MINISTRY OF WATER AND ENVIRONMENT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED SONI PIPED WATER SUPPLY AND SANITATION SYSTEM

Final Report

SUBMITTED BY:

Ministry of Water and Environment

PREPARED BY:

Alliance Consultants Limited

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ESIA TEAM AND DECLARATION

Following is the Environmental and Social Impact Assessment (ESIA) Team that undertook the ESIA for the proposed Soni Water Supply and Sanitation System located in Kirewa Sub-County, Tororo District. The assessment was done in accordance with the provisions of the *National Environmental Act No. 5 of 2019* of the Laws of Uganda, the *Environmental and Social Impact Assessment Regulations (2020)* and the *National Environment (Conduct and Certification of Environmental Practitioners) Regulations (2003).* It was carried on behalf of Alliance Consultants Limited that was contracted by the Ministry of Water and Environment. We the undersigned declare that we have no business, financial, other interest in the Ministry of Water and Environment's proposed Soni Water Supply and Sanitation System.

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LIST OF ACRONYMS

AfDB	African Development Bank
AIDS	Acquired Immune Deficiency Syndrome
APHA	American Public Health Association
BMP	Best Management Plan
BOQs	Bills of Quantities
CDO	Community Development Officer
CESMP	Contractors Environmental and Social Management Plan
CGV	Chief Government Valuer
DHI	District Health Inspector
DN	Norminal Diameter
DWD	Directorate of Water Development
DWRM	Directorate of Water Resources Management
EPB	Environmental Project Brief
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
GO	Grievance Officer
GoU	Government of Uganda
GRM	Grievance Redress Mechanism
HDPE	High Density Polyethylene
HIV	Human Immunodeficiency Virus
ISO	International Standard Organisation
ISS	Integrated Safeguards System
IUCN	International Union for Conservation of Nature
LC	Local Council
MEMD	Ministry of Energy and Mineral Development
MWE	Ministry of Water and Environment
NDPIII	Third National Development Plan
NEA	National Environment Act
NEMA	National Environment Management Authority
O$M	Operation and Maintenance
OHS	Occupational Health and Safety
OP	Operational Policy
OS	Operational Safeguard
PAP	Project Affected Persons
PPE	Personal Protective Equipment
RAP	Resettlement Action Plan
RGC	Rural Growth Center
SEP	Stakeholder Engagement Plan
TDS	Total Dissolved Solids
UNRA	Uganda National Roads Authority
WASH	Water Sanitation and Hygiene
WMP	Waste Management Plan
TDLG	Tororo District Local Government

EXECUTIVE SUMMARY

Project Overview and Objectives

According to the Water and Environment Sector Performance Report, 2019, 44.3% and 10.9% of the population depend on boreholes and piped water respectively to access clean water in rural areas. In small towns and rural growth centers, only 55.9% of the population had access to improved water sources by 2019.

The Government of Uganda (GoU), through the Ministry of Water and Environment (MWE) has embarked on improving safe water supply and sanitation coverage in rural areas, small towns and rural growth centers. Tororo District is one of the areas that currently have limited access to safe water and sanitation services. As a result, the MWE together with Tororo District Local Government (TDLG) are proposing establishment of the Soni Water Supply and Sanitation System, in line with the third National Development Plan (NDP III), and the Uganda's Vision 2040.

The overall aim of the project is to establish a mini piped water supply and sanitation system in Soni Rural Growth Center (RGC), Kirewa Sub County, Tororo District. The proposed project is will abstract 330 m^3/day in the ultimate year (2042), and will have the following major components:

- intake; 2 boreholes of yield of 11 m^3/hr and 6m^3/hr
- 2 pumping stations
- transmission pipe system of 1.78 km
- reservoir with a capacity of 100 m^3
- distribution network

The total cost of the project is estimated at Three Billion Three Hundred Forty-Four Million Nine Hundred Eighty-one Nine Hundred Eighty-eight Uganda Shillings only (UGX 3,344,981,988), inclusive of taxes.

The objective this study was to undertake an Environmental and Social Impact Assessment for the proposed project. The specific objectives were to:

I. Survey of all the identified sites including preparing a map/sketch of each site showing important existing features in the surrounding areas in relation to the sites,
II. Assessment baseline environmental conditions for monitoring future project components,
III. Evaluation of the relevant policy and legal framework pertaining the proposed project.
IV. Consultation with the relevant stakeholders and incorporate their comments into impact identification and mitigation,
V. Identification of all potential impacts and propose feasible mitigation impacts
VI. Preparation of an Environmental and Social Management and Monitoring Plan (ESMP) for the implementation of the proposed project. The ESMMP should outline: *i)* potential environmental and social impacts resulting from project activities; *ii)* proposed mitigation measures; *iii)* monitoring indicators; iv) responsibilities for implementation of the mitigation measures; *v)* responsibilities for monitoring the implementation of the mitigation measures

Description of the Project Area

Tororo District is located in Eastern Uganda. It borders with the Republic of Kenya to the East, Bugiri District to the West, Butaleja District to the North, Busia District to the South and Mbale to the North East. Administratively, the district is divided into (6) counties, one (1) municipality which are further sub-divided into sub-counties, parishes and subsequent villages. The proposed project will cover the villages in Kirewa Sub-county.

The proposed locations of the main project components are summarized as follows:

BH No. / Reservoir/Transmission	Village	Parish	Sub-county	Coordinates	
Borehole DWD 90935	Ngulimo	Mifumi	Kirewa	N0.745399	E033.935011
Borehole DWD 90936	Chawolo	Mifumi	Kirewa	N0.751017	E033.940083
Proposed Reservoir	Dago Zone	Soni	Kirewa	N0.756301	E033.934097
Transmission Line 1	Chawolo	Mifumi	Kirewa	N0.749753	E033.938055
Transmission Line 2	Dago Zone	Soni	Kirewa	N0.755827	0.33.939293

The vegetation at and around the proposed locations of the project components is characteristic of agricultural landscapes, dominated by grasses, shrubs, weeds, crops and a few trees. The abstraction and reservoir sites are already converted into agricultural use, while the transmission lines follow existing roads and will be restricted within the road reserves. Generally, all the project affected sites are already modified and not representative of the natural conditions. There are no sensitive ecosystems such as forests and wetlands which will be impacted by the project activities.

The main source water in the project area is groundwater, obtained through hand pump boreholes. Nevertheless, the boreholes are not enough, where communities reported spending travelling long distances, or waiting for long times at boreholes to access water.

Policy, Legal and Institutional Framework

There is an established policy, legal and institutional framework for environmental management in Uganda. The National Environmental Act (NEA Nr. 5) of 2019 provides for Environmental and Social Impact Assessment for projects which have adverse impacts on the environment. According to the NEA (2019), the proposed project is listed under Schedule 4 (Projects for which Project Briefs are required) and under Category 4, "Utilisation of water resources and water supply", Part (b) "Abstraction or utilization of ground water of less than 1,000 m^3 per day." Further, according the funder's (African Development Bank; AfDB) Integrated Safeguards System (ISS), the project is considered as category 2 (medium E&S risks) which requires the preparation of an Environmental and Social Impact Assessment ESIA. Some of the polices, laws and institutions that will guide the project implementation:

a) Policy Framework

- The National Water Policy, 1999
- The National Gender Policy, 1997
- The National Land Policy (2013)
- The National Land-Use Policy (2007)
- The Environment and Social Safeguards Policy (2018)

African Development Bank (AfDB) Operational Safeguard (OS) policies such as OS 1: Environmental and social assessment, OS 2: Involuntary resettlement, land acquisition, population displacement and compensation, OS 3: Biodiversity and ecosystem services, OS 4: Pollution prevention and control, hazardous materials and resource efficiency and OS 5: Labour conditions, health and safety will be important.

b) Legal Framework

- The Constitution of the Republic of Uganda; 1995; amended as at 15th February 2006, Government of Uganda.
- The National Environment no. 5 2019
- The Water Act, Cap 152 and The Water Resources Regulations, 1998
- The Land Act, Cap 227
- The National Environment (Environmental and Social Assessment) Regulations, 2020

- National Environment (Conduct and Certificate of Environment Practitioners Regulations (2003)
- The National Environment (Waste Management) Regulations (2020)
- The National Environment (Noise Standards and Control) Regulations, 2003.

c) Institutional Framework

- Ministry of Water and Environment (MWE)
- National Environmental Management Authority (NEMA)
- Ministry of Gender, Labour & Social Development (MGLSD)
- Ministry of Lands, Housing and Urban Development (MoLHUD)
- Tororo District Local Administration Structures

Potential Environmental and Social Impacts

The proposed project is associated with several positive impacts. These include:

- Employment opportunities and income
- Acquisition/improvement of skills
- Reduction of poverty and improved livelihoods of the local people
- Improvement in public health
- Achievement universal primary education
- Promotion of gender equality and empowerment of women and the girl child

However, the proposed project will also be associated with adverse impacts which must be mitigated. The following adverse impacts have been identified:

IMPACT	Overall Significance
Pre-construction and Construction Phase	
Loss of land and property	Moderate (6)
Traffic disruption	Minor (4)
Loss of vegetation	Moderate (6)
Introduction of plant invasive species	Minor (4)
Disruption of social order	Minor (4)
Noise from construction machinery	Moderate (6)
Solid waste generation	Moderate (9)
Occupational health and safety issues	Minor (4)
Community health and safety issues	Moderate (9)
Increased susceptibility to soil erosion	Moderate (6)
Air pollution and climate change	Moderate (9)
Theft of construction materials	Major (12)
Operation and Maintenance Phase	
Soil pollution	Minor (4)
Occupational safety and health issues	Minor (2)
Incapacity to operate and maintain the project components by local people	Moderate (9)
Unaffordability of water charges	Moderate (6)
Air pollution	Moderate (6)
Spread of sanitation and water borne diseases	Moderate (9)
Vandalization / theft project equipment	Moderate (9)
Decommissioning Phase	
Disruption of water supply	Moderate (9)
Traffic disruption	Moderate (9)
Disruption of social order	Minor (4)
Noise pollution	Moderate (9)
Solid waste generation	Moderate (9)
Occupational health and safety issues	Moderate (6)

IMPACT	Overall Significance
Public health and safety issues	Moderate (9)
Increased susceptibility to Soil erosion	Moderate (6)
Air pollution and climate change	Moderate (9)

Stakeholder Consultations

Consultation meetings were held with the Tororo District Local Government staff, Kirewa Sub-County staff and the local communities where the proposed project is to be located Stakeholder engagement constituted an important part of the ESIA process, in light of the Project's commitment to adhering to national requirements, as well as a best practice approach to public consultation, that is, an approach that encourages open and transparent dialogue, with as broad a range of stakeholder groups as possible.

A total of 44 stakeholders were consulted; 29 males and 15 females in a total of 5 meetings. A summary of the key findings from the stakeholder consultations is presented as follows:

Stakeholders	Concerns/views	Response
District leaders	• The leadership of Tororo District welcomes the project and anticipates that this water project will benefit the target area and reduce on the water stress experienced in the area since the existing reservoirs cannot supply adequate water to meet community demand. • There are many distribution networks in the district e.g., in Paya, Kirewa, Nowir among others which have been non- function which has caused the issue of low water supply. • Most water sources dry up in the dry season. • The district leadership anticipates that the implementation of this project will be done expeditiously. • The project will reduce burden on women and children carrying water for longer distances hence creating more time for other constructive work such agricultural production and attending school. • Booster pumps should be installed along the water distribution network to improve on water supply to distant areas. • We shall work closely with the consultant to ensure the success of the project. • The demand for water is high and the community is willing to pay in order to access the utility. • There is need for close collaboration between project partners and the district leaders during the course of the project implementation but most especially during the design of the project. • The technology used in the water supply system should be improved to increase water supply avoid the present situation of water scarcity faced in Tororo District. • We used to share water supply with Malaba but NWSC gave them their water and they are now enjoying • Currently, water is only supplied at night and not during the day time? I hope this project will address this concern • There is water rationing which is not based human	• Noted • The project seeks to increase access to safe water, and minimize water shortage in the area • The Developer will employ qualified staff to operate and maintain the water supply system to avoid the challenge of non-functionality • Project construction activities will start as soon as all the necessary approvals and financial resources are granted. Otherwise, the MWE recognizes the urgency of this project, in view of the water supply situation in the area • The design of the project includes reservoirs that have been sited at locations high enough to supply water by gravity in the entire project area • All the stakeholders, including at the district and lower levels will continuously be engaged during project implementation

	decision. They only give water to only those who complain. • The network is growing but the reservoir has not been upgraded.	
Community Level-Patiaka zone, Soni S/C	• We don't have enough water sources • There is only one borehole serving six zones. • Water is contaminated. • Too much pressure at the borehole causes fights and other forms of violence at the borehole. • There is a long distance to the borehole and therefore it takes a lot of time to access water from the borehole. • As a result of scarcity of water, it has led to poor hygiene. Some people do not bathe neither do they wash their clothes regularly. They are dirty. • Buying water bought from vendors is expensive. A jerrycan costs 500/. • There are forms of gender-based violence at the borehole; some women have been raped as they wait to get water. • Too much time is spent at the borehole waiting to fetch water. • During peak times, one person is given one jerrycan at a time and chances of getting another one are thin. • Our animals lack water due to scarcity of water in the area.	• The aim of the project is to increase supply of water of adequate quality. The project will help reduce the distances travelled to access water, reduce water charges (in comparison to what is charged by vendors) and safe the time spent at water sources waiting for water
Community Level- Kisera zone A, Kisoni zone, Pakitaka A, Pakitaka B	• Let us hope this project will be implemented. Other partners promise water projects and they don't come back. • There is one borehole serving six zones. • Water from the boreholes is clean but not enough. However, sometimes, the borehole is rusty and so water is not clean. • There is violence including fights for water at the borehole • There is poor hygiene as a result of scarcity of water; some people don't bathe and wash their clothes. • The borehole is locked by the caretaker so that it regains more water for the following day when demand for water is still high. Therefore, there is need for more water sources in the area. • We need water for irrigation to address the issue of famine. As such our crops can grow well and as a result get enough food for our families. • Water scarcity has exacerbated domestic violence in the homes. Men complain about their wives' delay at the borehole thinking they are having extramarital relationships.	• The MWE is committed to implement this project • The project seeks to increase access to safe water, and minimize water shortage in the area. This will help to reduce violence at boreholes and reduce distances travelled to water sources • The proposed project is intended to supply water for domestic purposes not irrigation. However, small scale irrigation may be undertaken at household level though charges have to be incurred. The MWE has another Department for Water for Production which provides water for irrigation purposes. This issue will be raised to the MWE
Community Level- Chawolo Village	• We get water from a near-by spring but the water is of very poor quality and this has led to many water users falling ill especially children getting diarrhea. • The spring has helped us to have easy access to water though in the dry season it dries up and then we have to move long distances looking for water. • We share the same water source with our animals since water sources are limited. • We welcome the project and we can't wait for it to start running because we really need this water.	• The project seeks to increase access to safe water in the project area, and minimize water shortage in the area. This will help reduces issues of water borne diseases associated with drinking contaminated water

	• Our livelihoods will greatly improve in this respect.	
Mixed Group Discussions: Water Vendors' Views	• The project is welcome since there is water scarcity in this area. • We share the same water source with our animals making it contaminated and dirty since water sources in our communities are limited. • We need more nearby water sources to serve our customers because the spring well which is accessed by most of the population in Chawolo Village dries up in the dry season and then we have to move long distances to look for water to supply our customers which somehow curtails our services • The borehole which serves the communities of Kisera zone A, Kisoni zone, Pakitaka A, Pakitaka B is locked by the caretaker in the evening so that it regains water for the following day and therefore we cannot get enough water for our customers. • Water scarcity in Patiaka village affects services of water vendors more so in the peak times when one person is given one jerrycan at a time and there are little chances of getting another one.	• The views are noted and they will be raised to the MWE. • The project will increase water supply in the project area to address water shortage. It is anticipated that the number of water sources will increase although there will be some money to be paid for water to cater for O&M. So, the vendors will be required to pay for the water they will fetch at the project sources.

Environmental and Social Management and Monitoring Plan (ESMMP)

The ESMMP has been provided to guide the implementation for this the project. The ESMMP provides for:

- Integration of Safeguards into Procurement Process (Contracts)
- Contractor Management Plans and Method Statements
- Required Approvals, Permits and Licenses
- Monitoring and Reporting Arrangements
- Enforcement of Compliance

Further, a grievance redress mechanism (GRM) has been provided. The aim and purpose of this system is to make the grievance handling procedures accessible, prompt and affordable to the project affected persons (PAPs) given the generally low values of some of the properties to be affected; and also provide an alternative to the costly and time-consuming formal courts procedures for handling grievances and disputes. The GRM seeks to establish mechanisms for raising complaints related to compensation for loss of land and other livelihood properties and assets and having such complaints resolved as amicably as possible through acceptable and binding corrective actions.

The total cost of implementing the ESMMP is estimated at Uganda Shillings Two Hundred Ninety-Three Million Two Hundred Thousand only (UGX 293,200,000), as reflected in the ESMMP matrix as follows:

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
Positive Impacts						
Employment opportunities and income	▪ Prepare a labour force management plan ▪ Preference for employment opportunities should be given to the local people where they have the required skills (for skilled labour activities). Otherwise, all activities which do not require skills such as casual activities should be given to the locals ▪ All laborers should be given contracts specifying their roles and responsibilities and renumerations ▪ The use of appropriate labour-intensive methods for some of the construction activities (for example excavation for pipelines) should be undertaken to enable as many local people (including women) as possible get jobs ▪ Priority for sourcing materials for construction and other services such as food and accommodation should be given to local suppliers ▪ Ensure that children are not employed on the project	-Labour force management plan in place -Details of the project staff, including origin, age	10 million (for the labour farce management plan)	Contractor MWE	CDO	Monthly
Acquisition/improvement of skills	▪ Foreign companies (if contracted) should be required to have a joint venture with local companies to build their capacity. ▪ Contracts terms for construction works for the project's construction and O&M phase should emphasize knowledge transfer and the project developer should monitor and ensure that the objectives are met. ▪ O&M manual and standard operating procedures must be handed over to the operator	-Details of the Contractor, including country of registration -Details of the Contracts agreement -Presence of the O&M manual	0	Contractor MWE	CDO DWO	Once, before start of construction works
Reduction of poverty and improved livelihoods of the local people	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain water	-Records of water abstraction and supply -Records of water quality assessment -Number of households	Part of the contract	MWE	DWO CDO	Quarterly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
		connected, and number public stand pipes				
Improvement in public health	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain water ▪ Sensitize communities on the dangers of using unsafe water sources	-Records of water abstraction and supply -Records of water quality assessment -Number of households connected, and number public stand pipes -Minutes of community sensitization	1 million (for community sensitization)	MWE	DWO CDO	Quarterly
Achievement universal primary education	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain water	-Records of water abstraction and supply -Records of water quality assessment -Number of households connected, and number public stand pipes	Part of the contract	MWE	DWO CDO	Quarterly
Promotion of gender equality and empowerment of women and the girl child	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain water	-Records of water abstraction and supply -Records of water quality assessment -Number of households connected, and	Part of the contract	MWE	DWO CDO	Quarterly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
		number public stand pipes				
Negative Impacts						
Pre-construction and Construction Phase						
Loss of land and property	▪ Prepare and implement a RAP ▪ All privately owned land to host project components should be duly compensated prior start of construction activities ▪ All property should be valued and duly compensated prior to start of construction works ▪ For property like crops, where possible, owners should be informed early about the project work plan and allowed to harvest them prior to start of construction ▪ Prepare a stakeholder engagement plan and ensure that stakeholder engagement is a continuous process throughout the project implementation	-RAP in place -Agreements of land sale -Compensation agreement	-80 million for a RAP -Cost of land and other property to depend on the actual value	Developer	CDO	Once, to be cleared before start of construction
Traffic disruption	▪ Prepare and implement traffic management plan	-Traffic management plan in place	6 Million	Contractor	CDO	Weekly
	▪ Liaise with the local traffic authority to manage traffic at busy crossings e.g., markets, schools, churches	-Records of agreed work plans with traffic police	1 Million	Contractor	CDO Traffic police Department, Tororo	Weekly
Loss of vegetation and soil cover	▪ Prepare a vegetation restoration plan	-A vegetation restoration plan in place	6.5 million	Contractor	DEO	Once, before start of construction activities
	▪ Restrict clearance to only areas to be constructed.	-Presence of bare soils	Part of the Contract	Contractor	DEO	Weekly
	▪ Landscaping and re-vegetation after construction especially around the water source and reservoir	-Presence of gullies due to soil erosion.	10 Million	Contractor	DEO	Weekly
	▪ Restrict alignment of the transmission route along road reserves	-Layout of the transmission line	Part of the Contract	Contractor	DWO /DEO	Monthly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
Introduction of invasive plant species	▪ All Construction machinery should be cleaned prior to their transport to and assembly at the project sites	-Records of machinery cleaning	1 Million	Contractor	DEO	Once, before start of construction activities
Disruption of social order	▪ Prioritize employment of local people where they have the required skills	-Record of project staff and their area of origin	Part of the Contract	Contractor	CDO	Weekly
	▪ Sensitize all workers to ensure awareness of and sensitivity to the local cultures, traditions and lifestyles	-Record of sensitization sessions	2.5 Million	Contractor	CDO	Monthly
Noise from construction machinery	▪ Schedule noise-intensive work for the least noise-sensitive time of the day (work between 8 am and 5 pm)	-Work schedule -Complaints about noise;	0	Contractor	DEO	Weekly
	▪ Provision of PPE to project workers	-PPE in use	Part of the Contract	Contractor	DEO	Weekly
	▪ Regular noise assessments	-Noise assessment reports	1 Million	Contractor	DEO	Monthly
	▪ Sprinkle water to dusty grounds during the dry seasons	-Records of air water sprinkling	10 Million	Contractor	DEO	Weekly
	▪ Cover earth materials with tarpaulin during transportation to minimise their falling off trucks;	-Presence of tarpaulins for covering loose material	1 Million	Contractor	DEO	Weekly
Solid waste generation	▪ Prepare a waste management plan	-A waste management plan in place	5 million	Contractor	DEO	Once, before start of construction activities
	▪ Use the excavated material for backfilling.	-Heaps of waste & excavated material on site -Areas backfilled	Part of the Contract	Contractor	DEO	Monthly
	▪ Provide waste bins for proper storage.	-Waste bins within the project area.	0.2 Million	Contractor	DEO	Monthly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
	▪ Contract a waste management company where waste volumes are large	-Contract agreement with a waste management company	2 Million	Contractor	DEO	Monthly
	▪ Provide temporary eco-san toilets on site during site works	-Eco-san toilet on site	Part of the construction contract	Contractor	DEO	Monthly
Occupational health and safety issues	▪ Prepare an occupational Health and safety plan	-An occupational health and safety plan in place	6.5 Million	Contractor	CDO DEO DHI	Once, before start of construction works
	▪ Provide workers with PPE and sensitise them on basic safety precautions.	-PPE in use	Part of the Contract	Contractor	DEO	Weekly
	▪ Provision of a first aid kit	-First aid kit	Part of the Contract	Contractor	DEO	Monthly
Community health and safety issues	▪ Prepare a community health and safety plan	-A community health and safety plan in place	5 Million	Contractor	CDO DEO DHI	Once, before start of construction works
	▪ Cordon off all dangerous areas along public roads	-Marks of dangerous places	1 Million	Contractor	CDO DEO	Weekly
	▪ Project vehicles transport material along community roads should not exceed 40 km/h.	-Records of sensitization of project drivers on speed limits -Speed limit signs on roads	1 Million	Contractor	DEO	Monthly
	▪ Schedule of construction works along community access roads should be communicated to public at least a week prior to start of construction works	-Proof of communication of work schedule with communities -Number accidents recorded	0.5 Million	Contractor	DEO	Bi-monthly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
	▪ Prepare and implement an HIV/AIDS management plan	-An HIV/AIDS management plan	10 Million	Contractor	DCDO	Quarterly
Increased susceptibility to soil erosion	▪ Prepare an erosion control plan	-An erosion control plan in place	5 Million	Contractor	DEO NEMA	Once, prior to start of construction activities
	▪ Immediately dispose of any excavated soil to avoid loose soil being washed away by storm water.	-Presence of erosion gullies within the site premises	1 Million	Contractor	DEO NEMA	Weekly
	▪ *Providing an erosion barrier around stockpiles of excavated soils*	-Presence of erosion barriers	5 Million	Contractor	DEO NEMA	Weekly
	▪ Plant bands of grass on erosion prone surfaces.	-Presence of plant bands	4 Million	Contractor	DEO NEMA	Quarterly
Air pollution and climate change	▪ Vehicles transporting construction material along community access roads should move as lower speeds, not exceeding 40 km/hr	-Speed limit signages along access roads	5- Million	Contractor	DEO CDO NEMA	Weekly
	▪ All lose material like sand, cement, murram, soil should be covered with a tarpaulin during transportation	-Trucks covered	1 Million	Contractor	DEO NEMA	Weekly
	▪ Excavated soil stored at the site should be covered with a tarpaulin	-Soils covered	0.5 Million	Contractor	DEO NEMA	Weekly
	▪ Water should be sprinkled on dusty ground where other measures cannot appropriately minimize dust emission	-Records of water sprinkling	2 Million	Contractor	DEO NEMA	Weekly
	▪ Repair and maintain construction equipment following the manufacturer's specifications, including on fuelling	-Records of vehicle repair and maintenance	10 Million	Contractor	DEO NEMA	Quarterly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
	▪ Offset emitted carbon dioxide during construction activities by planting local trees at all devastated sites	-Records of trees planted	5 Million	Contractor	DEO NEMA	Annually
Theft of construction materials	-Verification of project employees should be done by the local authorities.	-Records of employee verification exercise	1.5 Million	CDO	CDO	Prior to the start of construction activities -Any time staff are required
	Security guards should be hired to provide security at the construction sites.	-Presence of security guards	5 Million	CDO	CDO	-Weekly
Operation and Maintenance Phase						
Water Pollution	▪ Ensuring that storage containers are checked regularly for leakage	-Records of chemical leakage/ spillage	0.3 Million	Developer / Operator	DEO	Quarterly
Occupational Health and Safety	▪ Prepare an occupational health and safety plan	-Same as in the construction phase	Same as in the construction phase	Same as in the construction phase	Same as in the construction phase	Same as in the construction phase
	▪ Workers should be given appropriate PPE when handling chemical	-Workers using PPE	Part of the Contract	Developer / Operator	DEO CDO	Quarterly
	▪ Regular trainings on the operations of the water system	-Records of training on operation systems	3 Million	Developer / Operator	DWO	Quarterly
	▪ Installation of firefighting equipment at the abstraction point	-Presence of firefighting equipment	5 Million	Developer / Operator	DEO DWO	Quarterly
	▪ A well-equipped first aid kit should be availed to project workers.	-Presence of a first aid kit. -Records of injuries	Part of the Contract	Developer / Operator	DEO CDO	Quarterly
Incapacity to operate and maintain the project	▪ Train local community members in the operation and maintenance of the water supply infrastructure	-Number of trained community members in operation and maintenance of the	6 Million	Developer/ Operator	DWO	Quarterly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
components by local people		piped water supply system				
	▪ Prepare a quality management plan	▪ A quality Management plan in place	15 Million	Contractor Operator	DWO CDO DEO	Quarterly
Unaffordability of the water charges	▪ Levy charges in consideration of the income levels of the area. Charges for poor people should be just enough to cover the operational costs	▪ Records of water charges ▪ Complaints from the public	0	Developer / Operator	DWO CDO	Quarterly
	▪ Provide many public standard pipes where poor people can obtain water cheaply	▪ Number of public stand pipes	Part of the Contract	Developer / Operator	DWO CDO	Twice a year
Air pollution	▪ Sensitize communities on the use of public toilets, and the need for better sanitation	-Records of community sensitization	1 Million	Developer / Operator	DWO CDO	Once, after completion of construction
	▪ Provide sufficient ventilation on the public toilet	-Building drawings	Part of the Contract	Developer / Operator	DWO CDO	Once, prior to, and once after construction
Spread of sanitation and water borne diseases	▪ Ensure regular supply of sufficient water for flushing and washing hands by providing a reservoir tank at the toilet	-Presence of a reservoir tank at the toilet	Part of the Contract	Developer / Operator	DWO CDO DEO	
Vandalization / theft project equipment	▪ Sensitize community members about the importance of the project	-Records of community sensitization	2 Million	Developer / Operator	DWO CDO DEO	Once, prior to, and once after construction
	▪ Hire a security guard to provide 24-hour security at sensitive components such as the abstraction/pumping station	-Presence of security guards	To depend on the local security labour cost	Developer / Operator	DWO CDO DEO	Quarterly
	▪ Fence off major project components such as abstraction and reservoir sites	-Fenced project site	Part of the construction Contract	Developer / Operator	DWO CDO DEO	Twice a year

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
Decommissioning Phase						
Disruption of water supply	▪ Inform the communities in the affected areas well in advance about the decommissioning activities ▪ Provide alternative source of water	▪ Records of sensitization meeting about project decommissioning ▪ Presence alternative water sources	3 million for sensitization meetings	Operator Decommissioning Contractor	DWO CDO DEO	Quarterly, within the last two years of decommissioning
Traffic disruption	▪ Same as for the construction phase	▪ Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Disruption of social order	▪ Same as for the construction phase	▪ Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Noise pollution	▪ Same as for the construction phase	▪ Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Solid waste generation	▪ Same as for the construction phase	▪ Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Occupational health and safety issues	▪ Same as for the construction phase	▪ Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Public health and safety issues	▪ Same as for the construction phase	▪ Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
Increased susceptibility to Soil erosion	▪ Same as for the construction phase	▪ Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Air pollution and climate change	▪ Same as for the construction phase	▪ Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
TOTAL			**293,200,000**			

Further, the following other costs should be clear in the BoQs during the bidding process.

Item	Indicative Costs
Grievance Redress Mechanism	22,000,000
Stakeholder Engagement	24,000,000
Environment and Social Audit	35,000,000
Capacity Building and Trainings	20,000,000
Sub-total	**101,000,000**
Grand Total, including ESMMP (UGX 293,200,000)	**394,200,000**

CONCLUSION AND RECOMMENDATIONS

a) Conclusions

This environmental and social impact assessment for the Soni water supply and sanitation system has examined the project need, its compatibility with the surroundings, socio-economic benefits and the adverse social and environmental impacts. Enhancement measures have been proposed for the positive impacts, while mitigation measures to avoid, reduce and minimise the adverse impacts were also suggested, either as part of the design, or as measures to be implemented. Good practice measures were also identified in order to minimize the impact of the proposed development further. The proponent has agreed to these mitigation measures and they are, therefore, expressed as commitments.

Overall, the negative impacts of this project are rated by this study as largely insignificant; however, adequate mitigation measures have been proposed to address them. When mitigation actions and environmental and social monitoring plans are implemented, the project would have minimal residual environmental effects. Hence the project can be implemented in a sustainable way.

b) Recommendations

This study therefore makes the following recommendations:

- Many times, Project Contractors do not comply with the recommendations given in the project environmental report. This could tantamount to violation of the law with possible halting of the whole project by the relevant authorities, including NEMA. A copy of this report would be availed to the Project Contractor, and advised to follow the identified impacts, the ESMMP and develop the management plans identified there in.
- The project ought to be approved for implementation by the relevant authorities to enable fulfilment of the project main objective of improving access to safe water in the area

1 INTRODUCTION

1.1 Project Background

According to the Water and Environment Sector Performance Report, 2019, 44.3% and 10.9% of the population depend on boreholes and piped water respectively to access clean water in rural areas. In small towns and rural growth centers, only 55.9% of the population had access to improved water sources by 2019.

The Government of Uganda (GoU) has embarked on improving safe water coverage and supply across the entire country. The Water and Environment Sector Development Plan of Uganda prioritizes the construction of piped water supply systems in Rural Growth Centres to replace the currently overstretched hand-pumped borehole service technology. Consequently, the GoU, through the Directorate of Water Development of MWE and Tororo District Local Government, secured funding for development of water and sanitation system in Soni RGC, Kirewa Sub County, Tororo District. The proposed project shall ensure sustainable access to safe water and sanitation to a projected population of 6,701 people by 2042 in Soni RGC; and reduce walking distances to access water, thereby saving time for the education of the children in Soni RGC.

The proposed system will fully harmonize with Uganda's Joint Water and Environment Sector Support Programme and all relevant national sector policies and development plans. The specific outcome of the Water Supply Systems and Sanitation facilities will ensure sustainable access to safe water and improve of Water Sanitation and Hygiene (WASH) services, which are critical for health and socio-economic development in the rural growth center of Soni and Tororo District in general. This will contribute to creating a more stable socio-economic environment and hence boost commercial development of the project area and surrounding areas; and greatly contribute to the overall objective of the National Development plan and Vision 2040.

In recognition of the need for sustainable development, and in compliance with the National Environment Act of 2019 and regulations there under, the MWE initiated an Environmental and Social Impact Assessment (ESIA) process for the proposed project to identify and assess potentially negative and positive environmental and social impacts associated with the project and devise mitigation measures to avoid, minimize or mitigate the negative environmental and social impacts while enhancing the positive environmental and social impacts or benefits of the project.

From the initial environmental project screening that was undertaken, the proposed project was identified as one among those that require a Project Brief as per Section 112 of the National Environment Act. The proposed project is listed under Schedule 4 (*Projects for which Project Briefs are required*) of the National Environment Act, 2019 under Category 4, "Utilisation of water resources and water supply", Part (b) "Abstraction or utilisation of ground water of less than 1,000 m^3 per day."

This report presents the findings of the Environmental and Social Impact Assessment that was conducted for the proposed project.

1.2 Project Objectives

1.3.2 Consistency of the Project with National Priorities / Plans

The main factor motivating the implementation of the proposed project is the increasing demand for safe water supplies in the local communities in Tororo District and Uganda at large. Hence, the project addresses the national priority of increasing access to safe water by making efficient use of the available sources. This, in addition to the country's firm commitment to eradicate poverty, ensures that the project is firmly embedded within the country's national priorities. The NDP III highlights pollution as the major problem with water resources caused by bacterial and chemical contamination of both ground and surface water resource. This has led to inadequate sanitation facilities, unsafe disposal of municipal and industrial waste in urban and rural areas. To this effect, the GoU, through the MWE has set a target of increasing safe water supply from 70% to 85% in rural areas and 74% to 100% in urban areas (NDP III). This is also in line with the Vision 2040 target of having 100% of the population having safe water supply. The proposed project will contribute towards the extension of clean water to a domestic population of 6,701 people by 2042 in Soni RGC, Tororo District, Eastern Uganda.

1.2.1 Project Development Objectives

The overall objective of the project is to establish a mini solar-powered piped water supply and sanitation system in Kirewa Sub-county in Tororo District.

1.2.2 Objectives of the Environmental and Social Impact Assessment

This report covers all the contents of an Environmental and Social Impact Assessment report by way of a Project Brief as required under Schedule 2 of the National Environment (Environmental and Social Assessment) Regulations, 2020.

The main objectives of this report include the following:

a) Survey of all the identified sites including preparing a map/sketch of each site showing important existing features in the surrounding areas in relation to the sites,
b) Assessment baseline environmental conditions for monitoring future project components,
c) Evaluation of the relevant policy and legal framework pertaining the proposed project.
d) Consultation with the relevant stakeholders and incorporate their comments into impact identification and mitigation,
e) Identification of all potential impacts and propose feasible mitigation impacts
f) Preparation of an Environmental and Social Management and Monitoring Plan (ESMP) for the implementation of the proposed project. The ESMMP should outline: *i)* potential environmental and social impacts resulting from project activities; *ii)* proposed mitigation measures; *iii)* monitoring indicators; iv) responsibilities for

implementation of the mitigation measures; *v)* responsibilities for monitoring the implementation of the mitigation measures

The purpose of this report is to provide NEMA and the Lead Agency with sufficient and relevant information on the proposed project that can allow them establish whether or not the project is likely to have significant impact on the environment, and thus determine the basis for approval.

1.3 Justification of the Proposed Project

1.3.1 Demand for Better Water Supply Services

The project area has some of the existing water sources as either non-functional or inadequate to meet the demand of rapidly growing population. The most common water source in the project area is the hand pump, which is less efficient in the provision of water to large populations spread over distant places.

The impact of inadequate safe water supply falls primarily on the poor. Every year, thousands of Uganda's poor citizens die from preventable diseases caused by inadequate / unsafe water supply services. Hundreds of thousands more suffer from regular bouts of diarrhoea or parasitic worm infections as a result of unsafe water and/or poor sanitation practices that ruin their lives; women and children are the main victims. Further, poor sanitation (also associated with inadequate water supply) costs Uganda 389 billion Ugandan Shillings each year, equivalent to US$177 million, according to a desk study carried out by The Water and Sanitation Program (WSP). This sum is the equivalent of US$ 5.50 per person in Uganda per year or 1.1% of the National GDP. The costs of poor sanitation are inequitably distributed with the highest economic burden falling disproportionately on the poorest. For the poorest therefore, poverty is a double-edged sword; not only are poor people more likely to have poor sanitation, but also, they have to pay proportionately more for the negative effects it has.

1.4 Details of the Developer and Investment Cost

1.4.1 Details of the Developer

Project Title:	Proposed Mini-Solar Powered Piped Water Supply and Sanitation System in Kirewa Sub-county, Tororo District
Developer:	Ministry of Water and Environment / Tororo District Local Government
Address:	Plot 21/28 Port Bell Road, Luzira, P.O. Box 20026 Kampala, Uganda
Contact Person:	**Name:** Eng. Olweny Lamu **Designation:** Assistant Commissioner Research and Development **Mobile:** +256-772-453-395 **Email:** llolweny@yahoo.co.uk

1.4.2 Investment Cost

The cost estimate was based on the design assumptions and the preliminary engineering design. The total cost of the project is estimated at Three Billion Three Hundred Forty-Four Million Nine Hundred Eighty-one Nine Hundred Eighty-eight Uganda Shillings only

(UGX 3,344,981,988), inclusive of taxes. The detailed cost for each of the proposed project infrastructure are indicated in the table attached under Annex I.

1.5 Study Methodology

The study was undertaken by NEMA Certified Environmental Practitioners in accordance with the National Environment (Environmental and Social Assessment) Regulations, 2020, and other relevant legislation of Uganda. The Consultants undertook the task of preparing an Environmental and Social Impact Assessment by way of an Environmental Project Brief (EPB) for the proposed project. It involved clearly defining the assignment into a number of discrete activities, which facilitated development of a workable framework for the speedy and timely execution of the assignment. They included but were not limited to the following:

1.5.1 Environmental Screening

This is the stage at which the project was identified as among those that require a Project Brief as per Section 112 of the Act. The proposed project falls under Schedule 4 of the National Environment Act, 2019. The proposed project is listed in ***Category 4 - Utilization of water resources and water supply (b) Abstraction or utilization of groundwater of less than 1000 m³/day.*** The project requires an Environmental and Social Impact Assessment (ESIA) by way of a Project Brief as it will have an output of 330 m^3/day at the ultimate year of 2042 as per the design demand. Only projects for which more than 1000 m^3/day of water is to be abstracted from ground water (Category 4 (b) under Schedule Five), are required to under a full ESIA. Further, according the funder's (African Development Bank; AfDB) Integrated Safeguards System (ISS), the project is considered as category 2 (medium E&S risks) which requires the preparation of an ESIA.

1.5.3 Field Visits and Inspections

Field visits and inspections were carried out by the study/assessment team so as to get acquainted with the project activities in the study area, and also map out sampling sites. The areas that were visited included all the project affected villages in Kirewa Sub-county. Other places visited include: The proposed water abstraction sites in Ngulimo and Chawolo Villages both located in Mifumi Parish, Kirewa Sub-county and the proposed reservoir site in Dago Zone, Soni Parish, Kirewa Sub-county and the proposed water transmission routes from the abstraction sites to the reservoir site.

1.5.3 Literature Review

Key documents pertinent to the study were reviewed and these include;

i. The Engineering Design report for Soni Mini Solar Water Supply System;
ii. The Feasibility report for Soni Mini Solar Water Supply System;
iii. The relevant development and environmental legislation of Uganda;
iv. International, regional, provincial or communal environmental related guidelines;
v. International Finance Cooperation (IFC) Performance Standards;
vi. Third Uganda National Development Plan (NDPIII);

vii. Uganda Vision 2040;
viii. Water and Environment Sector Development Plan 2015/16-2019/20.

1.5.4 Community and Stakeholder Consultations

The success of a project depends on its acceptability by the members of the public and other stakeholders who it's intended to benefit. As a result, stakeholder consultations formed a very important part of this assessment.

The aim of this consultation was to enable affected parties and other stakeholders present their views and concerns that would contribute to the formulation and refinement of the project design.

The objectives of the consultation were to:

- provide information about the project and its potential impacts or benefits to those interested in or affected by the project, and solicit their opinions in this regard;
- provide opportunities to stakeholders to discuss their opinions and concerns;
- manage expectations and misconceptions regarding the project; and
- inform the process of assessing significance of impacts and developing appropriate mitigation measures.

The assessment team consulted the relevant project stakeholders. Mobilization of all social groups including men, women, youth, water user committee members, local leaders, and other community opinion leaders in the project area. Necessary consultation tools and aides, such as area maps indicating the project design, location of project components and project information briefs were displayed and shared during community consultations and other stakeholder consultative meetings.

A two-level stakeholder consultative procedure was adopted. At the first level were community members who live within the project affected villages. These consultations took place at the village level through participatory community dialogues. The second level was sub-county and district stakeholder consultations. These consultations were carried out at Chawolo, Pakita 'A', and Kisera 'A' villages, Kirewa Sub-county headquarters and at Tororo District headquarters.

The identification of stakeholders was based on the different activities involved in the project, the sectors the project lies in and the administrative locations of project components. The main considerations in the stakeholder group selection process were:

- Those involved in project preparation;
- Those whose activities coincide or overlap with those proposed by the project (such as relevant local government authorities, non-governmental organisations); and
- Those who may be directly affected by the project (The local population in the

project area).

The key stakeholders that were identified include project host community members and area residents, the area local authorities like the village LC1 chairperson, the District Water Officer, District Environment Officer and relevant government agencies among other stakeholders.

To ensure in depth explorations and insights into the feelings and thoughts of the various interest groups, a purely qualitative approach was employed during the consultation. These were conducted through meetings with representatives from relevant local authorities and the project host community members and area residents. In total, 44 stakeholders were consulted; 29 males and 15 females in a total of 5 meetings.

Stakeholder's views and their concerns are given in Section Five (5) of this report. These views and concerns were taken into consideration during impact identification and for informing impact enhancement and mitigation measures.

1.5.5 Flora Assessment

It is important to understand the vegetation of the project area as this will play an important role in re-vegetation of places that will be excavated/laid bare during the project activities. It will be necessary that sites are restored to as much as practically possible to conditions they were in before project activities. During the field visits, observation and identification of flora species at the sites for water abstraction and reservoir, and along the transmission lines were done. Flora species which could not be identified in the field were picked, kept in properly labelled plant press and transported to the Makerere University Herbarium for identification.

1.5.6 Fauna Assessment

Fauna assessment involved a survey of birds in the project area, using Timed Species Counts (TSCs) (Freeman et al., 2003). This method generates estimates of relative abundance by scoring 6 for species recorded in the first ten minutes, down to one for the last ten minutes of a one-hour count. The argument is that the common species are recorded in most counts, usually with a score of six, whilst rare species only score an occasional one. In addition, for a series of counts, the commonest species are recorded most times and usually with a high score.

Transect walks were made with the help of local guides, recording all species in order of their being encountered, whether by site or sound. Birds were identified with the help of a pair of binoculars and where there was doubt about identification, we referred to the field guide (Stevenson and Fanshawe, 2002).

An analysis of birds of conservation concern was conducted based on various categories as listed as follows:

Global, Regional and National Red-listed species

The bird lists were classified globally based on the Red-listed (IUCN, 2019) and nationally/ regionally based on Wildlife Conservation Society (WCS, 2016). These categories are indicated as:

- *CR Critical (Globally or Regionally or Nationally)*
- *EN Endangered (Globally or Regionally or Nationally)*
- *VU Vulnerable (Globally or Regionally or Nationally)*
- *NT Near-threatened (Globally or Regionally or Nationally)*
- *RR Regional Responsibility (Globally or Regionally or Nationally)*

1.5.7 Water Quality Measurements and Analysis

The physico-chemical quality of water for the two abstraction boreholes was analysed following procedures certified by the International Organization of Standardization – ISO and standard methods according to APHA/AWWA/WEF (2020). The water quality analysis was carried out at the National Water and Sewerage Corporation. The results of water quality analysis are presented in section 3.4.1 and Annex IV.

1.5.8 Noise Measurements

Baseline noise measurements in the project area were carried at various locations using a Benetech GM1356 digital sound level meter with a range of 30—130 dB (Plate 1). The noise results were compared to permissible limits (Table 1), according to the National Environment (Noise standards and Control) Regulations, 2003. The results of noise measurement are presented in section 3.3.

Table 1: Maximum Permissible Noise Levels for Construction sites

Noise at Receptor	Maximum noise level permitted in dB (A)	
	Day*	Night*
Residential	60	40
Commercial	75	50
Industrial	85	65
*Day is 6.00 a.m -10.00 p.m. and Night 10.00 p.m. - 6.00 a.m.		

Plate 1: Noise level meter used for noise assessment. Taken on 10th March 2023 by the Environmentalist

1.6 Structure of the report

The structure of this report is in conformity with NEMA guidelines and the different sections are outlined below: -

An executive summary providing a brief overview of the proposed project and its anticipated positive and negative impacts among others.

Chapter 1: Background information on the project, project objectives, methodology and report structure.

Chapter 2: A review of policies, laws, regulations and standards in relation to the development of the proposed project.

Chapter 3: Site baseline bio-physical and sociological information, area infrastructure and activities.

Chapter 4: Description of the proposed project components, preparation, construction and operations phase activities.

Chapter 5: Public consultations and disclosure, mentioning stakeholder concerns and measures to address them.

Chapter 6: An analysis of alternatives, including the Project alternative, No Project option and comparison of the two options.

Chapter 7: Evaluation of the identified environmental and social impacts and recommendation of appropriate mitigation measures for all significant negative environmental impacts predicted.

Chapter 8: An Environmental, Social Management and Monitoring Plan for addressing negative impacts and assessing effectiveness of mitigation measures, scheduling monitoring frequency and assigning responsibility.

Chapter 9: Grievance Redress Mechanism

Chapter 10: Conclusions and recommendations arising from the ESIA.

2 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

2.1 Introduction

The water and sanitation sector in Uganda has evolved over the past 10 - 15 years through several reforms and national instruments all geared towards increasing efficiency in implementation and effectiveness in delivery of services to the unserved. This continuous change process has enabled appropriate adaptation of sector policies and strategies to be incorporated into emerging national and international development agenda including the country's National Development Plan (NDP), Uganda Vision 2040 and also aligned towards the achievement of the United Nations Sustainable Development Goals (SDGs). This section provides an overview of national and international policies, laws and regulations/standards relevant to the proposed project as well as the national institutions responsible for water and environmental protection and conservation as well as health, safety and social safeguards.

2.2 Policies Relevant to the Proposed Project

The policies relevant to the proposed Soni Mini Solar Piped Water Supply and Sanitation System are presented in Table 2.

Table 2: Policies relevant to Soni Mini Solar Piped Water Supply System

Policy Title	Policy Goal	Relevance to Soni Mini Solar Water Supply and Sanitation System
The National Environment Management Policy for Uganda (2014)	The overall policy goal is to ensure sustainable development which maintains and promotes environmental quality and resource productivity for socio-economic transformation. The policy sets out in one of its key objectives to integrate, in a participatory manner, environmental concerns in all development policies, plans, activities and budgets at national, district and local levels.	Environment and Social Impact Assessment (ESIA) by way of a Project brief has been conducted for the proposed Construction of Soni RGC Mini Solar Piped Water and Sanitation Supply System (this Report). If the proposed impact mitigation measures are put in place, the project will promote economic and social development in a sustainable way. These have been developed in consultation with different stakeholders of the proposed project.
The National Water Policy, 1999	To promote an integrated approach to manage the water resources in ways that are sustainable and most beneficial to the people of Uganda	The proposed project seeks to increase on the amount of safe water supply in Soni RGC in Tororo District.
The National Gender Policy, 1997	Provides a framework and mandate for all stakeholders to address the gender imbalances within their respective sectors.	The gender policy recommends that integration of gender issues in national policies and projects will improve national welfare, contribute towards sustainable development, and improve the work of government ministries. The project will consider gender aspects during the different phases of its implementation.
The National Health Policy (1999)	To prevent transmission of diseases through Primary Health Care (PHC) including Sanitation and Hygiene.	The proposed project will help to improve the sanitation through improved provision and access to safe water to the communities.
The National Land Policy (2013)	The Policy was developed to ensure efficient, equitable and optimal utilisation and management of	Some project infrastructure like transmission lines, reservoirs and boreholes will be located on people's land. Unless

Policy Title	Policy Goal	Relevance to Soni Mini Solar Water Supply and Sanitation System
	Uganda's land resources for poverty reduction, wealth creation and overall socio-economic development.	where the land is given freely by the community, affected land should be compensated following provision of Uganda's Land laws
The National Land-Use Policy (2007)	The Policy has an overall goal of achieving sustainable and equitable socio-economic development through optimal land management and utilization in Uganda	The project components are of a small scale and will not compromise the existing land use plan
The National Employment Policy for Uganda (2011)	The overall goal is to promote productive and decent employment for all women and men in conditions of freedom, equity, security and human dignity	The proposed Soni Mini Solar Water Supply and Sanitation System will employ many people who will include casual and technical personnel, including those from the affected community.
The Environment and Social Safeguards Policy (2018)	The Policy was formulated to ensure that environmental and social concerns are integrated in all stages of project development and all levels including national, district and local levels, with full participation of the people as means of minimizing environmental and social impacts	The proposed project has developed an EBP (this report) in line with the principles outlined in the Policy.

2.3 Legal Framework Relevant to the Proposed Project

The Ugandan laws and regulations, and the African Development Bank (AfDB) Operational Safeguard (OS) Policies applicable to the proposed project are presented in Tables 3 and 4, respectively.

Table 3: Ugandan laws and regulations relevant to the Proposed Soni Mini Solar Water Supply System

Legal Framework	Provision(s)	Proposed Actions/Comments
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. Chapter 15, Article 237, Clauses (1) (2) (a) & (b) gives the Government the powers as guided by the Parliament to acquire land anywhere within the country and place it to the best use to benefit the citizens of the country, where deemed necessary.	The developer observes the Constitutional provisions. This is why the developer commissioned the ESIA process prior to implementation of the project. The waterworks, as well as distribution to neighbouring areas will be done while following mitigation measures. All land acquisitions will adhere to provisions of the 1995 National Constitution.
The National Environment no. 5 2019	Section 112 (1), requires a developer of a project to submit an acceptable EIA/EPB Report in accordance with the guidelines in the Fourth Schedule of this Act.	An EPB has been conducted for proposed Project so that it promotes economic and social development in a sustainable way.
The Water Act, Cap 152 and The Water	Under section 18 (2), a person wishing to construct any works or take and use water may apply to the	The developer will ensure that waste generated during

Legal Framework	Provision(s)	Proposed Actions/Comments
Resources Regulations, 1998	Director of Water Development Directorate in a prescribed form for a permit to do so. Under Section 31 (1) of the Act, a person commits an offence who, unless authorized under this Part of the Act, causes or allows wastes to come in contact with, or be discharged into water or allows water to be polluted	project implementation does not negatively impact water resources in the project area.
The Land Act, Cap 227	Section 42 states that Government or Local Government may acquire land in accordance with the provisions of Article 26 and clause 237 of the constitution. Section 74 (i) states that where it is necessary to execute public works on any land (for example construction of road), an authorized undertaker shall enter into mutual agreement with occupier or owner of the land in accordance with this act, and where no agreement is reached, the Minister may; compulsorily acquire land in accordance with Section 43 of the Act.	All the required land for the proposed project will be acquired in accordance with this Act.
The Occupational Safety and Health Act, 2006	The Act aims at ensuring the existence of safety and health at all work places and work environment.	The project shall adhere to occupational safety and health rules according to the mitigation measures suggested in this report.
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.	The developer shall ensure that all contractors and sub-contractors provide personal protective equipment (PPE) to employees to minimize accidents and injuries. Additionally, compensation will be paid to those affected.
The Town and Country Planning Act, 2014	The Town and Country Planning Act govern land use and land planning in urban and rural areas.	The developer shall use established guidelines for planning schemes, to acquire land as well as safeguarding the natural environment.
The Public Health Act Cap 281	Section 7 provides local authorities with administrative powers to take all lawful, necessary and reasonably practicable measures for preventing the occurrence of, or for dealing with any outbreak or prevalence of, any Infectious, communicable or preventable disease, to safeguard and promote the public health.	The developer/ Contractor shall provide for adequate sanitary facilities, proper solid and liquid waste management and provide and operate first Aid services especially in public places; and shall ensure that such facilities are available in all other privately allocated and developed areas requiring such to possess them. Anybody falling sick and needing services beyond the first Aid shall be

Legal Framework	Provision(s)	Proposed Actions/Comments
		referred to the nearest health centre. The developer /Contractor will implement HIV/AIDS prevention and control plan as part of the mitigation measures.
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 functions of the Municipal Councils include: land surveying and administration, physical planning, environmental protection (forests and wetlands, streams and so forth and ensuring proper sanitation	The developer shall work closely with Tororo District Local Government administration, including other lower local governments at sub county and village levels in carrying out activities related to the project for example monitoring the implementation of the Environment and Social Management and Monitoring Plan (ESMMP) for the project.
The National Environment (Environmental and Social Assessment) Regulations, 2020	Regulation 6(1) requires the developer of a project under section 112 of the Act and set out in Schedule 4 of the Act to undertake scoping and an environmental and social impact study in accordance with these Regulations. Regulation 16(1) requires the developer to carry out consultations with relevant stakeholders, communities likely to be affected by the project and the public while undertaking the environmental and social impact study.	The study has been conducted in line to the provisions of the Regulations. Various stakeholders in the project area were consulted to find out their views on the proposed project.
The National Environment (Wetlands, River Banks and Lake Shores Management) Regulations, 2000	Regulation 12(1) prohibits any person from carrying out an activity in a wetland without a permit issued by the Executive Director of NEMA. Under regulation 34(1), a developer desiring to conduct a project which may have significant impact on a wetland (for example dredging), river bank or lake shore, shall be required to carry out an environmental impact assessment in accordance with sections 20, 21, and 22 of the NES.	The proposed project activities shall not be carried out in or near any wetland.
National Environment (Conduct and Certificate of Environment Practitioners Regulations (2003)	Regulation 176 (1) states that no person shall conduct an EIA or carry out any activity relating to the conduct of an environmental impact study, or environmental audit as provided under the Act, unless the person has been duly certified and registered in accordance with the regulations	The Consultants who carried out this assessment are certified practitioners by NEMA.
The National Environment (Waste Management) Regulations (2020)	Regulations outline the requirements for the management of hazardous and non-hazardous waste including transport, storage, treatment, and disposal and licensing of waste contractors. Regulations require waste disposal in a way that would not contaminate water, soil, and air or impact public health.	The Project Developer should be aware of regulation requirements and legal standards when designing waste storage facilitates, likely avoiding wetland and riverine areas.

Legal Framework	Provision(s)	Proposed Actions/Comments
The Water (Waste Discharge) Regulations, 1998	The water (Waste Discharge) Regulations of 1998, are aimed at regulating the effluent or discharge of wastes on to land or into water. Under regulation 5(1), a waste discharge permit is required for a person who owns a facility which discharges or will discharge effluent or waste into the aquatic environment or on land. The alum sludge and backwash water from the water treatment works will have to be discharged responsibly.	In case of any waste discharged, a waste discharge permit shall be acquired from the relevant authorities.
The National Environment (Control of Smoking in Public Places) Regulations, 2004.	Section 3 entitles every person to a healthy environment, free from second-hand smoke. It further obliges all persons to safeguard the health of non-smokers. Sections 4 & 5 prohibit smoking in public places.	The Developer/ Contractor shall enforce a no-smoking ban in all public work places during construction and operation phases of the project and will ensure that there are clear signs indicating that smoking is restricted and prohibited in such areas.
The National Environment (Noise Standards and Control) Regulations, 2003.	Regulations 6 & 7 (II) sets permissible noise levels, Part III (Regulations 8, 9, 10 & 11) calls for the control and mitigation of noise; Regulation 9 specifically prohibits the generation of noise by place and time. Part IV instructs for a license for noise in excess of permissible levels.	Contractor and developer must enforce noise standards and working hours at the site allocated for development, both during the construction stage, as well as during operation and maintenance.
National Air Quality Standards, 2006 (Draft)	The Standards provides for permissible limits air quality parameters such as carbon dioxide, Nitrogen oxides, Sulphur oxides, Volatile Organic Compounds and particulates	The Developer and Contractor must implement and enforce mitigation measures for air pollution during the entire lifecycle of the project

Table 4: AfDB Operational Safeguard (OS) Policies

Operational Safeguard/Performance Standard	Key issue	Relevance/Applicability
OS 1: Environmental and social assessment	Mainstream environmental and social considerations, including those related to climate change vulnerability and thereby contribute to sustainable development in the region. It governs the process of determining a project's environmental and social category and the resulting environmental and social assessment requirements.	An environmental and Social Impact Assessment (ESIA) has been conducted for this project (this Report) where potential impacts have been identified and mitigation measures proposed. This will ensure that the project is implemented in a sustainable way.
OS 2: Involuntary resettlement, land acquisition, population	Mainstream resettlement considerations in AfDB operations. It consolidates the policy commitments and requirements set out in the Bank's	All people whose land is to be affected for example at the proposed water abstraction/ treatment site, reservoir sites

Operational Safeguard/Performance Standard	Key issue	Relevance/Applicability
displacement and compensation	policy on involuntary resettlement, and incorporates a number of refinements designed to improve the operational effectiveness of those requirements.	and some areas along the proposed pipeline route will be compensated prior to start of construction works.
OS 3: Biodiversity and ecosystem services	Identify and implement opportunities to conserve and sustainably use biodiversity and natural habitats as well as observe, implement, and respond to requirements for the conservation and sustainable management of priority ecosystem services.	Mitigation measures have been proposed in this report to minimize probable impacts of this project on biodiversity, including water resources so that their ability to provide ecosystem services to people are not compromised.
OS 4: Pollution prevention and control, hazardous materials and resource efficiency	Manage and reduce pollution in AfDB funded projects. It covers a range of key impacts including pollution, waste, and hazardous materials for which there are agreed international conventions, as well as comprehensive industry-specific and regional standards, to be followed to safeguard the environment and humans from being polluted as a result of the development activities.	The project will set up a waste management plan to handle liquid and solid wastes, including those of hazardous nature.
OS 5: Labour conditions, health and safety	Protection of workers' rights and provision of their basic needs. It establishes the Bank's requirements for its borrowers or clients concerning workers' conditions, rights and protection from abuse or exploitation of the labourers.	The project will abide by the labour laws to protect the interests of workers. This will include for example: providing contracts to all hired workers, providing workers with personal protective equipment, setting up a grievance handling mechanism to enable workers express their complaints, among others.

2.4 Institutional Framework

2.4.1 Ministry of Water and Environment

Ministry of Water and Environment (MWE) is responsible for ensuring sound environmental management that in turn ensures that there is sufficient water for domestic, agricultural and industrial uses. MWE has the responsibility for setting national policies and standards, managing and regulating water resources and determining priorities for water development and management.

2.4.1.1 The Directorate of Water Resources Management (DWRM)

The directorate is part of the Ministry of Water and Environment and is responsible for developing and maintaining national water laws, policies and regulations; managing, monitoring and regulation of water resources through issuing water use, abstraction and wastewater discharge permits; Integrated Water Resources Management (IWRM) activities; coordinating Uganda's participation in joint management of transboundary waters resources and peaceful cooperation with Nile Basin riparian countries.

2.4.1.2 The Directorate of Water Development (DWD)

The Directorate of Water Development (DWD) under MWE is the lead agency responsible for coordinating and regulating all water supply and sanitation activities. It provides technical support services and capacity development to local governments and other service providers. DWD comprises three Departments; Rural Water Supply and Sanitation; Urban Water Supply and Sanitation and Water for Production.

2.4.2 National Environment Management Authority (NEMA)

The National Environment Management Authority (NEMA) is a semi-autonomous institution, established under the National Environment Act, Cap. 153, in 1995, as the principal agency in Uganda, charged with the responsibility of coordinating, monitoring, regulating and supervising environmental management in the country. NEMA spearheads the development of environmental policies, laws, regulations, standards and guidelines; and guides Government on sound environmental management in Uganda. Air quality, effluent and noise standards issued by NEMA are key to project implementation.

2.4.3 Ministry of Gender Labour & Social Development

This ministry promotes issues of social protection, gender equality, equity, human rights, culture, decent work conditions and empowerment for different groups such as women, children, the unemployed youth, internally displaced persons, the older persons and persons with disabilities. The Ministry works with institutional structures at district levels including probation offices, community development offices, and labour offices.

The Department of Occupational safety and health of this ministry administers and enforces the Occupational Safety and Health Act, No.9, 2006, the Laws of Uganda and its subsidiary Legislation. Mandated to Evaluate and Control the Physical, Chemical, Physiological, Social and Technical factors that affect persons at Work and the Working Environment. As such it is a requirement for the project to obtain a Workplace registration certificate and certificates of examination of lifting equipment from this department during the contractor mobilisation phase. Additionally, it is mandatory to report fatal accidents and any lost time injuries of three days or more to this department.

2.4.4 Local Administration Structures

The proposed project falls within jurisdiction of Tororo District. Technical District personnel directly involved on the project include the Chief Administrative Officer, District Water Officer, and the Environment Officer.

3 ENVIRONMENTAL AND SOCIO-ECONOMIC BASELINE CONDITIONS

3.1 Project Location and its Environs

Tororo District is located in Eastern Uganda. It borders with the Republic of Kenya to the East, Bugiri District to the West, Butaleja District to the North, Busia District to the South and Mbale to the North East. Administratively, the district is divided into (6) counties, one (1) municipality which are further sub-divided into sub-counties, parishes and subsequent villages. The proposed project will cover villages in Kirewa Sub-county as depicted in Figure 1.

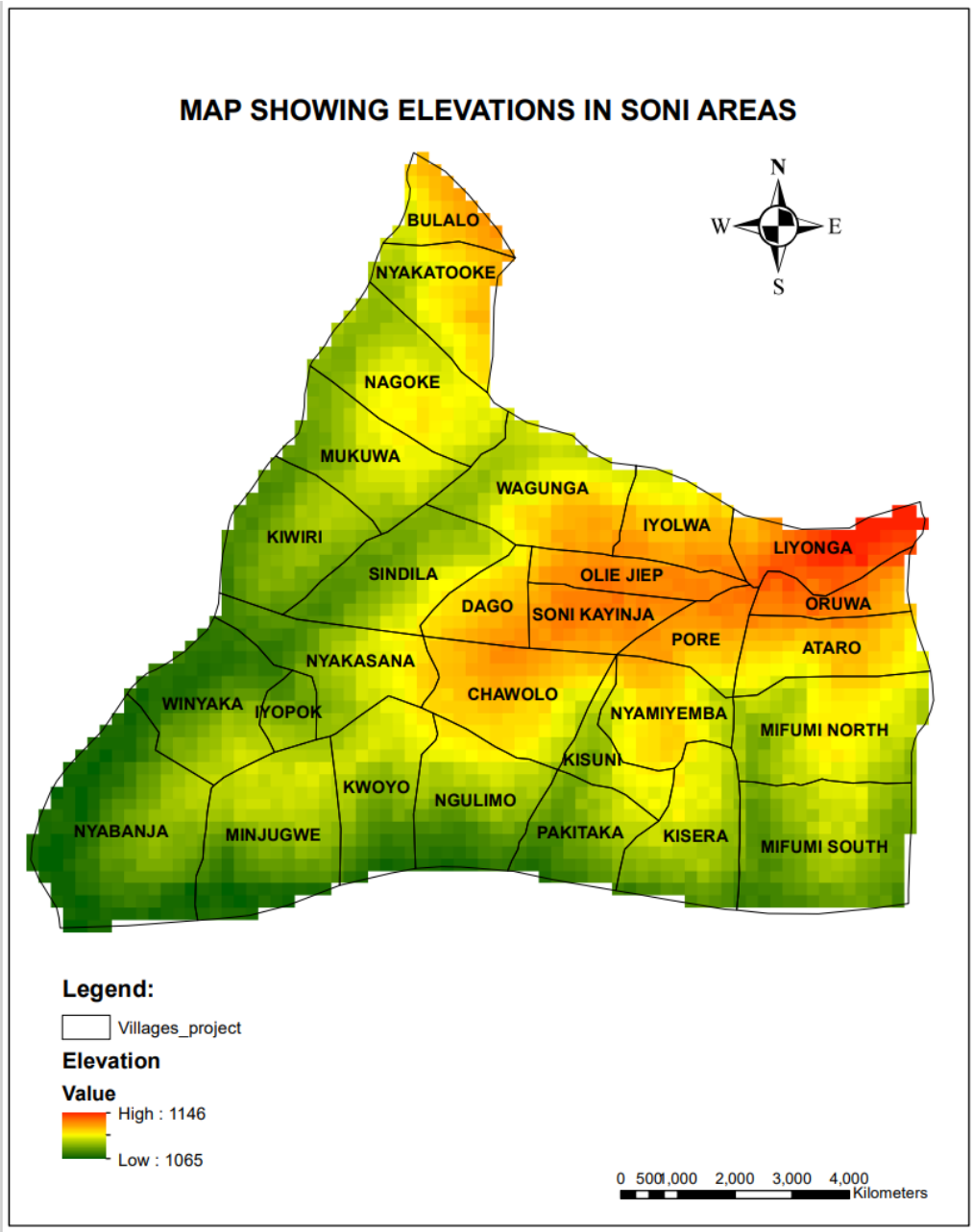


Figure 1: Proposed project area

The proposed project boreholes and reservoir tanks that will be constructed to supply water in the project area are located at GPS coordinates as presented in Table 5 and Figure 2.

Table 5: Location of the proposed project components

BH No. / Reservoir/Transmission	Village	Parish	Sub-county	Coordinates	
DWD 90935	Ngulimo	Mifumi	Kirewa	N0.745399	E033.935011
DWD 90936	Chawolo	Mifumi	Kirewa	N0.751017	E033.940083
Proposed Reservoir	Dago Zone	Soni	Kirewa	N0.756301	E033.934097
Transmission Line 1	Chawolo	Mifumi	Kirewa	N0.749753	E033.938055
Transmission Line 2	Dago Zone	Soni	Kirewa	N0.755827	0.33.939293

Figure 2: Google Earth Map of the proposed abstraction and reservoir sites

3.2 Biophysical Environment

3.2.1 Geology and Soils

Tororo District is underlined by the eastern volcanic rocks of Cretaceous to Miocene age (135 — 5.30 Ma) which comprise generally soda-rich agglomerates, lavas and tuffs extruded by central volcanoes that are represented by Mountain Elgon, that is the Mesozoic and Cainozoic rocks (DGSM, 2008). The area hosts carbonite resources related to the Carbonatite ring complexes along the Kenya — Uganda border. This is underlain by sediments of the Bugisu Series associated with Mt. Elgon. The tertiary pre-Elgon

volcanic rocks, which include Tororo rock and Osukuru hills, are known to be very rich in minerals, which have potential for the growth of industries (cement, fertilizers and fungicide industries).

The soils of Tororo District are sandy clay- and loam-type, with low contents of carbon, nitrogen and phosphorus.

3.2.2 Climate

Tororo District is characterized by sub-humid and orographic climate which is mainly brought about by its location close to the Elgon Mountain ranges. It has bi-modal rainfall with wettest season extending from March to May followed by a light dry 'season which runs from June to August. The second and light rain season is November and December. Rainfall peaks during the months of May and October and the driest season is from December — February. The annual rainfall ranges from 1,100 mm to 1,700 mm while the temperature varies between 16 —28 °C. The relative humidity ranges between 52% - 89%.

This climate is favorable for agriculture. However, prolonged droughts and abnormally heavy rains attributed to climate variability and change have in the past been reported in the district. For example, in 2007, heavy rains that resulted into flooding and later, followed by prolonged drought devastated agricultural activities in the district.

3.2.3 Drainage

There is presence of soil erosion due to steep hills and high-speed water especially in the project area which is highly attributed to poor farming practices. There is presence of large gullies formed as a result of surface run off water. In all the project area, there are presence of rocks and swampy sections that make accessibility difficult coupled with difficulty in reaching out some local communities with piped water. This presents a potential threat to high cost of investment in piped water supply system since there is need to construct bridges for pipes in some instances for easy access of water.

3.2.4 Topography

The land in the project area is generally hilly, with an elevation of 1,459.5 metres above sea level. The topography of Tororo is not prone to soil erosion.

Tororo District is located at an elevation of over 1,200 metres above sea level. Its relief consists of low hills and rolling plains, which are drained by seasonal streams. Most of the land is generally gentle and suitable for agriculture without risking severe run off of the top soils.

3.2.5 Flora and fauna

3.2.5.1 Flora

Around the proposed project area, vegetation is characteristic of agricultural landscapes, dominated by grasses, shrubs, weeds, crops and a few trees. The abstraction and reservoir sites are already converted into agricultural use, while the transmission lines

follow existing roads and will be restricted within the road reserves. Generally, all the project affected sites are already modified and not representative of the natural conditions. None of the vegetation species is of conservation concern as per the IUCN'S Red List of endangered species. Nevertheless, measures have been suggested to minimize disturbance on vegetation. The specific vegetation characteristics at and around the various sites are as follows:

Ngulimo BH - DWD 90935

The abstraction site is within a modified area surrounded by gardens of cassava and an access road (Plate 2). The site is characterized by regenerating species. Some of the species identified at the project site include: *Manhot esculenta, Artocarpus heteropphyllus, Carica papaya, Gomphrena celosioides, Schkuhria pinnata, Commelina benghalensis, Acalypha sp, Phyllanthus amarus, Mimosa pedica, Pancium maximum, Tridax procumbens, Conyza sp, Achyranthes aspera, Cynodon dactylon, Cucumis sativas, Fluegea virosa, Vernonia amygadlina. Albizia coriaria,* and *Solanum incanum.*

Plate 2: Vegetation at Ngulimo abstraction point. A cassava garden (Left) and an abandoned field dominated with shrubs (Right). Photos taken on 10th March 2023 by the Botanist

Chawolo BH - DWD 90936

The vegetation cover comprised of gardens of *Musa sp*, *Manhot esculenta, Zea may* with *Artocarpus heteropphyllus, Guajava psium, Coffea canephora* and *Carica papaya* fruits. Regenerating species included: *Gomphrena celosioides, Schkuhria pinnata, Aristolochia sp, Cissus verticillata, Commelina benghalensis*, *Acalypha sp, Phyllanthus amarus, Triumphetta sp, Mimosa pedica Pancium maximum, Tridax procumbens, Conyza sp, Achyranthes aspera, Cynodon dactylon, Cucumis sativas, Fluegea virosa, Vernonia amygadlina.* Trees included*: Eucalyptus gunnii, Albizia coriaria, Albizia zygia, Kigelia africana* (Medicinal tree) *Pseudocedrella odorata, Sperthoda nilotica* (Medicinal tree), and *Persea americana.* Plate 3 shows the vegetation cover at and around this site.

Plate 3: Vegetation at Chawolo abstraction point. Banana crops (Left) and a mix of banana crops and trees (Right). Photos taken on 10th March 2023 by the Botanist

Transmission Lines

Species identified along the transmission lines include: *Coffea canephora*, *Pancium maximum*, *Amaranthus sp, Megathyrsus maximus, Bidens pilosa, Commelina benghalensis, Pennisetum purpureum, Phyllanthus amarus*, *Zea mays*, *Musa sp*, and *Pennisetum glaucum.*

Reservoir Site

The vegetation at the proposed reservoir site was composed of regenerating *Oxygonum sinuatum, Gomphrena celosioides, Neotoni whitei, Phyllanthus amarus, Leonotis molisima, Schkuhria pinnata, Aristolochia sp, Cissus verticillata, Commelina benghalensis*, *Acalypha sp*, *Phyllanthus amarus*, *Triumphetta sp*, *Mimosa pedica Pancium maximum*, *Tridax procumbens*, *Conyza sp*, *Achyranthes aspera*, *Cynodon dactylon*, *Cucumis sativas*, *Fluegea virosa*, *Vernonia amygadlina*. Trees of *Albizia coriaria*, *Albizia zygia*, *pinus ficus sp*, *Kigelia Africana*, *Pseudocedrella odorata*, and *Sperthoda nilotica*. Invasive species such as *Lantana camara* and *Senna sp*. were observed at the proposed reservoir site. Plate 4 shows the vegetation cover at and around this site.

Plate 4: Vegetation at the proposed reservoir site

3.2.5.2 Fauna

From the field surveys conducted, a total 88 bird species were recorded in the project area. The most common species were Common Bulbul *Pycnonotus barbatus*, Bronze Mannikin *Spermestes cucullata*, these species were recorded within the first minutes in each of the five sites. The bird community sampled supports species of various categories, with forest edge species as the majority, followed by Grassland species (G). Forest generalists (F) and Water specialists were also well represented (Figure 3).

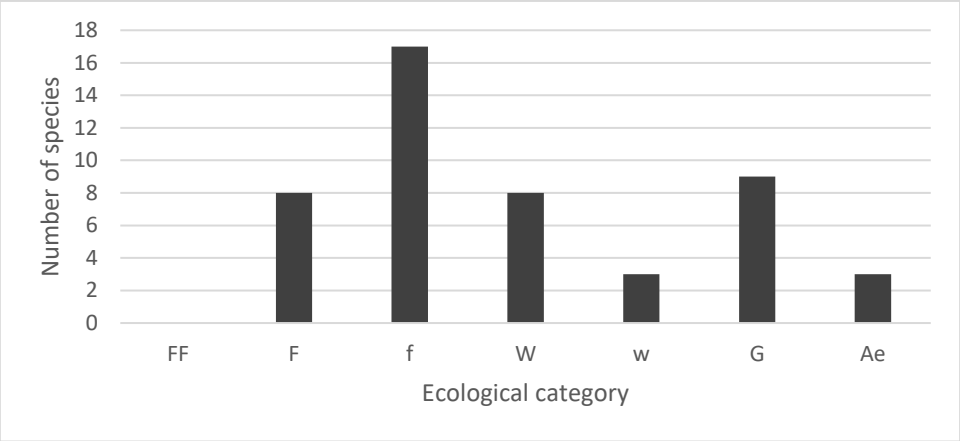


Figure 3: Number of species recorded under various ecological categories
(FF - Forest specialist, F - Forest Generalist, f - Tree Species, W - Water specialist, w - Water non-specialist, G - Grassland specialist, Ae - Aerial feeder)

Site accounts

There were differences in number of species recorded amongst sites assessed (Figure 2). Species richness was highest near the Dago reservoir area (36 species), followed by Chawolo abstraction site (29 species) whereas the lowest number of species was recorded along the transmission lines at Chawolo and Dago (Figure 4). Variations in number of species could be due to differences in anthropogenic factors, with mores species being recorded in areas with minimum human disturbance. Secondly, the proposed abstraction area was wet, therefore supporting a variety of species including water birds and land birds.

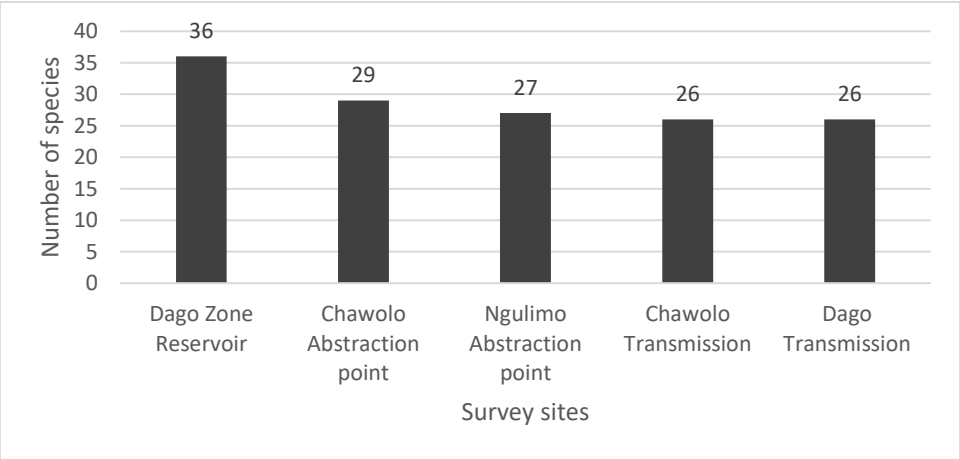


Figure 4: Number of species recorded in various sites along the water supply system

Birds of conservation concern

Table 6 lists the species of conservation concern recorded along the proposed water system. These included one globally listed species (European Roller *Coracias garrulous*), two nationally listed species (Leaf-love and Striated Heron; Plate 5) and four species of regional conservation importance.

Table 6: List of species of conservation concern and their level of relative abundance

2016 No	COMMON NAME	Scientific Name	Ecology	Red-list	Abundance
601	RED-CHESTED SUNBIRD	*Cinnyris erythrocercus*	W	R-RR	1.0
913	LEAF-LOVE	*Phyllastrephus scandens*	F	U-NT	1.0
431	SPOT-FLANKED BARBET	*Tricholaema lachrymosa*		R-RR	0.6
617	CARDINAL QUELEA	*Quelea cardinalis*	A	R-RR	0.4
178	STRIATED HERON	*Butorides striatus*	W	R-NT, U-NT	0.2
456	EUROPEAN ROLLER	*Coracias garrulus*	P	G-NT	0.2

Plate 5: Striated Heron *Butorides striatus,* this species is listed regionally and nationally as a threatened species. Photo taken on 11th March 2023 by the Ornithologist

Migrants

Table 7 lists all the migratory species recorded. These included five (5) Palearctic migrants and nine (9) Afro-tropical migrants. Palaerctic migrants breed in the Palaerctic region and found in Uganda during the northern winter, typically between October and March) whereas Afro-tropical migrants complete their journeys within Africa. The most abundant migratory species was Black Kite *Milvus migrans,* followed by Abdim's Stork *Ciconia abdimii* and Grey-Headed Kingfisher *Halcyon senegalensis* (Plate 6). The highest number of migratory species was recorded around Dago reservoir site (eight species). There were very few migrants along Chawolo transmission route.

Table 7: List of Migrant bird species recorded (PM-Palearctic migrant, AM-Afro-tropical migrants)

2016 No	COMMON NAME	Scientific Name	Ecology	Red-list	Abundance
337	BLACK KITE	*Milvus migrans*	PM/AM	LC	2.8
165	ABDIM'S STORK	*Ciconia abdimii*	AM	LC	2
467	GREY-HEADED KINGFISHER	*Halcyon leucocephala*	AM	LC	2
470	WOODLAND KINGFISHER	*Halcyon senegalensis*	AM	LC	1.6
619	RED-BILLED QUELEA	*Quelea quelea*	AM	LC	1.6
312	STEPPE EAGLE	*Aquila nipalensis*	PM	LC	1.2
455	ABYSSINIAN ROLLER	*Coracias abyssinicus*	AM	LC	1.2
560	GREY-BACKED FISCAL	*Lanius excubitoroides*	AM	LC	1.2
618	RED-HEADED QUELEA	*Quelea erythrops*	AM	LC	1.2
732	YELLOW WAGTAIL	*Motacilla flava*	PM	LC	1.2
441	WHITE-THROATED BEE-EATER	*Merops albicollis*	AM	LC	0.8
617	CARDINAL QUELEA	*Quelea cardinalis*	AM	R-RR	0.8
456	EUROPEAN ROLLER	*Coracias garrulus*	PM	G-NT	0.4
880	BARN SWALLOW	*Hirundo rustica*	PM	LC	0.4
916	WILLOW WARBLER	*Phylloscopus trochilus*	PM	LC	0.4

Plate 6: Grey-Headed Kingfisher, one of the Afro-tropical migrant species recorded along Soni Water System. Photo taken on 11th March 2023 by the Ornithologist

Water birds

The eleven water birds recorded are listed in Table 8. These included eight water specialists (W) and three non-water specialists (w*). The only important site for water birds was Chawolo abstraction area (all species were recorded here). The four other sites had only land birds. Little Egret was the most abundant water specialist as Black-headed heron for the non-specialists. Most of the water birds are not listed as threatened species apart from one species (Striated Heron *Butorides striatus*) which is listed nationally and regionally. Water bird are important for our wellbeing and to the environment in many ways for example, Water birds can maintain the diversity of other organisms, control

pests, be effective bio-indicators of ecological conditions, and act as sentinels of potential disease outbreaks. African Jacana *Actophilornis Africana* (Plate 7) was one of the common resident water bird specialists recorded.

Table 8: List of Water birds (water specialists –W and Non-specialists (w*)

2016 No	COMMON NAME	Scientific Name	Ecology	Red-list	Abundance
184	BLACK-HEADED HERON	*Ardea melanocephala*	W*	LC	1.2
184	LITTLE EGRET	*Egretta garzetta*	W	LC	1.0
191	SACRED IBIS	*Threskiornis aethiopicus*	W	LC	0.8
227	AFRICAN WATTLED LAPWING	*Vanellus senegallus*	W	LC	0.8
196	HADADA IBIS	*Bostrychia hagedash*	W*	LC	0.6
222	SPUR-WINGED LAPWING	*Vanellus spinosus*	W	LC	0.6
171	HAMERKOP	*Scopus umbretta*	W*	LC	0.4
162	YELLOW-BILLED STORK	*Mycteria ibis*	W	LC	0.2
178	STRIATED HERON	*Butorides striatus*	W	R-NT, U-NT	0.2
221	LONG-TOED LAPWING	*Vanellus crassirostris*	W	LC	0.2
230	JACANA	*Actophilornis africana*	W	LC	0.2

Plate 7: African Jacana *Actophilornis Africana* was recorded in the project area. Photo taken on 11th March 2023 by the Ornithologist

Forest species

During the assessment, we did not record any forest interior species (FF). FF species occurs only in natural primary forests. All the seven forest generalists (F) recorded along the proposed transmission line (Table 9; Plate 8). F species are less specialised, these also occur in small forest patches as well as encroached forests. Among the forest generalist, Fork-tailed Drongo and Long-crested Eagle were the most abundant. The highest number of these species were recorded near Dago water reservoir area. On the other hand, seventeen forest edge species (f) were recorded. These species do not depend on forests but do need trees for insects, seeds, shade, etc.

Table 9: List of forest generalist species (F) and their relative abundance levels

2016 No	COMMON NAME	Scientific Name	Ecology	Red-list	Abundance
550	FORK-TAILED DRONGO	*Dicrurus adsimilis*	F	LC	2.2
308	LONG-CRESTED EAGLE	*Lophaetus occipitalis*	F	LC	1.2
319	LIZARD BUZZARD	*Kaupifalco monogrammicus*	F	LC	1
913	LEAF-LOVE	*Phyllastrephus scandens*	F	U-NT	1
69	BLUE-SPOTTED WOOD DOVE	*Turtur afer*	F	LC	0.6
132	ROSS'S TURACO	*Musophaga rossae*	F	LC	0.4
594	OLIVE-BELLIED SUNBIRD	*Cinnyris chloropygius*	F	LC	0.4

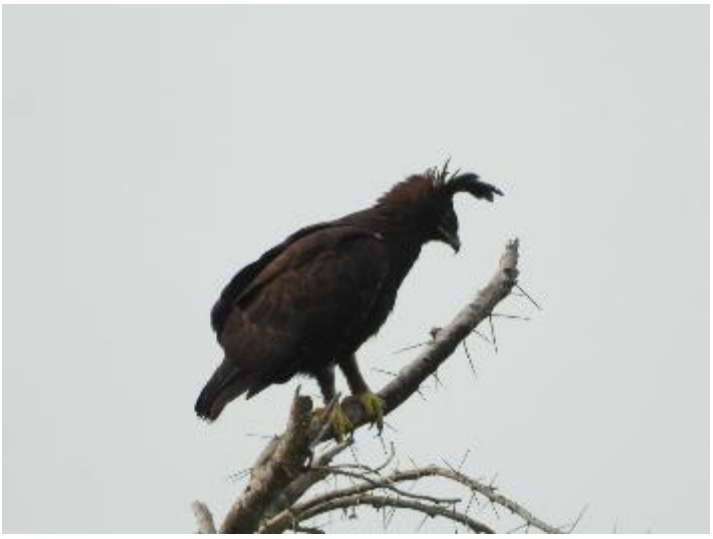


Plate 8: Long Crested Eagle, one of the forest generalist recorded at Ngulimo abstraction point. Photo taken on 11th March 2023 by the Ornithologist

Critical sites

The most critical sites are the ones near wetlands (Chawolo and Ngulimo abstraction areas points) (Table 10). Wetlands are important to birds in several ways for example, the migratory species use the wetland as stopovers and resting areas. Secondly, wetlands are a source of food for birds in form of plants, vertebrates and invertebrates. Regarding breeding, many bird species (both water birds and land birds) use swamps as breeding grounds. On the other hand, the three other surveyed sites (Dago transmission line, Chawolo transmission line and Dago reservoir) are already modified as a result of human settlement, cultivation and communication infrastructures.

Table 10: Critical habitat matrix generated along the proposed transmission line

IFC Critical habitat Criteria	Ngulimo Abstraction point	Chawolo Abstraction point	Dago Zone reservoir	Chawolo Transmission Line	Dago Transmission Line
Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species	2	3	2	1	1
Criterion 2: Endemic or restricted-range species	1	1	1	1	1
Criterion 3: Migratory or congregatory species	2	3	4	2	2
Criterion 4: Highly threatened and/or unique ecosystems	2	4	1	1	1
Criterion 5: Key evolutionary processes	2	2	1	1	1
Total Ranks	9	13	9	6	6

3.3 Noise Level

The noise levels recorded at the different sites in the project area are presented in Table 11. The results showed that baseline noise levels are within the permissible standards for residential and commercial areas.

Table 11: Noise levels in at selected project sites

Site	***Noise Reading***			**Background noise *sources/Remarks***
	Maximum dB(A)	Minimum dB(A)	Avg. Noise level dB(A)	
DWD 90935 -Ngulimo	53.3	45.1	49.2	People talking
DWD 90936 -Chawolo	*56.1*	*46.2*	*51.2*	People talking, Wind
Proposed Reservoir	*52.5*	*45.7*	*49.1*	*People talking*
Transmission Line 1	*51.8*	*44.3*	*48.0*	*People talking*
Transmission Line 2	*53.7*	*45.5*	*49.6*	*People talking*

3.4 Existing Water Supply Situation

Domestic water supply is from springs, wells and boreholes (Plate 9). Institutions use water from boreholes that have been drilled within their compounds and some amount from rainwater harvesting. These sources also serve communities in the neighbouring area. There are no solar piped water supply systems located within the project area. Majority of the residents in the Sub-county currently rely mostly on boreholes.

Plate 9: Existing water supply points. An existing well (Left) and a borehole (Right). Photos taken by the Water Resources Specialist on 10th March 2023

There are also two piped water systems within the Project Area; one is operated by NWSC which supplies area towards the terminal end of the Tororo GFS pipeline in outlying area of Tororo Municipality, the other supplies Lwakhakha town and its environs.

3.4.1 Water Quality

The water samples obtained from the boreholes sampled portray satisfactory physio-chemical characteristics. With this water quality, minimal treatment would be necessary. There are no water treatment works that require conventional treatment of water for consumption. The results of water quality analysis are presented in Table 12 and the details in Annex IV. The values of water quality are within the national standards for un-treated portable water for the measured parameters.

Table 12: Water quality of the project area

Parameter	Unit	National Standard for un- treated portable water	DWD 2742	DWD 2731
pH	-	5.5-9.5	6.79	6.8
Electrical Conductivity (EC)	µm	2500	364	479
Total dissolved Solids (TDS)	mg/L	1200	260	255
Total suspended Solids (TSS)	mg/L	0	0	0
Color: Apparent	PtCo	50	23	27
Turbidity	NTU	25	7	4
Alkalinity: Total as $CaCO_3$	mg/L	500	165	130
Bio Carbonate: as $CaCO_3$	mg/L	500	78	160
Hardness: Total	mg/L	600	54	68
Magnesium as Mg^{2+}	mg/L	100	28	34
Fluoride-F	mg/L	1.5	0.18	0.05
Chloride: Cl^-	mg/L	250	25	20
Calcium: Ca^{2+}	mg/L	150	40	54
Iron: Total	mg/L	0.3	0.45	0.65

Nitrate: N	mg/L	45	0	0

3.5 Existing Sanitation Situation

The Socio-Economic Household Survey investigated the sanitation situation in Soni RGC. Key areas of interest were: human excreta disposal facilities and practices; solid waste management practices; and hygienic practices such as hand washing, boiling of drinking water.

The Project area currently has no central piped sewerage facilities. The population is mainly served by pit latrines. In the Sub- County, 76.4% of the households reported to defecate in private latrines, while 23.6% share a latrine with the neighbour.

3.6 Socio-Economic Profile

3.6.1 Administrative Arrangement

Tororo District is divided into (6) counties and one (1) municipality which are further sub-divided into sub-counties, parishes and subsequent villages. The overall administration of the district is handled by the local council 5 (LC 5) chairperson, while the sub-county level administration is controlled by the local council 3 (LC 3) chairperson. The village levels are headed by local council 1 (LC 1) chairperson.

3.6.2 Population

The district currently has an estimated total population of 517,082 (2014 Population and Housing Census) with 102,627 households. The sex ratio is 93% implying that for every 100 females there are 93 males. The average household size is 5 members and the average dependency ratio is 113.7 implying that majority of the population are dependents. The population density of the district is 433 persons per square kilometres.

Determination of the baseline data for the domestic population was carried out using available data from UBOS (2014) national housing and population census, and additional data collected during the feasibility study. The collected data revealed that the growth rate of Tororo District is 2.73%. Using the UBOS data, the domestic population of the Project Area for the base year is 5,834. The domestic population projection for the project area is summarized in Table 13.

Table 13: Domestic Population projections in the project area

S/County	Parish	Village	Base Year	Population Growth Rate	Total Population				
			2022		2022	2027	2032	2037	2042
Kirewa	Mifumi	Mingujwe	460	2.73%	460	526	602	689	788
Kirewa	Mifumi	Nyabanja	357	2.73%	357	408	467	534	611
Kirewa	Mifumi	Winyaka	438	2.73%	438	502	574	657	752
Kirewa	Mifumi	Iyopok	243	2.73%	243	278	318	364	418
Kirewa	Mifumi	Nyakasana	348	2.73%	348	399	457	523	598
Kirewa	Mifumi	Kwoyo	264	2.73%	264	172	346	396	453
Kirewa	Mifumi	Ngulimo	236	2.73%	236	270	179	354	405
Kirewa	Mifumi	Chawolo	406	2.73%	406	464	531	608	696
Kirewa	Mifumi	Kisuni	219	2.73%	219	171	287	328	375

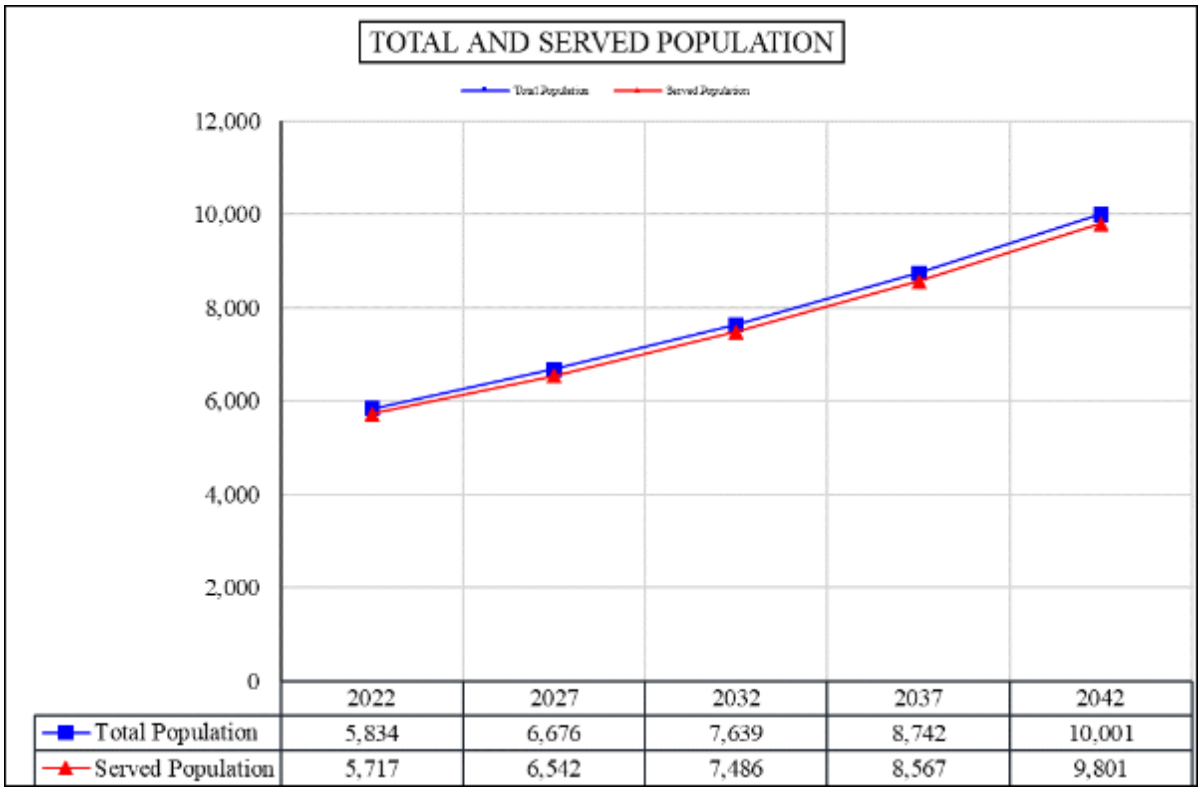
Kirewa	Mifumi	Pakitaka	280	2.73%	280	321	367	420	481
Kirewa	Mifumi	Kisera	285	2.73%	285	326	373	427	489
Kirewa	Mifumi	Nyamiyemba	176	2.73%	176	293	335	383	438
Kirewa	Mifumi	Mifumi- North	335	2.73%	335	383	438	501	573
Kirewa	Mifumi	Mifumi- South	176	2.73%	176	350	400	458	524
Kirewa	Soni	Oruwa	343	2.73%	343	392	449	514	588
Kirewa	Soni	Ataro	241	2.73%	241	276	318	362	414
Kirewa	Soni	Pore	273	2.73%	273	313	358	412	469
Kirewa	Soni	Sonikayinja	182	2.73%	182	208	238	272	311
Kirewa	Soni	Jiep	186	2.73%	186	213	244	2330	319
Kirewa	Soni	Bulalo	176	2.73%	176	201	217	263	171
Total			**5,834**	**2.73%**	**5,834**	**6,676**	**7,639**	**8,742**	**6,701**

The non-domestic population consists of commercial, industrial and institutional establishments. The current and project non-domestic population is presented is summarized in Table 14.

Table 14: Non-domestic population in the project area

Description	**No.**	**2022**	**2027**	**2032**	**2037**	**2042**
Eating Places	3	3	3	4	5	5
Lodges	2	2	2	3	3	4
Bars	4	4	5	5	6	7
Shops	15	15	17	20	23	26
Fuel Stations						
Abbatoirs	1	1	1	1	2	2
Butcheries	1	1	1	1	2	2
Dry Processing Mills	1	1	1	1	2	2
Markets	1	1	1	1	2	2
Offices	1	1	1	1	2	2
Police Posts	1	1	1	1	2	2
Churches	460	460	529	609	701	807
Mosques	165	165	190	219	252	289
Military						
Prison						1

The Water Supply Service Area is expected to cover most of the Project Area, with the majority (98%) of the population expected to be served by the water supply system as summarized in Figure 5.



	2022	2027	2032	2037	2042
Total Population	5,834	6,676	7,639	8,742	10,001
Served Population	5,717	6,542	7,486	8,567	9,801

Figure 5: Total and served population in the project area over the design period

3.6.3 Access to Infrastructure

Transport network: The access roads in the project area are mainly gravel roads and are generally well-maintained except, for certain stretches which become difficult to pass during rainy season. In addition, the railway line from Malaba – Kampala also traverses the project areas (Plate 10).

Plate 10: Transport network in the project area. A gravel road (Left) and a section of the Malaba-Kampala Railway (Right). Photos taken on 11th March 2023 by the Sociologist

Communication: The project area enjoys a good network coverage of telecommunication network. The major mobile telephone operators (MTN and Airtel) have services within the project area. The use of voice, data and mobile money has been incorporated into the daily life of the people in the area. There are several radio stations within Tororo town

and neighboring Mbale City which are accessible in the project area. TV networks of several local and international channels are also accessible.

Access to electricity: Most parts of the project area connected to the national electricity grid (Plate 11). However, many households and institutions utilize solar to power their energy needs.

Plate 11: A hydroelectricity transmission line in Kirewa Sub-county. Photo taken by the Sociologist on 11th March 2023

3.6.4 *Education*

Majority of the population in the Project area have attained formal primary level of education (86.7%), followed by secondary (10.3%), no formal education (1.8%), while only 1.2% attained University Education. It was therefore logical to expect that written project promotional materials can widely be used as a means of communication in the Project area since the majority of the people can read and write.

Education was also an important factor in enhancing the project activities appreciation/adoption. The project is dealing with people that have a basic level of educational background.

3.6.5 Economic Activities and Income

Like many other Ugandan districts, the economy of Tororo is dependent on agriculture, which employs over 79.1% of the total population. Fertile soils and suitable climate combine to support the cultivation of a number of crops in most parts of the district. Agriculture is mainly subsistence (75%) and takes place on smallholdings of approximately two acres using mainly simple farming tools (hoes, pangas etc). Only 0.35% of the population is engaged in commercial agriculture. Family members constitute the single most important source of labour.

The main commercial activities within the trading centres in the project area is retail trade in general merchandise and agricultural produce, service industry (restaurants and lodges), petty trade and service provision.

4 PROJECT DESCRIPTION

4.1 Proposed water supply system

In the design, Soni Water Supply System was sized based on the maximum day water demand of 330 m^3/day. A sump will be installed closer to the borehole that bear the reservoir. This design will be adopted due to the fact that the sump will be positioned closer to the Borehole near the reservoir and the system has reduced energy costs.

The proposed water supply project has a design period of 20 years, from 2022-2042, and will be composed of: water abstraction system, transmission mains, reservoir, distribution mains and intensification lines, water supply points (house connections, yard taps and public standpipes/kiosks).

4.1.1 Water Source and Intake

Currently, two boreholes are expected to supply the water intended to meet the demand of the project area. The water resources assessment study indicated that the proposed project shall rely on 2 production wells that is DWD 90935 located at N0.745399 E033.935011 in Ngulimo Village, Mifumi Parish, Kirewa Sub-county and DWD 90936 located at N0.751017 E033.940083 in Chawolo village, Mifumi Parish, Kirewa Sub-county (Plate 12). These production wells have a yield capacity of 11 m^3/hr and 6m^3/hr, respectively. The boreholes will be pumped for a duration of 18 hours whereby, the 6 hours of pumping shall be done using solar and the 12 hours shall use HEP/UMEME power supply.

Plate 12: Drilled Boreholes in the project area: Left is DWD 90935 – Ngulimo BH and Right is DWD 90936 – Chawolo BH. Photos taken by the Water Resources Specialist on 11th March 2023

The intake will have the pump house and shall be fenced. The water from the boreholes shall be pumped to the reservoir located on a hill and elevated to a height of 12.5 m above ground level.

The intake and the raw water mains system will be sized on the basis of the maximum day water demand of 330 m^3/day at the ultimate design period. The system will be designed to a capacity of the Soni Solar Mini-Piped Water Supply System and in future,

the system is recommended to be connected to the national electric grid. The intake was designed to cater for the project area water demands as described in Table 15.

Table 15: Water supply system capacity for the proposed Soni Mini Solar piped water supply scheme

Description	Quantity (m^3/d)	Comment
Maximum Day Demand	330	Maximum Day Demand revised to 330m^3/day due to low population
Transmission Main	330	Maximum Day Demand
Source: *Project Estimates, 2022*		

4.1.2 Transmission System

The components of the system include intake, transmission, reservoir, distribution lines and public stand pipes, as summarized in Table 16.

Table 16: Transmission and distribution details

No.	Pipe Description	Pipe Material	Length (m)
1	Transmission line 1	OD 75 HDPE PN16	920
2	Transmission line 2	OD 63 HDPE PN16	840

The detailed design specifications of the transmission systems from the Ngulimo and Chawolo boreholes are provided in Tables 17 and 18, respectively.

Table 17: Summary of transmission system of Ngulimo borehole to Dago Zone reservoir tank

Parameter	Transmission main
Depth of pump (m) in BH 90935	**92.55**
Flow (m^3/hr)	11.0
Flow (m^3/s)	0.0031
Ground Level at intake (m.a.s.l)	1,088.00
Ground Level at reservoir (m.a.s.l)	1,143.24
Ground Elevation intake tank and reservoir (m)	1,155.50
Reservoir Inlet Above Bottom Reservoir Level (m)	3.66
Height of Reservoir Above Ground (m)	12.5
Static head (m)	1164
Friction Coefficient, Cwh	140
Pipe Diameter (m)	0.0610
Velocity (m/s)	1.05
Length of Pipe (m)	840
Friction Loss (m)	17.30
Fittings losses - 10% (m)	1.73
Total dynamic head (m)	19
Residual Head (m)	1145
Pipeline Specifications	

Table 18: Summary of transmission system of Chawolo borehole to Dago Zone reservoir tank

Parameter	Transmission main
Depth of pump (m) in BH 90936	88.6
Flow (m^3/hr)	6.0
Flow (m^3/s)	0.0017
Ground Level at intake (m.a.s.l)	1,095.00
Ground Level at reservoir (m.a.s.l)	1,088.00
Ground Elevation intake tank and reservoir (m)	1,143.00

Parameter	Transmission main
Reservoir Inlet Above Bottom Reservoir Level (m)	3.66
Height of Reservoir Above Ground (m)	12.5
Static head (m)	1152
Friction Coefficient, Cwh	140
Pipe Diameter (m)	0.0450
Velocity (m/s)	1.05
Length of Pipe (m)	20
Friction Loss (m)	0.59
Fittings losses - 10% (m)	0.06
Total dynamic head (m)	1
Residual Head (m)	1151
Pipeline Specifications	

4.1.3 Storage Reservoirs

The required storage capacities are show in Table 19. The established reservoir capacity is 100 m^3 that is capable of satisfying the water demand during the ultimate design period at 2042.

Table 19: Reservoir specifications

No	Tank	Demand (m^3/d)	Calculated Tank Size (30%MDD)	Existing Tank (m^3)	Proposed Tank (m^3)	Tank Height (m)
1	Cold pressed steel tank	330	99	-	100	12.5
Source: Project Estimates, 2022						

The reservoir will be made of square cold pressed steel panels of length 1.22 m. It shall be provided with inlet, overflow, outlet, and drain pipe work. The following fittings shall also be provided for the reservoir:

I. Internal ladder of galvanised steel,
II. Wall mounted level indicator,
III. Vents on the tank roof,
IV. Roof level access cover of galvanised steel.

The size of the tank is indicated in Table 20. The access covers shall be at least 1200 mm above the finished level of the roof and shall be lockable. The roof vents shall be similarly set out and shall be fitted with vermin proofing and mosquito proofing fabric.

Table 20: Tank and Pipes sizes

No	Proposed Tank (m^3)	Tank Height (m)	Dimensions (m)			Pipe Sizes (DN, mm)			
			Length	Width	Depth	Inlet	Outlet	Overflow	Drain
1	100	12.5	4.88	5.59	3.66	100	100	100	100
Source: Project Estimates based on 6 hours of solar pumping and 12 hours of UMEME									

4.1.4 Main Reservoir Site Works

The site works at the reservoir consists of the following:

I. The general earthworks, The site pipe work,

II. The site drainage,
III. Miscellaneous works.

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

4.1.5 Distribution System

The downstream of the distribution systems reservoirs has been modelled using EPANET as indicated in Table 21.

Table 21: Summary of Distribution pipeline

No.	Pipe Description	Pipe Material	Length (m)
2	Distribution	OD 63 HDPE PN 6	8,340.0
4	Service pipe	OD 32 HDPE PN12	2,448.0

4.1.6 Service Connections

The service connections will include house connections, yard taps and standpipes. The location of the service pipes will not be known until applications for connections are received. At this stage, only an estimate of the sizes, quantities and costs can be given. On the basis of the population to be served at the tariff of USh 53 per 20 litres, the total number of connections required has been estimated. The criteria used to determine the number of service connections for each served population category is shown in Table 22.

Table 22: Population per category criteria

Category	Population Served	Source of Criteria
House Connection	5 persons per household	Socio-Economic Study Data
Yard Taps	5x2 Households per yard tap	Project Estimates
Standpipes	170 persons Per Standpipe	Maximum Number- DWD Water Manual 2013
	150 persons Per Standpipe	Considered for this Project.
Urban Poor	170 persons per Standpipe	Standpipe coverage

The required number of service connections is given below Table 23 for the ultimate year 2042.

Table 23: Summary of the project service connections

Served Population					Number of Service Connections			
Year	House Conn	Yard Tap	Stand Pipe	Total	House Conn	Yard Tap	Stand Pipe	Total
2022	58	58	3,792	**3,908**	3	6	25	**34**
2032	76	76	4965	**5117**	15	8	33	**56**
2042	100	100	6,501	**6,501**	20	10	43	**73**
Source: Project Estimates, 2022								

4.1.7 Valves and Fittings

In general, valves and fittings facilitate the operation of the water supply system. A careful design of the routing of the pipeline was done to minimize their number and related costs. The following valves and fittings shall be installed within the piped water supply network;

i. Section Valves - Section valves will not be provided to facilitate maintenance of the pipes by isolating one section from the others since the pipe network is limited in

length.

ii. *Air Valves – 1 Air valve shall be installed to release air from the pipeline, during normal operation (degasing due to changes in pressure) and during the pipe filling process. The air valves shall be installed at peaks/crests within the pipe network.*

iii. *Wash outs – no washouts will be installed on pipelines to drain the pipe section especially during cleaning out of sediments in the pipe. They are usually provided at pronounced low points or valleys in the pipeline.*

4.1.8 Summary of the water supply components

The components of the proposed project are summarized in Table 24.

Table 24: Summary of the water supply components

Component	Borehole at Ngulimo	Borehole at Chawolo
	MDD 330 m^3/day	**MDD330 m^3/day**
Intake Capacity, m^3/day	330	330
Solar Panel GF 270	38 No.	38 No.
Head, H(m)	98	89
Flow, Q (m^3/hr)	11	6
Transmission Mains (m)	1,760	20
Storage tanks (m^3)		
Reservoir (m^3)	100	100
Distribution Mains (m)	9,143	1,345
Source: Project Estimates May, 2022		

4.2 Proposed Sanitation System

4.2.1 Design of public and institutional toilets

The criteria set out for public and institutional toilets are as follows:

For public toilets, the criteria for the number of toilet stances required is set at 1 stance per every 40 users, while for institutions, the pupil to stance ratio shall be 1 per every 40 pupils. All public toilets shall have a urinal stance in the male's section. Additionally, large toilet blocks shall have 1 washroom each in male and female sections respectively. This is as per Ministry of Education and sports standards.

4.2.2 Design of Public and Institutional Toilets

A total of 1 unit of 2 stance VIP latrine will be constructed in future within the project area as seen in Table 25. The public toilet shall be constructed at a location to be proposed by the local authorities.

Table 25: Public Toilets in the Project Area

Sub-county	Parish	Village/ location	No. of people in area per day	No. of users/stance	No. of stances required	No. of blocks each of 2 stances
Tororo	Soni	Soni	60	40	2	1
TOTAL						
Source: Project estimates, May 2022.						

The designed toilet block which will measure 13 m X 7.0 m will have the following details:

- Septic Tank of effective capacity 15.4 m^3 in brickwork and reinforced concrete, rendered smooth inside complete with inlet and outlet manholes benching, heavy duty concrete manhole covers, OD 110 PVC ventilation pipe work clipped to toilet wall;
- Concrete grade C20 floors with terrazzo finish;
- Rendered and painted walls internally and externally;
- Glazed ceramic tiles for showers and urinals in toilet;
- Pre-painted galvanised corrugated iron sheets of gauge 28 sheeting on hard wood trusses;
- 1no. 2000 litre and 1no 1000 litre Polyethylene water tanks elevated at 4 m and 2 m heights respectively on a steel structure;
- Hard wood faced flush doors for internal doors, mild steel frame external doors with burglar proofing grills;
- Foul water drainage to soak pits;
- Wheel chair access ramp at entrance

The sanitation interventions in the project area will therefore include the design and construction of toilets, at the locations to be selected by the respective local authorities.

5 PUBLIC CONSULTATION AND INVOLVEMENT

5.1 Introduction

This section presents details of the stakeholder consultations that were undertaken for the project. It contains the consultation approach that was used, stakeholders that were consulted and the key issues and concerns that were identified during the consultation.

5.2 Concerns /Views of the Stakeholder

The Concerns/ views of the consulted stakeholders are presented in Table 26, and their details are presented in Annex III. Generally, the stakeholders consulted welcome the project because of the foreseen benefits that the communities and institutions would accrue from the project which majorly include addressing water supply shortages, long distances to the existing water sources as well as inadequate water sources compared to the increasing populations and the number of communities sharing the few available sources with domestic animals leading to water being contaminated and unsafe for domestic use.

Table 26: Stakeholder concerns/comments on the proposed project

Stakeholders	Concerns/views	Response
District Leaders: ✧ Assistant CAO: Mr. Okoth Kitong ✧ DEO's rep: Ms. Logoose Khanifa ✧ WTA: Mr. Nicholas Asodio	• The leadership of Tororo District welcomes the project and anticipates that this water project will benefit the target area and reduce on the water stress experienced in the area since the existing reservoirs cannot supply adequate water to meet community demand. • There are many distribution networks in the district e.g., in Paya, Kirewa, Nowir among others which have been non-function which has caused the issue of low water supply. • Most water sources dry up in the dry season. • The district leadership anticipates that the implementation of this project will be done expeditiously. • The project will reduce burden on women and children carrying water for longer distances hence creating more time for other constructive work such agricultural production and attending school. • Booster pumps should be installed along the water distribution network to improve on water supply to distant areas. • We shall work closely with the consultant to ensure the success of the project. • The demand for water is high and the	• Noted • The project seeks to increase access to safe water, and minimize water shortage in the area • The Developer will employ qualified staff to operate and maintain the water supply system to avoid the challenge of non-functionality • Project construction activities will start as soon as all the necessary approvals and financial resources are granted. Otherwise, the MWE recognizes the urgency of this project, in view of the water supply situation in the area • The design of the project includes reservoirs that have been sited at locations high enough to supply water by gravity in the entire project area • All the stakeholders, including at the district and lower levels will continuously be engaged during project implementation

	community is willing to pay in order to access the utility. • There is need for close collaboration between project partners and the district leaders during the course of the project implementation but most especially during the design of the project. • The technology used in the water supply system should be improved to increase water supply avoid the present situation of water scarcity faced in Tororo District. • We used to share water supply with Malaba but NWSC gave them their water and they are now enjoying • Currently, water is only supplied at night and not during the day time? I hope this project will address this concern • There is water rationing which is not based human decision. They only give water to only those who complain. • The network is growing but the reservoir has not been upgraded.	
Group Discussion: Patiaka zone, Soni S/C	• We don't have enough water sources • There is only one borehole serving six zones. • Water is contaminated. • Too much pressure at the borehole causes fights and other forms of violence at the borehole. • There is a long distance to the borehole and therefore it takes a lot of time to access water from the borehole. • As a result of scarcity of water, it has led to poor hygiene. Some people do not bathe neither do they wash their clothes regularly. They are dirty. • Buying water bought from vendors is expensive. A jerrycan costs 500/. • There are forms of gender-based violence at the borehole; some women have been raped as they wait to get water. • Too much time is spent at the borehole waiting to fetch water. • During peak times, one person is given one jerrycan at a time and chances of getting another one are thin. • Our animals lack water due to scarcity of water in the area.	• The aim of the project is to increase supply of water of adequate quality. The project will help reduce the distances travelled to access water, reduce water charges (in comparison to what is charged by vendors) and safe the time spent at water sources waiting for water
Community meeting: Kisera zone A, Kisoni zone, Pakitaka A, Pakitaka B	• Let us hope this project will be implemented. Other partners promise water projects and they don't come back. • There is one borehole serving six	• The MWE is committed to implement this project • The project seeks to increase access to safe water, and minimize

	zones. • Water from the boreholes is clean but not enough. However, sometimes, the borehole is rusty and so water is not clean. • There is violence including fights for water at the borehole • There is poor hygiene as a result of scarcity of water; some people don't bathe and wash their clothes. • The borehole is locked by the caretaker so that it regains more water for the following day when demand for water is still high. Therefore, there is need for more water sources in the area. • We need water for irrigation to address the issue of famine. As such our crops can grow well and as a result get enough food for our families. • Water scarcity has exacerbated domestic violence in the homes. Men complain about their wives' delay at the borehole thinking they are having extramarital relationships.	water shortage in the area. This will help to reduce violence at boreholes and reduce distances travelled to water sources • The proposed project is intended to supply water for domestic purposes not irrigation. However, small scale irrigation may be undertaken at household level though charges have to be incurred. The MWE has another Department for Water for Production which provides water for irrigation purposes. This issue will be raised to the MWE
Chawolo Village, Kirewa sub-county Chairman LCI (Mr. Richard Odoi) and community members	• We get water from a near-by spring but the water is of very poor quality and this has led to many water users falling ill especially children getting diarrhea. • The spring has helped us to have easy access to water though in the dry season it dries up and then we have to move long distances looking for water. • We share the same water source with our animals since water sources are limited. • We welcome the project and we can't wait for it to start running because we really need this water. • Our livelihoods will greatly improve in this respect.	• The project seeks to increase access to safe water in the project area, and minimize water shortage in the area. This will help reduces issues of water borne diseases associated with drinking contaminated water
Mixed Group Discussions: Water Vendors' Views	• The project is welcome since there is water scarcity in this area. • We share the same water source with our animals making it contaminated and dirty since water sources in our communities are limited. • We need more nearby water sources to serve our customers because the spring well which is accessed by most of the population in Chawolo Village dries up in the dry season and then we have to move long distances to look for water to supply our customers which somehow curtails our services	• The views are noted and they will be raised to the MWE. • The project will increase water supply in the project area to address water shortage. It is anticipated that the number of water sources will increase although there will be some money to be paid for water to cater for O&M. So, the vendors will be required to pay for the water they will fetch at the project sources.

	• The borehole which serves the communities of Kisera zone A, Kisoni zone, Pakitaka A, Pakitaka B is locked by the caretaker in the evening so that it regains water for the following day and therefore we cannot get enough water for our customers. • Water scarcity in Patiaka village affects services of water vendors more so in the peak times when one person is given one jerrycan at a time and there are little chances of getting another one.	

5.3 General recommendations to enhance sustainability of project

1. The district leaders welcomed the project and pledged total support when the project commences.
2. The district leaders recommend that they should be involved in design and implementation of the project. Experience shows that the projects that have been implemented without involvement of district leaders and technocrats have failed. Therefore, there is need for close collaboration between project partners and the district leaders.
3. Violence at the water sources has been reported at every level of consultations and therefore, for better water service delivery, there is need to intensify gender sensitization and violence reduction trainings at the community level.
4. There is need for inter-sectoral collaboration especially with Tororo District Local Governments and Uganda National Roads Authority to offer guidance on the classification and extent of road widths and reserves since some of the main project activities (laying water transmission pipes for water) will take place along road reserves.
5. The Contractor to operate the plant should have the technical knowhow and be able to employ skilled personnel for efficient operation and maintenance of the project infrastructure.
6. Public stand pipes need to be prioritised in the project to enable the poor and vulnerable persons who cannot afford individual connections to their homesteads
7. It is recommended that adequate and prompt compensation for PAPs' be implemented before project activity implementation.

6 PROJECT NEEDS AND DISCUSSION OF ALTERNATIVES

6.1 Introduction

Analysis of project alternatives as part of this environmental and social impact assessment considers other practicable strategies that can be taken to minimize or eliminate the negative impacts while enhancing the positive ones. This ensures that the project is implemented with minimal damage to environmental and socio-economic components.

6.2 The Project Need

Extension of a Piped Water Supply and Sanitation System to the proposed project area will generally come along with several benefits. These will include; meeting the increased demand for clean and affordable water and provision of job opportunities during the construction and operation phases and reduction on the water borne diseases (e.g., cholera, dysentery) related to using unsafe water among others. The availability of clean, safe and affordable water will also change the economic and wellbeing of people in the project area and Tororo District in general.

6.3 The "No- Action" Alternative

Analysis of the "No project option" as an alternative, provides an environmental and socio-economic baseline against which impacts of the proposed action can be compared. This alternative means that the status quo remains and the proposed piped water supply and sanitation system is not established in the area. The alternative ignores all positive impacts such as creation of employment to both skilled and unskilled labour, and provision of convenient, safe and affordable water that are likely to be realized in the area. The No-Action alternative is clearly not recommended.

6.4 Water Source Alternatives

Two water resource options were evaluated; ground water and surface water resources. The water resources assessment established that there are no reliable surface water sources around the project area, thus the surface water alternative was not explored. Therefore, the only available water source for consideration, and which was selected, was the ground water source.

6.5 Abstraction Location Alternatives

The two abstraction locations were considered because they had an already drilled borehole. Further, the location also had the following qualities:

- A hydrological assessment showed that the water is of adequate yield and quality
- Sufficient land which the owner was willing to offer for the project
- Closeness to the supply area

6.6 Power Source Alternatives

The power sources considered in the analysis included solar, diesel and hydroelectricity from the national grid. The evaluation of the power source alternative considered the associated cost for power source to pump the required water volumes and the investment costs. Solar power source was evaluated as the least costly source to install, operate and maintain. However, it was established that solar power is not independently adequate to pump water to meet the project area's water demand. As a result, solar power will be complemented by hydropower from the national grid. Given that solar power is dependent on the sunshine, the project area is sufficient to support the proposed solar system.

6.7 Design Considerations

Putting in place a piped water supply and sanitation system according to approved designs will be a priority as it helps in enhancing the future planning project area. Therefore, it will be paramount that the proponent ensures that the facilities especially at the water source have the following in place.

- Well-designed drainage system
- Sufficient walkways within established infrastructure especially at the pumping station
- Consideration of solid waste management and other waste refuse
- Proper landscaping
- Sufficient sanitary facilities for workers
- Well-built and firm reservoir
- Well maintained power supply system for example regular maintenance of the Solar Panels.
- Well maintained water transmission line

6.8 The Action Alternative

This option implies that Tororo District Local Government implements the proposed project as per the proposed project designs and recommendations by different stakeholders. A comprehensive environmental and social impact assessment has been undertaken. Details of the study are the subject of this project brief report. The study has found no significant issues (environmental and socio-economic) to stop the implementation of the project. Mitigation measures for the identified negative impacts of this alternative have been thoroughly discussed throughout this EPB. If they are implemented as proposed, the project will not cause damage to the environment. Therefore, we recommend that this alternative is the most appropriate.

7 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

7.1 Introduction and Approach to Impact Assessment

This chapter identifies, describes and evaluates significant environmental and social consequences (both positive and negative) of the preconstruction, construction, operation and decommissioning phases of the proposed Soni Water Supply and Sanitation System. While positive impacts should be enhanced, the proposed mitigation measures should be implemented as suggested to minimize or eliminate the predicted negative environmental and social impacts.

7.1.2 Impact Description Evaluation Methodology

Describing a potential impact involved an appraisal of its characteristics, together with the attributes of the receiving environment. Relevant impact characteristics included whether the impact is:

- Adverse or beneficial;
- Direct or indirect;
- Short, medium, or long-term in duration; and permanent or temporary;
- Affecting a local, regional or global scale; including trans-boundary; and
- Cumulative (such an impact results from the aggregated effect of more than one project occurring at the same time, or the aggregated effect of sequential projects. A cumulative impact is "the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions").

Each of these characteristics is addressed for each impact. Consideration of the above gives 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 during the study.

7.1.3 Impact Evaluation

Each impact is evaluated using the criteria listed in Table 27. To provide a relative illustration of impact severity, a numerical or relative descriptor is assigned to the impact intensity and receptor sensitivity for each potential impact. Each is assigned a numerical descriptor of 1, 2, 3, or 4, equivalent to very low, low, medium or high. The severity of impact was then indicated by the product of the two numerical descriptors, with severity being described as negligible, minor, moderate or major, as illustrated in Table 28. This is a qualitative method designed to provide a broad ranking of the different impacts of a project. Illustrations of the types of impact that were assigned the different grades of severity are given in Table 29.

Table 27: Classification of impact evaluation

No.	Classification	Description
1	Extent:	Evaluation of the area of occurrence/influence by the impact on the subject environment; whether the impact will occur on site, in a limited area (within 200 m from site); locally (up to 10 km from site); regionally (district wide, nationally or internationally i.e., >10km from site).
2	Persistence/Duration:	Evaluation of the duration of impact on the subject environment, whether the impact was temporary (<1 year); short term (1 – 5 years); medium term (5 – 10 years); long term (10 – 50 years); and permanent (>50 years).
3	Social Context / Sensitivity or Potential for Stakeholder Conflict:	Assessment of the impacts for sensitive receptors in terms of ecological, social sensitivity and such things as rare and endangered species, unusual and vulnerable environments, architecture, social or cultural setting, major potential for stakeholder conflicts. The sensitivity classification is shown below: ***High sensitivity**:* Entire community displacement, destruction of world heritage and important cultural sites, large scale stakeholder conflict, etc. ***Medium sensitivity**:* Displacement of some households, moderate level of stakeholder concern ***Low sensitivity**:* No displacements, no potential for stakeholder conflict.
4	Regulatory and Legal Compliance:	Evaluation of the impact against Local and International legislative requirements. ***High**:* Prohibition terms for specific activities/emissions. Major breach of regulatory requirements resulting in potential prosecution or significant project approval delays. ***Medium**:* Potential breach of specific regulatory consent limits resulting in non-compliance. ***Low**:* No breach of specific regulatory consent limits anticipated.
5	Overall Impact rating (Severity):	Using a combination of the above criteria, the overall severity of the impact was assigned a rating Severe, Substantial, Moderate, Minor and Negligible. **Note**: These are just guidelines that will constitute professional judgement required in each individual case.

7.1.4 Impact Significance or Severity

The textural description of the descriptors ranging from "Very low" to "High" is presented in **Error! Reference source not found.**28. Impact significance is determined from an i mpact significance matrix (Table 29) which compares severity of the impact with probability of its occurrence. Impact significance criteria are as follows:

Table 28: Criteria for rating impact intensity and likelihood

Criteria	Rating scales	Score
Intensity (the expected magnitude or size of the impact)	***Very Low***- where the impact affects the environment in such a way that natural, and /or cultural and social functions and processes are negligibly affected and valued, important, sensitive or vulnerable systems or communities are negligibly affected. Therefore, the environmental changes are within the existing limits of natural variations.	1

Criteria	Rating scales	Score
	Low- where the impact affects the environment in such a way that natural, and/or cultural and social functions and processes are minimally affected and valued, important, sensitive or vulnerable systems or communities are minimally affected. No obvious changes prevail on the natural, and / or cultural/ social functions/ process as a result of project implementation.	2
	Medium - where the affected environment is altered but natural, and/or cultural and social functions and processes continue albeit in a modified way, and valued, important, sensitive or vulnerable systems or communities are moderately affected.	3
	High - where natural and/or cultural or social functions and processes are altered to the extent that they will temporarily or permanently cease, and valued, important, sensitive or vulnerable systems or communities are substantially affected. The changes to the natural and/or cultural / social-economic processes and functions are drastic and commonly irreversible.	4
	None – where the impact will not materialize	0
Probability (The likelihood of the impact occurring)	***Low*** – where the possibility of the Impact materializing is very low (<20%)	
	Medium – where there is a good possibility (30%-60% chance) that the impact will occur.	
	High– where it is most likely (60% -100% chance) that the impact will occur.	

Table 29: Determination of Significance or Severity

Impact Significance		Sensitivity			
		1 Very low	2 Low	3 Medium	4 High
Intensity of Impact	1 Very low	1 Negligible	2 Minor	3 Minor	4 Minor
	2 Low	2 Minor	4 Minor	6 Moderate	8 Moderate
	3 Medium	3 Minor	6 Moderate	9 Moderate	12 Major
	4 High	4 Minor	8 Moderate	12 Major	16 Major

- ***Major***: The impact exceeds the accepted limit or standard, or has a large magnitude and occurs to highly valued/sensitive resource/receptors. These denote that the impact is unacceptable and further adequate mitigation measures must be implemented to reduce the significance. More details are provided in **Error! Reference source not found.**30.
- ***Moderate***: The impacts in this region are within accepted limits and standards and are considered tolerable but efforts must be made to reduce the impact to levels that are as low as reasonably practical. Adequate mitigation measures make the impact minor or avoidable.

- ***Minor***: Impacts in this region are considered acceptable as their magnitude is sufficiently small and within accepted standards, and/or the receptor is of low sensitivity/value. Adequate mitigation measures make the impact negligible/non-existent.
- ***Negligible***: Impacts in this region are almost not felt.

Table 30: Impact significance assessment criteria and rating scale

Impact Rating	Impact Description
Major	• Highly noticeable, irreparable effect upon the environment • Significant, widespread and permanent loss of resource • Major contribution to a known global environmental problem with demonstrable effects • Causing mortality to individuals of a species classified as globally or regionally endangered • Major expedience of water/air quality and noise guidelines representing threat to human health in long and short term • Causing widespread nuisance both on and off site
Moderate	• Noticeable effects on the environment, reversible over the long-term Localised degradation of resources restricting potential for further usage • Sub-lethal effects upon a globally or regionally endangered species with no effect on reproductive fitness and/or resulting in disruption/disturbance to normal behaviour returning to normal in the medium term • Elevated contribution to global air pollution problem partly due to preventable releases • Frequent breaches of water/air quality and noise guidelines • Causing localised nuisance both on and off site
Minor	• Noticeable effects on the environment, but returning naturally to original state in the medium term • Slight local degradation of resources but not jeopardising further usage • Disruption/disturbance to normal behaviour of a globally or regionally endangered species returning to normal in the short term • Small contribution to global air problem through unavoidable releases • Elevation in ambient water/air pollutant levels greater than 50% of guidelines • Infrequent localised nuisance
Negligible	• No noticeable or limited local effect upon the environment, rapidly returning to original state by natural action • Unlikely to affect resources to noticeable degree • No noticeable effects on globally or regionally endangered species • No significant contribution to global air pollution problem • Minor elevation in ambient water/air pollutant levels well below guidelines • No reported nuisance effects

Cumulative impacts were also assessed, in view of the valued ecosystem components as follows:

Step 1: The Assessment Team identified the incremental effects of the project on the identified Valued Environmental Components (VECs) within the environs of the sites. The VECs were selected based on information related to current or anticipated future

degraded or stressed conditions, anticipated presence of other human activities that will adversely affect the same VEC.

Step 2: Identified other past, present, and reasonably foreseeable future actions within the space and time boundaries that have been, are, or could contribute to cumulative effects (stresses) on the VECs or their indicators as identified.

Step 3: For the selected VECs, the experts compiled appropriate information on their indicators, described and assessed their historical to current conditions where possible. Depending upon the availability of information, the identified trends in the conditions of the VECs and their indicators shall be determined and analysed.

Step 4: The Team further linked the project to other actions like the upcoming projects in the study area to the selected VECs and their indicators.

Step 5: Assessment of the significance of the cumulative effects on each VEC over the time and the incremental effects (the direct and indirect effects) on specific VECs were also included.

Step 6: For VECs or their identified indicators were subjected to negative incremental impacts from the project and for which, the cumulative effects were significant, developed appropriate action-specific "mitigation measures" for such impacts. The mitigation measures were mainly be based on those identified in the study.

7.1.5 Development of Enhancement and Mitigation Measures

Enhancement measures for each identified positive impact have been proposed. Similarly, the mitigation measures for each of the negative impacts have been proposed. The Contractor / Developer should ensure that the proposed impact enhancement and mitigation measures are implemented

7.2 Potential Positive Impacts of the Project

Table 31 summarizes the positive social impacts that are likely to result from the proposed project.

Table 31: Positive Impacts of the Proposed Project

No.	IMPACT	REMARKS
1	Employment opportunities and income	▪ Employment opportunities will be available for numerous disciplines/professions during construction (short-term) and operation and maintenance (long-term) phases. Not only will the skilled be employed but equally unskilled personnel. The possible direct jobs include community workers (casual labour) and semi-skilled such as trenchers, plumbers, masons, painters, carpenters, mechanics, electricians, mixer operators, steel benders, drivers, community educators, porters, cooks, security guards, etc.). ▪ During operation and maintenance, employment opportunities will include cleaners, security guard, system operator among other. ▪ Employment opportunities will also be created during the decommissioning phase, including both casual and skilled laborers like excavators, welders, carpenters, etc

No.	IMPACT	REMARKS
2	Acquisition/improvement of skills	▪ People who have ever worked on similar projects before will improve on their skills. ▪ People who have never worked on such projects will acquire such skills which they would use to seek employment in future. ▪ The Project will provide grassroots management opportunities for the local people to both manage their piped water supply and protect their local environment.
3	Reduction of poverty and improved livelihoods of the local people	▪ Water is a catalyst for socio-economic development e.g., through agro-processing and business. The project will therefore enhance the growth of small-scale industries that depend on safe and adequate water supplies, which will improve the livelihoods of people in the area
4	Improvement in public health	▪ It was noted during the consultations that some of the current water were perceived to be of poor water quality. People will have access to safe water, which will help reduce the prevalence of water-borne diseases. ▪ Improved water supply will promote good health and reduce healthcare costs thus making overall national savings for investment in other developmental activities.
5	Achievement universal primary education	▪ Access to good water would save time and keep children healthy so that they would be able to attend school regularly.
6	Promotion of gender equality and empowerment of women and the girl child	▪ 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 on a daily basis 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).

7.3 Negative Impacts during the Pre-construction, Construction, Operation and Maintenance and Decommissioning Phases

The potential negative impacts of the proposed Soni RGC Water Supply and Sanitation Project are summarized in Table 32.

Table 32: Potential negative impacts

IMPACT	REMARKS	Intensity	Sensitivity	Overall Significance
Pre-construction phase and Construction Phase				
Loss of land and property	▪ Land will be required to accommodate project component e.g., at the proposed abstraction and reservoir sites ▪ Other properties such as crops, houses may be destroyed, especially those that may be found at sites for water abstraction, reservoir, along the alignment of the transmission system, along access corridors	2 Low	3 Medium	6 Moderate
Traffic disruption	▪ Project construction machinery, including trucks transporting material to the sites may disrupt traffic along public roads	2 Low	2 Low	4 Minor
Loss of vegetation	▪ Vegetation clearance to pave way for construction activities	2 Low	3 Medium	6 Moderate

IMPACT	REMARKS	Intensity	Sensitivity	Overall Significance
Introduction of plant invasive species	▪ Invasive plant species could be introduced by the project machinery from other areas	2 Low	2 Low	4 Minor
Disruption of social order	▪ Influx of foreign labour (outside of the project area e.g., from other districts) during construction works may results into disruption of the cultural norms and customs.	2 Low	2 Low	4 Minor
Noise from construction machinery	▪ Noise pollution may arise from construction equipment. This may cause a nuisance to the public and construction staff	2 Low	3 Medium	6 Moderate
Solid waste generation	▪ Solid waste will come especially from excavated material, unused construction material, packaging material, etc ▪ Faecal matter originating from construction staff	3 Medium	3 Medium	
Occupational health and safety issues	▪ Health and safety of workforce due exposure to unsafe site conditions, lack of protective gear etc. ▪ Potential of accidents e.g., falling in deep excavations	2 Low	2 Medium	4 Minor
Community health and safety issues	▪ Health and safety impact such injury due to falling debris from works along public routes, falling in excavated areas along public routes or near public places, accidents from project vehicles transporting material along community access roads, etc ▪ Spread of sexually transmitted diseases such as HIV/AIDS especially from labour force coming from outside the project area ▪ Accidents from construction trucks along public access roads	3 Medium	3 Medium	9 Moderate
Increased susceptibility to soil erosion	▪ Vegetation clearance may expose top soil to erosion during rain and heavy winds events ▪ Excavated soils may also be eroded if not well protected	3 Medium	2 Low	6 Moderate
Air pollution and climate change	▪ Dust emission from murram access road, uncovered loose construction material or construction waste ▪ Fumes from construction machinery, including greenhouse gases like carbon dioxide	3 Medium	3 Medium	9 Moderate
Theft of construction materials	▪ Construction staff and community members may steal construction material, which can compromise project progress and quality of work	3 Medium	4 High	12 Major
Operation and Maintenance Phase				
Soil pollution	▪ Soil pollution may result from spillage/leakage of water treatment chemicals such as chlorine	2 Low	2 Low	4 Minor
Occupational safety and health issues	▪ Health and safety of workforce due exposure to unsafe site conditions, lack of protective gear, e.g., drowning in reservoir tanks	1 Very Low	2 Low	2 Minor
Incapacity to operate and	▪ Local communities may not have adequate capacity to operate and maintain the project	3 Medium	3 Medium	9

IMPACT	REMARKS	Intensity	Sensitivity	Overall Significance
maintain the project components by local people	components, which may fail the project. It was noted during stakeholder consultations that existing water supply network in some parts of the district is non-functional due to poor operation and maintenance practices			Moderate
Unaffordability of water charges	▪ People in the project area current access water free of charge from the existing water sources. Some stakeholders were scared that they might fail to afford the water charges, which may be hiked by managers of the water scheme	3 Medium	2 Low	6 Moderate
Air pollution	▪ Obnoxious smell may result poor use of the public toilet e.g., due to failure to properly flush	3 Medium	3 Medium	6 Moderate
Solid waste	▪ Solid waste emanating from operation and maintenance activities both office and domestic ▪ Used solar batteries	3 Medium	3 Medium	9 Moderate
Spread of sanitation and water borne diseases	▪ Poor operation and maintenance of the public toilet e.g., lack of water for flushing and washing hands and failure to empty the septic tank may expose the public to water-borne and sanitation diseases like cholera, diarrhoea, dysentery etc	3 Medium	3 Medium	9 Moderate
Vandalization / theft project equipment	▪ The project equipment may be vandalized or stolen by community members, including solar panels, valves, pipes	3 Medium	3 Medium	9 Moderate
Decommissioning Phase				
Disruption of water supply	▪ The decommissioning of the project may affect water supply to the consumers. This might affect public health (through using unsafe water sources) and person hygiene	3 Medium	3 Medium	9 Moderate
Traffic disruption	▪ Project demolition machinery may disrupt traffic along public roads	3 Medium	3 Medium	9 Moderate
Disruption of social order	▪ Influx of foreign labour (outside of the project area e.g., from other districts) during demolition works may results into disruption of the cultural norms and customs. These may include drug misuse, inappropriate sexual behaviour, vulgar language among others	2 Low	2 Low	4 Minor
Noise pollution	▪ Intermittent noise from demolition equipment and heavy vehicles	3 Low	3 Medium	9 Moderate
Solid waste generation	▪ Solid waste will be generated especially from demolition debris, used batteries and solar panels ▪ Faecal matter originating from demolition staff	3 Medium	3 Medium	9 Moderate
Occupational health and safety issues	▪ Health and safety of workforce due exposure to unsafe site conditions, lack of protective gear etc. ▪ Potential of accidents e.g., falling in deep excavations	2 Low	3 Medium	6 Moderate

IMPACT	REMARKS	Intensity	Sensitivity	Overall Significance
Public health and safety issues	▪ Health and safety impact such injury due to falling debris from works along public routes, falling in excavated areas along public routes, accidents from project vehicles transporting material along community access roads, etc ▪ Spread of sexually transmitted diseases such as HIV/AIDS especially from labour force coming from outside the project area ▪ Accidents from demolition trucks along public access roads	3 Medium	3 Medium	9 Moderate
Increased susceptibility to Soil erosion	▪ Inappropriate demolition practices using heavy equipment and that expose the soil may induce/accelerate soil erosion and siltation of water courses. Contamination may occur as a result of accidental or structural spillage of fuels and lubricant chemicals, as well as from leakage from inadequately protected solid waste storage facilities and sites.	3 Medium	2 Low	6 Moderate
Air pollution and climate change	▪ Emissions from demolition equipment and vehicles, and dust emissions from the grounds. ▪ Fumes from construction machinery, including greenhouse gases like carbon dioxide	3 Medium	3 Medium	9 Moderate

7.4 Proposed Enhancement and Mitigation Measures

7.4.1 Proposed Enhancement Measures

The enhancement measures for the identified positive impacts related to this project have been proposed, as presented in Table 33.

Table 33: Proposed impact enhancement measures

No.	IMPACT	REMARKS
1	Employment opportunities and income	▪ Prepare a labour force management plan ▪ Preference for employment opportunities should be given to the local people where they have the required skills (for skilled labour activities). Otherwise, all activities which do not require skills such as casual activities should be given to the locals ▪ The use of appropriate labour-intensive methods for some of the construction activities (for example excavation for pipelines) should be undertaken to enable as many local people (including women) as possible get jobs ▪ All laborers should be given contracts specifying their roles and responsibilities and renumerations ▪ Priority for sourcing materials for construction and other services such as food and accommodation should be given to local suppliers ▪ Ensure that children are not employed on the project

No.	IMPACT	REMARKS
2	Acquisition/improvement of skills	▪ Foreign companies (if contracted) should be required to have a joint venture with local companies to build their capacity. ▪ Contracts terms for construction works for the project's construction and O&M phase should emphasize knowledge transfer and the project developer should monitor and ensure that the objectives are met. ▪ O&M manual and standard operating procedures must be handed over to the operator
3	Reduction of poverty and improved livelihoods of the local people	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain water
4	Improvement in public health	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain it easily ▪ Sensitize communities of the dangers on using unsafe water sources
5	Achievement universal primary education	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain it
6	Promotion of gender equality and empowerment of women and the girl child	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain water

7.4.2 Mitigation Measures

The mitigation measures to avoid, reduce or minimize the identified negative impacts have been proposed, as presented in Table 34.

Table 34: Mitigation measures

IMPACT	MITIGATION MEASURE
Pre-construction and Construction phase	
Loss of land and property	▪ Prepare and implement a RAP ▪ All privately owned land to host project components should be duly compensated prior start of construction activities ▪ All property should be valued and duly compensated prior to start of construction works ▪ For property like crops, where possible, owners should be informed early about the project work plan and allowed to harvest them prior to start of construction

IMPACT	MITIGATION MEASURE
	▪ Prepare a stakeholder engagement plan and ensure that stakeholder engagement is a continuous process throughout the project implementation
Traffic disruption	▪ Prepare a traffic management plan ▪ Liaise with the local traffic authority to manage traffic at busy crossings e.g., markets, schools, churches
Loss of vegetation and soil cover	▪ Prepare a vegetation restoration plan. The plan should ensure that: ➢ Vegetation clearance is restricted to only areas to be constructed. ➢ Landscaping and re-vegetation are undertaken after construction especially around the water abstraction source and at the reservoir site.
Introduction of invasive plant species	▪ All Construction machinery should be cleaned prior to their transport and assembly at the project sites
Disruption of social order	▪ Prioritize employment of local people where they have the required skills ▪ Sensitize all workers to ensure awareness of and sensitivity to the local cultures, traditions and lifestyles
Noise from construction machinery	▪ Schedule noise-intensive work for the least noise-sensitive time of the day (work between 8 am and 5 pm); ▪ Provision of PPE to project workers ▪ Regular noise assessments
Solid waste generation	▪ Prepare a waste management plan. The plan should ensure provide for: ➢ use the excavated material for backfilling. ➢ waste bins for proper waste storage. ➢ a waste collection company to manage waste generated. ➢ temporary eco-san toilet on site during site works
Occupational health and safety issues	▪ Prepare an occupational Health and safety plan. The plan should ensure: ➢ provision of workers with PPE and sensitise them on basic safety precautions. ➢ provision of a first aid kit; ➢ provision of adequate sanitary facilities;
Community health and safety issues	▪ Prepare a community health and safety plan, which should ensure that: ➢ all dangerous areas along public roads are cordoned off ➢ speed limit of project vehicles along community roads do not exceed 40 km/h. ➢ construction works along community access roads are communicated to public at least a week prior to start of the works ▪ Prepare an HIV/AIDS management plan ▪ Prepare a traffic management plan, which should include provision for: ➢ speed reduction humps at crossings of many people, e.g., at a school, market; ➢ reflective signature to direct traffic to designated areas; ➢ informing of local communities and road users in advance, in case access roads have to be closed.
Increased susceptibility to soil erosion	▪ Prepare an erosion control plan. The plan should provide for: ➢ immediate disposal (where possible) of any excavated soil to avoid loose soil being washed away by storm water. ➢ provision of an erosion barrier around stockpiles of excavated soils ➢ planting of bands of grass on erosion prone surfaces.
Air pollution and climate change	▪ Vehicles transporting construction material along community access roads should move as lower speeds, not exceeding 40 km/hr ▪ All lose material like sand, cement, murram, soil should be covered with a tarpaulin during transportation ▪ Excavated soil stored at the site should be covered with a tarpaulin ▪ Water should be sprinkled on dusty ground where other measures cannot appropriately minimize dust emission ▪ Repair and maintain construction equipment following the manufacturer's specifications, including on fuelling ▪ Offset emitted carbon dioxide during construction activities by planting local trees at all devastated sites

IMPACT	MITIGATION MEASURE
Theft of construction materials	▪ Verification of project employees should be done by the local authorities. ▪ Security guards should be hired to provide security at the construction sites.
Operation and Maintenance Phase	
Soil pollution	▪ Ensuring that storage containers for chemicals are checked regularly for leakage
Occupational safety and health issues	▪ Prepare an occupational Health and safety plan. The plan should ensure that: ➢ employees checking the water reservoir tanks have a harnessing equipment before any activities are carried out; ➢ workers are provided gloves and masks especially those handling chemicals; ➢ trainings on the operations of the water system are regularly conducted; ➢ safety signages are put at the reservoir tank points and abstraction point; ➢ firefighting equipment are installed at the abstraction point; ➢ a well-equipped first aid kit is availed to project workers.
Incapacity to operate and maintain the project components by local people	▪ Prepare a quality management plan ▪ Train local community members in the operation and maintenance of the water supply infrastructure
Unaffordability of the water charges	▪ Levy charges in consideration of the income levels of the area. Charges for poor people should be just enough to cover the operational costs ▪ Provide many public standard pipes where poor people can obtain water cheaply
Air pollution	▪ Sensitize communities on the use of public toilets, and the need for better sanitation ▪ Provide sufficient ventilation on the public toilet
Environmental Pollution from Solar Batteries	▪ Used or malfunction batteries should property stored awaiting being taken to the manufactures ▪ Gel batteries could be used instead of liquid ones
Spread of sanitation and water borne diseases	▪ Ensure regular supply of sufficient water for flushing and washing hands by providing a reservoir tank at the toilet
Vandalization / theft project equipment	▪ Sensitize community members about the importance of the project ▪ Hire a security guard to provide 24-hour security at sensitive components such as the abstraction/pumping station ▪ Fence off major project components such as abstraction and reservoir sites
Decommission Phase	
Disruption of water supply	▪ Inform the communities in the affected areas well in advance about the decommissioning activities ▪ Provide alternative source of water
Traffic disruption	▪ As for the construction phase
Disruption of social order	▪ As for the construction phase
Noise pollution	▪ As for the construction phase
Solid waste generation	▪ As for the construction phase
Occupational health and safety issues	▪ As for the construction phase
Public health and safety issues	▪ As for the construction phase
Increased susceptibility to Soil erosion	▪ As for the construction phase
Air pollution and climate change	▪ As for the construction phase

7.5 Cumulative Impacts

The proposed project will be implemented in a semi-urban setting where there are other competing land uses. This has a potential of triggering cumulative environmental impacts i.e., impacts both from the project and other activities that are likely to affect the same environmental resources or receptors. The most important valued ecosystem components (VECs) within the project areas likely to be affected are:

(a) Groundwater resources,
(b) Surface water resources,
(c) Flora and fauna

Table 35 gives a summary of the potential cumulative impacts and recommended mitigation measures:

Table 35: Potential cumulative impacts

Ecosystem Component	**Other "stressors" (potential sources of cumulative impact)**	**Potential impact**	**Description of mitigation measures**
Groundwater resources	-Opening up land due to urban development for construction of e.g., residences, industries, access roads -Abstraction of ground water by other projects	-Increased runoff-affecting recharge of local aquifers in the catchment -Reduction of ground water yield	-Carry out community awareness and sensitization regarding environmental conservation in the catchment -All projects intending to abstract groundwater should undertake a groundwater resources assessment -All projects intending to abstract groundwater should seek guidance from Tororo District Local Government
Surface water (quality and quantity)	-Land use changes which may affect water flow and retention in streams and wetlands -Human wastes from un-sewered settlements, animal waste from livestock, runoff from agricultural fields	-Reduction in water volumes/quantity in surface water bodies like wetlands, which will compromise groundwater recharge -Compromised of water quality of surface and groundwater	-Carry out community awareness and sensitization regarding environmental conservation in the catchment -Restore converted/rehabilitated degraded wetlands and forests in the catchment -Regularly monitor effluent standards of existing industries and all other effluent discharging entities in the catchment
Flora and fauna	Opening up land due to urban development for construction of *e.g.,* residences, industries, access roads	-Disturbance or loss of terrestrial species and their habitat due to increased development activities -Increased erosion and ensuing sedimentation/siltation of streams	-The MWE should participate in environmental conservation projects in the catchment or where they are non-existent, the MWE should initiate them, including restoring degraded ecosystems

8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

8.1 Introduction

The goal of the Environmental and Social Management and Monitoring Plan (ESMMP) is to ensure that environmental and socio-economic issues continue to be fully integrated into the decisions by the project proponent while promoting resource allocation efficiency throughout the lifetime of the project. This section provides a framework for managing and monitoring impacts for the life of the project. It is designed to ensure that the commitments, enhancement and mitigation measures identified, and in any subsequent assessment reports, together with any license approval or similar conditions, are implemented. In executing the project, the project proponents shall take all practicable measures to ensure that the requirements and recommendations of this report are complied with.

It also specifies monitoring actions and specific responsibilities assigned in order to check progress and the resulting effects on the environment during all project phases. Monitoring will begin immediately and will continue through both the construction and operation phases. One important aspect of monitoring will be to assess the effectiveness of the mitigation measures suggested, where they are found lacking, appropriate new actions to mitigate any adverse effects will be undertaken.

Therefore, this is a core tool that the Contractor will use to monitor project implementation and develop a standalone Environmental and Social Implementation Plan (ESIP) or Contractors Environmental and Social Management Plan (CESMP) to guide project implementation. This ESMMP is intended to guide the contractor in the preparation, implementation, monitoring and reporting on the CESMP. The CESMP will need to be regularly reviewed and updated as the project progresses to reflect any changes in project implementation and organization as well as regulatory requirements.

8.2 Integration of Safeguards into Procurement Process (Contracts)

8.2.1 Bidding

During the bidding process, the Contractor will be expected to include a brief methodology of the implementation of the relevant environmental and social safeguards and attach a cost of implementation of these plans in his proposal bid. In addition, the Contractor should provide relevant staff for the implementation of the safeguards including a Social Specialist supported by Community Liaison Officers and an Environment Specialist supported by HSE Officers. Lastly, the contractor must prove prior experience in adequately managing safeguards issues in the road sector.

8.2.2 Bill of Quantities (BoQs)

The BoQs must capture all relevant safeguards aspects. The indicative costs of implementing safeguards extracted from the ESMP budget should be clearly provided as a provisional sums or billable items in the Bills of Quantities. These should include safeguards staffing, documentation (CESMP, etc.), waste management, HIV/AIDS,

grievance redress, gender awareness, site clean-up and landscaping, monthly ESMP reporting among others. Laxity in the provision and use of personal protective equipment is a risk to the safety of workers. The BoQs should provide a sum for PPE and supervision be done to ensure that all workers undertake works while in full PPE.

8.2.3 Safeguards Clauses

As a best practice, the contracts for the civil works should include clauses on management of environment and social aspects. Sometimes, the clauses are weak and cannot be used to hold the contractors accountable. There is need to strengthen the clauses and to tailor them to the specific project safeguards aspects and management needs.

8.2.4 Procurement of the Contractor

Implementation of mitigation measures during construction is key to managing short- and long-term impacts and risks. As a best practice, the contracts for the civil works should include clauses on management of environment and social aspects. Sometimes, the clauses are weak and cannot be used to hold the contractors accountable. There is need to strengthen the clauses and to tailor them to the specific project safeguards aspects and management needs. The contractual agreement will also include clauses to enforce the implementation of the relevant mitigations. The clauses should be included in technical specifications in all contract documents related to the civil works. Safeguards clauses should be prescriptive and specify: what needs to be done, where it needs to be done, when and how the actions will take place, who is responsible, the monitoring and reporting requirements, and what sanctions or legal recourse are available for work that does not meet the required specifications.

8.2.5 Staffing

It is common for contractors to recruit unqualified safeguards staff or to assign safeguards duties to site foremen or clerks with no prior safeguards experience. Staffing requirements should be spelt out in the contracts. In addition, it may be useful to include the minimum requirements in the contracts for the civil works. Therefore, the MWE, through the supervising consultants must approve the contractor's Environment Officer, Health and Safety Officer and the Sociologist.

8.2.6 ESMP Monitoring and Reporting

Laxity in implementation and reporting on safeguards issues is common amongst contractors largely because they do not take safeguards issues seriously. This can be addressed by requiring contractors to prepare monthly environment and social monitoring reports. These should either be pay items and clearly included in the BoQs or a condition for certification and payment approvals. Contractor safeguards reports are usually characterized by failure to include useful monitoring indicators such as safety statistics (fatalities, minor injuries, near misses, etc.), number of trees cut, and number replanted amongst others. The contractors will require training on safeguards monitoring and reporting. The contractors need to undertake proper recordkeeping of all safeguard activities. The contractors should liaise with District technical offices such as the DEO and DCDO to ensure proper monitoring and timely implementation of project activities.

8.2.7 Project Reporting Commitments

The Contractor will be required to prepare regular reports (monthly, quarterly, and annual) on environmental, social, health and safety performance.

On an annual basis, the Contractor will, under the guidance of the MWE and Tororo District Local Government, engage services of an independent Environmental and Social Compliance Auditor to conduct an Environmental and Social Audit to determine the level of the Project's environmental and social performance. The report will provide the information and data required to determine compliance with national legal requirements as well as OPs of the AfDB. The aspects to be reported on will include; grievance management, labour management, traffic management, community health and safety and security, air quality, erosion and water pollution, waste management, emergency response, HIV/AIDS and gender management, Environmental and social restoration, among others.

8.3 Contractor Management Plans and Method Statements

The Contractor will be required to prepare some standalone safeguards management plans in addition to the Contractor's Environment and Social Management Plan (CESMP). Reference should always be made to the CESMP as the overarching document that contains general Control Statements for various impacts such as air quality, solid waste, and hazardous materials, water quality and ecosystem, noise and vibration control, erosion control, waste excavation and disposal and safety and occupational health. In addition to the Management Plans, the Contractor should prepare Method Statements for specific activities such as excavation works and submit for the Supervision Engineer's review and comments before commencement of works. If the Engineer notifies the Contractor that a specific method statement has failed to provide adequate mitigations, such a statement should be revised and resubmitted until when approved.

8.3.1 Labour Force Management Plan

The Contractor is expected to have a clear plan for recruitment of workers to promote project ownership by the communities. The Contractor should give preference to local people by recruitment of unskilled and semi-skilled labour from project villages and this should be done through local areas councils from where those seeking employment should get letters of recommendations.

8.3.2 Quality Management Plan

A quality management plan defines the quality policies and procedures relevant to the project for both project deliverables and project processes and who is charged with what responsibility to ensure compliance to set stands. Given the nature of this project, the contractor should have a quality management plan to guide the quality control and assurance processes to achieve the intended outcomes in terms of social, design, structural and investment outcomes in line with environmental and social safeguards policies.

8.3.3 Erosion Control Plan

Soil erosion risks are expected to be mainly associated with vegetation clearance, construction of access roads and storage of excavated materials. In some cases, the project area may receive high amounts of rainfall that will be associated with soil erosion.

An erosion control plan should be overlaid on the project grading plan(s) or site plan if there is not a grading plan. The erosion control plan needs to show what Best Management Plans (BMPs) will be used and where, as well as the total disturbance area. The plan must include measures to prevent erosion, contain sediment and control drainage. The erosion control plan must also include installation details of the BMPs as

well as notes. Construction sites often have areas where soil disturbing activities such as clearing, grading, or cut/fill work has stopped for a period of time. Bare areas that are not actively under construction need some type of temporary cover to prevent or minimize erosion in the event of rainfall. Applicable areas include topsoil stockpiles, rough graded areas, sediment basin dikes, ditches, temporary earthen structures, and graded areas undergoing settlement. The following controls may be considered:

- Stabilization which includes a wide range of erosion prevention practices that cover exposed soil such as the use of straw, mulch, erosion control blankets, plastic sheeting or tarpaulins.
- Temporary seeding which is a soil stabilization practice involving the establishment of temporary vegetative cover to reduce erosion on construction sites that have disturbed areas that are temporarily idle.

8.3.4 Waste Management Plan

The Waste Management Plan (WMP) shall be prepared to address waste management aspects associated with the construction of the markets in line with legal and regulatory requirements. The Contractor, all subcontractors, and vendors involved in the project shall have to adhere to this Plan. The Contractor is responsible for ensuring that waste is managed in accordance with this Plan by providing the necessary resources and by issuing instructions and guidance during project execution. The Contractor will implement waste management measures and practices throughout the construction period to mitigate the associated risks. The WMP will contain the following information:

- Relevant legislation and guidelines for waste management of the Project;
- The procedures and initiatives proposed to address the management of waste materials;
- Safeguards, mitigation measures and monitoring to manage waste impacts during construction;
- Roles and responsibilities of those involved in the implementation of waste management controls;
- An effective monitoring, auditing and reporting framework to assess the effectiveness of the controls implemented
- Checklists and forms for day-to-day waste management activities.

The Contractor shall undertake measures to respond to all generated categories of wastes. The Contractor should be aware that large quantities of cut to spoil may be generated which will require disposal. Therefore, the contractor is expected to identify potential sites for waste disposal before excavation works commence in order to secure the requisite approvals in a timely manner.

8.3.5 Occupational Health and Safety Plan

The Contractor will have to prepare a document that presents the framework for occupational health and safety management and monitoring measures to undertake. The OHS plan should typically cover safety programs that will be applied for promoting health and safety, preventing harm, fatality and hazards to the employees, sub-contractors, properties and the general public. The contractor should be aware of the presence of hippos in the area which usually move out in the night to graze and crocodiles being a river bank with riverine and floating vegetation. These can be dangerous if approached

and disturbed.

8.3.6 Community Health and Safety Plan

This Plan applies to project construction activities and the associated risks and potential impacts that these activities may have on community health and safety. The risks and potential project impacts to community health and safety can emerge from both within and outside the so-called project area of influence. Therefore, the scope of this plan focuses on the management of aspects associated with the interaction of construction activities, the workforce, and the community as well as mitigation of contagious diseases. The Plan should include control measures designed to avoid, minimize or mitigate the adverse effects of project activities on the health and safety of the community, while at the same time, enhancing the beneficial effects and capitalize on opportunities that may contribute to improving overall community well-being.

8.3.7 HIV/AIDS and Gender Management Plan

The Contractor in pursuit of his commitment to health and safety will organize trainings, conduct awareness and education on the use of infection control measure in the workplace. The Contractor is expected to provide appropriate PPE to protect workers from the risk of exposure to HIV/AIDS and incorporate HIV/AIDS information in occupational health and safety inductions, provide guideline in preventing the spread of HIV/AIDS and other sexually transmitted infections (STIs), publicize knowledge related to HIV/AIDS and STIs to the work crews and the surrounding communities, provide information on good HIV prevention interventions, including promotion of the correct use of condoms and ensure sufficient resources are available for HIV programs.

All the relevant stakeholders should be kept informed and up to date on issues pertaining to the project activities especially those, which affect them or where they have influence.

The Contractor should also provide a plan documenting how gender issues such as gender-based violence, employment segregation based on gender, among others will be addressed sexual violence

8.3.8 Traffic and road safety Management plan

The major purpose of this plan is to help protect road users and workers and keep traffic delays to a minimum through proper and clear signage and controls. The Traffic Management Plan will provide actions to ensure safety of road users and construction staff during construction the bridge and access roads. It will outline traffic control and traffic management procedures to prevent potential hazards associated with road use during construction. Any road work resulting in obstruction of roads needs to be managed so that safety is not compromised and disruptions and delays to road users are kept to a minimum. The Plan shall include a road safety awareness program.

8.3.9 Cultural Heritage Management Plan

This plan will include measures to manage risks and impacts on cultural heritage during construction. There could be other unknown physical cultural resources (PCRs) within the construction areas. If any chance finds are made, measures must be taken to ensure 'conservation' in accordance with legislation and to contact the Department of Monuments.

8.3.10 Stakeholder Engagement Plan (SEP)

All stakeholders need to be kept informed during project implementation so as to accord the necessary support and advice. This consultation and public participation will be on-going process that will continue throughout the implementation of the ESIA. In pursuit of timely, meaningful and appropriate stakeholder engagement, the contactor is expected to have a clear strategy for stakeholder engagement to assist in managing and facilitating future engagement through the various stages of the Project's life cycle from mobilization up to handover. The SEP shall detail the key stakeholders to be engaged and the schedule of engagements throughout the various stages of construction, decommissioning and the defects liability period.

8.3.9.1 Purpose of SEP

The SEP is an instrument for mapping and prioritizing stakeholders across levels and regions; and for guiding planned consultations and disclosure of relevant project information to/with identified stakeholders.

8.3.9.2 Stakeholder Categorization

Three (3) categories of stakeholder to be mapped out (across three levels at the national, regional and community) as follows.

a) Primary level stakeholders considered to have high influence and power in respect to the project, project area and potential impacts and project implementation. These require regular engagements and consultations throughout the project life.
b) Secondary level stakeholder considered to have either high influence but low power or high power but low influence. These will require to be initially consulted and regularly kept informed. These will require to be initially consulted and regularly kept informed.
c) Tertiary stakeholders considered to have low power and low influence.

8.3.9.3 Information Needs

The following information should be made available to all stakeholders, who are likely to be affected by positive and adverse environmental or social impacts from the project:

a) Purpose, nature, objectives and scale of the project.
b) Schedule and duration of proposed project activities.
c) Potential project risks and impacts extracted from the ESIA.
d) Proposed mitigation plans.
e) Available grievance mechanisms.
f) Envisaged consultation process, if any, and opportunities and ways in which the public can participate (via the SEP) and
g) Time and venue of any planned public meetings.

8.3.9.4 Disclosure Mechanisms

A number of strategies can used to enhance public information disclosure and stakeholder consultations including:

I. Scheduled public hearings at community level (village and parish) for initial disclosure, disclosure of draft reports and final reports including their implementation

II. Dedicated and select meetings with institutional stakeholders at the central regional, district and sub-county levels at different project phases
III. Dedicated meetings with select social groups like livelihoods groupings and vulnerable social groups including women, youth, PWDs and local leaders.
IV. Project Background Information Document (PBID) summaries will be prepared, translated and shared alongside other strategies described herein
V. Non-Technical Summaries (NTS) of the ESIA will also be developed for public disclosure through print media and info-shops for the regulators, funder and project proponent.

A template of a stakeholder engagement plan is depicted in Table 36.

Table 36: Stakeholder Engagement Plan template

Project phase	Activity	Objectives	Level and type/group of stakeholders	Methods/Tasks and Materials	Schedule/Frequency

8.4 Grievance Redress Mechanism (GRM)

8.4.1 Grievance Procedure and Rationale

This section describes the procedure and mechanism through which community members and PAPs will be able to report, make, place/lodge or express a grievance against the project, its staff or contractors as part of the mitigation measures. It also describes the roles and responsibilities for different structures in resolving grievances. A grievance is any dissatisfaction or sense of injustice, or unfairness felt by a person-in this respect a community member, PAP or his/her representative in connection with his/her compensation entitlements, RAP implementation process, the project Developer, Contractor and other scenarios related to project implementation. The grievance is usually brought to the attention of the person(s) in charge, referred to here as the Grievance Officer (GO). This grievance procedure is intended to put in place and facilitate accessible, prompt and cost-effective handling of grievances at the nearest points of service to community members and the PAPs.

The aim and purpose of this system is to make the grievance handling procedures accessible, prompt and affordable to the PAPs given the generally low values of some of the properties to be affected; and also provide an alternative to the costly and time-consuming formal courts procedures for handling grievances and disputes. The objective of the grievance handling systems and procedure is to establish for the community members and PAPs mechanisms for raising complaints related to compensation for loss of land and other livelihood properties and assets and having such complaints resolved as amicably as possible through acceptable and binding corrective actions.

8.4.2 Steps of the Grievance Process

The grievance mechanism is adopted from the MWE-RPF, 2012 already disclosed. The grievance mechanism operating at each location will receive inputs from four main sources:

I. Directly from the PAPs or other members of affected community.
II. From the RAP implementation team.
III. From the Monitoring and Evaluation Officer who will forward issues/concerns identified in the field.
IV. From the Local Government Offices at the Sub-county/District Levels since these are as close to the community as possible. Steps of the grievance process are described below.

Receipt of Complaint/Grievance

A verbal or written complaint from a PAP or community member will be received by the Grievance Officer (GO) (refer to Table 37 for the roles of the GO) or an assigned contact officer in a given administrative jurisdiction/authority near to community level and recorded in a grievance log which will be held in the Sub-county. The contact officer at the sub-county will be the Sub-county Chief.

Table 37*: Role of a Grievance Officer*

Role of a Grievance Officer
A Grievance Officer (GO), who will be a member of the Project Implementation Team, will lead the grievance mechanism. Principal responsibilities of the GO will include: 1. Recording the grievances, both written and oral, of the affected people, categorizing and prioritizing them and providing solutions within a specified time period. 2. Discussing grievances on a regular basis with the Working Group and coming up with decision/actions for issues that can be resolved at that level. 3. Informing the Steering Committee of serious cases within an appropriate time frame. 4. Reporting to the aggrieved parties about developments regarding their grievances and decisions of the Steering Committee. 5. Providing inputs into the monitoring and evaluation process **Source: MWE-RPF (Ministry of Water and Environment-Resettlement Policy Framework), 2012**

The grievance team will hold meetings at sub-county headquarters where grievances are received by a contact person who would then hand over received complaints to the GO, for entering into the grievance log using the grievance form.

The grievance log will indicate grievances, date opened/lodged, actions taken to address or reasons the grievance was not acted upon (e.g., the grievance was not related to the resettlement process); information provided to complainant and date the grievance was closed.

Grievances can be lodged at any time, either directly to the GO or the Sub-county headquarters. The process for lodging a complaint is outlined below:

I. The GO will receive a complaint from the complainant or from the appointed contact person at the sub-county headquarters.
II. The GO will ask the claimant questions in their local language, write the answers in English and enter them in English onto the Grievance Form.
III. A representative of an independent local civil society organization witnesses translation of the grievance into English.
IV. The GO reads the complaint in English and translates it into the complainant`s local language on the Grievance Form.
V. The local leader (representative of an independent local civil society organization) and the complainant both sign the Grievance Form after they have both confirmed the accuracy of the grievance.
VI. The GO lodges the complaint in the Grievance Log.

Determination of Corrective Action

If in their judgment, the grievance can be solved at this stage, the GO and a representative of a local independent civil society/organization 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 data base.

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.

Meeting with the Complainant

The proposed corrective action and the timeframe in which the grievance 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, Step 2 will be re-visited.

Implementation of Corrective Action

Agreed corrective actions will be undertaken by the project developer or its contractors within the agreed timeframe. The date of the completed action will be recorded in the grievance database.

Verification of Corrective Action

To verify satisfaction, the aggrieved person will be approached by the GO 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 (see Step 3). 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.

Action by the Local Leaders and Project Contractors

If the GO and independent observer cannot solve the grievance, it will be referred to relevant parties such as local leaders, District Officers, Construction Contractor, Valuer and MWE, for consultation and relevant feedback provided.

Action by the Grievance Committee

If the complainant remains dissatisfied and a satisfactory resolution cannot be reached, the complaint will be handled by the Grievance Committee. A dedicated Grievance Committee will be established to assess grievances that arise from disputes in each district (Agago, Kitgum, Pader). This will include the following members:

I. District Land Office Surveyor;
II. Representative of the valuer;
III. Grievance Officer
IV. SC LC III Council Representative where it applies.

This committee must have a quorum of at least three persons. Decisions will be reached by simple majority. The Grievance Committee should be constituted for as long as grievances are being lodged.

Once the Grievance Committee has determined its approach to the lodged grievance, this will be communicated to the GO, 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.

Action by Developer (MWE)

If no satisfactory solution is reached by the Grievance Committee, the complainant can be advised to lodge the complaint with the management of the developer at their regional head/offices to make the process easily accessible to the complainants. If no satisfactory solution is reached by developer's management, the complainant has the option to seek redress via judicial processes.

Alternative Action by Chief Government Valuer (CGV)

Some grievances may be beyond the capacity of the GO or the Grievance Committee to handle expeditiously without the technical support of other professionals like the CGV. Some of the grievances may be specifically related to the valuation process, valuation rates and awards. Therefore, the GO will determine whether a complaint can be resolved by the Grievance Committee or, if not, should be referred to the CGV for technical and administrative advice.

The CGV will make necessary consultations with offices he/she deems fit to consult in his/her capacity as CGV. If satisfactory solution is not achieved or provided by the CGV, the aggrieved person can resort to the judicial process.

8.4.3 Capacity Building for the Grievance Officer and Grievance Committee

It will be important for the appointed GO to be appointed based on his/her experience and training in conflict resolution through mediation and reconciliation. It will also be important for the GO to have sufficient skills in data management including data entry, data analysis and storage. This notwithstanding, it will be important that steps are taken to orient and build the capacity of the GO as part of the project implementation team in conflict resolution procedures such as mediation and reconciliation and other management areas such as record keeping and report writing and ICT equipment management.

The Grievance Committee members will also need to be oriented about the grievance management system. The capacities of the grievance committee members will also need to be built around issues of conflict identification, conflict information analysis and resolution based on issues in the land legislation through reconciliation and mediation.

8.4.4 Other alternatives

The other alternative recourse suggested as a last resort is for the complainant to seek redress from formal courts of law. The Land Act, Cap 227 establishes Land Tribunals at regional/district level. It empowers the Land Tribunals to determine disputes relating to amount of compensation to be paid for land acquired compulsorily for public interest. The affected person may appeal to a higher ordinary court. The Land Acquisition Act allows for any person to appeal to the High Court within 60 days of the award being made. The Land Act, Cap 227 also states that traditional authority mediators can play a role in settling land disputes.

8.5 Capacity Building and Trainings

The Capacity building and trainings will be conducted using the AfDB's and the National social and environmental (E&S) safeguards, as required by the AfDB for its projects to ensure early identification of possible risks and propose management measures so that the project is able to address the risks while maximizing positive outcomes.

Training will be conducted with the following primary objectives:

- Train the project beneficiaries and other government staff interested in the general safeguard requirements built into the E&S safeguards.

- Introduce the participants to the safeguard requirements of the AfDB and of the country.
- Examine the specific safeguard requirements of the AfDB funded projects.

The following outcomes are expected as the result of training.

- Improved knowledge and understanding on the E&S concepts and standards.
- Improved knowledge and understanding on the ESIA concepts and methodology.
- Improved knowledge and understanding on the ESMMP preparation.
- Improved knowledge and understanding on the ESMMP monitoring and reporting.

8.6 Required Approvals, Permits and Licenses

Several approvals and licenses will be required before commencement of certain construction activities. Securing of approvals requires preparation of the relevant documentation and payment of fees. This needs to be done during mobilization to ensure that all approvals are secured in a timely manner to avoid construction delays. It is important to ensure that all materials (sand and aggregates) are sourced from quarries, borrow pits and sand mines approved by NEMA and compliant with environmental laws. For all new materials sites to be opened up, NEMA approval must be secured while all existing sites should undertake/provide proof of having undertaken environmental compliance audits. For the success of the Soni WSSS, the following permits and licenses may be required by the project as presented in Table 38.

Table 38: Approvals, permits and licenses that may be required by the project

Approvals, Permits and Licenses Required	Issuing Authority	Party responsible for acquiring permit/license	Legal Framework
Water Abstraction Permit	DWRM	MWE Contractor	Water Act, cap 152
Wastewater Discharge permit	DWRM	MWE Contractor	Water Act, cap 152
Waste Disposal Permit	NEMA	MWE Contractor	National Environment Act Cap 153; National Environment (Waste Management) Regulation
Waste Transportation License	NEMA	Contractor	National Environment Act Cap 153; National Environment (Waste Management) Regulation
Storage of Hazardous/ Non-Hazardous Waste	NEMA	Contractor	National Environment Act Cap 153; National Environment (Waste Management) Regulation
License to emit noise in excess of permissible noise levels	NEMA	Contractor	National Environment Act Cap 153
Blasting, importation, storage and transportation of explosives	Ministry of Internal Affairs	Contractor	Explosive Act, Cap 298
Mining Permit, Extraction of minerals, opening up of quarries and sand pits	MEMD/ NEMA approval	Contractor	Mining Act, Cap 148
Permit for Storage of Petroleum Products and dispensing license	MEMD	Contractor	Petroleum Act, Cap 2003

Work Permits	Ministry of Internal Affair	Contractor MWE	Immigrations Act, Cap 66
Permit if the water transmission line is to cross the UNRA road (Road Permits)	UNRA	MWE	The Uganda National Roads Authority (General) Regulations 2017
Traffic Diversions consent	Uganda Police	Contractor	Traffic and Road Safety Act 1998
RAP approval conditions for this project	Chief Government Valuer	MWE Contractor	The Land Act Cap 227

8.7 Environmental and Social Monitoring Plan

A monitoring process will need to be established to check/assess the implementation progress and effectiveness of the mitigation measures suggested and the resulting effects of the proposed project on the environment. The process will begin during the construction stage and continue throughout the operation phase. It should also include regular reviews of the impacts that cannot be adequately assessed before the beginning of the project, or which arise unexpectedly. In such cases, appropriate new actions to mitigate any adverse effects will be undertaken.

A monitoring plan has been prepared considering the chronology of potential project activities. The recommendations in this report would provide a basis for tracking progress of the proposed project activities with regard to sound environmental practice and mitigation measures.

8.8 Roles and Responsibilities

In order to enhance the potential for integrating sustainability concerns in this proposed Piped Water Supply System, it is important to assign clear roles and responsibilities to dominant professionals, contractors and/or sub-contractors so as to ensure that environmental plans are implemented effectively.

8.8.1 Project Developer (MWE)

The MWE will be responsible for the implementation of the Project through contractors. The MWE will be responsible for contract management and will ensure that the contactors adhere to their contractual obligations and that they are compliant with the environmental and social standards as spelt out in their contracts.

The Project Developer will:

i) Have overall responsibility for environmental and social compliance;
ii) Ensure that appropriate resources are allocated to facilitate environmental and social management of the project, including financial and human resources;
iii) Review for quality and approve the CESMP for project implementation;
iv) Ensure that adequate supervision for implementation of the ESMMP is provided at all times;
v) Check that penalties for non-compliances with contractual environmental commitments are actioned; and e.g., Supervising Engineer is required to have an

Environmental & Social Management Specialist by contractual obligation. The Contractor's Environmental Specialist, Social Development Specialist and Health & Safety Specialist will ensure that the provisions in this ESMP are implemented within the sites under their supervision and to collect and transmit relevant information to the Supervising Engineer.

vi) Undertake regular compliance audits, including the mandatory Annual Environmental Compliance Audit in accordance with the National Environment Act.

8.8.2 Project Development Partner (AfDB)

The AfDB will be financing the project. Like other financing entities, the AfDB is expected to offer implementation support supervision to the project's environmental and social performance through reviews, approvals, meetings, training field inspections and missions. The AfDB is expected to have a safeguards team that can participate in safeguards missions.

Therefore; the AfDB will;

i) Provide appropriate guidance towards compliance with the Operational Safeguards;
ii) Allow for quick feedback on the any safeguards documentation of the project;
iii) Provide no-objection on environmental and social matters whenever required; and
iv) Play an oversight role in implementing the Safeguards Requirements.

8.8.3 NEMA and Lead Agencies

NEMA will, in consultation with Tororo District Local Government (represented by District Environment Officer), monitor all environmental phenomena with a view of assessing any possible changes in the environment and their possible impacts; the operation of the water supply facility with a view of determining its immediate and long-term effects on the environment.

8.8.4 Project Contractor

During sites preparation and construction, the contractor will be responsible for ensuring compliance with all relevant legislation as well as adherence to all environmental and socio-economic mitigation measures specified in the Environment and Social Management Plan. The contractor is also responsible for managing the potential environmental, socio-economic, safety and health impacts of all contract activities whether these are undertaken by themselves or by their subcontractors. Other responsibilities of the contractor include: preparation of a Contractors Environmental and Social Management Plan (CESMP), workers' Code-of-Conduct, that all workers will have to read and abide with through signing.

8.8.5 Tororo District Local Government

Although the contractor will have the primary role in delivering on the measures set out in the ESMMP, Tororo District Local Government will have the ultimate responsibility for ensuring that the measures are delivered. In this respect, Tororo District Local Government will review and approve contractor plans for delivery of the actions

contained in the ESMP and subsequently during project operation, review contractor performance through monitoring, audits and inspection to ensure that all proposed mitigation measures are implemented as well as ensuring regulatory compliance.

8.9 The Monitoring Team

It is recommended that a core team of individuals preferably headed by the Tororo District Environment Officer (DEO) and the Water Officer (DWO). Other important players to take part in monitoring include the Community Development Officer (CDO) at the district or sub-county levels and the local leaders at sub-county, parish and village levels.

The monitoring team will start its work during the site preparation and construction process and continue throughout the operation phase and should ensure that the proposed mitigation measures are implemented as suggested in this report. The monitoring team will most particularly check for the following issues among others:

- Collaboration of the Project Proponents with NEMA and other relevant authorities to ensure that operations of the water scheme meet regulatory requirements.
- Efficient and functional water and sanitation system at the premises.
- Proper storage, handling and final disposal of any solid waste produced at the premises.
- General cleanliness and good housekeeping in and around the facilities.
- Emergency preparedness especially in cases of fire outbreak.
- Constant acquisition of appropriate permits and/or licenses from respective institutions and compliance with the regulatory framework.
- Supervise implementation of all the proposed mitigation measures.
- Compile a monitoring report indicating all non-conformances to mitigation measures.

8.10 Enforcement of Compliance

Laxity in implementation and reporting on safeguards issues is common amongst contractors during project implementation largely because they do not take safeguards issues seriously. This can be addressed by requiring the contractor to prepare monthly environmental and social monitoring reports. These should either be pay items and clearly included in the BoQs or a condition for certification and payment approvals. The contractor must be required to undertake proper recordkeeping of all safeguards' activities. Slackness in the provision and use of PPE is a risk to the safety of workers. The BoQs should provide a sum for PPE and supervision be done to ensure that all workers undertake works while in full PPE.

The Supervising Engineer must strictly supervise implementation of the ESMP and where there are breaches, the supervising engineer should issue written instructions, cautions and warnings as applicable. Where the contractor fails to comply, contractual clauses should be invoked, and penalties or fines effected. If necessary, the civil works can be suspended if the contractor repeatedly fails to adhere to instructions. The MWE should

penalize the supervising consultant if he fails to supervise and enforce ESMP implementation by the contractor.

8.11 Environmental and Social Management and Monitoring Plan (ESMMP) Matrix

The ESMMP matrix (Table 39) provides a detailed guidance for managing impacts, monitoring indicators, indicative costs for impact mitigation, responsibility for implementing the mitigation measures, the monitoring institution and the monitoring frequency. The Contractor and Developer/Operator must ensure that the ESMMP is implemented, and should allow the monitoring institution to carry out the monitoring duties without any obstruction.

Table 39: Environmental and social management and monitoring plan

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
Positive Impacts						
Employment opportunities and income	▪ Prepare a labour force management plan ▪ Preference for employment opportunities should be given to the local people where they have the required skills (for skilled labour activities). Otherwise, all activities which do not require skills such as casual activities should be given to the locals ▪ All laborers should be given contracts specifying their roles and responsibilities and renumerations ▪ The use of appropriate labour-intensive methods for some of the construction activities (for example excavation for pipelines) should be undertaken to enable as many local people (including women) as possible get jobs ▪ Priority for sourcing materials for construction and other services such as food and accommodation should be given to local suppliers ▪ Ensure that children are not employed on the project	-Labour force management plan in place -Details of the project staff, including origin, age	10 million (for the labour farce management plan)	Contractor MWE	CDO	Monthly
Acquisition/improvement of skills	▪ Foreign companies (if contracted) should be required to have a joint venture with local companies to build their capacity. ▪ Contracts terms for construction works for the project's construction and O&M phase should emphasize knowledge transfer and the project developer should monitor and ensure that the objectives are met. ▪ O&M manual and standard operating procedures must be handed over to the operator	-Details of the Contractor, including country of registration -Details of the Contracts agreement -Presence of the O&M manual	0	Contractor MWE	CDO DWO	Once, before start of construction works
Reduction of poverty and improved livelihoods of the local people	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain water	-Records of water abstraction and supply -Records of water quality assessment	Part of the contract	MWE	DWO CDO	Quarterly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
		-Number of households connected, and number public stand pipes				
Improvement in public health	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain water ▪ Sensitize communities on the dangers of using unsafe water sources	-Records of water abstraction and supply -Records of water quality assessment -Number of households connected, and number public stand pipes -Minutes of community sensitization	1 million (for community sensitization)	MWE	DWO CDO	Quarterly
Achievement universal primary education	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain water	-Records of water abstraction and supply -Records of water quality assessment -Number of households connected, and number public stand pipes	Part of the contract	MWE	DWO CDO	Quarterly
Promotion of gender equality and empowerment of women and the girl child	▪ Ensure consistent supply of water of adequate quality and quantity ▪ Extend water to as many users as possible in the project area ▪ Provide as many public stand pipes as possible where poor people can obtain water	-Records of water abstraction and supply -Records of water quality assessment	Part of the contract	MWE	DWO CDO	Quarterly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
		-Number of households connected, and number public stand pipes				
Negative Impacts						
Pre-construction and Construction Phase						
Loss of land and property	▪ Prepare and implement a RAP ▪ All privately owned land to host project components should be duly compensated prior start of construction activities ▪ All property should be valued and duly compensated prior to start of construction works ▪ For property like crops, where possible, owners should be informed early about the project work plan and allowed to harvest them prior to start of construction ▪ Prepare a stakeholder engagement plan and ensure that stakeholder engagement is a continuous process throughout the project implementation	-RAP in place -Agreements of land sale -Compensation agreement	-80 million for a RAP -Cost of land and other property to depend on the actual value	Developer	CDO	Once, to be cleared before start of construction
Traffic disruption	▪ Prepare and implement traffic management plan	-Traffic management plan in place	6 Million	Contractor	CDO	Weekly
	▪ Liaise with the local traffic authority to manage traffic at busy crossings e.g., markets, schools, churches	-Records of agreed work plans with traffic police	1 Million	Contractor	CDO Traffic police Department, Tororo	Weekly
Loss of vegetation and soil cover	▪ Prepare a vegetation restoration plan	-A vegetation restoration plan in place	6.5 million	Contractor	DEO	Once, before start of construction activities
	▪ Restrict clearance to only areas to be constructed.	-Presence of bare soils	Part of the Contract	Contractor	DEO	Weekly
	▪ Landscaping and re-vegetation after construction especially around the water source and reservoir	-Presence of gullies due to soil erosion.	10 Million	Contractor	DEO	Weekly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
	▪ Restrict alignment of the transmission route along road reserves	-Layout of the transmission line	Part of the Contract	Contractor	DWO /DEO	Monthly
Introduction of invasive plant species	▪ All Construction machinery should be cleaned prior to their transport to and assembly at the project sites	-Records of machinery cleaning	1 Million	Contractor	DEO	Once, before start of construction activities
Disruption of social order	▪ Prioritize employment of local people where they have the required skills	-Record of project staff and their area of origin	Part of the Contract	Contractor	CDO	Weekly
	▪ Sensitize all workers to ensure awareness of and sensitivity to the local cultures, traditions and lifestyles	-Record of sensitization sessions	2.5 Million	Contractor	CDO	Monthly
Noise from construction machinery	▪ Schedule noise-intensive work for the least noise-sensitive time of the day (work between 8 am and 5 pm)	-Work schedule -Complaints about noise;	0	Contractor	DEO	Weekly
	▪ Provision of PPE to project workers	-PPE in use	Part of the Contract	Contractor	DEO	Weekly
	▪ Regular noise assessments	-Noise assessment reports	1 Million	Contractor	DEO	Monthly
	▪ Sprinkle water to dusty grounds during the dry seasons	-Records of air water sprinkling	10 Million	Contractor	DEO	Weekly
	▪ Cover earth materials with tarpaulin during transportation to minimise their falling off trucks;	-Presence of tarpaulins for covering loose material	1 Million	Contractor	DEO	Weekly
Solid waste generation	▪ Prepare a waste management plan	-A waste management plan in place	5 million	Contractor	DEO	Once, before start of construction activities
	▪ Use the excavated material for backfilling.	-Heaps of waste & excavated material on site -Areas backfilled	Part of the Contract	Contractor	DEO	Monthly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
	▪ Provide waste bins for proper storage.	-Waste bins within the project area.	0.2 Million	Contractor	DEO	Monthly
	▪ Contract a waste management company where waste volumes are large	-Contract agreement with a waste management company	2 Million	Contractor	DEO	Monthly
	▪ Provide temporary eco-san toilets on site during site works	-Eco-san toilet on site	Part of the construction contract	Contractor	DEO	Monthly
Occupational health and safety issues	▪ Prepare an occupational Health and safety plan	-An occupational health and safety plan in place	6.5 Million	Contractor	CDO DEO DHI	Once, before start of construction works
	▪ Provide workers with PPE and sensitise them on basic safety precautions.	-PPE in use	Part of the Contract	Contractor	DEO	Weekly
	▪ Provision of a first aid kit	-First aid kit	Part of the Contract	Contractor	DEO	Monthly
Community health and safety issues	▪ Prepare a community health and safety plan	-A community health and safety plan in place	5 Million	Contractor	CDO DEO DHI	Once, before start of construction works
	▪ Cordon off all dangerous areas along public roads	-Marks of dangerous places	1 Million	Contractor	CDO DEO	Weekly
	▪ Project vehicles transport material along community roads should not exceed 40 km/h.	-Records of sensitization of project drivers on speed limits -Speed limit signs on roads	1 Million	Contractor	DEO	Monthly
	▪ Schedule of construction works along community access roads should be communicated to public at least a week prior to start of construction works	-Proof of communication of work schedule with communities	0.5 Million	Contractor	DEO	Bi-monthly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
		-Number accidents recorded				
	▪ Prepare and implement an HIV/AIDS management plan	-An HIV/AIDS management plan	10 Million	Contractor	DCDO	Quarterly
Increased susceptibility to soil erosion	▪ Prepare an erosion control plan	-An erosion control plan in place	5 Million	Contractor	DEO NEMA	Once, prior to start of construction activities
	▪ Immediately dispose of any excavated soil to avoid loose soil being washed away by storm water.	-Presence of erosion gullies within the site premises	2 Million	Contractor	DEO NEMA	Weekly
	▪ *Providing an erosion barrier around stockpiles of excavated soils*	-Presence of erosion barriers	5 Million	Contractor	DEO NEMA	Weekly
	▪ Plant bands of grass on erosion prone surfaces.	-Presence of plant bands	4 Million	Contractor	DEO NEMA	Quarterly
Air pollution and climate change	▪ Vehicles transporting construction material along community access roads should move as lower speeds, not exceeding 40 km/hr	-Speed limit signages along access roads	5- Million	Contractor	DEO CDO NEMA	Weekly
	▪ All lose material like sand, cement, murram, soil should be covered with a tarpaulin during transportation	-Trucks covered	1 Million	Contractor	DEO NEMA	Weekly
	▪ Excavated soil stored at the site should be covered with a tarpaulin	-Soils covered	0.5 Million	Contractor	DEO NEMA	Weekly
	▪ Water should be sprinkled on dusty ground where other measures cannot appropriately minimize dust emission	-Records of water sprinkling	2 Million	Contractor	DEO NEMA	Weekly
	▪ Repair and maintain construction equipment following the manufacturer's specifications, including on fuelling	-Records of vehicle repair and maintenance	10 Million	Contractor	DEO NEMA	Quarterly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
	▪ Offset emitted carbon dioxide during construction activities by planting local trees at all devastated sites	-Records of trees planted	5 Million	Contractor	DEO NEMA	Annually
Theft of construction materials	-Verification of project employees should be done by the local authorities.	-Records of employee verification exercise	1.5 Million	CDO	CDO	Prior to the start of construction activities -Any time staff are required
	Security guards should be hired to provide security at the construction sites.	-Presence of security guards	5 Million	CDO	CDO	-Weekly
Operation and Maintenance Phase						
Water Pollution	▪ Ensuring that storage containers are checked regularly for leakage	-Records of chemical leakage/ spillage	0.3 Million	Developer / Operator	DEO	Quarterly
Occupational Health and Safety	▪ Prepare an occupational health and safety plan	-Same as in the construction phase	Same as in the construction phase	Same as in the construction phase	Same as in the construction phase	Same as in the construction phase
	▪ Workers should be given appropriate PPE when handling chemical	-Workers using PPE	Part of the Contract	Developer / Operator	DEO CDO	Quarterly
	▪ Regular trainings on the operations of the water system	-Records of training on operation systems	3 Million	Developer / Operator	DWO	Quarterly
	▪ Installation of firefighting equipment at the abstraction point	-Presence of firefighting equipment	5 Million	Developer / Operator	DEO DWO	Quarterly
	▪ A well-equipped first aid kit should be availed to project workers.	-Presence of a first aid kit. -Records of injuries	Part of the Contract	Developer / Operator	DEO CDO	Quarterly
Incapacity to operate and maintain the project	▪ Train local community members in the operation and maintenance of the water supply infrastructure	-Number of trained community members in operation and maintenance of the	6 Million	Developer/ Operator	DWO	Quarterly

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
components by local people		piped water supply system				
	▪ Prepare a quality management plan	▪ A quality Management plan in place	15 Million	Contractor Operator	DWO CDO DEO	Quarterly
Unaffordability of the water charges	▪ Levy charges in consideration of the income levels of the area. Charges for poor people should be just enough to cover the operational costs	▪ Records of water charges ▪ Complaints from the public	0	Developer / Operator	DWO CDO	Quarterly
	▪ Provide many public standard pipes where poor people can obtain water cheaply	▪ Number of public stand pipes	Part of the Contract	Developer / Operator	DWO CDO	Twice a year
Air pollution	▪ Sensitize communities on the use of public toilets, and the need for better sanitation	-Records of community sensitization	1 Million	Developer / Operator	DWO CDO	Once, after completion of construction
	▪ Provide sufficient ventilation on the public toilet	-Building drawings	Part of the Contract	Developer / Operator	DWO CDO	Once, prior to, and once after construction
Spread of sanitation and water borne diseases	▪ Ensure regular supply of sufficient water for flushing and washing hands by providing a reservoir tank at the toilet	-Presence of a reservoir tank at the toilet	Part of the Contract	Developer / Operator	DWO CDO DEO	
Vandalization / theft project equipment	▪ Sensitize community members about the importance of the project	-Records of community sensitization	2 Million	Developer / Operator	DWO CDO DEO	Once, prior to, and once after construction
	▪ Hire a security guard to provide 24-hour security at sensitive components such as the abstraction/pumping station	-Presence of security guards	To depend on the local security labour cost	Developer / Operator	DWO CDO DEO	Quarterly
	▪ Fence off major project components such as abstraction and reservoir sites	-Fenced project site	Part of the construction Contract	Developer / Operator	DWO CDO DEO	Twice a year

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
Decommissioning Phase						
Disruption of water supply	▪ Inform the communities in the affected areas well in advance about the decommissioning activities ▪ Provide alternative source of water	▪ Records of sensitization meeting about project decommissioning ▪ Presence alternative water sources	3 million for sensitization meetings	Operator Decommissioning Contractor	DWO CDO DEO	Quarterly, within the last two years of decommissioning
Traffic disruption	▪ Same as for the construction phase	▪ Same as for the construction phase	1000000	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Disruption of social order	▪ Same as for the construction phase	▪ Same as for the construction phase	2500000	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Noise pollution	▪ Same as for the construction phase	▪ Same as for the construction phase	5000000	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Solid waste generation	▪ Same as for the construction phase	▪ Same as for the construction phase	4200000	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Occupational health and safety issues	▪ Same as for the construction phase	▪ Same as for the construction phase	-	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Public health and safety issues	▪ Same as for the construction phase	▪ Same as for the construction phase	6000000	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
Increased susceptibility to Soil erosion	▪ Same as for the construction phase	▪ Same as for the construction phase	10000000	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase

IMPACT	ENHANCEMENT/MITIGATION MEASURE	INDICATOR	ESTIMATED COST OF MITIGATION (UGX)	RESPONSIBLE PARTY	MONITORING INSTITUTION	MONITORING FREQUENCY
Air pollution and climate change	▪ Same as for the construction phase	▪ Same as for the construction phase	23000000	Same as for the construction phase	Same as for the construction phase	Same as for the construction phase
TOTAL			**293,200,000**			

Further, the following other costs (Table 40) should be clear in the BoQs during the bidding process. Additional details on the main activities are presented in Annex V.

Table 40: *Other cost items to be included in the BoQs during the bidding process*

Item	Indicative Costs
Grievance Redress Mechanism	22,000,000
Stakeholder Engagement	24,000,000
Environment and Social Audit	35,000,000
Capacity Building and Trainings	20,000,000
Sub-total	**101,000,000**
Grand Total, including ESMMP (UGX 293,200,000)	**394,200,000**

9 CONCLUSION AND RECOMMENDATIONS

9.1 Conclusions

This environmental and social impact assessment for the Soni water supply and sanitation system has examined the project need, its compatibility with the surroundings, socio-economic benefits and the adverse social and environmental impacts. Enhancement measures have been proposed for the positive impacts, while mitigation measures to avoid, reduce and minimise the adverse impacts were also suggested, either as part of the design, or as measures to be implemented. Good practice measures were also identified in order to minimize the impact of the proposed development further. The proponent has agreed to these mitigation measures and they are, therefore, expressed as commitments.

Overall, the negative impacts of this project are rated by this study as largely insignificant; however, adequate mitigation measures have been proposed to address them. When mitigation actions and environmental and social monitoring plans are implemented, the project would have minimal residual environmental effects. Hence the project can be implemented in a sustainable way.

9.2 Recommendations

This study therefore makes the following recommendations:

- Many times, Project Contractors do not comply with the recommendations given in the project environmental report. This could tantamount to violation of the law with possible halting of the whole project by the relevant authorities, including NEMA. A copy of this report would be availed to the Project Contractor, and advised to read this report with focus on impacts and their mitigation measures. Further the Contractor should get acquainted with the ESNNP and thereafter develop management outlined therein.
- The project ought to be approved for implementation by the relevant authorities to enable fulfilment of the project main objective of improving access to safe water in the area

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ANNEXES

Annex I: Summary of the project investment cost

Bill No	Description	Investment Costs (Ush)
	GENERAL	
TOR G-1	General Items	14,335,100
TOR G-2	Method Related Charges	20,234,000
TOR G-3	Day Works	6,944,200
	WATER SUPPLY AND EQUIPMENT	
TOR W-1	Borehole Pump Station and Sump	411,225,933
TOR W-2	Borehole Pumping Mains	113,330,494
TOR W-3	Reservoir Tank and Site Works	433,182,111
TOR W-5	Distribution Network	483,130,983
TOR W-6	Mechanical	285,649,900
TOR W-7	Borehole electrical works	710,548,950
TOR W-8	Guard House	18,918,875
TOR W-9	Consumer Connections	18,983,800
TOR W-10	Tools and Equipment	9,310,000
	Sub-Total 1	**2,516,484,345**
	Allow for 10% contingency	251,648,434.5
	Sub-Total 2	**2,768,132,779**
	Allow for 18% VAT	498,263,900.3
	Grand Total	**3,266,396,680**

Sanitation Cost Estimate

D o	Unit	Quantity	Rate (USh)	Amount (USh)
Construction of 1 units of 2 Stance VIP Public Sanitation Facility complete, 1No. Urinal, 2No. disabled people equipped stances; complete with hand	No.	1	48,546,789	48,546,789
TOTAL				**48,546,789**

Annex II: List of affected villages in the project area

S/County	Parish	Village
Kirewa	Mifumi	Mingujwe
Kirewa	Mifumi	Nyabanja
Kirewa	Mifumi	Winyaka
Kirewa	Mifumi	Iyopok
Kirewa	Mifumi	Nyakasana
Kirewa	Mifumi	Kwoyo
Kirewa	Mifumi	Ngulimo
Kirewa	Mifumi	Chawolo
Kirewa	Mifumi	Kisuni
Kirewa	Mifumi	Pakitaka
Kirewa	Mifumi	Kisera
Kirewa	Mifumi	Nyamiyemba
Kirewa	Mifumi	Mifumi- North
Kirewa	Mifumi	Mifumi- South
Kirewa	Soni	Oruwa
Kirewa	Soni	Ataro
Kirewa	Soni	Pore
Kirewa	Soni	Sonikayinja
Kirewa	Soni	Jiep
Kirewa	Soni	Bulalo

Annex III: List of Stakeholders Consulted

STAKEHOLDER CONSULTATIONS

Name of Agency/stakeholder/community: TORORO DISTRICT HQs

Purpose of consultation (tick appropriate box):				
	Scoping:		ESIA: ✓	
	Sensitization:		RAP:	
	Environmental Audit		Other (specify):	

DATE: 10/03/2023

PROJECT NAME: ESIA FOR MORIKISWA MINI-PIPED WATER PROJECT

PROPONENT:

NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
Lapose Khamidah	Ag. DEO	0753088771	
Nicholas Asodio	WTA	0784304991	
OKOTH KITONG	FOR CAO	0777059818	

STAKEHOLDER CONSULTATIONS

Name of Agency/stakeholder/community: SONI/S/C, PAFAK ZONE
SONI MINI SOLAR POWERED PW

Purpose of consultation (tick appropriate box):				
	Scoping:		ESIA: ✓	
	Sensitization:		RAP:	
	Environmental Audit		Other (specify):	

DATE: 11/03/2023

PROJECT NAME: SONI MINI WATER PROJECT

PROPONENT:

NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
NYABURU JANE	PAKISAKA	0754920730	N.J
ODONGO JOSEPH	PAIGAKA	0702921116	
OPIYENO TOMAS	PAKITAKA	0758438739	
ANYANGO FREDY	PAKITAKA	0781514442	
AIHIRWE MARGRET	PAKITAKA		
OCHORI OKOYA	PAKITAKA B		
AKUMU MASILIANA	PAKITAKA A'		
APYANGO UDITA	PAKITAKA B		
OCHIENG ROBART	PAKITAKA B'		
SALIMON OKOYO	PAKITAKA A"		
AKETCH MARGRET	PAKITAKA A		

STAKEHOLDER CONSULTATIONS

Soni S/C

Name of Agency/stakeholder/community: Kisera A, Kisoni, Pakitaka

Purpose of consultation (tick appropriate box):					
	Scoping:			**ESIA:** ✓	
	Sensitization:			**RAP:**	
	Environmental Audit			**Other (specify):**	

DATE: 11/03/2023

PROJECT NAME:

PROPONENT:

NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
OWOR JOHN MARTIN	Chm	0704662023	
Ochieng Richard			
Ayuku Omito			
ORIANE James	Host	0754881184	
Ochieng PATRICK			
ODONGO PAUL			
Yeremia Otto			
Owere John		0763633337	
Owino Opendi		0700272120	
Okecho Gobbiez		0752667701	
Okello Tonny		0753597247	
Nyaburu Justine		0757328715	JUSTINE
Adikin Jamfer			
Okumu Kevin			
JACOB DABE BIWANG	KISERA CENTRAL	0755658172	

STAKEHOLDER CONSULTATIONS

Name of Agency/stakeholder/community: CHAWOLO VILLAGE, KIREWA S/C							
Purpose of consultation (tick appropriate box):	**Scoping:**			**ESIA:**		✓	
	Sensitization:			**RAP:**			
	Environmental Audit			**Other (specify):**			
DATE: 11/03/2023							
PROJECT NAME: SONI MINI SOLAR POWERED PIPED WSS							
PROPONENT: BALBERT WATER SOLUTIONS							

NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
[illegible]	chairman	0759234627	
[illegible]	member		
[illegible]	"		
ACHIENG ROSE	"	0740115897	
[illegible]	"	0705[illegible]622	
OCHIENG DANIEL	"	0740300555	
[illegible]	"		
OKORI CHARLES		0702153561	
AKETCH ROSE		0741583378	
OKOTH MOSES			
OKORI MOSES		0701896515	
NYAKECHO ELIZABETH			
ASIKINI MOREEN			

Annex IV: Water Quality Analysis Results

PARAMETER	UNITS	STANDARDS			TEST RESULTS					
		NATIONAL DRINKING WATER		WHO DRINKING WATER	RIVER LWAKHAKHA TGFS INTAKE POINT SAMPLE NUMBER					
		GV	MAC		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Colour	Hazen Units	-	-	15 TCU	18	87	-	11	12	8.7
pH	(pH units)	5,5 - 8,5	5,0 - 9,5	-	7.7	7.02	7.2	7.4	7.5	7.5
Electrical Conductivity	um			-	43	-	47	42		55
Total Dissolved Solids	mg/litre	1000	1500	1000	30	-	33	29	34	41
Suspended Solids at 105°C	mg/litre	-	-	-	3.0	10	12	14	2.7	14
Turbidity	NTU	10	30	5	11	13	10.1	4.1	7.7	2.2
Total Alkalinity as $CaCO_3$	mg/litre			-	25	40	30	22	28	33
Total Hardness as $CaCO_3$	mg/litre	600	800	500	19	28	22	20	23	28
Calcium	mg/litre	-	-	-	4.8	23	5	4	5.6	6
Magnesium	mg/litre	-	-	-	1.7	-	2.2	2.4	2.2	3.2
Sodium	mg/litre	-	-	200	2	-	3	2	3	2.4
Potassium	mg/litre	-	-	-	1.8	-	1.3	1.2	1.1	1.2
Total Iron	mg/litre	1	2	0.3	1.0	0.1	1.2	0.7	0.61	0.97
Fluoride	mg/litre	2	4	1.5	0.09	1.46	0.1	0.05	0.05	0.12
Chloride	mg/litre	250	500	250	3	5.5	5	3	<3	<3
Sulphates	mg/litre	250	500	250	7.0	7.0	8.0	5.0	6	9.0
Nitrates as N	mg/litre	5	11	11	0.12	0.7	<0.002	<0.002	0.1	0.07
Nitrites as N	mg/litre	0	1	1	<0.002	0.07	<0.002	<0.002	<0.002	<0.002

Annex V: Other items to be considered during preparation of the BoQs

a) Grievance Redress Mechanism Main Activities

S/N	ACTIVITY	Indicative COST (UGX)
1.	Preparations for and attending monthly meetings for project workers and the contractor's representatives.	1000000
2.	Gender sensitisations for project contractor about employment considerations for both men and women	3000000
3.	Gender mainstreaming on the project including gender inspections and monitoring	2000000
4.	Establishment of grievance mechanism structures and committees in the project	2000000
5.	Establishment of grievance office and orientation of office personnel	1000000
6.	Rent for GRM office	1000000
7.	Renumeration and facilitation for the grievance officer	4000000
8.	Stakeholder sensitization on the grievance procedure	1000000
9.	Stipends and refreshments for GRM committee members	1000000
10.	Community sensitisations and engagements about grievance mechanism redress	2000000
11.	Office facilities, stationery and other secretarial services for GRM offices and committees	3000000
12.	Monitoring and Evaluation by the project staff and the district team	1000000
13.	GRAND TOTAL	22,000,000

b) Stakeholder Engagement Plan Main Activities

ITEM	ACTION PLANNED	TARGETED PERSONS	ENGAGEMENT APPROACHES	ISSUES FOR DISCUSSION	Indicative Cost (UGX)
1	Engagement and consultative meetings With district leaders	- HIV Focal Person, - Health Centers III or IV Heads, Population offices in the Districts, LC5s, RDC, CDO, LABOUR OFFICE DPC, DISTRICT ENGINEERS	-Face to face meetings -Informal working sessions/KIIs -Data/information sharing -Distribution of IEC materials -Media coverages through radio and TV spots	• Mitigation of likely impacts of the project. • Baseline environmental, economic & social information. • Project views/concerns. • Grievance management • Mitigation/monitoring	3,000,000
2	Engagement with LCI, LCII, LCIII, LCIV Chairpersons	Project affected persons	-Face to face meetings -panel discussions -Information leaflets and fliers, -Observations -photographs -Information dissemination and sharing	• Project impacts • Affected PAPs • Grievances • Police records	4,000,000
3	Engagement with Employer's workforce	Project affected persons	Focus group discussions	• *Regulatory requirements/ permits and licenses;* • *mitigation and monitoring* • *Grievance management*	3,000,000
4	Local Community Engagements at village levels	Project affected persons	-Community gatherings -Focus group discussions	• *impacts and expectations* • *Local solutions* • *Links and ties with the local community* • *Compensation of PAPs*	2,000,000
5	Radio talk shows	Project affected persons	Discussions		2,000,000
6	Formation of GMCs	Project affected persons	Community meetings	• impacts and expectations • Local solutions • *Links and ties with the local community*	3,000,000
7	Project safety campaigns	Project affected persons	Community meetings and schools	• *Project safety incidences, mitigation measures*	4,000,000

ITEM	ACTION PLANNED	TARGETED PERSONS	ENGAGEMENT APPROACHES	ISSUES FOR DISCUSSION	Indicative Cost (UGX)
8	NGOs in HIV/AIDS, GBV and Child protection & awareness sector	Groups; women, children elderly	Key informant interviews Case studies, photographs	• *Project impacts and expectations from the proposed project*	3,000,000
Total					**24,000,000**

c) Environmental and Social Audit

The Environmental and Social Audit should be conducted during and at the end of the construction phase to understand the compliance of the Contractor in relation to the implementation of the ESMMP.

The Environmental and Social Audit should include the following activities:

S/N	Activity	Indicative cost (UGX)
1.	Review of the ESMMP	2000000
2.	Interviewing the Contractor about the implementation of the ESMMP	2000000
3.	Interviewing the workers about the implementation of the ESMMP	4000000
4.	Interviewing community members about the implementation of the ESMMP	15000000
6.	Carrying out measurements and observations on the biophysical	4000000
6.	Assessing the compliance of the Contractor to ESMMP	4000000
7.	Identifying issues that require correction	2000000
Total		35,000,000

d) Capacity Building and Trainings

S/N	Description of training	Target participants	Timeframe	Cost (UGX)
1	Labour conditions, GRM health and safety	District Local Government	During construction and operation	10,000,000
2	Water rights issue, Community disagreements, GRM	Project Beneficiaries/ Farmers	During Operation	10,000,000
Total				20,000,000