and the habitats. Hence it is for this reason that an ecological baseline was undertaken to ascertain the extent of sensitivity, of all water routes, for better planning towards realizing viable economic developments.

Therefore, the biological studies focused on;

- Generating baseline data on the flora and fauna along the project area through compilation of species records present in the area for the different taxa
- Identify habitats and species for assessment and evaluation of for their sensitivity, based on the global IUCN conservation status and local/ national protection status
- Identification of all invasive species within project areas.
- Identification of potential project impacts on flora and fauna, as well as the associated habitats
- Proposed mitigation measures to the impacts

c) Method for the study

Desk reviews of existing data for the study area;

A desk-based approach was employed to review relevant sources of data about biodiversity in project area. The conservation status of species was determined by assessments against the IUCN red list (IUCN 2020), the National redlist (WCS, 2016).

Field survey methods

Flora

Sampling locations followed pre-determined geo-referenced the proposed site alignments that were varying in length and width. Each geo-referenced site was considered as an independent transect along which the surveys were conducted to record observed plant species. The sampling conformed to the general base line (gradsect) (Wessels et al. 1998) that enabled the traversing of existing vegetation types. Site specific vegetation descriptions to determine habitat types were based on species dominance and floral features such as herbs, shrubs and trees along the transects.

Upon a comprehensive identification of the flora records and habitat type determination, analysis of likely impacts to the vegetation and flora was also assessed visa-viz the anticipated project activities. Also of interest was the occurrence of invasive species in or near the project area, and the proximity of the study area to other ecologically sensitive features.

Field survey methods for fauna

Herptiles.

a) Visual Encounter Survey (VES) method

Herptiles (Reptiles and amphibians) were surveyed using Visual Encounter Survey (VES) method. Random search during VES increases chances of finding animals on addition to covering a wider survey area. The water line was used as a transect and VES for reptiles was conducted following the

water line visually searching for animals. This method involved a search on the ground, in the leaf litter, along the river and proximity gardens and encountered species were noted. Species were assessed against the IUCN Red list in order to understand their conservation status.

b) Interview with Local People

Reptile surveys for this assignment were also conducted through interviews with local people, asking them about physical signs (skin shades and color, prints, bones, fecal samples etc.) of Reptile presence within the area.

Sampling design

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

Avifauna

The proposed water line was used as a transect. Birds were surveyed through areas of different habitat along the water line. A line transect count is a highly adaptable method in terrestrial systems and can be universally applied to species from different ecological categories (Gibbons and Gregory 2006). Bird identification was based on Stevenson and Fanshawe (2002). Species were assessed against the IUCN Red list (IUCN, 2021) in order to understand their conservation status.

Habitat Classification

Birds recorded were classified into categories, where possible, basing on the standard habitat classification by Bennun and Njoroge (1996) and Carswell et al. (2005). This classification is widely used in evaluation of avifauna in Uganda. The categories are;

- FF - Forest specialists (species of typical forests interior)
- F - Forest generalists (species less specialized also occur in small patches of forests)
- G – Grassland species
- f - Forest visitors
- W - Water bird specialists (normally restricted to wetlands or open waters)
- w - Water bird non specialists (often found near water)
- Ae – Aerial feeders

A species can fit into two ecological categories; for instance, it can be a water non specialist at the same time forest visitor. In this categorization, it is important to note that species of the open areas are not categorized to finer details of vegetation descriptions and are based on generalizations of natural habitat types. Bush land, thickets and human modified habitats such as gardens and built areas are not directly included. Because they are not tied to any restrictions, species in the non-specialist categories i.e. G, f, F and w can inhabit a wide range of open habitats in the landscape including bush land, thicket, woodland, and cultivated areas. The 'FF', 'F' and 'f' species also comprise the tree species and stress the importance of trees in areas where they are recorded.

Conservation Status

Birds were further classified according to their conservation status i.e. whether they are species of conservation concern (C) as from Bennun and Njoroge (1996), Carswell et al. (2005) and the IUCN Red List of Threatened Species described as species of global (G) or Regional (R) importance in the categories of; CR - Critically Endangered, EN – Endangered, VU – Vulnerable, NT - Near-Threatened, LC – Least Concern. Bennun and Njoroge (1996) also recognize a category RR - Regional

Responsibility, for species that may not be globally threatened but are at regional level and this has been included here.

4.2.5 Social economic Baseline

a) The Baseline surveys

The study Design of the socioeconomic baseline study was cross-sectional descriptive involving both quantitative and qualitative methods of data collection and analysis. The qualitative methods were used in order to cater for parts of the study that required in-depth understanding and also for the purpose of data triangulation.

Methodologically, the social-economic assessments have been compiled using both qualitative and quantitative approaches. Data analysis methods included the use of formal estimates, proportion of parameters representative of project, random and purposive sampling, formal surveys, use of ranking and scoring statistics to analyse data and use of questioners and checklists. Data analysis methods used when analysing observed behaviours, cultural and religious patterns, attitudes and characteristics was carried out through using open ended in-depth interviews and focus group discussions.

Literature including District documents ranging from Development plans, Sector Documents and Population and Housing Census Data (UBOS 2014) were reviewed. Screening transect walks, key stakeholder engagements, key informant interviews, and local community consultations also informed this socioeconomic assessment.

b) Objectives of the socioeconomic survey

The main objective of the survey was to understand the social –economic conditions of the project area so as to provide a baseline reinforcement into the project designs but also provide a platform upon which water supply intervention will be monitored in the future. Major survey components for this assignment included the following:

- Socio-demographic characteristics including population, gender, household size, education etc.
- Socioeconomic characteristics such as occupation, home ownership, assets and tenure,
- Water use patterns such as quantities, sources, problems and costs,
- Sanitation conditions - facilities and corresponding use such as type, condition, problems and cost, all of which indicate the type of improvements.
- Livelihood sources, incomes/expenditures of households and other priorities (land use and social set up).

4.3 Socioeconomic survey methodology

Key stakeholders were identified at the national, regional, district, Sub County and community level through interviewing experts, brainstorming and document review. Stakeholder identification and engagement is an on-going process that requires regular review and updating. Therefore, the stakeholder list can be updated from time-to-time. The consultant collected and analysed data and held consultations with various stakeholders and other interested and affected parties involved, to ensure that all existing data relevant to the assignment is available to us. We undertook site survey to determine the area of influence and gather information under several key areas such as: (a) Socioeconomic conditions in the surrounding communities such as health and infrastructure and (b) Current land use in the proposed project sites. Participatory stakeholder identification was used in identifying and analysing the key stakeholders, including planning for their participation. Therefore, it

was the starting point of our participatory processes and provides the foundation for the design of subsequent stakeholder activities throughout this study. Identified stakeholders include:

Table 4-1: Categorization of Stakeholders to be engaged during ESIA

Category	Stakeholders targeted	Method of engagement	Roles and responsibilities
National	National Environment Management Authority (NEMA); Ministry of Gender, Labour and Social Development (MGLSD)	Key Informant Interviews (KIIs)	-NEMA is responsible for the review and approval of ESIAs, post-implementation audits and monitoring of approved projects. Coordinate, inspect, supervise and monitor project activities to ensure that the environment and natural resources are not depleted but managed sustainably. -MGLSD under department of Occupational Health and Safety (OHS) is responsible for inspecting and registering the workplace and monitoring of conditions under which employees on the project are subjected.
Regional	Regional offices of the Ministry of Water and Environment including: Rural Water and Sanitation Regional Centers (RWSRCs), Umbrella Authorities (UAs), NEMA, Water Management Zones (WMZs	KIIs	Construction supervision including the implementation of the proposed ESMP and implementation of the WSPP.
District	District Local Government of Rakai. Specifically, the following offices of Water, Natural Resources, Planning, Health, Production and Community Development and the political wing including the Chairperson LC V and Councillors representing the beneficially areas, NWSC	KIIs	Mobilze support for the project. Monitor social-environmental impacts both during construction and operation phases
Sub County	Sub county Chief, Community Development Officer, LC III Chairpersons	Focused Group Discussions (FGDs and KIIs	Mobilize local communities and key stakeholders to participate in EIA consultations and/or public hearings
Community	Local Council I, Landlords of sites where the water infrastructure will be	FGDs and KIIs	Develop construction (works) schedules in their respective areas. -Participate in the scheduled meeting

Category	Stakeholders targeted	Method of engagement	Roles and responsibilities
	constructed and any CBOs or local NGOs in the sector		regarding the project activities and progress -Identify mitigation measures of the environmental and social issues -Monitor the progress of the project activities Input in the planning and identification of water and sanitation facilities.

4.3.1 Sampling and Selection of Respondents

The sampling process was primarily purposive. The ESIA targeted individuals, groups and communities that have a stake in the proposed project. As thus, only such entities as identified in the stake holder analysis were selected to participate in the consultation process. Key informants at various levels and from different specialties, right from the community were also purposively selected to contribute their views on the impact of the project. This widened the perspectives on the projects, enrich the data collected and ultimately provided deep insights about the knowledge and attitudes of the various stakeholders towards the project.

Socioeconomic surveys were conducted to define impacts and to provide a monitoring baseline following an initial desktop data review. Effective resettlement planning entails conducting a displaced persons' census and an inventory of affected land and assets at the household, enterprise, and community levels. The data was collected via a mixed-method approach incorporating both quantitative and qualitative assessments, as well as an assessment of available secondary resources. Quantitative surveys were conducted for all PAHs.

Qualitative data was gathered to provide supporting details for the quantitative data collection surveys. Qualitative data collection was based on KIIs, FGs, and participatory methodologies including village transect walks. Household socioeconomic surveys was undertaken alongside the cadastral and asset surveys. The land and asset component measured and described fixed assets for each household including land holdings, land type, buildings, crops, and trees. This information was collected to inform compensation agreements and to assist in resettlement impact assessments.

4.3.2 Study Methods

Stakeholder analysis sought to answer the following fundamental questions: Who are the key stakeholders (primary/secondary)? What are the interests of these stakeholders? How have they been and or will be affected (positively/negatively)? Which stakeholders are most important for the success of the study? How will various stakeholder groups participate throughout the study? The following methods were used for the social environment survey.

- *Primary data source* - Primary data sources included Focused Group Discussions (FGDs and Key Informant Interviews (KIIs) with local technocrats and leadership[2].

- *Key Informant Interview (KII)* - targeted civil servants, political leaders and representatives of the management structures who are responsible for environmental management activities on various levels. Key informants were interviewed and selected based on their roles as leaders, specialized knowledge and experience on the subject under study.
- *Focused Group Discussions (FGDs)* – targeted stakeholders at Sub County, Parish and Village levels. FGDs were used as a qualitative approach to gain an in-depth understanding of social issues. The method aimed at obtaining data from a purposely selected group of individuals on the proposed project activities.
- *Secondary sources* - These include: existing data, existing environmental data, existing reports/documents, pre- and post- implementation of management/construction decisions, EIA reports and ESMPs in place. Examples of these documents include: Kyankwanzi District Development Plan, District State of Environment Report, and Engineering Design Report for Bugomolwa RGC Water Supply and Sanitation System etc.

4.3.3 Ethical considerations

Permissions to conduct the study in the district was sought from Kyankwanzi District, Nkandwa Sub - County and community Local Council Authorities. All participants in the study were informed about the project and emphasized that, their participation in the survey was voluntary and all information collected at the household level would be kept confidential and be used only for its intended purpose of the project. Although respondents/participants were encouraged to participate, they were informed that they were free to turn down the invitation or withdraw from the study at any point if they so wished.

4.3.4 Disclosure methods:

Disclosure of the proposed project activities and environmental and social information was an integral part of stakeholder consultation process. This involved providing stakeholders with complete, accurate and understandable information on the project. Meetings with stakeholders at District and Subcounty level were organized with the help of MWE liaison officer to facilitate exchange of information and opinions between consultants as well as soliciting for views.

4.4 Impact identification, assessment and analysis

This ESIA adopted a systematically procedure in identifying, describing and assessing the potential impacts from the proposed construction and operation of Bugomolwa RGC Water Supply and Sanitation System on Value Environmental Components (VECs) or Value Social Components (VSCs).

An impact, as defined by the international standard ISO 14001:2015 is “any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization’s environmental aspects”. Throughout the document, an ‘impact’ is taken to be a negative impact. Where there is a positive impact this is described as ‘beneficial’. An environmental aspect is defined as an “element of an organization’s activities or products or services that can interact with the environment”. Environment is defined as “surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation.”

i. Impact description

Describing a potential impact involves an appraisal of the proposed road rehabilitation components together with the attributes of the receiving environment. Relevant impact characteristics may include whether the impact is:

- **direct (or primary)** – impacts that result from a direct interaction between a planned project activity and the receiving environment (e.g., between occupation of the facilities and pre-existing habitats)
- **indirect (or secondary)** – impacts that follow on from the primary interactions between the project and its environment because of subsequent interactions in the environment (e.g., loss of part of a habitat affects the viability of a species population over a wider area)
- **induced** – impacts that result from other activities that are encouraged to happen as a consequence of the project (e.g., new business set up to cater for increased traffic on roads)
- **transboundary** – impacts that extend or occur across a national boundary
- **cumulative** – those that result from the incremental impact, on areas or resources used or directly affected by the project, from other existing, planned or reasonably defined developments when the risks and impacts identification process is conducted (IFC PS1).

Each of these characteristics was addressed for each impact. Consideration of the above gave a sense of the relative **intensity** of the impact. The **sensitivity** of the receiving environment was determined by specialists based on the baseline data collected and literature data during the study.

ii. Impact Evaluation for significance

The significance of impacts on VECs was determined based on scoring VEC sensitivity and the impact:

- Magnitude
- Duration
- Extent.

The scale of significance was defined from impact characterization based on ecological-toxicological, physical-chemical and social studies and expert judgment. Also, significance was determined for impacts before the proposed mitigation has been applied and determined again on the residual impact after the proposed mitigation

Evaluation Aspect	Characteristic description		Score
Magnitude of Impact	General Impact	The magnitude of impact is a measure of the degree of change that will be caused by the project activity on the existing environment and social conditions	Negligible = 2 Small = 4 Medium = 6 Large = 8 Very large = 10.
	Cultural Heritage VEC	Category 1 and Category 2 tangible cultural heritage with strong intangible elements, impacts are nonreplicable, so the cultural heritage sensitivity range is based on a maximum score of ten, and the magnitude score were halved	Negligible = 1 Small = 2 Medium = 3 Large = 4 Very large = 5
Duration of Impact	Impact duration is the length of time over which an impact may occur ▪ **time**, for example, hours, weeks, months or years;		1= Transient: <1 year 2= Short term: 1–5 years 3= Medium term: 6–15 years 4= Long term: 16–25 years

Evaluation Aspect	Characteristic description		Score
	▪ **project phases**, for example, throughout construction, during operations; a defined period after cessation of operations; and ▪ **generations** of plants, animals or people		5= Very long term: >25 years
			1= (0-10%)-Only in exceptional circumstance 2= (10-35%)-Unlikely 3= (35-60%)-Possible 4= (60-90%)-Likely 5= (90-100%)- Expected
Extent of Impact	The extent of impact describes the geographical area that may be impacted by the proposed development		1= Site boundaries / Individuals in the potentially affected communities 2= Local/Village setting/ Entire PACs 3=District/Region/habitant of regional importance 4= National/ species of national importance 5= International/ transboundary species
VEC Sensitivity	General Impact	The sensitivity of a VEC is based on its vulnerability, value and resilience	very low = 1 low = 2 moderate = 3 high = 4 very high = 5.
	VEC Cultural Heritage	Category 1 and Category 2 tangible cultural heritage the sensitivity scoring was doubled to account for the lack of resilience of such features, plus their high value and vulnerability	very low = 2 low = 4 moderate = 6 high = 8 very high = 10.
Impact Significance	**= magnitude + extent + duration + VEC sensitivity** *A score of 19 or more is considered a significant impact.*		
	5-6	7 - 11	12 -18	19 - 25
	Negligible	Minor	Moderate	Major

Cumulative Impacts

Residual cumulative impacts were assessed, taking into consideration:

- the residual impacts of the project
- the additional management strategies and mitigation measures proposed to manage cumulative impacts.

The significance of cumulative impacts was determined qualitatively based on a predicted exceedance of VEC thresholds, limit of acceptable change or preferred condition.

Cumulative Impact Assessment has been conducted as required by Regulation 15 of the National Environment and Social Assessment Regulations, 2020 and the requirements of the IFC's Performance Standard 1 (PS1).

4.5 Environmental and Social Management

An Environmental and Social Management and Monitoring Plan (ESMMP) was developed to guide implementation of the proposed mitigation measures in an effective manner to ensure sustainability of the project development throughout its life. The ESMMP summarizes the planned mitigation measures against the anticipated environmental impacts and the responsibility for its implementation.

5 ENVIRONMENTAL & SOCIOECONOMIC BASELINE

5.1 Physical environmental baseline

5.1.1 Climate

Kyankwanzi district has a tropical climate with moderate rainfall and temperature. The rainfall pattern is bimodal with two seasons and annual rainfall varying between 560 mm to 1272 mm of rain and with rainy days averaging between 90 and 130 per year. The maximum monthly rainfall in the last six years is 1383 mm. The months of March to May and September to November receive very heavy and well-distributed rains of up to 1200 mm. There are two dry seasons from June to July and December to February. This therefore provides for two-season crop farming areas which constitute a big portion of the area mentioned.

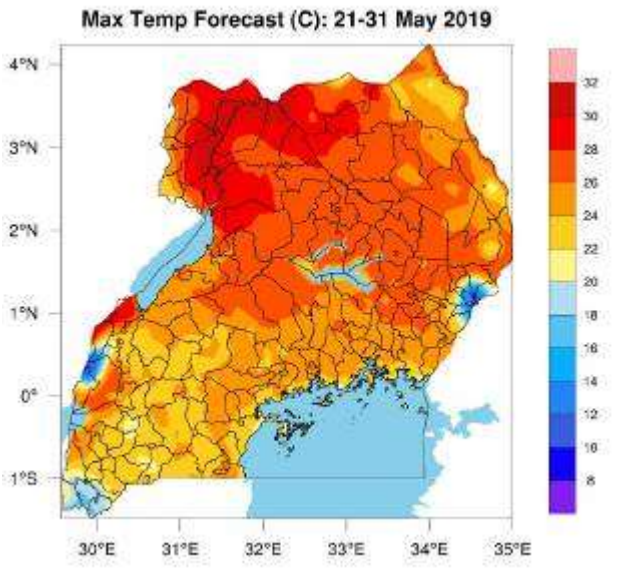


Figure 5-1: Uganda Temperature Map

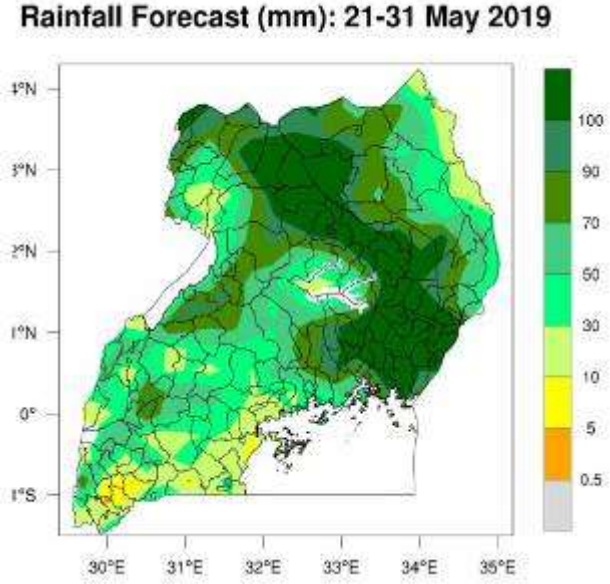


Figure 5-2: Uganda Rainfall Map

Source: Uganda National Meteorologic al Authority (http://www.unma.go.ug/)- May 2019

5.1.2 Geology and Soils

Most of the soils in Bugomolwa are Petric Plinthosols Arenosols followed by Gleyic arenosols, Gleyic, Histosols, Lake, Leptosols, Luvisols, open water, and finally. These types of soils and rainfall availability is responsible for somewhat good yields of the crops planted within the district as shown Figure 5-3

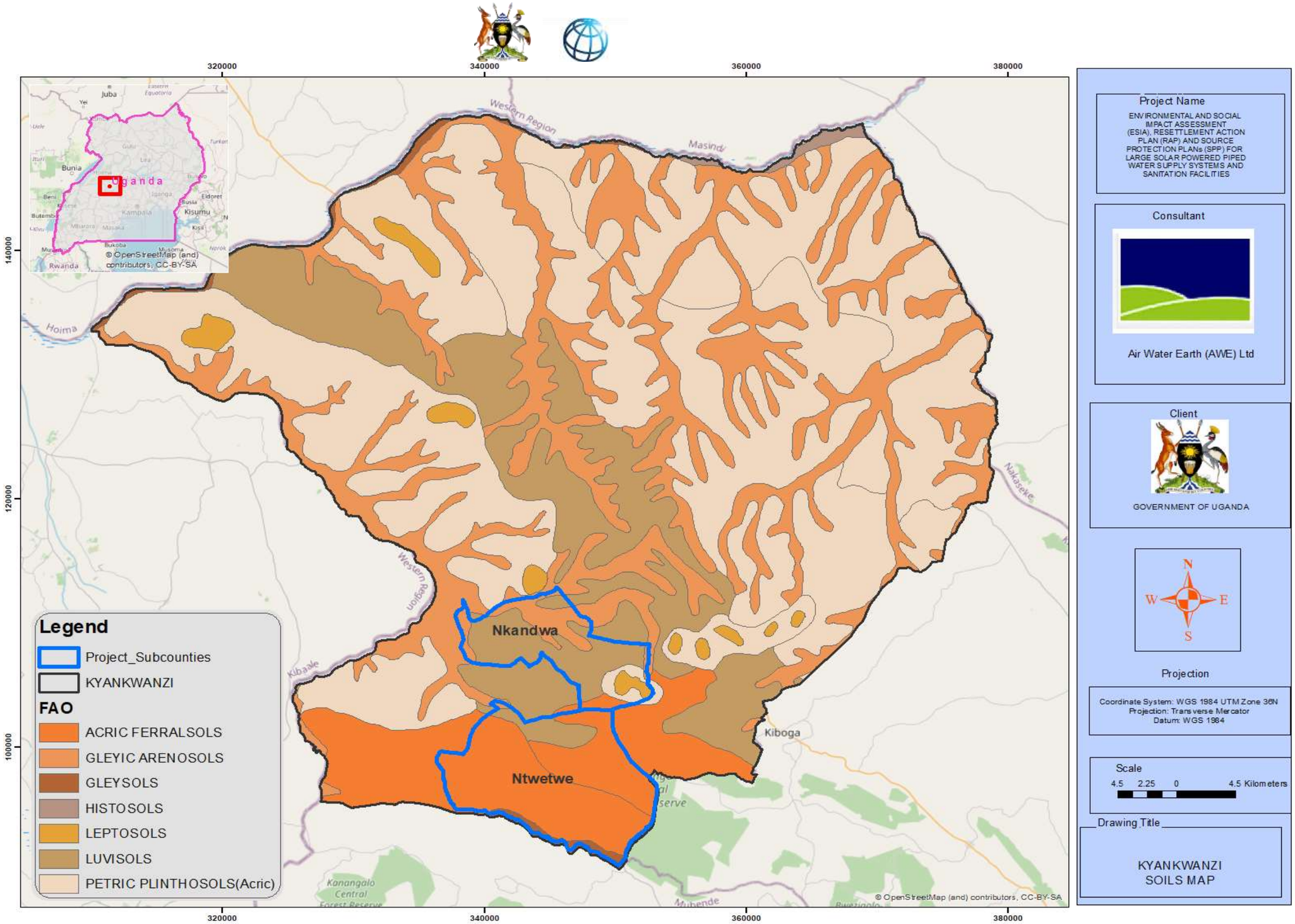


Figure 5-3: Soils and Geology map of Nkandwa Sub county

5.1.3 Vegetation and Land Use

Kyankwanzi District land use has been categorized into major zones basing on rainfall distribution pattern, soil and vegetation types, major economic activities and socio-cultural norms of the people. These zones are Peri urban, pastoral, Agro-pastoral and arable zones. In general, the district is endowed with a good climate with temperatures ranging from 14.40C and 31.70 C all year around. Most parts of the district receive an annual rainfall of 1383 mm, well distributed and exclusively bi - model. Despite the above climatic conditions, the soils in the district are increasingly becoming infertile. This coupled with increasing land shortage forces farmers to move to the fragile ecosystems (forests and wetlands) for cultivation of especially Matooke, coffee and maize. The land under agriculture (crop) has decreased over time due to land fragmentation and this has affected commercial growing of crops in the district. Commercial farming (above 10 acres of land) is currently in only Nsambya Sub County.

Crop production dominates Kyankwanzi`s agricultural activities. Almost 74.6% of farm holdings are engaged in crop production as a principal activity and close to 60% are engaged in mixed farming. The farmers grow food and the traditional cash crops.

The project area for the proposed water supply pipelines traverses through settlements and farmlands, associated with bushy vegetation cover dominated by herbaceous-weedy species and very sparsely distributed trees and shrubs that occurred at low abundances. This type of land use/ cover will be highly considered while trenching for both transmission and distribution system. all the vegetation cover traversed by the transmission line is of no conservation concern and no plant species were identified as rare or eco-sensitive during the study in and around the project area.The details of land use in Kyankwanzi District are further shown in the map in Figure **5-4** below.

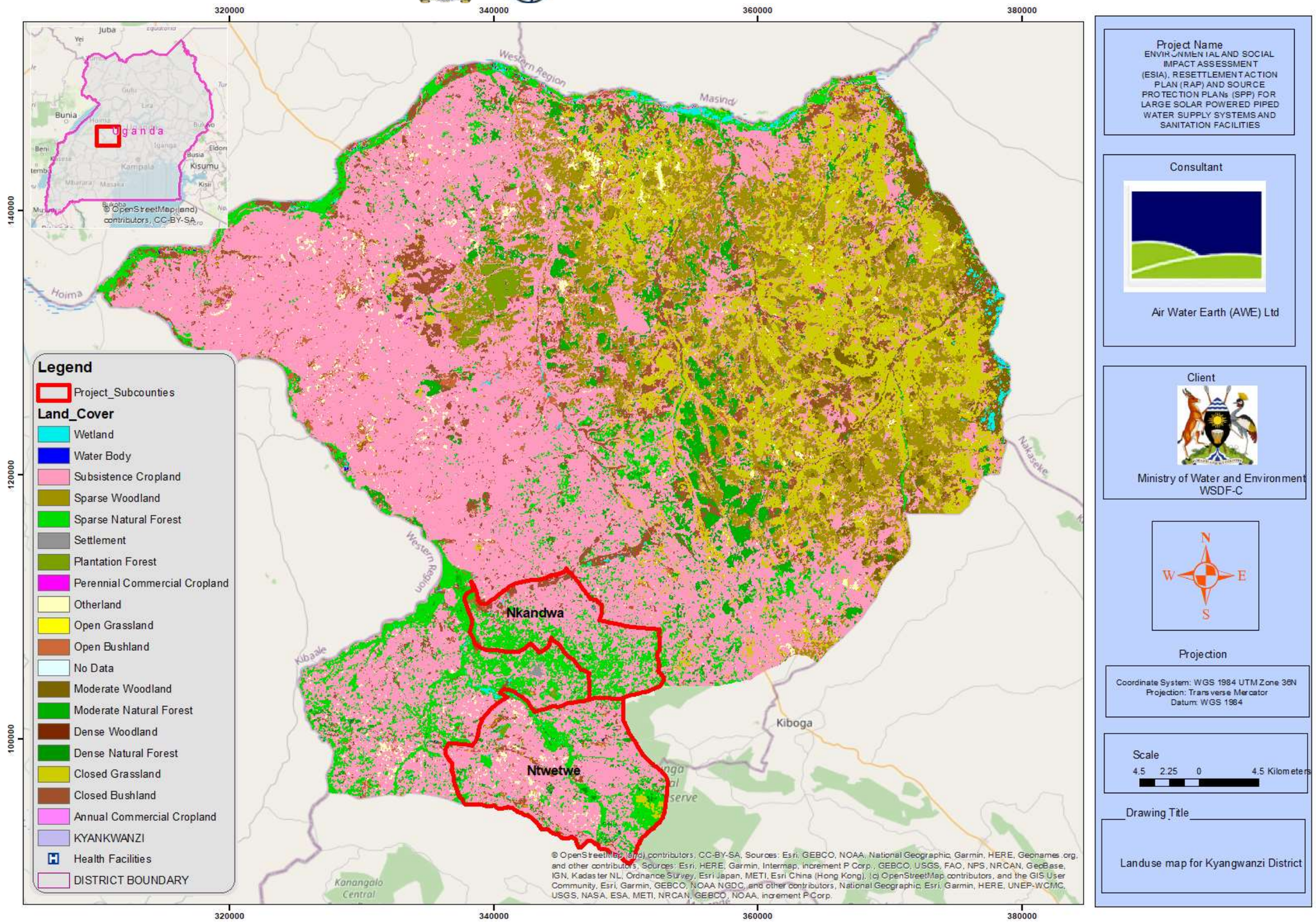


Figure 5-4: Land use map of Nkandwa sub county, Kyankwanzi District

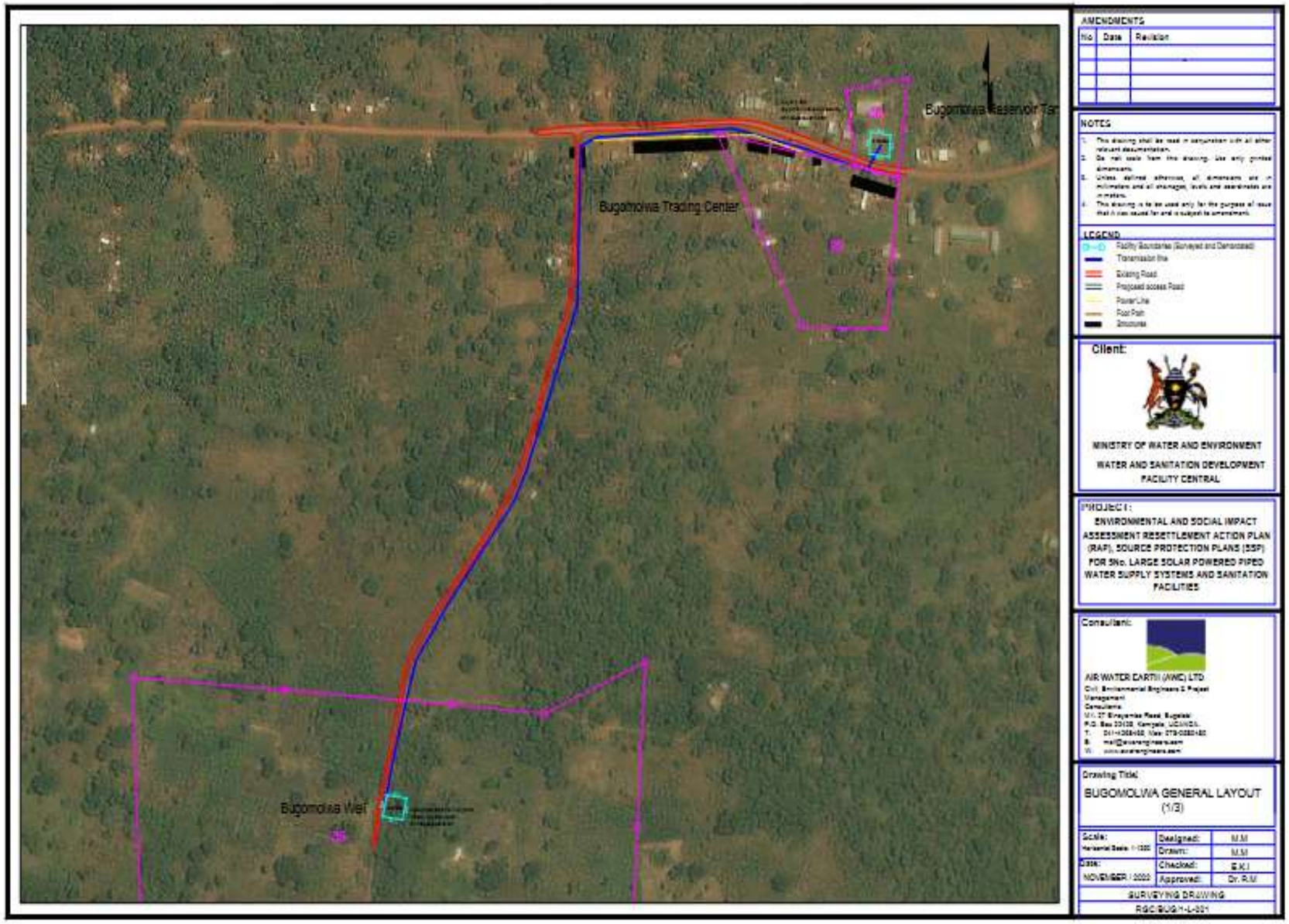


Figure 5-5: Google image indicating the project components and the transmission main

5.1.4 Water Quality Bugomolwa Project Area (Kyankwanzi)-Ground Water Sources

For this study, insitu and laboratory sampling was done from the 7 ground water sources and 1 surface water source. These were sought to be the potential sources of water being utilised by the project area. Table 5-1 shows the location of the water quality sampling points with coordinates.

Table 5-1 Location of Water quality sampling points for Ground and Surface Water Sources

FID	NAME	EASTING	NORTHING	Coordinate System - UTM 36 N
1	Kikonge Production Well	320638	134154	
2	Kikonge community BH	320400	134609	
3	Kamugeye Community BH	320113	135669	
4	Kikonge community BH2	319776	134619	
5	Kikonge unprotected spring	319776	134625	
6	Nakasero Community BH	317418	132138	
7	Kiyinikibi Community BH	349581	104044	
8	Kyanywa community BH	349563	104686	

In-situ tests were carried out using the Hanna Meter on the 7 ground water sources and 1 surface water and results showed the following (Table **5-2**):

i) pH was on average 6 on the ground water sources while 5.69 on surface water sources.
ii) DO was higher in the community boreholes of Nakasero and Kamugeye
iii) Kikonge unprotected spring presented the highest turbidity (19.63NTU) followed by Kikonge Production well (5.23NTU)

Table 5-2: In-situ water quality results (Numbers are average ± stdev, n = 3)

Location	DO (mg/L)	PH	Temp (°C)	Electrical Conductivity (µS/cm)	TDS (ppm)	Salinity	Turbidity (NTU)	DO (%)
Kikonge Production Well	1.57±0.07	6.06±0.02	26.43±0.04	169.67±19.34	83.33±6.85	0.07±0	5.23±0.53	23.4±1.28
Kikonge community BH	2.17±0.11	6.45±0.02	24.05±0.03	212.67±2.05	106.33±0.94	0.1±0	0.7±0.14	30.8±1.02
Kamugeye Community BH	2.56±0.02	6.62±0.01	23.86±0.04	273.67±0.47	137±0	0.13±0	0.7±0.99	35.2±0.5
Kikonge community BH2	1.75±0.14	5.78±0.08	24.79±0.07	110.33±0.47	55±0	0.05±0	2.67±0.09	25.1±2.06
Kikonge unprotected spring	3.29±0.01	5.69±0.01	26.76±0.05	32.67±0.47	16.33±0.47	0.01±0	19.63±0.83	47.57±0.34

Location	DO (mg/L)	PH	Temp (°C)	Electrical Conductivity (µS/cm)	TDS (ppm)	Salinity	Turbidity (NTU)	DO (%)
Nakasero Community BH	3.22±0.03	5.91±0.01	25.03±0.05	170±0	85±0	0.08±0	0±0	45.3±1.07
Kiyinikibi Community BH	2.26±0.06	6.01±0.02	24.23±0.11	414±2.16	207.33±1.25	0.2±0	0.03±0.05	32.17±0.05
Kyanywa community BH	2.37±0.09	5.87±0.02	24.52±0.05	176±0	88±0	0.08±0	0.83±0.29	33.37±1.8

Dissolved Oxygen; EC- Electrical Conductivity; TDS – Total Dissolved Oxygen; ORP – Oxidation Reduction Potential *The national potable water quality standards for pH is 5.5-9.5, EC- 2500 µS/cm, and TDS – 1500 ppm

Commentary

Generally, for all sampled locations, in-situ water quality was substantially conforming to the surface water standards. This was attributed to the low vulnerability of the resources and high natural protection from point sources of contamination.

Table 5-3: Laboratory analysis results for Bugomolwa RGC

Sample ID / Parameters	Kikonge Production Well	Kikonge community BH	Kamugeye Community BH	Kikonge community BH2	Kikonge unprotected spring	Nakasero Community BH	Kiyinikibi Community BH	Kyanywa community BH	US EAS 12 National Potable Water Standards
Apparent Color (Ptco)	9	0	9	46	314	0	7	51	Ns
Total Alkalinity mg/L	110	105	95	100	100	110	100	90	Ns
Nitrates mg/L	15.9	14.8	6.1	16.8	4.8	4.2	18.6	21.9	Ns
Ammonia mg/L	nd	nd	0.001	0.001	0.009	0.009	0.010	nd	45
Total Phosphorus mg/L	0.331	0.029	0.25	0.259	0.435	0.308	0.03	0.02	0.5
Ortho Phosphates mg/L	0.162	0.013	0.105	0.128	0.217	0.153	0.010	nd	2.2

Sample ID / Parameters	Kikonge Production Well	Kikonge community BH	Kamugeye Community BH	Kikonge community BH2	Kikonge unprotected spring	Nakasero Community BH	Kiyinikibi Community BH	Kyanywa community BH	US EAS 12 National Potable Water Standards
Fluorides mg/L	0.16	2.22	0.12	0.01	1.66	0.20	0.36	0.25	Ns
Total Iron mg/L	0.29	0.21	0.09	0.62	5.32	0.08	0.11	0.08	1.5
Chlorides mg/L	2.7	2.0	1.1	1.0	1.4	0.9	13.9	2.1	0.3
Manganese mg/L	0.12	0.02	0.04	0.01	0.03	0.02	0.06	0.01	Ns
BOD_5, mg/L	3	29	18	15	11	14	23	10	0.1
COD mg/L	14	66	42	36	23	44	61	43	Ns
Thermotolerant Coliforms (cfu/100 mL)	6995	715	20	2100	575	0	140	71	Ns

Uganda National Bureau of Standards – Uganda Standard Potable Water Specification (US EAS 12:2014; ICS 13.060.20); ns-not specified; nd – not detected: Detection limit for Nitrates, Total Phosphorus, BOD_5 and COD is 0.015 mg/L, 0.02 mg/L, 0.5 mg/L, and 5 mg/L respectively.

Commentary

Water sampling from the specified locations of the project area was undertaken to ascertain the baseline water quality. A comparison with the US EAS 12 national treated drinking water standards indicates that the water from the sampled locations complies with all the measured parameters except for Total Iron, Fluorides and Thermotolerant coliforms (grayed cells). The high iron levels (>0.3 mg/L) measured in all the samples accounts for undesirable taste in beverages, staining of sanitary ware and laundry. The source of iron in the water at all the sampled locations may likely be due to high vulnerability of the source to natural environmental features such as mineral springs, carbonate deposits, salt deposits within the recharge (groundwater) and catchment (surface water) areas of these water sources. Higher concentrations of Thermotolerant coliforms implies high vulnerability and low natural protection of the water sources to polluting activities like poor waste disposal and most likely pit latrines coverage exfiltration into groundwater resources. The measured apparent colour, suspended solids and total iron concentrations for these sources likely negatively impact the aesthetics (coloration, e.g. dirty) of the water. The total phosphorus concentrations in these water sources shows that they are not likely recipients of wastewater or runoff from the catchment area containing relatively high levels of phosphorus which nutrient is associated with eutrophication. Whereas the national drinking water standards do not have guidelines for BOD_5 and COD (typically wastewater quality parameters), a comparison with national effluent discharge standards shows that these are well below (BOD_5 <50 mg/L; and COD<70 mg/L). The low levels of BOD_5 and COD point to the fact that the sampled water sources are with low levels of organic matter that are likely to exact relatively low oxygen demand.

Photo 5-1: Rain water harvesting (10,000 l) at Bugomolwa P/S in Kyankwazi District) at 36N 0350177 0104631

Photo 5-2 Sampling at Kiyinikibi Comm. BH bore hole 36N 349581 104044 and at Kyanywa Comm. BH at 36N 349563 104686

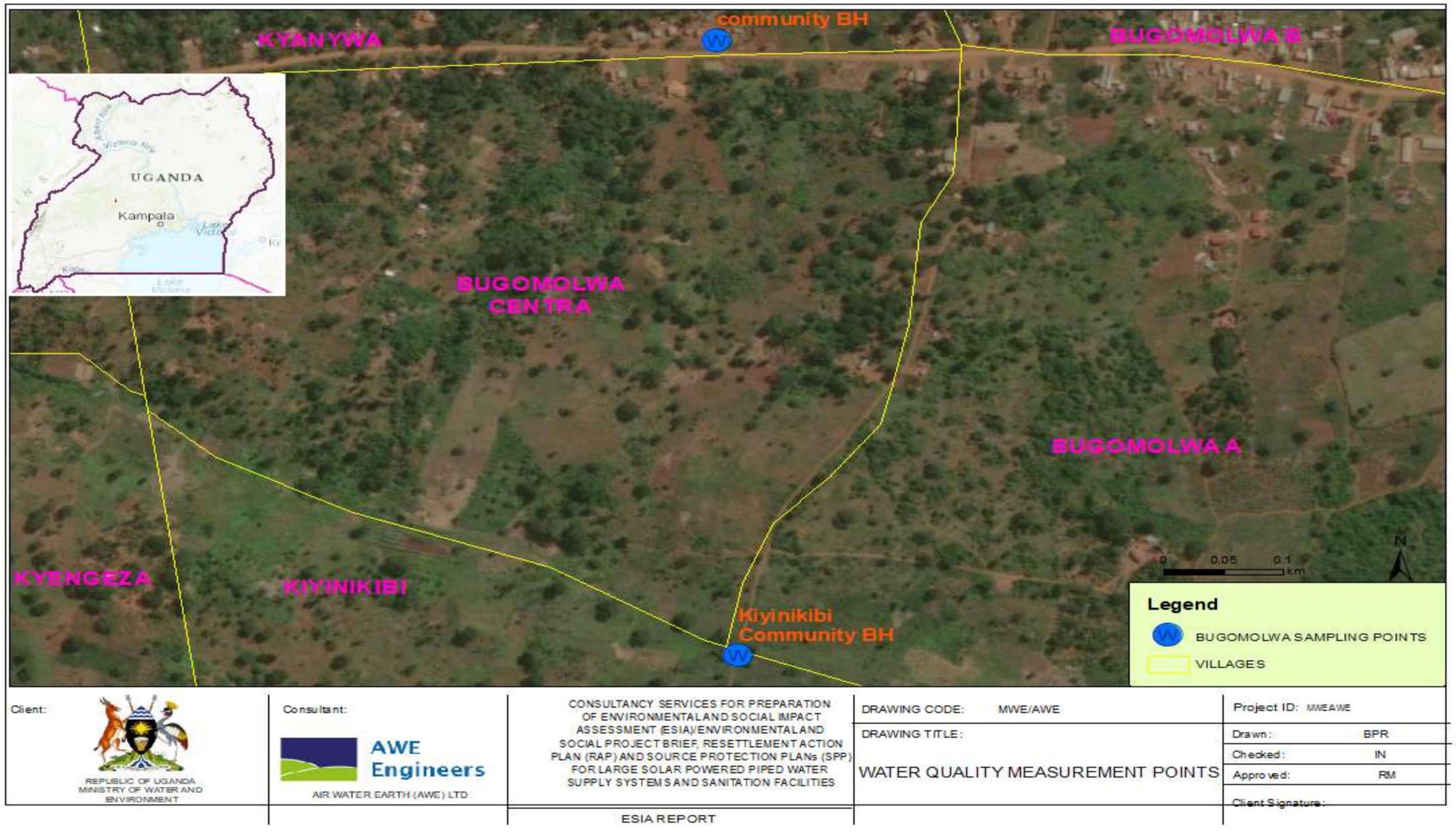


Figure 5-6. Sampled Boreholes in Bugomolwa RGC

5.1.5 Hydrology

The hydrology of an area is determined by its **weather patterns and by physical factors such as topography, geology, and vegetation**. Also, as civilization progresses, human activities gradually encroach on the natural water environments, altering the dynamic equilibrium of the hydrologic cycle and initiating new processes and events.

A bigger percentage of Kyankwanzi District is in a low-lying area and is drained by seasonal streams into Kafu (Figure 5-9). Bugomolwa RGC like Kyankwanzi District is also low-lying and is drained by seasonal rivers i.e., Kanangalo, Kitumbi and Logolima joining that discharge into R. Kafu.

5.1.5.1 River Kanangalo micro-catchment

River Kanangalo micro-catchment is located in Mpongo Subcatchment, upstream R. Kafu catchment. It starts from the utmost part of the catchment (1600 m a.s.l), and flows in a general northerly direction where it joins R. Kitumbi. The source of River Kanangalo is located in Kyankwanzi District. The micro-catchment is estimated at 382.9 sq.km whereas the drainage area up to the proposed abstraction point is 222.5 sq.km. The length of River Kanangalo is approximately 50 km from source to confluence with R. Kitumbi and approximately 25 km from source to proposed abstraction point.

5.1.5.2 Surface Water Monitoring Network

R. Kafu Catchment is gauged and monitored about along Kampala – Gulu road (83213). The gauge station has been functioning from 1952 to 2018 when the last data in the dataset available to the consultant was obtained. There was missing data ranging between 1952 to 2018 owing to mechanical breakdown and insurgencies that led to abandonment of the data collection process. Gaps varied from one day to a month. The gaps up to 3 days were filled judiciously guided by the shape of the observed hydrograph around that period. In the few other cases when the gaps were large up to a month, the monthly flows were assumed as equal to the average flows for that month corresponding to similar wet season. **Error! Reference source not found.** below indicates the discharge data temporal coverage.

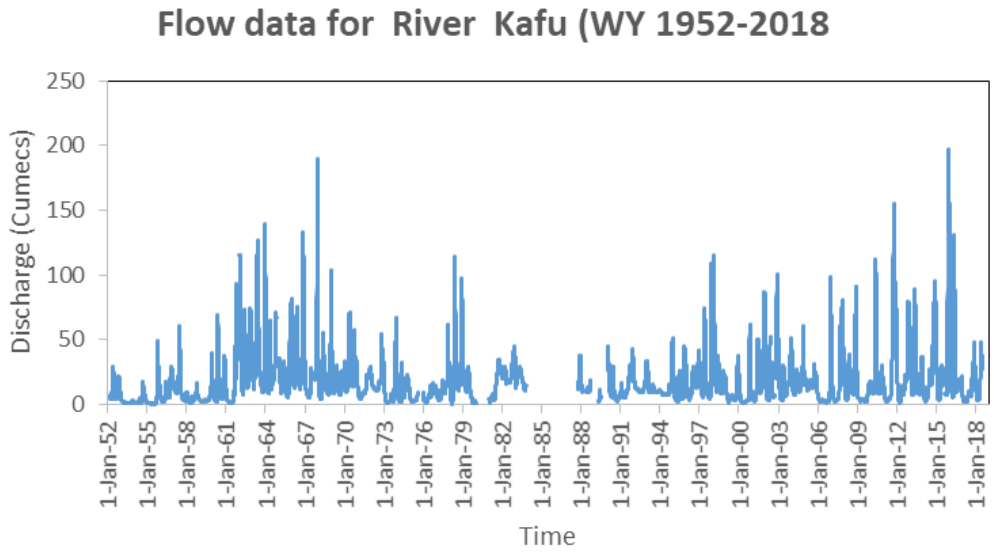


Figure 5-7: Flow duration series for R. Kafu along Kampala – Gulu road (83213)

- **Characteristics of the R. Kanangalo micro-catchment**

The R. Kanangalo micro-catchment for the contributing area was delineated as shown in below using ArcGIS 10.7 from source DEM. The catchment has an area of 222.5 km^2.

The catchment lies between 1610 – 1038 m.a.s.l. The catchment is relatively flat area having large pen plains and seasonal.

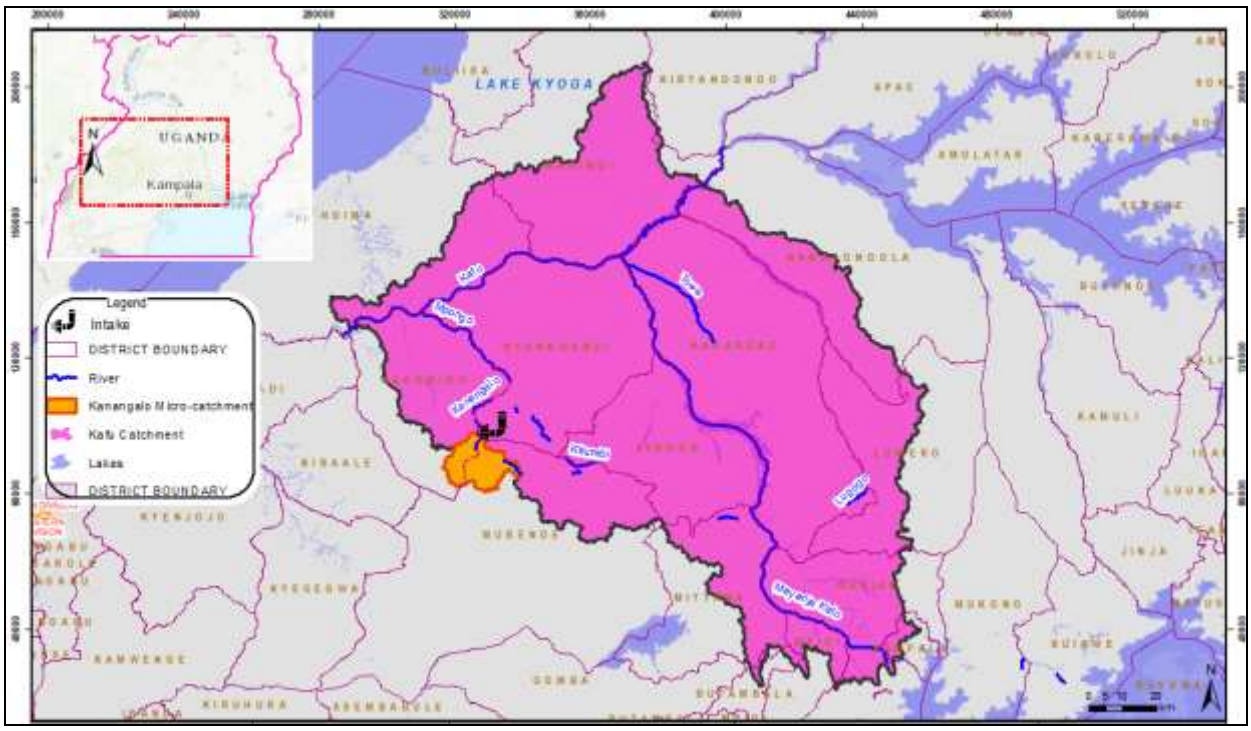


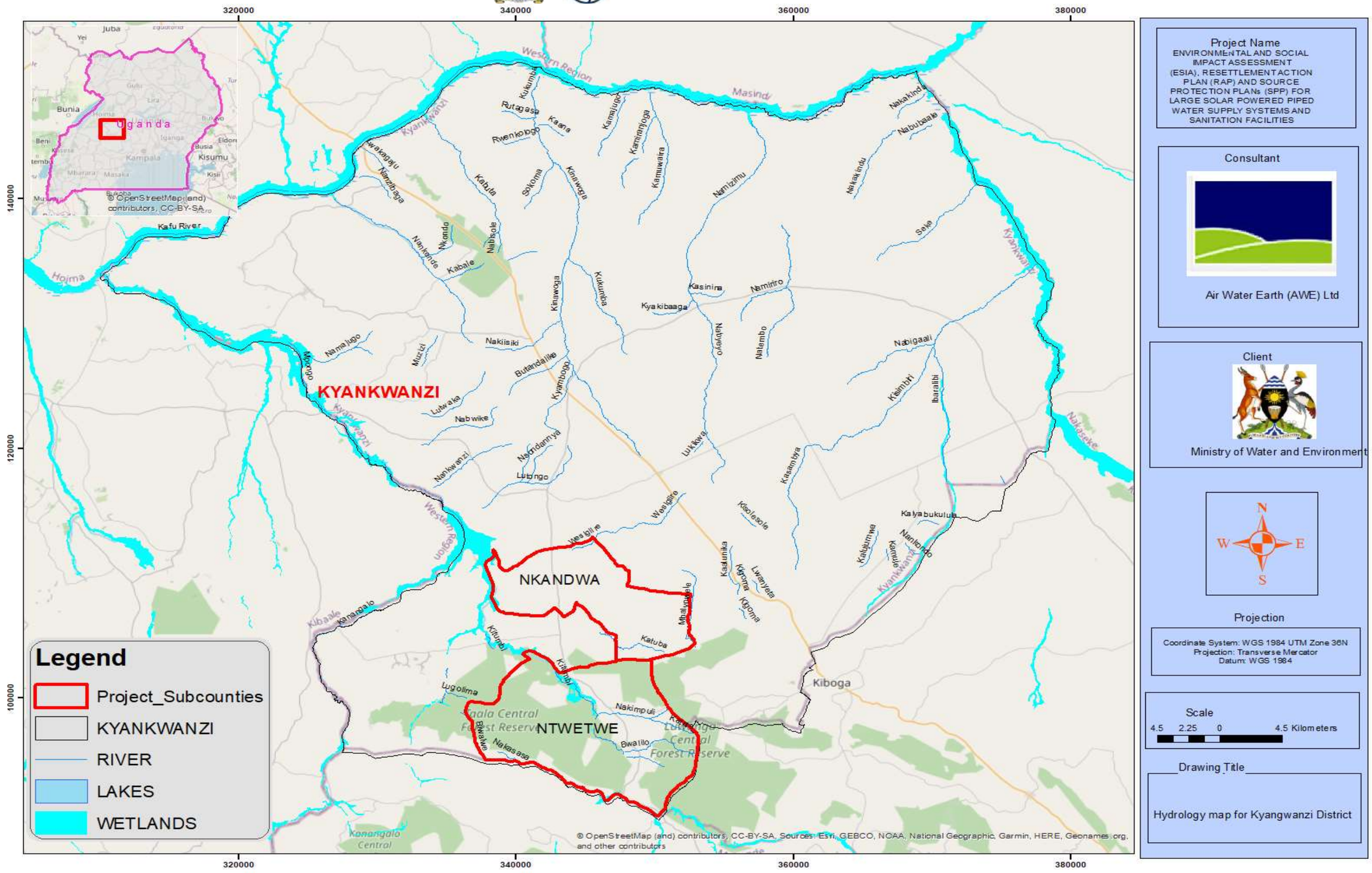
Figure 5-8: Hydrological Basin for R. Kanangalo contributing area

5.1.1 Topography

The district lies at an altitude ranging between 1,400 to 1,800 meters above sea level. The landscape and topography in general have gentle undulating hills merging into coalescent pediments. Standing at a low slope gradient, the long pediments drop into broad, flat-bottomed valleys where there is dense settlement.

The district has highland areas, which are deeply incised with deep slopes. They form prominent ridges, which eventually merge into shallow depressions. Therefore, the district's landscape is grouped into two distinctive topographic zones; Undulating topography with flat bottomed valleys and dissected plateau.

The topography of Bugomolwa RGC can be broadly divided into two; the flat land whose vegetation can be characterized as grassland Savannah, which is interspersed with thorn and bushes (preferred by Pastoralists) and patches of arable land. Elsewhere, land is generally hilly with rugged areas (occupied by cultivators and a few herders) Figure 5-10 below.



Project Name
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA), RESETTLEMENT ACTION PLAN (RAP) AND SOURCE PROTECTION PLANs (SPP) FOR LARGE SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES

Consultant

Air Water Earth (AWE) Ltd

Client

Ministry of Water and Environment

N
W E
S

Projection

Coordinate System: WGS 1984 UTM Zone 36N
Projection: Transverse Mercator
Datum: WGS 1984

Scale
4.5 2.25 0 4.5 Kilometers

Drawing Title

Hydrology map for Kyangwanzi District

Figure 5-9: Hydrology in Kyankwanzi District

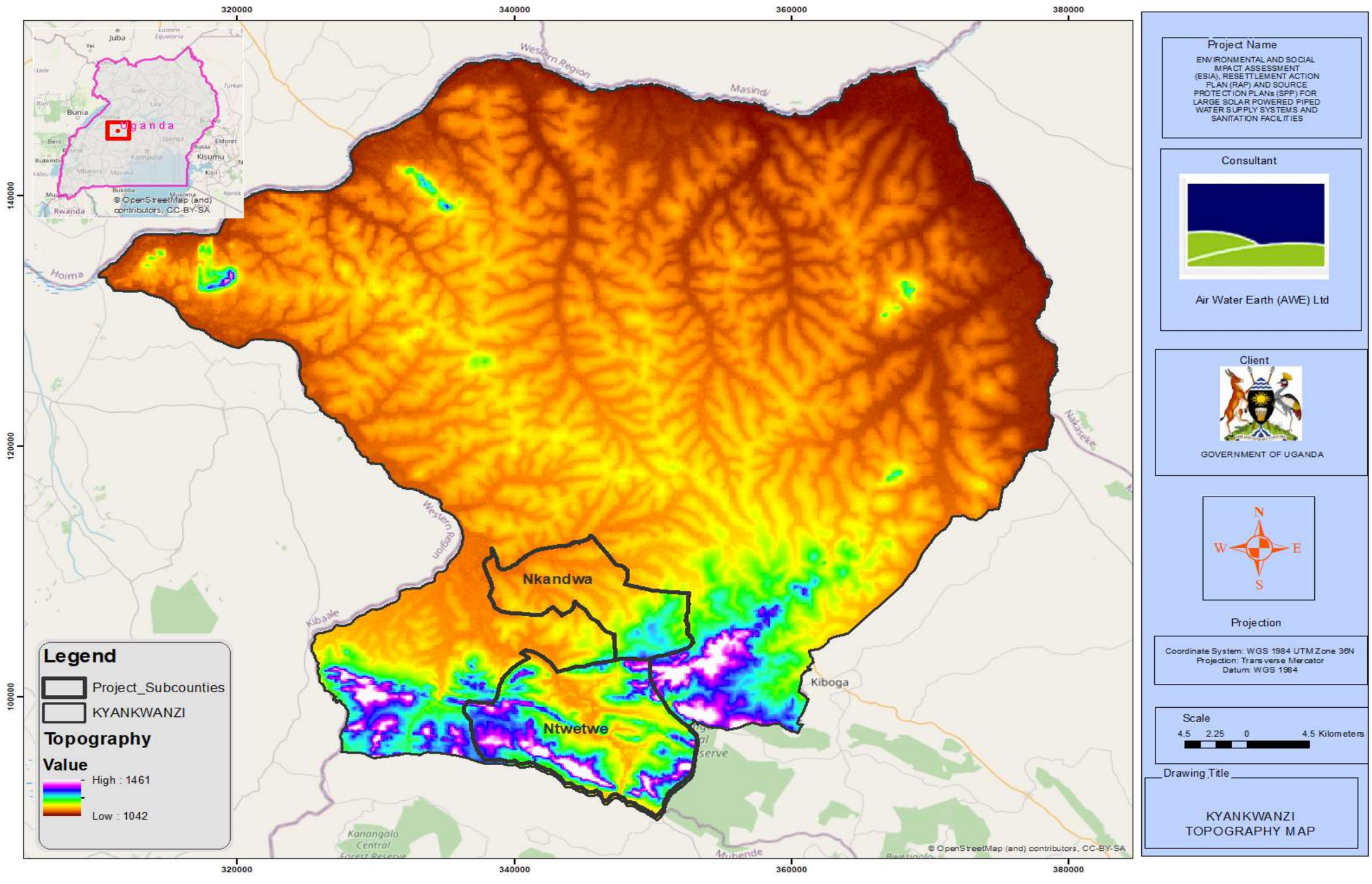


Figure 5-10: Topographic map of Nkandwa, Kyankwanzi District.

5.1.2 Ambient Air Quality

The results form measurement of air quality parameters measured in the atmosphere in and around the RGC project Area are presented in the **Error! Reference source not found.** below. These measured levels taken between 23rd March and 26th March 2022, were compared with the Draft National Air Quality standards as shown in Appendix G Measurements showing non-compliance are highlighted in the table below:

Table 5-4 Ambient Air Results

Location (UTM 36N Coordinates)	Particulates (µg/m³)		Coordinates	Notes
	Max	Average	Partial	
Project water source	207	126	349518.225°E 104343.019°N	Downwind. 1.3m/s south westerly breeze.
Bugomolwa Cental Trading centre	23	139	350005.642°E 104948.633°N	1.2m/s south westerly breeze.
Kiyinikibi village	164	86	349518.225°E 104343.019°N	0.8m/s south westerly breeze.
Kyanywa community BH	192	54	349563.321°E 104686.010°N	2.1 m/s south westerly breeze
St.Kizito Bugomolwa primary school	331	96	0350177.022°E 0104631.340°N	0.6m/s southerly breeze.

Inference from measurements:

These measurements indicate a reasonably clean environment with respect to air quality;

a) Generally, particulates levels conformed to the draft national limit of 300 µg/m³, inferring a clean environment with respect to air quality.

b) At all locations where measurements were made, in Bugomolwa gas monitoring equipment did not detect CO, NO, NO_2, Cl_2, ClO_2, H_2S and combustible gases. These measurements indicate a generally pristine environment with respect to air quality.

Therefore;

- The contractor should ensure that the workers are adquately protected from exposure to excessive dust through provision of appropriate gear including masks.
- The site should be adequately boarded off during construction to reduce exposure of neighbours to dust
- Where needed, dust suppression should be done with a water bowser.
- Project vehicles should have a restricted speed limit of 40 km/h through settlements and trading centres to minimize road dust.

Photo 5-3 Ambient Air quality and Noise level measurements at Bugomolwa Central Trading centre

Photo 5-4 Ambient Air quality and Noise level measurements at Kiyinikibi village

Photo 5-5 Ambient Air quality and Noise level measurements at the Kyanywa community Bore Hole

5.1.3 Ambient Noise

Construction projects have the potential to cause annoyance in the community due to noise, Dust and vibration emissions. The Control of Pollution Act provides a framework within which the disruption associated with major schemes can be managed and controlled. Best practice and good community relations are often as important as prior consent and agreed working hours in minimizing the impact of inevitably noisy activities. In Kyankwanzi District, measurements were taken around the proposed area for construction at different locations as shown in the map below. A vicinity map showing the site, surrounding properties, and sound measurement locations is presented in Figure **5-11**The project area is generally residential South, East, North and West of the sites.

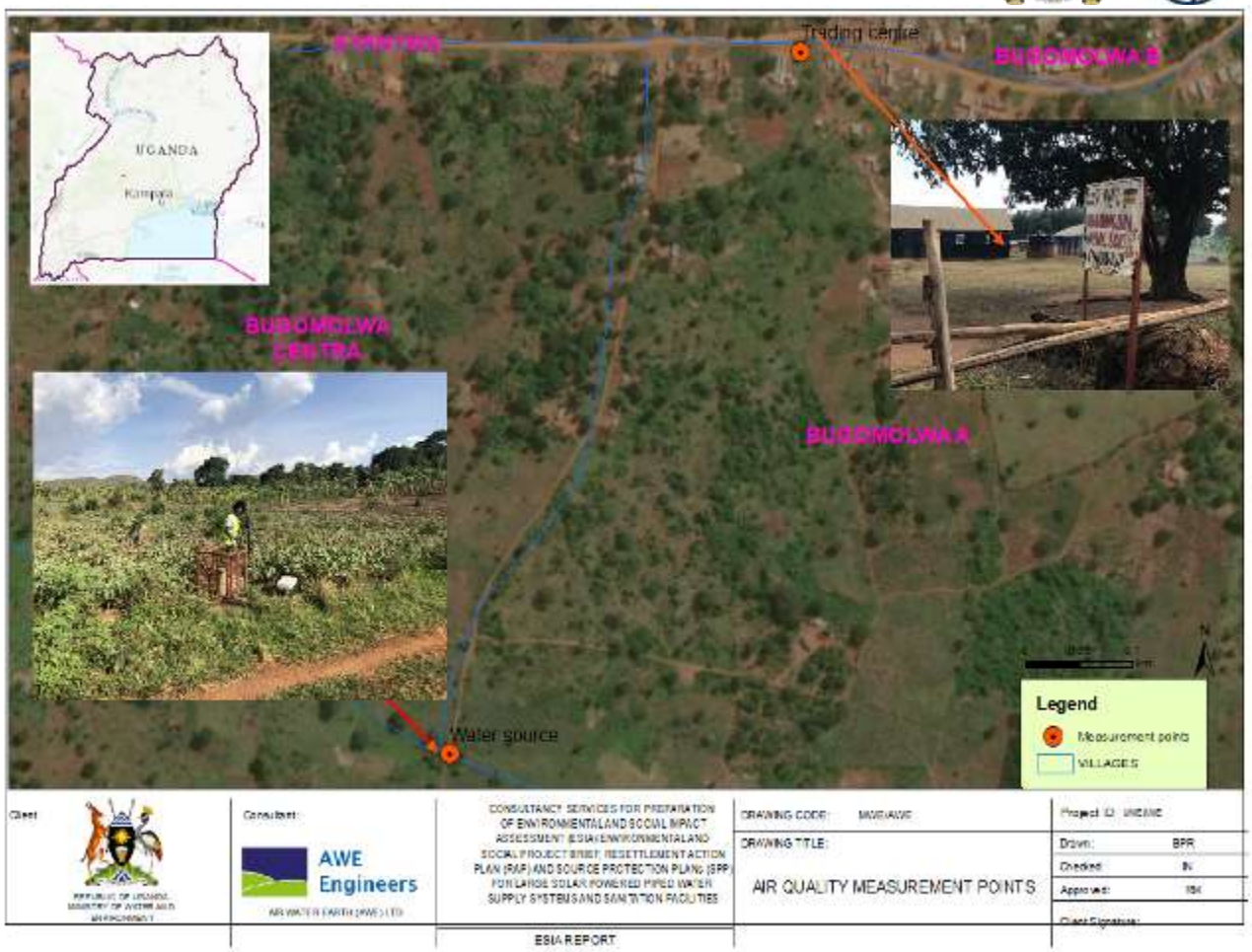


Figure 5-11 Location map of the physical environment quality measurement points

Day Time Noise Measurement Results

This section presents the results of noise monitoring conducted in 25th March 2022 with in the Bugomolwa RGC and the surrounding area. The purpose of the study was;

- To evaluate the baseline noise levels around the RGC with respect to the noise permissible levels.
- Provide recommendations for environmental noise mitigation, if necessary, and also suggest ways the contractor can manage the noise during project implementation.

From the baseline noise measurements conducted, inferences were made on the noise in the Project Area, with comparison against the standards provided in the National Noise Standards and Regulations. Results of daytime noise measurements taken within the Bugomolwa RGC project Area are presented below and comparison made against the permissible National standards as shown in Appendix G. Noise levels measured above 55 dBA are highlighted and inferences from the results are summarized in the Table 5-5 below.

Table 5-5 Ambient noise Measurement results.

Location UTM 36N Coordinates	Location	Sound Pressure Level dB(A)				Notes
		L_{AMax}	L_{Aeq}	L_{90}	L_{50}	
349583E 104051N	Project water source	56.3	49.9	43.5	50.5	Human conversations, vehicular traffic, pedestrian conversations
349909E 104664N	Bugomolwa Central Trading centre	70.1	66.7	42.0	48.5	Human conversations, Pedestrian conversations
349581E 104044N	Kiyinikibi village	61.7	55.2	53.0	58.0	Human conversations. Children playing, trading centre activities, Vehicular traffic
349563E 104686N	Kyanywa community BH	65.0	45.0	46.0	63.5	Human conversations, Pedestrian conversations, Mooing cattle
349523E 104675N	St.Kizito Bugomolwa primary school	69.4	54.1	42.5	48 .0	Public address system, Human conversations, Vehicular traffic, wind

National Noise Standards:

1. *National standards (Maximum permissible levels for general environment) for mixed residential areas are: 55 dBA and 45 dBA for day and night time limits respectively.*
2. *Maximum permissible noise levels, L_{eq} (continuous or intermittent) for construction sites shall not exceed:*
   - *Residential: 60dBA*
   - *Commercial: 75dBA*
   - *Industrial: 85 dBA*

Inference from day-time noise measurements:

The L_{Aeq} measured most areas showed a pristine environment with an exception of Bugomolwa Central Trading centre and Kiyinikibi village indicated some existing impact from human conversations however, the community can tolerate. Therefore;

During project implementation, the contractor should aim at reducing the work site noise output by;

- Choosing low-noise machinery
- Maintaining and lubricating equipment and machinery.

5.1.4 Waste Management

Waste Types and Management Practices

According to the survey conducted in March 2022, majority of the 187 respondents burn their waste (54%) and practise open dumping (31%). 8% do dump their waste in shallow pits whereas 4% scatter it in the garden, 1.8 use public waste disposal and 1.2% have no planned waste disposal mechanism (Figure 5-12). Besides homestead rubbish collection pits and pit latrines, waste disposal facilities were not observed at community level during the survey.

Figure 5-12: Solid waste disposal method in the RGC

Some households were composting waste for fertilizers used in their gardens. However, reuse of waste like plastic mineral water bottles was also observed among the communities as these were used for stocking and selling kerosene. During project implementation wastes like paper bags (cement bags), food refuse, human wastes are expected, and proper waste management facilities should be put in place by the contractor to properly handle this waste.

Waste Management Facilities

There are no engineered domestic waste disposal and management facilities in the project area and waste is managed at household level prevalently by burying and open-air burning.

Table 5-6: Waste sources in the Bugomolwa proposed Project Area

Type of waste	Generation Source	Constituent of Waste
Household	Multi-family dwellings	Food waste, rubbish, ashes, plastics, papers, textiles
Commercial	Markets, retail and auto repair shops in Bugomolwa Central Trading center	Food waste, rubbish, ashes, occasionally hazardous wastes
Institutional	Schools, health centre, Churches	Paper wastes, medical waste and plastic waste
Road	Playgrounds, junctions	Plastics, papers, dead animals, rubbish
Gardens and livestock waste	Field and row crops, domestic livestock	Dropping of animals manure, plants twigs, and vegetable residual, putrescible materials

5.2 Biodiversity for Bugomolwa RGC

5.2.1 Flora/ Vegetation

The project area for the proposed water supply pipelines traverses through settlements and farmlands, associated with bushy vegetation cover dominated by herbaceous-weedy species and very sparsely distributed trees and shrubs that occurred at low abundances. The site characteristics of the project area are presented in the photographic illustrations below in photos below:

Photo 5-6 Landscape cover along the Transmission corridor Bugomolwa A

Photo 5-7: Landscape cover along the Transmission corridor Bugomolwa B

Photo 5-8: Landscape cover along the Transmission corridor Bugomolwa Central

Plant Species Diversity and Richness

A total of 90 plant species in 76 genera from 33 families were recorded within the project area (Appendix H). Among the species recorded shrubs were the highest in terms of life forms, with a total of 40 species, followed by herbs with 20 species, then grasses and climbers with 11 species respectively while the trees had the least presentation of 08 species Thus, the woody species contributed 53.3 percent by species richness as compared to 46.7 percent of the non-woody species. The woody species constituted of trees and shrubs while the non-woody species were of herbs and grasses.

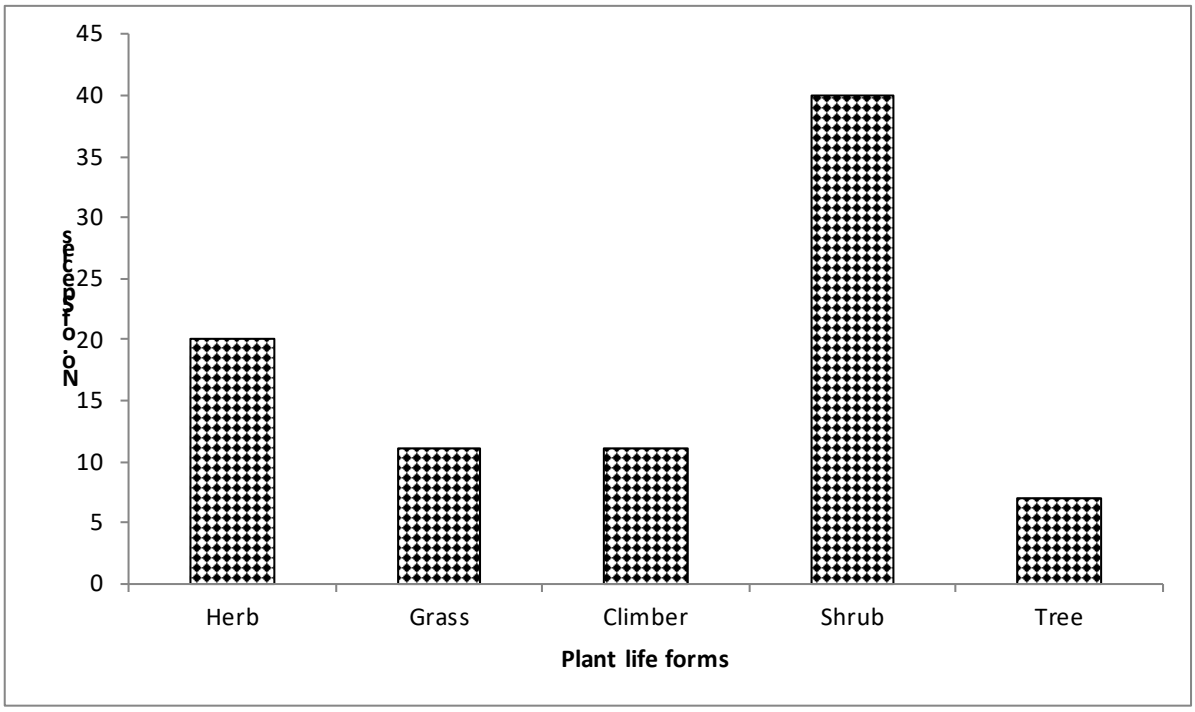


Figure 5-13: Distribution of plant life

Sensitive habitats and species of conservation concern

In terms of conservation, the habitats are of negligible ecological sensitivity, given that they are modified and degraded with low biodiversity value as per the details of the species records provided in (Appendix I).

Threatened species

There was NO globally or nationally Red listed species were cited in the project area (IUCN, 2022; WCS, 2016), and no restricted range plant species occurred within the project area. Hence the project area doesn't have any flora species that requires special protection status.

Invasive species

Recorded invasive plant was only ***Chromoleana odorata*** that occurred in small sub-populations in low abundances. These plants have the potential to spread further once favorable conditions prevail, and their spread is often triggered by disturbances in the ecological systems. They are potential threats to conservation, and may cause economic or environmental damage (NARO, 2007). They displace native species through aggressive and altered recruitments in natural ecosystems. Thus, their management is therefore important.

5.2.2 Fauna

Reptiles

A total of only three (03) reptile species were documented in the project area namely; *Hemidactylus brookii, Agama agama and Trachylepis striata.* Because most lizards have well-developed limbs and are agile predators this increases their colonization success in such disturbed and less suitable habitats. These reptilian species were not evaluated by (IUCN 2022), and neither are they protected by CITES.

Avian

A total of 16 bird species were recorded (Appendix 2, and all were assessed to be Least Concern as per the IUCN redlist categories (IUCN, 2022). The low avian richness could be attributed to the absence of suitable habitats for avian such as forests, and tall trees as well as substantial bushy vegetation cover along the project corridor, leaving a few avian species that are able to tolerate disturbances within the project area. The increase in population growth and settlements exert pressure on the natural environment, making it less suitable for the co-existence of wildlife, and mammals. The current environmental set-up of the project area hardly supports mammals to thrive. The nature of the project will have some negative impacts on the fauna species identified especially birds and other microorganisms in the proposed project area these have been identified, assessed and mitigated accordingly **(Section 6.4 and 6.5**) and an ESMP developed for implementation at every phase of the project.

SOCIOECONOMIC BASELINE

5.2.3 Social-Economic Environment

Nkandwa Sub county is made up of six (6) parishes. The parishes are further sub divided into twenty-five (25) LC I zones or villages. The parishes and their LC I/villages are as below: -

Table 5-7:Villages in Nkandwa Sub county.

Name of Parish	No. of LCIs/Villages
Nkandwa	4
Ntimba	3
Bugomolwa	5
Kasoolo	5
Nakalama	4
Kabuwuka	4
Total	**25**

Office of the Subcounty Chief.

5.2.4 The Demographic Characteristics

The distribution of a population by age and sex is among the basic types of information needed for planning. Sex and age composition of a population has significant implications for the reproductive potential, human resource, school attendance, family formation, health care and other service delivery in general.

5.2.5 Population size and distribution

The 2014 National Population and Housing Census (NPHC) revealed that Kyankwanzi District had 181,795 persons as shown in table below.

Table 5-8 Population of Kyankwanzi District from the population census and current

Sex	2014	2022
Male	111,539	140,577
Female	103,154	130,009
Total	214,693	270,586

Source: HPC 2014

5.2.6 Population dynamics

There has been both internal and external migration to the district. In particular, the following key trends have been noticed in the last 15 years.

- Banyoro to areas of Nsambya, Butemba and Kyankwanzi.
- Banyakole to areas, Kyankwanzi, Butemba and Nsambya.
- Bakiga in the areas of Nsambya, Gayaza and Ntwetwe.
- Basoga to areas of Nsambya and Butemba.
- Banyarwanda to Kyankwanzi, and to other cattle keeping areas.

5.2.7 Population.

The total number of households in Bugomolwa Parish is 1494 as shown below:

Subcounty	Parish	Population size by Parish			
Nkandwa	Bugomolwa	Male	Female	Sex Ratio	Total
		736	758	97.1	1494

Source: Central Region - Parish Level Profiles (Census 2014)

Primary data indicated that within the rural growth center, the females are at 51.8% while the males are 48.2%.

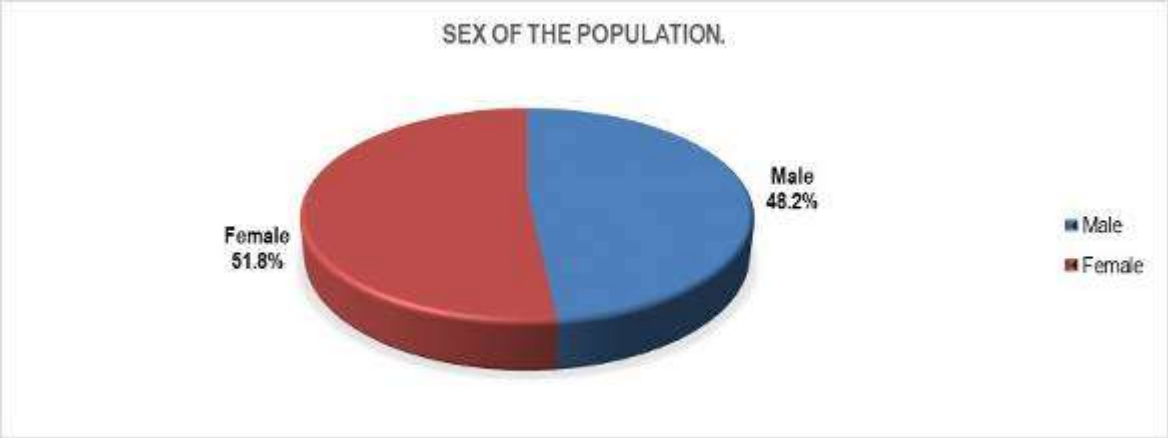


*Figure 5-14: Sex of the population***.**

Marital Status.

Marital status within the rural growth center includes all forms of consensual unions whether legal or non-legal, religious or cultural. Findings from the socioeconomic survey indicate that majority of the respondents namely 70.9% are married while 5.0% are single 9.2% are divorced and then 14.9% are widowed. They were 141 respondents in the survey. This means these are established families, parents and children and their other offspring. Married families use more married than single households and therefore the project implementer should connect positively with these families to ensure project sustainability. Most of the divorce household heads were female. Married people constitute the biggest percentage according to the household survey.

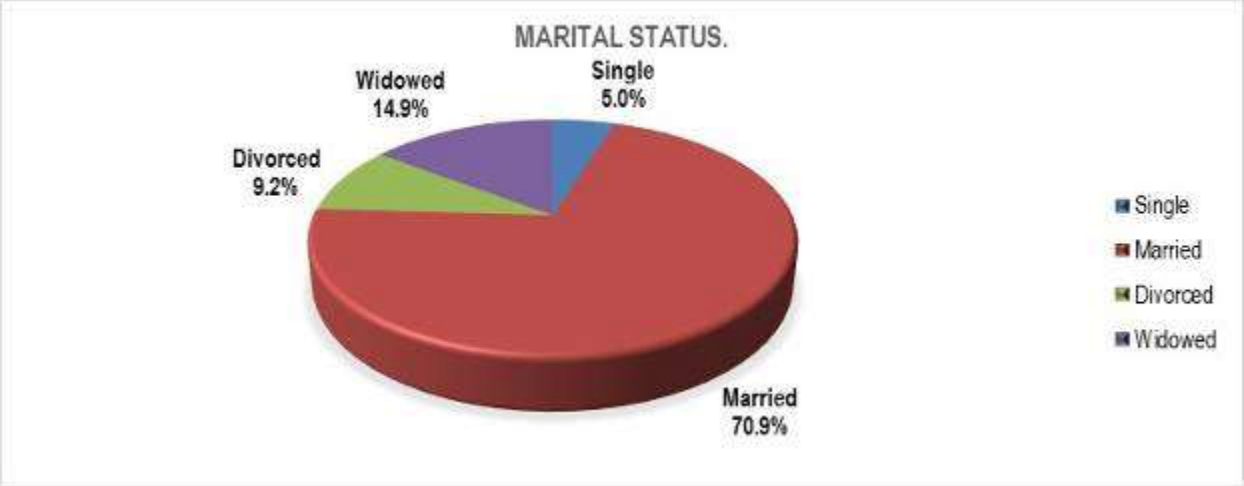


Figure 5-15: Marital Status.

5.2.8 Water and Sanitation in Bugomolwa RGC.

Water supply in Bugomolwa Rural Growth Center is mainly via point sources. Primary data indicates that the most common water source in the area are community boreholes at 97.9% and protected wells at 2.1% as shown in *Figure 5-16* below:

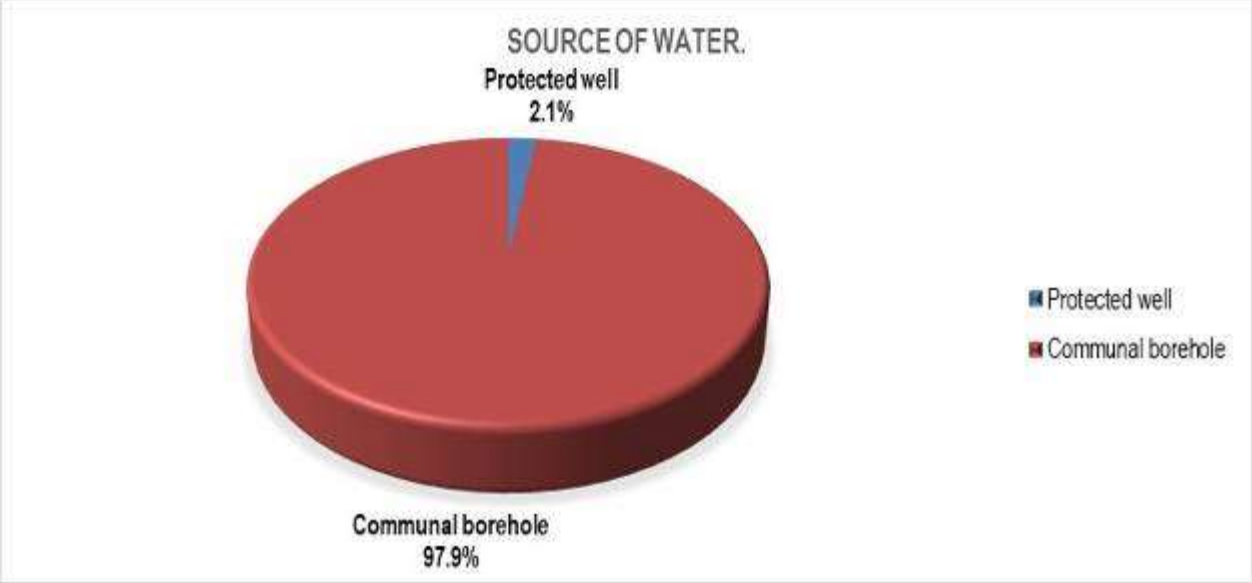


Figure 5-16: Sources of water in the project area.

The source of water is an important determinant of the health status of household members. Safe and clean water is a prerequisite for reducing many common diseases of both adults and children such as diarrhea, dysentery and cholera. The importance of access to safe drinking water is underlined by the fact that it is one of the SDGs (SDG 6) and in NDP II where during the planning period, government focused on increasing access to safe water from 65% to 79% in rural areas and from 77% to 100% in urban area. It is

a commitment to achieve universal and equitable access to safe and affordable drinking water for all by 2030 which can only be achieved through piped water supplies**.**

During focus group discussions with the LC1s within Bugomolwa Rural Growth Center, the Leadership indicated that water stress increases during the dry season since the bore holes get spoilt and experience mechanical breakdowns during the dry season. When water cannot be accessed from these boreholes, the water is bought at 500/= a jerry can from water vendors. Other problems faced during the dry season include: crop failure and emaciation of animals. The community members complained about the dire lack of water in the area especially for the animals. The respondents also noted that residents use between 10 -12 20-liter jerry cans a day in the household for both domestic use and animals.

Figure 5-17: Stakeholder consultations with the Chairmen of the LC1s at Bugomolwa RGC.

Existing Water Sources

The boreholes in the rural growth centre are listed below:

Table 5-9: Boreholes in Bugomolwa Rural Growth Centre.

VILLAGE	NUMBER OF FUNCTIONAL WATER SOURCE.	STATE OF BOREHOLE	CHAIRMEN OF THE WATER PROTECTION COMMITTEE OF THE BOREHOLES/SHALLOW WELLS.
Bugomolwa A LC1	1 borehole.	Non-functional.	-
Bugomolwa B LC1	1 shallow well	Non- functional	-
Bugomolwa Central	1 shallow well	Non- functional	-
Kyinikibi LC1	2 functional borehole and one non- functional borehole	1 functional borehole and one non- functional borehole	**Borehole1:** Chairman Bukenya of 0772014270. **Borehole 2**; Chairman Abiasali of Telephone no: 0758743287

Kyanwa LC1	2 functional boreholes	2 functional boreholes.	**Borehole 1**: Chairman Abdu Nsereko of Telephone: no 0779322544 **Borehole 2:** Chairman Mukasa (Imam)

Source: Community records.

All water sources have water user committees that manage, and co-ordinate activities related to the water sources. They are elected after two years and the structure is as follows: Chairman, Vice Chairman, Secretary, Treasurer, Askari and Information Secretary at village level.

Households in the community that fetch water from these boreholes pay 5000/= every six months to the water user committees and this money is used for the maintenance of the boreholes. The money collected from these water sources is used for the maintenance of the borehole in case of break downs.

Alternatively, some residents buy water from water vendors. Within the RGC, there is one water vendor who sells water on a motor bike while nine sell water on bicycles. The water vendors sell each jerrycan at 500/=. Water is also fetched at a dam in Mutiba Parish which is near the rural growth centre. There is a dam that was constructed by Government in Kyinyika Parish but water did not flow into the dam.

The Water Department at Kyankwanzi District carries out rehabilitation of water sources and allocates a small budget for training and selection of the water user committees. In case a community wants a borehole/shallow well, they are encouraged to form water user committees then the community pays 200,000/= for a borehole and 300,000/= for a valley dam for the construction. The developmental partners working within the Water and Sanitation of Kyankwanzi District are World Vision and CECE, Community efforts for Child Empowerment that provides water purifiers. within the Community. World Vision set up a source in front of the Nkandwa Subcounty headquarters to supply the villages of Nkandwa A, Nkandwa B, Kasanja and Lwemigawa within the Subcounty. World Vision will also supply 10 villages in Kiryanungu Subcounty with water. These villages are outside the project area. There is no overlap in the villages so far. Further consultations with management of World Vision in order to avoid duplication of the project activities should therefore take place.

Figure 5-18:World Vision water source in front of Nkandwa Subcounty Headquarters to supply the villages of Nkadwa A, Nkandwa B, Kasanja and Lwemigawa villages.

Sanitation.

Sanitation is a critical component of human life and this is reaffirmed by the importance the SDGs and NDP III attach to it. SDG 6 goes beyond drinking water to also address sanitation and hygiene. As such, the socioeconomic survey went ahead to assess the coverage of human excreta disposal facilities in the project area. predominantly the project area is covered by traditional pit latrine with exceptional of a few lined latrines especially at schools and hospitals. The study indicated at 90.2% of households owned traditional pit latrine against 5.3 % community latrine and 4.5 shallow pits. Consultation with stakeholders indicated that there were 5 public toilets spread within the district. Publicly shared latrines present a number of challenges including;

- Lack of responsibility in regards to maintenance since there is no sense of ownership;
- In case of a disease breakout, it easily spreads to the entire community and if fatal it could easily wipeout the whole community.

Figure 5-16: VIP pit latrines at Bugomolwa Primary School.

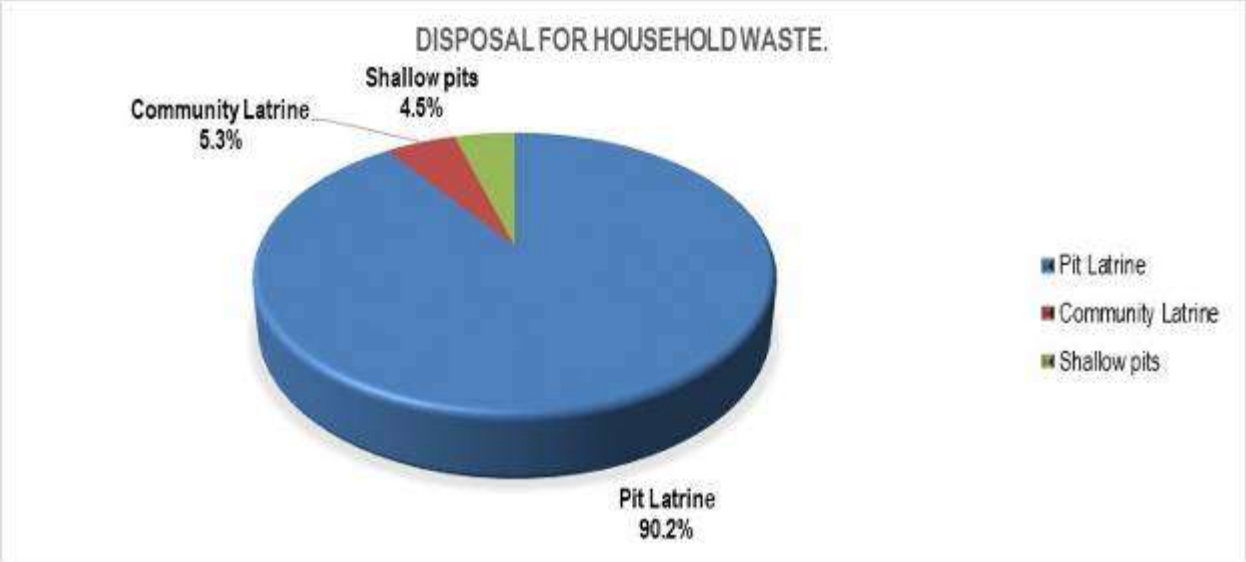


Figure 5-19: major disposal for household waste.

Scarcity of water; could generally have a bearing on the health of the community. Access to proper sanitation ensures dignity and helps prevent the spread of diseases such as cholera that are associated with fecal contamination. This therefore explains the relevance of the project in terms of increasing access to water sources.

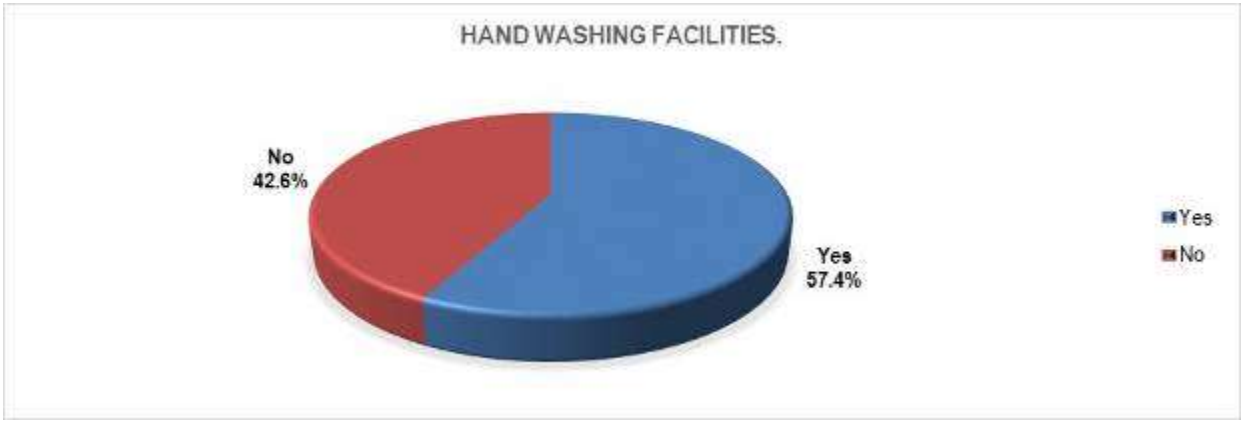


Figure 5-20: Existence of hand washing facilities.

Hand washing after toilet use protects people against some hygiene deficiency diseases. Handwashing interrupts the fecal and oral transmission cycle. Availability of hand washing facilities at or near the toilet can be used as a proxy measure of hygiene after toilet use. SDG 6 Target 6.2 aims to achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. Indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water, can be used to monitor progress towards the goal. According to the socioeconomic survey conducted, most of the

households in Bugomolwa RGC have a localized hand washing facility (57.4%). The survey had 141 respondents.

5.2.9 Ethnicity

According to social-economic survey studies within the project area, most of the inhabitants are the Baganda at 52.5%, Banyoro at 18.4%, Banyarwanda at 14.9%, Baruuli at 3.5%, Banyankore at 2.1%, Bagisu at 1.4%, and others at 7.1%. There is a need to consider the ethnicity during employment since it ensures local participation while giving priority to natives to benefit from the job opportunities to increase ownership of the project.

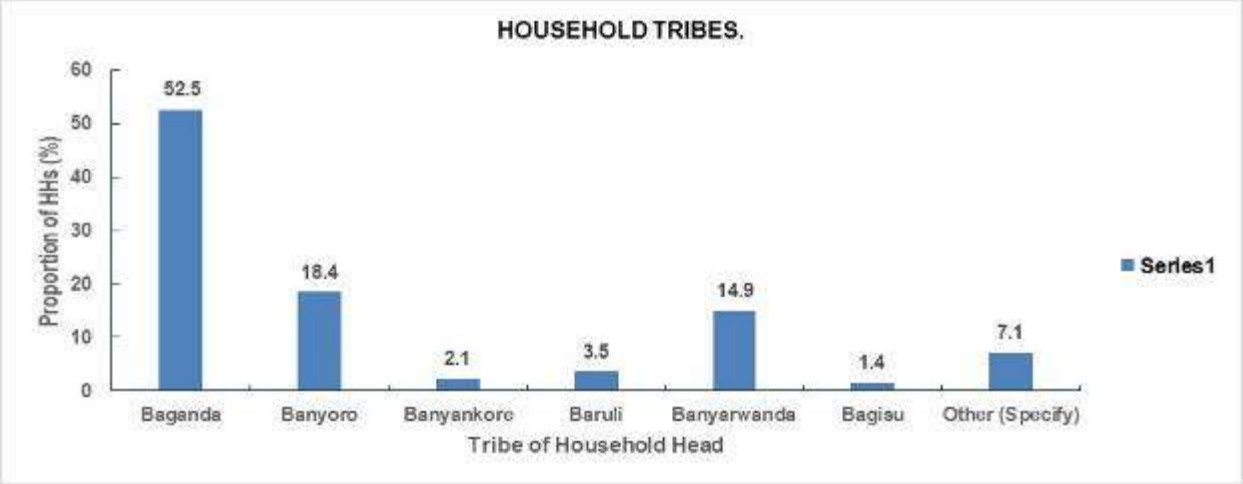


Figure 5-21: Household Tribes in the project area.

5.2.10 Religion.

Places of worship gather several people and are significant in information dissemination about ESIA studies especially community consultations. Also, days of worship are important to note to enable planning for activities to minimize disruption during such days.

Table 5-10: Religious institutions within the Project Area

Institutions	Denomination	Village.	Estimated No. of people in a single congregation
Bugomolwa Roman Catholic Church.	Catholics.	Bugomolwa A	450
Bugomolwa Pentecostal Church	Pentecostal	Bugomolwa B	170
Bugomolwa Divine International Church.	Pentecostal	Bugomolwa B	150
Bugomolwa Chapel	Catholics.	Bugomolwa Central	100
Bugomolwa Mosque.	Moslem	Bugomolwa Central.	300
Kiyinkibi Mosque.	Moslem	Kyinkibi	240
Abu baker Islamic Center.	Moslem	Kyanywa	120

Source: Primary data.

Primary findings in the project area indicated that dominant religions in the area in ascending order are the Catholics at 40.4%, Protestants at 31.2%, Moslems at 12.8%, SDA at 8.5% and Pentecostal at 5.0% as shown below:

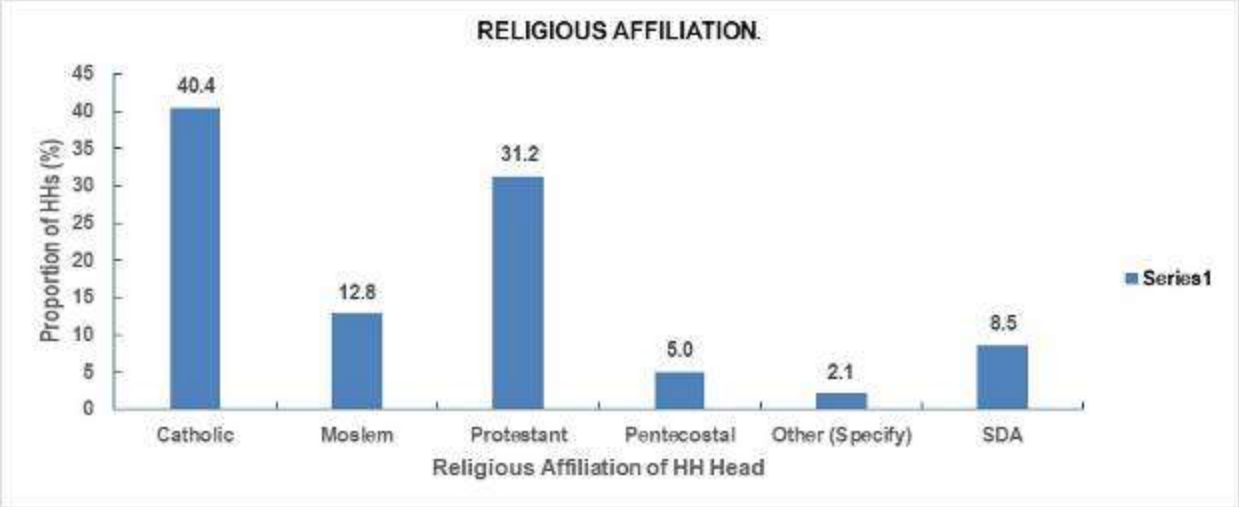


Figure 5-22: Religious affiliation of household head heads within the project area.

5.2.11 Education

Education levels were assessed in order to understand the potential grade or level of employability as well as livelihood of the community. The results indicated that majority of the population in the 141 sampled households have attained primary education (46.1%), 14.9% attained ordinary level, 9.9% attained A' level, 2.1% attained vocational level while 27.0% have never had education. Education provides opportunities to have access to sources of information, an important factor for information dissemination and awareness creation.

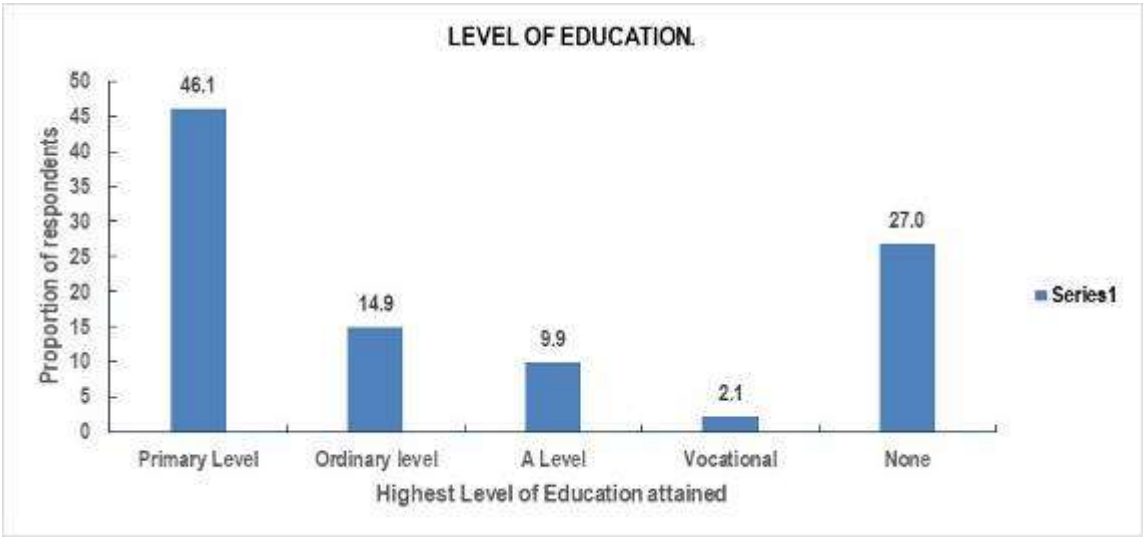


Figure 5-23 : Level of Education.

The educational level of a person represents the development of character or mental power. It helps the community in raising their understanding and the level of acceptance of, or receptivity to, new developments or projects. Furthermore, it indicates the functional literacy and skill level of a community.

Figure 5-24: Bugomolwa Primary School.

Challenges faced in the education sector include: inadequate housing for staff and limited classrooms to primary school pupils. Below are the schools in the RGC.

Table 5-11: Schools in Bugomolwa RGC.

Name of Village.	School	Approximate Enrolment.	Status
Bugomolwa A	Bugomolwa P/S	550	Gov't.
Kyanwa	Abu baker Islamic Center Primary School	220	Private.

5.2.12 Household Incomes.

Household income is important in assessing the poverty levels of the community and ability to pay for services and utilities. The level of household income influences the levels of asset ownership, consumption, expenditures, and wellbeing. Unskilled communities tend to generate low incomes to the household, which contributes to poverty. It is difficult to rank household incomes based on asset ownership. The expenditure approach was used towards deriving income approximations. Household earnings include income from subsistence farming, commercial farming, wage employment, income from non-agricultural enterprises, property incomes, transfers, remittances, and organizational support amongst others. Kyankwazi is one of the districts in the cattle corridor that crosses the country from south-west to north-east.

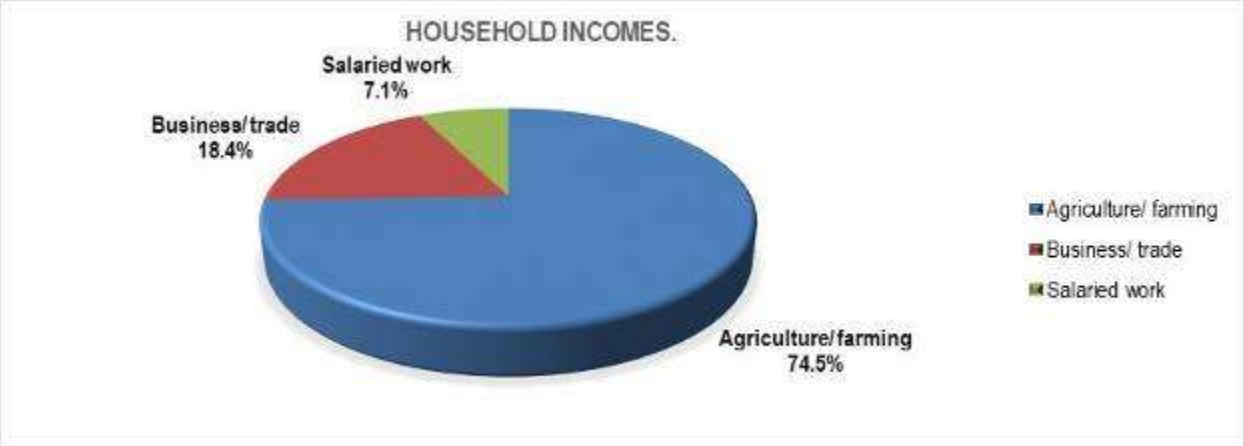


Figure 5-25: Incomes of Households.

The poverty headcount ratio at national poverty lines (% of population) in Uganda was reported at 20.3 % in 2018, according to the World Bank collection of development indicators. The 2021/2022 national budget process has however indicated that 25% of the citizens, that is a quarter of the population, is back to living below the poverty line. The poverty headcount of Kyankwanzi District is 34.6% while that of Ntwentwe County is 26.6%. The increase in poverty rates has been attributed to the Covid-19 pandemic.

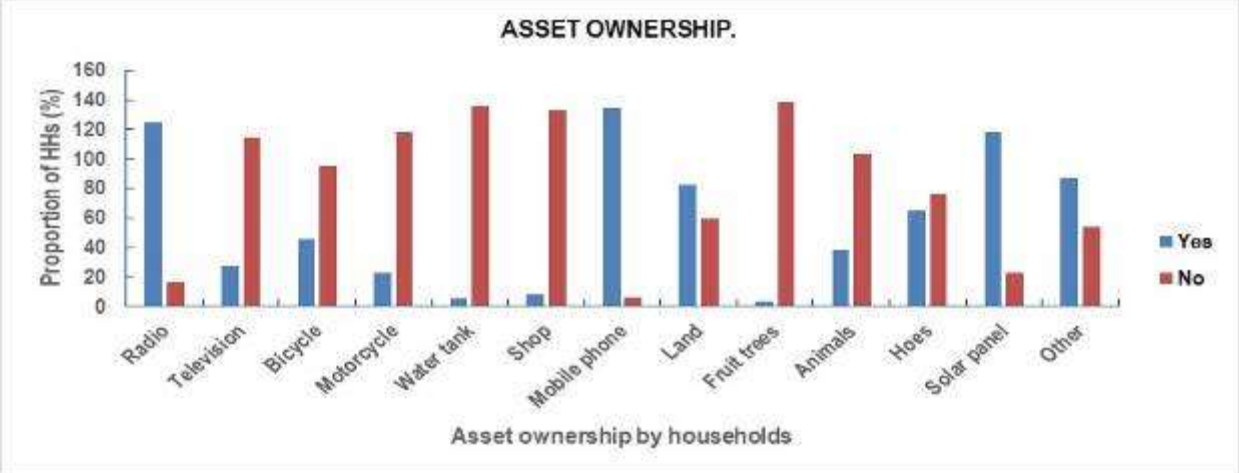


Figure 5-26: Asset Ownership by household.

Primary data indicates that 41.1% 0f the households in Bugomolwa RGC earn less than 100,000/= while only 4.3% earn above 600,000/=. Lower incomes correlate with higher levels of poverty.

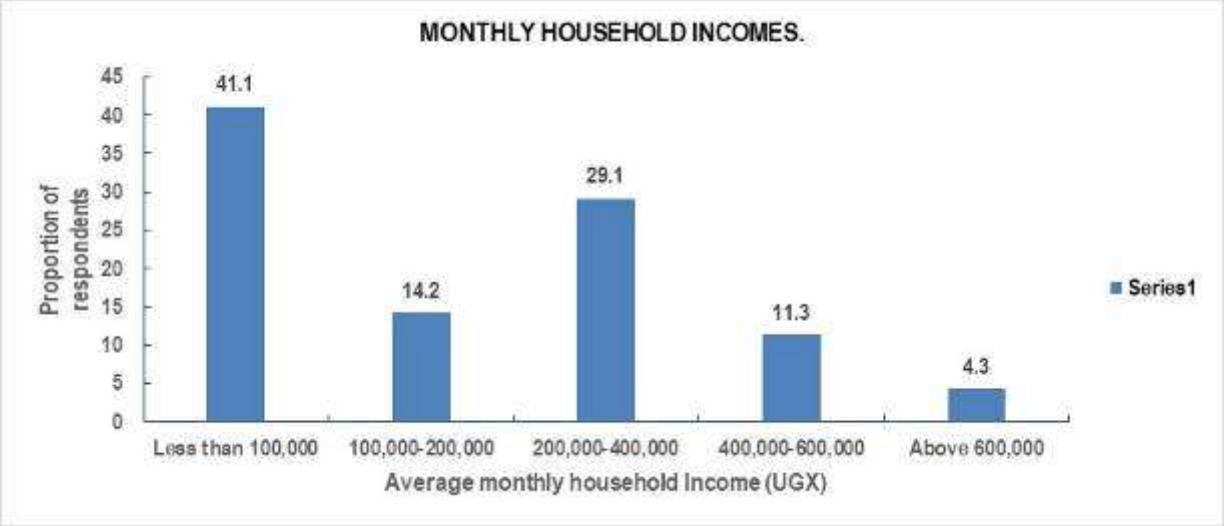


Figure 5-27: Monthly household Incomes.

Expenditure Patterns

Majority of households in the Project area spend most of their income on food at (97.9%), clothes (17.2%), medical bills (91.5%), school fees (85.8%), water bills (47.5%), rent (22.7%), energy (15.2%) and others at (3.6%). Putting into consideration the typical under-reporting of incomes/expenditures by respondents in such surveys, it is only clear that on average the population in the area is of low-income earners. This means if the piped water supply for the upcoming project is not free, the charge should be so minimal to ensure usability and affordability of the local persons.

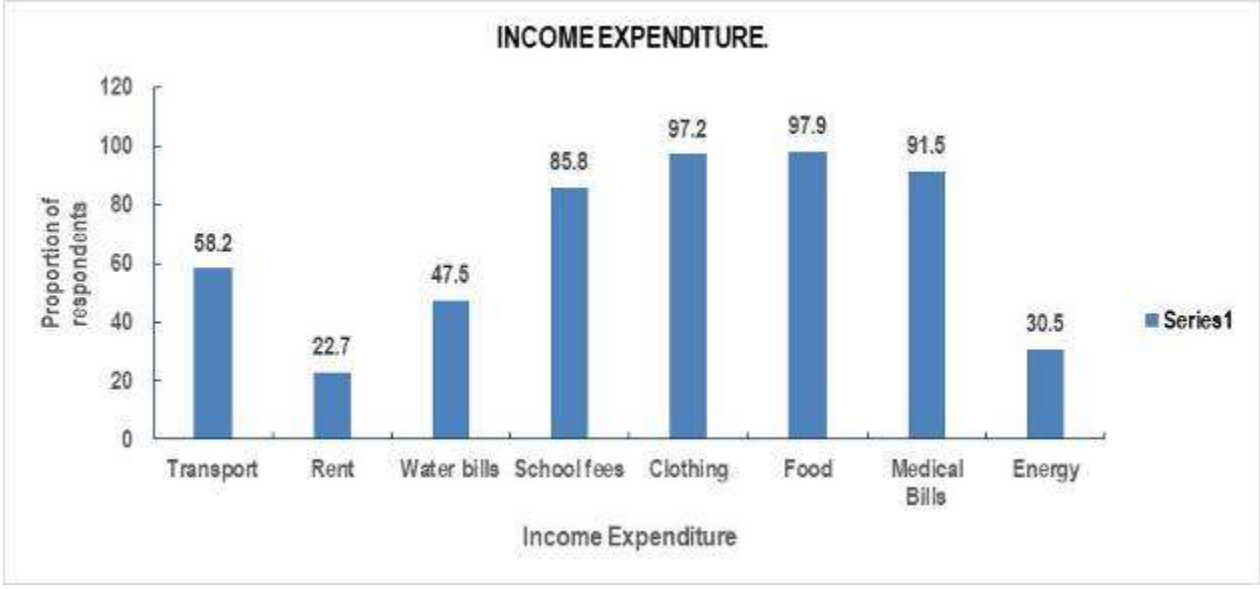


Figure 5-28: Income Expenditure in the project area.

5.2.13 Financial Services, Savings and Credit Societies.

Within Bugomolwa RGC, there has been an emergence of SACCOs whose main function is to bridge rural communities that do not have access to financial services. The district has limited access to financial services in the district. The lending interest rate ranges from 1.5% to 3% per month for SACCOs. This limits access of capital to the business community and discourages the rate of investments and reduces potential economic growth developments, required to generate employment and critical in increasing income levels. Focus Group discussions revealed that over 60% community members save with SACCOs. There is an increased use in mobile money services as mobile users become more accustomed to the practice of cash transfer, bill payments, and airtime transfers; more advanced transfer and payment services. The penetration for such advanced mobile services in Bugomolwa RURAL Growth Center reaches and empower the unbanked money by way of storing and keeping their money in handheld phone device

5.2.14 Crime and Security.

During District Stakeholder consultations, the District Community Development Officer mentioned that domestic violence rates are high and the rates escalated during the period of Covid-19. The role of the District Community Development Office is to facilitate victims of domestic violence with medical aid, legal assistance in lodging cases with police, registering and compiling complaints. The most common cases involve women being offended by men.

There is a need to raise awareness to curb domestic violence. Women fear to report to the Police because of fear social reactions from the community. There are also reported incidences of men being assaulted by their wives in the homestead. Most men assaulted preferred to keep silent because fear of humiliation by the community. The most common causes of domestic violence include: infidelity, over drinking, high illiteracy rates, poverty and ignorance.

During community consultations, the community members reported that lack of adequate water in the homestead is a cause of domestic violence in that women go too far places to look for water and come home late and tired. Therefore, they do not carry out some chores at home and this is a cause of arguments in the household.

During the operation phase of the project, the Contractor should therefore publicize a Code of Conduct that should be adhered to by project workers to reduce crime rates and as part of a public relations plan with the aim of maintaining social cohesion.

Table 5-12:Trend Analysis of Cases reported from 2020 to date.

Reported Cases.	2022(Jan- September)	2021	2020
Cattle Theft	11	14	10
Malicious Damage	7	8	10
Common Assault	4	5	6
Domestic Violence	17	10	9

Land Wrangles.	10	9	8

Source: Office of the District Probation Officer- Kyankwanzi.

The community reports other cases to the Police and Local Leaders the Local Leaders involve the LC1 Chairmen, Church Elders and Clan leaders.

Figure 5-29:Stakeholder consultations with the DCDO, DNO and DPO at Kyankwazi District Headquarters.

5.2.15 Energy in the District.

Energy plays a central role in Local Economic Development, as it is crucial for sustainable economic growth and enhances poverty reduction efforts. It is important to all the departments for productivity, efficiency and quality service delivery. The major sources of energy for cooking are firewood and charcoal. Primary data indicates that 52.4% of the people in the area use charcoal for cooking while 47.6% use firewood for cooking. The demand for wood fuel is growing faster than the supply can recover. This leads to competing over natural resources, and environmental degradation. According to socioeconomic assessments, the commonest form of energy used for lighting is solar at 64.3%. of 141 while 28% use Grid Electricity for lighting. The Households that depend on kerosene for lighting are at 7.0% in spite of its negative health impacts.

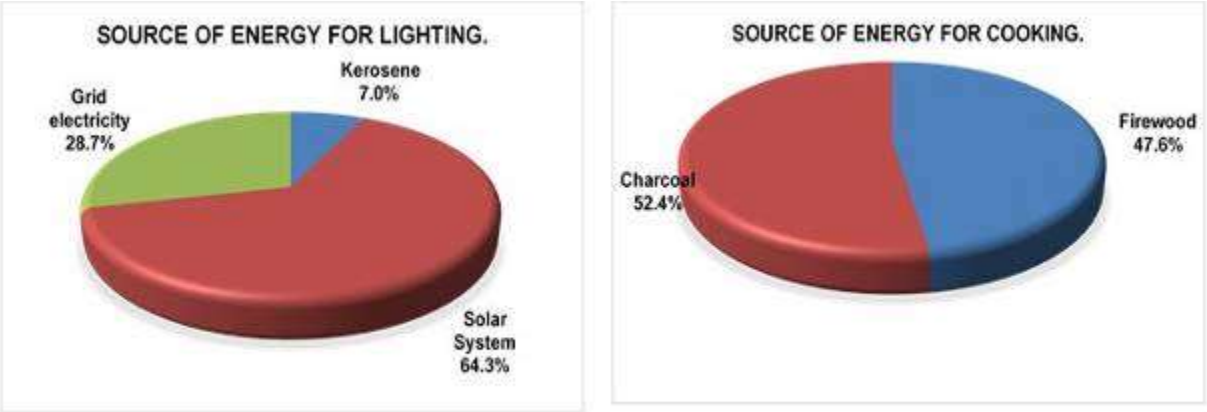


Figure 5-30: Energy sources used for lighting and cooking food.

Other petroleum products such as diesel and petrol are the major energy sources mostly used for transportation. The high price of fuel tends to influence the prices of moving goods and people impacting livelihoods as living costs increases and local economic development with less capital to invest.

5.2.16 Labour Relations.

During stakeholder engagement, the Consultant sought to understand the labor trends within the district. Consultations with the District Labour Officer indicated that there is a need to sensitize the community on the roles of the Labour Office. provide information on Occupational Safety and Hazards, need for PPEs, Health and Labour rights. Limited finances limit the office's ability to follow up on cases.

Table 5-13:Cases reported to the District Labour Office.

Case Reported.	**Year**		
	2022	**2021**	**2020**
Unpaid Wages	3	7	2
Unfair Termination	2	2	1
Industrial Accidents.	2	1	1

5.2.17 Land Tenure Systems and Ownership.

Land tenure systems in the area include Leasehold (including Bibanja owners) at 18%, Freehold at 49%, Customary (with certificates) at 25%, Customary (without certificate) at 49%.

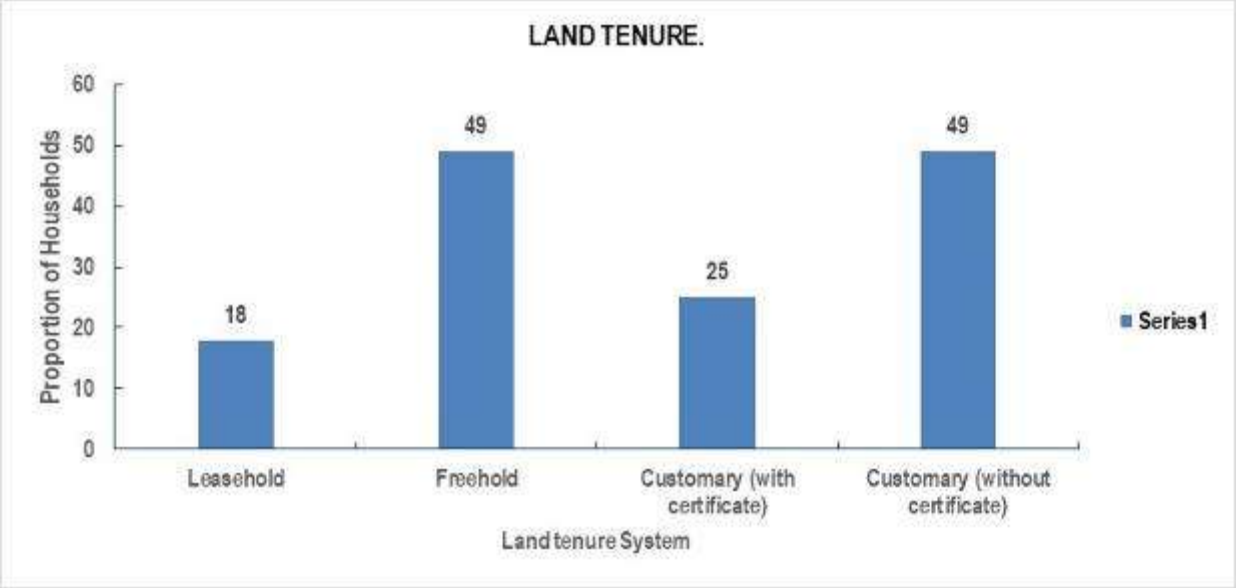


Figure 5-31: Land Tenure Systems.

Household survey data established that majority of landowners acquired land through inheritance at 37.3%, Purchased at 61.0%, Leasing at 1.7%.

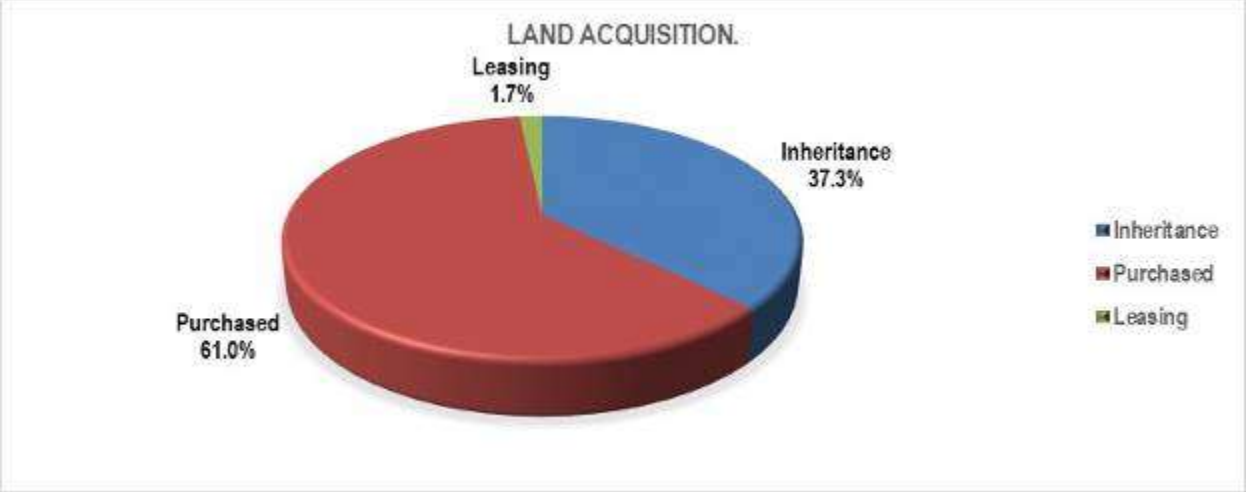


Figure 5-32: Land Acquisition in the Project Area.

5.2.18 Land Use.

The main land use is agriculture, animal husbandry and charcoal burning and is determined by land tenure systems and customs. Tenure arrangement is associated with several pressures including; overgrazing, bush burning and land fragmentation. These pressures tend to limit the sustainable utilization of the land resource and instead lead to over exploitation.

Figure 5-33; Land use in Bugomolwa RGC.

It is important that landowners especially where reservoir is to be constructed are engaged well in advance before the construction starts. Consultation held with some of the landowners during ESIA studies indicated that most of them were willing to offer their land but expressed desire of being compensated.
Consultation within the study area and indeed key stakeholder's engagement revealed that land use is as follows in the RGC: Building is at 31.2%, Livestock farming at 13.5%, Grazing land at 13.9%, Crop farming at 36.8%, Brick making at 4.5%. The area is predominately a farming community. During transect walks, various plantations ranging from Maize, beans, red pepper, groundnuts were seen throughout the area.

The contractors therefore need to consider seasons during implementation phase of the project. Since most of the landowners practice crop farming, it is important that construction starts during the dry seasons to avoid destruction of crops but also importantly because this is the time when communities are not so much engaged in farming and therefore can provide labour.

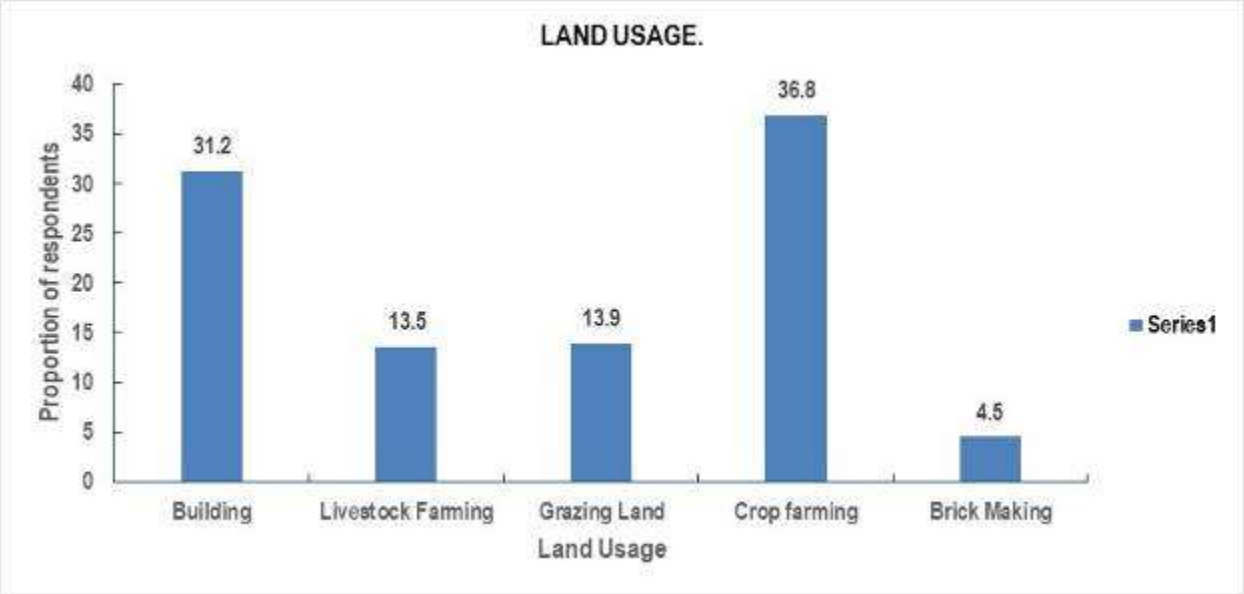


Figure 5-34: Land use in the Project Area.

5.2.19 Settlement and Housing Conditions in Bugomolwa Rural Growth centre.

There are predominately three main settlement patterns in Bugomolwa Rural Growth centre and these are categorized as below:

- A dispersed settlement pattern where the buildings and cattle farms are spread out and is often found in upland areas.
- A nucleated settlement pattern where a lot of buildings grouped together and is often found in lowland areas.
- A linear settlement where the buildings are built in lines mostly along the main access roads.

Similarly, these types of settlement are of different sizes. They range from hamlets, villages to towns. Hamlets are tiny settlements that are a collection of houses, some centered around a few farms and maybe without a shop. Villages are small settlements where many hundreds of people live and they have a few shops, a place of worship and maybe a school too. Bugomolwa Rural Growth center has a relatively large number of settlements that usually have amenities like bars, shops, saloons and butchers

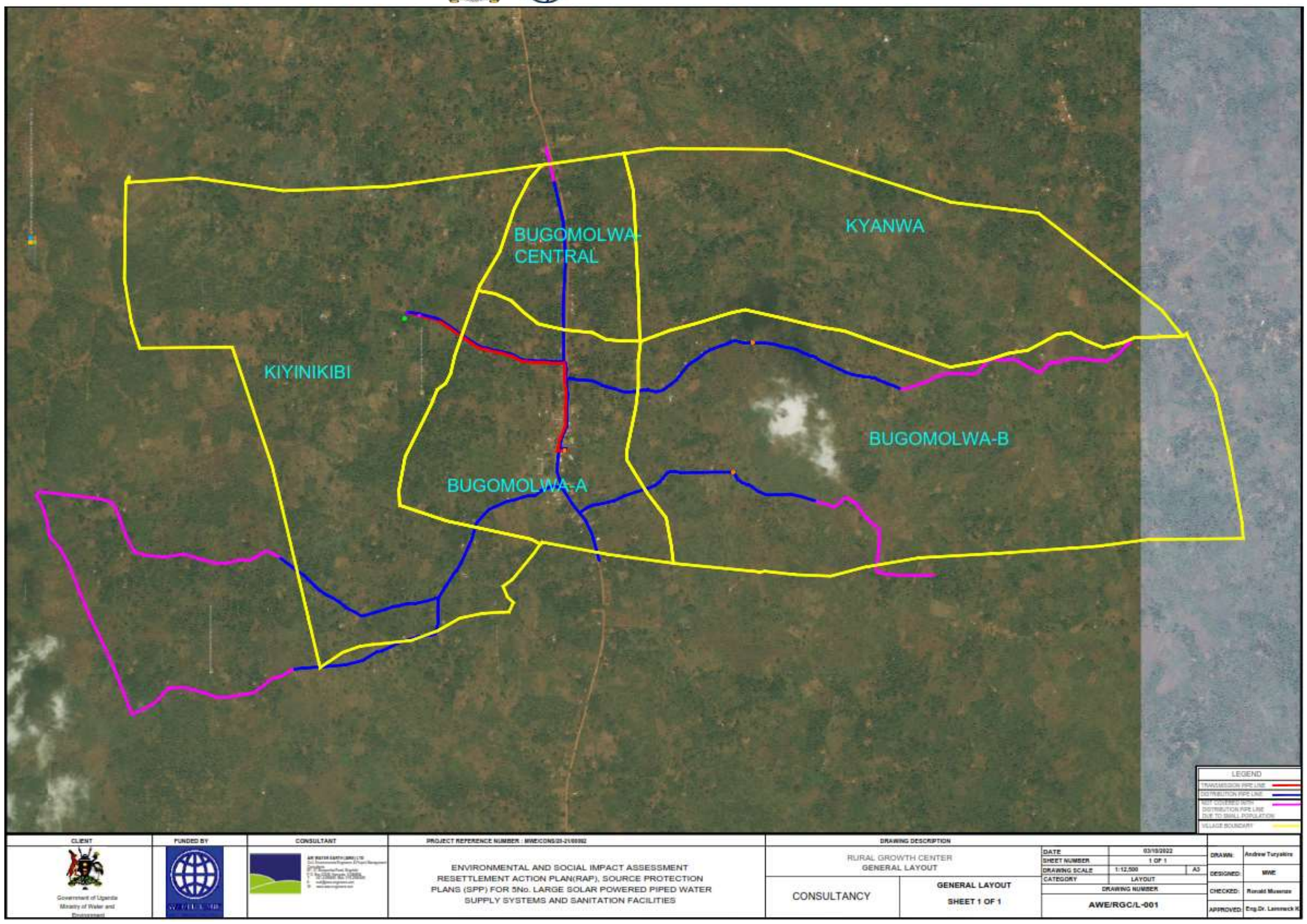


Figure 5-35: Settlement pattern in the Project Area.

5.2.20 Livelihood sources.

It was noted from the household surveys conducted that the major sources of livelihoods are got from animal husbandry namely cattle keeping, papyrus making, agriculture, fishing, vending, trading, informal businesses like carpentry and tailoring as shown in the *Figure* ***5-36***.

Figure 5-36:Bugomolwa Rural Growth Center.

a) Trading.

Bugomolwa Rural Growth centre is characterized by a local economy highly dominated by micro, small and medium enterprises (MSMEs). The population within the trading center is high compared to the surrounding areas is significant. Respectively that are the estimated numbers of MSMESs by category in the Table below are provided by LC1 Chairpersons of Bugomolwa A, Bugomolwa Central, Bugomolwa B, Kyinikibi and Kyanwa LC1s.

Table 5-14: Micro, small and medium enterprises within Bugomolwa RGC.

	Category of MSMEs	Bugomolwa RGC
1	Retail Shops	12
2	Saloons ,2 for men and 2 for women	4
3	Clinics	2
4	Restaurants	2
5	Second hand clothes (Mostly seasonal traders who move from market to market)	7
6	Bars	30
7	Grinding mill	2
8	Water vendors	10
9	Butcheries (beef & pork)	4
10	Builders	20
11	Mechanics	5, (bicycle repairers are 3 while boda boda repairers are 2.)
12	Builders	9

	Category of MSMEs	Bugomolwa RGC
13	Milk vendors	7
14	Chapatti makers	4
15	Transporters/Commuters.	8
16	Tailors	4
17	Carpenters	7
18	Charcoal burners	10
19	Papyrus makers (from lake Kyoga)	10
20	Mobile money attendants	3
21	Water trucks.	5
22	Drug shops	2
23	Lodge	0
24	Wholesale Produce Dealers	3

b) Agriculture.

Agriculture is a core sector of Uganda's economy. The sector employs approximately 69% of the population and contributed around 23.93 percent to the GDP of Uganda. Agriculture carried out in the area is for both home consumption and commercial purposes.62% of the food grown is sold at home while 25.4% is taken to the nearest market.54% of the respondents reported that the market is between 0- 1.5km.

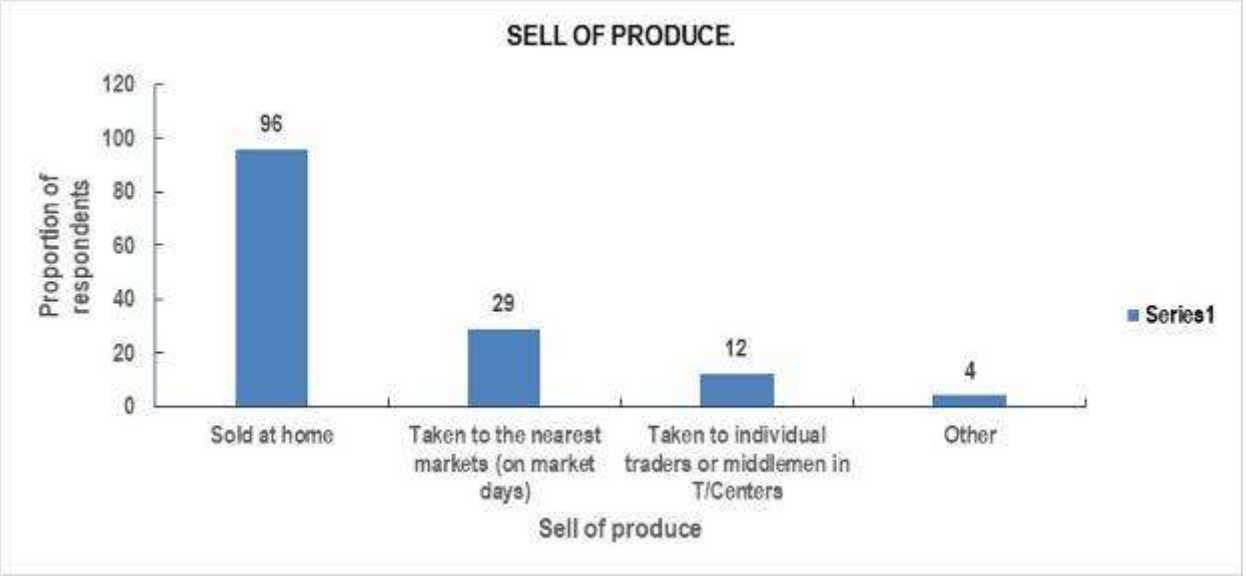


Figure 5-37: Sell of produce in the project area.

The level of mechanization for households is very low. Most of the households use rudimentary tools when farming and family labour is majorly used. Agriculture is mainly rain-fed and is affected by weather. On a gender perspective, the sources of livelihoods for both men and women do not differ significantly. Women are engaged in almost all activities carried out by men. Formal employment opportunities are limited in the project area. The institutions that provide formal employment opportunities to the local people include health centers, schools, cooperative and credit societies and the local government.

Figure 5-38: Matooke and beans gardens in Bugomolwa RGC.

Agriculture presents immense opportunities for growth in other sectors like manufacturing, especially ago-processing. It is for these reasons that the sector has been given priority in the national development plan. The Agricultural sector has been structured along the following lines:

- Traditional Cash Crops: include coffee and tobacco.
- Non-traditional Cash Crops: include; maize, sweet potatoes, cassava, beans, millet, sorghums amongst others.
- Livestock sub-sector: include cattle, goats, sheep, pigs and poultry birds.

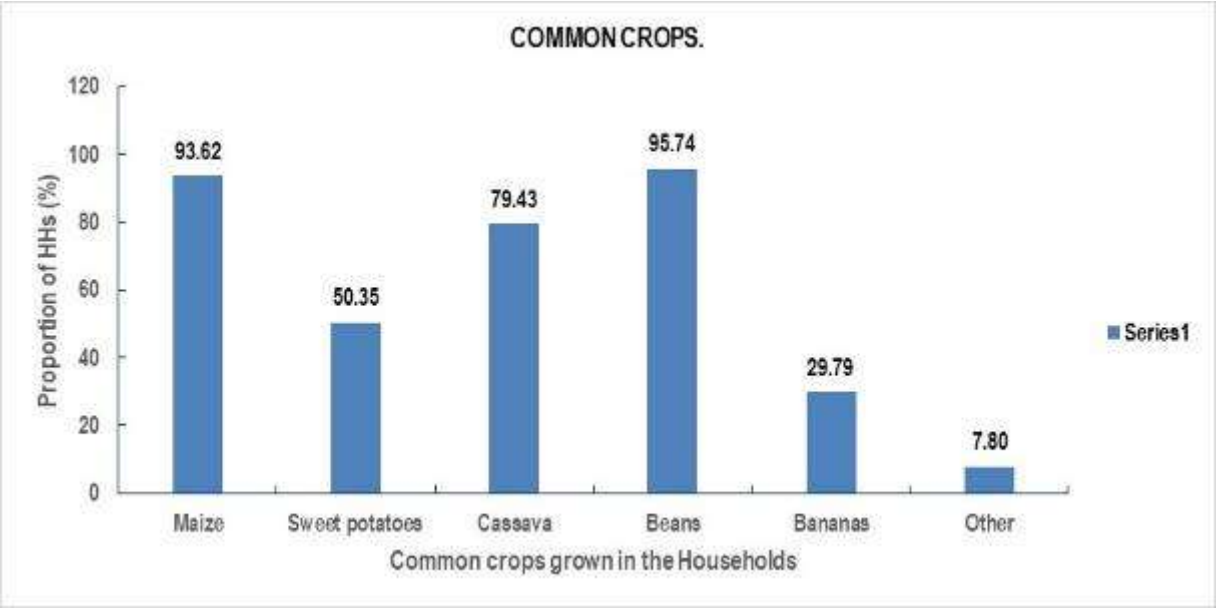


Figure 5-39: Food crops grown in project area.

The inhabitants of the area engage in subsistence agriculture. The major food crops grown in the households include maize (93.62%), sweet potatoes (50.35%), cassava (79.43%), beans (95.74%), bananas (29.79%), and others (7.80%). Coffee the main cash crop at 61% as per results of the community engagement meetings.

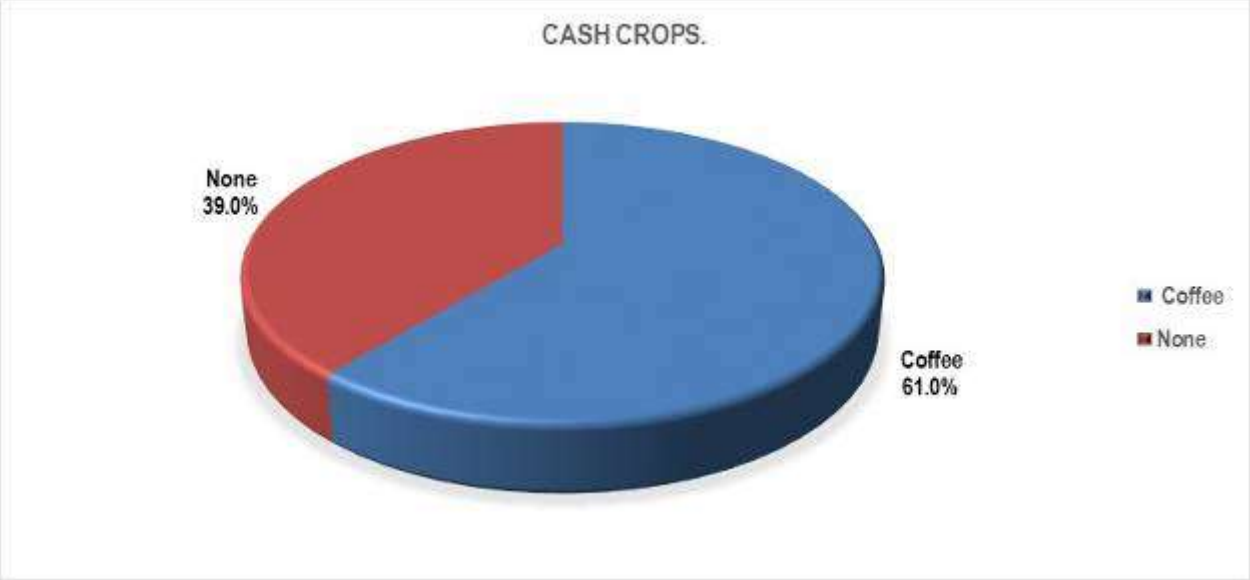


*Figure 5-40: Cash crops grown in the project area***.**

Animal husbandry is also carried out in the area with the most common animals as shown in ***Figure 5-41***:

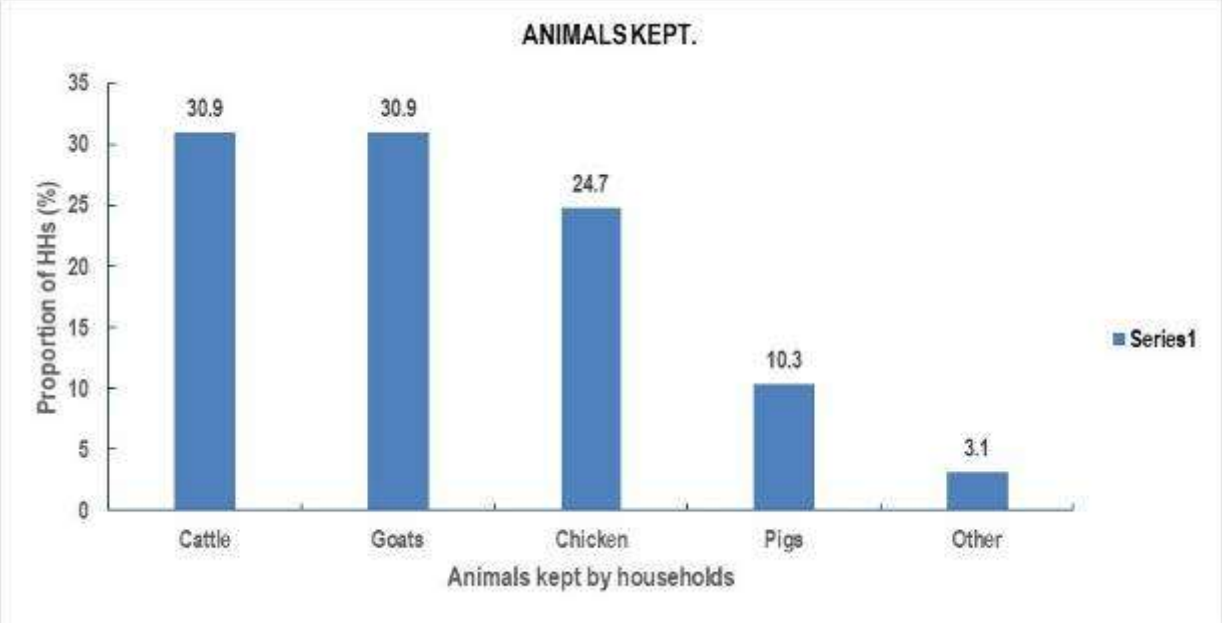


Figure 5-41: Animals kept in the households.

5.2.21 Gender

Gender Roles

Generally, tasks at the household level in the project area are strongly gendered; Wives take on a lot of responsibilities, assuming most of the household daily tasks while men's tasks are often perceived by women as being limited to the provision of "sauce". Findings of the household survey indicate that wives are more involved in cultivation and farming than men. However, men predominantly take on the "large" expenses of the household e.g., Building houses, purchase of household items, medical expense and schools. The responsibility of firewood and water collection mainly falls on wives boys and girls below 18 years while table below reveals findings from focus group discussions in regards to gender roles.

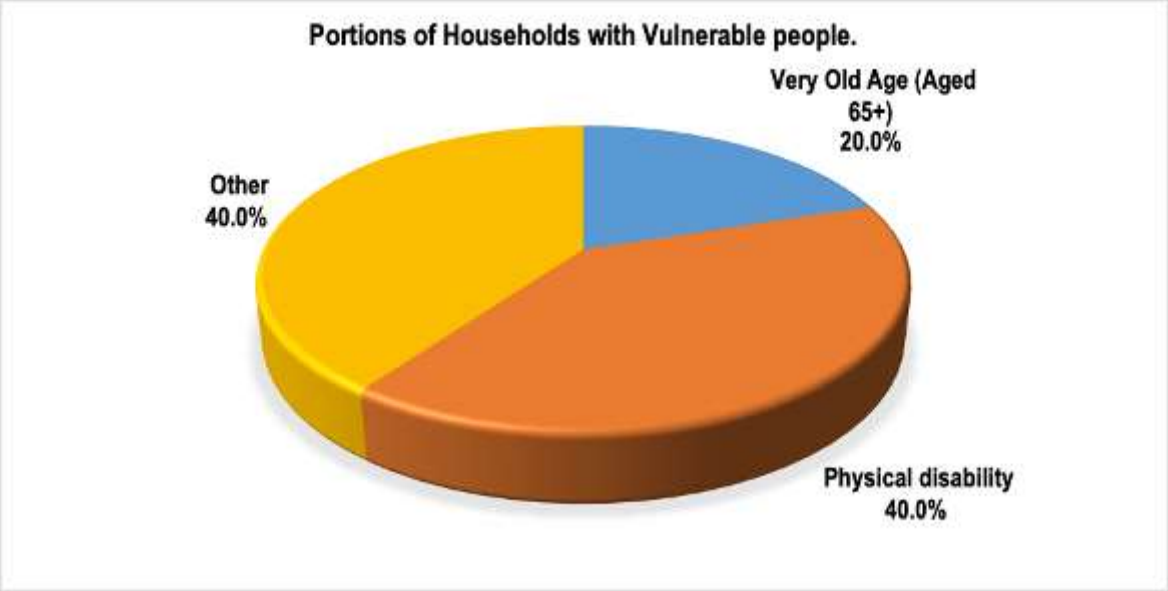
In terms of other domestic variables, Women are responsible for small expenses including food, household supplies, paraffin, soap and clothing and although men are expected to pay for school fees and health care, Women often complain that men spend a lot of money on alcohol and fail to provide for the family.

Table 5-15: Gendered household roles.

	Adult Male	Adult Female	Young Male	Young Female
Level of responsibility (% age)				
Cultivation	30.5	68	1.5	0
Harvesting	20.5	78.1	1.4	0
Firewood Collection	10.7	74.5	2.1	12.8
Water Collection	12.1	71.6	14.2	2.1
Building House	80.1	19.9	0	0
Purchase of Household Items	80.4	19.6	0	0
Paying for Health	79.5	20.5	0	0
Paying for school fees	83	17	0	0

5.2.22 Vulnerability.

The socioeconomic development sub -component's goal is to promote sustainable socio - economic development for the poor, the women and other vulnerable groups in the project area. Within the groups described below there may be overlapping vulnerabilities (e.g., elderly women and disabled).40% of the respondents indicated that the main cause of vulnerability is physical disability while 20% indicated that their main source of physical disability is old age of above 65 years.



Therefore, during the survey, vulnerable groups were identified based on information received during widespread consultations with communities and government representatives and the nature of their vulnerability are described below:

Elderly

Although older persons are generally considered to be too weak to perform productive work and are regarded to be economically dependent on others, they make valuable contribution to society as guardians of traditions and cultural values which are passed on from generation to generation. In addition, the community pointed out that most elderly person often have chronic illnesses and the lack of water affects their well-being.

Persons with Disabilities

The disabilities may range from physical, mental or long-term illness. These are vulnerable due to the reduced labour/income producing potential and require additional resources and support in the care of the disabled person. Limited access therefore affects their quality of life.

Widows

Most Ugandan societies are patriarchal in nature, which limits the ability of widows in taking control and final decision over the physical and financial resources of the family. The in-laws have always utilized the archaic beliefs and practices to strip all the resource which would have helped the widow to look after the family, leaving her more vulnerable. Hence, Widows usually suffer two common experiences; a loss of social status and reduced economic circumstances.

Women

Women can be considered vulnerable due to traditional general roles, which place a high burden of household labour on them and exclude them from participating in decision making; lack of land ownership and denial of property and inheritance rights; lower levels of education and lack of awareness about their rights; and vulnerability to sexual and gender-based violence. Women are generally more engaged in agriculture and are therefore more sensitive to land issues. Women are discriminated against in traditional decision making around customary land, which is dominated by male clan elders.

Youths

Within the project area, youth work in a range of jobs including; farming, motorcycle riding, motor vehicle repair, petty trading, casual labour, construction work, hairdressing, art and craft and tourism among others. During community consultations, youth mentioned that they face a major challenge in their access to employment due to their limited professional abilities and scarce job opportunities. Obstacles to create their own business are numerous, such as the lack of capital and the lack of knowledge of enterprise management. The support got from the district and government is very little and when available it does not reach the youth at the lowest level in the village but is rather shared among those in positions of influence.

Youths' expectations from the road construction project are high; in terms of job opportunities, skills development and business opportunities among others. Employment of youth especially in casual work during project implementation will not only improve their livelihood but will also create a sense of ownership of the project in the community. This will in turn help control crime e.g., theft of construction material since they are already benefiting from the project.

Orphans and other vulnerable children

According to the National Strategic Programme Plan on Interventions for Orphans and Other Vulnerable Children for Uganda, an orphan is defined as a child younger than 18 years of age who has lost one or both parents. A child who has lost a mother is a maternal orphan while a child who has lost a father is a paternal orphan. A child who has lost both parents is a double orphan. However, Death of a father has been a major explanatory factor for orphan hood for the different background characteristics compared to death of mother or both parents. According to the 2014 NHPC, 3,468 (7.4%) of the children aged 0-17 years have lost at least a parent

According to Child Protection Act 2020 (Draft), the right of children and their wellbeing is fundamental in all aspects of life. Their wellbeing should be always safeguarded to ensure proper up bring for the benefit of Uganda.

5.2.23 Communication.

The survey also sought to ascertain the various means thru which households/community access/receive information and news in the project area. Results show that the respondents (100%) access information through radio, (3%) through IEC materials, posters, (98%) through radios, (23%) through extension work by government officials, (12%) through group members.

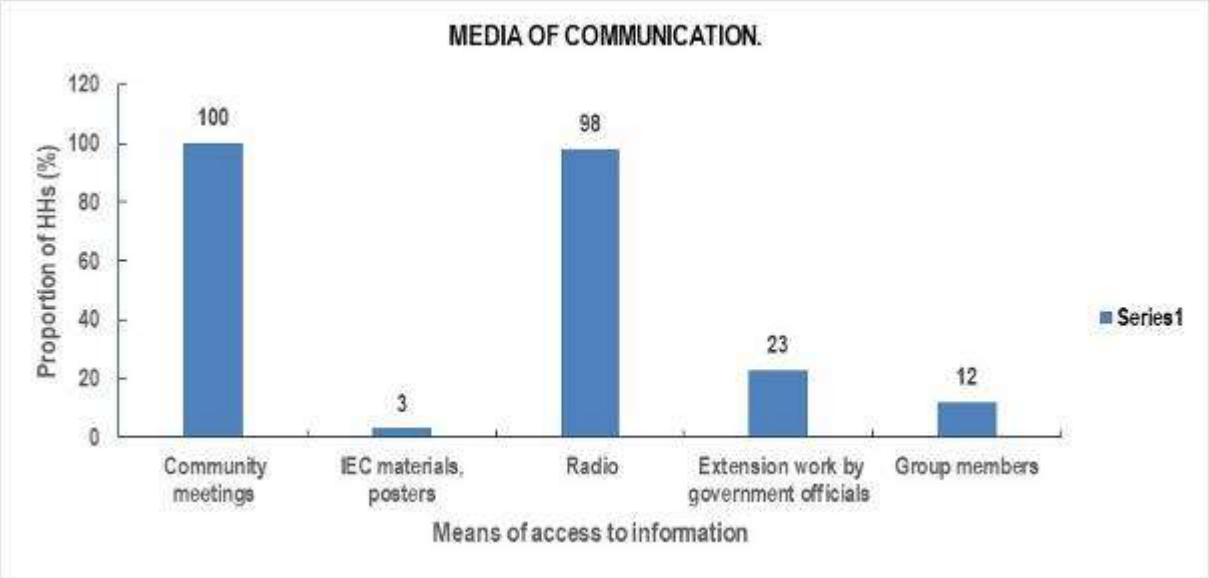


Figure 5-42: Media of communication.

The most common radio stations listened to in the district are: Kiboga radio, Kyankwanzi FM, Radio Hoima, Radio Simba, Radio Vok and Radio Maria Bukwiri.

5.2.24 Health

Survey results in the area indicate that most people, 19.1%, travel approximately between 0-1.5 km and 8.5% travel 2.5-3.5 km to receive treatment a health centre, 31.2 travel 3.5-5.0km and then 38.3 travel above 5.0km to receive treatment.

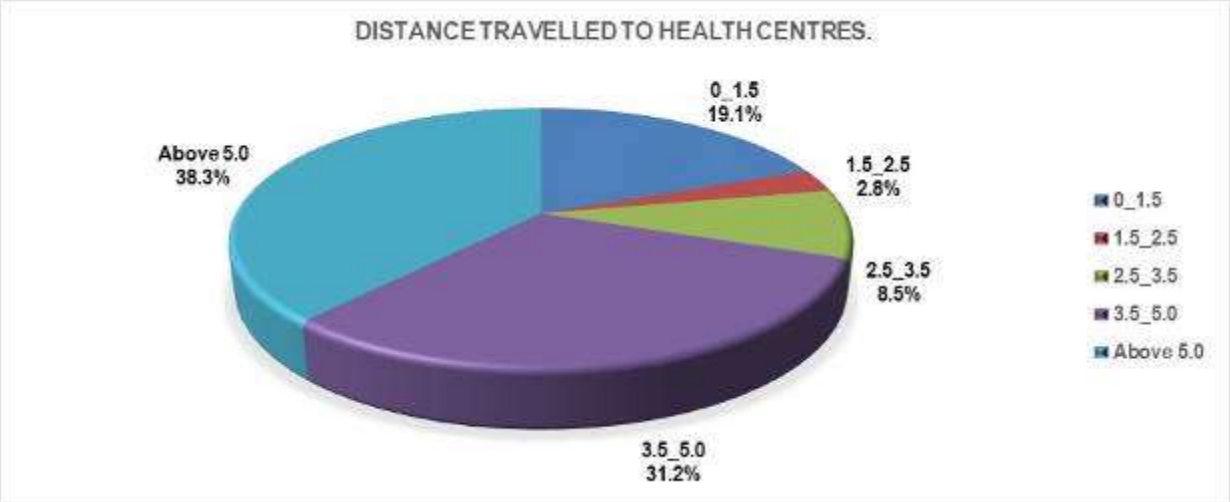


Figure 5-43: Distance travelled to health centers.

Health Facilities commonly used in Rural Growth Center by Ownership.

Social –economic Surveys in the project area indicated that the most common health facility used in the area is the private clinic at 41.1% followed by the Government Health Center II then the Government Health Center III at 14.9% and the Community Hospital at 2.8%.

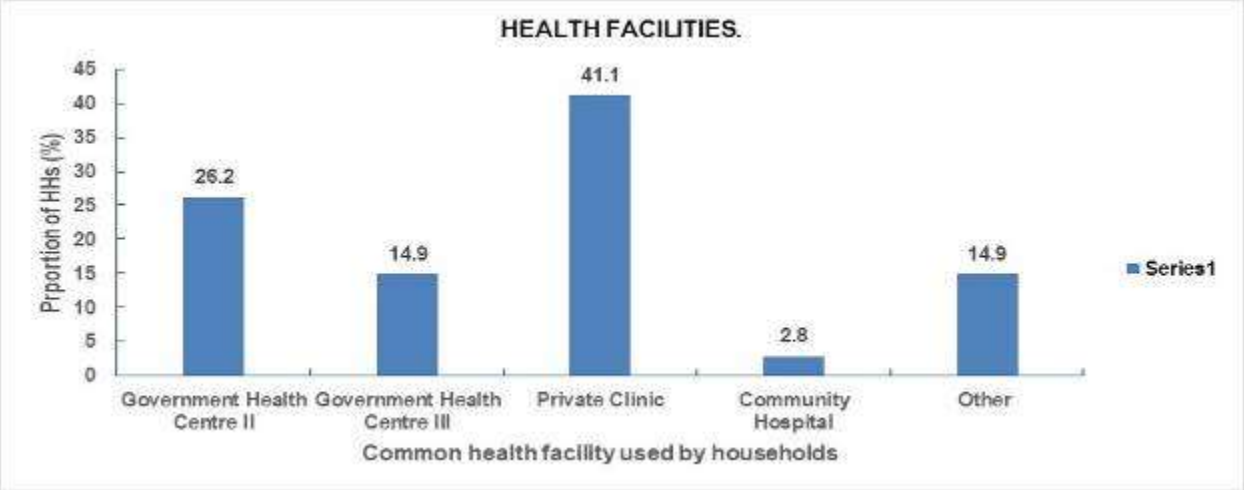


Figure 5-44: Health facilities used in the project area.

In order to inquire more about malaria, respondents were asked about mosquito net ownership. A big number of them responded in affirmative. 90.8 % of the people owned a net. This implies that either they are not using nets or using them wrongly thus the high prevalence levels of malaria. One Chairperson informed the consultant that most of the nets distributed by Government had just been converted into chicken houses thus rendering the effort of fighting malaria useless. He also attributed these levels to the unclean water and the streams which breeds a lot of mosquitoes. The commonest illnesses in the household involve malaria at 50.2% and cough/flue at 35.1% as shown in *Figure* ***5-45*** below:

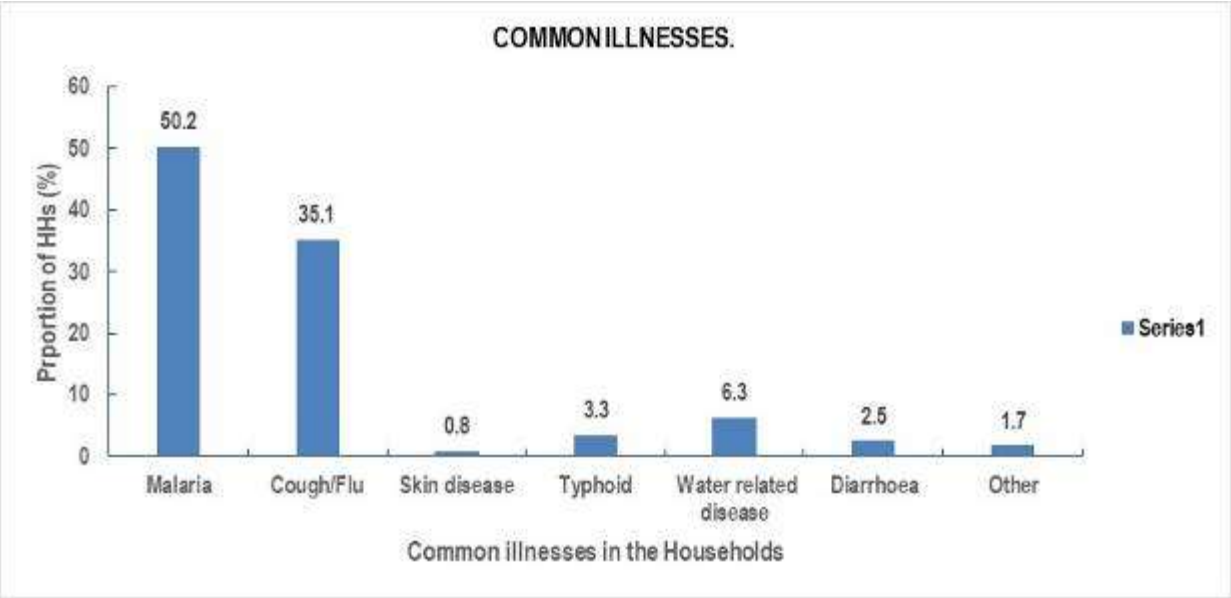


Figure 5-45: Common illnesses in Project area.

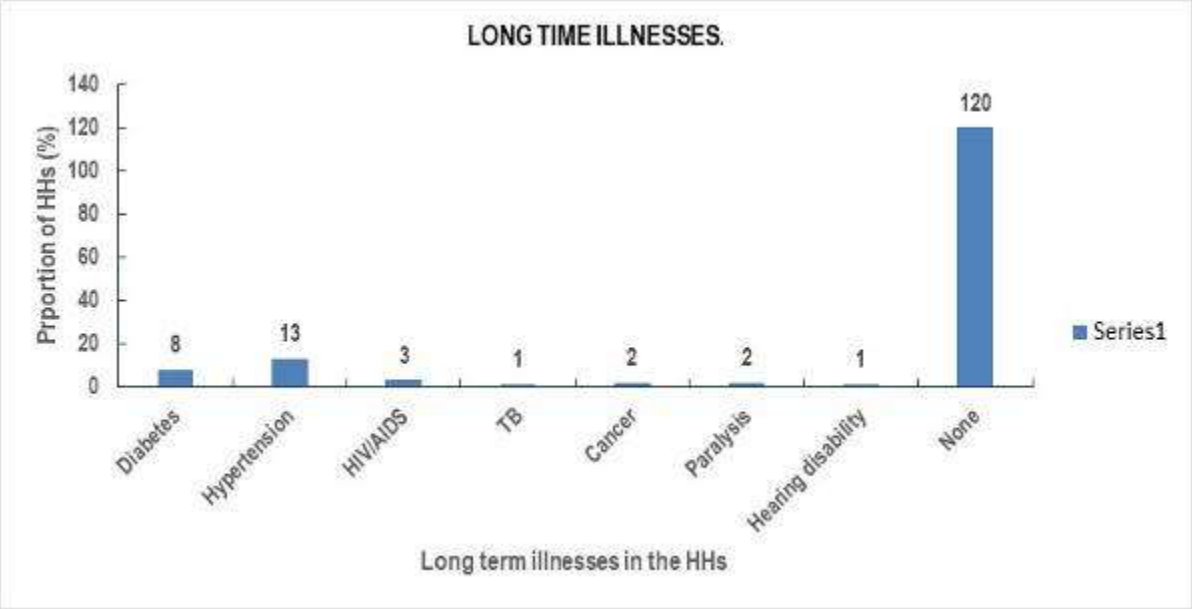


Figure 5-46: Long Term Illnesses in the area.

HIV/ /AIDS

According to the Ministry of Health estimates 2020, the HIV prevalence among adults (15-49 years) in Uganda is 5.4**%**. The prevalence is higher among females. There has been a drastic reduction in the number of new HIV infections between 2010 and 2020. Reduction in HIV prevalence within the study area is related to the massive sensitization that has been on-going for years now majorly by the presidential initiatives on HIV but also by the efforts of the district municipality as emphasized by the District Health Officer.

Of the 141households that were interviewed within Bugomolwa Rural Growth Center, 96.3% knew about HIV contraction and its effects against only 3.7 %. Of the households interviewed, (93.4 %) know where to get HIV/AIDS services compared to (6.6 %) Among the HIVAIDS services reported during household survey, the commonest was HIV testing which was available in all government health facilities standing at (21.3 %) followed by counselling (20.3 %). Others included awareness, care and treatment, provision of condoms and distribution of ARVS among others.

Government health facilities provide a number of HIV/AIDS services according to the District Health Officer including Testing and counselling, treatment and provision of ARVs and more often provision of food to the most vulnerable type of HIV victims. Private facilities handle majorly counselling and testing while NGOs involve in holistic care including home visits and education.

As a safeguard against the increase of HIV/AIDS during the implementation phase, clear HIV policies and guidelines especially for the workers and communities have to be put up. These guidelines should be explained well to the workers periodically. Campaigns about AIDS should also be undertaken within the communities.

5.2.25 Development Partners in the Project Area.

The proposed project area has a number of other development partners namely: Community efforts for Child Empowerment (CECE), World Vision working in the area of sanitation and water. According to the District Community Development Officer, World Vision has been a prominent development organization that helps the district in a number of social thematic including health, education, domestic violence, gender mainstreaming, poverty reduction and inclusion among others.

Table 5-16: Developmental Partners within Bugomolwa Rural Growth Center.

Developmental Partner	Services offered.	Contact of Organization.
World Vision	World Vision is a prominent development organization works in a number areas including health, education, domestic violence, gender mainstreaming, poverty reduction and inclusion among others.	Bandu Roy. Area WASH Officer Kyankwanzi District. Tel:0707928107 World Vision Offices, Ntwetwe Subcounty. Kyankwanzi District.
CECE, Community Efforts for Child Empowerment.	Provision of water purifiers within Bugomolwa Rural Growth Center.	Community Efforts for Child Empowerment (CECE) Masodde-Kisekende Village, Wattuba Sub county, Kyankwanzi District. P. O. Box 51, Kiboga – Uganda: Email: info@cece.or.ug Office: +256392846728

5.3 Physical Cultural Resources.

Physical cultural assessments of the project area revealed that there are some features of heritage importance. 85.1% of the respondents indicated that there are no areas of spiritual significance on the land. While 14.9% responded in the affirmative. Furthermore, during stakeholder consultations, respondents revealed that they had local cultural norms and beliefs that are of great importance to them. These norms are attached to the seasons of planting, weeding and harvesting their crops.

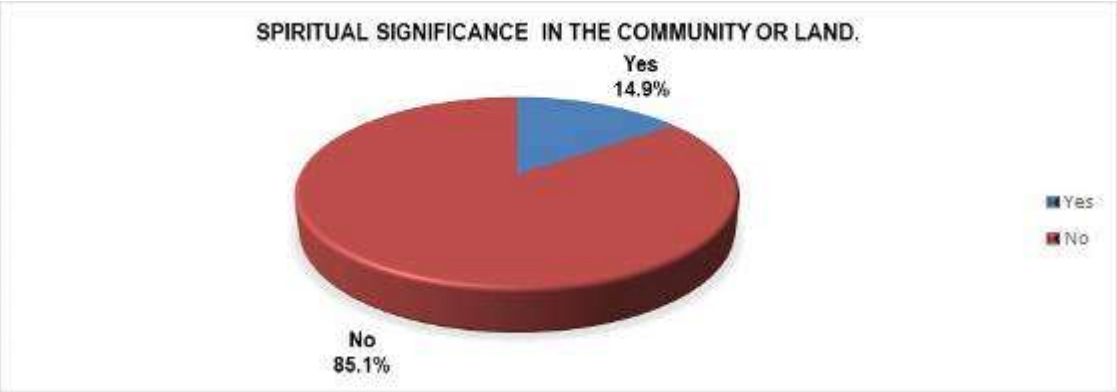


Figure 5-47;Areas of Spiritual Significance on the land or community.

Much as there was no evidence of presence of underground archaeological artefacts, their existence cannot be ruled out. There is a need to therefore develop and implement a chance finds procedure to guide in handling chance finds in case of significant archaeological discoveries during the construction phase of the project.

6 ASSESSMENT OF POTENTIAL SOCIAL & ENVIRONMENTAL IMPACTS

6.1 Introduction

Key potential environmental and social impacts of the project for each stage of the project cycle are assessed in this chapter Prediction and analysis of possible positive and negative impacts of construction works for the water system are discussed. Impact analysis involved determination of nature of impact, its magnitude, extent, duration of potential impacts. For the proposed development, potential positive and negative impacts were identified both for the construction phase and operation phases. Throughout this report, impacts have been characterized as:

a) "Positive" when they;
   - Enhance socioeconomic welfare e.g. health, employment,
   - Enhance quality of existing environment.

b) "Negative" when they;
   - Reduce socioeconomic welfare of people,
   - Reduce quality of existing environment,
   - Reduce economic value e.g. of surrounding property.

An improvement and increase in potable water supplies and sanitation may generate interrelated improvements in health, economic and social welfare of the community. However, in addition to the many possible beneficial impacts, adverse impacts may arise from these improvements. The impact of potable water supply and sanitation on health depends on the quality and quantity of the piped water supply; the proportion of population covered; and the utilization of the water and sanitation facilities by the population. In this chapter, prediction, and analysis of possible positive and negative impacts of construction and operation of the water pump station, Sanitation facilities, and the reservoirs is presented, with main focus on the proposed construction of the pump station at the motorized borehole.

6.2 Positive Impacts

The anticipated positive impacts of both construction and operational phase are elaborated below.

	Positive Impact	Enhancement measure
6.2.1 *Employment opportunities*		
Construction Phase	The design, feasibility and planning phase provided financial benefit and employment for local consultants. This is a positive but short-term and reversible socioeconomic impact. The use of appropriate labour-intensive methods for some of the construction activities (e.g., construction of the pump station, and Reservoir) would present employment opportunities for local people and generate direct income benefits to local households. Contract provisions for the construction works require most of the labour force (at least 50%) to be drawn from the local population with particular emphasis on youth and women. Since construction is estimated to take a certain number of months, this phase will provide short-term job opportunities for local people. Some people will be employed in the digging of the transmission and distribution networks, sand and stone quarries, and sale of earth materials to the proposed project and in the service sector around the project site. The project is estimated to employ around 70 workers during the construction phase.	▪ The contractor should involve local leaders in recruitment process to ensure full and fair participation of local communities. ▪ Wherever feasible, local people should be considered for job opportunities commensurate with their level of skills. ▪ Adequate occupational health and safety standards should be provided to ensure the work environment is conducive. ▪ A training programme for artisans (builders, plumbers) in the project area could be facilitated by the project to ensure skills transfer during the construction period.
Operational Phase	Operation of the constructed water supply system will create additional long-term technical and non-technical job opportunities for professionals, casual laborers, etc. Staffing will be required in the Sub County and Rural Growth Centre (RGC) to operate the constructed water supply system by: Operating the system in accordance with the service standards; Maintaining the system; Developing the system; Billing the consumers; Collecting revenue; Receiving applications for and making new connections; Making extensions to the system or assets; Attending to all customers; Keeping records of the operations of the system; and Writing status reports for the operations of the system.	▪ Wherever feasible, local qualified people will be considered for job opportunities. ▪ Adequate occupational health and safety standards should be provided to ensure the work environment is conducive.

	Positive Impact	Enhancement measure
6.2.2 *Income* to material/ equipment suppliers		
Construction Phase	The scale of construction works is moderate in the proposed project area. Although some of the equipment and materials required for the project will be sourced nationally or even internationally to ensure quality is achieved, several equipment and materials (such as gravel, bricks, plumber, steel reinforcement and cement for civil works) can be sourced locally within Kyankwanzi district and the neighbouring districts. Local suppliers of materials and equipment involved in the project will benefit financially. This is a positive but short-term and reversible impact.	▪ Conscious or unwitting purchase of these materials from unlicensed operations indirectly promotes environmental degradation at illegal quarry sites and can cause medium to long-term negative impacts. It should therefore be a contractual obligation for contractors to procure construction materials from quarries legitimately licensed by the respective district authorities.
OP	During operational phase, Bugomolwa RGC WSS will require material and equipment for maintenance such as cement, paint, pipes, fittings, etc.	▪ Acquisition of material from licensed dealers
6.2.3 Acquisition/improvement of skills		
Construction Phase	People who have never worked on such projects would acquire such skills, which they would use to seek employment in future, and as a benefit from the capacity building incorporated in the program, the implementing authorities would have adequate capacity for managing the environmental and social assessment and permitting processes. It is expected that for the construction of the water source points, some degree of capacity building will be provided (organized and un-organized) through the transfer of new technologies and new skills to (un-skilled) labour. This will happen through on-the-job training as well as through exposure to modern water quality practices, management and logistics procedures. Local sub-contractors and companies will also benefit from the transfer of skills and will also build additional local capacity.	▪ To maximize capacity building for local communities, programs and technical training courses as well as on-the- job training should be provided in specific skills areas for suitable candidates from local communities to enhance minimum levels of education and the possibility of being employed during operational phase. ▪ Co-operation between international suppliers of specialized equipment and contractors and local contractors and sub-contractors and companies should result in the transfer of skills

	Positive Impact	Enhancement measure
Operational Phase	Most water supply and sanitation projects are built through the labour of residents who are directed by a small cadre of sub-professional or supervisory personnel from outside the community. Community participation can also have a great impact on the effectiveness and sustainability of water supply and sanitation programs. It can also help to minimize many of the potential negative environmental impacts associated with them. The Project would provide grass root management opportunities for the local people to both be involved in the management of the water supply and protect their local environment.	▪ Where the required skills are available locally, the local people should be given priority commensurate to their level of training.
6.2.4 Increased Public Revenue / Taxes		
Construction Phase	The implementation of the project will increase revenue and taxes for both the central and local authorities. This includes indirect taxes resulting from the construction project such as Value Added Tax (VAT) on materials and services, Pay As You Earn (PAYE) for construction workers and other formally employed persons who will form by far the majority of created employment opportunities) as well as revenue to pension funds such as National Social Security Fund (NSSF).	▪ The contractor should emit all regulatory payments.
6.2.5 Boost to the Local Economy		
Construction Phase	The workforce will get most of their food and other necessities from the surrounding area and this will provide a market for the local agricultural producers, and craft producers and other small businesses (local shops). This will in turn increase the incomes of the local people, which can be invested in other (productive) activities and be used for paying school fees, medical expenses and other domestic needs. The project will stimulate local economic activities by: ▪ Provision for direct employment opportunities to the workforce thus contributing towards alleviation of poverty and income generation for the local community; ▪ Stimulation of business activities related to contracting works for local entrepreneurs (sub-contractors); ▪ Providing trading opportunities for local communities and other small enterprises in the area; ▪ Providing opportunities for provision of basic and other services for the contractors and immediate community. The project will consider employment of locals.	▪ The contractor should emit all regulatory payments. ▪ The contractor should employ as practical as possible the community members ▪ MWE/DWD should invest heavily in the construction and operation of the Bugomolwa RGC water supply and sanitation system which would involve use of locally available materials.

	Positive Impact	**Enhancement measure**
Operational Phase	The increased provision of potable water supply and sanitation has positive beneficial impact on health and ultimately directly and indirectly on productive and economic benefits. ▪ Livestock and poultry keeping: Improved water supply would lead to an increase in poultry and livestock keeping in homesteads. A permanent water source near or on the farm will permit an increase in cattle and improve the production of milk and beef. Those farmers who previously felt water to be a crucial constraint preventing them from keeping such livestock as grade cows and pigs, poultry like chicken or expanding their activities in this regard, may find it feasible to do so. ▪ Small scale gardens: The increased provision of piped potable water supply may have positive beneficial impact on the irrigation of small-scale gardens around homes if there is excess water available and it can be used for irrigation of small-scale garden plots near each household or tap. This will have positive beneficial impacts on increasing agricultural productivity and perhaps also improving nutrition status of households. ▪ Small scale industries: The ample availability of piped potable water supply may lead to improvements in the small-scale industrial development and increased production.	▪ Water supply should be set taking into consideration the different levels of users. ▪ The users should also be educated to avoid wasteful use of the resources. ▪ The business community should take advantage of the development to establish businesses that would otherwise be impossible without safe piped water.

	Positive Impact	Enhancement measure
6.2.6 Improved health status of households of the project host communities		
Construction Phase	The provision of an adequate, safe water supply and sanitation has positive impacts on the health of users by greatly reducing the incidence of communicable enteric and infectious related diseases, which, in many instances occur in communities due to lack of adequate sanitation and potable water supply. Each potable water supplies as well as safe disposal of human excreta are needed to break the chain of transmission diseases. Changes in water supply may affect different groups of disease in different ways; one group may depend on changes in water quality, another on water quantity and availability and another on indirect effects of standing water which is related to sanitation. ▪ Direct health benefits of the project to the affected population will result in a reduction in the incidence of water-related diseases particularly diarrhoea, typhoid, intestinal worms, skin and eye problems, dysentery and cholera. ▪ Loss of productivity resulting from sickness related to water-borne diseases and expenditure on related medical care will therefore reduce. Therefore, improvement in water supply in several of the poor informal settlements will directly contribute to improved public health within the project communities.	▪ Educate users on the proper use, regular cleaning, and effective maintenance of both the household and public facilities.
6.2.7 Educational enrolment and attendance		
Operational Phase	Construction and Operation of the water system will lead to considerably increased and consistent access to safe water for the project host communities. In relation to increased provision of potable water supply, time savings are the most immediate and easily measured benefits although its magnitude will depend on the conditions prevailing before the construction of the piped water supply. Consequently, time spent on searching and waiting for water by women and children will be saved. This will enable children, especially the girl child to regularly and promptly attend school, while mothers will get more time to prepare their children for school. Assuming other factors are available (such a scholastic material, teachers) school attendance and performance will improve.	▪ Periodic maintenance of Bugomolwa RGC water supply and sanitation system

	Positive Impact	Enhancement measure
6.2.8 Promotion of gender equality and empowerment of women and the girl child		
Operational Phase	The expected reduction in water collection distances and times will be particularly beneficial to women and children, especially girls, who bear the burden of fetching water and have to walk long distances or queue for long periods. The proposed project would free women and girls of the burden of having to spend a lot of their time collecting and carrying water almost daily often from sources distant from their houses. This reduction in burden would allow women and girls time for other activities including involvement in economic ventures that could contribute to reducing poverty and furthering their education (thus increasing school enrolment). It will mean more opportunities for girls to attend schools and more time for women to engage in other economically and educational beneficial activities.	▪ Periodic maintenance of Bugomolwa RGC water supply and sanitation system
6.2.9 *Attainment* of the Sustainable Development Goals; SDGs		
	The effect of providing safe water and hygienic sanitation services would help in the attainment of all other Sustainable Development Goals (infant mortality, poverty reduction, improved health and increased school enrolment rate). The Project would provide opportunities for the GoU through MWE/DWD to aim at achieving the Sustainable Development Goals (SDG) specifically SDG 6. The proposed project would result in bringing improved water and sanitation services closer to the people. The skill for managing water supply and sanitation facilities would result in building social capital which could be extended to better manage the local environment and water resources. The project would include environmental awareness which could be deployed to manage the environment better.	▪ Periodic maintenance of Bugomolwa RGC water supply and sanitation system

	Positive Impact	Enhancement measure
6.2.10 *Combat* HIV/AIDS, malaria, and other diseases		
Operational Phase	The Project would result in prevention of vector borne diseases related to water sources (such as guinea worms, Onchocerciasis, and schistosomiasis) and diseases related to excreta contaminated water and poor hygiene (cholera, typhoid, and diarrhoea diseases) due to the increased provision of safe and clean water. Safe drinking water, personal/household hygiene and improved sanitation would reduce infant/child morbidity and mortality; improve their nutritional status and their ability to perform better in schools. The marginal price of improved hygiene and sanitation promotion would make them cost effective health interventions.	▪ The awareness campaigns for public health, hygiene and sanitation particularly targeted at women and girls should be widened to include measures for tackling HIV/AIDS and other diseases such as schistosomiasis and diseases related to excreta contaminated water and poor hygiene (cholera, typhoid, and diarrhoea diseases).
6.2.11 *Increased* access to clean water		
Operational Phase	▪ Reduction of current water shortages. ▪ Improvement of water quality. ▪ Reduction of the time spent and distance travelled to fetch water, which would signify an improvement in the general living conditions of the people. ▪ Improvements in public and household sanitation. ▪ Awareness of personal hygiene. ▪ Overall improved health conditions for the beneficiary population. ▪ Income generating activities for the poor will increase as result of availability of reliable supply of water in public places e.g. commercial water service providers.	▪ Periodic maintenance of Bugomolwa RGC water supply and sanitation system
6.2.12 Eradication of poverty and improved livelihoods of the local people		
Operational Phase	▪ The proposed project would result in an increase in the volume of water for production which could result in improved livelihoods of the local people. ▪ Water is indispensable for survival and improving the quality of life – for health (drinking, eating and bathing) and for economic development (ago-processing and business). The project would, therefore increase productive activities through reduced sick days and time saved in fetching water.	▪ Periodic maintenance of Bugomolwa RGC water supply and sanitation system

6.3 Negative Impacts during Construction

6.3.1 Construction waste generation

Evaluation Aspect	Impact description	Score
Magnitude of Impact	During the construction of the pipeline and the water supply system, activities will generate large quantities of assorted waste including bulky construction waste (concrete, concrete products, wooden boards, wrapping materials (plastics, and textiles, metallic strips/pieces, obsolete equipment, and equipment parts, among others). Concrete waste may result from both in-situ and ex-situ concrete works. Failure to adhere to instructions and poor workmanship could lead to spillage thus generating waste. This category of waste presents challenges because of being bulky and dense and cannot be easily reused or recycled.	Large = 8
Duration of Impact	The construction phase period is a total of 1 year	1= Transient: <1 year
Extent of Impact	Waste generated at the camps (where the workers will be staying) will be site-specific, however, waste generated along the RoW pipeline and the construction sites will be disposed of along the community through which the water pipeline traverses.	2= Local/Village setting/ Entire Project Affected Communities
VEC/VSC Sensitivity	VEC/VSC: The Community, drainage channels Wastes of all categories, if not properly managed, will impact diverse receptors, including the neighboring seasonal streams that drain into River Kafu. General household waste especially garbage will decompose rapidly attracting pathogens and disease-carrying vectors with the potential to impact community health and safety. High-density bulky waste when dumped in sensitive ecosystems like wetlands will impair drainage, destroy habitats and affect breeding sites of fauna. Hazardous waste has characteristics that render such waste very toxic, corrosive, infectious or radioactive, such that when poorly managed, exposure thresholds are very low leading to grave impacts on the environment and community health. Some hazardous wastes are carcinogenic.	High = 4
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 15**	**Moderate**

Impact mitigation measures

- The contractor should develop and implement a waste management plan entailing all measures to be employed in managing waste right from generation, storage, collection, transportation to final disposal. This should be done in consultation with the district environmental officer and health inspector
- Undertake continuous sensitization of workers on proper waste management practices. This should form part of the daily tool box talks and workers' training
- The contractor should provide adequate well labeled containers for purposes of storage of the various waste streams at the camp
- The contractor shall procure the services of a NEMA licensed waste handler to collect, transport and dispose of hazardous wastes and non-hazardous wastes.
- Provide an area within the construction site to allow for sorting and segregation of materials
- No burning of waste materials which produces black smoke shall be approved. Plastics shall not be burned.
- The campsites shall have adequate toilets with a septic tank-soak-away treatment system
- Liaise with Kyankwanzi district leaders to support in the collection of domestic waste from the construction site for final disposal in the council dumping sites

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Large=8	1= Transient: <1 year	2= Local/Village setting/ Entire Project Affected Communities	High = 4	15	Moderate
After Mitigation	Small =4	1= Transient: <1 year	2= Local/Village setting/ Entire Project Affected Communities	Low= 2	7	Minor

Residual mitigation measure

- Continuous sensitization of the construction workers about waste sorting, recycling and appropriate disposal at the designated sites for waste.

6.3.2 Land acquisition for infrastructure

Evaluation Aspect	Impact description	Score
Magnitude of Impact	It includes permanent land acquisition of 20m by 20m for construction at the source and 20m by 20m at the reservoir. The main PAPs are the two individuals at source and reservoir. 0.97km (that is, from the source to the reservoir) pipeline network and trenching to the detriment of landowners. The Ministry of Water and Environment intends to compensate all the PAPs whose land will be permanently taken by the project.	Medium = 6
Duration of Impact	The land take would be permanent where all the project components would be constructed and temporary along the pipeline network.	1= Transient: <1 year
Extent of Impact	The extent of this impact will be local and will be at the village level.	2= local (at the site and around the village)
VEC/VSC Sensitivity	VEC/VSC: Land owners The land for the water abstraction was donated by the family of the district chairperson to the sub county for the purpose of the WSS project (And the Borehole is already in existence), and the proposed reservoir site is land owned by the sub county previously was used for farmers' cooperative. The district and local authorities in Sub County have already been engaged together with the local landlords and they agreed with communities whose land will be used for the proposed project construction in Kyankwanzi particularly. Other sensitive receptors include the different roads whose reserve will be encroached upon during pipe laying which will be restored at decommissioning.	low = 2
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating =9**	**Minor**

Impact mitigation Measures

- Landowners that require compensation (where possible) as project-affected persons should be compensated before the commencement of the project activities.

- The district and local authorities have already been engaged together with the local land lords and they agreed with communities whose land will be used for the proposed project construction (Consent forms were signed and they have been attached to RAP**.** No grievances were reported and are envisaged.
- MWE shall ensure that this land and any impacted assets are compensated for in accordance with the provisions of the RAP

Mitigation Level	**Magnitude of Impact**	**Duration of Impact**	**Extent of Impact**	**VEC Sensitivity**	**Rating**	**Significance**
Before Mitigation	Medium = 6	1= Transient: <1 year	2= local (at the site and around the village	low = 2	9	Minor
After Mitigation	Small =4	1= Transient: <1 year	2= local setting/ site boundaries	very low = 1	8	Minor

Residual mitigation measures

- Awareness and sensitization campaigns should be conducted to ensure that the locals know that the project is benefiting them and that some of their lands may be encroached upon to ensure that the project benefits the community.

6.3.3 Vegetation and crops loss

Evaluation Aspect	**Impact description**	**Score**
Magnitude of Impact	The existing vegetation cover (Water abstraction area, 6.7 km pipeline, Reservoir Area) will be cleared to give way to the construction process on all sites.The study indicated that at the source there will be a major loss of 2 young trees called Musambya. There were no PAPs along the easement corridor while there were 12 mature bananas , 8 average bananas and 1 young good grafted mango tree at the reservoir	Medium = 6
Duration of Impact	The construction phase period is a total of 1 year	1= Transient: <1 year
Extent of Impact	Vegetation will only be cleared from the sections of the right of way for the pipe laying and the sites for installing the different components like solar panels and pump motors among others	2= Local/Village setting
VEC/VSC Sensitivity	VEC: Project Area Flora	low = 2
	The habitats along the roads (RoW for the pipeline) are modified bushy habitats, dominated by herbaceous-weedy species and very sparsely distributed trees and shrubs that occurred at low abundances, within the urban set-up. Most of the existing access roads for the pipe laying present an edge effect on vegetation and flora distribution and abundance. The vegetation is of large grasses and herbaceous-weedy species, with a very sparse, yet limited distribution of tree species generally. In terms of conservation, the habitats are of negligible ecological sensitivity, given that they are modified and degraded with low biodiversity value as per the details of the species records provided in (Appendix I). There was NO globally, or nationally Red listed species were cited in the project area (IUCN, 2022; WCS, 2016), and no restricted range plant species occurred within the project area. Hence the project area does not have any flora species that requires special protection status. (Section 5.2.1)	
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 11**	**Minor**

Impact mitigation Measures

- After construction, there should be landscaping and re-vegetation. The premises should be planted with vegetation/grass and ornamental trees.
- The water source should be fenced off to reduce ongoing agricultural activities around the borehole to avoid pollution entering the boreholes especially when it rains heavily.
- Minimize vegetation clearance by clearly demarcating work areas.
- Provide environmental awareness training to all employees.
- MWE shall ensure that this land and any impacted assets are compensated for in accordance with the provisions of this RAP
- Rehabilitate all disturbed areas

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Medium= 6	1= Transient: <1 year	2= local setting/ site boundaries	low = 2	11	Minor
After Mitigation	Small =4	1= Transient: <1 year	2= local setting/ site boundaries	very low = 1	8	Minor

Residual mitigation measures

- The developer (MWE) should ensure that the contractor does not decommission the project until there has been enough rehabilitation done at all the disturbed locations.

6.3.4 Generation of Noise

Evaluation Aspect	Impact description	Score
Magnitude of Impact	Noise and vibrations will mainly result from the use of equipment like excavators and bulldozers, graders and dump trucks (80-90 dB[3]) during site preparation and construction activities. Noise levels will also vary depending on time and distance as the construction spreads along the pipeline route. The registered baseline Noise levels (45 to 66.7 dB) are presented in section 5.18. However, the project area is a residential mixed area with a threshold of 55dB and it is compliant with the National Environment (Noise Control) Regulation, 2003.	Medium= 6
Duration of Impact	The construction phase period is a total of 1 year. However, the equipment will operate in phases	1=short term 1-5 years
Extent of Impact	The extent of this impact will be around the local setting through which the water pipeline traverses and the site	2= local setting/ site boundaries
VEC Sensitivity	VEC/VSC: the community members, fauna (domestic animals), and project workers.	Low = 2
	The construction activities will mainly be done during the day when most of the VECs are at their workplaces or the gardens. If exposed, they will have minor irritations. People in Bugomolwa Central Trading are already used to high noise levels (66.7dB) evidencing the anticipated minor irritations.	
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 11**	**Minor**

[3] https://www.researchgate.net/figure/Construction-Equipment-Noise-Emission-Levels-greatest-to-least_tbl2_228381219

Impact mitigation strategies:

- Reduce the number of equipment or substitute heavy equipment with low equipment eg excavators, graders and other heavy machinery with manpower in the clearing and trenching process of the pipeline.
- The contractor should take extra care when selecting the working equipment to avoid the use of old equipment or damaged equipment with high level of noise emissions that would have a negative impact in the environment.
- Contractor will ensure that equipment is properly maintained and fully functional in accordance with the manufacturer's recommendations regularly.
- Regular maintenance, monitoring and, where necessary, the use of silencing equipment will be employed with the aim of reducing noise emissions.
- The selected contractor will be required to submit detailed information on the noise levels which will be generated by the specific methods and equipment proposed and to identify actions required to minimise the noise impact.
- Pumps, generators and other mobile equipment will be sited as far as practicable from housing and other noise-sensitive locations, noise generating works will not be undertaken during night hours.
- During periods of inactivity, equipment will be switched off whenever possible. A limited number of construction activities may have to continue on a 24-hour basis.

Mitigation Level	**Magnitude of Impact**	**Duration of Impact**	**Extent of Impact**	**VEC Sensitivity**	**Rating**	**Significance**
Before Mitigation	Medium= 6	1=short term 1year	2= local setting/ site boundaries	Low = 2	11	Minor
After Mitigation	Small = 4	1=short term 1year	2= local setting/ site boundaries	very low = 1	8	Minor

Residual mitigation measures

- Conduct awareness campaigns to inform the locals about the noise that will be generated by the construction works
- Create a grievance committee and implement a Grievance Redress Mechanism to ensure any complaints about noise are handled at the site.
- The contractor should ensure that noise levels emanating from machinery, vehicles and noisy excavation and construction activities are kept at a minimum for the safety, health and protection of people in the nearby areas.

6.3.5 Increased siltation of the aquatic habitats

Evaluation Aspect	**Impact description**	**Score**
Magnitude of Impact	Some of the excavated sediments from the project site especially along the 0.97km pipeline trench and the construction spoils emanating from the excess excavated material and construction debris is likely to increase siltation, especially in the nearby seasonal streams that drain into River Kafu **(Section 5.1.5)** ecology, affecting the associated aquatic habitat.	Small = 4
Duration of Impact	The construction phase period is a total of 1 year	1=short term 1-5 years
Extent of Impact	The extent of this impact will be local to the nearby water sources or drainage channels in the surrounding areas	2= site boundaries /local setting
VEC Sensitivity	Sensitive receptors include the existing water sources downstream	Moderate = 3

Evaluation Aspect	Impact description	Score
	and drainage channels with their existing fauna. Siltation could result into destruction of habitat for most of the animals and even flooding of the neighboring areas	
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 10**	**Minor**

Impact mitigation measures

- Ensure that the site is at all times drained adequately and surface runoff is directed appropriately to avoid water logging of adjacent areas and of the undulating drainage channel in the Sub County.
- Construct drainage channels to manage all the runoff from the project activities.

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Small = 4	1=short term 1year	2= local village/ site boundaries	Moderate =3	10	Minor
After Mitigation	Negligible =2	1=short term 1year	2= local setting/ site boundaries	Very low = 1	6	Negligible

Residual mitigation measure

The developer should ensure that the contractor drains all the runoff from the site works appropriately.

6.3.6 Increased incidences of diseases like HIV/AIDS

Evaluation Aspect	Impact description	Score
Magnitude of Impact	There's the possibility of an increased number of people in the project district as more people are coming in to seek employment. The district had a 4.6% positivity rate in 2018 of the 21,025 people that tested. An increase in population may pose a risk of the easy spread of HIV/AIDS among the locals and the workers themselves.	Medium= 6
Duration of Impact	The construction phase period is a total of 1 year	1=short term 1-5 years
Extent of Impact	The extent of this impact will be on the village and the district	3=Project district
VEC Sensitivity	Sensitive receptors include the existing people in the district and those coming in for work. Although the community already has programs and campaigns to control the spread of the virus.	Very high = 5
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 15**	**Moderate**

Impact mitigation measures

- The contractor should liaise with the District and Sub County CDO to mobilize communities during the recruitment process to reduce on the influx of people who come into the district for employment.
- The contractor should emphasize equal opportunities for both men and women which will empower the women to do more than be vulnerable to the men.
- The Contractor should, in conjunction with local health authorities, undertake to educate and sensitize the workforce on STDs and HIV/AIDS. Condoms must be made available to the workforce as a must.

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance

Before Mitigation	Medium= 6	1=short term 1year	3=Project district	Very high= 5	15	Moderate
After Mitigation	Small = 4	1=short term 1year	3=Project district	High= 4	12	Moderate

Residual mitigation measures

- Regularly conduct free testing of the workers and community members with mandatory counselling of all individuals sick or not.

6.3.7 Fauna

Evaluation Aspect	Impact description	Score
Magnitude of Impact	Disturbance or loss of protected/endangered animal species/communities and their habitat due to construction activities (noise, dust, fumes, pollution, vehicles, vegetation clearing) at the borehole, water tank, pumping stations and pipeline network areas.	Medium =6
Duration of Impact	The construction phase period is a total of 1 year	1=short term 1-5 years
Extent of Impact	The extent of this impact will be local and along the pipeline RoW	2= local village setting
VEC Sensitivity	▪ A total of only three (03) reptile species were documented in the project area namely; Hemidactylus brookii, Agama agama and Trachylepis striata. These reptilian species were not evaluated by (IUCN 2022), and neither are they protected by CITES. ▪ A total of 16 bird species were recorded (Appendix 2, and all were assessed to be Least Concern as per the IUCN redlist categories (IUCN, 2022).	low = 2
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 11**	**Minor**

Impact mitigation Measures

- Minimize vegetation clearance to the project-specific site.
- Protect water resources from pollution.
- Protect soils from contamination.
- Rehabilitate all disturbed areas.

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Medium=6	1=short term 1year	2= local village setting	low = 2	11	Minor
After Mitigation	Small =4	1=short term 1year	2= local village setting	very low = 1	8	Minor

Residual mitigation *measure*

- Rehabilitate the project site as much as possible

6.3.8 Increased susceptibility to Soil Erosion

Evaluation Aspect	Impact description	Score
Magnitude of Impact	Increased soil erosion is likely to occur in the vicinity of project sites during the construction of the water source points and other related construction works. The site earthworks will reduce soil stability and hence make the soils aggregated and more susceptible to erosion, especially during the rainy season. This will be mitigated with restoration and replanting of some of the vegetation cover to reduce susceptibility to erosion.	Small=4
Duration of Impact	The construction phase period is a total of 1 year	1=short term 1-5 years
Extent of Impact	The extent of this impact will be local	1= Site Boundaries
VEC Sensitivity	Most of the soils in Bugomolwa are Petric Plinthosols Arenosols followed by Gleyic arenosols, Gleyic, Histosols, Lake, Leptosols, and Luvisols. Sensitive receptor is the cleared site and soils which if not properly mitigated can cause erosion that could be detrimental to the environment downstream.	Very Low = 1
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 7**	**Minor**

Impact mitigation measure

- The reservoir site will be hoarded off to intercept any eroded material and any soil material will remain within the site until it is taken away for proper disposal or used for back filling to avoid loose soil being washed away by storm water.
- The project proponent will also ensure that proper landscaping and vegetation restoration is carried out to further reduce the possibility of soil erosion.
- The Project Contractor should backfill all trenches immediately after laying the pipes for the transmission and distribution networks and compact such areas as to near level prior to excavation.
- Use proper techniques for trenching and shoring (Use right angle intersections & use bunding)

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Small=4	1=short term 1year	1= site boundaries	Very Low = 1	7	Minor
After Mitigation	Negligible=2	1=short term 1year	1= site boundaries	Very Low=1	5	Negligible

Residual mitigation measure

- The developer (MWE) should ensure that the contractor does not decommission the project until there has been enough rehabilitation done at all the disturbed locations.

6.3.9 Increased accidents and occupational hazards

Evaluation Aspect	Impact description	Score
Magnitude of Impact	During construction activities such as site preparation, earthworks, the construction and operation of Bugomolwa RGC water supply and sanitation system among others, risks and accidents could occur	Large = 8

Evaluation Aspect	Impact description	Score
	Risks associated with Occupational diseases could be as a result of; ▪ Carrying of loads (Ergonomics/ musculoskeletal disorder), ▪ Exposure to physical agents at worksite, including Noise and Dust (pneumoconiosis), ▪ Exposure to biological agents at worksite, especially contact with infected personnel; workers or beneficially members and infected surfaces (Communicable diseases such as COVID19, Hepatitis B). Basing on the present global pandemic situation (2020), influx of workers in the project area, may increase the risk of COVID19 exposure to the community members, since its perceived they may be originating from different parts of the country (which may be hotspot areas). The contractor should be concerned with the issues of safety for several reasons including: ▪ Legal obligations imposed by OSH Act ▪ Contractual requirements ▪ Direct and indirect financial impact (profit picture) ▪ Corporate and personal legal liability (fiduciary duty) ▪ Ethical duty and moral obligation ▪ Public image and reputation ➢ Direct costs include medical cost and compensation. ➢ Indirect/hidden costs include: ▪ time lost from work by the injured party ▪ loss in earning power, economic loss to injured worker's family ▪ diminished quality of life for the injured party ▪ loss of efficiency by breaking up crew ▪ cost to train new or replacement employees ▪ damage to equipment and tools ▪ loss of production ▪ cost incurred by delays ▪ failure to meet contract demands (completion, etc) ▪ overhead costs associated with disruption of work ▪ clean-up and repair costs ▪ administrative costs of investigations and reports ▪ loss of future project due to adverse publicity ▪ cost of fines The implementation of the project will increase both human and motor traffic in the project area which may result in a high risk of accidents and occupational hazards.	
Duration of Impact	The construction phase period is a total of 1 year	1=short term 1-5 years
Extent of Impact	Accidents will inevitably happen but are more likely if safety procedures and practices are not in place. The extent of this impact will be local and village setting	2= Local and village setting
VEC Sensitivity	The sensitive receptors are the workers and the locals who may get serious injuries during the construction works. However different construction activity stages are associated with different hazards and the range from very dangerous hazards that	very high = 5.

Evaluation Aspect	Impact description	Score
	could lead minor accidents to fatal accidents once exposed to the receptor. Examples of these occupational hazards could be: - ▪ Excavation: - falls, injuries, dust inhalation ▪ Workshop: - burns, eye piercings, flames, wounds ▪ Installation: -back aches, injuries ▪ Community engagement, especially agents registering prospective consumers wishing to get electricity connection may be exposed to Communicable diseases such as COVID19 In case of occurrence of this hazard (exposure to the receptor), there may be near misses or reportable lost time injury or dangerous occurrence or fatal cases which may have legal implication causing.	
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 16**	**Moderate**

Impact mitigation measures

- The contractor should prepare and implement an Occupational safety and health management plan that will be guided by a risk assessment that the contractor should undertake prior to commencement of works
- Depending on the occupational safety and health hazards encountered while performing assigned tasks, workers may require using properly fitting personal protective equipment (PPE) to avoid injuries and illness. They (workers) must be provided with full protective gear. These include working/safety boots, overalls, helmets, goggles, earmuffs, masks, gloves etc.
- A first aid kit should be provided at all active sites. This should be fully equipped always and should be managed by qualified persons.
- Safety awareness may be gained through regular safety training or personal interest in safety and health.
- Local individuals preparing food for the workers at the site must be controlled to ensure that food is hygienically prepared. Allow only authorized food vendors to supply food for the workers in the site
- The Contractor should have work men's compensation cover. It should comply with the Workers Compensation Act, 2000, as well as other Ordinances and Regulations.
- Workers should always be sensitized on social issues such as drugs, alcohol, diseases etc.
- Appoint an Occupational Health and Safety (OHS) officer at the site, with necessary authority and resources to manage OHS issues
- The contractor shall conduct daily toolbox talks of all workers to emphasize safety measures
- All excavations at the site should be demarcated using reflective tape to prevent accidental falls
- The contractor should provide appropriate scaffolds and work platforms to ensure safe working heights
- To avoid accidents at night due to reduced visibility, works should be limited to daytime
- The contractor's Health and safety officer shall maintain an accident log detailing all accidents and incidents that have occurred and corrective measures put in place to prevent further occurrence.

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Large = 8	1=short term 1year	2= Local and village setting	Very high = 5	12	Moderate
After Mitigation	Small=4	1=short term 1year	2= Local and village setting	Low =2	9	Minor

Residual mitigation measure

- MWE will procure a qualified contractor who is aware of OSH measures
- Refresher training of the workers on safety at a construction site.

- Ensure that there is a financial reserve to compensate or treat those injured during construction works.

6.3.10 Sourcing of Construction Materials

Evaluation Aspect	Impact description	Score
Magnitude of Impact	Sourcing of materials such as sand, gravel bricks/blocks and timber if not well regulated and controlled can have a significant impact on the points of sourcing especially if it not acquired from a certified or approved site.	Medium=6
Duration of Impact	The construction phase period is a total of 1 year	1=short term 1-5 years
Extent of Impact	Material such as marram, sand and Aggregate may be sourced from the entire Kyankwanzi district	3=District/Region
VEC Sensitivity	The sensitive receptor is the source of materials although the contractor will source from licensed areas and will obtain permits to access the materials from legally recognized sources.	Moderate = 3
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 13**	**Moderate**

Impact mitigation measures

- The Contractor should liaise with local authorities to ensure that materials such as sand, aggregate and gravel are only taken from quarries and borrow pits with the necessary environmental permits.
- Prepare separate Project Briefs/ ESIA reports as required by the National Environment Act (2019) for all new sites where materials like sand and stones are to be extracted/sourced.

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Medium=6	1=short term 1year	3=District/Region	Moderate = 3	13	Moderate
After Mitigation	Small=4	1=short term 1year	3=District/Region	very low = 2	10	Minor

Residual mitigation measure

- The contractor should ensure to source from the already existing sources around the proposed project site instead of developing new sources of raw materials.

6.3.11 Archaeological / cultural/Historical Sites

Evaluation Aspect	Impact description	Score
Magnitude of Impact	No known archaeological or historical sites exist on the proposed project routes or proposed construction sites. Therefore, no impacts on any features of importance to national heritage are expected. The Asset survey indicates that the RGC Water Supply and Sanitation Project will not impact any graves. However, the construction activities of the Bugomolwa RGC Water Supply and Sanitation Project have the potential to trigger OP 4.11 Physical Cultural Resources. During excavation works for Project infrastructure, there might be chance finds. Any chance finds will be	Small = 2

Evaluation Aspect	Impact description	Score
	treated in line with the requirements of OP 4.11. The objective of OP 4.11 is to avoid, or mitigate, adverse impacts on cultural resources from World Bank Funded Development Projects.	
Duration of Impact	The construction phase period is a total of 1 year	1=short term 1-5 years
Extent of Impact	The extent of this impact will be local	3= District/region
VEC Sensitivity	Physical cultural assessments of the project area revealed that there are some features of heritage importance. 85.1% of the respondents indicated that there are no areas of spiritual significance on the land. While 14.9% responded in the affirmative. These include shrines and burial grounds. A case in point is the land at the source that has a shrine. The owner of the land on which this water source is located is Muwumuza Solomon of Telephone number:0783058466 (Outside the construction area). Furthermore, during stakeholder consultations, respondents revealed that they had local cultural norms and beliefs that are of great importance to them. These norms are attached to the seasons of planting, weeding and harvesting their crops (Section 5.4). Much as there was no evidence of presence of underground archaeological artefacts, their existence cannot be ruled out as may be discovered during excavations (chance finds)	very high = 10.
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 16**	**Moderate**

Impact mitigation measures

- The contractor should develop and implement a chance finds procedure in case of any encounter
- Contractor should ensure that key members of his staff are briefed. Any such features that may be found that were not apparent on the surface investigation will be reported by the project management and appropriate procedures followed to hand them over to the authority responsible for national heritage and antiquities.

Mitigation Level	**Magnitude of Impact**	**Duration of Impact**	**Extent of Impact**	**VEC Sensitivity**	**Rating**	**Significance**
Before Mitigation	Low =4	1=short term 1year	3= District/Region	Moderate = 6	14	Moderate
After Mitigation	Low =4	1=short term 1year	3=District/Region	Very Low =2	10	Minor

Residual mitigation measure

- Ensure to handle any findings during construction with the uttermost sensitivity socially to avoid any conflicts with the communities.
- Undertake continuous sensitization of workers on the potential encounter of PCRs and the procedure of handling them
- Local leaders and religious leaders should be notified if the finds are not of interest to the Department of Museums and Monuments. These shall guide the contractor in reburying such finds.

6.3.12 Risk of Traffic Accidents and Disruption of traffic flow

Evaluation Aspect	Impact description	Score
Magnitude of Impact	During the construction phase, it is sometimes inevitable that some sections of the access roads are temporarily closed, and traffic diverted to either new or existing routes The trenches created for the pipe crossing can lead to accidents if proper signage is not put in place along the access roads. Construction traffic accidents would have a significant social impact and are likely to affect members of the public like children, women, the disabled, elderly people, livestock etc.	Medium= 6
Duration of Impact	The construction phase period is a total of 1 year	1=short term 1-5 years
Extent of Impact	The extent of this impact will be local/ village setting	2= Local and village setting
VEC Sensitivity	The sensitive receptors are people, commercial vehicles, livestock, and children among others. The contractor will ensure there are signage put in place to avoid any accidents	High = 4
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 13**	**Moderate**

Impact mitigation measures

- The contractor should develop and implement a robust traffic management plan;
- Best transport safety practices should be adopted with the goal of preventing traffic accidents and minimizing injuries suffered by project personnel and the public by: employing safe traffic control measures, including road signs and flagmen/traffic guides to warn of dangerous conditions and children crossings; and setting speed limits on all access roads in the project area will be 30km/h for light vehicles and 20km/h for heavy vehicles.
- All workers, including sub-contractors and casual labour, will undergo an environmental, health and safety induction before commencing work on site. This will include a full briefing on site safety and rules.
- The affected communities will be informed of the timing and duration of the construction activities across access roads and any uncertainties or potential for change and also sensitized on the dangers of construction sites and the need to keep away.
- Identifying optimum routes from pipe storage areas to the ROW to avoid sensitive receptors such as schools and hospitals, wherever possible and putting in place journey management plans.
- Restrictions on hours of driving (including night time restrictions where sensitive receptors may be affected) and timing of vehicle movements to avoid busy periods in urban areas, particularly the start and end of school and the working day
- Control over routes used by vehicles to avoid construction traffic using inappropriate roads and other road users gaining access to the pipeline spread and access roads.
- Ensuring adequate vehicle maintenance to ensure that vehicles do not produce significant emissions and that all safety features including brakes, lights etc. are in good condition.
- Any traffic diversions should be communicated in time, with clear signage
- Ensure that diversion or detours should be adequately maintained;
- Hire, train and deploy traffic flag persons to guide traffic

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Medium= 6	1=short term 1year	2= Local and village setting	High= 4	13	Moderate

After Mitigation	Small =4	1=short term 1year	2= Local and village setting	High= 4	11	Minor

Residual mitigation measure

- Ensure regular training of the workers on safety at the construction site.
- Ensure that there is a financial reserve to compensate or treat those injured during construction works.

6.3.13 Social Misdemeanor by Construction Workers

Evaluation Aspect	Impact description	Score
Magnitude of Impact	While most workers may originate from the local community where they have families, there might be others from distant places working away from their families. With some disposable income to spend, this might induce illicit sexual relationships, with the attendant risk of the spread of HIV/AIDS. Irresponsible sexual relationships in project communities can break families and heighten the risk of contracting HIV/AIDS. In addition, a Code of Conduct for workers must also be signed by each project worker, and adhered to by the contractors. It ought to be translated into predominant local language of the workforce. Labour influx in the project community is likely to increase HIV/AIDS due sexual relations between project workers and the local community; workers taking advantage of young girls in the community due to high poverty levels and vulnerability, teenage pregnancies and dropping out of school etc. Violence Against Children (VAC) such as potential use of child labour; sexual relationship with underage children, teenage pregnancies, school drop outs etc. Conflict in the community/families (social cohesion and disruption) due to project workers engaging in sexual relationships with married women in the community etc. is also anticipated.	Medium= 6
Duration of Impact	The construction phase period is a total of 1 year	1=short term 1-5 years
Extent of Impact	The extent of this impact will be local/ village setting	2= Local and village setting
VEC Sensitivity	The sensitive receptors are people in the project area and families. Illicit sexual relationships can be short-term but have long-term and irreversible effects however, the contractor will implement a code of conduct for his workers to ensure that they are educated about not breaking up families	Very High = 5
Impact Significance = magnitude + extent + duration + VEC sensitivity	**Rating = 14**	**Moderate**

Impact mitigation measures

- As a contractual obligation, contractors shall be required to have an HIV/AIDS policy and a framework (responsible staff, action plan, etc.) to implement during project execution.
- A sensitization programme for the would-be affected local communities will be conducted prior to commencement of and during the project implementation and the following issues should be included i.e. HIV/AIDS, VAC, GRM in place and conflict management.
- A code of conduct (appropriate to behaviors in workplace and with respect to relations with local community) will be developed and approved by MWE, which will be signed by all workers on the project.
- Local workers will preferentially be employed, paid directly through their banks and access to bars by workers from outside the project area in the local communities controlled.

- All construction workers shall be orientated and sensitized about responsible sexual behaviour in project communities.

Mitigation Level	**Magnitude of Impact**	**Duration of Impact**	**Extent of Impact**	**VEC Sensitivity**	**Rating**	**Significance**
Before Mitigation	Medium= 6	1=short term 1year	2= Local and village setting	Very High= 5	14	Moderate
After Mitigation	Small = 4	1=short term 1year	2= Local and village setting	High= 4	11	Minor

Residual mitigation measure

- Conduct counselling and therapy for the affected families for restoration and reconciliation.

6.3.14 Violation of children's rights by Contractor and labour force on site

Evaluation Aspect	**Impact description**	**Score**
Magnitude of Impact	The proposed 6.7 km pipeline traverse areas with settlements and schools. During its trenching, it is expected that a number of people will move to the project area as part of project workers as well as those seeking employment, and this may increase assault and sexual abuse of children. During the construction phase, the project might cause violation of child rights and abuse by the contractor's workforce. The project may also risk the employment of children to work in the project either by the contractor or its sub-contractors.	Large = 8
Duration of Impact	The construction phase period is a total of 1 year	1= Transient: <1 year
Extent of Impact	Considering the current economic situation in the country, the impact could extend beyond the local communities to the district level where children could be attracted from outside the town council to work on project sites.	3=District/Region
VEC Sensitivity	The water supply systems are located within the town centre which has a collection of children. More so, young boys and girls may choose to drop out of school to seek employment on the project directly or indirectly. It is also likely that workers associated with the project will engage in sexual relationships with school and under aged children. Sexually abused children may suffer complications that can last their times, including contracting diseases, and child pregnancies. Children may be tempted to drop out of school to work on the project and earn some money	Very high = 5
Impact Significance = magnitude + extent + duration + VEC sensitivity		**Rating= 18** **Moderate**

Impact mitigation measures

- Develop and implement Children Protection Strategy that will ensure minors are protected against negative impacts associated with the project.
- The contractor should ensure to have a strict policy on child labour to ensure that no children (under 18) are employed on the project
- All staff of the contractor must sign a code of conduct, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior;
- Children under the age of 18 years shall not be hired on-site as provided by Employment Act
- Ensure that the HR office monitors the workforce with respect to child labour.

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Large=8	1= Transient: <1 year	3=District/Region	Very high= 5	18	Moderate
After Mitigation	Medium =6	1= Transient: <1 year	3=District/Region	High= 4	15	Moderate

Residual mitigation measure

- Counsel all children whose rights have been violated and encourage them to go back to school and build their future
- The contractor shall engage with Uganda Police (Family Protection Unit) and District Probation Offices to ensure that workers and communities are sensitized about child protection issues
- Cases of abuse should be reported to the police for investigation and prosecution
- The contractor will be required to collaborate with communities to provide information regarding child abuse incidences.

6.3.15 Impact on air quality

Evaluation Aspect	Impact description	Score
Magnitude of Impact	During the construction phase, Suspended Particulate Matter (dust) is expected to be the main pollutant associated with earthwork activities and material handling, e.g., Excavating, haulage, tipping and stockpiling, leveling, and landscaping, other vehicle movements especially during the dry season. Exposed road surfaces during the dry season can generate a lot of dust that will add to the air pollution loading. Other sources of air pollution will be vehicular emissions (CO, NOx, SOx and PM) from construction equipment. The key sources of air emissions include generators, vehicular movement on unpaved surfaces (dust). The emissions include particulate matter as well as gases. The construction activities will typically involve dumper trips every day for the transportation of construction materials. However, these emissions are envisioned to be minimal since material delivery will be scheduled, trench excavation is manually and areas to be cleared are minimal.	Medium = 6
Duration of Impact	The construction phase period is a total of 1 year	1= Transient: <1 year
Extent of Impact	Dust emissions often vary substantially from day to day, depending on the level of activity, the specific operations, and the prevailing meteorological conditions. The impact of dust nuisance will be confined within the project boundary and restricted to the construction phase. Dust will inevitably occur at and inside the construction site and will also be generated alongside the haul routes from the other village access routes as materials are brought to the site.	2= Local/Village setting/ Entire Project Affected Communities
VEC Sensitivity	The sensitive receptors include residential establishments along the project roads, schools, health centers and worship centers located along the alignment. Commercial establishments along the roads will equally be affected by dust especially those selling foodstuffs and clothing that can easily be stained by dust and in turn lose sale value. Being that the proposed water supply system will be located in Bugolomwa town council, a busy commercial centre, dust will be a major concern if not well mitigated. Generally, particulates levels conformed to the draft national limit of 300	Very High = 5

Evaluation Aspect	Impact description	Score
	µg/m^3, inferring a clean environment with respect to air quality (Section 5.1.2). At all locations where measurements were made, in Bugomolwa gas monitoring equipment did not detect CO, NO, NO_2, Cl_2, ClO_2, H_2S and combustible gases. These measurements indicate a generally pristine environment with respect to air quality, hence receptors are not exposed to this impact as of yet. Fugitive dust released during above activity may cause immediate effect on construction workers, inhabitant around the road alignment especially those residing in downward wind direction. Settlements and social amenities close to the project roads e.g., schools, health centers. Methane and Volatile Organic Carbons had readings less than the detection limit at 0 ppm as the minimum level for this equipment. The particulate matter assessment results (PM 10, PM 2.5, and TSP) were all within required limits set out in the East African Air quality standards and the World Bank EHS guidelines Dust is a challenge both to humans and vegetation; in plants, exposure to dust, even in low quantities, affects plant and fruit growth, in construction, dust can cause damage to equipment by increasing abrasion of moving parts in equipment and clogging of air filters. To humans, it can be irritating to eyes and worsen health conditions of people with respiratory illnesses. Dust can cause financial loss to business owners along the roads by staining commodities, among other effects. Dust can lead to impairment of the biological function of plants and animals through smothering or other means. Whether dust deposition becomes a nuisance is subjective. It depends on a variety of factors including the sensitivity of nearby locations, the frequency of any deposit occurring and the nature of the dust. Owing to this subjectivity, there are no statutory limits or widely used standards for dust deposition	
Impact Significance = magnitude + extent + duration + VEC sensitivity		**Rating= 14**	**Moderate**

Impact mitigation measures

- The contractor should undertake regular sprinkling of water on access roads used for material haulage to suppress dust
- Cover all material stockpiles with tarpaulins or other such suitable covering to prevent material from becoming airborne.
- The contractor shall institute measures to control emission of gases from vehicles and equipment, this can be done by frequent and timely servicing of these vehicles
- All trucks used for transporting materials to and from the site should be covered with tarpaulins, or other acceptable type covers (which will be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s).
- Provide PPEs such as nose masks to the workers on the construction site
- Ensure that all project equipment is serviced on a regular basis
- Enforce vehicle speed restrictions
- The engines whether for trucks or other plant/equipment should be well maintained in an efficient form to reduce on gaseous emissions

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance

Before Mitigation	Medium = 6	1= Transient: <1 year	2= Local/Village setting/ Entire Project Affected Communities	Very High= 5	14	Moderate
After Mitigation	Small = 2	1= Transient: <1 year	2= Local and village setting	Moderate=3	8	Minor

Residual mitigation measure

- The contractor shall undertake continuous awareness creation to the public regarding the scheduled works to minimize submission of complaints from the public

6.3.16 Gender inequalities and gender-based violence at the workplace and in communities

Evaluation Aspect	Impact description	Score
Magnitude of Impact	Gender inequality is expected during the construction phase and may occur through discrimination against women during recruitment, unequal distribution of work, unequal pay for women, lack of provision of separate facilities for women, among others. Sexual harassment against women might also happen as a result of mixing of women and men at the construction site. In the community, this may refer to GBV-related risks incurred as a result of projects creating changes in the communities in which they operate and causing shifts in power dynamics between community members and within households. Male jealousy, a key driver of GBV, can be triggered by labor influx on a project when workers are believed to be interacting with community women with the fear that it could exacerbate the risk of family breakdown. Also men employed on the project may engage in extra marital affairs as a result of accumulating disposable income from the project.	Large = 8
Duration of Impact	The construction phase period is a total of 1 year	1= Transient: <1 year
Extent of Impact	Women and girls in the project community area	2= Local/Village setting/ Entire PACs
VEC Sensitivity	Within the project community, women who may gain employment through the project, gender stereotyping may affect their self-esteem and performance and may prefer to stay out of employment not because they lack skills but due to gender harassment. For men, high disposable income especially for males increases the predisposition to extramarital affairs, completely abandoning their families and resulting in single mothers. Some husbands reportedly become unruly and abuse their wives because they feel they can access any woman of their choice. The affairs may involve both married and un-married male and females and sometimes young females below the age of consent and may lead to high level of family conflict, family break-ups and physical violence among others. Consequences of family breakages, sexual assault and associated sexually transmitted diseases can lead to long term effects	Very high = 5
Impact Significance = magnitude + extent + duration + VEC sensitivity		**Rating= 16** **Moderate**

Impact mitigation measures

- The contractor will implement the worker's code of conduct (attached to the GBV Action Plan) as stipulated in the worker's employment contract.
- Provide gender sensitive sanitary facilities (toilets and bath shelters) for use by workers.
- All workers will be oriented and sensitized about sexual behaviours that are likely to happen within the proposed project area.
- The contractor will conduct sensitization of the communities around the proposed project.
- Recruit a Social Development Officer/ Sociologist to ensure compliance with Gender and equity requirements under the contract
- Sensitization to both contractors and communities on gender-related issues for example, during construction, gender-sensitive messages should be adopted (examples include "Go Slow, Road Works in Progress" as opposed to "Men at Work"
- Workplace environment including tools and fixtures should be gender friendly.

Mitigation Level	**Magnitude of Impact**	**Duration of Impact**	**Extent of Impact**	**VEC Sensitivity**	**Rating**	**Significance**
Before Mitigation	Large= 8	1= Transient: <1 year	1= Site boundaries / Individuals in the potentially affected communities	Very High= 5	16	Moderate
After Mitigation	Small = 4	1= Transient: <1 year	1= Site boundaries / Individuals in the potentially affected communities	High = 4	10	Minor

Residual mitigation measure

- Conduct counselling for all the affected parties in an attempt to restore lives and families as a whole.

6.4 Negative Impacts during the Operation Phase

6.4.1 Water quality and pollution

Evaluation Aspect	**Impact description**	**Score**
Magnitude of Impact	Generally, for all sampled locations, in-situ water quality was substantially conforming to the standards. The quality of water recommended is that which is physically, chemically and bacteriologically safe for human consumption. When not thoroughly treated, water could be a source of water-related diseases which could affect the whole project communities, thereby causing an epidemic in the area. Transmission of water can also result in pollution entering the boreholes. Also during repairs of the water system, it may be prone to contamination.	Small = 2
Duration of Impact	The project is estimated to operate and serve the community for at least 5 to 15 years	3= medium-term: 6–15 years

Evaluation Aspect	Impact description	Score
Extent of Impact	The impact will mainly occur at the community level	2= Local/Village setting/
VEC Sensitivity	VEC: The community members, animals	Very high = 5
	Pollution of water could cause very detrimental effects on both people and their animals if not properly handled could result in an epidemic and death. However, the developer intends to regularly treat all the water before it is distributed.	
Impact Significance = magnitude + extent + duration + VEC sensitivity		**Rating= 17** **Moderate**

Impact mitigation Measures

- The borehole should be covered and sealed so that dirt, water, sand and other debris cannot fall in. Transmission and distribution pipes should also be covered underground to reduce exposure.
- The water source should be fenced off to reduce on going agricultural activities around the borehole to avoid pollution entering it especially when it rains heavily
- The borehole's raised concrete apron around base should be cleaned all time to prevent dirty water from seeping back into the hole.
- Conduct regular water quality tests and analysis for raw water to inform the treatment options.
- Prepare and implement a water source protection plan (WSPP).

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Small = 2	3= medium-term: 6–15 years	2= Local/Village setting	Very High= 5	17	Moderate
After Mitigation	Negligible = 1	3= medium-term: 6–15 years	2= Local/Village setting	High = 4	10	Minor

Residual mitigation measure

- Ensure that a water source protection plan is implemented
- Ensure that quarterly monitoring reports for all the water abstraction points are done and submitted to DWRM

6.4.2 Water quantity and yield

Evaluation Aspect	Impact description	Score
Magnitude of Impact	This could be due to declining groundwater recharge and over-pumping. The project sites are prone to suffering from rapid land use change (deforestation, soil erosion, etc.) thus the recharge of the groundwater supplying the boreholes may be affected in the long run. However, hydrological study of boreholes to determine water table depths, borehole yields and local use of groundwater have been undertaken during project feasibility and portray a good yield	Medium = 6

Evaluation Aspect	Impact description	Score
Duration of Impact	The project is estimated to operate and serve the community for at least 5 to 15 years	3= medium-term: 6–15 years
Extent of Impact	The impact will mainly occur at the community level among the communities and the district as a whole	3=District/Region/habitant of regional importance
VEC Sensitivity	VEC: The community members, animals.	Very High = 5
	Primary data indicates that the most common water source in the area are community boreholes at 97.9% and protected wells at 2.1%. Of which most Boreholes in the project area are not functional (Table 5-9). Depletion of the water could pose serious issues for the communities which could lead to hunger, and the death of animals and people.	
Impact Significance = magnitude + extent + duration + VEC sensitivity		**Rating= 17** **Moderate**

Mitigation / Enhancement Measures

- Get involved with catchment management planning that could improve land management and restore groundwater recharge.
- Encourage contour ploughing, mulching and other agricultural practices that increase soil water retention and percolation into the underlying aquifer.
- Reduce the amount of water being taken – if demand in the area is growing then look at developing new water sources.
- Keeping records of how much is being pumped (either volumes or number of hours for which the pump is being used per day). Find out if sudden drops in level correspond to pumping activity.
- Prepare a water source protection plan

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Medium = 6	3= medium-term: 6–15 years	3=District/Region/habitant of regional importance	Very High= 5	17	Moderate
After Mitigation	Small = 4	3= medium-term: 6–15 years	3=District/Region/habitant of regional importance	High = 4	14	Moderate

Residual mitigation measure

- Keeping records of how much is being pumped (either volumes or number of hours for which the pump is being used per day). Find out if sudden drops in level correspond to pumping activity.
- Prepare a water source protection plan

6.4.3 Water supply system failure

Evaluation Aspect	Impact description	Score

Evaluation Aspect	Impact description	Score
Magnitude of Impact	Insufficient cost/funding for operation and maintenance would lead to poor maintenance of the system which eventually could lead to frequent breakdowns of the water supply system and consequent shutdown, which further could require major and costly rehabilitation. Other sources of failure in the water system could be due to sabotage (possibly by the water vendors who envisage loss of livelihoods), illegal connections which could result in decreased water pressure, and vandalism (theft of water system parts).	Very large = 10
Duration of Impact	The project is estimated to operate and serve the community for at least 5 to 15 years	3= medium-term: 6–15 years
Extent of Impact	The impact will mainly occur at the community level	2= Local/Village setting
VEC Sensitivity	VEC: The community members, animals. water supply system Primary data indicates that the most common water source in the area are community boreholes at 97.9% and protected wells at 2.1%. Of which most Boreholes in the project area are not functional (Table 5-9). The system failure could result in the pollution of the water source and scarcity of water which could lead to other unpredicted impacts like lack of food	Very High = 5
Impact Significance = magnitude + extent + duration + VEC sensitivity		**Rating= 20** **Major**

Impact mitigation / Enhancement Measures

- Payment for water supply services is the only way to keep the service running continuously and therefore tariffs would be designed to ensure financial viability. Cost recovery would be achieved through service fee payments.
- Sensitization and awareness about the dangers of vandalizing the water supply system facilities should be done especially by the local leaders and the developer (MWE/DWD).
- Legal and applicable punitive measures like arrests and prosecution should be taken to those caught vandalizing the water system facilities in order to curtail and to serve as an example to those who would want to engage themselves in such acts.
- Put in place a water user committee to oversee the operations of the water system.
- Fence off the areas like water abstraction points, pump houses, water storage reservoir tanks and other water supply structures like the community tap stands to mitigate trespass and sabotage.
- Employ a security guard at the facility to ensure there is no unauthorized entry.

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Very large = 10	3= medium-term: 6–15 years	2= Local/ Village setting	Very High= 5	20	Major
After Mitigation	Small = 4	3= medium-term: 6–15 years	2= Local/ Village setting	High = 4	13	Moderate

Residual mitigation impact

- The developer should hire services of security guards to monitor and guard the water supply system facilities.

6.4.4 Loss of water due to the accidental cutting of pipes

Evaluation Aspect	Impact description	Score
Magnitude of Impact	Digging and construction of water facilities within close vicinity/on the water transmission network could result in pollution and loss of water.	Medium = 6
Duration of Impact	The project is estimated to operate and serve the community for at least 5 to 15 years	3= medium-term: 6–15 years
Extent of Impact	The impact will mainly occur at the community level	2= Local/Village setting
VEC Sensitivity	VEC: The community members, animals	High = 4
	Cutting of pipes could lead to loss of water and contamination of the source points which may lead to communicable diseases like diarrhoea, dysentery among others	
Impact Significance = magnitude + extent + duration + VEC sensitivity		**Rating= 15** **Moderate**

Impact mitigation / Enhancement Measures

- Sensitization and awareness about the dangers of vandalizing the water supply system facilities should be done especially by the local leaders and the developer (MWE/DWD).
- The developer should fence off all the premises of the different project components like the pumping stations, reservoir sites and any other erected structures.
- Put in place a water user committee to oversee the operations of the water system.

Mitigation Level	Magnitude of Impact	Duration of Impact	Extent of Impact	VEC Sensitivity	Rating	Significance
Before Mitigation	Medium =6	3= medium-term: 6–15 years	3=District/Region/habitant of regional importance	High= 4	16	Moderate
After Mitigation	Small =4	3= medium-term: 6–15 years	3=District/Region/habitant of regional importance	Moderate = 3	13	Moderate

Residual mitigation measure

- Refresher training of water source committee to oversee the operations of the water system.
- Enforce tariffs on the water so that there's a fund for quickly fixing any failures with the water supply system.

6.4.5 Environmental Impacts of Decommissioning

Evaluation Aspect	Impact description	Score
Magnitude of Impact	After the water system infrastructure has attained its lifetime, it will either be rehabilitated or decommissioned to return the affected area to a natural environment like that which would have existed prior to construction. However, some of the structures/facilities may still have other beneficial uses such as run-off control, recreation, and water supply among others. Therefore, prior to destroying the structure, it is crucial to know whether the structure can be reused through the refurbishment of the structures and equipment. Decommissioning of the water system can have a negative impact on the environment of the area from the release of built-up sediments into the neighboring ecosystems. There will be changes in the quality of the seasonal swamp (physical and chemical characteristics). These will include: ▪ *Changes to aquatic ecology:* The smaller animals like the macro–invertebrate's population distributions would be affected especially during the rainy season, as their digestions would become slower leading to unfavorable conditions for reproduction. When the levels of suspended solids are in excess, the non–organic sediment loading increases where the sediment particles are ingested and become hard to digest. ▪ *Pollution:* Decommissioning will lead to a temporary increase in noise and vibration as well as air pollution due to emissions of dust. The removal of concrete and similar non-recyclable construction materials may cause land degradation. ▪ *Socioeconomic impacts:* Removal of structure may impact the socioeconomic conditions such as loss of employment thus reducing livelihoods and damage to land use.	Small =4
Duration of Impact	The project is estimated to operate and serve the community for at least 5 to 15 years. But decommissioning will be for a week	1= transient <1 year
Extent of Impact	The impact will mainly affect the immediate site boundary neighbors.	1= Site boundaries / Individuals in the potentially affected communities
VEC Sensitivity	VEC: Neighbors to the proposed site Decommissioning will be done in line with the ESMP to avoid any detrimental effects from the whole process.	Moderate
Impact Significance = magnitude + extent + duration + VEC sensitivity		**Rating= 9** **Minor**

Impact mitigation Measures-Ref to Table 6-1(next page)

The water system infrastructure can always be rehabilitated from time to time and might not necessarily have a life span and with the passage of time social and environmental scenario will change. Therefore, the decommissioning plan discussed above cannot be framed in the present scenario; however, the various migratory measures should meet the following requirement in addition to decommissioning plan to be developed before decommissioning:

- Decommissioning will be undertaken in accordance with the legislation prevailing at that time, in liaison with the relevant regulatory authorities and adhere to the health and safety guidelines to ensure that the decommissioned facilities do not deteriorate to the point where they become a hazard to the public or the environment.
- Safe disposal of waste and concrete and similar non-recyclable construction materials, restoration of all disturbed sites to per-construction conditions through bioengineering measures.

Mitigation Level	**Magnitude of Impact**	**Duration of Impact**	**Extent of Impact**	**VEC Sensitivity**	**Rating**	**Significance**
Before Mitigation	Small =4	1= Transient: <1 year	1= Site boundaries / Individuals in the potentially affected communities	Moderate =3	9	Minor
After Mitigation	Negligible =2	1= Transient: <1 year	1= Site boundaries / Individuals in the potentially affected communities	Low= 2	6	Negligible

Residual mitigation measure

- Safe disposal of waste and concrete and similar non-recyclable construction materials, restoration of all disturbed sites to pre-construction conditions through bioengineering measures.

Table 6-1: Decommissioning Phase Adverse Impacts

Environmental Component	Potential Environmental Impact	Potential Mitigation Measure
Surface Water Quality	Pollution of water bodies from erosion of unconsolidated materials, contaminated soil, wastes (solid and liquid), etc. As a result of demolition activities.	▪Rehabilitate all areas e.g. grass/tree planting. ▪Take samples of the runoff water into the receiving water body nearby and ensure free pollution. ▪Remove all contaminated soil identified and dispose of it in an approved site. ▪Close any waste disposal facility on site and make provision for drainage in such a way as to prevent future pollution.
Flora	Disturbance or loss of plant species or communities (terrestrial, aquatic) due to dust fall-out onto leaves and soil, dump erosion.	▪Rehabilitate or stabilize all cleared areas using indigenous vegetation until handover of the site.
Fauna	Disturbance or loss of animal species/communities and their habitat due to the lack of rehabilitation etc.	▪Rehabilitate or stabilize all cleared areas using indigenous vegetation where possible.
Soils	Re-use of soils in rehabilitation and re-instatement of pre-project capability.	▪Replace subsoil and overburden first and then cover with saved topsoil. Do not use heavy equipment to replace topsoil because this can cause compaction.
	Soil erosion from denuded areas and demolition activities.	▪Maintain erosion protection works. ▪Rehabilitate or stabilize all disturbed areas.
Topography	Reinstate the topographic profile.	▪Backfill, contour and landscape.
Air quality	Dust from un-rehabilitated sites and demolition activities.	▪Avoid dusty activities e.g. loading and dumping on windy days & monitor dust emissions.
	Odours from waste dump.	▪Avoid activities that can lead to pilling of wastes in the project area. ▪Dispose of all the wastes in gazetted sites
Noise and vibration	Noise generated by demolition equipment and earth moving equipment	▪Prescribe noise reduction measures if appropriate e.g. restricted working and transport hours and noise buffering.
Health and safety	Risk of accidents and ill health as a result of the project	▪Fence all unsafe and dangerous areas & monitor environmental health (air quality, water quality).
Aesthetic and amenity values	Improvement of the visual impact of the site on scenic views.	▪Rehabilitate with trees, grass and shrubs where possible. ▪Consult with the local community and tourist industry.

Note:

- Mitigation measures were designed to avoid, reduce, mitigate, or compensate for adverse environmental and social impacts and inform the Environmental and Social Management Plan (ESMP).
- Closure and decommissioning of the project were identified as a key issue. An environmental management plan is developed during the assessment, and it prescribes procedures for closure and post-operation to ensure that the environment is restored as much as possible to its original state.

7 ANALYSIS OF PROJECT ALTERNATIVES

This section provides an overview of the location and design alternatives that have been considered as part of project planning. The current description of the Project as provided above (Chapter 2) is the result of examining various alternatives, aimed at developing a Project that is both technically and financially feasible, and which minimizes environmental and social impacts to as low as reasonably practicable.

7.1 "No Project" Option

The "no project option" alternative here means that the status quo of the area is maintained and that the proposed project would not be undertaken. This scenario is neither a tenable nor beneficial alternative because sustainable safe water supply is required to support socioeconomic development within Bugomolwa and the surrounding areas. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions but cannot be a means to achieving the objectives of the proposed project of supplementing the water supply, bring water closer to population concentrations and improving the livelihood of the community.

7.2 The Action Option

a) Siting

The proposed project area that is, Bugomolwa Nkandwa sub county access to safe water in is as low as 12%. Kyankwanzi as district has 675 domestic water points which serve a total of 153,020 people – 133,966 in rural areas. 80 water points have been non-functional for over 5 years and are considered abandoned. Kyankwanzi has 1 piped scheme this project therefore is very necessary for the project area and therefore negative impacts shall be mitigated with the utmost importance so as to ensure project sustainability.

The access rate in Nkandwa Sub County was the second lowest (12%) implying many communities are left with without sources of safe water. The majority of the population travel significantly long distances to the water source since the functional deep bore holes have little yield that sometimes they are left to recover thus making long ques at such sources and the fact that the majority of the population are cattle keepers, the few private valley tanks that are sank by individuals are shared by animals and people. This therefore made it feasible to construct a piped water supply system in this RGC to provide relief to the fast-growing centre.

b) Source selection

Information collected from the Directorate of Water Resources Management shows that there has been significant development of groundwater in the Bugomolwa area including deep and shallow boreholes. However, all these boreholes have yields of 5 m^3/hr, making them insufficient to meet the demand of 205.5m^3/day by 2042 or even 102.1m^3/day by 2032 of a wider area in the Bugomolwa area. The source that was selected therefore of 24m^3/hr in Kiyinibi village will be able to supply the surrounding villages of Bugomolwa B.

7.3 Alternative Water Sources

7.3.1 Surface water

While carrying out a reconnaissance survey of the project area, it was found that no surface water source existed in the vicinity, which could be considered for planning a feasible water supply

option. Therefore, no surface water source was taken into consideration for project planning and implementation.

7.3.2 Ground water

It was informed by the MWE that the project area has some already installed production wells, which could be considered as a source for the project. One production well already installed at village Kiyinikibi during the year 2018 was found to be suitable for using as reliable source for this scheme. Thus, this production well has been proposed as the source for this project and its details are given below: Location, Discharge and Water Quality of installed Production well in Bugomolwa Trading Centre

S.No.	Parish	Name of Place	DWD No.	Location coordinates	Yield	Quality of water
1	Bugomolwa	Kiyinikibi	53781	0°56'28.03"N & 31°38'53.48"E	24 m^3/hr	Potable

7.3.3 Rainwater harvesting

Rainwater harvesting is done by the institutions like schools, markets and the health centers within the project area and this water source is only reliable during the rainy season. Queuing was observed in some of the boreholes, and the environmental condition around the water facilities were generally poor as some are shared with animals.

7.3.4 Environmental and Social Considerations

The potential impact of the water supply scheme infrastructure on the landscape and ecology were considered, this was mainly from the field studies. These factors have been subsequently addressed within the interactive process of environmental assessment and the findings presented in this ESIA report.

- **Noise and proximity of housing:** The proposed water system infrastructures were judged to lie distant from homesteads and settlements but within the commercial centre of the project area; that adequate separation distances could be achieved to avoid noise nuisance during both the construction and operation phase given the nature of the development. Construction activities for the water system should be carefully controlled. In addition, apart from the vehicle movements, the noise in this kind of project is minimal.
- **Land ownership:** The local landlords including the Sub County officials are willing to be involved to donate or be involved in land acquisition process for the required pieces of land for the construction of the proposed project components and therefore, the Sub County and district officials should engage the local land lords to willingly offer the required land. The transmission lines will pass along road reserves but where peoples land will be affected, local leaders and the local communities have been engaged. Resettlement Action plan (RAP) shall be conducted for survey, valuation and subsequent compensation for those whose property will be affected during the construction especially the transmission lines and for some of the water infrastructures. However, there are no resettlement and displacement issues anticipated.
- **Community Opinion:** Water supply systems elsewhere in Uganda have not attracted local concern and resentment among the local residents. Likewise, in the case of the Bugomolwa

RGC Water Supply and sanitation System, the development would not have much significant negative impact on the dwelling and settlements. The communities consulted welcomed the proposed project.

7.3.5 Technical and Design Considerations

There is a wide range of construction and furnishing materials which can be sourced locally for example sand, aggregates, bricks, etc. During construction, certified equipment and modern technology e.g. Water pipes, Storage Reservoirs, metal bars and fittings that meet the Uganda National Bureau of Standards (UNBS) requirements. Implementing the Water Supply System according to approved designs will be a priority as it will lead to the provision of improved quality and quantity of water supplied, reduced morbidity and increased productivity of households; and increased enrolment of children in educational institutions, better livelihood opportunities and induced development and employment opportunities. Therefore, it will be paramount that MWE/DWD and the Operator ensure that the Water Scheme has the following in place:

- An area of at least 50m x 50 is recommended for fencing in order to prevent contamination of the source and for the safety of hydraulic structures and installations for each of the intakes.
- Well-designed drainage system at the Water offices and around the borehole
- Consideration of noise and traffic generated by the trucks to and from the site during the construction, solid waste management itself at the site both during construction and operation (especially at the offices premises)
- Security mechanisms including fire safety mechanisms and security guard at all the water infrastructure facilities
- Well-designed access route from the main road

Conclusion

From the above analysis, “no project option,” which means that the status quo of relying on the hand pump water source is certainly not a guarantee of sound environment management at the site. Consequently, the most important issue is the implementation of the predicted mitigation measures (ESMMP) in addition to adoption of sound construction and operation practices. This will lessen or prevent the anticipated negative effects and at the same time reap the social and economic benefits associated with operation of the project as indicated in the brief.

8 STAKEHOLDERS CONSULTATIONS

This section describes the stakeholder's inputs in the project as a means of ensuring that they are free to participate and fully understand the ongoing project in their area. It documents the views of the stakeholders and informs project implementer's interests and concern of stakeholders.

The International Association for Public Participation defines 'public participation' as a means to involve those who are affected by a decision in the decision-making process. It promotes sustainable decisions by providing participants with the information they need to be involved in a meaningful way, and it communicates to participants how their input affects the decision. This chapter describes the process of the public consultation. Views from stakeholders, local authorities and communities were sought through meetings. The feedback from these consultations has been taken into account when preparing this report. A stakeholder is anybody who can affect or is affected by a project, policy, program, plan or an organization. Stakeholder identification was based on issues related to the project scope of works, relevance and influence of the stakeholders and administrative and traditional setting of the project area. Stakeholders consulted included the district and Sub county leadership, local leaders and the community.

8.1 Objectives of stakeholder consultations

The broad objective of the stakeholder engagement process was to provide the local authorities, interested parties and the communities likely to be affected by the project an opportunity to air out their views, concerns, and opportunities as regards the proposed project and to consequently address their concerns.

The specific objectives of the exercise included the following:

- To provide information about the project and to tap stakeholder information on key environmental and social baseline information in the project areas;
- To provide opportunities to stakeholders to discuss their views, opinions, suggestions and concerns about the project and its environmental and social impacts. To manage expectations and misconceptions regarding the project;
- To create an enabling environment through which the project will smoothly be implemented and operate.

8.2 Stakeholder identification and Analysis

Stakeholder Identification

A stakeholder may be defined as 'any individual or group who is potentially affected by the project or can themselves affect the project. 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. The study targeted individuals, groups/institutions and communities that have a stake in the proposed water project. Thus, only such entities as identified in the stakeholder analysis were selected to participate in the consultation process.

The following aspects were considered when identifying and prioritizing stakeholders for this ESIA:

(i) Who could be adversely affected by environmental and social impacts?
(ii) Who are the most vulnerable among the potentially impacted, and are special engagement efforts necessary?
(iii) Which stakeholders can best assist with the early scoping of concerns and impacts?

(iv) Who strongly supports or opposes the changes that the project will bring and why?

(v) Who is it critical to engage with first, and why? (IFC 2007)

Stakeholder analysis and process

The stakeholder categories and subcategories identified are presented in table below Table 8-1:

Table 8-1 stakeholder analysis

Group	Stakeholder	Description and key attributes
Funder	World Bank	✓ To ensure that the Banks Safeguards Operational Policies have been observed and implemented as appropriate. ✓ Support the project with funding
National Level Stakeholders	Ministry of Lands Housing and Urban Development (MoLHUD)	✓ Approves all reports presented by the consultant regarding valuation
	Ministry of Gender, Labour and Social Development (MoGLSD)	✓ Protection of human rights and vulnerable social groups. ✓ Occupational and community health and safety of workers. ✓ Approval and monitoring of the social safeguards ✓ Approval of permits like workplace permits, OHS
	Ministry of Water and Environment (MWE)	✓ Overall mandate to monitor, assess and regulate water resource ✓ Monitor and guide the use of wetlands for sustainability and other water bodies within the project areas ✓ Approval of the Water abstraction permits ✓ The implementer of the Project ✓ Overseeing and monitoring the project activities
	NEMA	✓ Regulation of the environmental aspects of the project(s). ✓ Legally mandated to handle certain critical environmental issues ✓ Provide the necessary permits and approvals for quarries, borrow pits and other auxiliary sites ✓ Work closely with the project team to handle all matters related to environmental protection ✓ Overall clearance of ESIA and other project briefs about the project facilities. ✓ Monitor and supervise the ESIAs compliance
Local Governments	District (Kyankwanzi District Local Government)	✓ Mobilize various stakeholders including the communities/beneficiaries ✓ Monitoring and supervision support for the implementation of the projects. ✓ Offer security to the project team (RDCs Office) ✓ Review the ESIA and give comments (Environment Office)

Group	Stakeholder	Description and key attributes
	Nkandwa Sub County (Technical and political staff)	✓ Make decisions that may affect the project, ✓ Offer support and supervision of the project ✓ Help in the identification of the location of the water and sanitation facilities.
	Local Councils	✓ Mobilize communities ✓ Offer support in the planning, implementation and operation of the project ✓ Offer support in the identification of the locations of the water and sanitation facilities ✓ Monitoring of the projects ✓ Provide social justice to vulnerable communities ✓ Incorporate information about the project in their teachings, gatherings/meetings for acceptance especially regarding water and hygiene-related information.
Different Community groups,	Traders, landlords, tenants, business people, affected persons (Landowners who offered land for the facilities)	✓ Develop construction (works) schedules in their respective areas. ✓ Participate in the scheduled meeting regarding the project activities and progress ✓ Identify mitigation measures of the environmental and social issues ✓ Monitor the progress of the project activities ✓ Input in the planning and identification of water and sanitation facilities.

In order to manage overwhelming expectations of the stakeholders, it is important to understand who the stakeholders in project of concern are. This was the initial concern of the consultant in the piped water supply. A list of stakeholders was analyzed and those that need immediate consultation at this stage identified.

8.3 Methodology adopted for stakeholder engagement

Table 8-2: Preliminary identified stakeholders

Level	Preliminary identified stakeholder
National Level	Ministries, Authorities, Agencies
	NGOs,
Local Government level	Districts
	Sub counties
Community Level	Local councils, Religious leaders, Opinion leaders, CBOs

Table 8-3: Stakeholders engagement approach

Consultation approach	Techniques that will be used to conduct consultations, include; i. Individual interviews; ii. Local community meetings; and iii. Face-to-face meetings with district officials, government departments and ministries.

Dialogue approach	ECOS approach will be used to guide the scoping stakeholder discussion. That's is; ▪ E - Existing condition of the project area ▪ C - Challenges faced by the communities in the project area ▪ O- Opportunities that can be realised as a result of project implementation ▪ S - Stakeholders that should consulted or brought on board in relation to the project.

8.3.1 Methods used during consultations

Engagement methods	Description
i. Household/Questionnaire surveys 	Questionnaire survey also known as socio-economic survey or household (HH) survey is perceived to be a convenient method for collecting huge amounts of qualitative and quantitative data from the large number of respondents
ii. Key Informant Interviews (KIs) 	Interviews with key stakeholders will be conducted to obtain in-depth qualitative data with regard to the project impacts. KIs interviews will be held with officials from; relevant Government Ministries, Area Members of Parliament and Officials from the District Local Governments.
iii. Focus Group Discussions (FGD) 	FGD will be held with community members who will be directly impacted by the project components during all phases. .
iv. Semi-structured interviews 	This shall be mainly intended for key informants including the local council chairpersons or their representatives, district level personals including leadership and more importantly the line ministries.

Engagement methods	Description
v. Community Consultations 	Public consultations with local communities within the project area will be held to generate information for evidence based impacts and recommendations. Several community consultations will be held in each of the villages.

8.3.2 Stakeholder consultation Process

Level	Key issues to consider
Stakeholders identification 	Preliminary identification of stakeholders groups will start with investigating specific threat and opportunity factors and developing a list of key stakeholders associated with each. This will be based on the five (5) key questions below: ▪ Who are key players in development and implementation of the project? ▪ What key resources will be impacted? ▪ Who is most dependent on these resources? ▪ Which government sectors and Ministry Departments are involved? ▪ Which agencies license certain aspects of the project or are most knowledgeable about, and capable of dealing with project impacts or resources to be affected? Who is managing these resources? **Error! Reference source not found.**
Interests, influence & importance of stakeholders 	To assess influence and importance of each stakeholder and potential impact of the project upon each stakeholder, the six (6) key issues that will be investigated included: ▪ Who is directly responsible for decisions on issues important to the project? ▪ Who holds positions of responsibility in interested organizations? ▪ Who is influential in the project area (both thematic and geographic areas)? ▪ Who will be affected by the project? ▪ Who will promote/support the project, provided that they are involved? ▪ Who will obstruct/hinder the project if they are not involved?
Stakeholders engagement	Finally, the third step will be determining how to involve the different identified stakeholders. It is evident that different stakeholders will be engaged in different ways at the various stages of the project,

	from gathering and giving information, to consultation and dialogue. Relevant stakeholders will be identified through a stakeholder analysis exercise. During ESIA, stakeholder engagement will be guided by World Bank/IFC guidance note.

Table 8-4: Some concerns and issues raised during engagements

Description of stakeholder	Method of engagement (Title of individual Engaged)	Their Views and Concern	Consultant's Response
National stakeholders			
National Environment Management Authority (NEMA)	Method used: Key informant interviews through writing letters and conducting meetings with officials	▪ NEMA's approval of ToRs was issued with a number of conditions and recommendations to be observed or executed during the ESIA study. (See Appendix A)	All the conditions and recommendation have been used to guide this study
Ministry of Gender Labour and Social Development (Gender Department)	Method used : Key informant interviews through writing letters and conducting meetings with officials		
	Peace Ayesigwa (Gender Specialist)	▪ Health provision onsite, the contractor should provide gender sensitive toilets, adequate in accordance to the number of workers and provide for privacy. ▪ The contractor should ensure that women are also employed on the project. ▪ A gender violence plan should be implemented during project implementation	These have been addressed in **section 6** and **section 10**
MGLSD (Occupational Health and Safety Department)	Method used: Key informant interviews through writing letters and conducting meetings with officials		
	Sharifah Nakigozi (Occupational Hygienist)	▪ Appreciated that fact that the activities to be undertaken are broken down in the ESMPs, attached a cost and a person responsible for monitoring them and included in the BOQs because this ensures compliance and easy implementation of the environmental and social safeguards.	-
	Arinaitwe Dinah (DOSH official)	▪ The contractor should develop and implement	These have been addressed

		programs for training and sensitization of workers on occupational safety and health. ▪ Accident and incident records should be well kept at the construction camp/offices ▪ Any incident that renders a worker off site for 3 days should be reported to the commissioner Occupational safety and health department. ▪ The contractor should provide an eating area and also provide portable water for drinking to all workers. ▪ First aid facilities and a trained first aider should be put in place. ▪ The system of referral to the nearby clinic or hospital should be in place. ▪ Pre-medical assistance/examination for workers should be conducted ▪ There should be an HIV/AIDS policy and implementation of the measures to prevent spread of HIV/AIDS among workers and community.	in this study specifically **Section 6, 9 and 10**
Ministry of Local Government	**Method used**: Key informant interviews through writing letters and conducting meetings with officials		
	Banyenzaki Mayie (Principal inspector)	▪ The CDOs and DEOs are normally unable to fully be engaged in the monitoring and supervision of the projects because of budget constraints since environment and social issues are considered as cross cutting issues, therefore the costing of these should be done appropriately in the ESMP.	Noted and was addressed in the ESMP **(Section 9.6)**
	Nakalembe Angela (AST MoLG)	▪ Emphasized that during project implementation	Addressed in **Section 6** and

		the locals should be given priority for both skilled and unskilled employment on the project.	emphasized in S**ection 10**
	Kizito Simon (P1 MoLG)	▪ Design climate resilient structures especially for the drainages where often times we depended on historical data to design them and they get spoilt fast instead of designing them depending on new data or the nature of the environment they are in.	**Addressed in Section 6 and 9**
	Turyahabwe Daniel (SAS MoLG)	▪ Appreciated the fact that the activities to be undertaken are broken down in the ESMPs, attached a cost and a person responsible for monitoring them and included in the BOQs because this ensures compliance and easy implementation of the environmental and social safeguards.	-
Ministry of Water and Environment	**Method used:** Key informant interviews through writing letters and conducting meetings with officials	▪ MWE both as a client and as a stakeholder commissioned this study and has guided the study from start to finish	**(See Appendix I)**
Kyankwanzi District Officials			
Stakeholder	**Method of Engagement**	**Concerns or issues raised**	**Consultant's Response**
Natural Resources Officer	**Semi-structured interviews:** This was mainly intended for key informants including the local council chairpersons or their representatives, district level personals including leadership and more importantly the line ministries.	▪ The piped water supply should be evenly distributed to ensure the whole of project area gets the water	All the villages in the project scope will be considered for water taps
Deputy CAO	Semi-structured interviews: This was mainly intended for key informants including the local council chairpersons or their representatives, district level personals including leadership and	▪ Locals should be given labour opportunity during construction. ▪ There is a need to strategize how this can get to the common person elsewhere as well.	Included as one of the enhancement measures All the stakeholders with

	more importantly the line ministries.	▪ The consultant should aim at involving all stakeholders at all levels.	interest in the project have been engaged.
Lands officer	**Semi-structured interviews:** This was mainly intended for key informants including the local council chairpersons or their representatives, district level personals including leadership and more importantly the line ministries.	▪ Compensation should be done according to the district compensation rates. ▪ The component of compensation of the land owners should be stressed and the project should ensure that it is done before project commencement to avoid conflicts with the owners.	This is addressed in the RAP and valuation report Refer to the RAP and Valuation report
Water officer	**Semi-structured interviews:** This was mainly intended for key informants including the local council chairpersons or their representatives, district level personals including leadership and more importantly the line ministries.	▪ There is need to establish water management committees and finding means of sustaining them. Many are established but shortly die out due to no strategy to sustain them.	Consultant stressed this in the mitigation and enhancement measures (Section 6.2)
District Planner	**Semi-structured interviews:** This was mainly intended for key informants including the local council chairpersons or their representatives, district level personals including leadership and more importantly the line ministries.	▪ The study should include the fact that this Bugolomwa RGC is unplanned and therefore care should be taken to ensure the project does not get in the way of other future infrastructural developments.	Addressed in the Recommendations (Section 10)
Nkandwa sub county			
Stakeholder	**Method of Engagement**	**Concerns or issues raised**	**Consultant's Response**
Parish chief	**Method used:** Focussed Group discussions. FGD were held with community members who will be directly impacted by the project components during all phases	▪ The site should be fenced off to avoid vandalism of components. ▪ Communities should be sensitized especially regarding the corridor of the distribution line given the fact that there is no land compensation. ▪ The community should be engaged throughout the project cycle.	This has been addressed in the mitigation measures **(Section 6)**
Chairperson Kiyinikibi	**Method used:** Focussed Group discussions.	▪ The Ministry should help more in drilling other water sources across Sub County. Many other	Addressed in the Recommendations **(Section**

	FGD were held with community members who will be directly impacted by the project components during all phases	areas have the same problem hence the need of more water points ▪ Jobs that can be done by the locals should be given to them especially during construction. ▪ Water should be distributed evenly according to the settlement patterns.	**10)**
Chair Person Bugomolwa B	**Method used:** Focussed Group discussions. FGD were held with community members who will be directly impacted by the project components during all phases	▪ The ministry should help the community to form a more sustainable water user committee to solve any issues that arise during the operation of the water supply system. ▪ All Schools and religious centers especially the mosque need to be allocated water taps as they are the biggest users of the resource	Addressed in the Recommendations **(Section 10)**
The Community (Bugomolwa A, B and C Kiyinikibi, Kyanywa villages)	**Method used:** Community consultations Public consultations with local communities within the project area were held to generate information for evidence based impacts and recommendations. Several community consultations were held in each location of the project component (source and Reservoir).	▪ The Ministry should help more in other areas to ensure at least bigger coverage of Nkandwa is covered by clean water supply. ▪ Issues of domestic violence and sexual harassment associated with projects of such a nature should be guarded from the start of the project. ▪ Construction works should be done during dry seasons so that distraction of crops can be minimized.	Addressed in the Recommendations **(Section 10)** Gender based violence discussed in **section 6.3.16**

Some of the pictorial evidence of stakeholder engagements

Engagement with the CAO

Engagement with the Assistant Water officer

Engagement with the land officer

Engagement at Nkandwa Sub County

Engagement at the Reservoir site

Engagement at the source.

9 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

This environmental and social management & monitoring plan, ESMMP (Table **9-1**) for the proposed construction works and operation of the proposed mini piped water and supply project, identifies the potential environmental and social aspects that should be managed and monitored. It identifies parties responsible for managing the impact, indicators, the monitoring authority, associated costs and any training or capacity building needs and reporting. The various aspects of the ESMMP are detailed in sections below.

9.1 Management Plan Principles

The project is geared towards enhancing social and economic benefits through sustainable water supply. Development of the proposed piped Water Supply and sanitation Project would be expected to comply with the environmental conservation requirements in accordance with the established Ugandan laws and regulations. To realize these goals, acceptability by a majority of the beneficiaries and stakeholders as well as ensuring minimal effects to the physical environment will require to be ensured through participation in the project and continuous consultations, evaluations and review of the design aspects throughout project implementation cycles.

It is also recommended that the environmental management guiding principles specific to this project improvement and water resources management be established to allow integration of environmental management considerations during construction and operations. Among the factors that need to be considered in this particular project implementation will include;

i. The procedure, materials and equipment used in the construction and operation of the water supply system should ensure low maintenance costs for sustainability,
ii. Control of soil erosion and siltation of existing surface water sources (rivers and streams), incorporation of project components sustainability and operational provisions and the associated components,
iii. Enhancing integration of environmental, social and economic functions in the project implementation,
iv. The contractors and other players in the project activities be prevailed upon to implement the EMP through a sustained supervision and continuous consultations, and
v. Involvement of the community in the project implementation to enhance ownership and capacity building for long term operations of the facility.

9.2 The Monitoring and Reporting Arrangements

To ensure effective implementation of the project, monitoring will be done throughout the project life. Monitoring will verify if predicted impacts have actually occurred and check that mitigation actions recommended in the ESIA are implemented and their effectiveness. Monitoring will also identify any unforeseen impacts that might arise from project implementation.

The usefulness and effectiveness of this project brief will only be realized through a systematic monitoring programme. The monitoring plan will inform strategic and outline environmental decision making throughout the project life cycle. All mitigation actions will be guided by prior actions undertaken on project sites.

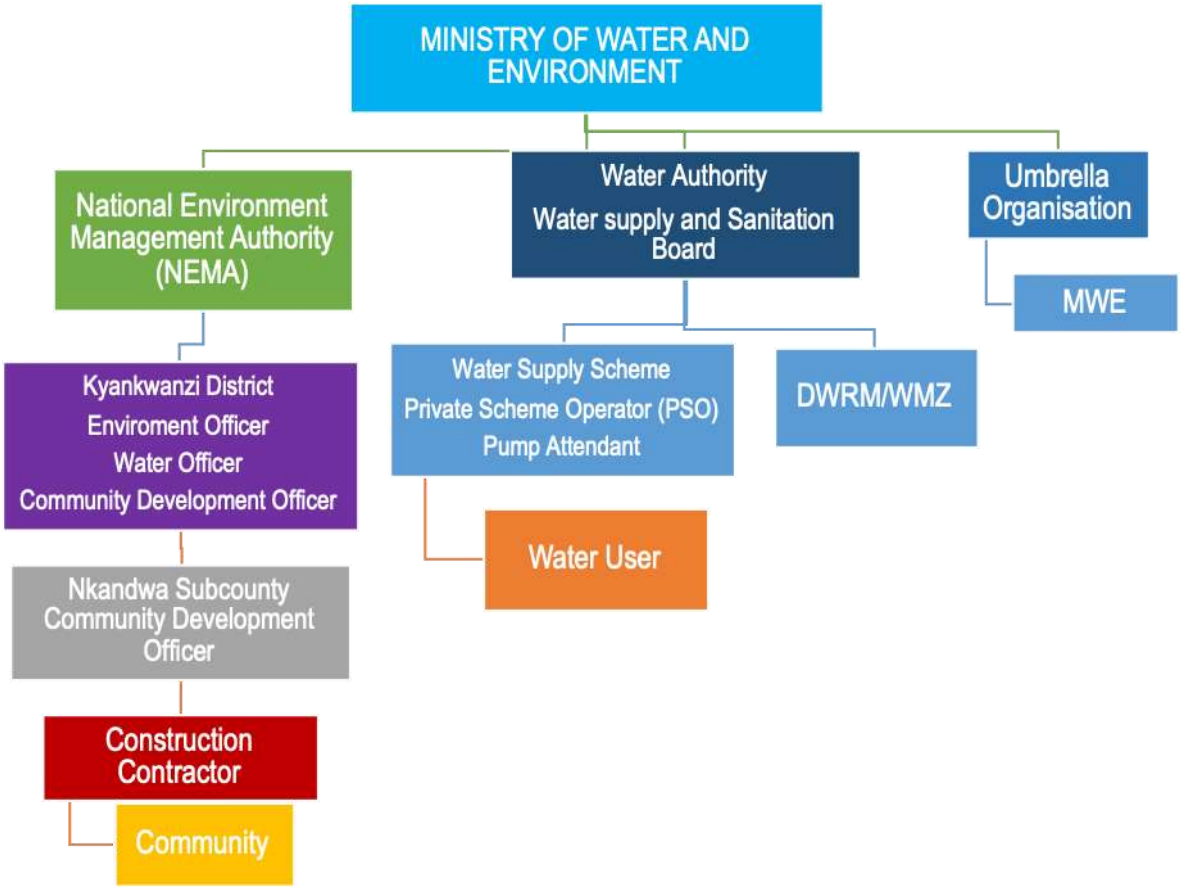
Monitoring during the project operation will occur at two Levels namely compliance monitoring and effects monitoring.

i. **Compliance monitoring** will be undertaken to assess the level of implementation of prescribed mitigation in Chapter (7). Supervision will be key for this Level of monitoring. Monitoring of the project construction will be done daily and a monthly report will be presented to MWE by the contractor.

ii. The second form of monitoring will be **Effect monitoring**. This level of monitoring will evaluate the effectiveness of suggested mitigation measures in stemming impacts as predicted in the Impact chapter (7).

9.3 Institutional Arrangements

The contractor is responsible for the full-time monitoring and implementation of the ESMMP and will be supervised and guided by MWE. The chain of ESMMP monitoring will follow;



Who monitors and how: Implementation of the ESMMP and the project as a whole will be monitored by a number of entities right from ministry level to lower local government.

Construction Phase

i. NEMA or the district environmental officer who represent NEMA at the Local Administration Level will act as NEMA's representative at site. Monitoring by NEMA is "third party monitoring" but this is its regulatory mandate according to Part XII of the National Environment Act 2019.

ii. The District Water Officer will monitor the construction phase to ensure the proper installation of the project components using the appropriate material and equipment.

iii. Community through its leaders will advise MWE and the contractor on matters of project community and their concerns.
iv. Contractor will undertake construction activities and oversee the implementation of mitigation measures as specified in this document and any other actions that will be deemed necessary. The contractor can undertake internal auditing and monitoring to assess progress in implementation of the ESMMP.

Monitoring in this phase will be done through site inspection, review of site records (Accident Log, issuance of PPE, waste records, training and inductions etc.), review of grievances logged by stakeholders and any discussions with affected persons (construction workers, residents near the project facilities).

Operational Phase

i. The eastern Umbrella organization will be in charge of overall management of the system and will give operation and maintenance support to the scheme operators.
ii. Water User Committee (WUC) composed of two members from each tap stand in the 4 villages of the piped water system area, one of whom shall be a woman, these will monitor the day-to-day management and usage of the tap stands. The WUC will play mainly community mobilization role and will support the scheme operator in day-to-day administration of the scheme.

In order to enhance the potential for integrating sustainability concerns in the proposed project development and activities, it is important to assign clear roles and responsibilities to dominant professionals, contractors and/or sub-contractors so as to ensure that the project ESMMP will be implemented effectively.

9.3.1 Role of NEMA

The National Environmental Management Authority (NEMA) will, in consultation with a lead agency;

i) First and for most review and assess this ESIA for this proposed project site and activities in relation to its approval *(before project construction).*
ii) Monitor all environmental issues with a view of making an assessment of any possible changes in the environment and their possible impacts *(During both establishment and operation).*
iii) Monitor the operation of the project activity with a view of determining its immediate and long-term effects on the environment. *(During project construction / operation).*
iv) Appointing an environmental inspector by the authority; that may enter the project premises at free will for the purpose of monitoring the effects on the environment of any activities carried out on the premises *(During project construction / operation)*.

9.3.2 Role of Kyankwanzi District Local government

a) **Engineer**; inspect the project works as per the engineering specifications and verify all acquired permits.
b) **District Water Officer (DWO)**; inspect the project on behalf of the district technical administration wing/ Chief Administrative officer (CAO). Monitor all technical water works.
c) **District Environmental Officer (DEO)**; inspect the project sites on behalf of NEMA and monitor against NEMA approval project environmental conditions.
d) **Senior Community Development Officer (SCDO);** inspect the project sites on behalf of the district and monitor against NEMA approval project social conditions, review and

approve community engagement minutes and reports, and assess the effectiveness of the project grievance system

e) **District Labour Officer (DLO)**; inspect the project sites on behalf of MGLSD, monitor project site working environment in relation to OHS defined standards.

9.3.3 The Role of MWE

MWE will have the secondary role in delivering on the measures set out in the ESMMP, as the developer.

i) MWE has complied by utilization of services of a NEMA registered environmental firm to guide in preparation of this PB for submission to the authority for its approval (before construction)
ii) Giving details of a proposed project prior to commencement and making copies of the non-technical summary of any Environmental Impact Statement available at site (before construction).
iii) MWE will be responsible for ensuring compliance with all relevant legislation as well as adherence to all environmental and socioeconomic mitigation measures specified in the ESMMP (during construction).
iv) MWE through its Kyankwanzi field office will appoint from the technical members, the project focal person to oversee the day-to-day implementation of the ESMMP, and to whom the contractor will report to.
v) Undertake scheduled site supervision to determine state of environmental and social compliance.
vi) Overall supervision of this ESMMP and evaluation of its implementation.
vii) Review the proposed project activities, methodologies and plans in relation to the requirements of the mitigation and management measures of this ESMMP.
viii) Receive, record, investigate any grievance and order the contractor to make corrective actions and respond to the public on the corrections conducted. Work with communities to address any social issues. Handle social issues during project operation stage.
ix) Carry out sensitization sessions of the community members and contractor about the project, safety and health measures and environmental practices (during construction).
x) Will serve to build strong and open communication with Local authorities, communities and faith organizations among others within this project area.

9.3.4 The Role of Contractor

The hired contractor will have the primary role in delivering on the measures set out in the ESMMP, as the contractor.

i) The contractor will be responsible for ensuring compliance with all relevant legislation as well as adherence to all environmental and socioeconomic mitigation measures specified in the ESMMP (during construction).
ii) Ensuring that all environmental monitoring data is made available at regular intervals and that any divergences from performance standards will be fully explained, together with any necessary preventative (during construction).
iii) The contractor may appoint a Safety and Health officer preferably the site agent to develop and enforce safety and health precautionary measures for both the workers and the community at large (during construction).

iv) The contractor's site agent will act as the Contractor's Community Liaison Officer to bridge the gap between the contractor and the community, handle grievances, and face of the project in the community (during construction). Ensure community concerns are addressed
v) Implement project site layout design and projecting daily operational activities to ensure compliance with project engineering design and the ESMMP with regards to environmental protection and impact mitigation.
vi) Day to day monitoring of environmental matters - this will include wider environmental aspects including matters not directly concerned with the actual construction.
vii) Awareness raising and training of contractor's staff with respect to environmental issues; this will include notification of the severe penalties for non-compliance with instructions which may include dismissal. Design and conduct appropriate induction training for all workers on recruitment about safety, health and environment while working in the project areas.
viii) Preparation of weekly and monthly environmental inspection and monitoring report in a format acceptable to MWE
ix) Undertake mainstreaming of gender issues into the entire project including but not limited to work placements, tools and fixtures, sanitary utilities, creating awareness on sexual harassment and any other forms of discrimination based on gender, ethnic background and race.
x) Ensure that all workers are provided with appropriate PPEs and further enforce their use at all times

9.3.5 The role of the Umbrella organisation

After construction, the piped water supply and sanitation system will be handed over to the Eastern umbrella organization for management. This will play a number of roles as listed below;

i) Provide operation and maintenance support to the scheme operators.
ii) Help to restore functionality in emergency situations and to implement repair works and scheme extensions,
iii) Provide training to local Water Boards,
iv) Promote payment for water services (water metering),
v) Conduct advisory financial audits
vi) Monitor drinking water quality through regular sampling.

9.3.6 The Water User Committee (WUC)

It is recommended that a WUC be constituted where each tap stand shall nominate two representatives who shall represent the tap community in the central water user committee (WUC). At least one of the representatives of each tap stand shall be a woman. The WUC shall consist of these 2 representatives of each tap stand and a local council 1 representative; the committee shall then form an executive consisting of Chairman, Treasurer and Secretary. The rest shall be members. Since the scheme covers more than one village, each of the 2 villages shall nominate a local council 1 representative to the WUC.

The role and responsibilities of the CWUC shall be as follows:

i) Mobilize user communities to meet their obligations towards any form of contributions to the construction, operation and maintenance of the scheme.
ii) Ensure effective representation of every tap stand to the WUC meetings.
iii) Make bye-laws for the management of the piped water system.

iv) Report to the Umbrella organisation on difficult repairs and replacements beyond the capacity of the System Operator.
v) Select local artisans to be trained on the job during construction.
vi) Sensitize beneficiaries over ownership of the scheme and mobilize the community to protect and maintain the scheme.
vii) Sensitize the beneficiaries on good hygiene practices and promote good sanitation in the households in the scheme area.
viii) Channel community interests and concerns to the Umbrella organisation and other relevant stakeholders.

9.3.7 The role of the Scheme Operator (SO)

While the piped water supply and sanitation system shall be under management of the Eastern umbrella organisation, the water Scheme shall be operated by a Scheme Operator (SO). The SO shall be an individual with a zeal and willingness to manage the day today affairs of the scheme for and on behalf of Umbrella organisation and the entire beneficiary community for an agreed management fee.
The roles and responsibilities of the SO will include:

i) Ensure smooth running of the scheme and constant supply of water to user community.
ii) Engage services of trained mechanics/plumbers to carry out repairs on the system when need arises and pay them accordingly.
iii) Attend to community complaints and provide regular updates to Umbrella organization and WUC about such complaints.
iv) Maintain order at the water collection point
v) Ensure security of the scheme at all times.
vi) Keep a clean working environment
vii) Prepare monthly / quarterly technical and financial reports on the scheme operations and report to the Umbrella organization.
viii) Report suspected system malfunctions or illegal connections to the Umbrella organization and where necessary to the WUC.

9.3.8 The Water Users

The role and responsibilities of the water users shall be as follows:

i) Nominate two representatives who shall represent the tap community in the water user committee (WUC)
ii) Attend community meetings called upon by WUC in conjunction with the Local council
iii) Abide by the bye-laws for the management of the piped water system.
iv) Report to SO and WUC on any difficulties, repairs, linkages faults in the water system
v) Promoting good hygiene practices and good sanitation in the households in the scheme area.
vi) Sustainable usage of water from the system.
vii) Payment of O&M funds/ water user fees for the success of the project.

9.4 Communication and Progress Reports

This section describes the monitoring program and reporting required for ensuring effective implementation of this project ESMMP, including assignment of responsibilities and environmental and social performance monitoring to be conducted as part of the project.

9.4.1 Emergency/Environmental Response

For monitoring emergencies, the Supervisor will target the following:

- The contractor's activities for non-compliance with environmental specifications
- Grounds for non-compliance are identified. If non-compliance is not rectified and the significance of the non-compliance warrants it, the procedure to halt construction will be initiated.

MWE appointed project focal person can instruct the contractor to halt work if:

- Construction activities are unexpectedly and significantly affecting key environment features;
- There is likelihood or actual occurrence for an environmental emergency;
- A government agency has ordered the work to halt to enable supervision of remedial activities before work can commence.

9.4.2 The Monitoring Indicators

The monitoring team should most particularly check for the following issues among others;

i. The general cleanliness and good housekeeping in and around the project premises
ii. The project site preparedness capacity.
iii. Proper storage, handling and final disposal of the waste generated at the project site.
iv. Personal protective equipment of the workforce.
v. Efficient and functional water and sanitation system during construction.
vi. Check the monthly monitoring reports
vii. Safety measures put in place
viii. Number of sensitization meetings
ix. Work plan updates

9.4.3 Frequency of Monitoring and Reporting

Monitoring will be undertaken throughout the project period (Table **9-1**). Detailed monthly monitoring reports with clear illustrations of implementation of mitigation measures will be compiled by the contractor overseen by MWE. These detailed reports with evidence of compliance will be prepared and appended to summary monthly reports.

Table 9-1: Environmental and Social Monitoring Plan

Activity	Monitoring frequency	Responsible party	Output
Supervision and management	Daily	Contractor	Reports
Site operation	Daily	Contractor	Daily reports
	Weekly	Contractor/ MWE	Reports
	Monthly	Contractor/ MWE	Reports
Quarterly and Annual monitoring reports	Quarterly / Annually	SO	Minutes and inspection records

9.5 Grievance Redress Mechanism

There will be a necessity to resolve conflicts swiftly in order to expedite the project's planning and construction phase and for the smooth eventual operational activities. Therefore, a grievance redressing mechanism is essential for Recycling Facility. This procedure will address this need in detail. The objectives of the grievance process as explained in the subsequent chapter of these guidelines will be as follows:

- Provide affected people with avenues for making a complaint or resolving any dispute that may arise;
- Ensure that appropriate and mutually acceptable corrective actions are identified and implemented to address complaints;
- Verify that complaints are satisfied with outcomes of corrective actions;
- Avoid the need to resort to judicial proceedings.

Grievance management is an important step in community engagement. There had been and will be community grievances throughout the project's various development stages. It is expected that all such grievances be amicably resolved if the developer is to abide by the global and country specific Social Safeguard guidelines. In practice, in similar compensation and resettlement activities, many grievances arise from misunderstandings of the Project policy, or result from conflicts between neighbors, which can usually be solved through adequate mediation using customary rules or local administration at the lowest level. Most grievances can be settled with additional explanation efforts and some mediation using customary dispute settlement mechanisms.

The purpose of Grievance management shall be to provide opportunity for the aggrieved parties to resolve issues through arbitration and negotiation based on transparent and fair hearing. It will allow the parties in the dispute to arrive at a win -win solution. Final outcome thus be that the extra judicial systems will work smoothly and that number of disputes seeking interventions at the country judiciary will be made minimal. The functioning a proper grievance management mechanism is a requirement in view of the above. The overall management of grievances is the responsibility of the developer or/and the contractor. The Project, thus, will put in place an amicable, extra-judicial mechanism for managing grievances and disputes based on explanation and mediation by third parties. Procedures relevant to this amicable mechanism are detailed below. It will include three different levels:

- Registration by project of the complaint, grievance or dispute;
- Processing by project of the grievance or dispute until closure is established based on evidence that acceptable action was taken; and
- In the event where the complainant is not satisfied with action taken by project as a result of the complaint, an amicable mediation can be triggered involving a mediation committee independent from the Project.

Managing grievances needs a clear and transparent procedure well instituted within the management structure of the project. At minimum, such a procedure should consist of the following steps:

a) to receive the grievances,
b) to acknowledgement the receipt,
c) investigation and resolution,
d) Closeout and follow-up.

I. The need to maintain a Grievance Register

There should be Grievance Register which would record all the grievances, complaints and issues the stakeholders would wish to bring to the attention of the Developer or the Contractor. It should be kept at a place where all will have easy access; preferably this should be placed at the office (allocated for the Grievance Committee (GC)). It should contain the date of the entry, name and contact details of the complainant; nature of grievance, Signature (on one side of the Register) and actions taken to address

or reasons the grievance was not acted on, the signature of the GC and Complainant as to how the grievance was closed and date (on the other side of the Register.

II. Recording of the complaints into the Grievance Register

The following steps are to be followed when the complaints will be received: Receipt of complaint (a verbal or in written) will be received by the Community Liaison Officer or any other officer (a member of the Grievance committee).

- The complainant can obtain the assistance from a member of the grievance committee or the Site welfare officer to lodge such an entry in to the Grievance Register.
- The Officer Responsible or the GC member, who is at present, will communicate with the complaint in a language acceptable to the complainant.
- Since the site working is carried out in English Language, the Site welfare officer or the member of the Grievance committee may lodge the entry in English language
- After lodging the complaint in the register, the officer recorded such complain shall read to the complaint what is recorded and sign the entry made into the Grievance Register

III. Formation of a Grievance Committee

In Uganda at the local level, the village leaders and the LC (1) play a key role in managing disputes. The Parish level committees formed for the management of disputes is the lowest level of accepted forms of reconciliation board at which the complainants can have access to for justice if issues will not be resolved at the village level. However, in order to strengthen the village level reconciliation of disputes specially over the issues arising from the project related matters, appointing of a Grievance Committee has been considered a viable option according to the accepted practices. It is expected that grievances depending on the complexity and nature can be resolved either at the site level, at the grievance committee level or at the project developer's top management level or at the judiciary level. It means that if a complainant is not satisfied with the site level solution offered by the site manager or the project's administration manager, the matter can be taken up by the Grievance Committee (GC).

The constituency of the grievance committee and its role is explained in the following section. This GC is to be considered the vital body which prevents any grievances to be heard at higher levels. In parallel and where necessary, the GC holds meetings or other appropriate communication with the complainant, with the aim of reducing any tensions and preventing them from escalating. During closeout, the GC seeks to confirm that its actions have satisfied the complainant. During follow-up, the GC, with the assistance of the Site Construction Manager investigates the causes of grievances, where necessary, to ensure that the grievance does not recur.

The composition of Grievance Committee is depicted below:

a) Representative from area – 02 Members (preferably from each Sub County)
b) Representative of Women – 02 Members
c) Representative of the Local Government – 02 Community Development Officers
d) Representative from the developer – 01 Member
e) Representative from the contractor – 01 Member

Members of the Grievance will be provided training on conflict resolution and given more exposure on procedures of managing grievances.

IV. Performance Indicators in respect of the functioning of the Grievance Committee

Key interventions include:

- Setting up of a Functional Grievance Committee;
- Addressing employee's and affected persons (PAPs) grievances in all project phases.

V. Grievance Redress Procedure

The Grievance Redress Committee will receive a written grievance or complaint. Preferably these should be those, which the Reconciliatory Committee has failed to handle. This Committee will dispense grievances/complaints as described below;

Legal Redress

If the complainant feels dissatisfied with the administrative arbitration decision by the Grievance Redress Committee (GRC), the complainant will then seek legal redress in courts of law. If the complainant is not satisfied with the decision made above, he or she may lodge an appeal to the civil court.

VI. Proposed Process of Grievance Management

The ESMP recommends the following process, which should be adopted by the project support team:

a) Lodging Complaint

The Grievance Management Coordinator/Officer will receive complaint from the PAP in the local language and complete a Grievance Form, which will be signed by the leader of the Local Grievance Management Committee and the PAP/complainant. This will then be lodged in the Grievance Log/Register provided by the Grievance Management Coordinator/Officer.

b) Determining Corrective Action

If in their judgment, the grievance can be solved at this stage and the Grievance Management Coordinator/Officer and a representative of an NGO/CBO will determine a corrective action in consultation with the aggrieved person. A description of the action; the time frame in which the action is to take place; and the party responsible for implementing the action will be recorded in the grievance database.

Grievances will be resolved and status reported back to complainants within 30 days. If more time is required this will be communicated clearly and in advance to the aggrieved person. For cases that are not resolved within the stipulated time, detailed investigations will be undertaken and results discussed in the monthly meetings with affected persons. In some instances, it may be appropriate to appoint independent third parties to undertake the investigations.

c) Meeting the Complainant

The proposed corrective action and the time frame in which it is to be implemented will be discussed with the complainant within 30 days of receipt of the grievance. Written agreement to proceed with the corrective action will be sought from the complainant (e.g. by use of an appropriate consent form). If no agreement is reached, the above step will be re-visited.

d) Implementation of corrective Action

The Project or its Contractors/Operators within the agreed time frame will undertake agreed corrective actions. The date of the completed action will be recorded in the grievance database.

e) Verification of the Corrective Action

To verify satisfaction, the aggrieved person will be approached by the Grievance Officer to verify that the corrective action has been implemented. A signature of the complainant will be obtained and recorded in the log and/or on the consent form. If the complainant is not satisfied with the outcome of the corrective action additional steps may be undertaken to reach agreement between the parties. If additional corrective action is not possible alternative avenues maybe pursued.

f) Action by Local leaders and Contractor(s).

If the Grievance Co-coordinator and NGO/CBO representative cannot solve the grievance, it will be referred to relevant parties such as local leaders, District Officers, NEMA, Valuer and MWE, for consultation and relevant feedback provided.

g) Action by Grievance Redress Committee (GRC)

If the complainant remains dissatisfied and a satisfactory resolution cannot be reached, the complaint will be handled by the Grievance Redress Committee. A dedicated Grievance Committee will be established to assess grievances that arise from disputes. This will include the following members: -

a) MWE Chair,
b) IWMDP Project Coordinator,
c) Resettlement Officer/Social Scientist Secretary,
d) Project's Environmental Focal Point,
e) The Chair of the local community (LC I Chairman),
f) A member of a recognized non-government organization, A Community Leader.

This committee must have a quorum of at least two-thirds persons. Decisions will be reached by simple majority. The Grievance Committee should be constituted for as long as no more grievances are lodged. Once the Grievance Committee has determined its approach to the lodged grievance, this will be communicated to the Grievance officer, who will communicate this to the complainant. If satisfied, the complainant signs to acknowledge that the issue has been resolved satisfactorily. If the complainant is not satisfied however, the complainant notes the outstanding issues, which may be re-lodged with the Grievance Committee or the complainant may proceed with judicial proceedings. The effectiveness of the GRM will be evaluated during the periodical performance reporting and as part of the Environmental Audits.

The GRM should be assessed on the following parameters: -

a) Number of complaints:
b) Grievance issues by type and how they were resolved:
c) Total received, total justified,
d) Total resolved at various levels including the type of agreement reached,
e) Total referred to legal system/courts of law, including clarification on who initiated (local leaders, PAP or MWE) the referral and subject matter.

VII. Proposed Terms of Reference for the Grievance Management Coordinator/Officer

In line with MWE's resettlement policy framework, projects need to adopt appropriate measures that minimize the risks relating to constructing the water supply and sanitation project. Based on consultations with stakeholders in both districts, effective management of grievances strongly enhances the performance of projects through elimination of construction delays, proper expectation management and increasing community support for the project the current situation

suggests that community members incur high transaction costs to ensure that their grievances are handled.

Therefore, MWE will seek the services of a grievance management coordinator to support the existing framework in documenting, analysing and engaging stakeholders on how to manage project related grievances as a way of minimizing to delays in works related to unresolved grievances. The roles and responsibilities of the grievance management coordinator will include: -

a) to coordinate the work of the Grievance Committee, including calling and chairing scheduled meetings;
b) help train Community and Local Government staff engaged in grievance management for land and crops;
c) provide advice and assistance to such persons;
d) monitor progress of grievances;
e) inform Members of outcome of vote on whether or not to proceed to grievance;
f) act as primary Association contact with lawyers and liaise with legal counsel regarding on going grievance issues;
g) And report on informal disputes and grievances to MWE Project Implementation Unit on a regular basis.

Training and Qualifications: Minimum of a relevant university degree with 5 years' experience in grievance handling in rural communities with solid working knowledge of environment, resettlement and compensation issues in Uganda.

9.5.1 Grievance Redress mechanism for project workers

Worker's Grievance Redress Mechanism

Employee Grievances may include;

a. Undesirable working conditions in physical terms.
b. Changes without prior notice.
c. Poor employee relations.
d. Improper wage adjustments.
e. Dissatisfactory office policies in case of: Promotion, Demotion, Leaves, Overtime
f. Violation of laws.
g. Inadequate safety, health, and welfare amenities.
h. Labour-management hostility.
i. Incidences of workplace favouritism and nepotism, among others.

Workers' Council

The WSSP project in Bugomolwa RGC will employ a sizeable workforce. For better organisation and management of workers' grievances, this substantial number shall necessitate the establishment of a Workers' Council. The workers' council shall consist of each category of workers organizing themselves and selecting male and female representatives. These categories will include;

a. Casual workers
b. Drivers, Operators and Turn men
c. Flag Personnel
d. Contractor's ESH team
e. Consultant Site Sociologist

For effective confidence building and confidentiality, the Consultant Site Sociologist shall be the secretary to document and manage the grievance log, minutes, and writing workers' council reports. The other members will select a Chairperson and Vice Chairperson. The council shall meet at least once every week to ensure timely management of workers' issues.

Roles of Workers' Council

With management support from the contractor, supervising consultant and MWE, the workers' council shall play a significant role in proactive management of employer –employee relations, workers' welfare and grievances within the workplace. This council shall not interfere with either Management's authority or its obligation to manage their contracts but rather provides a formally recognized opportunity and avenue for their grievances to be lodged and managed and their rights to be heard and respected.

Workers' Council shall;

a. Provide a forum for consultation, frank exchange of information, discussion and joint problem solving between management and employee representatives on issues pertaining to staff welfare, rights, discipline; any proposed changes dealing with policies, procedures and working conditions.
b. Receive and report workers complaints/grievances to management and negotiate for timely redress, / participate in arbitration of cases between workers and management through disciplinary hearings and / or between fellow workers through conflict resolution meetings
c. Represent the interests of workers pertaining to their terms and conditions of employment, staff welfare, staff development and other matters of concern to the workers, and to negotiate with the contractor's management on their behalf accordingly.
d. Educate Workers on their rights, discipline, code of conduct, spirit of staff unity across the project as well as on respect for cultural diversity pertaining to workers of different races, tribes, religion and other cultural differences
e. Regularly solicit for employees' suggestions/opinions to management through appropriate and organized channels such as their representatives, suggestion box, or joint meetings from time to time
f. Act as a point of contact between the employees and management; establish and maintain good relations, foster effective two-way communication and mutual understanding between workers on one hand, and with management on another.
g. Identify and represent concerns of special interest groups on the project such as women, expectant and lactating mothers, workers with disability etc.
h. Organize and conduct monthly Workers' Grievance Management Committee (GMC) meetings to review and discuss staff welfare, discipline and related matters; compile and share in timely manner meeting minutes with the contractor, supervising consultant and MLHUD pointing to key action areas requiring attention.
i. Report any incident(s) of violation of workers' rights, staff indiscipline and related issues to management for redress
j. Keep adequate log of all matters that come before the Workers' GMC for better reference and effective management

NB: *Any appeals from the Workers' Council shall be referred to either the Site Disciplinary committee (if disciplinary in nature) or to the Site GMC*

Site Disciplinary Committee

A *Site Disciplinary Committee* comprising of the following members will be established to manage appeals from workers' council;

- Consultant's Lead Sociologist (Chairperson)
- Contractor's Human Resource Officer (Secretary)
- Chairperson of Workers' Council

NB: *The committee may adopt any other member deemed important depending on the issue being resolved.*

The committee shall meet at least twice every month, during working hours based on a meeting schedule prior agreed with project Management (contractor and supervising consultant). A special meeting, if required, may be held at the call of the Chairperson at short notice in consultation with the project management. The site disciplinary committee shall ensure fairness and make recommendations to the Contract Manager on the appropriate course of action.

NB: *Any resulting appeal against recommendations from the Site Disciplinary Committee shall be escalated to the Site GMC chaired by the Resident Engineer for overall guidance and appropriate actions. MWE may involve mandated offices including Labour Officers, Labour Unions, among others to conclude the emerging labour issues.*

Site GMC (act within 5 days upon receipt of Grievance)

For timely management of complaints, the project shall have a grievance desk at the site (Site GMC). The Site GMC shall include the following members;

- Resident Engineer- Chairperson
- Site Engineer
- Contractor's Sociologist
- Contractor's Health and Safety Officer
- Consultant's Sociologist- Secretary
- Consultant's Environmentalist

Under the supervision of the consultant's Sociologist, the Site GMC shall make immediate responses to grievances related to contractor's workers, agents, sub-contractors or suppliers. A toll free telephone number can be provided at the site GMC desk to enable workers report any complaints. For unresolved workers' grievances, the site GMC shall escalate these to MWE.

Stages of handling workers' grievances;

Option 1: Informal discussion

If workers have a grievance or complaint regarding their work, they shall, wherever possible, raise their concern with a supervisor or manager as it may be possible to find a solution informally. This shall make it more likely that disputes can be resolved quickly, closer to the source of the problem, making it less likely that the issue escalates into an intractable problem. Nonetheless, the issue and response shall still be logged and tracked from the perspectives of checking outcomes and monitoring

Option 2: Formal complaint

If the grievance is not resolved informally, the aggrieved shall proceed to resort to the formal grievance redress mechanisms, following the following steps;

Step 1: Lodging the compliant to Workers' Council

If the matter is serious and/or the worker wishes to raise the matter formally, the worker shall set out the facts of the grievance in writing to the committee, with support and guidance from the section representative who then forwards the complaint to the secretary. The secretary then records the complaint in the log book and notifies the chairperson. Alternatively, the worker may raise complaint through suggestion boxes, phone calls, text messages or email to the secretary (Consultant's Site Sociologist).

Step 2: Assessment of compliant and investigation by Workers' Council within 5 days

On receipt of the complaint, the secretary shall make further investigations and in consultation with Chairperson shall schedule for a meeting (depending on the urgency of the complaint) to assess the complaint and determine the corrective action. The assessment shall also identify the key issues that have been raised, together with any root causes, and shall determine the outcome that the worker is looking for from the process. Any additional

information shall be gathered to allow a full assessment. The appropriate form of investigation will depend on the type of complaint and the seriousness of the allegation. In general terms, the committee shall try to understand the key issues and interview the individuals involved in a complaint, e.g. those managing the workers, or those responsible for the activity or service that is raised in the grievance. The workers council shall conclude the issues or escalate the issues to the Disciplinary committee. Concluded issues which require attention of management shall be communicated formally by the Secretary to Contract Manager for action with a copy to the Resident Engineer. The issues which require escalation shall be referred to the Secretary of the Site Disciplinary committee (Contractor's Human Resource Officer).

Step 3: Determination of corrective action by Disciplinary committee within 7 days

A disciplinary committee shall hold hearings, and invite both the offender and the offended. The disciplinary committee shall give fair hearing to anyone suspected as offender in order to make fair judgment guided by the Workers' Code of Conduct. On assessment of the complaint and judgement derived from hearings convened for complaints of disciplinary nature, the disciplinary committee will advise / recommend to the contractor's management in writing on the appropriate course of action to be taken against the suspected offender. The submission shall be made by the Chairperson to Contract Manager with a copy to the Resident Engineer.

Step 4: Site GMC (act within 5 days upon receipt of Grievance)

The Site GMC shall handle workers' complaints with utmost commitment and with a view of getting a settlement. The Site GMC may review the views of the workers' council and/or the disciplinary committee to ascertain the merits and demerits pertaining to the complaint in a bid to find an amicable solution. The Site GMC shall handle grievance resolution in line with the safeguard's provisions of the project and acceptable just mechanisms. For unresolved grievances, the site GMC shall escalate or refer these to MLHUD.

Step 4: Feedback from the affected parties

The contractor or worker shall give feedback to the GRC on the implementation of the Committee recommendation and this shall be recorded in the log book.

Step 5: Appealing to MLHUD against the Verdict of the Site GMC

Any issues that require escalation beyond Site GMC shall be referred to MWE. The issues shall be referred by the Resident Engineer and addressed to Permanent secretary MWE with Attention to Social Development Specialist.

Upon the receipt of case the project management team shall review and handle the matter within 10 days. The team shall comprise at the minimum the following;

- Project Engineer (Chairperson)
- Social Development Specialist (Secretary)
- Environment Specialist
- Communication Specialist

In the event that MWE finds a valid case, it would then re-visit the process of investigation in consultation with the District Labour Office and/or any other relevant office/ agency.

Feedback from the affected parties

The contractor or worker shall give feedback to the GMC on the implementation of the Committee recommendation and this shall be recorded in the log book.

The steps of the Worker's grievance management process are illustrated below;

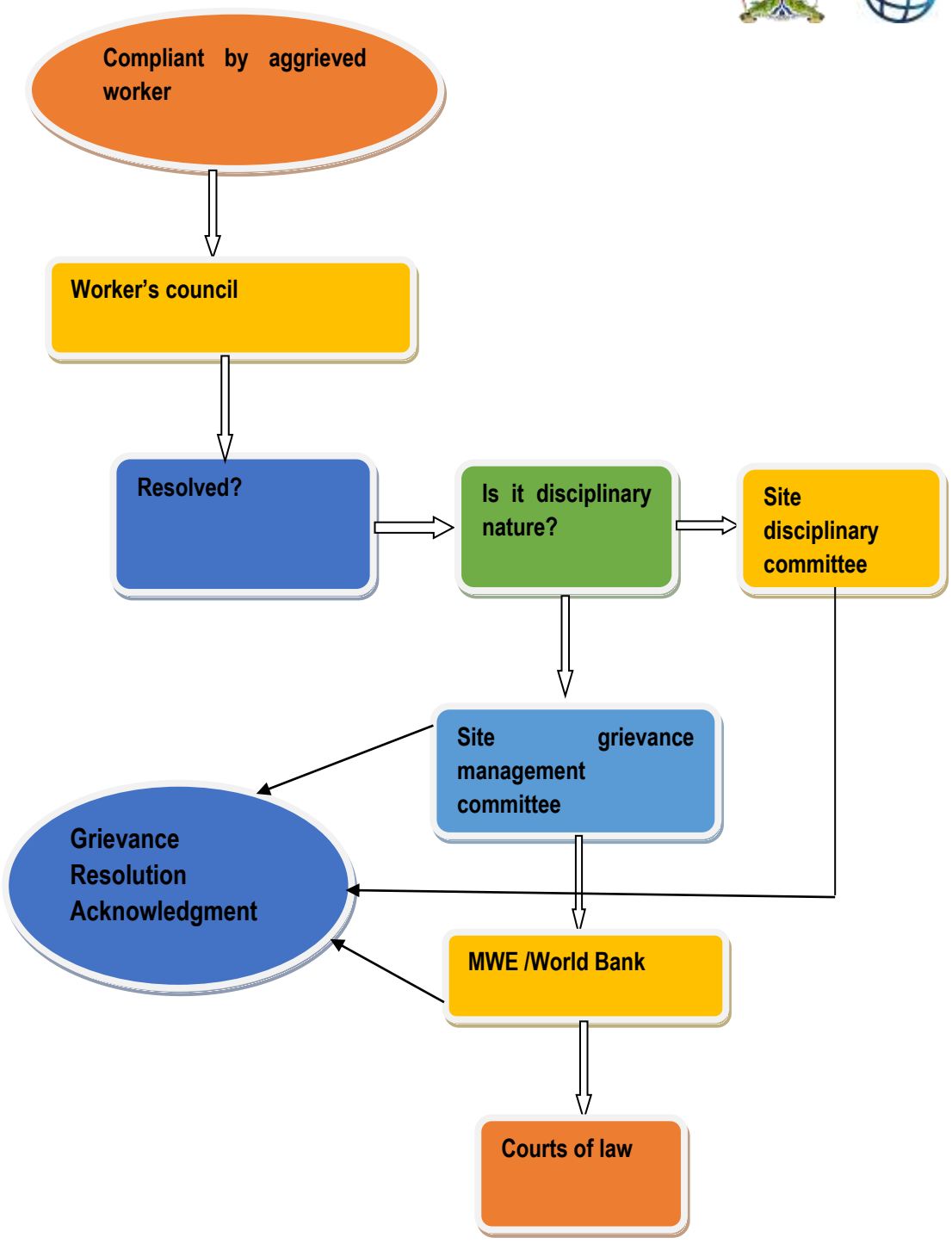


Figure 9-1: Grievance Redress mechanism process flow chart

9.6 Bugomolwa Water Supply and Sanitation System ESMMP

Table 9-2: Environmental and Social Management and Monitoring Plan (ESMMP)

No.	E&S Component	Risk/Impact	Mitigation/Enhancement measure	Duration	Implementation Cost Per Agency (UGX)					Monitoring						
					Implementation time	Cost Description (all costs in UGX)	MWE	DLG	Contractor	Outcome/Performance Indicators	Monitoring value	Means of verification	Monitoring activities	Frequency	Monitoring cost	Responsible party
ENVIRONMENTAL SAFEGUARDS																
1	Construction waste	Contamination of soil and water resources Visual blight Odour nuisance	Ensure that all the cut to spoil generated during excavations is used for backfilling or disposed off appropriately	Throughout project life time	At the start of the project	Part of the Contractor's Environmentalist work	-	-	No additional cost	Possession of a systematic process of handling cut to spoil	1	Records of transporting cut to spoil away or evidence of backfilling on site	Field verification visits	Quarterly	Included in the project Supervision Fees	Kyankwanzi district supervision team Kyankwanzi town council Developer (MWE) NEMA
			Purchase assorted Dustbins at the site and plastic trash bags for collection of waste along the road (RoW) for the pipeline	1 year	At the start of the project	Lump sum cost for 2 dust bins for biodegradable and 2 dust bins for non-biodegradable waste Plastic trash bags: 2 along the RoW road each at 2000, replaced monthly	-	-	Dust bins: 300,000x2 = 600,000 Sacks: 18x2000x12 = 432,000 = **1,032,000**	No. of labeled dustbins at the camp No. of trash bags on each road	4 dust bins at the site 2 trash bags on each road	Purchase records of the dustbins and trash bags	Field verification, waste generation and disposal records	Monthly	Included in the project Supervision Fees	
2	Construction noise	Disruption of neighbouring activities	Sensitization of workers on regulatory noise limits and measures to reduce noise at the workplace	Weekly	Throughout project	Part of the daily tool box talks	-	-	No additional cost	No. of workers sensitized Tool box talk records	-	Records of tool box talks and training held with works	Review of workers sensitization records	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district supervision team
			Conduct routine noise monitoring along the project roads	Quarterly	Throughout project	Provisional sum for monitoring equipment	-	-	**4,000,000**	No. of noise monitoring sessions	4	Review of noise monitoring reports	Field inspections, review of monitoring reports	Quarterly	Included in the project Supervision Fees	
3	Loss of vegetation	Habitat loss Loss of species diversity Loss of aesthetic	Tree planting should be and around the site and along the way leave as required	1 year	After start of works	Procuring seedlings, planting and tree care for 1 year Provisional sum for 100 trees, at			100x5,000 = **500,000**	No. of trees planted	100 trees around the site road	Tree procurement records and planting reports	Site inspections	Quarterly	Included in the project Supervision Fees	Kyankwanzi district supervision team NEMA MWE

No.	E&S Component	Risk/Impact	Mitigation/Enhancement measure	Duration	Implementation Cost Per Agency (UGX)					Monitoring						
					Implementation time	Cost Description (all costs in UGX)	MWE	DLG	Contractor	Outcome/Performance Indicators	Monitoring value	Means of verification	Monitoring activities	Frequency	Monitoring cost	Responsible party
		beauty				the site, each tree at 5000										
			Limit vegetation clearance to only project site boundaries and the required trenching area.	At Induction / Toolbox talks/ Monthly field visits meetings	Throughout the project lifetime	Part of the Contractor's Environmentalist work			No additional cost	No. of Workers Inducted	All workers	Worker training records (minutes, attendance lists and photos)	Site inspections, interviews with workers	Monthly	Included in the project Supervision Fees	
			Clearly mark the vegetation to be preserved or cut along the RoW for pipe laying	Throughout the project	At the start of construction works	Fuel, paint, equipment 300,000			300,000 = **300,000**	No. of trees marked	-	Tree demarcation reports	Field verification visits, review of tree demarcation reports	Quarterly	Included in the project Supervision Fees	
4	Impact on air quality	Air pollution leading to short- and long-term respiratory health effects, staining of trade commodities in shops along roads causing losses to owners due to increased vehicular movements along the roads	Cover material transporting trucks with tarpaulins to reduce fugitive dust	Continuous	Throughout project	Provisional sum for 2 tarpaulins per truck. Each tarpaulin at 80,000. For 2 trucks Total no.: 2x2=4	-	-	80,000x4 = **320,000**	No. of tarpaulin purchased and in use	4	Purchase records of the tarpaulins	Field verification visits, testimonies from workers and community along the roads especially in trading centres	Quarterly	Included in the project Supervision Fees	Kyankwanzi district MWE NEMA
			Sprinkle water on dusty project roads	Continuous	Throughout project	Provisional cost of 1,000,000			**1,000,000**	No. of trips of water/ number of days the contractor sprinkles water on dusty surfaces	-	Water bowser operation records	Field verification visits, testimonies from workers and community	Monthly	Included in the project Supervision Fees	Kyankwanzi district MWE Subcounty teams NEMA
			Undertake routine air quality monitoring	Quarterly	Throughout project	Provisional sum for monitoring equipment			5,000,000	No. of air quality meters purchased	-	Air quality meter purchase records	Review of air quality monitoring reports	Quarterly	Included in the project Supervision Fees	Kyankwanzii district MWE Subcounty teams NEMA

No.	E&S Component	Risk/Impact	Mitigation/Enhancement measure	Duration	Implementation Cost Per Agency (UGX)					Monitoring						
					Implementation time	Cost Description (all costs in UGX)	MWE	DLG	Contractor	Outcome/Performance Indicators	Monitoring value	Means of verification	Monitoring activities	Frequency	Monitoring cost	Responsible party
5	Surface and ground water pollution	Siltation and Contamination of surface and ground water	Use the oil spill containment kits	Project life time	Start of construction phase	Provisional sum of 1,000,000			1,000,000	No. of oil spill kits in effective use	At least 1 at the site	Oil spill kits supply records, training records, reports on their application	Field visits	Quarterly	Included in the project Supervision Fees	NEMA Kyankwanzi district MWE
			Proper storage and disposal of solid and liquid waste	Continuous	Throughout project	Covered under waste management component (SN.1)			No additional cost	No. of tonnes of solid wastes disposed	-	Waste inventory and disposal reports	Field verification visits, review of waste management reports	Monthly	Included in the project Supervision Fees	
			Routinely monitor water quality of the water source and the neighbouring water sources especially for E-coli resources	Throughout the project	Quarterly	Provisional sum of 2,000,000 per quarter			2,000,000x4 = **8,000,000**	No. of water quality monitoring sessions	4	Review of water quality monitoring reports	Field inspections, review of monitoring reports	Quarterly	Included in the project Supervision Fees	
6	Soil contamination	Potential contamination of soils	Collect and store oil and grease spill and oil-soaked material in labelled containers	Throughout the project	Throughout the project	Part of the Contractor's Environmentalist work Use empty oil drums			No additional cost	No. of well labeled containers	-	Hazardous waste generation and storage records	Site inspections	Monthly	Included in the project Supervision Fees	Kyankwanzi district Contractor
			Develop and implement a spill contingency plan	Throughout the project	Throughout the project	Part of the Contractor's Environmentalist work			No additional cost	Plan in place and being implemented	1	Presence of the plan	Review of the plan, site inspection	Quarterly	Included in the project Supervision Fees	MWE NEMA
SOCIAL SAFEGUARDS																
7	Occupational health and safety impacts	Exposure of workers to Occupational Health and Safety hazards COVID19 infection Disease spread due to poor hygiene and sanitation	Display appropriate safety signage at the project work sites.	1 year	Throughout Project life	Provision lump sum for signage for camp and roads			**1,000,000**	No of signage installed	-	Displayed safety signage at the site	Field verification visits	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Ensure that Occupational safety and health best measures, emergency preparedness and response trainings of all workers are done regularly	Quarterly	Start of construction phase	Part of the Contractor's Health and Safety officer work			No additional cost	Approved OSH plan, Emergency preparedness and response plan	1	Plans in place and being implemented	Review of the OSH and emergency plans Field verification	Quarterly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE

No.	E&S Component	Risk/Impact	Mitigation/Enhancement measure	Duration	Implementation Cost Per Agency (UGX)					Monitoring						
					Implementation time	Cost Description (all costs in UGX)	MWE	DLG	Contractor	Outcome/Performance Indicators	Monitoring value	Means of verification	Monitoring activities	Frequency	Monitoring cost	Responsible party
													visits			
			Screening all employees and visitors for COVID19 and Ebola at the campsite	Continuous	Throughout project	Cost of Purchase of 2 temperature guns @ 450,000			450,000x2 = **900,000**	Possession and use of a temperature gun at site	2	Records of temperature screening at the site	Review of temperature screening records	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Purchase of masks and sanitizers for workers as measures to prevent the spread of COVID-19 and Ebola	Start of construction phase	Throughout project	Washable face masks for Workers Each worker 8 masks - @2,000 for 50 workers			50x8x2,000 **= 800,000**	No of face masks issued	8 masks for each worker	Mask distribution records	Review of mask distribution records Field verification visits	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
						Hand sanitizer lump sum cost-500,000			**500,000**	Qty of sanitizer procured	-					Contractor
			Provide fully stocked first aid kits, fire extinguishers and will ensure that workers are trained on their use	Start of construction phase	Throughout project	2 First Aid boxes @ 200,000 (1 at the site and 1 at road RoW) 2 Fire extinguishers @ 150,000			**400,000**	No. and presence of full stocked first aid boxes No. of installed fire extinguishers	2 kits 2 at the site	Purchase and refill records of the first aid kits and extinguishers	Field verification visits	Quarterly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Purchase Personal Protective Equipment for workers, supervisors and visitors	Workers: Bi-annually	Throughout project	Provisional sum for 50 workers Overalls @25,000 Helmet@15,000 Gumboots @15,000 Gloves@ 5,000 Earmuffs – 20,000 Reflector jackets @15,000			**4,750,000**	No. of PPE issued by type %age number of employees with full PPE set	All workers	PPE distribution records	Review of PPE distribution records	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
				Visitors: Once	Throughout project	Provision for 10 No for supervisors, 20 extras, including visitors each Reflector			**450,000**	No. of reflector jackets procured for visitors	30	Distribution records	Filed inspections	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE

No.	E&S Component	Risk/Impact	Mitigation/Enhancement measure	Duration	Implementation Cost Per Agency (UGX)					Monitoring						
					Implementation time	Cost Description (all costs in UGX)	MWE	DLG	Contractor	Outcome/Performance Indicators	Monitoring value	Means of verification	Monitoring activities	Frequency	Monitoring cost	Responsible party
						Jackets at 15,000										
			Provide drinking water for workers at the camp and along each road	Daily	Throughout the project	Provisional sum for purchase of containers and water treatment such as purchase of water guard			**4,000,000**	No. of drinking water points at the camp and along each road	1 at the camp, 2 points along each road	Water points at each project site Testimonies by workers	Field verification inspections	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Procure portable Drinking water for visitors	Monthly	Throughout the Project	Provision cost for purchase of drinking water			**500,000**	No of visitors received safe drinking water on site	-	Availability of water for visitors	Field verification visits	Monthly	Included in the project Supervision Fees	Contractor
			Establish mobile toilets for site workers separate for each gender and accessible by persons with disabilities	1 year		Provisional sum for mobile toilets, per gender, for workers			**15,000,000x2** **30,000,000**	No of mobile toilets provided along each road	2 mobile toilets 2 toilets at site (separate for male and female)	Presence of mobile toilets along the roads	Field verification visits	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
8	Traffic and road safety	Increased traffic Accidents Disruption of normal living conditions of neighbouring people and activities	Put in place flags persons at the roads whenever project vehicles or machines are operating	At the start of the Project	Throughout the project	Part of the Contractor's Environmental Health and Safeguards officer's work	-	-	No additional costs	Presence of flags persons during operations on all the project access roads	1	Presence of flags persons	Field verification visits	Quarterly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Proper road and traffic control signage should be put in place during pipe laying	Continuous	Throughout the project	Provisional lump sum	-	-	**6,000,000**	Presence of signage along the roads	-	Field verification visits	Field verification visits	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Manage, report and document accidents and incidences	Continuous	Throughout project	Provisional lump sum	-	-	**4,000,000**	Presence of an updated accident log book	1 at the site	Updated accident log. Records of accident reports submitted to respective offices	Review of accident log and reports	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Train workers on emergency response in case of accidents and	At Induction / Toolbox talks / site	Throughout project	HSE officer's daily activities	-	-	No additional costs	No. of workers trained Tool box talk records	All workers	Training records (minutes,	Review of training records	Monthly	Included in the project Supervision	Contractor Kyankwanzi

No.	E&S Component	Risk/Impact	Mitigation/Enhancement measure	Duration	Implementation Cost Per Agency (UGX)					Monitoring						
					Implementation time	Cost Description (all costs in UGX)	MWE	DLG	Contractor	Outcome/Performance Indicators	Monitoring value	Means of verification	Monitoring activities	Frequency	Monitoring cost	Responsible party
			incidences	meetings						Meeting minutes		attendance lists and photos)			Fees	district MWE
			Sensitize workers especially drivers to practice road safety and maintenance of all vehicles in good working conditions	At Induction / Toolbox talks / site meetings	Throughout project	Part of the Contractor's Clerk of works and HSE team's work	-	-	No additional costs	No. of Workers sensitized Tool box talk records	All workers	Training records (minutes, attendance lists and photos)	Review of training records	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
9	Employment and economic development	Creation of employment opportunities Increase of income and boosting of local products, suppliers and businesses	Development and implementation of a Labour Force Management Plan and human resource policies that favor local labour	1 month	Start of construction phase	Part of the Contractor's Human resource manager's work			No additional costs	Presence of Approved Labour Force Management plan	1	Review of labour force management plan Review of quarterly labour turn over records	Review of labour force management plan Review of quarterly labour turn over records	Quarterly	Included in the project Supervision Fees	Contractor District labour officer
			Publicly advertising the available job opportunities and services stating clearly the requirements and qualifications (such as subcontracting)	Continuous	Throughout project	Provisional sum for advertising through media, flyer and other means.	-	-	**1,000,000**	Number of adverts displayed Number of Local suppliers engaged Number of local people hired	-	Review of quarterly labour turn over records	Review of quarterly labour turn over records	Quarterly	Included in the project Supervision Fees	Contractor Local council chairpersons
10	Management of grievances	Complaints from affected persons about the project in general, its staff and contractors like GBV, VACs, inequality, abuse of workers' rights, destruction of property among others.	Put in place a grievance redress mechanism to resolve any complaints and issues that may arise from the project	Continuous	Throughout the project	Part of contractor's bid	-	-	No additional costs	Presence of grievance log. Presence of grievance reports No. of grievances received No. of grievances handled No. of forwarded grievances	1	Review of grievance log and reports	Review of grievance log and reports Engagements with community and other stakeholders	Monthly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
11	GBV, SEA and Gender equality	Gender based Violence	Design and develop IEC materials	1 month	Start of the project	Provisional cost for Printing and Disseminating			1,000,000	Proof of disseminating materials at the site, in community and another	-	Reports on the IEC material	Field verification visits	Quarterly	Included in the project Supervision	Contractor Kyankwanzi

No.	E&S Component	Risk/Impact	Mitigation/Enhancement measure	Duration	Implementation Cost Per Agency (UGX)					Monitoring						
					Implementation time	Cost Description (all costs in UGX)	MWE	DLG	Contractor	Outcome/Performance Indicators	Monitoring value	Means of verification	Monitoring activities	Frequency	Monitoring cost	Responsible party
		Sexual Exploitation and Abuse Gender inequality				materials				key points		disseminated			Fees	district MWE
			Develop, train workers and implement Contractors Workers' Code of Conduct	Start of construction phase	Throughout project	Contractor's sociologist and Human resource manager	-	-	No additional costs	No. of workers that have signed the code of conduct against GBV No. of workers trained	All workers	Copies of signed codes of conduct	Document review	Quarterly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Manage, monitor and report on GBV aspects	Continuous	Throughout project	Contractor Sociologist			**2,000,000**	Report on incidences related to GBV on the project and the community	-	Review of reports, confirmation through community engagement	Review of reports, confirmation through community engagement	Quarterly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Development, training workers and implementation of a No Sexual Harassment Policy	Start of construction phase	Throughout project	Part of the Contractor's sociologist's work	-	-	No additional costs	Presence of No Sexual Harassment Policy	1	Signed sexual harassment policy by workers, training records	Review of training records	Quarterly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Develop and implement a Gender Action plan to promote equality	Start of construction phase	Throughout project	Part of the Contractor's sociologist's work	-	-	No additional costs	Presence of an approved Gender Action Plan	1	Approved gender action plan	Review of the plan	Quarterly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
12	Child Protection	Violation of children's rights Child sexual abuse Child labour	District officials (Probation officer, CDO) to Sensitize workers and community on child protection	During routine supervision	Throughout the project	Cost for district officials 500,000 per quarter		500,000x4 = **2,000,000**	-	No. of sensitization engagements held	4	Records of sensitization held	Review of reports	Quarterly	Included in the project Supervision Fees	Contractor Kyankwanzi district MWE
			Engagement with Probation officer and Police	Continuous	Throughout project	Contractor's Sociologist			No additional costs	Cases received and concluded in relation to child protection	-	Records of cases	Report review	Quarterly	Included in the project Supervision Fees	
			Manage minor aspects on Child protection	Continuous	Throughout project	Contractor's Sociologist			No additional costs	Case monitoring and Outcomes Descriptions of good behaviour by contractor workers and members of the community	-	Records of cases	Report review	Quarterly	Included in the project Supervision Fees	
			Development and implementation of a Child	Continuous	Throughout project	Part of the Contractor's	-	-	No additional costs	Presence of signed Child Protection Codes	All workers	Signed child protection	Report review	Quarterly	Included in the project	

No.	E&S Component	Risk/Impact	Mitigation/Enhancement measure	Duration	Implementation Cost Per Agency (UGX)					Monitoring						
					Implementation time	Cost Description (all costs in UGX)	MWE	DLG	Contractor	Outcome/Performance Indicators	Monitoring value	Means of verification	Monitoring activities	Frequency	Monitoring cost	Responsible party
			Protection Code of Conduct and No Sexual Harassment Policy for workers to protect children			sociologist's work				of Conduct Presence of No Sexual Harassment Policy		codes No. of cases registered from community in relation to child protection			Supervision Fees	
13	HIV and AIDS spread in the Community and workers	Increased spread of HIV/AIDS and other sexually transmitted diseases between workers and communities	Sensitization of workers and community on HIV/AIDS and other sexually transmitted diseases	During routine supervision	Throughout the project	Cost for district officials and health providers 1,000,000 per quarter	-	**4,000,000**	-	No. of sensitization engagements held	4	Sensitization records (minutes, attendance lists and photos)	Review of reports	Quarterly	Included in the project Supervision Fees	Contractor District Community Development Officer District Health Inspector
			Distribute free condoms to workers and the community	Monthly	Throughout the project	Condom supplies in coordination with the District Health officer and local health centers	-		**1,000,000**	Record of received and distributed condoms at worksite, worker's and camp site	-	Condom distribution records Testimonies by workers and community	Site verification visits	Monthly	Included in the project Supervision Fees	Contractor District Health officer District community development officer
14	Physical Cultural Resources	Destruction of PCRs	Conduct incidental training of workers on management of chance finds	Quarterly Incidental	Throughout project	Part of the contractor's ESHS team's work			No additional cost	No. of training conducted No. of workers trained	-	Training records (minutes, attendance lists and photos)	Review of reports	Quarterly	Included in the project Supervision Fees	Contractor District supervision team
15	Security	Increase of crime like theft	Conduct vetting of employees before contracting	At hiring	Throughout Project life	Contractor's Human resources/ Project Manager			-	Number of screened personnel at hiring	-	Applicant screening records	Review of applicant screening reports	Quarterly	Included in the project Supervision Fees	Contractor Local council chairpersons
			Hire security guards from a registered company that have records of each guard, to protect both the contractor and the project site	1 year	Throughout Project life	Provisional sum of 200,000 - Monthly payment to the security guards 1 at the site			200,000x12 **2,400,000**	Contract of security service provider Security officer hired No. of man hour worked by guard	12	Signed contracts	Site verification visits	Quarterly	Included in the project Supervision Fees	Contractor Police
			Issue out Identifications for	Once	At hiring	Provision for			**250,000**	No of employees with	50 workers	Possession	Site	Quarterly	Included in	Contractor

No.	E&S Component	Risk/Impact	Mitigation/Enhancement measure	Duration	Implementation Cost Per Agency (UGX)					Monitoring						
					Implementation time	Cost Description (all costs in UGX)	MWE	DLG	Contractor	Outcome/Performance Indicators	Monitoring value	Means of verification	Monitoring activities	Frequency	Monitoring cost	Responsible party
			employees			5,000 per ID for 50 workers replaceable one				valid IDs		of valid IDs by all workers	verification visits		the project Supervision Fees	District supervision team

10 CONCLUSION AND RECOMMENDATION

Bugomolwa RGC Piped Water and Sanitation System is being proposed by the Ministry of Water and Environment for Nkandwa Sub county in Kyankwanzi district. This is envisaged to bring an end to water stress and over reliance on a few low yielding boreholes within the project area of Bugomolwa Rural Growth Centre and neighbouring community. It is also envisaged that, the area experiences scarcity of safe clean water and high growing population. Further still, the project will also address the focal area of access to clean water as stipulated under the Uganda Vision 2040 and the National Development Plan III. The project also contributes towards achieving SDG *(specifically SDG 6 on clean water and sanitation)*. Several beneficial impacts envisaged will include:

- Improved quality of water supplied to communities.
- Improved quantity of water supplied to communities.
- Provision of employment opportunities construction and operation phases.
- Improved health and sanitation due to improved water quality and quantity.
- Improved local economies and induced development especially sourcing of raw materials for construction activities and tree seedling during growing business boost during operation phase.
- Small scale irrigation farming especially in vegetables and flowers since most household heads are involved in subsistence agriculture.
- An increase in revenue for the sub county from water project collections.
- Initiate the move away from the status quo of rural women and children's perpetual carrying of water on their heads from unprotected and distant point water source and allow them to engage in income generating activities and to improve the image of the woman and children.
- Improved image of the Sub County and parishes in terms of providing good services to its people hence more funding from potential funder.

However, the ESIA findings indicate that direct impacts will be fairly compassionate and limited to the project area where construction works will be undertaken. Direct negative impacts will include:

- Soil erosion
- Destruction of vegetation and crops,
- Increased noise nuisance by construction works and equipment,
- Increased sediment loads into the downstream beyond water sources
- Improper disposal of generated waste
- Improper management of construction waste,
- Land loss and damage to property,
- Land pollution, waste and drainage problems,
- Landscape and land use impacts
- Loss of vegetation and soil degradation especially at the construction sites and trenching activities for the pipelines,
- Occupational health and safety risks for the workforce,
- Risk of accidents
- Social misdemeanour by construction workers (e.g., conflicts due to influx of labour, child abuse and early age pregnancies, child labour, in the project community such as increase in irresponsible activities that may increase HIV/AIDS due sexual relations between project workers and the local community; workers taking advantage of young girls in the community

due to high poverty levels and vulnerability, teenage pregnancies and dropping out of school etc.; Violence Against Children such as potential use of child labour; sexual relationship with underage children, teenage pregnancies, school drop outs etc. Conflict in the community/families (social cohesion and disruption) due to project workers engaging in sexual relationships with married women in the community etc.

A RAP was undertaken and identified 3 (three) major PAPs and elaborated to address all compensation issues that are anticipated and an EMMP has also been presented in the preceding Chapter to ensure positive impacts are enhanced while negative impacts are mitigated. Physical resettlement issues are not anticipated.

During this ESIA study, comprehensive stakeholder consultations were conducted with relevant stakeholders and MWE/DWD will liaise with them to ensure effective implementation of the proposed mitigation measures for the anticipated negative impacts as indicated in the ESMMP. MWE/DWD should work closely with the local leaders and Local Government to ensure smooth implementation of the ESMMP and if impacts not contemplated during this ESIA arise, the management of DWD should immediately address them in consultation with NEMA. If any other structures/ expansion not described in this report takes place, it will be considered separate and an ESIA Report/Project brief will be prepared by DWD or the Contractor and submitted to NEMA for approval before implementation.

The following mitigation measures should be considered as conditions of approval as they are regarded as being essential as far as rendering potentially significant impacts acceptable. Implement the ESMMP for all provided project phases with special attention being given on:

- Undertake Annual Environmental Audits and submit reports to NEMA.
- Conduct regular water quality tests and analysis for raw water to inform the treatment options.
- Maintaining good house-keeping through the duration of the construction phase.
- Screening unsightly aspects from public view including excavations (where practical), construction material storage areas, waste storage areas and ablutions.
- Erect fencing around construction sites to act as screens minimizing the effect of wind in generating dust emissions.
- The re-vegetation of all areas of natural vegetation with indigenous species that have been disturbed as a result of construction activities and maintain the 200m buffer zone.
- Designation of construction materials and fuel storage areas.
- Effective control of waste and containment of storm water especially during rainy season.
- Implement dust suppression measures (use of water) when appropriate.
- Train workers on issues of HIV/AIDS. Social cohesion and disruption and Violence Against Children (VAC) should not be permitted.
- Adhere to Occupational Health and Safety Act, 2006 provisions e.g. monitoring noise levels and provision of protective equipment to staff.
- At least 75 % (subject to availability) local labour from Kyankwanzi district should be used and 95% (subject to availability and skills levels) local contractors should be used.
- The Developer (DWD) monitors compliance together with stakeholder wide monitoring group comprising technical staff from local government institutions.
- Fencing is recommended in order to prevent contamination of the water source and for security of hydraulic structures and installations for the pump station.

- Prepare and implement a Water Source Protection Plan for the catchment area of the water sources.

The ESMP contained herewith should be included within the Bidding documents for project works for all Project components. The Bid documents should require that the Contractor be responsible for the implementation of the requirements of the ESMP through his own Contractor's ESMP, which will adopt all of the conditions of the ESMP and add site-specific elements that are not currently known, such as the Contractors camp and borrow pit locations. This ensures that all potential bidders are aware of the environmental requirements of the Project and its associated environmental costs.

To ensure compliance, the Contractor should employ a competent safeguards team comprising of an Environmentalist, sociologist and Health and Safety officer, to monitor and report project activities throughout the Project Construction phase.

The ESMP and all its requirements should then be added to the Contractors Contract, thereby making implementation of the ESMP a legal requirement according to the Contract. The contractor will then prepare his Contractor's ESMP, which will be approved and monitored by the district supervision team. Should the team note any non-conformance with the ESMP, the Contractor can be held liable for breach of the contractual obligations of the ESMP.

The project should take into consideration that Bugomolwa RGC is unplanned and therefore care should be taken to ensure this project does not get in the way of other future infrastructural developments for example roads sewer systems among others.

The ministry should help the community to form a more sustainable water user committee to solve any issues that arise during the operation of the water supply system and help more in other areas to ensure at least bigger coverage of Nkandwa is covered by clean water supply.

Therefore, the proposed Bugomolwa RGC Water Supply and sanitation System is environmentally and socially feasible for implementation provided the recommended mitigation and monitoring measures implemented and the proposed implementation arrangements upheld.

11 BIBLIOGRAPHIES

1. Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets, available at www.ifc.org/HB-StakeholderEngagement).
2. WCS (2016). National red list for Uganda for the following taxa: mammals, birds, reptiles, amphibians, butterflies, dragonflies and vascular plants, www.nationalRed list.org/files/2016/03/National-Red list-for-Uganda.pdf
3. Constitution of the Republic of Uganda, 1995
4. Ministry of Water and Environment; Framework and Guidelines for Water Source Protection - Volume 2: "Guidelines for Protecting Water Sources for Piped Water Supply Systems"
5. National Draft National Air Quality Standards, 2006
6. National Employment Act, 2006
7. National Environment Health Policy -2005
8. National HIV/ AIDS Policy, 1992
9. Uganda Land (Amendment) Act, 2010,
10. Uganda Land Acquisition Act, Cap 229
11. Uganda Land Act, Cap 227(1998)
12. Uganda Local Governments Act, Cap 243
13. National Environment (Conduct and Certification of Environmental Practitioners) Regulations, 2003
14. National Environment (Environmental Impact Assessment) Regulations, 2020
15. National Environment (Noise Standards and Control) Regulations, 2003
16. National Environment (Waste Management) Regulations, 2020
17. National Environment Act, 2020
18. National Environment Management Policy, 1994
19. National Gender Policy, 1997
20. Occupational Health and Safety (OHS) Policy.
21. Occupational Safety and Health Act, 2006
22. Uganda Public Health Act, Cap 281
23. Uganda National Land Policy, 2013
24. Uganda Water Act, Cap 152
25. Uganda Workers' Compensation Act, 2000
26. Uganda's new Environmental Bill 2017,
27. All Africa.com. (n.d.). Uganda's Tourism Contribution To GDP Rises To Shs6 Billion. Retrieved from Uganda Tourism: http://www.visituganda.com/news/details/ugandas-tourism-contribution-to-gdp-rises-to-shs6-billion
28. bikalemesa, j. m. (n.d.). Hoima Town. Retrieved from Fortune of Africa: http://fortuneofafrica.com/ug/hoima/
29. Buckley , C., Foxon , K., Broukaert, C., & Rodda, N. (2008). Scientific support for the design and operation of Ventilated Improved Pit latrines (VIPs) and the efficacy of pit latrine additives. Pretoria: : Water Research Commission (WRC Project No. K5/1630).
30. Chan, J. K. (2010). World Applied Sciences Journal 10 (Special Issue of Tourism & Hospitality). Assessing Key Satisfiers and Sustainable Ecolodge, 78-90.

31. Githinji, D. N. (2011). Factors favoring the growth of Uganda's tourism industry. Retrieved from Uganda Travel Guide.
32. Hamilton , S. (2016). Creation of a Bathymetric Map of Lake Victoria, Africa. doi:http://dx.doi.org/10.7910/DVN/SOEKNR.
33. Hotel, H. K. (n.d.). Things to Do and Places to Discover while at Hoima Kolping Hotel . Retrieved from Hoima Kolping Hotel: http://www.ugandakolpinghotels.com/index.php/hoima-attractions
34. Joan, C., Aaron A, F.-S., & Marc A., D. (2015, December). Anaerobic digestion of undiluted simulant human excreta for sanitation and energy recovery in less-developed countries. Energy for Sustainable Development, 29, 57-64. doi:https://doi.org/10.1016/j.esd.2015.09.005
35. MWE. (2017). Uganda Water Supply Atlas 2017.
36. MWE. (2018). Uganda Water and Environment Sector Performance Report .
37. Myuganda. (2017, November). 250,000 More Tourists Expected in Uganda in 2018. Retrieved from MyUganda: https://www.myuganda.co.ug/about-uganda/250000-more-tourists-expected-in-uganda-in-2018
38. NASA. (2018, May 28). NASA SURFACE, METEOROLOGY, SOLAR ENERGY, AIR TEMPERATURE AND GLOBAL HORIZONTAL RADIATION 22 YEAR MONTHLY AVERAGED VALUES. Retrieved from https://eosweb.larc.nasa.gov/cgi-bin/sse/grid.cgi?&num=214091&lat=0.069&submit=Submit&hgt=100&veg=17&sitelev=&email=skip@larc.nasa.gov&p=grid_id&p=clrskyday&p=swv_dwn&p=exp_dif&p=avg_dnr&p=srf_dwn0&p=avg_kt&p=avg_nkt&p=clr_sky&p=clr_kt&p=clr_nkt&p=lwv_dwn
39. Schuster-Wallace , C., Wild , C., & Metcalfe, C. (2015). VALUING HUMAN WASTE AS AN ENERGY RESOURCE. Institute for Water, Environment and Health (UNU-INWEH). United Nations University. Retrieved from http://inweh.unu.edu/wp-content/uploads/2016/01/Valuing-Human-Waste-an-as-Energy-Resource-Web.pdf
40. Seguya, D. A. (2012). UGANDA VOTED AS THE BEST TOURIST DESTINATION. Retrieved from Uganda Tourism and resource center: Hoima district was part of former Bunyoro District. At Independence, Bunyoro was a kingdom and Hoima was an entity within the Kingdom. When Ugandan Kingdoms were abolished in 1967, Bunyoro became a district. In 1974 Bunyoro was divided into North Bunyoro

APPENDIX A: NEMA APPROVED LETTER FOR TERMS OF REFERENCE

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

19th September, 2022

The Permanent Secretary,
Ministry of Water and Environment,
P.O. Box 20026,
KAMPALA.

Tel: +256 414 505 942.
Email: mwe@mwe.go.ug / ps@mwe.go.ug

RE: SCOPING REPORT AND TERMS OF REFERENCE FOR UNDERTAKING AN ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF A SOLAR PIPED WATER SUPPLY AND SANITATION SYSTEM FOR BUGOMOLWA RURAL GROWTH CENTER, NKANDWA SUB COUNTY, KYANKWANZI DISTRICT (EIATOR 9561)

The Scoping Report and Terms of Reference (TOR) for carrying out an Environmental and Social Impact Assessment (ESIA) for the above-mentioned project that was submitted to this Authority for review and consideration for approval, refers.

This Authority has reviewed and considered the submission; and hereby grants **approval** of the Scoping Report and Terms of Reference. However, note that this approval **does not grant permission** to start implementation of any of the proposed project activities, as this is **not** an **EIA Certificate of Approval**.

In addition to the scope of work presented in the Scoping Report and TORs, the Ministry of Water and Environment, shall make due consideration of the following aspects during the conduct of the ESIA study, and the preparation of ESIA report:

i. The project description should comprehensively describe all the components, activities, processes including the equipment and any chemicals to be used, how they will be used, and stored, as well as precautions to minimise impacts on human health and the environment.

ii. Provide adequate information on the hydrological studies for the proposed water source to ascertain its sufficiency to sustain the piped water supply to the target communities without causing significant negative impacts on the water source.

iii. Make reference to the National Environment (Environment and Social Assessment) Regulations, S.I. 143/2020 and other applicable policies, laws and regulations, clearly highlighting the relevant provisions therein and measures that will be implemented to ensure compliance with the relevant environmental and social requirements.

iv. Undertake geotechnical investigations of the different project component sites to inform the design and construction of the different components of the solar water supply and sanitation system and describe how these findings have been taken into account. Attach the report of the geotechnical studies to the ESIA report.

v. Ensure that the baseline information provided is specific to the different project sites for the various project components, covering the soils, water, air quality and noise in the project area, as well as analyses of the relevant parameters likely to be negatively impacted by the project activities. Append results of analyses from an accredited laboratory to the report.

vi. Ensure that the Directorate of Water Resources Management, local communities nearby/along the project area of influence and Kyankwanzi District Local Government are among the entities consulted and the views/concerns of all the consulted entities are well-documented and included in the ESIA report.

vii. Attach to the ESIA report a well-labelled and legible copy of the proposed site lay-out plan (preferably covering A-3 paper size) clearly showing the location of the various project components.

viii. Append to ESIA report authentic copies of land acquisition / ownership documents or relevant authorization to utilize the land for the proposed project components and activities.

ix. Provide a detailed evaluation of alternatives/options of the water source, the project design, technologies to be used, component sites selection; and a justification for selecting the preferred option.

x. Attach a legible google map and photographs (preferably coloured) clearly showing the state of the proposed project components' location and their environs to assess compatibility.

xi. Ensure that **detailed evaluation of the potential environmental impacts**, risks and residual impacts associated with the proposed project components and activities is provided.

19/09/2022

xii. Provide **detailed mitigation measures and costed environmental management and monitoring plans** (*preferably in table matrix format*), to cater for the environmental and social impacts associated with the proposed project activities, covering both the construction and operational phases.

xiii. Provide details on the different waste streams that will be generated and the measures for safely handling and disposing of such waste so as to prevent pollution of the environment and negative impacts on human health.

xiv. Indicate the estimated cost of the project evidenced by a certificate of valuation of the capital investment of the project, issued by a qualified and registered valuer as provided in schedule 5 (3f) of the National Environment (Environmental and Social Assessment) Regulations, 2020.

xv. Be mindful of any other critical environmental aspects/concerns, which may have not been initially foreseen during the preparation of the TORs, and include assessment of such concerns in the ESIA report.

xvi. In accordance with regulation 49 (2) of the National Environment (Environmental and Social Assessment) Regulations, 2020, you are required to pay a non-refundable administration fee of thirty percent (30%) of the total ESIA fees payable upon submission of the Environmental and Social Impact Statement to this Authority.

Note that only registered environmental practitioners including the team leader should be contracted to conduct the ESIA for the proposed project.

This is therefore to inform you that you can proceed to carry out the ESIA studies for the proposed Solar Piped Water Supply and Sanitation system for Bugomolwa Rural Growth Centre, Kyankwanzi District.

19/09/2022

Patience Nsereko
FOR: EXECUTIVE DIRECTOR

APPENDIX B: RECORDS OF THE CONSULTATIONS

Stakeholder engagement meeting for the consultancy service for Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) and Source Protection Plans (SPP) for 5No. Large solar powered Piped Water Supply Systems and Sanitation Facilities in Bugomolwa & Kikonge-Nakasero in Kyankwanzi District, Lubaali in Kasanda District and Kikonge in Nakasongola district.		
Client: **MINISTRY OF WATER AND ENVIRONMENT (MWE)**	**Stakeholder:** Kyankwanzi District Local Government. **23RD, March, 2022.** **Kyankwanzi District offices- CAO's Office.** **Compiled by: AWE.**	Consultant: **AIR WATER EARTH (AWE) Ltd.**
		
Agenda;	1. Introduction. 2. Welcoming remarks from the Chairman. 3. Project introduction by Consultant's Team Leader AWE. 4. Remarks from the members present. 5. Discussions and way forward. 6. Closure of Meeting.	
1. Introductions and Welcoming remarks from the chair;	The meeting was chaired by the CAO, Ms. Tuuahurirwa Marion who welcomed Air water Earth to the District and thanked them for coming up with a good project in their district since the community is in need of water especially for livestock.	
2. Project introduction from the Consultant's Team Leader.	The team leader thanked the members present so that to discussion on the proposed water supply systems in the district. He then introduced the assignment of the team (ESIA, SPP and RAP studies), objectives, methodology, timelines and expectations from the district.	
3. Remarks from the members present	The CAO advised the consultants to get all the information concerning the project from the Technical Officers on all information so that the project could start as soon as possible. Atamba Elizabeth, the water officer noted that there are no financial resource in the budget for water source protection measures but the district has some water source protection measures programs. Water source protection committees are being formed and they pay 200,000/= for a borehole and 300,000/= for a valley dam for the construction. The money collected from these water sources is being used for the maintenance of the boreholes. The developmental partners working within the District are World Vision and CeCe, Community efforts for Child Empowerment that provides quifers for purifying water within the Community.	
4. Way forward from the consultant.	The district technical committee will be consulted concerning all the information needed to accomplish the assignment. All the local leaders and community members will be engaged to accomplish this assignment. Currently, at the scoping stage, followed by full ESIA studies, where the entire team will be engaged.	
5. Closure of meeting.	The meeting was then closed by the CAO who thanked the Consultants for the engaging the District Leadership in the initial stages of the project.	

Stakeholder engagement meeting for the consultancy service for Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) and Source Protection Plans (SPP) for 5No. Large solar powered Piped Water Supply Systems and Sanitation Facilities in Bugomolwa & Kikonge-Nakasero in Kyankwanzi District, Lubaali in Kasanda District and Kikonge in Nakasongola district.		
Client: MINISTRY OF WATER AND ENVIRONMENT (MWE)	**Stakeholder:** Nkandwa Subcounty. **24th, March, 2022.** **Venue: Nkandwa Subcounty Offices.** **Compiled by AWE Ltd.**	Consultant: **AIR WATER EARTH (AWE) Ltd.**
		
Agenda;	1. Opening Prayer. 2. Self-Introduction. 3. Remarks from the Chairperson LCIII. 4. Project introduction by the Team Leader AWE. 5. Question and Answer Session, Discussions and Reactions. 6. Action Points and way forward. 7. Closure of the meeting.	
1. Opening Prayer.	The Opening Prayer was said by Ajuna Edison the Parish Chief.	
2. Self-Introduction	The meeting was chaired by the Vice Chairperson III Nkandwa who welcomed Air water Earth consultants and thanked them coming in their district. Therefore, he requested all members present to introduce themselves then invited the consultant to brief the members about the project.	
3. Remarks from Chairperson LCIII.	The Chairperson LC III thanked AWE for the developed project in the area because water is life. The Project is overdue and people have been asking when they will get water. He noted the World Vision is one of the partners in the water and sanitation in the sub county they have plans of establishing a water supply scheme in the sub counties of Kiryanungu and Nkandwa. Water will be supplied in four villages within Nkandwa Sub county and the villages are: Nkandwa A, Nkandwa B, Kasanja and Lwemiyaga and also water will be supplied in ten villages after in Kiryanungu Sub county.	
4. Project Introduction by the Team Leader AWE.	The team leader thanked the District Leadership for the opportunity and time given to the team in relation to discussion on the proposed water supply scheme. He then introduced the assignment of the team (Water Source Protection Plans, ESIA and RAP studies), objectives, methodology, timelines and expectations. i) Scoping to develop Terms of Reference to be submitted to NEMA is the phase of the project that is being carried out. ii) Environmental and Social baseline studies will be carried out following World Bank Safe Guards after scoping. iii) After this Scoping stage, a compressive ESIA study will be conducted and most importantly the community will be the major stakeholder involved in the study. Documentation of their inputs, concerns, comments and suggestions will be key in the findings and recommendations. iv) Scoping is being carried out after seismic studies to establish the quantity and quality of water. A Solar water supply system will pump water into the reservoir from where it will be distributed to different public pipe stands. v) Resettlement Action plans will be carried out at a later stage for the reservoir area. A Surveyor and Valuer will be incorporated into this process.	
5. Questions and Answer Session, Discussions and reactions.	Mukeshimanya Beatrice, the Community Development Officer noted that water is very important in the community. Rape and defilement cases have been registered due to the long distances being traveled by the women to fetch water within the sub county for example in villages like Nakalama B where water is fetched in swamps surrounded by trees.	

	Inquiry from the Subcounty Chief; Ssekate Jude Thadeus, In order to mitigate social impacts that could arise from the project, will the Ministry have an MOU with the community in order to avoid ill acts from companies for example non-payment of workers and cases of Contractors leaving children behind after their period of work? **Reply from Environmentalist.** As part of ESIA studies, the Consultant will develop an Environment and Social Management Plan and an Environmental and Social Monitoring Plan. These will involve guidelines on how the Contractor should be managed by the District and Sub county out sourcing of Labour and which regulations to follow, guidelines on how the Contractor should mix with communities. The Consultant will also draft Grievance Redress Mechanisms so that tool to be used by aggrieved stakeholders about the project. **Question from Kibuuka Charles, Parish Chief.** When is the project expected to start and what methodology will be used for valuation during the Resettlement Action Plan? **Reply from the Sociologist:** Before the project is carried out, as a prequisite, baseline studies should be carried out. Approved rates from Land Boards and the Chief Government Valuer and Professional opinion will be used during the Resettlement Action Plan which is going to take place at the reservoir areas. **Inquiry from Ajuna Edison, the Parish Chief.** World Vision had interests of developing the source at Bugomolwa B but they were stopped by the Ministry of Water and Environment, their plan was to supply Ntimba sub county with water. **Reply from Environmentalist.** World Vision had no extraction of water permit so they could not carry out any activities concerning water source point. But as time goes on each are will be supplied with water. **Question from Takalirya Edward.** In case a borehole is drilled and the water is not enough for the community, what will be the solution? **Reply from the Environmentalist.** There are clauses in the Contractors Contract that will provide for operation and maintenance. However, the water source protection committees will be formed for these new water sources. Money collected from these sources will be used for operation and maintain ace. **Question from the Sub County Chief, Ssekate Jude Thadeus:** Could all the water sources to be constructed be put under an umbrella body for better operation and maintenance? **Reply from the Sociologist.** An example of an umbrella body is National Water and Sewerage Corporation that manages water in the urban areas. They are majorly profit making entities that set up their stands and pipes according to the demand for water in the area. However, since these are rural growth towns with populations of less than 5000, it is more practical to set up water committees and carry out water source protection. **Inquiry from the Sociologist.** Are there any cultural sites or particular cultural norms related to water that you would want us to take note of? **Reply from Sociologist.** There are no specific cultural sites of importance however in the area, there are believed cultures related to water for example, “when you dig a hole and put a pipe in the land, the soil loses its fertility.”
6. Action Points and Way Forward.	The Consultant will expedite the ESIA, RAP studies and water source protection plans so that the Contractor will come on ground. The Leaders should sensitize members of the community so that when teams doing socioeconomic studies will come on board. Consultations with other stakeholders including World Vision are ongoing.

Stakeholder engagement meeting for the consultancy service for Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) and Source Protection Plans (SPP) for 5No. Large solar powered Piped Water Supply Systems and Sanitation Facilities in Bugomolwa & Kikonge-Nakasero in Kyankwanzi District, Lubaali in Kasanda District and Kikonge in Nakasongola district.		
Client: MINISTRY OF WATER AND ENVIRONMENT (MWE)	**Stakeholder: Chairpersons of Bugomolwa A, Bugomolwa B, Bugomolwa Central, Kiyinikibi and Kyanywa of Nkandwa Sub county.** **March, 23rd, 2022** **Bugomolwa Primary School.** **Compiled by: AWE.**	Consultant: **AIR WATER EARTH (AWE) Ltd.**
		AWE Engineers
Agenda;	1. Introduction 2. Welcoming remarks from the Chairperson LC1 Bugomola 'A' 3. Project introduction 4. Remarks from the members present 5. Discussions and way forward 6. Closure of meeting.	
1. Introductions and Welcoming remarks from the chair;	The meeting was chaired by Nakimera Benna Mayanja, Chairperson Bugomolwa "A" who welcomed Air water Earth and the Chairperson present. She was excited about the water project because the community was water stressed. The only village with boreholes is Kyinikibi and Kyanwa with two boreholes each. Other villages do not have boreholes. The Government had constructed for them a dam in Kyinikibi but it does not have water therefore it is non-functional. These villages share Bugomolwa Trading Center with relatively low populations. Bugomolwa A has a population of 400people with 80 households while Bugomolwa B has a population of 700 people and 131 households, Bugomolwa Central has a population of 200 people and 59 households, Kiyinikibi has a population of 280 and 65 households and Kyanywa has a population of 300 and 70 households. She then welcomed the Consultants to give a brief of the Project.	
2. Project introduction the consultant.	The team leader thanked the Village Leadership for the opportunity and time given to the team in relation to discussion on the proposed water supply scheme. He then introduced the assignment of the team (Water Source Protection Plans, ESIA and RAP studies), objectives, methodology, timelines and expectations. • Scoping to develop Terms of Reference to be submitted to NEMA is the phase of the project that is being carried out. • Environmental and Social baseline studies will be carried out following World Bank Safe Guards after scoping. • After this Scoping stage, a compressive ESIA study will be conducted and most importantly the community will be the major stakeholder involved in the study. Documentation of their inputs, concerns, comments and suggestions will be key in the findings and recommendations. • The water source for these villages that share Bugomolwa Rural Growth Centre has been identified at Bugomolwa 'C'. • Scoping is being carried out after seismic studies to establish the quantity and quality of water. A Solar water supply system will pump water into the reservoir from where it will be distributed to different public pipe stands. • Resettlement Action plans will be carried out at a later stage for the reservoir area. A Surveyor and Valuer will be incorporated into this process.	
3. Remarks from the members	The Ministry of Water and Environment should consider compensation for the land at the source of and not only the reservoir area due to the fact that both are needed for the community development,	

present	this was suggested by the caretakers of the property where the source will be placed namely Muhumuza Solomon, Chairperson Bugomolwa 'C' and Matovu Patrick, VHT Coordinator Bugomolwa. Since the existing boreholes have already functioning water user committee, Water source protection for the new facilities will be carried out. The Chairpersons for two boreholes in Kyinikibi are Mr. Bukenya of Telephone number 0772014270 and Sevume Abiasali of telephone number 0758743287.While the numbers of the Chairman of the boreholes in Kyanywa are Abdu Nsereko of Telephone number 0779322544 and Chairman Mukasa of telephone number 0706052399. Households in the community that fetch water from these boreholes pay 5000/= every six months to the water user committees and this money is used for the maintenance of the boreholes. In the community there is one person who sells water on a motorcycle while six people sell the water on bicycles and three people carry and sell water to people's homes directly. Boreholes get spoilt mostly during the dry season. The water user committees consist of the Chairman, Secretary, Treasurer, Askarl, Vice Chairman and Information Secretary. The five villages mentioned are the project area but With time new connections and sources can be found in other villages in the Sub county depending on the quality and quantity of water. Water will then be extended to all the eighteen villages in Nkandwa Sub county.
4. Discussions and way forward	Both the community and the District will constantly be engaged during both studies. Other professionals namely the Valuer, the Surveyor and the team for Socioeconomic surveys will come on ground.
5. Closure of meeting.	The meeting was then closed by Takalirya Edward, the Vice Chairperson LCIII Nkandwa Sub county.

Stakeholder engagement meeting for the consultancy service for Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) and Source Protection Plans (SPP) for 5No. Large solar powered Piped Water Supply Systems and Sanitation Facilities in Bugomolwa & Kikonge-Nakasero in Kyankwanzi District, Lubaali in Kasanda District and Kikonge in Nakasongola district.		
Client: MINISTRY OF WATER AND ENVIRONMENT (MWE)	**Stakeholder: Chairpersons of Bugomolwa A, Bugomolwa B, Bugomolwa Central, Kiyinikibi and Kyanywa of Nkandwa Sub county.** **March, 23rd, 2022** **Bugomolwa Central Trading Centre** **Compiled by: AWE.**	Consultant: **AIR WATER EARTH (AWE) Ltd.**
		AWE Engineers
Agenda;	1. Introduction 2. Project introduction from the Sociologist. 3. Remarks from the members present 4. Discussions and way forward 5. Closure of meeting.	
1. Project introduction from the team leader.	The team leader thanked the Village Leadership for the opportunity and time given to the team in relation to discussion on the proposed water supply scheme. He then introduced the assignment of the team (Water Source Protection Plans, ESIA and RAP studies), objectives, methodology, timelines and expectations. • Scoping to develop Terms of Reference to be submitted to NEMA is the phase of the project that is being carried out. • Environmental and Social baseline studies will be carried out following World Bank Safe Guards after scoping. • After this Scoping stage, a compressive ESIA study will be conducted and most importantly the community will be the major stakeholder involved in the study. Documentation of their inputs, concerns, comments and suggestions will be key in the findings and recommendations. • The water source for these villages that share Bugomolwa Rural Growth Centre has been identified at Bugomolwa 'C'. • Scoping is being carried out after seismic studies to establish the quantity and quality of water. A Solar water supply system will pump water into the reservoir from where it will be distributed to different public pipe stands. • Resettlement Action plans will be carried out at a later stage for the reservoir area. A Surveyor and Valuer will be incorporated into this process.	
2. Remarks from the members present	The women were so grateful and thanked Awe team for the new water project in their community because of water scarcity. Long distances travelled looking for water will come to an end when they receive the tap water. Women emphasized that domestic violence cases will end since the women will have enough water for all the house chores for example cooking to avoid being beating by their husbands. Sanitation will be highly promoted in the households due to enough water in the community.	
3. Discussions and way forward	Both the community and the District will constantly be engaged during both studies. Other professionals namely the Valuer, the Surveyor and the team for Socioeconomic surveys will come on ground.	
4. Closure of meeting.	The meeting was then closed by Takalirya Edward, the Vice Chairperson LCIII Nkandwa Sub county.	

Stakeholder engagement meeting for the consultancy service for Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) and Source Protection Plans (SPP) for 5No. Large solar powered Piped Water Supply Systems and Sanitation Facilities in Bugomolwa & Kikonge-Nakasero in Kyankwanzi District, Lubaali in Kasanda District and Kikonge in Nakasongola district.		
Client: MINISTRY OF WATER AND ENVIRONMENT (MWE)	**Stakeholder: Chairpersons of Bugomolwa A, Bugomolwa B, Bugomolwa Central, Kiyinikibi and Kyanywa of Nkandwa Sub county.** **March, 23rd, 2022** **Bugomolwa central Trading centre.** **Compiled by: AWE.**	Consultant: **AIR WATER EARTH (AWE) Ltd.**
		AWE Engineers
Agenda;	**1. Introduction** **2. Welcoming remarks from the Chairperson LC1 Bugomolwa 'A'** **3. Project introduction** **4. Remarks from the members present** **5. Discussions and way forward** **6. Closure of meeting.**	
1. Introductions and Welcoming remarks from the chair;	The chairman thanks the Awe team for coming in the district and was grateful for the new water project because his community lacked enough water. He said that it is always a good idea to consult the community local leaders about any project to take place in the community. He promised full support towards the Awe team during their research studies and requested the community members to be cooperative.	
2. Project introduction from the team leader.	The team leader thanked the Village Leadership for the opportunity and time given to the team in relation to discussion on the proposed water supply scheme. He then introduced the assignment of the team (Water Source Protection Plans, ESIA and RAP studies), objectives, methodology, timelines and expectations. • Scoping to develop Terms of Reference to be submitted to NEMA is the phase of the project that is being carried out. • Environmental and Social baseline studies will be carried out following World Bank Safe Guards after scoping. • After this Scoping stage, a compressive ESIA study will be conducted and most importantly the community will be the major stakeholder involved in the study. Documentation of their inputs, concerns, comments and suggestions will be key in the findings and recommendations. • The water source for these villages that share Bugomolwa Rural Growth Centre has been identified at Bugomolwa 'C'. • Scoping is being carried out after seismic studies to establish the quantity and quality of water. A Solar water supply system will pump water into the reservoir from where it will be distributed to different public pipe stands. • Resettlement Action plans will be carried out at a later stage for the reservoir area. A Surveyor and Valuer will be incorporated into this process.	
3. Remarks from the members present	The members thanked Awe team for the information that was given concern the new water project. The community members requested the Awe team to offer them job opportunities during the construction phase.	
4. Discussions and way forward	Both the community and the District will constantly be engaged during both studies. Other professionals namely the Valuer, the Surveyor and the team for Socioeconomic surveys will come on ground.	
5. Closure of meeting.	The meeting was then closed by Takalirya Edward, the Vice Chairperson LCIII Nkandwa Sub county.	

APPENDIX C: ATTENDANCE LISTS

STAKEHOLDER CONSULTATION

ATTENDANCE REGISTRATION SHEET

Name of Agency/Stakeholder:	NKANDWA SUBCOUNTY MEETING				
Purpose of consultation (tick appropriate box)	Scoping	✓	ESIA	✓	
	Sensitisation		RAP	✓	
	Environmental Audit		Other (specify)		
Date:	24th March 2022				
Project name:	RAP, ESIA AND WSPP FOR SOLAR POWERED WATER RESOURCES				
Proponent:	MINISTRY OF WATER AND ENVIRONMENT				

Name of person met:	F/M	Designation	Contact (Tel)	Sign/ initial
TAKALIRYA [illegible]	M	V/C/P LC III NKANDWA	0758250646	[signature]
SSEKATE JUDE THADEUS	M	SUB-COUNTY CHIEF	0717-422418	[signature]
KIBUUKA CHARLES	M	PARISH CHIEF	0789562289	[signature]
MUZAMIRU Kalid	M	Secr. for health	0708047213	[signature]
KAMUGA Jimmy	M	I-D	0780721001	[signature]
NYAKAITSI VIOLET	F	PARISH CHIEF	0776616542	[signature]
MUKESHIMANA BEATRICE	F	CDO	0758119 6240	[signature]
AJUNA EDISON	M	PARISH CHIEF	0777222466	[signature]
NYAKAITU [illegible]	F	PARISH CHIEF	0781251301	[signature]

Air Water Earth (AWE LTD)
www.awe-engineers.com
ISO9001:2008
Stand. Doc. No. AWE/034

STAKEHOLDER CONSULTATION

ATTENDANCE REGISTRATION SHEET

Name of Agency/Stakeholder:	KYANKWANZI DISTRICT LOCAL GOVERNMENT				
Purpose of consultation (tick appropriate box):	Scoping	✓	ESIA	✓	
	Sensitisation		RAP	✓	
	Environmental Audit		Other (specify)		
Date:	MARCH 23rd 2022				
Project name:	RAP, ESIA AND SCOPING FOR RGC UNDER SOLAR POWERED WATER SYSTEMS IN KYANKWANZI				
Proponent:	MINISTRY OF WATER AND ENVIRONMENT				

Name of person met:	F/M	Designation	Contact (Tel)	Sign/ initial
① TUMWIRIRWA MARION	F	CAO	0772413380	[signature]
② Atuhaire Elizabeth	F	ADHO-SAN	0705728701	[signature]
③ Nankya Dorothy E.	F	DNRO	0701115623	[signature]
④ KABUNGA HOOD	M	PHYSICAL PLANNER	0705470036	[signature]
5. Aseka George	M	ADHO (MOB)	0782405163	[signature]
6. SSERAGGALA WILLIAM	M	DISTRICT PLANNER	0772399095	[signature]

Air Water Earth (AWE LTD)
www.awe-engineers.com
ISO9001:2008
Stand. Doc. No. AWE/034

STAKEHOLDER CONSULTATION

ATTENDANCE REGISTRATION SHEET

Name of Agency/Stakeholder:	NKANDWA SUB COUNTY KYANKWAZI DISTRICT				
Purpose of consultation (tick appropriate box):	Scoping	✓	ESIA	✓	
	Sensitisation		RAP	✓	
	Environmental Audit		Other (specify)		
Date: March 23rd 2022					
Project name: ESIA, RAP WSPP FOR RGCs UNDER SOLAR POWERED WATER SYSTEMS IN KYANKWAZI					
Proponent: MINISTRY OF WATER AND ENVIRONMENT					

Name of person met:	F/M	Designation	Contact (Tel)	Sign/ initial
BAGAMBA EZRA	M	Bugomolwa Centre	0782184935	[signature]
HAKIMERA BENHA MAYANJA	F	BUGomolwa 'A' C/P	0781260570	[signature]
TAKAFIRWA EDWARD	M	V/C/PLOT NKANDWA	0785019705	[signature]
BANANA KYANDA YESSE	M	C/P LCII BUGomolwa	0777423180	[signature]
MUHUMUZA SOLOMON M.	M	C/PERSON BUGOMOLWA C	0782058446	[signature]
SSEKIMPI LEONARD	M	C/PERSON KYAMUYWA	0705286779	[signature]
MUKUSANGA LAWRENCE	M	C/P LC'I KINIKIBI	0751244917	[signature]
MATOVU PATRICK	M	VHT co-ordinator Bugomolwa	0777467434	[signature]
KAKANDA RICHARD NJOGERERE	M	C/PERSON L.C.I Bugomolwa B	0781058214	[signature]

Air Water Earth (AWE LTD)
www.awe-engineers.com
ISO9001:2008
Stand. Doc. No. AWE/084

APPENDIX D: QUESTIONNAIRE

GOVE ANDA
MINISTRY OF WATER AND ENVIRONMENT

SOCIAL-ECONOMIC SURVEY QUESTIONNAIRE

CONSULTANT

AIR WATER EARTH (AWE)

www.awe-engineers.com

SOCIOECONOMIC SURVEY QUESTIONNAIRE –

We are currently conducting a social survey study and you are being selected as one of the key respondents for this exercise. **Your** responses are aimed at aiding successful preparation of the feasibility study **only** and shall be treated with the highest level of confidentiality they deserve.

Date of interview: ____ /_____/2022

Village: _____ County _____ Sub county:_____

Parish: _____ District: _____

SECTION A: FAMILY INFORMATION

Name of Household Head (Surname, First Name) _____

Gender: _____ (M/F)

Age Range:

(18-25)	☐	(46-55)	☐
(26-35)	☐	(56-65)	☐
(36-45)	☐	Over 65	☐

Tribe:

Banyankore	☐	Baganda	☐
Banyarwanda	☐	Banyoro	☐
Bakiga	☐	Others specify ……..	
Batooro	☐		

Is the household head from this area? Yes ……. No

If no, When did you migrate to this area?: _____ ☐ ☐

What was the cause of the migration?

Marriage	☐	Conflicts	☐
Business	☐	Others specify ……..	
Employment	☐		

Marital status (tick appropriate response):

Single	☐	Widowed	☐
Married No:_____	☐	Others specify ……..	
Divorced	☐		

What is religious affiliation of the HH head?

Catholic	☐	Pentecostal	☐
Protestant	☐	SDA	☐
Islam	☐	Others specify ……..	

Have you attended any form of education? Yes ……. ☐ No ☐

If yes, what is the highest level of education you/ attained/currently in?

Primary Level	☐	Vocational Training	☐
Ordinary Level	☐	University	☐
A' level	☐	Others specify ……..	

Do you know how to read and write the English language?	Yes ☐ No☐
Do you know how to read and write in the local language?	Yes ☐ No☐
Do you have any school going child in the Household	Yes ☐ No☐
How do they access the schools?	Footing ☐ 3. Motorcycle ☐ Bicycle ☐ 4. Others (specify) …… ☐
What problems affect the quality of education at school attended by your child?	……..……..

How many people live in the household? _____

Adult Males	
Adult Females	
Children Males	
Children Females	

How many people living in the household are elderly?.....

How many people living in the household are disabled?.....

What kind of vulnerability do you have (HH)? (Can be multiple response)

1. Very Old (Aged 65+)		Widowed		Child- headed	
2.Disabled		Displaced		Others (specify)	
3. Chronically ill		Female-Headed			

In what capacity do you live on this land? (Tick appropriate response)

Land Owner	☐	Squatter	☐
Tenant (Kibanja)	☐	Licensee	☐
Co-owner	☐	Encroacher	☐
		Others specify ……..	

What land type is your piece of land?

Customary	☐	Lease Hold	☐
Freehold	☐	Others specify ……..	

How long have you lived on / used this land? ..... (Years)

How did you acquire this land?

Bought	☐	Squatter	☐
Inherited	☐	Allocation by LC 1	☐
Renting	☐		

What is the average size of your land ……..(acres)

On average, What is the cost of an acre of land when sold? _____

Do you have any land related conflicts in your area? Yes ☐ No ☐

If yes, What is the main source of Land conflicts? _____

How are Land conflicts addressed or resolved in this area? _____

Apart from settlement, what do you use the land for?

Crop farming	☐	Bee Keeping	☐
Livestock grazing	☐	Extraction (e.g murrum)	☐
Trading/business activities	☐	Others specify ……..	

Who ensures there is food in the household

Household Head	☐	Daughter	☐
Spouse	☐	Grand child	☐
Son	☐	Others specify ……..	

How many meals do you have in a day?

One	☐	Three	☐
Two	☐	Others specify ……..	

Does your household often have food surplus?

Always	☐	Sometimes	☐
Frequently	☐	Once in a while	☐
		Never	☐

Does your household ever go hungry at any time of the year?

Always	☐	Sometimes	☐
Frequently	☐	No	☐
		Never	☐

If yes, during what season (Specify months)

January	☐	July	☐
February	☐	August	☐
March	☐	September	☐
April	☐	October	☐
May	☐	November	☐
June	☐	December	☐

What are the common food crops grown in the household?

1=Maize
2= Sweet potatoes
3= Cassava
4 = Beans
5= Bananas
Others (specify)…….

What are the common cash crops grown in the household? 1= Coffee 2= Cotton 3= Tobacco Others (specify)…….		
What is the approximate distance to the market from your household?	0-1.5 km 1.5-2.5km 2.5-3.5km 3.5- 5km Over 5km	
Does the household keep any animals? 1. Yes 2. No	Yes	No
If yes, how many of the following animals does the household have?	Cattle	
	Goats	
	Sheep	
	Chicken	
	Ducks	
	Pigs	
	Others (specify)	
How does the household graze their animals?	Free range (common property) Grazing on private/household property, Others (specify)_____	
Where do you obtain water for animals?	River Stream Unprotected well Unprotected Spring Communal borehole Protected well Protected Spring Other (Specify)	

Do you do fishing in the present situation? Yes ☐ No ☐

Are there areas / features of spiritual significance to you or your community on your lan☐? Yes ☐ No

If yes, what is the feature?_____

SECTION B: HOUSEHOLD ASSETS and livelihood Resources

Main source of income of head of household: _____

Main source of income		Subsistence	Commercial
	1 Agriculture, crop		
	2 Agriculture,		

	Livestock		
	3 Fishing/Fish farming		
	4 Salaried Employment 5 Trading (Specify) _____ 7 Casual Wage Labourer 8 Remittance from abroad 9 Pension 10 Others specify ……..		

What is the average household income? ((UgShs))		
Do you have any household member having access to regular source of income?	Yes	No
For those household members who are participating in economic activities, what are their various sources of income	Yes	No
How much do you spend on the following per month?		
Transport monthly		
Rent monthly		
Water bills monthly		
School fees monthly		
Clothing monthly		
Food monthly		
Medical bills monthly		
Energy monthly		
Other expenses		

Do you have at least one of the following items in this household (read out)? 1. Yes ☐ 2. No ☐

Radio	Mobile phone
Television	Land
Bicycle	House
Motorcycle	Animals
Car	Hoes
Shop	Solar panel
Ploughs	Others specify ……

If you wanted to borrow 100,000 for one month from a person outside your home, would this be easy?	Yes	No
What is the highest amount of money you would borrow for a		

month in this area		
Do you have any borrowing institutions or associations in your area?	Yes	No
If yes, Mention any one of them (write the name of the institution)		

Do you have electricity in this area? 1. Yes 2. No

What type of energy is used for the following activities in your household? ***(Tick as applicable*)**

Activity	**Grid Electricity**	**Kerosene**	**Firewood**	**Charcoal**	**Solar system**	**Gas**	**Biogas**
Lighting							
Cooking							
Electronic gadgets							

What major problems do you experience in your area?

a) Major problems (circle the code)	b) Specify/What causes the problems
Income related problem?	
Production related problem	
Marketing problem	
Illiteracy and Ignorance	
Access to quality education	
Disease	
Access to quality healthcare	
Transport problems	
Remoteness and isolation	
Environmental problems	
Land wrangles	
Others (Specify)	

FARM PRODUCTION AND FOOD SECURITY
What is the major source of food for this household? Buy from the market ☐ Grown on this parcel ☐ Grown elsewhere ☐ Other *(specify)*……
Where do you usually sell your produce? Don't sell at all ☐ Local market ☐ Outside market ☐ (far from home) Outside the district ☐ Co-operatives ☐ Other *(specify)* ……
What problems have you experienced in your production activities? (Multiple response - Probe for: water, soils, land size, capital, attitude etc.) …… ……

GENDER ROLES

Among the household members, whose primary responsibility is it to: ***(Tick)***	Activity	Husband	Wife	Adult Male	Adult Female	Young Male	Young Female	All household Members
	1). Cultivation							
	2).Harvesting							
	3).Fire wood collection							
	4).Water collection							
	5).Building house							
	6).Purchase household items							
	7).Paying for health							
	8).Paying for school fees							

SECTION D: ACCESS TO WATER: (Include all the questions given by Engineer)

What is the main source of water for your household?	*Source of water*	*Distance from household (meters)*	
	1. River/Stream	0-1.5 km 1.5-2.5km 2.5-3.5km	3.5- 5km Over 5km
	2. Household connection	0-1.5 km 1.5-2.5km 2.5-3.5km	3.5- 5km Over 5km
	3. Rain water/ harvesting	0-1.5 km	3.5- 5km

	Tanks	1.5-2.5km 2.5-3.5km	Over 5km
	4. Unprotected well	0-1.5 km 1.5-2.5km 2.5-3.5km	3.5- 5km Over 5km
	5. Unprotected Spring	0-1.5 km 1.5-2.5km 2.5-3.5km	3.5- 5km Over 5km
	6. Protected well	0-1.5 km 1.5-2.5km 2.5-3.5km	3.5- 5km Over 5km
	7. Yard Taps/ Public stand posts	0-1.5 km 1.5-2.5km 2.5-3.5km	3.5- 5km Over 5km
	8. Communal borehole/Pump	0-1.5 km 1.5-2.5km 2.5-3.5km	3.5- 5km Over 5km
	9.Protected Springs	0-1.5 km 1.5-2.5km 2.5-3.5km	3.5- 5km Over 5km
	10.Other (specify)	0-1.5 km 1.5-2.5km 2.5-3.5km	3.5- 5km Over 5km
How sufficient is the water?	Throughout the year Insufficient during the dry season	Insufficient throughout the year Other (Specify) ……..	
How much time per day do you spend fetching water on a single trip?	Less than 30 minutes 30 minutes to 1 hour	1_2 hours More than 2 hours	
How many 20Ltr jerricans of water do you use per day?			
Do you pay for the water you consume?	Yes	No	
If yes, how much do you pay per day?			
Are you satisfied with the quality of drinking water? (Taste, colour, odour, hardness)	Fully satisfied ☐ Satisfied ☐ Neutral ☐	Not very satisfied ☐ Not satisfied at all ☐	
What are the reasons for non – satisfaction with the quality?	Taste ☐ Colour ☐ Odour ☐	Hardness ☐ Others specify ☐ ☐	
What problems do you encounter with the water sources?	1. Too steep 2. Too expensive	6. Swampy 7. Long Queue	

	3. It dries up 8. Others (Specify)…… 4. Long distance 5 Poor water quality	
Do you boil Water for drinking?	Yes ☐	No ☐
How satisfied are you with the current water supply?	Fully satisfied ☐ Satisfied ☐ Neutral ☐	Not very satisfied ☐ Not satisfied at all ☐
How reliable is the water supply (Specify the number of breakdowns in a month)	1 2 3	Above 3 Not Applicable
How much time is taken to repair breakdowns	Hours Days Weeks	Months N/A
What is your preferred water source?		

SECTION E: WILLINGNESS TO PAY

Would you and your household members be willing to actively participate and contribute towards the project implementation activities	Yes	No
Would you be willing to pay for improved water services	Yes	No
How much would you be willing to pay per 20Ltre jerrycan of water	Shs 500 Shs 400 Shs 300	Shs 200 Shs 100 Other (Specify)
What is the preferred distance of a stand post from your home	500 metres 400 metres 200 metres	100 metres Other (Specify)
What suggestions would you you give for the water tap sustainability		

SECTION F: SANITATION FACILITIES AND PRACTICES (Include all the questions by the water analysist- Engineer)

Does your household have a latrine/other toilet facility?

If yes, Specify the kind of Latrine/ Toilet facility?

Traditional pitlatrine ☐ Ecosan toilet ☐

Ventilated Improved Pitlatrine ☐ Shallow pits

Flush toilet ☐ Others specify……

If no, how do you dispose human waste in your household

Open bush
Community Latrine
Other (Specify)

Specify the hygienic Status of the toilet/ Latrine	Clean Dirty Not Applicable	
Does the Latrine have a cover?	Yes	No
Does the toilet/Latrine have a cleanable slab	Yes	No
(Through Enumerator observation), Are there any faeces around the compound of the household	Yes	No
Does the household have proper drainage	Yes	No
What is your preferred Toilet/ Latrine technology?		

Do you have a working hand washing facility next to the latrine /toilet? Yes ☐ No ☐
Does your household have a drying rack? Yes ☐ No ☐
What is the **major** method of disposing household waste?

Burn Backyard Dustbins	Dump Dig a hole Other (Specify)

SECTION E: ACCESS TO HEALTH SERVICES

Has anyone in your household been ill, had an accident in the last two months? Yes ☐ No ☐

What are the most common illnesses, health issues in your household?		Which of these long-term illness (chronic)/conditions do members of your household have	
Malaria Cough/Flu STIs Burns Ulcers	Eye infection Water related disease Respiratory infections Intestinal diseases Others (specify)	Diabetes Hypertension HIV/AIDs TB Cancer Epilepsy	Paralysis Nodding disease Speech impairment Blindness Hearing Disability Others (specify)
Specify the water related disease; incase of 7			

What kind of health facility does your household use?

Facility	Name	Facility	Name
Government Health Centre I	……	FBO Hospital	……
Government Health Centre II	……	Drug shop	……
Government Health Centre III	……	NGO hospital	……
Community hospital	……	Herbalist	……
Private hospital	……	Do not use any	……
Private clinic	……	Other (specify)	……
Pharmacy	……		

How far is the nearest health center in kilometers?

0-1.5 km☐ 1.5-2.5km ☐ 2.5-3.5km ☐ 3.5- 5km ☐ Over 5km ☐

How satisfied are you with the services offered at the health facility?

Very satisfied ☐ Dissatisfied ☐ Indifferent☐

Satisfied ☐ Very Dissatisfied ☐

If Yes/ No, state the reason……

Is every child of 5 years and below in your Household fully immunized?

Yes ☐ No ☐

b) If No, what is the reason they are not immunized?

Not interested ☐ Do not know ☐

Afraid of immunizing ☐ Far off the facility ☐ Others, (Specify)……

Do all members of your household have access to mosquito nets?

Yes ☐ No ☐

Are you knowledgeable of HIV/AIDs means of contraction and its effects? Yes ☐ No ☐

Are there any HIV and AIDS services available to the people in this community☐ Yes ☐ No ☐ Don't know

If yes, what HIV and AIDS services are available to the community?

What challenges do people face in accessing these services?

Do you practice family planning in your household? Yes ☐ No ☐

SECTION H: COMMUNICATION

How does the household/community access/receive information and news? (multiple)	Community meetings Village Public speakers IEC materials, posters Radio TV Extension work by government officials	Newspapers Places of worship Neighbours Internet others (specify…….
What the most prefered source of information?		
Name the radio stations most listened to by the household.		
	☐ ☐	
What is the commonest form of transport in your area? Boda Boda Taxi Private car Walking		

SECTION I: ENVIRONMENTAL ISSUES

What are some of the major environmental problems in your household?	Soil erosion Reduction in Agriculture production. Famine/ Drought	Loss of soil fertility Flooding. Over-use of agro-chemicals Land slides Drainage Others specify.
In your opinion what can be done to mitigate these environmental problems?	Public education Re-afforestation Control of soil erosion terracing	Heavy penalty on polluters God's intervention Others (specify)
What are the **main** sources of information on environmental issues?		

SECTION J: COMMUNITY INVOLVEMENT AND PARTICIPATION IN DEVELOPMENT PROJECTS

What is the major attitude of community members towards participation in development activities? Positive Very positive Negative
What is a major cause of problems/violence in the community?
How would you want to participate in the project development? outline them--ARSDP

Have you or anyone close to you in your household experienced domestic violence?	Yes	No
If yes, briefly explain the cause of the violence		
What kind of violence was it?		
How was the issue addressed and resolved	LCs Police Courts of Law Clan/Elders	Religious Institutions Mutually resolved Other (Specify)

SECTION L: KNOWLEDGE OF THE PROJECT

Is there any Livelihood group in your community? Yes ☐ No ☐

a) Do you belong to any of them? Yes ☐ No ☐

If yes, what is the name of the group? _____

Do you know about the proposed project? Yes ☐ No ☐

If yes, what do you know about it? _____

SECTION M: CHALLENGES AND OPPORTUNITIES:

What positive outcomes do you or your community anticipates benefiting from the implementation of the water supply project Infra-structural development Creation of employment Provision of clean and safe water Easy water access Boosting of businesses Development of other sectors Other (Specify)
What negative outcomes do you and your community expect from the implementation of this proposed project? Displacement of people Theft Noise pollution Air pollution Loss of land Destruction of houses and property Destruction of crops High crime rates Other (Specify)
What are the biggest challenges with which you as a household must cope? High costs of rent Low incomes High taxes High water bills Unemployment High electricity bills Inadequacy of clean water Pollution High crime rates High costs of Education Other (Specify)

THANK YOU

APPENDIX E: WATER QUALITY CERTIFICATES

MAKERERE UNIVERSITY
DEPARTMENT OF CIVIL ENGINEERING
PUBLIC HEALTH AND ENVIRONMENTAL ENGINEERING LABORATORY
Tel: 041-4543152 E-mail: robinah.kulabako@mak.ac.ug

CERTIFICATE OF ANALYSIS -WATER QUALITY

CLIENT : Air Water and Earth (MWE)

PROJECT : Consultancy services for ESIA RAP and source protection plans for five large solar powered piped water supply system and sanitation facilities in Bugomolwa and Kikonge Nakasero (Kyankwazi), Lubocali (Kasanda) and Kikonge (Nakasongola)

Sampling date:22nd to 25th March 2022 **Delivery date**: 28th March 2022 **Analysis date**: 28th to 30th March 2022

Sample ID / Parameters	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Apparent color (Ptco)	45	262	6	33	34	9	0	9	46	314	0	7	51	191	165	102
Total Alkalinity mg/L	135	145	95	105	105	110	105	95	100	100	110	100	90	95	80	105
Nitrates mg/L	20.6	nd	4.6	7.7	11.4	15.9	14.8	6.1	16.8	4.8	4.2	18.6	21.9	5.5	24.9	12.3
Ammonia mg/L	0.033	0.002	0.001	nd	0.019	nd	nd	0.001	0.001	0.009	0.009	0.010	nd	0.009	nd	nd
Total Phosphorus mg/L	0.003	0.140	0.002	0.193	0.320	0.331	0.029	0.25	0.259	0.435	0.308	0.03	0.002	0.155	nd	0.002
Ortho Phosphates mg/L	nd	0.067	nd	0.094	0.156	0.162	0.013	0.105	0.128	0.217	0.153	0.010	nd	0.077	nd	nd
Fluorides mg/L	0.56	0.06	0.89	nd	0.52	0.16	2.22	0.12	0.01	1.66	0.20	0.36	0.25	0.04	2.40	2.42
Total Iron mg/L	5.16	0.89	0.30	0.15	0.25	0.29	0.21	0.09	0.62	5.32	0.08	0.11	0.08	1.07	0.73	0.67
Chlorides mg/L	30.2	2.3	3.2	14.2	12.9	2.7	2.0	1.1	1.0	1.4	0.9	13.9	2.1	4.8	4.1	5.6
Manganese mg/L	0.13	0.01	0.05	0.08	nd	0.12	0.02	0.04	0.01	0.03	0.02	0.06	0.01	nd	nd	0.02
BOD_5 mg/L	nd	7	12	24	21	3	29	18	15	11	14	23	10	13	40	33
COD mg/L	6	26	32	63	59	14	66	42	36	25	44	61	45	32	110	103
Thermotolerant coliforms (cfu/100mL)	10	3985	4250	20	3935	6995	715	20	2100	575	0	140	71	320	495	155

Key: nd-Not detected; Detection limit for Nitrates, Ammonia, Total Phosphorus, Ortho Phosphates, Fluorides, Manganese and BOD_5 is 0.015, 0.008, 0.02, 0.005, 0.02 and 0.01, 0.5mg/L respectively.

Sample description (source name) and appearance

1. Kikooge Nakasongola District — Clear water with no visible suspended solids
2. Lake kyoga Nakasongola — Unclear water with visible suspended solids
3. Kikooge well 2 — Clear water
4. Kikooge Bore hole 3 — Clear water
5. Katuba Primary school — Clear water
6. Kikonge community BH Kyankwanzi — Clear water
7. Kikonge community BH1 Kyankwanzi — Clear water
8. Kamegeje BH — Clear water
9. Banangwa source BH — Clear water
10. Kikonge unprotected spring — Dirty water with visible suspended solids
11. Nakasero BH — Clear water
12. Kiyinikibi BH — Clear water
13. Kyangwa BH — Clear water
14. Kalungi spring kasanda District — Unclear water with visible suspended solids
15. Lubaali community BH Kasanda District — Unclear water with visible suspended solids
16. Lubaali shallow well Kasanda District — Unclear water with with some visible solids

07 APR 2022

Checked by: Robinah N. Kulabako (PhD)
In-charge PHEE lab

APPENDIX F: NATIONAL AIR QUALITY STANDARDS

POLLUTANT	AVERAGING TIME FOR AMBIENT AIR	EXAMPLES TO WHICH STANDARDS ARE APPLICABLE TO	STANDARD FOR AMBIENT AIR	STANDARD FOR EMISSIONS (POINT SOURCES)
Acid mist	24 hr	Acid manufacture, battery manufacture and acid changing, chemical stores and labs	100 μgNm^{-3}	
Ammonia	24 hr	Refrigeration, chemicals stores and labs, fish processing Combustion processes, boilers or any process involving sulphur burning	200 μgNm^{-3}	50 mg/Nm^3
Asbestos	24 hr	Construction industry, garages/car repairs, asbestos manufacture	0.01 fibres ml^{-1}	
Baggase	24 hr	Sugar processing plants	200μNgm^{-3}	
Carbon dioxide	8 hr	Breweries, soft drink industries, burning processes	9.0 ppm	
Carbon monoxide	8 hr	Combustion processes, boilers	9.0 ppm	
Cement	24 hr	Cement industries, construction	200 μgNm^{-3}	50 mg/Nm^3
Ceramics	24 hr	Tile and brick industries, ceramic industries, construction	200 μgNm^{-3}	
Chlorine	24 hr	Water treatment, fish processing, chemical stores and labs	200µg Nm^{-3}	< 3mg/Nm^3
Cobalt	1 month	Cobalt processing, copper mining	1.0 μgNm^{-3}	
Coffee dust	24 hr	Coffee processing and trading	200 µg Nm^{-3}	
Cotton fibres	24 hr	Cotton farming, ginning and export, textile manufacture	200 μgNm^{-3}	
Copper dust	1 month	Copper mining and processing, metal works and fabrication	1.0 μgNm^{-3}	0.5 mg/Nm^3
Electrode manufacture emissions	24 hr	Electrode manufacture, garages/car repairs, welding, metal fabrication	150 μgNm^{-3}	20 mg/Nm^3
Grain dust	24 hr	Grain milling, bakeries, feed mills, breweries, agriculture	200μgNm^{-3}	
Hydrocarbons	24 hr	Chemical stores and labs, fuel depots and stations	5 mgm^{-3}	
Hydrogen Sulphide	24hr	Waste water treatment, tanneries	15 μgNm^{-3}	15 mg/Nm^3
Lead	1 month	Battery manufacture and repair metal fabrication	1.0 μgNm^{-3}	0.5 mg/Nm^3
Lime	24 hr	Lime and cement industries, agriculture, construction	200 μgNm^{-3}	
Nitrogen oxides (NO_x)	24 hr 1 year Arithmetic mean	Combustion processes, welding	0.10 ppm	300 mg/Nm^3
Ozone	1 hr		0.10 ppm	
Pesticides	24 hr	Pest control and plant protection		
Phosphates	24 hr	Fertiliser manufacture, soap and detergents industry	200 μgNm^{-3}	50 mg/Nm^3
Silica	24 hr	Construction industry, detergent and manufacture, quarries	200 μgNm^{-3}	

POLLUTANT	AVERAGING TIME FOR AMBIENT AIR	EXAMPLES TO WHICH STANDARDS ARE APPLICABLE TO	STANDARD FOR AMBIENT AIR	STANDARD FOR EMISSIONS (POINT SOURCES)
Smoke	Not to exceed 5 min. in any one hour	Industry, trade or nay combustion process	Ringlemann scale No.2 or 40% observed at 6m or more	
Soot	24 hr	Combustion, charcoal and brick making, boilers	500 µgN m^{-3}	
Sulphur dioxide	24 hr	Combustion processes, boilers or any process involving sulphur burning	0.15 ppm	400 mg/Nm^3
Sulphur trioxide	24 hr	Sulphur burning, sulphuric acid manufacture	200µgNm^{-3}	
Synthetic fibres	24 hr	Synthetic textiles manufacture	0.01fibres ml^{-1}	
Tea dust	24 hr	Tea processing and manufacture	200 µgNm^{-3}	
Tobacco dust	24 hr	Cigarette manufacture including tobacco curing, tobacco farming	200µgN m^{-3}	
Total suspended particles/ particulate emissions	24 hr	Industries (e.g. cement, lime), quarries, grain milling, coffee processors, pharmaceuticals and any other trade	300 µgN m^{-3}	<50mg/Nm^3
Wood dust	24 hr	Saw mills, timber works and furniture making, construction	1 mgNm^{-3}	20mg/Nm^3
VOCs	24 hr	Breweries, fuel depots and stations	6 mgNm^{-3}	20mg/Nm^3

Beaufort scale of wind speed

Beaufort scale number and description	Wind speed equivalent at a standard height above flat ground		Specifications for estimating speed over land
	m/s	Km/hr	
0 Calm	0 – 0.2	< 1	Calm; smoke rises vertically
1 Light air	0.3 – 1.5	1 – 5	Direction of wind shown by smoke-drift but not wind vanes
2 Light breeze	1.6 – 3.3	6 – 11	Wind felt on face; leaves rustle; ordinary vanes moved by wind
3 Gentle breeze	3.4 – 5.4	12 – 19	Leaves and small twigs in constant motion; wind extends light flag
4 Moderate breeze	5.5 – 7.9	20 – 28	Raises dust and loose paper; small branches are moved
5 Fresh breeze	8.0 – 10.7	29 – 38	Small trees begin to sway, crested wavelets form on inland waters
6 Strong breeze	10.8 – 13.8	39 – 49	Large branches in motion; whistling heard; umbrellas used with difficulty.
7 Near gale	13.9 – 17.1	50 – 61	Whole trees in motion; inconvenience felt when walking against the wind
8 Gale	17.2 – 20.7	62 – 74	Breaks twigs off trees; generally impedes progress
9 Strong gale	20.8 – 24.4	75 – 88	Slight structural damage occurs
10 Storm	24.5 – 28.4	89 – 102	Seldom experienced inland; trees uprooted; considerable structural damage occurs

11 Violent Storm	28.5 – 32.6	103 – 117	Very rarely experienced; accompanied by structural damage
12 Hurricane	32.7 and over	118 and over	Widespread damage

APPENDIX G: NATIONAL NOISE STANDARDS

MAXIMUM PERMISSIBLE NOISE LEVELS

PART I

Regulation 6(1)

Maximum Permissible Noise Levels for General Environment

Column 1	Column 2	
Facility	**Noise Limits B (A) (Leq)**	
	DAY	**NIGHT**
A. Any building used as hospital, convalescence home, home for the aged, sanatorium and institutes of higher learning, conference rooms, public library, environmental or recreational sites.	45	35
B. Residential buildings	50	35
C. Mixed residential (with some commercial and entertainment)	55	45
D. Residential + industry or small-scale production + commerce	60	50
E. Industrial	70	60

Time Frame: use duration

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

Night : 10.00p.m - 6.00a.m

The time frame takes into consideration human activity.

APPENDIX H: FLORA AND FAUNA SPECIES DISTRIBUTION WITHIN THE PROJECT AREA

Annex 1: Plant species distribution within the project area

S/N	Family	Species	Plant life form	IUCN Conservation status
1	Mimosaceae	Acacia hockii	Shrub	LC
2	Mimosaceae	Acacia polycantha	Tree	LC
3	Amaranthaceae	Achyranthes aspera	Herb	LC
4	Asteraceae	Berkheya spekeana	Shrub	LC
5	Palmae	Borassus aethiopum	Tree	LC
6	Asteraceae	Chromoleana odorata	Shrub	LC
7	Ranunculaceae	Clematis hirsuta	Climber	LC
8	Amaranthaceae	Cyanthula uncinulata	Herb	LC
9	Poaceae	Cynodon dactylon	Grass	LC
10	Pontederiaceae	Eichhornia crassipes	Herb	LC
11	Poaceae	Eichinocloa colona	Grass	LC
12	Poaceae	Eleusine indica	Grass	LC
13	Euphorbiaceae	Euphorbia triculi	Shrub	LC
14	Moraceae	Ficus natalensis	Tree	LC
15	Poaceae	Hyparrhenia cymbaria	Grass	LC
16	Poaceae	Hyparrhenia ruffa	Grass	LC
17	Poaceae	Imperata cylindrica	Grass	LC
18	Papilionaceae	Indigofera sp	Shrub	LC
19	Papilionaceae	Indigofera spicata	Shrub	LC
20	Euphorbiaceae	Jatropha curcas	Shrub	LC
21	Asteraceae	Laggera alata	Shrub	LC
22	Verbenaceae	Lantana camara	Shrub	LC
23	Lamiaceae	Leonitis nepetifolia	Shrub	LC
24	Anarcadiaceae	Mangifera indica	Tree	LC
25	meliaceae	Melia azederach	Tree	LC
26	Poaceae	Melinus repens	Grass	LC
27	Nympaeaceae	Nymphaea caerulea	Herb	LC
28	Poaceae	Panicum arundinaceum	Grass	LC
29	Poaceae	Panicum maximum	Grass	LC
30	Euphorbiaceae	Ricinus communis	Shrub	LC
31	Caesalpiniaceae	Senna hirsuta	Shrub	LC
32	Caesalpiniaceae	Senna obtusifolia	Shrub	LC
33	Caesalpiniaceae	Senna samea	Shrub	LC
34	Malvaceae	Sida ovata	Shrub	LC
35	Solanaceae	Solanum incanum	Shrub	LC
36	Poaceae	Sprobolus pyramidalis	Grass	LC
37	Leguminosae	Tamarindus indica	Tree	LC
38	Apocynaceae	Thevetia peruviana	Shrub	LC
39	Asteraceae	Tridax procumbens	Herb	LC
40	Tiliaceae	Triumfetta rhomboidea	Shrub	LC
41	Typhaceae	Typha capensis	Herb	LC
42	Asteraceae	Vernonia amygdalina	Shrub	LC

Annex 2: Birds recorded within the project area

S/N	Common/ Scientific name	IUCN Conservation Status
1	African Jacana *Actophilornisafricanus*	LC
2	African Marsh-Harrier *Circus ranivorus*	LC
3	Barn swallow *Hirundorustica*	LC
4	Black and White Mannikin*Lonchura bicolor*	LC
5	Black Kite *Milvusmigrans*	LC
6	Black-bellied seed cracker *Pyrenestesostrinus*	LC
7	Black-headed Weaver *Ploceusmelanocephalus*	LC
8	Black-necked Weaver *Ploceusnigricollis*	LC
9	Black-throated Apalis*Apalisjacksoni*	LC
10	Black-winged Stilt *Himantopushimantopus*	LC
11	Yellow billed Barbet *Tracylaemuspurpuratus*	LC
12	Blue spotted wood dove *turturafer*	LC
13	Bronze sunbird *Nectariniakilimensis*	LC
14	Brown throated-Wattle-eye *P. cyanea*	LC
15	Buff-spotted Flufftail*Sarothruraelegans*	LC
16	Cassin's Spinetail*Neafrapuscassini*	LC
17	Cattle Egret *Bubulcus ibis*	LC
18	Collared sunbird *Anthreptescollaris*	LC
19	Common Waxbill *Estrildaastrild*	LC
20	Diederik Cuckoo *Chrysococcyxcaprius*	LC
21	Equatorial Akalat*Sheppardiaaequatorialis*	LC
22	Eurasian Hobby *Falcosubbuteo*	LC
23	Gray Crowned-Crane *Balearicaregulorum*	LC
24	Green Sandpiper *Tringaochropus*	LC
25	Green sunbird *Anthreptesrectirostris*	LC
26	Grey headed sparrow *Passer griseus*	LC
27	Grey-throated Barbet *Gymnobuccobonapartei*	LC
28	Harrier Hawk *Polyboroidesradiatus*	LC
29	Helmeted Guineafowl *Numidameleagris*	LC
30	Holub's Golden Weaver *P. xanthops*	LC
31	Laughing Dove *Streptopelia senegalensis*	LC
32	Least Honeyguide *Indicator exilis*	LC
33	Lemon bellied *CrombecSylviettadenti*	LC
34	Yellow-backed Weaver *Ploceusmelanocephalus*	LC
35	Lesser Striped swallow *Hirundoabyssinica*	LC
36	Martial Eagle *Polemaetusbellicosus*	LC
37	Mosque swallow *Hirundosenegalensis*	LC
38	Northern Olive Thrush *Turdusabyssinicus*	LC
39	Northern red Bishop *Euplectesfranciscanus*	LC
40	Olive-bellied sunbird *Nectariniachloropygia*	LC

APPENDIX I : MINISTRY OF WATER AND ENVIRONMENT CORRESPONDENCES

TEL GENERAL: +256 41 4505942
TELEPHONE: +256 41 4505945
+256 41 4505950
+256 41 4220203
+256 41 4321316
+256 41 4221198
FAX: +256 414505941
Email: mwe@mwe.go.ug
ps@mwe.go.ug
website: www.mwe.go.ug

THE REPUBLIC OF UGANDA

MINISTRY OF WATER AND ENVIRONMENT
P. O. BOX 20026
KAMPALA – UGANDA

In any correspondence on this subject please quote Ref. No. **AWE/MWE/ESIA/2022-2**

18th May, 2022

The Team Leader,
Air Water Earth Ltd
M1,27 Binayomba Road, Bugolobi
P. O. Box 22428, Kampala, Uganda

CONSULTANCY SERVICES TO UNDERTAKE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA), RESETTLEMENT ACTION PLAN (RAP) AND SOURCE PROTECTION PLANS (SPP) FOR FIVE (5) LARGE SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN BUGOMOLWA & KIKONGE-NAKASERO IN KYANKWANZI DISTRICT, LUBAALI IN KASANDA DISTRICT AND KIKOOGE IN NAKASONGOLA DISTRICT. CONTRACT NO: MWE/CONS/20-21/00092

WAY FORWARD FOR ESIA STUDIES

Reference is made to your submission of the above captioned subject on 5th May,2022 under reference number **AWE-MWE/Rural/ESIA-RAP/05-2201** regarding the way forward for ESIA studies in which you were indicating that you were proceeding with Project Briefs instead of full scale ESIAs.

We are writing to remind you to refer to the Expression of Interest which had clear Terms of Reference (TORs) which stipulated conducting full ESIAs for the 4RGCs of Bugomolwa, Lubaal, Kikonge and Kikooge. Under Form of Contract, clause (b) and Appendix A of the Contract that was signed on 17th January, 2022, it is clearly stipulated that the deliverables shall be Environmental and Social Impact Assessment (ESIA), Resettlement Action Plan (RAP) And Source Protection Plans (SPP). The simplified ESMP/ Project Briefs shall only be required for the SPPs.

The Ministry therefore requests that you follow the contract as well the TORs to execute full ESIAs for the above mentioned projects. You are further required to fast track the milestones as agreed upon during the inception meetings.

Eng. Olweny Lamu
FOR: PERMANENT SECRETARY

APPENDIX J: PUBLIC CONSULTATION AND DISCLOSURE PLAN

Introduction

This Public Consultation & Disclosure Plan (PCDP) outlines and documents MWE consultation and disclosure practices that will be adopted during the implementation of the Water and Sanitation Supply Project in Bugomolwa by MWE. The PCDP includes details of public involvement activities with Bugomolwa communities, which will occur:

- During the feasibility assessment, EISAs, RAP and even construction stages of the WSSP of Bugomolwa RGC.
- During development of the Project; and,
- Continuing throughout the life of the Project

To ensure proper and appropriate infrastructural developments occur in Uganda by the World Bank, WB and NEMA endorses the concept that communication with project stakeholders is an essential component of any environmental and socio-economic assessment process.

AWE is committed to pro-active and ongoing communication with all agencies, organizations, and individuals with an interest in the development of the Project. The World Bank develops the PCDP from the Public Consultation & Disclosure requirements or guidelines.

Goal of the PCDP

The PCDP seeks to define a technically and culturally appropriate approach to consultation and disclosure. The goal of this Plan is to ensure adequate information is provided to project-affected people and other stakeholders in a clear and timely manner, and that these groups are provided sufficient opportunity to voice their concerns and opinions so that they can influence project decisions.

The approach will also be undertaken in a manner consistent with the local cultural norms of the area and of Uganda as a whole. Public consultation will occur through a variety of mediums and venues, in order to meet the need to effectively communicate and consult with various stakeholder groups in a culturally appropriate manner. In all cases, the methodologies employed will be further developed through initial discussions with the stakeholders.

Objectives of the PCDP

The PCDP is a useful tool for managing communications between MWE and stakeholders. The PCDP aims to improve and facilitate decision-making and create an atmosphere of understanding that actively involves individuals, groups, and organizations that can affect, or be affected by, development of the Project.

Emphasis of the Plan is to allow implementation of a formal program of communication in an objective, simple manner, to focus efforts on improving communications between the client (MWE) and interested parties. Monitoring and evaluation of program results and behavior of the respected parties will enable constant development and improvements to the program over time.

Objectives of the PCDP

- Keep stakeholders informed of MWE's WSSP activities in Bugomolwa
- Consult and educate stakeholders on all aspects of the project
- Develop community inputs to project development and design
- Generate and document broad community support for the Project
- Improve communications between interested parties
- Document development of formal public consultation

- Describe formal complaint submittal and resolution mechanisms
- Disclosure of project documents as per IFC Standards

Key aspects of the consultation and disclosure process include:

- Regular release of Project-related information, including World Bank policies, Project details, answers to frequently asked questions, and rights and responsibilities of affected people, presented as required in a manner consistent with local cultural norms of the area and of Uganda.
- Articulation and delivery of clear, consistent messages from key staff to the public and stakeholders, ensuring that community workers and staff are aware of MWE's position regarding the project and are capable of responding to questions/comments appropriately
- Communication to be undertaken in both Luganda and English
- Regular meetings and forums documented by MWE community workers to present Project-related information, answer questions, and address concerns
- An open-door policy for interaction with Community Liaison Officers, such that stakeholders feel comfortable approaching them directly to ask questions, discuss matters, and raise concerns
- Management of a responsive grievance and complaints procedure for recording and responding to comments and concerns in a constructive and timely manner.

The Consultation Process will develop through four main phases: (i) Initial Consultations (ii) During Negotiations, (iii) Implementation, and (iv) Post-resettlement/ relocation & Monitoring.

Stakeholder engagements were done both at sub county level, district and community level **(See Section 8)**

Identification of stakeholders

A stakeholder may be defined as 'any individual or group who is potentially affected by the project or can themselves affect the project. 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. The study targeted individuals, groups/institutions and communities that have a stake in the proposed water project. Thus, only such entities as identified in the stakeholder analysis were selected to participate in the consultation process.

The following aspects were considered when identifying and prioritizing stakeholders for this ESIA:

(vi) Who could be adversely affected by environmental and social impacts?
(vii) Who are the most vulnerable among the potentially impacted, and are special engagement efforts necessary?
(viii) Which stakeholders can best assist with the early scoping of concerns and impacts?
(ix) Who strongly supports or opposes the changes that the project will bring and why?
(x) Who is it critical to engage with first, and why? (IFC 2007)

Stakeholder analysis

The stakeholder categories and subcategories identified are presented in table below

Stakeholder analysis

Group	Stakeholder	Description and key attributes
Funder	World Bank	✓ To ensure that the Banks Safeguards Operational Policies have been observed and implemented as appropriate. ✓ Support the project with funding
National Level Stakeholders	Ministry of Lands Housing and Urban Development (MoLHUD)	✓ Approves all reports presented by the consultant regarding valuation
	Ministry of Gender, Labour and Social Development (MoGLSD)	✓ Protection of human rights and vulnerable social groups. ✓ Occupational and community health and safety of workers. ✓ Approval and monitoring of the social safeguards ✓ Approval of permits like workplace permits, OHS
	Ministry of Water and Environment (MWE)	✓ Overall mandate to monitor, assess and regulate water resource ✓ Monitor and guide the use of wetlands for sustainability and other water bodies within the project areas ✓ Approval of the Water abstraction permits ✓ The implementer of the Project ✓ Overseeing and monitoring the project activities
	NEMA	✓ Regulation of the environmental aspects of the project(s). ✓ Legally mandated to handle certain critical environmental issues ✓ Provide the necessary permits and approvals for quarries, borrow pits and other auxiliary sites ✓ Work closely with the project team to handle all matters related to environmental protection ✓ Overall clearance of ESIA and other project briefs about the project facilities. ✓ Monitor and supervise the ESIAs compliance
Local Governments	District (Kyankwanzi District Local Government)	✓ Mobilize various stakeholders including the communities/beneficiaries ✓ Monitoring and supervision support for the implementation of the projects. ✓ Offer security to the project team (RDCs Office) ✓ Review the ESIA and give comments

Group	Stakeholder	Description and key attributes
		(Environment Office)
	Nkandwa Sub County (Technical and political staff)	✓ Make decisions that may affect the project, ✓ Offer support and supervision of the project ✓ Help in the identification of the location of the water and sanitation facilities.
	Local Councils	✓ Mobilize communities ✓ Offer support in the planning, implementation and operation of the project ✓ Offer support in the identification of the locations of the water and sanitation facilities ✓ Monitoring of the projects ✓ Provide social justice to vulnerable communities ✓ Incorporate information about the project in their teachings, gatherings/meetings for acceptance especially regarding water and hygiene-related information.
Different Community groups,	Traders, landlords, tenants, business people, affected persons (Landowners who offered land for the facilities)	✓ Develop construction (works) schedules in their respective areas. ✓ Participate in the scheduled meeting regarding the project activities and progress ✓ Identify mitigation measures of the environmental and social issues ✓ Monitor the progress of the project activities ✓ Input in the planning and identification of water and sanitation facilities.

In order to manage overwhelming expectations of the stakeholders, it is important to understand who the stakeholders in project of concern are. This was the initial concern of the consultant in the piped water supply. A list of stakeholders was analyzed and those that need immediate consultation at this stage identified.

The Resettlement Action Plan

The RAP component of this project will include mainly the landowners whose land is being taken permanently for the construction of the source components and the reservoir. The different properties that are along the RoW for pipe laying. A valuation report has been undertaken and every PAP will be compensated in accordance with the district compensation rates.

Stakeholder groups

The following are the different groups of stakeholders considered for this study

- Government agencies; including but not limited to NEMA, MoGLSD, MLHUD, MWE among others
- Traditional authorities; heads of clans and tribes among others
- Local communities; sub county heads like chairmen, parish chiefs etc
- Special interest groups like children and women who have been directly impacted by the scarcity of water.
- Non-governmental organizations operating in the project area
- Media; local media platforms like radios to increase awareness of the project in Bugomolwa RGC

Stakeholder consultation Process

Level	**Key issues to consider**
Stakeholders identification 	Preliminary identification of stakeholders groups will start with investigating specific threat and opportunity factors and developing a list of key stakeholders associated with each. This will be based on the five (5) key questions below: ▪ Who are key players in development and implementation of the project? ▪ What key resources will be impacted? ▪ Who is most dependent on these resources? ▪ Which government sectors and Ministry Departments are involved? ▪ Which agencies license certain aspects of the project or are most knowledgeable about, and capable of dealing with project impacts or resources to be affected? Who is managing these resources?
Interests, influence & importance of stakeholders	To assess influence and importance of each stakeholder and potential impact of the project upon each stakeholder, the six (6) key issues that will be investigated included: ▪ Who is directly responsible for decisions on issues important to the project? ▪ Who holds positions of responsibility in interested organizations? ▪ Who is influential in the project area (both thematic and geographic areas)?

	▪ Who will be affected by the project? ▪ Who will promote/support the project, provided that they are involved? ▪ Who will obstruct/hinder the project if they are not involved?
Stakeholders engagement 	Finally, the third step will be determining how to involve the different identified stakeholders. It is evident that different stakeholders will be engaged in different ways at the various stages of the project, from gathering and giving information, to consultation and dialogue. Relevant stakeholders will be identified through a stakeholder analysis exercise. During ESIA, stakeholder engagement will be guided by World Bank/IFC guidance note.