



**REPUBLIC OF UGANDA**

**RURAL WATER SUPPLY AND SANITATION DEPARTMENT**  
**WATER SUPPLY AND SANITATION PROGRAMME III**

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF  
SHUUKU-MATSYORO PIPED WATER SUPPLY AND SANITATION SYSTEM PHASE II**

**ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT REPORT**



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## ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BOD	Biochemical Oxygen Demand
BoQs	Bill of Quantities
CAO	Chief Administrative Officer
CBOs	Community Based Organizations
CDO	Community Development Officer
CFP	Chance Find Procedure
CGV	Chief Government Valuer
CMP	Construction Management Plan
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
dBA	Decibels
DCDO	District Community Development Officer
DEO	District Environment Office
DMM	Directorate of Museums and Monuments
DNRO	District Natural Resources Office
DO	Dissolved Oxygen
DWD	Directorate of Water Development
DWRM	Directorate of Water Resources Management
EAC	East African Community
EHS	Environment, Health and Safety
EHSGs	Environment, Health and Safety Guidelines
EIA	Environment Impact Assessment
EMMP	Environmental Management and Monitoring Plan
EPB	Environment Project Brief
ESIA	Environmental and Social Impact Assessment
ESIS	Environmental and Social Impact Statement
ESMMP	Environmental and Social Management and Monitoring Plan
ESMP	Environmental and Social Management Plan
ESSs	Environment and Social Standards
FGDs	Focus Group Discussions
FIs	Financial Intermediaries
GBV	Gender Based Violence
GC	Grievance Committee
GFS	Gravity Flow Scheme
GIIP	Good International Industry Practice
GIS	Geographical Information System
GoU	Government of Uganda
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HIV	Human Immuno deficiency Virus
HWFs	Hand Washing Facilities
ICRs	Implementation Completion Reports
IEC	Information Education and Communication
IFC	International Finance Corporation
ILO	International Labour Organization
IPF	Investment Project Financing
ISRs	Implementation Supervision Reports
IUCN	International Union for Conservation of Nature
KII	Key Informant Interview
Km	Kilometre



LAeq	Average Noise Level
LA <sub>MIN</sub>	Lowest Noise Level
LA <sub>MAX</sub>	Highest Noise Level
LC	Local Council
MoGLSD	Ministry of Gender, Labour and Social Development
MoLHUD	Ministry of Lands, Housing and Urban Development
MWE	Ministry of Water and Environment
NDP III	Third National Development Plan
NEA	National Environment Act
NEMA	National Environment Management Authority
NES	National Environment Statute
NGOs	Non-Government Organizations
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
NSSF	National Social Security Fund
NWIS	National Wetland Information System
MWE	National Water and Sewerage Corporation
OPs	Operational Procedures
OSH	Occupational Safety and Health
O&M	Operation and Maintenance
PAPs	Project Affected Persons
PAYE	Pay As You Earn
PCDP	Public Consultation and Disclosure Plan
PCRs	Physical Cultural Resources
PMT	Project Management Team
PPE	Personal Protective Equipment
PWDs	Person With Disabilities
RAP	Resettlement Action Plan
RGC	Rural Growth Centre
RWSRCs	Rural Water and Sanitation Regional Centres
SDGs	Sustainable Development Goals
SDLG	Sheema District Local Government
SEHS	Social Economic and Health Survey
STDs	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infections
S/C	Sub-County
SO <sub>x</sub>	Sulfur Oxides
TN	Total Nitrogen
TOC	Total Organic Carbon
ToR	Terms of Reference
TP	Total Phosphates
TSS	Total Suspended Solids
UAs	Umbrella Authorities
UBOS	Uganda Bureau of Statistics
UGX	Uganda Shillings
UN	United Nation
UNBS	Uganda National Bureau of Standards
URA	Uganda Revenue Authority
UWSD	Urban Water and Sewerage Department
VAT	Value Added Tax
VES	Visual Encounter Survey
VIP	Ventilated Improved Pit latrines
VOCs	Volatile Organic Compounds
WB	World Bank

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ABBREVIATIONS

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WHO	World Health Organization
WHT	Withholding Tax
WMD	Wetland Management Department
WMZ	Water Management Zone
WSS	Water Supply System
WTP	Water Treatment Plant



## ESIA TEAM COMPOSITION

Table 1 presents the composition of the Environmental and Social Impact Assessment (ESIA) team that will undertake the ESIA for the proposed Shuuku-Matsyoro Water Supply and Sanitation System (WSSS) Phase II in accordance with the provisions of the *National Environmental Act No. 5 of 2019* of the Laws of Uganda, the national Environment (*Environmental and Social Impact Assessment Regulations (2020)*) and the *National Environment (Conduct and Certification of Environmental Practitioners) Regulations (2003)*.

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**Table 1: Proposed ESIA Team Composition**

Name of Key Specialists	Assigned Position	Signature
Dr. Denis Byamukama, PhD. <i>NEMA Certified Environmental Impact Assessor (CC/EIA/073/22) – Team Leader</i>	Team Leader/Water Quality and Waste Management Specialist	
Mr. Pius Kahangirwe, MSc. <i>NEMA Certified Environmental Impact Assessor (CC/EIA/159/22) – Team Leader</i>	Environmental and Natural Resources Management Specialist	
Mr. Andrew Nkambo, BSc. <i>NEMA Certified Environmental Practitioner (CC/EIA/273/22) – Team Member</i>	Plant Ecologist	
<b>Contributing Specialists</b>		
Dr. Emmanuel Tumwesigye	Hydrologist	
Mr. Anthony Begumisa	Sociologist	
Ms. Sheila Akatukunda	Faunal Studies	
Ms. Hamidah Namatovu	Occupational Health and Safety	
Mr. Simon Njuki	GIS Expert	
Ms. Jackline Abitegeka	Environmentalist	

## EXECUTIVE SUMMARY

### ES01: Project Background and Objectives

The Government of Uganda with support from the African Development Bank will implement the Water Supply and Sanitation Program - Phase III (WSSP III). The Project Development Objective of WSSP III is; to contribute to enhanced productivity and improved quality of life of the population, through provision of safe water and sanitation services in project areas. The project will also contribute to the achievement of National Development Plan III objectives, Vision 2040 and Sustainable Development Goals.

For a society to be healthy, adequate safe water is a necessity. A healthy society makes it possible for most people to participate in worthwhile socioeconomic activities that would raise household income and so eliminate poverty. In Uganda, most of the rural areas and upcoming small towns access water from point water sources like boreholes, protected springs and shallow wells. These point water sources are in many cases characterized by low level of service, poor functionality and poor water quality in addition to diminishing water resources. The project targets to increase on the number of people served with phase I of the project (Detailed Engineering Design Report, March 2016). The Shuuku-Matsyoro WSSS is envisaged to bring an end to water stress and overreliance on a few low yielding boreholes within the project area of Shuuku- Matsyoro and neighbouring community.

The project's development goals include strengthening water resource management in the project's target areas and enhancing water delivery and sanitation services. The following three strategic areas will help the project accomplish this Project Development Objective (PDO): establishing the required infrastructure for water and sanitation in designated areas; assisting water-related institutions (including the Ministry of Water and Environment (MWE), local governments, and service providers) in developing and strengthening plans to establish and consolidate operational efficiency and service quality in small towns and rural areas; and (iii) enhancing national and regional capacity to enhance water accessibility.

### ES02: Project Components and Description

The proposed project infrastructure and facilities include the following components:

- ❖ Intake weir across the river
  - ❖ Raw water collection channel
  - ❖ Intake sump
  - ❖ Raw water pumps, and
  - ❖ Raw water abstraction main (from River Kitakure)
  - ❖ High rise main
  - ❖ Power Line Extension
  - ❖ New installations of water treatment facilities will be required at Kitakure
  - ❖ Supplying and laying of 3.9km of Transmission pipelines to the reservoirs
  - ❖ Construction of 6 new storage reservoirs in the respective project areas
- 

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- ❖ Supplying and laying of 106 km of distribution mains within the respective project areas.
- ❖ Making New Consumer Connections.

Like in many other rural parts of the country, men in the district are the major owners of land and main decision makers as regards to land and other household property. From consultations with local authorities it was revealed that land belongs to the family and the man as the head of the household has a right to make all decisions

The project area is currently served by water schemes like Shuuku- **Matsyoro** GFS I, **Matsyoro** I & II water supply scheme located in Sheema North and Shuuku water supply scheme in Sheema South. The existing **Matsyoro** water supply scheme, located in Kyangyenyi, Kigarama and Masheruka sub-counties, has 2 separate lines **Matsyoro** I and II. The two schemes are gravity flow schemes and were constructed in 1990-1992. Water sources that currently supply these water supply systems (**Matsyoro** I and II) are located in **Matsyoro** Parish of Kyangyenyi Sub-county and Masheruka Parish of Masheruka Sub-county respectively.

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**ES03: Policy, Legal and Institutional Framework**

In compliance with the National Environment Act 2019 and the National Environment (Environmental and Social Assessment) Regulations 2020, MWE undertook an Environmental and Social Impact Assessment (ESIA) and this report presents the findings of an ESIA that has been undertaken at the proposed project sites. The ESIA study has been conducted in consideration of the policies, legal and institutional frameworks relevant to this proposed project. Various policies and laws have been reviewed in relation to the proposed project activities e.g. construction and operational requirements, environmental quality, land use, public health, occupational safety, labour standards and other legal obligations. AfDB Safeguard Policies have also been reviewed during this detailed ESIA study to ensure that the proposed development meets these requirements and some of the clauses that are likely to be triggered have been identified and the corresponding mitigation and enhancement measures proposed in this ESIA report.

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**ES04: Stakeholder Consultations and engagement**

A comprehensive stakeholder engagement was carried out during ESIA specifically with Sheema District Local Government Officials, Sub-County Officials, Local Community Representatives and Community members among others. The main findings from the stakeholder engagements were largely categorized into two parts i.e. the anticipated impacts (both negative and positive) and general concerns on the project. Some of these issues included the requirement to engage all the relevant stakeholders, considering the gender issues by incorporating them into project design and protecting women during the project implementation, employing local community members, no child labour on the project, contractors and SO providing protective personal Equipment (PPE), contractor and SO paying all the workers on time, contractor providing first aid kits among others

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**ES05: Summary of the anticipated impacts and mitigation measures**

It is anticipated that the establishment of the water scheme is expected to have the following benefits:

**Table 22: Summary of the anticipated positive Environment and Social Impacts and their enhancement measures**

CP: Construction phase

OP: Operation Phase

Ref No.	Anticipated Environment & Social positive Impacts	Enhancement Measures
CP1	Employment opportunities	✓ The contractor should involve local leaders in recruitment process to ensure full and fair participation of local communities.
CP2	Income to material/ equipment suppliers and contractors	✓ Earth materials needed for construction, for example, aggregate (stones and sand) will be obtained from quarry operations
CP3	Acquisition/improvement of skills	✓ The Local leaders will play a vital role in screening and recommending those seeking for employment
CP4	Increased Public Revenue / Taxes	✓ The contractor should pay all the taxes including VAT, PAYE and NSSF of the workers
CP5	Impacts on Local Capacity	✓ Ensure Co-operation between international suppliers of specialized equipment and contractors and local contractors and sub-contractors and companies for transfer of skills
CP6	Boost to the Local Economy	<ul style="list-style-type: none"> <li>✓ Provide direct employment opportunities to the workforce thus contributing towards alleviation of poverty and income generation for the local community;</li> <li>✓ Stimulate business activities related to contracting works for local entrepreneurs (sub-contractors);</li> <li>✓ Provide trading opportunities for local communities and other small enterprises in the area;</li> <li>✓ Provide opportunities for provision of basic and other services for the contractors and immediate community. The project will consider employment of locals</li> </ul>
CP7	Capacity Building	✓ To maximize capacity building for local communities, programs and technical training courses as well as on-the-job training will be provided in specific skills areas for suitable candidates from local communities to enhance minimum levels of education and the possibility of being employed during operational phase
OPI	Improved health status of households in the project communities	✓ Educate users on the proper use, regular cleaning and effective maintenance of both the household and public facilities
OP2	Educational enrolment and attendance	✓ Make the water tariffs affordable to everyone so that children, especially the girl child to regularly and promptly attend school, while mothers will get more time to prepare their children for school.
OP3	Acquisition of new skills	✓ Where the required skills are available locally, the local people should be given first priority commensurate to their level of training. Government institutions involved in the management of the project will also

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		<u>acquire new skills.</u>
OP4	<u>Improvement in household economic status</u>	✓ <u>Water supply should be set taking into consideration the different levels of users. The users should also be educated to avoid wasteful use of the resources</u>
OP5	<u>Employment opportunities</u>	✓ <u>Wherever feasible, local qualified people will be considered for job opportunities. Adequate occupational health and safety standards should be provided to ensure the work environment is conducive.</u>
OP6	<u>Promotion of gender equality and empowerment of women and the girl child</u>	✓ <u>Make the water tariffs affordable to everyone so that women and girls are freed 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.</u>

- ~~Improved access to clean and safe water~~
- ~~Improved health conditions due to access to safe clean water~~
- ~~Employment during construction and operation of the water scheme~~
- ~~Eradication of poverty and improved livelihoods of the local people through employment~~
- ~~Reduced expenditure on water and medical bills due to diseases~~
- ~~Reduced time spent walking long distances to wells and springs especially women~~
- ~~Reduction of child mortality~~
- ~~Improved local economies and induced development especially sourcing of raw materials for construction activities~~
- ~~Ensure environmental sustainability~~

8 Further still, the project will also address the focal area of access to clean water as stipulated under the Uganda Vision 2040 and the National Development Plan III (NDP III). The project will also contribute towards achieving Sustainable Development Goals (SDG) (*specifically SDG 6 on clean water and sanitation*).

However, impacts and some concerns were raised by various stakeholders as regards to the project and these include:

- Poor waste management practices at construction sites
- Destruction of existing vegetation especially when establishing the intake and trenching
- Soil erosion due to loss of vegetation especially at the water abstraction point
- Land degradation
- Dust and vehicle emissions
- Increase in noise and injuries on duty
- Increased spread of communicable disease associated with construction labour
- Destruction of crops during the trenching activities along distribution lines.

However, the ESIA findings indicate that adverse impacts will be mitigated and are limited to the project sites where construction works will be undertaken. Various enhancement and mitigation measures have been proposed and the developer should ensure that these are implemented such as:



**Table 33: Summary of the anticipated negative Environment and Social Impacts and their mitigation measures**

Ref No.	Anticipated Environment & Social negative Impacts	Mitigation Measures
CP1	Soil Degradation	<ul style="list-style-type: none"> <li>▪ Topsoil and subsoil will be stockpiled for re-use in backfilling and reinstatement;</li> <li>▪ To preserve soil structure: there will be minimum handling of soils; loose tipping of soils, that is, without compaction will be employed and temporary spoil heaps will not be higher than 3m;</li> <li>▪ Contractor will avoid use of old equipment or even damaged equipment that is most likely to have oil leakages thus contaminate the soils;</li> <li>▪ The contractor will be required to develop a waste management plan prior to start of construction activities;</li> <li>▪ Contractor will ensure that equipment is properly maintained and fully functional in accordance with the manufacturer's recommendations;</li> <li>▪ During reinstatement, the trench back-fill material will be compacted to a level similar to the original surrounding soils to avoid subsidence as a consequence of rain water channeling.</li> <li>▪ Recreation of a stable landform that mirrors the pre-disturbed condition as this will minimise the risk of preferential erosion and therefore facilitate natural re-vegetation.</li> </ul>
CP2	Generation of noise	<ul style="list-style-type: none"> <li>▪ Contractor will ensure that equipment is properly maintained and fully functional in accordance with the manufacturer's recommendations</li> <li>▪ Regular maintenance, monitoring and, where necessary, the use of silencing equipment will be employed with the aim of reducing noise emissions.</li> <li>▪ The selected contractor will be required to submit detailed information on the noise levels which will be generated by the specific methods and equipment proposed and to identify actions required to minimise the noise impact.</li> <li>▪ Pumps, generators and other mobile equipment will be sited as far as practicable from housing and other noise sensitive locations, work will not be carried out Sunday during service time or hours.</li> <li>▪ During periods of inactivity, equipment will be switched off whenever possible. A limited number of construction activities may have to continue on a 24-hour basis. These include horizontal direction drilling, pipeline cleaning and hydrostatic pressure testing which are relatively low noise activities.</li> <li>▪ The Contractor should provide PPE like ear muffs where levels exceed recommended threshold (85dBA) to all workers on site</li> </ul>

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CP3	<u>Improper management of construction wastes</u>	<ul style="list-style-type: none"> <li>▪ <u>The wastes will be properly segregated and separated to encourage recycling of some useful waste materials, that is, some excavated material can be used as backfills.</u></li> <li>▪ <u>The contractor and MWE will work hand in hand with the District to facilitate sound waste handling and disposal from the site. All wastes must be taken to the approved dumpsites and proof of safe disposal should be secured.</u></li> <li>▪ <u>Hazardous wastes such as paints, cement, adhesives will be managed through a third party contractor certified by NEMA to handle hazardous waste. The contractor and MWE should work hand in hand to facilitate sound waste handling and disposal from the site.</u></li> </ul>
CP4	<u>Contamination of Water resources</u>	<ul style="list-style-type: none"> <li>▪ <u>Equipment, materials and chemicals must not be stored within 30 m of a watercourse bank;</u></li> <li>▪ <u>Construct a proper drainage system around the site and to the final storm water retention or disposal point to stop direct run off into the nearby land and water courses;</u></li> <li>▪ <u>All construction equipment will be kept in good operating condition to avoid oil or fuel leakages that might contaminate water resources;</u></li> <li>▪ <u>Materials like sand and aggregates will be kept in bounded areas to avoid being washed away into water resources by runoff;</u></li> <li>▪ <u>MWE will ensure the contractor complies with its environmental management policies e.g. the National Environment (Wetlands, River Banks and Lakeshore management regulations, 2000).</u></li> </ul>
CP5	<u>Air Pollution</u>	<ul style="list-style-type: none"> <li>▪ <u>Travel speeds of construction vehicles along the road especially at trading/ business centres will be controlled using humps and travel speeds will not exceed 30km/h;</u></li> <li>▪ <u>Trucks will be covered during haulage of construction materials to reduce on spillage of materials;</u></li> <li>▪ <u>Wherever dust suppression is necessary, water will be sprayed over dusty areas;</u></li> <li>▪ <u>It will be ensured that all equipment leaving the site, clean up their tires in case they are dirty;</u></li> <li>▪ <u>Construction work will be undertaken by an experienced and duly registered contractor with a verifiable sense of environmental awareness and responsibility;</u></li> <li>▪ <u>Workers will be provided with PPE (dust masks, safety goggles) and the use of PPE shall be enforced;</u></li> <li>▪ <u>All construction equipment and trucks will be kept in good operating condition by regular servicing to reduce noise and exhaust emissions; and</u></li> <li>▪ <u>As part of the bidding processes, contractors will be required to provide their environment management</u></li> </ul>

		<p><u>plans that meet mitigation actions proposed in this ESIA</u></p>
CP6	<p><u>Occupational Health and Safety Risks for the Workforce</u></p>	<ul style="list-style-type: none"> <li>▪ <u>All construction workers will be oriented on safe work practices and guidelines and ensure that they adhere to them.</u></li> <li>▪ <u>Training will be conducted on how to prevent and manage incidences. This should involve proper handling of electricity, water etc. and sensitization on various modes of escape, conduct and responsibility during such incidences. All must fully be aware and mentally prepared for potential emergency.</u></li> <li>▪ <u>Quarterly drills will constantly be undertaken or conducted. This will test the response of the involved stakeholders. Such drills will keep them alert and they will become more responsive in the case of incidences.</u></li> <li>▪ <u>Signage will be used to warn staff and/ or visitors that are not involved in construction activities of dangerous places.</u></li> <li>▪ <u>Personnel will only undertake tasks for which they are trained/ qualified. A formal 'permit to work' system will be in place and strict instructions will be given for operators of equipment.</u></li> <li>▪ <u>Supervision of works will be done quarterly to ensure that safety conditions are met while any deviation from safety regulations is immediately reclaimed following the best practices regarding safety at work equipment.</u></li> <li>▪ <u>Communication line shall be ensured in between workers and drivers of heavy equipment.</u></li> <li>▪ <u>Daily Toolbox morning talks will be conducted to inform all workers of the anticipated risks from the day's work.</u></li> <li>▪ <u>Evacuation procedures will be developed by the contractor to handle emergency situations</u></li> </ul>
CP7	<p><u>Risks of accidents</u></p>	<ul style="list-style-type: none"> <li>▪ <u>Transport safety practices will be adopted with the goal of preventing traffic accidents and minimizing injuries suffered by project personnel and the public by: employing safe traffic control measures, including road signs and flagmen/traffic guides to warn of dangerous conditions and children crossings; and setting speed limits on all access roads in the project area will be 30km/h for light vehicles and 20km/h for heavy vehicles.</u></li> <li>▪ <u>Service ducts installed by the road contractor will be used where applicable to avoid cutting through roads that have just been upgraded.</u></li> <li>▪ <u>All workers, including sub-contractors and casual labour, will undergo an environmental, health and safety induction before commencing work on site. This will include a full briefing on site safety and rules.</u></li> </ul>



		<ul style="list-style-type: none"> <li>▪ <u>The affected communities will be informed of the timing and duration of the construction activities across access roads and any uncertainties or potential for change and also sensitised on the dangers of construction sites and the need to keep away (community sensitisation).</u></li> <li>▪ <u>Identifying optimum routes from pipe storage areas to the ROW to avoid sensitive receptors such as schools and hospitals, wherever possible and putting in place journey management plans.</u></li> <li>▪ <u>Restrictions on hours of driving (including night time restrictions where sensitive receptors may be affected) and timing of vehicle movements to avoid busy periods in urban areas, particularly the start and end of school and the working day</u></li> <li>▪ <u>Control over routes used by vehicles to avoid construction traffic using inappropriate roads and other road users gaining access to the pipeline spread and access roads.</u></li> <li>▪ <u>Ensuring adequate vehicle maintenance to ensure that vehicles do not produce significant emissions and that all safety features including brakes, lights etc. are in good condition</u></li> </ul>
12	<p><u>CP8</u> <u>Landscape, Land Use Impacts and Loss of Structures</u></p>	<ul style="list-style-type: none"> <li>▪ <u>The contractor will be required by MWE to develop and implement a Reinstatement Plan.</u></li> <li>▪ <u>MWE shall ensure that this secured land and any impacted assets are utilized in friendly and environmentally manner.</u></li> <li>▪ <u>Reinstatement of the water pipeline will be done in such a way as return the visual integrity of the landscape as closely as possible to its previous condition.</u></li> <li>▪ <u>In areas where grading of the working width impacts on the local topography, reinstatement will be undertaken in a manner which is generally sympathetic to the existing contours. However, at locations along the route where extensive grading will be required to provide a level working area, it may not be possible to return the topography to its pre-existing form as this may exacerbate erosion risks given the type of soils in these areas and would preclude access to the sewer line for inspection, maintenance or emergency response.</u></li> <li>▪ <u>Wherever possible the removal of existing mature trees will be avoided, provided that the integrity of the pipeline is not jeopardised. Thus trees to be retained will be marked prior to commencement of works in the relevant sections of the network.</u></li> </ul>
	<p><u>CP9</u> <u>Social Misdemeanour by Construction Workers</u></p>	<ul style="list-style-type: none"> <li>▪ <u>As a contractual obligation, contractors shall be required to have an HIV/AIDS policy and a framework (responsible staff, action plan, etc.) to implement during project execution.</u></li> <li>▪ <u>A sensitisation programme for the would-be</u></li> </ul>

		<p><u>affected local communities will be conducted prior to commencement of and during the project implementation.</u></p> <ul style="list-style-type: none"> <li>▪ <u>A code of conduct (appropriate to behaviours in workplace and with respect to relations with local community) will be developed and approved by MWE which will be signed by all workers on the project.</u></li> <li>▪ <u>Local workers will preferentially be employed, paid directly through their banks and access to bars by workers from outside the project area in the local communities controlled.</u></li> <li>▪ <u>All construction workers shall be orientated and sensitized about responsible sexual behaviour in project communities</u></li> </ul>
CP10	<u>Loss of Land and displacement of economic activities</u>	<ul style="list-style-type: none"> <li>▪ <u>Ensure timely and appropriate compensation</u></li> <li>▪ <u>Take into consideration local community and household preferences. For instance, the landowner is willing to relocate part of his house and underground tank and he is supported by local leaders.</u></li> <li>▪ <u>PAPs should be given financial literacy on how to use their compensation packages.</u></li> <li>▪ <u>In-kind compensation can be considered especially for institutional landowners.</u></li> <li>▪ <u>LGs should be involved in mobilisation and sensitizing Project Affected Persons (PAPs).</u></li> </ul>
CP11	<u>Conflicts due to influx of immigrant labour</u>	<ul style="list-style-type: none"> <li>▪ <u>The Contractor should develop guidelines for behavioural conduct, including penalties for its workers.</u></li> <li>▪ <u>Workers must be sensitized on proper social behaviour and conduct with regard to community norms prior to starting work. Workers should be sensitized to avoid engaging in sexual relations with underage girls and married women</u></li> </ul>
CP12	<u>Risk of violence against children</u>	<ul style="list-style-type: none"> <li>▪ <u>Employers at both the construction and operation phase should have a strict employment code of conduct.</u></li> <li>▪ <u>At the induction of employees, the employer should emphasise that molestation of children especially the girl child is punishable by taking the culprit to court.</u></li> <li>▪ <u>An employer who tries to shield or cover up for the employee caught in the act will equally be prosecuted, according to the penal code.</u></li> <li>▪ <u>Monitoring school attendance</u></li> <li>▪ <u>Sensitization in schools</u></li> <li>▪ <u>Reporting mechanisms in place such as a whistleblowing system</u></li> </ul>
CP13	<u>Risk of Child Labour</u>	<ul style="list-style-type: none"> <li>▪ <u>The project implementation team should put a mechanism in place to identify the presence of all persons under the age of 18 and ensure that they are not employed on the project.</u></li> </ul>



		<ul style="list-style-type: none"> <li>▪ <u>Put notices on work sites (NO CHILD LABOUR) in order to silence agitations</u></li> <li>▪ <u>Engage District Community Development Office (DCDO), Gender Officers, Parish Chiefs among others.</u></li> <li>▪ <u>Monitoring school attendance</u></li> <li>▪ <u>Sensitization in schools</u></li> <li>▪ <u>Reporting mechanisms in place such as a whistleblowing system</u></li> </ul>
CP14	<u>Risk of Gender Based Violence</u>	<ul style="list-style-type: none"> <li>▪ <u>The Contractor should have a sexual harassment policy and mainstream it to ensure strict adherence to established mechanisms to avoid the emergence of these challenges;</u></li> <li>▪ <u>MWE should ensure that social safeguards personnel are recruited as part of the project implementation personnel to supervise contractors and to continuously engage communities;</u></li> <li>▪ <u>Put GBV reporting mechanisms in place;</u></li> <li>▪ <u>Community sensitization among men and women</u></li> </ul>
CP15	<u>Increase in HIV/AIDS and STDs and other communicable diseases</u>	<ul style="list-style-type: none"> <li>▪ <u>Sensitize workers on proper social behaviour and conduct with regard to community norms, HIV/AIDS and other sexually transmitted diseases. HIV/AIDS policies should be developed at the workplace;</u></li> <li>▪ <u>Establish and implement Contractors' HIV/AIDS Workplace Policy;</u></li> <li>▪ <u>Free HIV/AIDS testing, counselling and condom distribution be encouraged for both workers, sex workers and local community;</u></li> <li>▪ <u>The pathways for transmission of HIV/AIDS and STIs are well known, foreseeable and can be mitigated. Social bonds are not readily controlled, and the permanence of HIV/AIDS transmission makes this particular impact of social bonding both negative and also positive. Social bonds leading to lasting marriages and children occur in such situations; early pregnancies and sexual exploitation can also occur</u></li> <li>▪ <u>Sensitization of workers on risks of communicable diseases such as Covid, waterborn diseases,..and ways of preventing them</u></li> <li>▪ <u>Avail and keep clean sanitation facilities with hand washing facilities and soaps to workers on construction sites to mitigate risks of contamination of communicable diseases.</u></li> </ul>
OPI	<u>Occupational Health and Safety Risks</u>	<ul style="list-style-type: none"> <li>✓ <u>The channel crossings will be clearly demarcated to indicate the ones that are meant for only pedestrian traffic, those that can be used by bicycles and motorcycles and general traffic. The crossings for only pedestrians should have bollards with reflective strips installed at the ends to strict access to other traffic.</u></li> <li>✓ <u>Side rails will be installed along the channel crossings to enhance community safety and minimize the risk of</u></li> </ul>

		<p><u>falling into the channels.</u></p> <ul style="list-style-type: none"> <li>✓ <u>Community sensitization to allow proper usage of the crossing points and avoid accidents when crossing after a heavy downpour.</u> <ul style="list-style-type: none"> <li>▪ <u>Community sensitization to instill a sense of ownership of the project and project infrastructure so as to encourage community vigilance and hence reduce vandalism or theft of metal work fabrication, such as safety railings.</u></li> </ul> </li> </ul>
OP2	<u>Loss of income from Project-related activities</u>	<ul style="list-style-type: none"> <li>✓ <u>All people taken on to work on this Project will be informed about its duration and phasing beforehand, so that they can plan accordingly.</u></li> <li>✓ <u>The MWE Supervising Engineers will take note of Consultants, Contractors and sub-contractors that produce quality work, in line with their contracts and industry best practice during the construction phase, and prioritize them for available maintenance work during the life of the Project.</u></li> <li>✓ <u>Unskilled labourers taken on from the local communities surrounding the project area will be kept on for maintenance works of the channel, where possible.</u> <ul style="list-style-type: none"> <li>▪ <u>Where feasible, upon discussion with the local area leaders, committees will be selected along the densely populated sections along the channel with the aim of promoting vigilance against garbage.</u></li> </ul> </li> </ul>
OP3	<u>Risk of accidents</u>	<ul style="list-style-type: none"> <li>✓ <u>Side rails will be installed along the river crossings to enhance community safety and minimize the risk of falling into the river.</u></li> <li>✓ <u>Community sensitization to allow proper usage of the crossing points and avoid accidents when crossing after a heavy downpour.</u> <ul style="list-style-type: none"> <li>▪ <u>Community sensitization to instil a sense of ownership of the project and project infrastructure so as to encourage community vigilance and hence reduce vandalism or theft of metal work fabrication, such as safety railings</u></li> </ul> </li> </ul>
OP3	<u>Air pollution</u>	<ul style="list-style-type: none"> <li>✓ <u>The vehicles will be switched off when not in use so as to minimize the release of fugitive emissions.</u> <ul style="list-style-type: none"> <li>▪ <u>The vehicles and machinery will be regularly serviced and maintained to optimum working conditions to minimize potential emissions.</u></li> </ul> </li> </ul>
OP4	<u>Disturbance due to noise pollution and vibrations</u>	<ul style="list-style-type: none"> <li>✓ <u>The Contractors and workers for operation and maintenance should be especially mindful when carrying out construction near sensitive receptors such as business centres.</u></li> <li>✓ <u>Maintenance activities will be limited to daytime, especially in residential areas to minimize disturbance of residents.</u></li> <li>✓ <u>Regular care and maintenance of vehicles and equipment must be undertaken to ensure they run smoothly so as to minimize emissions of noise.</u> <ul style="list-style-type: none"> <li>▪ <u>Project machines and vehicles will be turned off</u></li> </ul> </li> </ul>



		<p style="text-align: center;"><u>when not in use</u></p> <ul style="list-style-type: none"> <li>✓ <u>The Contractors and workers for operation and maintenance should be especially mindful when carrying out construction near sensitive receptors such as business centres.</u></li> <li>✓ <u>Maintenance activities will be limited to daytime, especially in residential areas to minimize disturbance of residents.</u></li> <li>✓ <u>Regular care and maintenance of vehicles and equipment must be undertaken to ensure they run smoothly so as to minimize emissions of noise.</u> <ul style="list-style-type: none"> <li>▪ <u>Project machines and vehicles will be turned off when not in use</u></li> </ul> </li> </ul>
OP5	<u>Disturbance due to noise pollution and vibrations</u>	
OP6	<u>Improper waste management</u>	<ul style="list-style-type: none"> <li>✓ <u>A waste management plan will be developed by the Maintenance Contractors, and approved by MWE to ensure that measures for handling all operation and maintenance waste (dredged material and waste debris) are in place.</u></li> <li>✓ <u>The principles of an integrated solid waste management system will be implemented i.e. reduction at source, reduce, reuse and recycle</u> <ul style="list-style-type: none"> <li>▪ <u>Waste transportation vehicles will be covered to avoid spillage or waste getting blown off during haulage.</u></li> </ul> </li> </ul>
OP7	<u>Impact on water resources and the receiving habitats</u>	<ul style="list-style-type: none"> <li>✓ <u>The quantity and quality of storm water reaching the river must be reduced within the catchment. Implementation of an integrated catchment management plan (ICMP) would be an effective undertaking.</u></li> <li>✓ <u>The designed channel corridors need to be protected from encroachment.</u></li> <li>✓ <u>The channels must be regularly and adequately maintained – including replacement of damaged lining, vegetation clearing, de-silting, garbage/debris removal and dredging.</u> <ul style="list-style-type: none"> <li>▪ <u>MWE will closely engage NEMA and WMD in programmes aimed towards protection of natural wetland systems, since the storm water from the drainage channel will have an impact on the downstream receiving bodies.</u></li> </ul> </li> </ul>
OP8	<u>Traffic Disruptions</u>	<ul style="list-style-type: none"> <li>▪ <u>Preparing a Traffic Management Plan to minimize the risk of traffic disruption, especially in areas where the major roads will require re-construction of culvert crossings. Using Appropriate safety signs during construction (e.g. 'Heavy Trucks Turning', 'Road Diverted', 'Half Road Closed', etc.)</u></li> </ul>
OP9	<u>Increase in HIV/AIDS and STDs and other communicable diseases</u>	<ul style="list-style-type: none"> <li>▪ <u>Sensitize workers on proper social behaviour and conduct with regard to community norms, HIV/AIDS and other sexually transmitted diseases. HIV/AIDS policies should be developed at the workplace;</u></li> <li>▪ <u>Establish and implement OS' HIV/AIDS Workplace Policy;</u></li> </ul>



		<ul style="list-style-type: none"> <li>▪ <u>Free HIV/AIDS testing, counselling and condom distribution be encouraged for both workers, sex workers and local community;</u></li> <li>▪ <u>The pathways for transmission of HIV/AIDS and STIs are well known, foreseeable and can be mitigated. Social bonds are not readily controlled, and the permanence of HIV/AIDS transmission makes this particular impact of social bonding both negative and also positive. Social bonds leading to lasting marriages and children occur in such situations; early pregnancies and sexual exploitation can also occur</u></li> <li>▪ <u>Sensitization of workers on risks of communicable diseases such as Covid, waterborn diseases,..and ways of preventing them</u></li> <li>▪ <u>Avail and keep clean workers' sanitation facilities with hand washing facilities and soaps sites to mitigate risks of contamination of communicable diseases.</u></li> </ul>
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- Maintaining good house-keeping of the water facilities
- Screening unsightly aspects from public view including excavations, construction material storage areas, waste storage areas and ablutions, erecting fencing around construction site to act as a screen minimizing the effect of wind in generating dust emissions
- Re-vegetation of all areas of natural vegetation that have been disturbed as a result of construction activities
- Proper waste management in accordance with the National Environment (Waste Management) Regulations, 2020 such as continuously monitor and evaluate the processes that generate waste streams from source through to recovery, recycling and disposal
- Containment of storm water especially during rainy season
- Timely compensation of the Project Affected Persons (PAPs) where necessary
- As a contractual obligation, contractors shall be required to have an HIV/AIDS policy and a framework (responsible staff, action plan, etc.) to implement during project execution
- Local workers will preferentially be employed and paid directly through their banks
- All construction workers shall be orientated and sensitized about responsible sexual behaviour in project communities.

Based on the above anticipated benefits and adverse impacts, an Environmental and Social Management Plan (ESMP) has been elaborated to ensure that environmental and social impacts, risks and liabilities identified are effectively managed during the construction, operation and closure of the proposed project. The ESMP specifies the avoidance, mitigation, adaptation, prevention and management measures to which the developer is committed and shows how the Project will mobilize organizational capacity and resources to account for the factors evaluated in order to implement the compiled measures with an estimated or indicative cost of the ESMP implementation about Uganda Shillings One Hundred Twenty Million (UGX 120,000,000).

Therefore, the proposed project is environmentally and socially feasible for implementation provided the recommended mitigation and monitoring measures are implemented, and the proposed implementation arrangements are upheld.



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# 1 INTRODUCTION

## 1.1 Overview of Water and Environment Sector

The Water and Environment sector consists of two sub-sectors: (i) the Water Supply and Sanitation (WSS) sub-sector; and (ii) the Environment and Natural Resources (ENR) sub-sector. The WSS sub-sector comprises water resources management, rural water supply and sanitation, urban water supply and sanitation, and water for production. The ENR sub-sector comprises environmental management; management of forests and trees; management of wetlands and aquatic resources; and weather and climate. The Rural Water Supply and Sanitation sub-sector is defined to include all those areas under the jurisdiction of District Local Councils and Rural Growth Centres, but excluding those urban areas governed by Town Boards, Town Councils, Municipalities and Kampala Capital City. In practice this means that rural water supply covers those communities and villages with populations up to 1,500 and Rural Growth Centres (RGCs) with populations between 1,500 and 5,000.

The Project Development Objectives are to improve water supply and sanitation services and strengthen water resources management in project targeted areas. The Project will achieve this Project Development Objective (PDO) through three strategic areas: (i) delivering the necessary water and sanitation infrastructure in targeted areas; (ii) supporting water related institutions (Ministry of Water and Environment (MWE), local government, and service providers) develop and strengthen measures to establish and consolidate operational efficiency and service quality in small towns and rural areas; and (iii) strengthening national and regional capacity to improve Water Resources Management (WRM). The Project's implementation approach will consider spatial differences between rural, small towns and urban large towns. It will also ensure that citizen engagement strategy, gender approaches, and sanitation and hygiene campaigns are included to foster behaviour change and ownership within the population. Combined with infrastructure investments to support WSS services, the Project will integrate water source and catchment protection measures, comprehensive sanitation planning and service delivery support to ensure sustainability and increase resilience to climate variability.

## 1.2 Project Background

The Government of Uganda with support from the African Development Bank will implement the Water Supply and Sanitation Program - Phase III (WSSP III). The Project Development Objective of WSSP III is; to contribute to enhanced productivity and improved quality of life of the population, through provision of safe water and sanitation services in project areas. The project will also contribute to the achievement of National Development Plan III objectives, Vision 2040 and Sustainable Development Goals. Under the WSSP III, funds have been provided to undertake Environmental and Social Impact Assessments (ESIAs) and Source Protection Plans (SPP).

The proposed Water Supply and Sanitation Program Phase III (WSSP-III) will support Government of Uganda efforts of increased access to water and sanitation services through construction of 5 urban/multi-purpose water supply systems covering 7 urbanized towns some of which will be at district headquarters, which have strategic socio-economic importance to the district local governments. The multi-purpose schemes shall provide raw water for improved agricultural productivity for over 500Ha. In the rural areas, the WSSP III shall construct 6 rural water supply systems, serving 12 rural growth centres. These are areas of high population concentration, economic growth and industrial development. Additionally, 2 earth dams shall be rehabilitated in the rural areas to improve of water for production storage.

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The program has 3 components drawn, namely;

- i) Rural Water Supply and Sanitation (RWSS),
- ii) Urban and Multi-Purpose Water Supply (U&MWSS)
- iii) Program Management Support (PMS)

**The Rural Water Supply and Sanitation Component** is designed with a country wide spread, to construct 2 large rural water supply schemes, which include Nyabuhikye-Kyikyenyke (Phase II) and Shuuku-Matsyoro (Phase II). The schemes will take advantage of the primary infrastructure constructed during Phase I (under WSSP II) to increased service coverage. The component will also provide 10 solar powered water schemes in Acholi, Lango, Teso, Buganda and Bukedi Sub Regions ensuring that the schemes target areas not covered by the Gravity Flow Scheme (GFS). Water for production earth dams will also be rehabilitated in Mubende and Agago districts increasing water storage by 1,300 cubic meters. The geographical spread of these proposed systems/project areas has taken into consideration the distribution of other existing projects across the country implemented under WSSP I, WSSP II, IWMDP etc. The rural water supply schemes will provide access to water supply to an incremental target population of over 315,862 beneficiaries by 2028 (and 570,482 over the design period by 2048). The Rural Water Supply and Sanitation (RWSS) Component will construct gender segregated and disability friendly sanitation facilities in public places (including highway sanitation) and schools.

The focus of the proposed project is the construction of the functional water and sanitation supply system and the proposed activity will be focused on the Shuuku-Matsyoro water supply and sanitation system phase II.

### 1.3 Justification of the Project

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The people in the project area and the surrounding areas depend on wells, boreholes, open rivers/ streams and shallow wells as sources of water. The access rates in Sheema vary from 7% in Kakindo TC Sub-County to 95% in Rugarama Sub-County. Sheema has 1,329 domestic water points which serve a total of 185,681 people – 125,194 in rural areas. 190 water points have been non-functional for over 5 years and are considered abandoned according to the Water Atlas (MWE, February 2023). The current water sources are not safe and the quality of the water here is poor for drinking and therefore implementation of the project will relieve women from wasting time at trekking to safe water sources, school going children will be able to go to school and the quality of water will improve hence improving the quality of life among the population.

The increasing population in the proposed project area has resulted in the need to increase on the accessibility and provision of safe and clean water for the local communities. In the view of the above, the Ministry of Water and Environment through the Rural Water and Sanitation Department is implementing a project whose overall objective is to sustainably increase access to safe water supply and improve on sanitation to the communities of Shuuku and Matsyoro in Sheema district thereby contributing to Sustainable Development Goals (SDGs) 6 and 12.

~~Furthermore, the current water sources are not safe and the quality of the water is poor for drinking and therefore implementation of the project will relieve women from wasting time at water sources, school going children will be able to go to school and the quality of water will be improved hence improving the quality of life among the population.~~

The current water supply and sanitation situation is undesirable. All the communities in the proposed project area have serious problems accessing safe water sources. The majority of families use unprotected water sources due to lack of better options. In addition, these sources are more than 500m from most homesteads. The existing gravity flow systems are not reliable, as most standpipes are without water. This is because the gravity flow schemes are

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fed from springs and River Shuuku- Matsyoro GFS Phase I, where some communities were not served during the implementation of phase I of the project.

#### 1.4 ESIA Requirements

The proposed development falls under Schedule 5 of the National Environment Act No.5 of 2019 (i.e. Utilization of water resources and water supply). It is in the category of projects requiring mandatory Environmental and Social Impact Assessment (ESIA) before implementation. An Environmental and Social Impact Study is thus required before NEMA can give clearance for the proposed construction of the Shuuku- Matsyoro WSS phase II to proceed.

In accordance with the *National Environmental Act No. 5 of 2019* of the Laws of Uganda and the *Environmental and Social Impact Assessment Regulations (2020)*, the Environmental and Social Impact Study process starts with the scoping exercise that identifies areas and issues that should be included and addressed in the ESIA study process. The issues identified through the scoping process were developed into the Terms of Reference (ToR) that were submitted to NEMA for review so that any other areas and issues deserving attention are identified and included before the ESIA commences. Thus, this ESIA was guided by the scoping process.

Therefore, this ESIA report has been developed in conformity with the National and [African Development Bank \(AfDB\) Operational WB safeguards \(OS\) policies and frameworks](#). This ESIA report has been prepared following Uganda's and the World Bank's Environmental and Social requirements, sets out to identify potential environmental and social impacts of the proposed [Matsyoro Bitya](#) Water Supply and Sanitation Project, with a view of informing the final engineering design and recommending mitigation measures to be implemented during [both](#) construction and operational phases of the project. The main objective is to carry out an ESIA for the proposed construction of Shuuku- Matsyoro WSS II. Specific objectives include the following:

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

#### 1.5 Details of Developer and Investment Cost

The project is to be implemented by the Ministry of Water and Environment. The investment cost of the project is approximately Uganda **Shillings Fifteen Billion Six Hundred Seventy-Eight Million Eight Hundred Eleven Thousand Five Hundred Thirty-Three shillings** only inclusive of VAT only including all taxes **(UGX 15,678,811,533)** [and the ESMP implementation of about 120,000,000 is included in this estimated project cost](#).

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

**Ms. Martha Nagaiga**  
Directorate of Water Development,  
Rural Water Supply and Sanitation Department,  
Headquarters, Plot 3-7, Kabalega Crescent, Luzira,  
P. O. BOX 20026, Kampala, Uganda

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E-mail: [nmalizah@yahoo.com](mailto:nmalizah@yahoo.com)

## 1.6 Structure of the ESIA report

This Environmental and Social Impact Assessment report is concise and limited to the significant environmental and social issues. It focuses on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting the data. The report contains, but not limited to the following major contents:

- 1) Cover Page (Title of the proposed project, Location, Name, Address and information of the developer)
- 2) Table of content
- 3) Declaration by ESIA team and their details
- 4) List of acronyms
- 5) Executive Summary
- 6) Introduction
- 7) Policy, Legal and Administrative/Institutional Framework and Capacity assessment of the public entities in charge of ESIA.
- 8) Description of the Proposed Project.
- 9) Description of methodology and techniques used in the assessment and analyses of project impacts.
- 10) Baseline conditions of the physical, biological and socio-economic environment of the project area, including results of relevant studies and other geophysical and geotechnical studies.
- 11) Description/Assessment of the Environment and social impacts of project activities.
- 12) Analysis of Alternatives.
- 13) Environmental and Social Impacts and Mitigation Measures.
- 14) Chance finds procedure to facilitate the handling of any unknown or known Physical Cultural Resource(s).
- 15) Grievance Redress Mechanism to facilitate the handling of any complaints that may arise during project implementation.
- 16) Environmental and Social Management Plan (ESMP) matrices detailing measures for addressing potential negative environmental and social impacts of the project. In addition, the ESMP should clearly identify institutional arrangement, roles, responsibilities, implementation schedules and costs in addressing the mitigation measures that will be proposed in the ESIA, including capacity building requirements; and
- 17) E&S Monitoring Plan with clear monitoring indicators and institutional roles to be used in tracking the implementation and compliance of the proposed mitigation measures;
- 18) Institutional mandates.
- 19) List of References.
- 20) Appendices:
  - Approved Scoping Report/Terms of Reference
  - Land title/agreements
  - Records of Stakeholder meetings
  - Map, drawing and pictorial complement, especially to convey information on the project affected area and proposed project activities
  - Chance Finds Procedure
  - Grievance Redress Mechanism

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## 1.7 Addressing NEMA Responses to Terms of Reference

SN	REQUIREMENTS	COMMENTS
1.	Ensure that the project description is comprehensive for each of the project components, including the designs of the different project components. In addition, clearly indicate the chemicals that will be used in the water supply system and how these will be stored, handled and associated waste disposal of	The project description has been given under Chapter 3 of this Report. Calcium hypochlorite. Dosing of calcium hypochlorite will be by proportional-feeder dosing feeders for liquid chlorine solutions. The calcium hypochlorite solution will drip into the inlet chamber of the clear water tank by a mechanism for controlling the dosing rate
2.	Undertake geotechnical and hydrological investigations of the proposed project sites/water sources so as to inform the designs and construction of the water supply and sanitation system	The geotechnical and hydrological investigations were undertaken during the Feasibility and Design stages and these have been used in the preparation of this report
3.	Carry out comprehensive consultations with all the relevant key stakeholders including, Sheema district Local Government, the Directorate of Water Resources Management and the local community in the neighborhood of the proposed proposed sites. The views of the stakeholders consulted should be well documented/addressed and lists of persons consulted appended in the EIA report.	Consultations with the different stakeholders were done as indicated in Chapter 7 of this Report and the annex 2 which shows the proof and those consulted
4.	Ensure that the local government departments including, the Environment, Water, physical planning and the engineering departments are consulted and concerns that may arise taken into account and incorporated in the design, construction and operation of the project.	These were comprehensively engaged as indicated in Chapter 7 and the annex 2 (consultation lists)
5.	Study the land tenure and identify potential project affected persons/properties at the proposed sites. Propose plans for land acquisition and/or compensation where required, including resettlement action plans, where applicable.	Land acquisition process was completed and the land is already secured as indicated in annex 6 (Land ownership document)
6.	Provide current baseline information that is project sites the associated project components and their neighborhood, accurate GPS coordinates clearly indicating the boundaries of the project sites and the associated components and images/maps of the project sites.	Chapter 5 gives the baseline information of the project area
7.	Provide site specific baseline information. In particular, assess site baseline soils and air quality taking into account key parameters relevant to the nature of the project. Append the results of the analysis from an accredited laboratory to the ESIA report	Water Quality Analysis was done during the Design Stage and these results were used during the ESIA study
8.	Carry out an evaluation of negative impacts associated with the proposed Shuuku-Matsyoro Water Supply and Sanitation project and provide detailed mitigation and environmental management and monitoring plans	These have been addressed under Chapter 8 of this Report.

SN	REQUIREMENTS	COMMENTS
	that relate to the identified environmental impacts from the proposed project. In particular, the following issues should be comprehensively assessed and appropriate mitigation actions provided in the ESIA	
9.	Potential waste streams from the construction and operation of the piped water supply and sanitation system and management of such waste, as well as measures for preventing pollution of the environment and degradation of any sensitive ecosystems that may be within the vicinity of the project sites	These have been addressed under Chapter 8 of this Report.
10.	Occupational health and safety issues likely to arise from the operation of the factory	Occupational health and safety issues have been considered though this is not a factory but WSS.
11.	Provide a clear, and eligible copy of the site lay out plan (preferably each covering A-3 size paper) showing the equipment, clear boundaries of the project sites and the associated components in relation to its environs	Annex 5 shows the general layout of the project site
12.	Include in the ESIA report comprehensive analysis of alternative/options to selected project location, design and technology among others	These have been addressed under Chapter 6 of this Report.
13.	Append to the ESIA report authentic copies of land ownership and acquisition documents	This has been addressed under the annex 6 of this Report
14.	Indicate the project cost of the project and append a copy of certificate of valuation issued by a qualified and registered Valuer, in accordance with the provision of Schedule 5, 3(f) of the National Environment (Environmental and Social Assessment) Regulation, 2020.	Addressed under section 1.5 and with the attached Valuation Certificate as indicated with the certified Bill of Quantities (BoQs) as shown in <b>Annex 7</b>
15.	Provide evidence of payments of 30% ESIA fees under regulation 49 (2) of the National Environment (Environmental and Social Assessment) Regulations, 2020.	Attached as the First page of this Report and <b>Annex 8</b> of this report



## 2 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

### 2.1 Introduction

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

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

### 2.2 Policies and plans relevant to the Proposed Project

Table 2 below presents the policies and plans related to the project.

*Table 42: Policies and plans related to the Project*

Policy	Goal and objectives	Relevancy of the Policy to the proposed project
National Environment Management Policy, 2014	The overall policy goal is sustainable development which maintains and promotes environmental quality and resource productivity for socio-economic transformation. The Policy provides a system of Environmental Impact Assessment (EIA) and environmental monitoring so that adverse environmental impacts can be foreseen, eliminated or mitigated.	Environment and development are interrelated, and this policy requires that environmental aspects are considered in all development projects such as the rehabilitation and expansion work. Therefore, this ESIA study has been conducted to take into consideration any adverse social and environmental impacts of the construction works
The National Water Policy, 1999	The goal of this policy is to provide guidance on development and management of the water resources of Uganda in an integrated and sustainable manner, so as to secure and provide water of adequate quantity and quality for all social and economic needs, with full	Because the management of the storm water drainage has an impact on downstream water quality, this policy is relevant to the proposed project since the proposed project activities are aimed at controlling floods and improving the quality of run-off that is

Policy	Goal and objectives	Relevancy of the Policy to the proposed project
	participation of all stakeholders and mindful of the needs of future generations. The policy aims to: Promote rational use of water; Control pollution and promote safe storage, treatment and disposal of waste, which could pollute water and impact public health; and Promotion of awareness of water management and development issues and capacity building.	discharged into the River Kitakure. This project will be implemented to adequately convey storm water through the respective catchments to improve on storm water management in the City, and reduce flooding problems which can contribute to water pollution
The National Land Policy, 2013	The goal of this Policy is: “to ensure an efficient, equitable and optimal utilization and management of Uganda’s land resources for poverty reduction, wealth creation and overall socio-economic development”. One of its objectives is to ensure sustainable utilization, protection and management of environmental, natural and cultural resources on land for national socio-economic development.	By undertaking an ESIA for the proposed project, the developer is ensuring planned and environmentally friendly infrastructure development. Enhancement and mitigation measures should be implemented by the developer and the contractor(s) to ensure that all land use practices conform to land use plans and the principles of sound environmental management such as biodiversity preservation, soil and water protection, conservation and sustainable land management.
Uganda National Climate Change Policy, 2015	The overarching objective of the policy is to ensure that all stakeholders address climate change impacts and their causes through appropriate measures, while promoting sustainable development and a green economy including integration of climate change issues into planning, decision making and investments in all sectors.	ESIA promotes the wise use of water resources to minimize harmful effects to the environment and water resource monitoring. It promotes and strengthen the conservation and protection against degradation of watersheds, water catchment areas, river banks and water sources in order to increase their resilience to climate change impacts.
The National Health Policy, 2010	The overall objective of this policy is to reduce mortality, morbidity and fertility, and the disparities therein.	The project will contribute to the reduction of water borne diseases thus improving on the health of communities that carryout activities along the Channel.
The National Gender Policy, 2007	The goal of this policy is to mainstream gender issues in the national development process in order to improve the social, legal/civic, political, economic and cultural conditions of the people of Uganda, particularly women. The policy recognizes women	This policy would especially apply in the recruitment process of labour, both during construction and operation phase. Men and women should have equal opportunities for available jobs. This policy also requires provision of a work environment that is

Policy	Goal and objectives	Relevancy of the Policy to the proposed project
	and children as the main carriers and users of water and related sanitation facilities. It anchors the importance of gender responsiveness in terms of planning, implementation and management of water and sanitation initiatives.	safe and conducive to women, as it is for men, considering gender-disaggregated differences and vulnerabilities. For example, women should have separate facilities from men at workers' camps and sites.
The Occupational Health and Safety (OHS) Policy	This policy seeks to: Provide and maintain a healthy working environment; Institutionalize OHS in the power-sector policies, programs and plans; and Contribute towards safeguarding the physical environment. The OHS Policy also takes into consideration the Health Sector Strategic Plan, all of which aim to improve the quality of life for all Ugandans in their living and working environment.	This policy will be especially relevant for OHS of construction crews and subsequently, operation and maintenance personnel. The policy will also have relevance in mitigation measures that protect the public from health and safety impacts as a result of project construction and subsequent operation and maintenance activities.
The Environmental Health Policy 2005	The policy provides a framework for the development of services and programs at National and Local Government levels that establish the environmental Health priorities.	Analysis of water quality was done during the design phase where water samples were collected at the proposed intake point on River Kitakure and analyzed in the laboratory to ascertain the pollution variation.
The National Policy for the Conservation and Management of Wetland Resources, 1995.	The goal of this Policy is to curtail the rampant loss of wetland resources and ensure that benefits from wetlands are sustainable and equitably distributed. Wetlands acting as sources of water supply wastewater treatment should be fully protected. This policy outlines guidelines for wetland resource developers.	The proposed project is aimed at Conservation and Management of Wetland Resources within the catchment area. The designs will adhere to the principles of sustainability such that areas within wetlands are left intact, as much as possible
The National Land Use Policy, 2007	The overall goal for the national land use policy is "To achieve sustainable and equitable socioeconomic development through optimal land management and utilization in Uganda." Specific goals of this policy include among others: To adopt improved agriculture and other land use systems that will provide lasting benefits for Uganda; To reverse and alleviate adverse environmental effects at local, national, regional and global levels.	By undertaking an ESIA for the proposed project, the developer is to ensure planned and environmentally friendly infrastructure development. Enhancement and mitigation measures should be implemented by the developer and the contractor(s) that ensure all land use practices conform to land use plans and the principles of sound environmental management such as biodiversity preservation, conservation and sustainable land management.
The National	HIV/AIDS is recognized by Ministry of Health as a	It is anticipated that during the construction phase,

Policy	Goal and objectives	Relevancy of the Policy to the proposed project
HIV/AIDS Policy, 2004	considerable risk in construction of infrastructure projects and it (together with the Ministry of Gender, Labour and Social Development) encourages employers to develop in-house HIV/AIDS policies, provide awareness and prevention measures to workers and avoid discriminating against workers living with or affected by HIV/AIDS. The policy encourages employee awareness and education on HIV/AIDS. The policy also guides about HIV/AIDS management including awareness and provision of condoms in workplaces.	there may be an influx of people into the project area possibly resulting into sexual fraternisation and a risk of HIV/AIDS spread. The construction contractors or their subcontractors, will provide in-house HIV Policy, worker sensitisation and provision of free condoms. This policy is relevant to the project if implementation of proposed construction activities leads to immigration into the project area by people seeking construction jobs and indulging in prostitution or irresponsible sexual fraternisation associated with HIV/AIDS risk.
The National Child Labour Policy, 2006	The policy provides an enabling environment for the prevention, protection and elimination of child labour. It is intended to establish guiding principles in Uganda's effort to eliminate child labour and priorities for government and stakeholder action. This policy is based on recognition that all human beings, adults and children, have rights. Children by virtue of their age and needs are entitled to specific rights, including education, health, survival development, protection and participation.	The project management should ensure that all employees are above 18years and not school going.
The National Orphans and other vulnerable children's Policy, 2004	The goal of the Policy is full development and realization of rights of orphans and other vulnerable children. The policy provides support to vulnerable children and families such that their capacity to sustain themselves is strengthened; and provides residential care for orphans and other vulnerable children as a last resort	The project Developer (MWE) and the contractor(s) including their sub-contractor(s) will ensure that the project activities do not compromise or in any way affect the lives and livelihood of all the vulnerable groups like the orphans and children in general during the project implementation
The National Equal Opportunities Policy, 2006	The National Equal Opportunities Policy provides a framework for re-dressing imbalances, which exist against marginalized groups while promoting equality and fairness for all. With a goal of: providing avenues where individuals and groups' potentials are put to	The Water supply projects come along with a lot of opportunities including service delivery, trainings and employment. The project will avail equal opportunities and affirmative action.

Policy	Goal and objectives	Relevancy of the Policy to the proposed project
	maximum use by availing equal opportunities and affirmative action.	
The National Sanitation Policy for Uganda, 1997	The Goal of this policy is to promote and preserve the health of the community through improved sanitation. Attaining and maintaining a good standard of sanitation and greatly contribute to reducing mortality and morbidity from sanitation related diseases as well as improving the socio-economic status of the community.	The proposed project will promote proper management of solid and liquid wastes and promote IEC for behaviour change concerning sanitation.
Uganda Vision 2040	In 'Vision 2040', Uganda sets goals to achieve by the year 2040 ranging from political, economic, social, energy, water, and environment. It acknowledges that the slow accumulation of infrastructure i.e. water among others retards the economic development.	Investment in the water supply infrastructure is therefore of dire importance so as to provide people with safe water and also spur economic development. The proposed project aims at providing and accessing safe water which always disrupt the economic dealings and at times loss of life through water related diseases
National Development Plan III (NDP III)	The plan focuses on increasing and matching the capacity of the local authorities with the high urbanization rate of Uganda where most of the urban areas in Uganda have expanded beyond their original spatial plans with many of them surrounded by vast sprawling unplanned settlements and have increasingly encroached into the wetlands and drainage corridors contributing to the frequent flooding especially when it rains.	Investment in the water supply infrastructure is therefore of dire importance so as to provide people with safe water and also spur economic development. The proposed project aims at providing and accessing safe water which always disrupt the economic dealings and at times loss of life through water related diseases.

### 2.3 Laws and regulations relevant to the Proposed Project

Table 3 below presents the Legal framework related to the project.

*Table 53: Legal framework related to the project*

Legal Framework	Provision and Requirement	Relevancy to the proposed project
The Constitution of the Republic of Uganda; 1995;	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	All environmental impact actions of the project are therefore meant to conform to the broader objectives of the Constitution which requires a

amended as at 15 <sup>th</sup> February 2006, Government of Uganda.	and future generations. The Constitution is the cardinal law in Uganda upon which all environmental laws and regulations are founded.	healthy environment for all citizenry. ESIA report has been prepared for NEMA's consideration before implementation of the project. Therefore, this Project will be implemented in a manner that will incorporate the appropriate safeguards for environmental and social issues, especially land take. Any land required for the implementation of the construction activities will be obtained within the confines of the law.
The National Environment Act No. 5 of 2019	This act provides for various strategies and tools for environment management, which also includes the ESIA for projects likely to have significant environmental impacts. The Third Schedule of the National Environment Act, No. 5 of 2019 lists projects to be considered for environmental impact assessment. Under that categorization, most water resources related projects fall under two ground and surface water resources.	The Act governs and guides environmental management in Uganda. This ESIA is prepared to conform to the Act's requirement that projects likely to have significant environmental impact undertake an ESIA before they are implemented. ESIA report has been prepared for NEMA's consideration before implementation of the project.
The Water Act, Cap 152 and The Water Resources Regulations, 1998	Management of water resources Regulation and issuing of water use, abstraction and wastewater discharge permits; Prevention of water pollution. Managing and monitoring and regulation of water resources	Water abstraction permit should be obtained from DWRM before operation phase. Water analysis was done during the design stage and national standards for portable water.
The Land Act, Cap 227	Section 74 (i) states that where it is necessary to execute public works on any land, an authorized undertaker shall enter into mutual agreement with occupier or owner of the land in accordance with Act.	These tenure systems will be important during resettlement planning. The extent of works designed to ensure the construction of the WSS will necessitate land take in the Project Area. Any land required for the implementation of this Project will be acquired in accordance with the provisions of this Act.
The Occupational Safety and Health Act, 2006	Provision of Occupation Health and Safety of workers and Inspection of places of works. This Act requires that employers provide and maintain safe working conditions and take measures to protect workers and the public from risks and dangers of their works, at his or her own cost (Section 13). Employers with more than 20 workers should prepare and	An ESMP has been prepared and the Contractor will ensure the workplace is registered under the Ministry of Gender, Labour and Social Development (MoGLSD) under the Department of OHS. The construction activities will require workers during the construction, and operation

	often revise a written policy with respect to safety and health of workers (Section 14). The contractor therefore is obliged to provide employers with washing facilities, First Aid, facilities for meals and safe access to workplaces	and maintenance phases. Therefore, the Act requires that MWE and all contractors must ensure that workers have a safe working environment at all times and that their health is not at risk as a result of the working environment.
The Workers' Compensation Act, 2000	This requires compensation to be paid to a worker injured or acquired an occupational disease or has been harmed in any way in the course of his/her work.	This Project will require workers during construction, operation and maintenance phases. Any injury or illness resulting from Project related activities will be subject to conditions of the Workers' Compensation Act. Sheema District Labour officers will also be involved in ensuring compliance of the Contractor's' with labour laws. The developer shall ensure that all contractors and sub-contractors provide personal protective equipment (PPE) to employees to minimize accidents and injuries and ensure workers safety onsite.
The Public Health Act, Cap 281	The Public Health Act aims at avoiding pollution of environmental resources that support health and livelihoods of communities. It gives local authorities powers (Section 103) to prevent pollution of watercourses.	MWE and the Contractor(s) shall provide for adequate sanitary facilities, proper solid 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 needs services beyond the first aid shall be referred to the nearest health centre. MWE should implement an HIV/AIDS prevention control plan as part of mitigation measure. The disposal of waste from the proposed project will have to be appropriately managed so as to prevent risk to public health, in line with the provisions of this Act.
The Local	Provides for the system of local governments based on the	The developer will work closely with the

Governments Act, Cap 243	decentralization of district for the enforcement of environmental law.	District Water Officer (DWO), District Natural Resources Officer (DNRO) and Town Council/Sub-County Community Development Officer in carrying out monitoring activities to ensure no damage onto the environment and social amenities.
The Investment Code Act, Cap 92	Section 18(2) (d) of the Act requires an investor to take necessary steps to ensure that development and operation of an investment project do not cause adverse ecological and socio-economic impacts.	MWE is the implementing agency for the project that received funding from the AfDB. This ESIA is in partial fulfilment of the requirements of this Act, since adverse ecological and socio-economic impacts as a result of the project implementation have been identified and mitigation measures developed.
The Employment Act, 2006	This Act is the principal legislation that seeks to harmonize relationships between employees and employers, protect worker's interests and welfare and safeguard their occupational health and safety through: i) Prohibiting forced labour, discrimination and sexual harassment at workplaces (Part II; Part IV). ii) Providing for labour inspection by the relevant ministry (Part III). iii) Stipulating rights and duties in employment (weekly rest, working hours, annual leave, maternity and paternity leaves, sick pay, etc. (Part VI). iv) Continuity of employment (continuous service, seasonal employment, etc. (Part VIII). This Act is relevant to both construction & operation phases.	The Act will govern labour arrangements and conditions under which persons hired by the project work. It prohibits Child labour (a condition the contractor must comply with) as well as providing guidance on work rights during the post-construction phase.
The Mining Act, Cap. 148	Stone quarry sites and gravel borrow pits will be necessary for materials needed to construct the concrete works of the project components. Therefore, applicable licenses shall be obtained from the Commissioner of the Geological Survey and Mines. The Mining Act of 2003 regulates mining developments including set up of new quarries and/or sandpits. Relevant environmental studies required for this license application are described in Part XI.	This Act will apply to the project's contractor(s) who will be required to obtain license for extraction of stone/ aggregate and murrum materials required for construction. The extraction of stone/aggregate and murrum materials will be undertaken in line with the provisions of this Act. Issues of restoration of the sites after extraction of murrum will be of key importance after construction of the proposed project.



The Children's Act, Cap 59	<p>This is an Act to reform and consolidate the law relating to children; to provide for the care, protection and maintenance of children; to make provision for children charged with offences and for other connected purposes.</p> <p>Part II of the second schedule of this Act defines a child as a person below the age of eighteen (18) years.</p> <p>In the same schedule under Section 8 of this Act provides that no child shall be employed or engaged in any activity that may be harmful to his or her health, education or mental, physical or moral development.</p>	<p>This Project will require workers during construction, operation and maintenance phases. No child should be employed under project work force requirement however, any employment or engagement of children will be done in line with the restrictions of this Act and the Employment Act to ensure that risks to children are either eliminated, or reduced to as low as reasonably practicable. In addition, the contractor will confirm age of potential labourers prior to hiring through National Identity card, birth certificate or confirming with LC and community elders. Sheema District Probation Officers will provide guidance to Contractors and their employees' areas of compliance.</p>
The Historical Monuments Act, 1967	<p>Sub-section 12(1) requires that any portable object discovered in the course of an excavation shall be surrendered to the Minister who shall deposit it in the Museum. The Act adds that, notwithstanding provisions of the subsection, where any object is discovered in a protected site, place, or monument, the owner of the protected site, place, or monument shall be entitled to reasonable compensation.</p>	<p>This Act requires that any chance finds encountered during project construction shall be preserved by the Department of Monuments and Museum in the Ministry of Tourism, Wildlife and Heritage.</p> <p>Any chance find objects, material or infrastructure that may be identified as falling under the category of 'archaeological paleontological ethnographical and traditional interests' during the Project implementation will therefore, be reported to the Department of Museums and Monuments for advice and where necessary undergo a forensic assessment</p>
The National Environment (Environmental and Social Assessment) Regulations, 2020	<p>According to sections 15 of the Regulations, the developer of any project that has or is likely to have a significant impact on the environment is required to undertake an ESIA process after approval of the ToRs.</p>	<p>ESIA report has been prepared for NEMA's consideration after the approval of the Terms of References before implementation of the proposed project.</p>
The National	<p>In Regulation 17 (1), every landowner, occupier or user who is</p>	<p>Prior to any works at the discharge of effluent</p>

Environment (Wetlands, River Banks and Lake Shores Management) Regulations, 2000	adjacent or contiguous with a wetland shall have a duty to prevent the degradation or destruction of the wetland and shall maintain the ecological and other functions of the wetland. The tool used under these Regulations to ensure compliance is the permit.	back into the environment or any wetland, MWE will seek permission from NEMA, as provided for in these Regulations. Water source protection measures and an independent WSPP have been proposed to protect any wetland resources within the catchment area for the Shuuku-Matsyoro WSS II.
The National Environment (Waste Management) Regulations, 2020	Regulation 5 (1) stipulates that a person who generates waste, a waste handler or product steward has a duty of care and shall take measures to ensure that waste is managed in a manner that does not cause harm to human health or the environment among other provisions.	These regulations apply to both construction and operation-phase waste which should be managed in a way such as to avoid environmental and public health impact. Therefore, all the generated various types and volume of waste should be managed and conform to these regulations.
The National Environment (Noise Standards and Control) Regulations, 2000.	Part III Section 8 (1) requires facility operators, to use the best practicable means to ensure that the emission of noise does not exceed the permissible noise levels. The regulations require that persons to be exposed to occupational noise exceeding 85 dBA for eight hours in a day should be provided with requisite hearing protection.	All construction activities should be carried out between 7am – 6pm by the Contractor as working hours. No construction activities to be carried out at Night. Noise levels should also be monitored and not to exceed 85dB as per Regulation.
The Water Resources Regulations, 1998	With regard to water abstraction, Part II: Section 3 Sub-section (1) of these regulations requires application for Water Permits by anyone who: (a) Occupies or intends to occupy any land; (b) Wishes to construct, own, occupy or control any works on or adjacent to the land referred to in regulation 10; may apply to the Director for a water permit.	Water abstraction permit will be obtained by the developer from the Directorate of Water Resources Management (DWRM) before operation phase.
The National Environment (Standards for Discharge of Effluent into Water or on Land) Regulations, 2020	Section 5 details that a person shall not discharge effluent into water or land except in accordance with the Act, the Water Act, the National Environment (Waste Management) Regulations, 2020, the Petroleum (Waste Management) Regulations, 2019, the Water (Waste Discharge) Regulations, these Regulations and environmental standards. For this project, this standard is applicable to liquid waste/ sewage treatment plant and public toilets.	Effluent/liquid waste (such as human waste, food scraps, oils, soaps and chemicals) should not be discharged into any wetland or in the River water resources and should be managed in a manner that does not cause harm to human health or the environment.
Draft National Air	The draft national air quality standards provide Uganda's	These standards will apply particularly during

Quality Standards, 2006

regulatory air quality standards.

Pollutant	Averaging time for ambient air	Standard for ambient air
Carbon dioxide (CO <sub>2</sub> )	8 hour	9.0 ppm
Carbon monoxide (CO)	8 hour	9.0 ppm
Hydrocarbons	24 hour	5 mg m <sup>-3</sup>
Nitrogen oxides (NO <sub>x</sub> )	24 hour 1 year arithmetic mean	0.10 ppm
Smoke	Not to exceed 5 minutes in any one hour	Ringlemann scale No.2 or 40% observed at 6m or more
Soot	24 hour	500 µg Nm <sup>-3</sup>
Sulphur dioxide (SO <sub>2</sub> )	24 hour	0.15 ppm
Sulphur trioxide (SO <sub>3</sub> )	24 hour	200 µg Nm <sup>-3</sup>

Note: ppm = parts per million; "N" in µg/lm<sup>-3</sup> connotes normal atmospheric conditions of pressure and temperature (25°C and 1 atmosphere).

construction of the water treatment plant and reservoirs.

The National Environment (Audit) Regulations, 2020

Part III on Environmental Compliance Audit, Section 12, Sub-section (1) requires the developer of a project or activity listed in Schedule 3 to these Regulations to carry out an environmental compliance audit.

The project will involve construction and operation of water supply and sanitation facilities that have a potential to impact negatively of the environment. Therefore MWE should conduct Environmental Audits to assess if there are impacts, to what extent and mitigate them.

## 2.4 International legal and lenders requirements

Uganda is a party to a number of international and regional agreements which requires her to comply with provisions of the agreements when setting up projects like the Shuuku-Matsyoro Piped Water Supply and Sanitation Project Phase II.

International financial institutions like the African Development Bank (AfDB) have environmental and social safeguard policies that are designed to avoid, mitigate, or minimize adverse environmental and social impacts of projects supported by them. These are complimented by the Performance Standards (PS) which have been set by the International Finance Corporation (IFC). These safeguard policies and performance standards (Table 4) can be used and adhered to during the project cycle to ensure that the project meets the international standards.

**Table 64: The Safeguard policies and Performance Standards relevant to the Project**

Operational Safeguard/ Performance Standard	Key Issues	Relevance/Applicability
<b>OS 1:</b> 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.
<b>OS 2:</b> Involuntary resettlement, land acquisition, population displacement and compensation	Mainstream resettlement considerations in AfDB operations. It consolidates the policy commitments and requirements set out in the Bank's policy on involuntary resettlement, and incorporates a number of refinements designed to improve the operational effectiveness of those requirements	All people whose land is to be affected for example at the proposed water abstraction site, reservoir sites and some areas along the proposed pipeline route <u>totalling to about 4 acres will be compensated prior to start of construction works was secured by the Sheema District Local Government.</u>
<b>OS 3:</b> 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.
<b>OS 4:</b> Pollution prevention and control, hazardous materials	Manage and reduce pollution in AfDB funded projects. It covers a range of key impacts including pollution, waste,	The project proponent and contractor will set up a waste management plan to handle

and resource efficiency	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	liquid and solid wastes, including those of hazardous nature.
<b>OS 5:</b> 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 ( <b>Annex VII</b> ) to enable workers express their complaints, among others.
<b>Performance Standards</b>		
<b>PS1:</b> Social & environmental assessment and management systems	It establishes the importance of: (i) integrated assessment to identify the environmental and social impacts, risks, and opportunities of projects; (ii) effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and (iii) the client's management of environmental and social performance throughout the life of the project.	An ESIA has been carried out. Potential impacts of the project have been identified and their mitigation measures proposed. Stakeholder involvement was a major component of the ESIA.
<b>PS 2:</b> Labour and working conditions	This performance standard is concerned with management of labour risks such as lack of contracts, insufficient wages, exploitation of minors, discriminatory hiring, unsafe and un hygienic living conditions, internal grievance handling, excessive over-time and handling of casual laborer.	A grievance handling mechanism will be put in place where workers can lodge their complaints.  The project will employ workers following the relevant labour laws of Uganda.
<b>PS3:</b> Resource efficiency and pollution prevention	Requires project to efficiently use resources and to minimize or avoid pollution to the environment	The Developer shall ensure that pollution control measures are in place and only the required resources are utilized.
<b>PS4:</b> Community health, safety and security	This performance standard looks at aspects that can expose the public to accidents, excessive noise, traffic	An ESMMP has been put in place detailing the management of impacts related to community

	congestion, diseases, insecurity, among others	health, safety and security.
<b>PS5:</b> Land acquisition and involuntary resettlement	Establishes requirements for efficient and timely compensation and/ resettlement of project affected persons	All the required for project activities will be obtained following the laws of Uganda, and all people whose land is affected will be compensated prior to the start of project activities
<b>PS6:</b> Biodiversity conservation and sustainable management of living natural resources.	Requires that projects put up necessary measures to conserve biodiversity and natural habitats	An ESMMP has been put in place with measures to ensure biodiversity is not adversely impacted by the implementation of the project.
<b>PS7:</b> Indigenous peoples	Promotes the protection of indigenous people	No indigenous peoples as defined under this standard are considered to be resident in the project area.
<b>PS8:</b> Cultural heritage	Requires that all resources of cultural importance are identified and protected	No cultural resources were identified during this assessment. However, any cultural resource that may be identified at any stage of project operation will be protected and relocated according to the established laws of Uganda. A chance finds procedure (Annex V) will guide handling and management of any PCRs that may be found during civil/earth works.

## **2.5 Institutional Framework and Capacity assessment of the public entities in charge of ESIA enforcement.**

**2.5** The table below shows the different institutions and public entities in charge of the Environment and Social Impact assessment in Uganda.

**Table 75: Institutional framework and capacity assessment of public entities in charge of ESIA enforcement for the project**

Institution	Role
Ministry of Water and Environment	<ul style="list-style-type: none"> <li>▪ Review and approve the ESIA report (ESIS) as the client/Developer before submission to NEMA.</li> <li>▪ Through Sheema District Natural Resources Office (DNRO), undertake environmental monitoring during project implementation.</li> <li>▪ Apply for Surface Water Abstraction Permits from DWRM.</li> <li>▪ Compensate local Project Affected Persons (PAP) for any loss</li> </ul>

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	<p>or negative effect of the project before implementing the project.</p> <ul style="list-style-type: none"> <li>▪ Implement mitigation measures and actions to protect the environment and monitor implementation of proposed measures in the specific site- ESMPs. .</li> </ul>
Directorate of Water Resources Management (DWRM)	<ul style="list-style-type: none"> <li>▪ Issue water abstraction and wastewater discharge permits.</li> <li>▪ Ensure monitoring of surface water resource, laboratory and field works and ultimately water pollution control..</li> </ul>
National Environment Management Authority (NEMA)	<ul style="list-style-type: none"> <li>▪ The Environmental Monitoring and Compliance Department of NEMA will be responsible for the review and approval of ESIA's, post-implementation audits and monitoring of approved projects. Although project sponsors have a responsibility for monitoring their own activities, NEMA carries out its own monitoring largely through District Environmental Officers and environmental inspectors at NEMA's head office/ Lead Agencies.</li> <li>▪ Coordinate, inspect, supervise and monitor project activities to ensure that the environment and natural resources are not depleted but managed sustainably.</li> </ul>
Directorate of Environment Affairs (DEA)	<ul style="list-style-type: none"> <li>▪ Coordinate, inspect, supervise and monitor the environment and natural resources.</li> <li>▪ Ensure that environmental policies and laws are respected while implementing water resources related projects.</li> </ul>
District Local Administration Structures (Sheema District Local Government)	<ul style="list-style-type: none"> <li>▪ Local government structures are important for mobilising support for the project as well as monitoring its social-environmental impacts both during construction and operation phases.</li> <li>▪ <u>Facilitate and/or coordinate activities of the developer in their areas of jurisdiction.</u></li> <li>▪ <u>Mobilize local communities and key stakeholders to participate in EIA consultations and/or public hearings.</u></li> <li>▪ <u>Hire a water System Operator to manage the installed infrastructure</u></li> </ul>
Ministry of Gender, Labour and Social Development (MGLSD)	<ul style="list-style-type: none"> <li>▪ The department of Occupational Health and Safety (OHS) is responsible for inspecting and registering the workplace and monitoring of conditions under which employees on the project are subjected.</li> </ul>
Developer (Ministry of Water and Environment/ Rural Water Supply and Sanitation Department)	<ul style="list-style-type: none"> <li>▪ Apply for Surface Water Abstraction Permits from DWRM.</li> <li>▪ Compensate local Project Affected Persons (PAP) for any loss or negative effect of the project before implementing the project.</li> <li>▪ <u>Implement mitigation measures and actions to protect the environment and monitor implementation of proposed measures in the specific site- ESMPs.</u></li> <li>▪ <u>Provide periodic E&amp;S reports</u></li> <li>▪ <u>Organize and supervise E&amp;S annual Audits</u></li> </ul>
Contractor	<ul style="list-style-type: none"> <li>▪ The Contractor(s) must include in their schedule of works, all</li> </ul>

proposed mitigation measures.

- The Contractor(s) must have designated personnel (Supervising Consultants) to monitor environmental, safety and health matters during construction works, and report regularly to the Developer.
- It is recommended that the Supervising Consultant Team include an Environment Management Specialist, who must be responsible for the day-to-day guidance of the project activities on environment and social compliance to the requirements of the Contract and legislation.
- [To develop a code of conduct that all the workers will read and acknowledge to abide by through signing](#)

## 2.6 PERMITS AND LICENSES

A list of some of the permits and licenses necessary for execution of the project are indicated in the Table below.

**Table 86: Permits and licenses required by the proposed development**

No.	Permit or License Name <sup>1</sup>	Issuing Authority	Responsible for acquiring the permit
1.	Certificate for Approval for ESIA for the project	National Environment Management Authority (NEMA)	Rural Water Supply and Sanitation Department (RWSSD) under the Directorate of Water Development (DWD)
2.	Surface Water Abstraction Permit	The Directorate of Water Resources Management (DWRM) under the Ministry of Water and Environment (MWE)	Operator
3.	Permit to carry out an activity in a wetland/river bank	NEMA	RWSSD
4.	Construction Permit	Sheema District Planning Office	Contractor
5.	Workplace Registration Certificate	Department of Occupational Safety and Health under the Ministry of Gender, Labour and Social Development (MGLSD)	Contractor
6.	Equipment Inspection Certifications	Department of Occupational Safety and Health/Ministry of Gender, Labour and Social Development (MGLSD)	Contractor
7.	Solid Waste Management License (to collect, transport, store, treat or dispose of	NEMA	Both the Contractor and Operator

<sup>1</sup> And any other permits or licenses prescribed by NEMA in the Certificate of Approval for the ESIA Report.



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	<i>waste)</i>		
8.	Effluent Discharge Permit	DWRM under MWE	Operator

## 3 PROJECT DESCRIPTION

### 3.1 Location of the Proposed Project

The project is located in Sheema District in Ankole sub-region of South-western Uganda. Sheema District is one of the new districts in Uganda. It was established by Act of Parliament and began functioning on 1<sup>st</sup> July 2010. Prior to this date, it was part of Bushenyi District. Sheema District is bordered by Buhweju District to the North, Mbarara District to the East, Ntungamo District to the South, Mitooma District to the South-west and Bushenyi District to the West. It lies approximately between Eastings 164750mE and 219250mE and Northings 9914850mN and 9954200mN. The district has a total land area of 698.3 Sq. Kilometres. Sheema District headquarters is located at Kibingo in Sheema Town Council, which lies approximately 33 kilometres by road, west of Mbarara, the largest town in Ankole sub-region. The headquarters lies at E: 206138m N: 9934156m and at average altitude of 1456m above sea level.

*Table 97: Demographic Characteristics of the Sub-counties of the Project Area.*

Sub-counties to be Served	Land Area (Km <sup>2</sup> )	House holds		Population			Density (No. / km <sup>2</sup> )
		Number	Average Size	Males	Females	Total	
Kyangyenyi	88.1	6,708	4.6	14,930	16,333	31,263	355
Kigarama	64.4	4,887	4.4	10,149	11,493	21,642	336
Masheruka	62.6	3,962	4.4	8,542	9,303	17,845	285
Shuuku	41.1	2,847	4.1	6,125	6,799	12,924	314
Kashozi	61.4	3,166	4.5	6,750	7,568	14,318	233
Rugarama	30.5	2,013	5.0	4,819	5,329	10,148	333
Sheema TC	47.1	3,654	4.3	7,568	8,350	15,918	233
<b>Total</b>	<b>395.2</b>	<b>27,237</b>	<b>4.5</b>	<b>58,883</b>	<b>65,175</b>	<b>124,058</b>	<b>298</b>

Source: Sheema District Planning Office

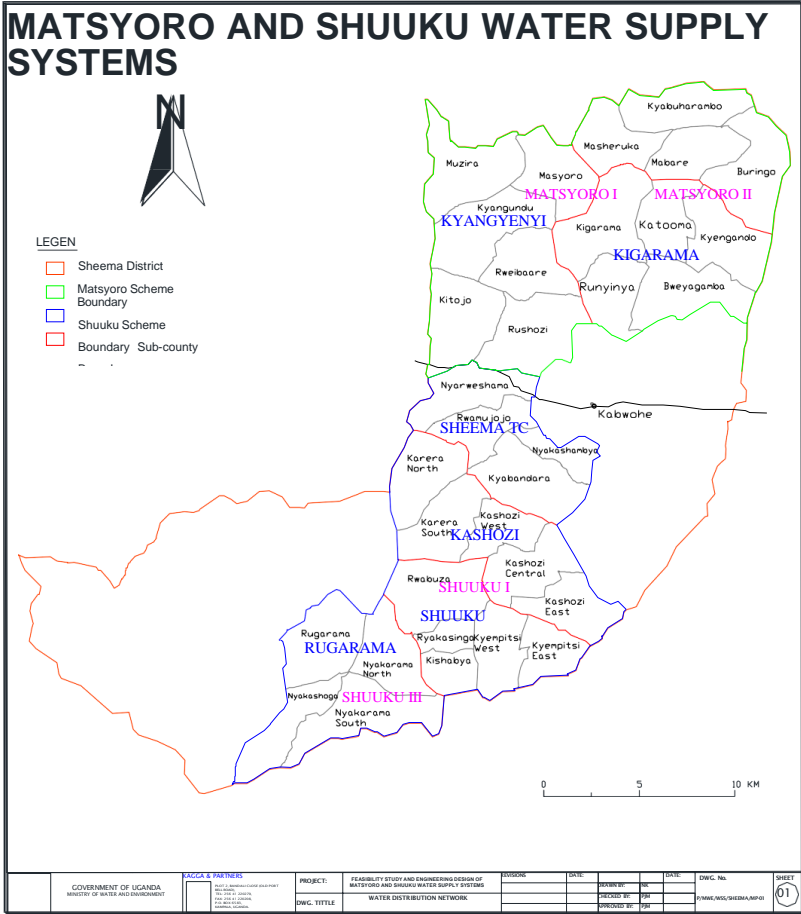


Figure 1: Map showing location of project area of Shuuku- Matsyoro Phase II

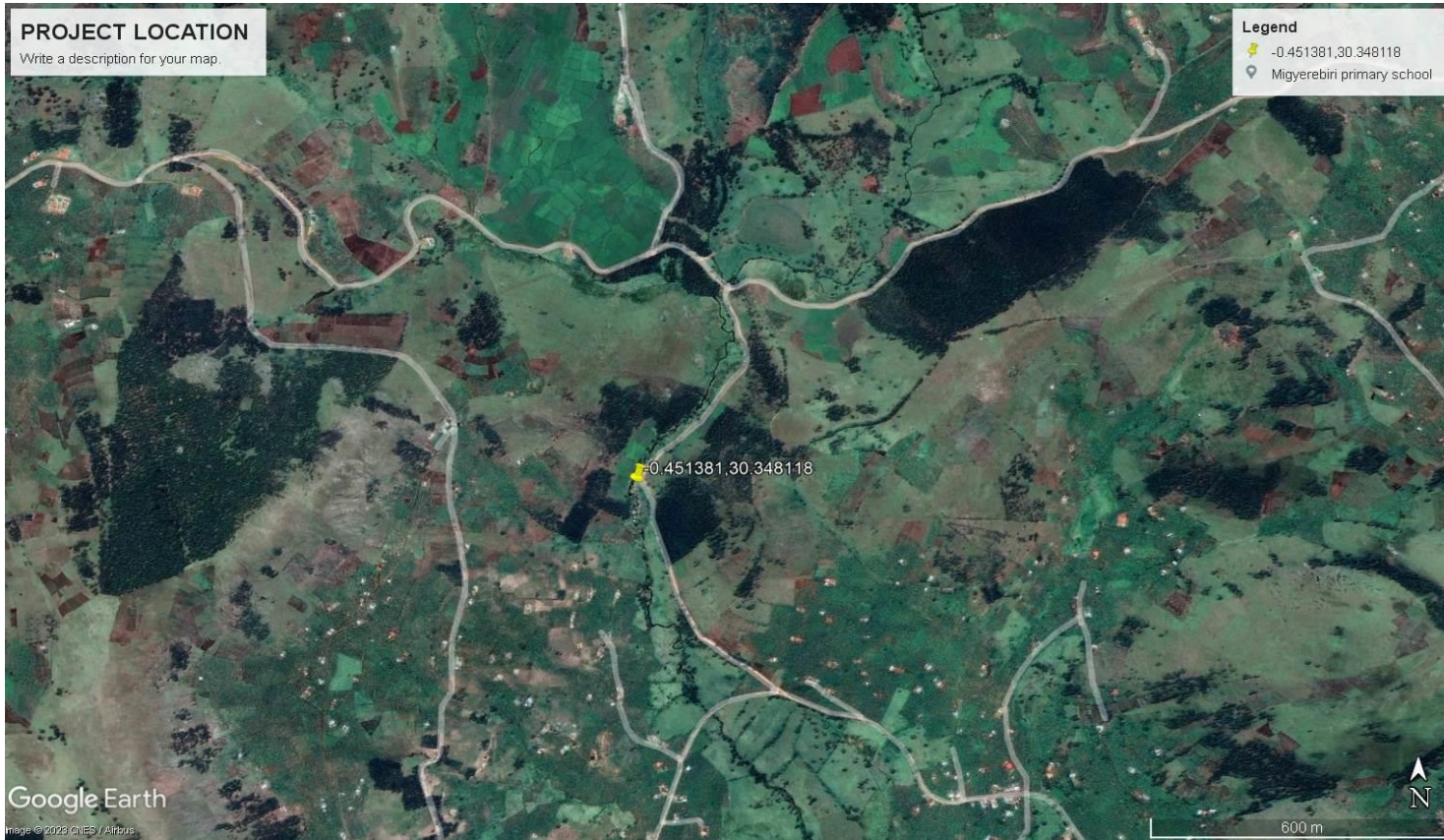


Figure 2: Google Map showing the location of the Project area

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### 3.2 Project Description and Design

A reinforced concrete weir will be constructed at a determined section across River Kitakure to channel raw water into the water treatment works.

#### 3.2.1 Water abstraction and Intake Works

The proposed abstraction and intake work for the raw water of Matsyoro WSS Phase II will be from River Kitakure at the GPS Coordinates **36M (204810.76mE; 9950049.73mS)** consisting of abstraction pipes and sedimentation tanks connecting to the transmission mains that convey water to the storage tank.

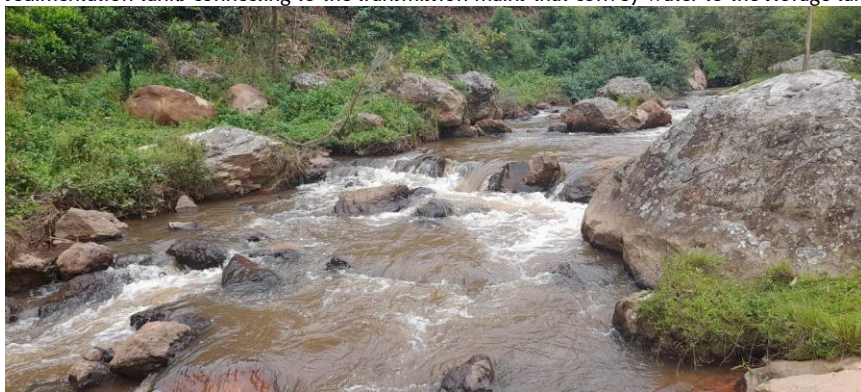


Plate 1: The proposed intake site on River Kitakure in Nyamitoma village; Matsyoro parish in Kyangyenyi Sub county

#### 3.2.2 Design of Treatment Plant

Based on the results of the quality of raw water of the proposed water sources, new installations of water treatment facilities will be required at Kitakure at coordinates **36M (204847.47mE; 9949983mS)**. The treatment works will provide a treated water output capacity of 3,500 m<sup>3</sup>/day on a 20-hour operation basis.



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**Plate 2: Proposed site for the Water Treatment Plant (WTP) about 100m away from the proposed intake site**

The treatment process will comprise of the following processes:

- ❖ Aeration
- ❖ Alum Dosing
- ❖ Flocculation
- ❖ Coagulation
- ❖ Clarification
- ❖ Filtration
- ❖ Disinfection/Chlorine Dosing
- ❖ pH Correction

**a) Aeration**

Aeration will be provided by a 5-step cascade aerator of concrete construction of width 4.20m. Each step is to be 0.50 x 0.50m. At a design loading of 35m<sup>3</sup>/h per meter width on the cascade aerator, overflow area of 28.35 m<sup>2</sup>, the aerator has capacity of 3,500 m<sup>3</sup>/day which is adequate. The structure is to be of reinforced concrete construction and applied with an elastomeric cementitious waterproof coating to internal concrete surfaces against leakages.

**b) Alum Dosing**

The Alum dosing unit will follow aeration. Two solution tanks one for mixing and the other for dosing each of 1250 litre capacity will be provided in the chemical dosing structure. They will both hold 48 hours of supply.

For the purposes of sizing of the solution tanks, a dosage rate of 80mg/l (alum solution) has been assumed to give the following storage and mixing facilities required for maximum throughput of 3,500 m<sup>3</sup>/day.

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Weight of alum = 431 Kg/d  
3 months storage = 40 tonnes

At 10% solution strength, the required flow rate is 1.79 l/min. A hand regulated gravity doser tap with constant level tank complete with float valve shall be installed. The Alum dosing unit will be provided with a shelter of 26G roofing sheets on 50x75 mm timber purlins at 1m centre to centre on 100x50 mm timber rafters on 100x50 mm tie and struts on 150x50 mm tie beam on 100x75 mm wall plates on 100mm dia. steel hollow poles. The Two 1250 litre mixing tanks and the Alum dosing unit will be seated on a mass concrete platform.

Aerated and alum dosed water will be delivered to flocculator mixing channel through two 250mm dia. outlet pipes.

**c) Mixing Channel**

Mixing of the water with aluminium sulphate (alum) will be achieved by a 13.23 X 0.45 X 0.85m deep mixing channel that allows a 104 seconds detention time.

**d) Flocculation/ Coagulation**

Flocculator comprising a baffled chamber of horizontal flow has been designed with channel flow velocity of 0.3 m/s. Flow velocity in the slots at the inlet end shall be 0.6 m/s gradually reducing to 0.3 m/s in the slots at the outlet end. The Flocculator will be built of reinforced concrete. The dimensions of the flocculator are as below:

- ❖ Length = 6.00m
  - ❖ Width = 2.22m
-

- ❖ Depth = 3.00m
- ❖ Inlet slot width = 0.2m
- ❖ Outlet slot width = 0.30m
- ❖ Baffle length = 2.65m
- ❖ Baffle width = 0.20m
- ❖ Baffle spacing = 0.77m

**e) Clarification**

The clarifiers comprise 2No. rectangular horizontal flow tanks in reinforced concrete. The tanks are designed for a surface loading of 1.5 m<sup>3</sup>/m<sup>2</sup>/hr to meet the design throughput of 3,500 m<sup>3</sup>/day. The dimension of each tank are as below:

- ❖ Length = 13.30m
- ❖ Width = 4.50m
- ❖ Depth = 2.92m

The clarifier inlet comprises of 16No. circular openings of diameter 200mm. The tank outlet consists of 2No. 200mm dia. pipe. Plastic lamella plates spaced at 100mm and inclined at 55° to the horizontal shall be installed in the tanks for improved efficiency to accommodate possible drastic seasonal variations in the turbidity of the raw water. An elastomeric cementitious waterproof coating shall be applied to the tank's internal concrete surfaces against leakages.

**f) Filtration**

The rapid gravity filters consist of 3no. units in reinforced concrete, each with a separate inlet to allow for closure of one during servicing and backwashing. At a design filtration rate of 10m<sup>3</sup>/m<sup>2</sup>/hr, a total filtration area of 17.50 m<sup>2</sup> has been designed to accommodate a production capacity in excess of 3,500 m<sup>3</sup>/d. Each bed will be of length 3.0 m and width 2.0m. The lateral pipe of the filters will consist of 96No. orifices on an 8 by 12 rectangular grid at a spacing of 265 by 260mm respectively. The structure will be coated with an elastomeric cementitious waterproof coating to the tank internal surfaces against leakages.

The filter media shall consist of:

Fine media: quartz sand; grain size 7mm; uniformity coefficient 1.2, depth 0.7m.

Support media: washed natural gravel 0.5m depth; 4 layers sizes 2-2.8, 5.6-8, 16-23 and 38-54mm.

**g) Backwashing for the Filter**

Backwash water at a rate of 65m<sup>3</sup>/m<sup>2</sup>/hr from a 100m<sup>3</sup> pressed steel tank on structure, elevated 7.0m above filter floor, through a 150mm diameter outlet. A 100 mm diameter pipe will be connected from the pumping main to deliver water into a 100m<sup>3</sup> pressed steel backwash tank installed at a higher ground to enable periodical backwashing of the rapid sand filters for water treatment works to remain functional. The backwash tank will also serve the office and the operators housing for their domestic water requirement.

**h) Disinfection /Chlorination**

Chlorination/ disinfection will be by calcium hypochlorite. Dosing of calcium hypochlorite will be by proportional-feeder dosing feeders for liquid chlorine solutions. The calcium hypochlorite solution will drip into the inlet chamber of the clear water tank by a mechanism for controlling the dosing rate. The dosing unit will consist of 2No. 100 litre chlorine mixing tanks and dosers at the inlet of the clear water tank.

The dosing rates will be as follows:

- ❖ Chlorine dosage= 2.0mg/l
- ❖ Chlorine required per day= 7,000g/d
- ❖ Chlorine concentration= 65.0%
- ❖ Quantity of powder required per day= 10,769g/d

- 
- ❖ Bruto required =9.8l/d
  - ❖ Chlorine solution strength=10.0%
  - ❖ Required Chlorine solution=98.0 l/d
  - ❖ Dosing rate =0.068l/min

**i) pH Correction**

The pH of the clear water will be adjusted to the acceptable range of the national potable water standards. pH correction will be done using soda ash. Dosing of soda ash will be by proportional-feeder dosing feeders for liquid soda ash solution. The soda ash solution will drip into the inlet chamber of the clear water tank by a mechanism for controlling the dosing rate. The dosing unit consist of 2No. 100 litre soda ash mixing tanks and dosers at the inlet of the clear water tank. The dosing rates will be as follows:

- ❖ Soda Ash dosage= 2.0mg/l
- ❖ Soda Ash required per day= 7,000g/d
- ❖ Soda Ash concentration= 65.0%
- ❖ Quantity of powder required per day= 10,769g/d
- ❖ Soda Ash required =9.8l/d
- ❖ Soda Ash solution strength=10.0%
- ❖ Required Soda Ash solution=98.0 l/d
- ❖ Dosing rate =0.068l/min

**j) Clear Water Tank**

A clear water tank of capacity 100 m<sup>3</sup> will be constructed at Kitakure at an elevation of 1610m. The tank will be a 5.0 x 50 x 4.5m deep reinforced concrete structure. The tank will have chlorine and soda ash contact time of 30minutes. The tank is to be constructed with all associated pipework, valves.

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**k) Clear water pump and main**

A pump of 175m<sup>3</sup>/h with 60m head and 125 kW power will be installed at the clear water tank to pump water through a 250mm diameter and 4,300m long pumping main into a storage reservoir tank at an elevation of 1585m. The pump with all associated pipework and electrical installations will be housed with a 2.0x2.5m blockwork pump house structure with concrete floor and corrugated galvanized roofing sheets.

**l) Ancillary Buildings**

Laboratory rooms, office, operator's house and stores together with their ancillary structures will be constructed at recommended locations at the site of the water treatment works. Fencing, security lighting and site water supply system will also be installed together with the drainage ditching.

**m) Power Supply**

Power supply requirement for the water treatment works is to be from the 3-phase UMEME grid to be extended from trading centre to the water treatment works. A standby generator will be required in case of power outage from the UMEME grid. The alternative to UMEME power is the solar power.

### 3.2.3 Treated Water Storage

The treated water storage will be provided by three 500 m<sup>3</sup> hot pressed galvanized steel plate ground tank on reinforced concrete support structure complete with pitched cover, internal pipework, level indicator, access ladder. The tanks will be constructed at Matsyoro at an elevation of 1620m with all associated pipework, valves. The tanks will form a balance between continuous supply and day demand in the distribution area.

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Plate 3: Proposed Site for the Water Reservoir tank in Nyamitoma village; Matsyoro parish in Kyangyenyi Sub county

### 3.2.4 Transmission Mains

Raw water mains will be laid from the raw water abstraction works at Kitakure intake and Matsyoro to the water treatment works at Kitakure. Table below gives the specific details of the two raw water mains.

Table 108: Specifications of the Raw water mains

	Matsyoro to Main Transmission Line	Main Transmission Line to Kitakure
Material	uPVC	uPVC
Diameter	200mm	250mm
Length	1,500m	3,900m
Pressure class	PN 10	PN 10

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### 3.2.5 Distribution Networks

The treated water from the storage reservoirs will be distributed to the various project service areas of Kyangyenyi, Kigarama and Masheruka sub-counties. Hydraulic designs for the distribution pipe network have been designed using EPANET 2.0 software. uPVC and HDPE pipes of sizes ranging from OD60- OD280 mm will be laid for distribution of water to the service areas. Table below summarizes the details of distribution pipeline for proposed Matsyoro WSS.

Table 119: Total Length of the Pipeline Distribution Network for Matsyoro WSS

Diameter(mm)	Material	Length (Km)
OD63	HDPE	11
OD90	HDPE	12
OD110	HDPE	34
OD160	uPVC	25
OD225	uPVC	9
OD280	uPVC	15
<b>Total</b>		<b>106</b>

The existing distribution pipes shall be re-used as secondary distribution lines as far as technically

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possible.

### 3.2.6 Sanitation Improvement

- ❖ Types of sanitation facilities proposed for the project area depend on the level of service for water supply and income levels.
- i) Water borne sanitation in the form of septic tank systems or central sewerage are proposed for house connections or for people with middle/ high income levels.
- ii) Onsite sanitation or non-water borne facilities for areas with low water consumption (e.g. yard tap or stand tap users)

A five stance public water borne toilet will be constructed at public place within the project area as selected by the District Authorities in each of the sub counties.

### 3.2.7 Service Connections

Households and institutions that would like to have private connections will be provided with the same. ~~Those that cannot afford a private connection will obtain water from yard taps in the neighbourhood. Public tap stands and water kiosks are discouraged because of abuse and wastage of water.~~

All water points shall be yard connections where people shall have to apply for the house water connections. Households and institutions that would like to have private connections will be provided with the same. 50 Those that cannot afford a private connection will obtain water from yard taps in the neighbourhood and this will be made accessible for everyone by charging fair tariffs. Public tap stands and water kiosks are not encouraged because of abuse and wastage of water.

### 3.2.8 Network Intensification

There are some parts of the proposed water supply areas where the trunk mains are adequate but the mains are too far away for the customers to be able to connect at reasonable cost. As a measure to increase the densification of the distribution networks as a drive to increase the customer base, and allow a neater layout of the service connection pipes, some pipe work intensification will be required.

The intensification lines will be demand-driven, and installed where there are adequate applications for connections. Estimated quantities for this item have thus been included in the Bills of Quantities to cater for this.

### 3.3 O&M Tools and Equipment

Part of the investment will be used to supply new O&M tools and equipment. Equipment will be supplied for the running the water supply system and well as equipping the water office. These will include;

- Plumbing Tools and Equipment,
  - Mechanical Tools and Equipment,
  - Electrical Tools and Equipment,
  - Miscellaneous Tools,
  - Chemical Equipment and Chemicals.
-

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### 3.4 Pipe materials

Pipe materials commonly used in Uganda include ductile iron (DI), steel, galvanized steel (GS), un-plasticized polyvinyl-chloride (uPVC) and High Density polyethylene (HDPE). The suitability of a given pipe type for a particular application is influenced by the following factors:

- Its availability on the market in respect of sizes and pressure classes.
- Its cost price and that of its associated valves and fittings.
- Susceptibility to corrosion, mechanical damage, ageing and other causes of material deterioration.
- Storage costs.
- Ease of transportation.

The design team recommended use of HDPE for piped of diameter of utmost OD 90 mm, while uPVC for larger diameters Shuuku-Matsyoro piped water supply based on the above factors. The minimum piped pressure rating we have recommended is PN10 because pipes with a pressure rating of PN 6 have lower thickness and prone to damage although they can be used when the static pressure is less than 50m.

### 3.5 Standards

The materials that will be specified for implementation of the scheme shall meet the relevant ISO specifications especially imported otherwise the materials must meet the national standards of the country in which they are manufactured and shall not be lower than the corresponding BS specifications. The existing UNBS, BS, ISO standards and also new standards by the same institutions will also be taken into account in the design of the water supply infrastructure.

The Civil Engineering standard method of measurement issued by the Institution of Civil Engineers, London, CESMM3, 1995 or an updated version CESMM4, 2012 shall be used as the standard for the preparation of bills of quantities in civil engineering work in Uganda unless a different method is stated and modified to suit local conditions.

### 3.6 Plants and Equipment

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

### 3.7 Construction Activities

#### a) Project Phases

- **Mobilization Phase** - This phase will involve mobilization of the construction human resource, equipment, construction materials, erection of temporary worker's camp and storage yard. The location of the project temporary camp will be agreed upon with the local leadership, landowners and contractor.
- **Construction Phase** - All project activities under this phase are supposed to be carried along the tracks, route and access paths within the boundaries of the identified project sites without disturbing or obstructing the neighbors and businesses. To ensure this, the contractors will seal off the site perimeter with corrugated iron sheets or other suitable material during project construction implementation. In case of trenches, proper barricade have to be applied to warn and protect the people of impending dangers of falling into open pits and trenches. Upon completion of preliminary activities and on-site investigations, actual construction of the project components and facilities will start which will involve:

- Setting out to demarcate rights of way, work areas, clearing limits. Access paths, detours, bypasses and protective fences or barricades should all be in place before construction begins.
- Excavation of trenches for water pipe lines;
- Trench sheeting and bracing to protect collapsible trench side walls;
- Placing concrete to bases of foundations;
- Laying of mains water pipes; and
- Backfilling, disposal of overburden and surface restoration to at least match the condition that existed prior to the water works construction.
- **Demobilization Phase** - Demobilization phase will involve clearing of the project site of all construction and unwanted material. The disposal of any unwanted material will be done by the contractor. The waste materials may include packaging, wood, steel crates, cardboard, wrapping materials, construction debris, boxes, sacks, drums, cans and chemical containers, etc. Damaged areas will need to be restored before commissioning the project. Upon completion of the contractor's obligations, the contractor will hand over the project to MWE, the client.
- **Operation Phase** - This will involve employment of operators both skilled and unskilled, operation of the water supply system, maintenance of the facilities put in place, etc.

**b) Construction Method**

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

**c) Plants and Equipment**

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

**d) Earthworks**

The earthworks including site clearance, general filling and excavation, and trenching can be carried out either by manual labor or mechanical equipment where large quantities are involved.

**e) Concrete works**

Concrete production is expected to be by the use of concrete mixers and/or manual production for the small works and where use of a mixer may be impractical.

**f) Structural Steel**

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

**g) Reinforcement Steel fixing**

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

**h) Masonry**

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

**i) Pipe laying**

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**Commented [AMCMU4]:** It is imperative to explain how the operation of the water supply system, maintenance of facilities put in place will be managed during the operation phase to ensure sustainability of the project. This should be added in table 5.

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

**j) Electro-Mechanical Installations**

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

**k) Implementation Schedule**

The main objective is to determine a total duration of the project, which equals a "critical path" of events that determine the total duration. The anticipated implementation schedule is as per Table below

*Table 1210: Proposed Project Implementation Schedule*

Activity	Duration (Months)
Tendering Process	4
Tender Evaluation	
Contract Negotiation and Award	
Construction of Works	18
Defects Liability Period	12
<b>Total</b>	<b>34</b>

**l) Estimated Number of Workers**

The contractor is expected to employ about 120 workers on the site both skilled and unskilled. However, this number may keep on fluctuating depending on the need and availability of resources.

**3.8 Quality Assurance**

It is the responsibility of the supervising consultant to ensure that the desired quality of work is achieved. The materials supplied for the works should not deviate from those specified. At each stage during the construction process, samples of materials have to be taken to the Materials Laboratory for testing to ensure conformance to the specifications.

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## 4 METHODOLOGY

### 4.1 Introduction

This section outlines the methodology that was used to assess the environmental and social baseline and to identify, predict & assess the environmental and social impacts of the project on each relevant environmental component. It also covers the methodology for the identification of mitigation and monitoring measures that was recommended to address these impacts and identification of relevant stakeholders. The methodology consists of a review of Uganda's institutional arrangements, regulations and policies. Environmental and social impacts of the proposed project will be predicted in relation to environmental and social receptors and natural resources while comparing prevailing pre-project conditions and post-project situations.

The requirement for environmental impact assessment in Uganda is set out by the *National Environment Act No. 5 of 2019* and the *Environmental and Social Impact Assessment Regulations of 2020*. This process will be guided by the Environmental Impact Assessment (EIA) Guidelines (NEMA, 1997) and the process is schematically presented in Figure 3.

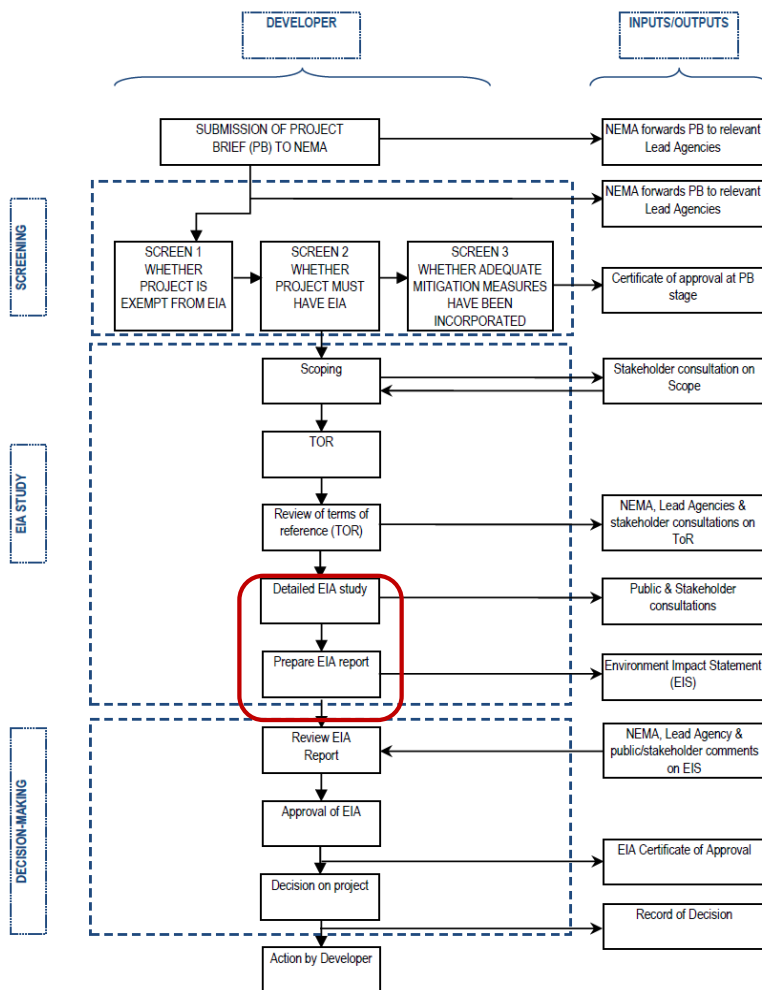


Figure 3: ESIA process that will be adopted as provided for under the Laws of Uganda

#### 4.2 Physical Environment Survey

Baseline ambient noise levels, air quality and water quality were measured, not only to inform construction contractors about the pre-construction conditions existing at proposed sites, but also the first annual environmental audit. These were determined through the following actions:

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#### 4.2.1 Ambient Noise Assessment

Baseline noise measurements were undertaken at locations around the proposed construction sites with potential receptors such as water abstraction point, proposed site for construction of water treatment plant etc. Measurements of ambient noise levels were carried out using a precision integrating sound level meter, with an active range of 0-130 decibels (dB) and complying with IEC 651 and ANSI S4 standards. A Casella CEL-621C digital noise logger was set to record for a sample period of 10 minutes at each of the selected locations. The assessment procedure involved recording the  $LA_{MAX}$  and  $LA_{MIN}$  decibel levels. Measurement points were recorded using a Global Positioning System (GPS) receiver and the noise sources together with the ambient environment at each location noted. The obtained results were compared against the *National Environment (Noise Standards and Control) Regulations, 2003*. The regulations require that persons to be exposed to occupational noise exceeding 85 dBA for 8 hours in a day should be provided with requisite hearing protection.

#### 4.2.2 Air Quality Assessment

Baseline air quality was measured using Digital MultigasRAE Meter for air composition (Oxygen, VOC and CO<sub>x</sub>), Casella Microdust Pro Digital meter (PM<sub>2.5</sub> concentrations) and a Ibrid MX 6 Portable Multi Gas Monitor (SO<sub>x</sub>, NO<sub>x</sub>). Measurement points or locations were selected basing on presence of potential receptors (such as construction sites for water treatment etc.) and an averaging period of 8 hours was used. For gaseous emissions.

- The equipment was powered on and left in measuring mode for the first two minutes to allow zeroing and self-calibration. This will be followed by 10 minutes of measurement to allow digital readings to stabilize before they could be recorded.
- Measurements were conducted at each of the selected points to determine whether there would be any gaseous emissions detected.
- Values for Carbon monoxide (CO), Oxygen (O<sub>2</sub>), Volatile Organic Compounds (VOCs), Sulfur oxides (SO<sub>x</sub>) and Nitrogen Oxides (NO<sub>x</sub>) were recorded.

For particulate matter.

- The equipment was allowed for two minutes for zeroing down and thereafter, it captured the samples for 5 minutes with an interval of 10 seconds.
- For every sampled point, a GPS coordinate was recorded.

### 4.3 Biological Environment Survey

#### 4.3.1 Flora Assessment

Transect walks were taken along the banks of River Kitakure and edges of the swamp; and records were made of the vegetation along the stretch. While some plant species were identified on site, specimens of others were collected and taken for confirmation at the Makerere University Herbarium. Additional information was obtained through consultation with communities on the local names, use and importance of some plant species. An inventory of the impacted vegetation was taken. The International Union for Conservation of Nature's Red List of Threatened Species (IUCN 2022) was utilized for categorization of species. Some of the tools that were used included: Plant press, Secateurs, Ivy tags, Measuring tape, Diameter tape and camera.

#### 4.3.2 Fauna Assessment

##### 4.3.2.1 Birds

Surveys were conducted along the areas planned for the water supply and sanitation systems. Bird species occurrences was surveyed through point count surveys using observations, hearing and consultations during

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which all species detected and encountered were recorded. Great emphasis was placed on species of conservation importance. Species identification was based on Stevenson and Fanshawe (2002) while some species were categorised according to IUCN (2022). Some of the tools that were used included: Binocular and camera.

#### 4.3.2.2 Butterflies

Random sweeping using sweep net was done (biodiversity rapid assessment) and it involved a transect walk through the areas recording all butterfly species encountered on wings. Sample specimens were taken for most of the species, except for those whose identification could be easily confirmed in the field. Opportunistic observations were included to help build the species list. Each of the butterfly species was assigned to one of the ecological categories (Akite, 2008). Some of the tools that were used include: insect net and camera.

#### 4.3.2.3 Herpetiles

Both reptiles and amphibians were surveyed using Visual Encounter Survey (VES) method (Rodda *et al.*, 2007). Visual Encounter Surveys were conducted by observation while walking through sites proposed for the project for a prescribed period of time, visually searching systematically along transects for animals. VES involved a search on the ground, trees and grasslands. Herpetiles were surveyed during the day from 08:00 am to 07:30 pm (Spawls *et al.*, 2006). Some of the tools that were used include: A camera and snake stick.

### 4.4 Social Environment Survey

#### 4.4.1 Stakeholder Identification and Analysis

A rigorous stakeholder analysis was carried out prior to the commencement and during the consultation process. This activity enabled the consultants to identify all the key entities- individuals, groups and communities, with a stake or those likely to be affected or to affect the proposed project in any way. Key stakeholders were identified at the national, regional, District, Town Council/Sub County and community level through interviewing experts, brainstorming and document review. Stakeholder identification and engagement is an on-going process that requires regular review and updating. Therefore, the stakeholder list was updated from time-to-time.

The ESIA team collected and analysed data and held consultations with various stakeholders and other interested and affected parties involved, to ensure that all existing data and information relevant to the assignment was obtained. The ESIA team undertook site survey to determine the area of influence and gathered information under several key areas such as:

- Socio-economic conditions in the surrounding communities such as health and infrastructure,
- Current land use in the proposed project sites.

Participatory stakeholder identification was used in identifying and analysing the key stakeholders, including planning for their participation. Therefore, it was the starting point of the participatory processes and provided the foundation for the design of subsequent stakeholder activities throughout this study. Identified stakeholders are summarised in Table 11 together with the method of engagement:

**Table 13: Categorization of Stakeholders to be engaged during ESIA**

Category	Identified stakeholders	Method of engagement	Role
National	National Environment Management Authority; Ministry of Gender, Labour and Social	Key Informant Interviews (KIIs)	NEMA is be responsible for the review and approval of ESIA's, post-implementation audits and

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Category	Identified stakeholders	Method of engagement	Role
	Development		<p>monitoring of approved projects.</p> <p>-Coordinate, inspect, supervise and monitor project activities to ensure that the environment and natural resources are not depleted but managed sustainably.</p> <p><u>In reference to ESIA approval conditions, NEMA requires the developer to undertake annual Environment and Social Compliance Audits during the project operation.</u></p> <p>-MGLSD under department of Occupational Health and Safety (OHS) is responsible for inspecting and registering the workplace and monitoring of conditions under which employees on the project are subjected <u>both during the construction and operation phases.</u></p>
Regional	Regional offices of the Ministry of Water and Environment including: Rural Water and Sanitation Regional Centres (RWSRCs), Umbrella of Water and Sanitation (UWS), NEMA, Water Management Zones (WMZs)	KIIs	Construction supervision including the implementation of the proposed ESMP and implementation of the WSPP.
District	District Local Government of Sheema. Specifically, the following offices of Water, Natural Resources, Planning, Health, Production and Community Development and the political wing including the Chairperson LC V and Councillors representing the beneficially areas.	KIIs	Mobilize support for the project. Monitor social-environmental impacts both during construction and operation phases.
Town Council/ Sub County	Town Council/Sub county Chief/Clerk, Community Development Officer, LC III Chairpersons	Focused Group Discussions (FGDs) and KIIs	Mobilize local communities and key stakeholders to participate in EIA consultations and/or public hearings.
Community	Local Council I, Landlords of sites where the water infrastructure will be constructed and any CBOs or	FGDs and KIIs	Develop construction (works) schedules in their respective areas.

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**Commented [JA5]:** What do you mean with Regional? It seems to be within Uganda

**Commented [U6R5]:** The Ministry of water and Environment has regional offices in the 6 regions within the Country which take on monitoring and supervisory role on behalf of the headquarters.

**Commented [AMCMU7R5]:** ESMP implementation doesn't have any supervisor at local level?  
The Water System Operator should be added as key stakeholders during operation phase. Always harmonize with other chapters.

Category	Identified stakeholders	Method of engagement	Role
	local NGOs in the sector		-Participate in the scheduled meeting regarding the project activities and progress -Identify mitigation measures of the environmental and social issues -Monitor the progress of the project activities Input in the planning and identification of water and sanitation facilities.

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#### 4.4.2 Sampling and Selection of Respondents

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

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

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Qualitative data was gathered to provide supporting details for the quantitative data collection surveys. Qualitative data collection was based on Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), and participatory methodologies including village transect walks.

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#### 4.4.3 Study Methods

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

An interview guide was used for both KIIs and Focus Group Discussions (FGDs) to elicit both baseline information and key concerns/issues from the selected key informants. KIIs and FGDs also aimed at information feedback, education and communication (Information, Education and Communication (IEC)) to both the interested and affected stakeholders/ community and the following questions were utilized for ESIA among others:

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- i. How will the proposed project for water supply and sanitation benefit the targeted communities?
- ii. How can the anticipated positive impacts and or benefits be enhanced?

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- iii. Do you feel the proposed project is likely to have risks and or impacts on the environment and the population? If yes, how will the proposed project impact negatively on the following aspects:
- Physical environment (geology and soils, hydrology and water resources (quantity and quality, visual and aesthetic quality, air quality, noise etc.)
  - Biological environment (vegetation and wild animals)
  - Social environment (land use, population, housing, employment, transportation and traffic, public services, utilities, public health and safety, cultural resources etc.)
- iv. Can you propose possible mitigation measures that can be put in place to ensure that the anticipated negative impacts are either avoided, minimized and mitigated from causing unintended harm to the environment or people?

**a) Document Review**

These include: existing data, existing environmental data, existing reports/documents, pre- and post-implementation of management/construction decisions, EIA reports and ESMPs in place. Examples of these documents include: Sheema District Development Plan, District State of Environment Report, Engineering Design Report for Shuuku-Matsyoro Water Supply and Sanitation System (March, 2016) etc.

**b) Key Informant Interviews**

Key Informant Interviews (KIs) were held with civil servants (e.g. Chief Accounting Officer, District Natural Resources Officer, District Environment Officer, District Community Development Officer, District Water Officer, Sub County Chiefs etc.), political leaders (LCV Chairperson, LC III Chairperson) and representatives of the management structures who are responsible for environmental management activities on various levels (e.g. the Village Natural Resources Management Committees). Key informants were interviewed and selected on the basis of their roles as leaders, specialized knowledge and experience on the subject under study.

**c) Focus Group Discussions**

Focus Group Discussions (FGDs) were held with stakeholders at Sub County, Parish and Village levels. FGDs were used as a qualitative approach to gain an in-depth understanding of social issues. The method aimed at obtaining data from a purposely selected group of individuals on the proposed project activities. Groups of people with the same social, economic and/gender characteristic were clustered together (with between 8-12 members each) and a guided discussion was held with these groups with the ultimate goal of eliciting community baseline information regarding the project development, impacts and issues of concern and the mitigation measures.

**d) Transect Walks**

Transect walks were carried around to gather more information through observation regarding the social and economic activities taking place, impact extents and also stimulating informal interaction with the community members and their experiences that helped in understanding the community dynamics in the project areas. A camera was used to take pictures of interest within the project areas that are presented in this report.

**4.5 Impact Assessment and Evaluation**

Based on the project details and the baseline environmental and social status, potential impacts as a result of the construction, operation and decommissioning of the proposed project activities have been identified. An impacts analysis criteria that takes into account the magnitude or intensity of impacts based on project activities and sensitivities in the project area that was identified in the environmental and social baseline. Impact characteristics considered are described in Table 11 and include:

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- Type of impact, where direct or indirect
- Status, where positive or negative
- Duration of impact
- Intensity of impact
- Likelihood of impact occurring
- Spatial extent of area of impact
- Sensitivity of receptor of impact

The first six parameters give a sense of magnitude of impact, which together with sensitivity; result in an overall severity of impact.

**Table 1412: Impact Assessment and Evaluation**

Criteria	Description
Type of Impact	<ul style="list-style-type: none"> <li>▪ Direct - An impact that appears immediately as a result of an activity of the project. For example, the loss of vegetation is a direct impact of site clearing. The direct impacts would be experienced mainly during the construction process, and include effects on the physical environment, health and safety of the construction workers.</li> <li>▪ Indirect - An impact that is related to the project but that arises from an activity of the project at a secondary level. For example, the demand for supplies and services may cause indirect impacts on the local economy by increasing indirect employment opportunities.</li> </ul>
Status	<ul style="list-style-type: none"> <li>▪ Positive</li> <li>▪ Negative</li> </ul>
Duration	<ul style="list-style-type: none"> <li>▪ The lifetime of the impact; this is measured in the context of the life-time of the proposed development. Whether the Impact will be:               <ul style="list-style-type: none"> <li>▪ Intermittent – not occurring at all times.</li> <li>▪ Temporary-only for a short period.</li> <li>▪ Short term - the impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase.</li> <li>▪ Medium term - the impact will last for the period of the construction phase, thereafter it will be entirely negated.</li> <li>▪ Long term - the impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter</li> <li>▪ Permanent</li> </ul> </li> </ul>
Intensity	<ul style="list-style-type: none"> <li>▪ Whether or not the intensity (magnitude) of the impact would be high, medium, low or negligible (no impact). An attempt to quantify the impacts of components on the affected environment will be described as using following definitions:               <ul style="list-style-type: none"> <li>▪ Negligible</li> <li>▪ Low - where impact alters the affected environment in such a way that natural processes of functions are not affected in any significant way.</li> <li>▪ Moderate - where the affected environment is altered, however, function and process continue, albeit in a modified manner.</li> <li>▪ High - where function or process of the environment is seriously altered and disturbed to the extent where it temporarily or permanently ceases.</li> </ul> </li> </ul>
Spatial Extent	<ul style="list-style-type: none"> <li>▪ The physical and spatial size of the impact; a description of whether the impact would occur on a scale described as follows:               <ul style="list-style-type: none"> <li>▪ Site - whether the impact will be within limited locale of the project site / study area affecting the whole or measurable portion of the area.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>Local - whether the impact will affect the environment or communities along the border of the study area or in the extended area adjacent to the site or perhaps outside the immediate environment.</li> <li>Regional - whether the impact extends beyond the study area affecting areas on a regional scale.</li> </ul>
Likelihood	<ul style="list-style-type: none"> <li>The probability or likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The probability that a certain impact will occur on scale described below: <ul style="list-style-type: none"> <li>Uncertain - insufficient information to determine its probability. Because the precautionary principle is followed, this increases the significance of the impact.</li> <li>Improbable - the impact is unlikely to occur.</li> <li>Probable - the impact could possibly happen, and mitigation planning should be undertaken.</li> <li>Highly probable - it is most likely that the impact will occur at some or other stage of the development.</li> <li>Certain - the impact will take place regardless of any prevention plans, and only mitigatory actions can be relied on to contain the effect.</li> </ul> </li> </ul>
Sensitivity	<ul style="list-style-type: none"> <li>Degree of change effected on natural processes or people's livelihoods; the sensitivity of the receptor of the impact to change <ul style="list-style-type: none"> <li>Very low</li> <li>Low</li> <li>Moderate</li> <li>High</li> </ul> </li> </ul>

62 Table 13 below presents a quantitative format for ranking impacts based on parameters above, summarised as magnitude and sensitivity.

**Table 1513: Quantitative Rating of Impacts**

Significance			Sensitivity			
			Very low	Low	Medium	High
Magnitude	Very low	1	1 Negligible	2 Minor	3 Minor	4 Minor
	Low	2	2 Minor	4 Minor	6 Moderate	8 Moderate
	Medium	3	3 Minor	6 Moderate	9 Moderate	12 Moderate
	High	4	4 Minor	8 Moderate	12 Moderate	16 Severe

Table 14 below presents the overall impact rating criteria, with illustrations of such impacts.

**Table 1614: Overall Impact Rating and Description**

Overall Rating	Impact	Description of Impact	Significance
Severe		<ul style="list-style-type: none"> <li>Non-compliance with national policy, environmental laws and regulations</li> <li>Highly noticeable, irreparable effect upon the environment</li> <li>Significant, widespread and permanent loss of resource</li> <li>Major contribution to a known global environmental problem with demonstrable effects</li> </ul>	>12

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Overall Rating	Impact	Description of Impact	Significance
		<ul style="list-style-type: none"> <li>▪ Causing mortality to individuals of a species classified as globally or regionally endangered</li> <li>▪ Major exceedance of water/air quality and noise guidelines representing threat to human health in long and short term</li> <li>▪ Causing widespread nuisance both on and off site</li> <li>▪ Extensive property damage or loss,</li> <li>▪ Widespread effects on livelihoods.</li> </ul>	
<b>Moderate</b>		<ul style="list-style-type: none"> <li>▪ Frequent breaches of national regulations, including water/air quality and noise guidelines, wetlands and river banks regulations causing localised nuisance both on and off site</li> <li>▪ Noticeable effects on the environment, reversible over the long term.</li> <li>▪ Localised degradation of resources restricting potential for further usage</li> <li>▪ 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 but returning to normal in the medium term</li> <li>▪ Elevated contribution to global air pollution problem partly due to preventable releases</li> <li>▪ Unplanned immigration flows</li> <li>▪ Increased traffic in sensitive environments</li> <li>▪ Increased serious crime rates</li> <li>▪ Widespread physical resettlement, affecting livelihoods</li> </ul>	6 – 12
<b>Minor</b>		<ul style="list-style-type: none"> <li>▪ Noticeable effects on the environment, but returning naturally to original state in the medium term</li> <li>▪ Slight local degradation of resources but not jeopardising further usage</li> <li>▪ Disruption/disturbance to normal behaviour of a globally or regionally endangered species returning to normal in the short term</li> <li>▪ Small contribution to global air problem through unavoidable releases</li> <li>▪ Elevation in ambient water/air pollutant levels greater than 50% of guidelines</li> <li>▪ Infrequent localised nuisance</li> <li>▪ Population increase not expected to stress existing infrastructure</li> </ul>	2 – 4
<b>Negligible</b>		<ul style="list-style-type: none"> <li>▪ No noticeable or limited local effect upon the environment, rapidly returning to original state by natural action</li> <li>▪ Unlikely to affect resources to noticeable degree</li> <li>▪ No noticeable effects on globally or regionally endangered species</li> <li>▪ No significant contribution to global air pollution problem</li> <li>▪ Minor elevation in ambient water/air pollutant levels well below guidelines</li> <li>▪ No reported nuisance effects.</li> <li>▪ Temporary or intermittent changes to livelihoods or life quality aspects</li> </ul>	< 2

#### 4.6 Identifying Mitigation Measures and ESMP Preparation

Possible mitigation measures considering all the project implementation phases have been identified and described in detail. Measures and actions to address negative impacts have followed the risk management hierarchy of avoidance and prevent, minimization, mitigation or restore and compensation. Measures proposed are in compliance with the Ugandan legislation and those of the AfDB Performance Standards.

The ESMP is well defined with performance indicators, targets and acceptable criteria that can be tracked over defined periods, with estimates of the resources and responsibilities for implementation. The ESMP format is flexible to ensure the integration of project specific mitigating, enhancing and monitoring requirements. The ESMP's scope and level of details is proportional to the number and complexity of the measures required to ensure the project's environmental and social sustainability.

The following components constitute the minimal contents of an ESMP:

- a) *Objectives of the ESMP* - This section specify what the ESMP aims to bring the project into compliance with applicable national environmental and social legal requirements and the Bank's safeguards policies and procedures. The other objective of the ESMP is to outline the mitigating/ enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate or compensate for adverse environmental and social impacts, or to enhance the project beneficial impacts. It also addresses capacity building requirements.
- b) *Context the ESMP* - briefly describes project activities and major environmental and social components that will likely be affected positively or negatively by the project. It describes and analyses the physical, biological and human conditions prevailing in the project area, highlighting relevant environmental and social issues among others.
- c) *Beneficial and Adverse Impacts* - This section focuses on beneficial impacts that can be enhanced to improve the project environmental and social performance as well as on adverse impacts that require mitigation measures to be minimized or compensated.
- d) *Enhancement/Mitigation Measures and Complementary Initiatives* - This section proposes feasible and cost effective measures to address the impacts previously defined, in order to accrue project benefits through enhancement measures or to reduce potentially adverse environmental and social impacts to acceptable levels (mitigation measures).
- e) *Environmental and Social Monitoring Program* - A monitoring program aims to ensure that mitigation and enhancement measures are implemented, that they generate intended results and that they are modified, ceased or replaced when inappropriate.
- f) *Responsibilities and Institutional Arrangements* - The implementation of enhancement and mitigation measures and the completion of the monitoring program require to clearly establish responsibilities among the various organizations involved in project implementation and operation. The ESMP proposes support to the organizations that may have insufficient capacities to fulfill their obligations. This support could be provided through various means including technical assistance, training and/or procurement.
- g) *Estimated Cost* - This section estimates the capital and recurrent cost associated with the various proposed measures (enhancement and mitigation), the monitoring program, consultations, complementary initiatives and institutional arrangements.

Table 15 provides a summary template for Monitoring Requirements.



**Table 1715: Summary Template for Monitoring Requirements**

Phasing	Mitigation Measure	Parameters to be Monitored	Location	Measurements	Frequency	Responsibilities	Cost
Pre-Construction Phase							
Construction Phase							
Operation and Maintenance Phase							

A monitoring program aims at ensuring that mitigation and enhancement measures are implemented, that they generate intended results and that they are modified, ceased or replaced when inappropriate. Further, it allows assessing compliance with national environmental and social policies and standards. A monitoring program include two parts:

- a) *Surveillance activities* - The surveillance aims to ensure that the proposed mitigation and enhancement measures are effectively implemented during the construction phase.
- b) *Monitoring activities* - These activities consist in measuring and evaluating the project impacts on some environmental and social components of concern and to implement remedial measures, if necessary.

The program defines as clearly as possible the indicators to be used to monitor the mitigation and enhancement measures that need to be assessed during project implementation and ~~the~~ operation. The monitoring program also provides technical details on monitoring activities such as methods to be used, sampling locations, frequency of measurements, detection limits, and definition of thresholds that will signal the need for corrective actions. The process for establishing a monitoring programme consist of the following actions:

- Specific management and monitoring objectives;
- Identification of the scope of monitoring;
- Recommend appropriate monitoring environmental and social aspects and technology;
- Specify how the information collected should be used in decision-making;
- Define the spatial boundaries and select map scales and sites for observation, measurement or sampling;
- Select key indicators for direct measurement, observation or sampling;
- Define how the data will be analysed and interpreted and how it should be presented in monitoring reports;
- Define the precision and accuracy required in the data;
- Consider compatibility of data to be collected with historical data and with related contemporary data;
- Set minimum requirements for monitoring

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## 5 BASELINE CONDITIONS

### 5.1 Physical Environment

#### 5.1.1 Topography

The topography of Sheema District is characterized by high hills of Keishegunju, Kyangyenyi and Nshongi hills in Kyangyenyi Sub-County, Bwayegamba hill in Kigarama Sub-County and Muhito hills in Kitagata and Kasaana Sub counties. In addition, Sheema District has numerous undulating hills, low-lying plateaus, valleys, swamps and wetlands with numerous streams (draining much of the low-lying areas) and rivers like Rwamuganga and Kooga Rivers. These features lie between 1,350 – 1,950 meters above sea level as shown in the plate below.



Plate 4: Topographical view of the project area.

### Sheema District Water Supply Project - Topography

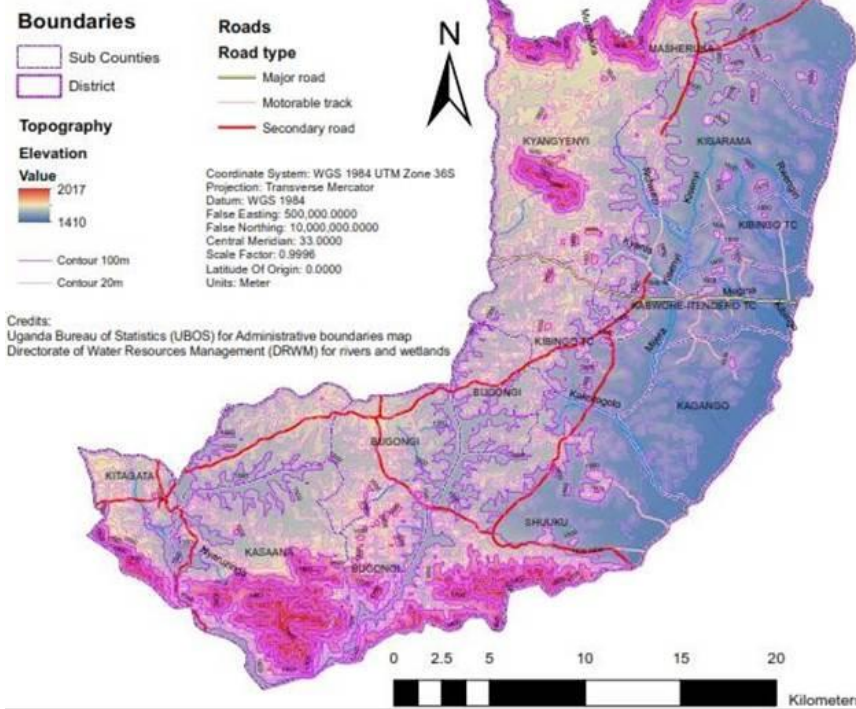


Figure 4: The Map of Sheema District showing the elevation and the contours

#### 5.1.2 Climate

The project area receives between 1000 – 1520mm of rainfall annually with a mean annual rainfall of 1255mm. It has got two rainfall maxima which coincide with the two equinoxes. The mean annual maximum temperature ranges from 22°C to 30°C and the Mean annual minimum temperature ranges between 12°C to 20°C.

There are four seasons:

- ❖ January to February, there is a short dry spell,
- ❖ March to June there is a wet season,
- ❖ June to August is a long dry season, and
- ❖ September to December is a long wet season.

This climate is conducive and suitable for agricultural activities carried out in the district as it provides continuous access to water and agricultural production.

#### 5.1.3 Geology and Soils

The project area of Sheema is largely characterised by Precambrian rock comprising large argillaceous

sediments now seen as slates, phyllites and micaschists. These rocks are extensively metamorphosed and granitized.

The water abstraction point for Kitakure river is situated in high grade metamorphic rocks (Rukungiri suites) full of granitic gneisses which are competent rocks that can withstand erosion. The drawback for these rocks is that they are sometimes foliated and highly jointed due to the high grades of metamorphism. Migyera-Ibiri water source is within quartzitic sandstones due to degree of compactness of the quartzite and the stability of the mineral quartz in the quartzite and can withstand both flooding and climatic changes outside the water source. Themylonites are indicators of regional intense ductile deformation and brecciation. Due to the intense parent rock deformation, these rocks are unstable and may be regions prone to erosion in case of severe flood.

All the water source and project area are entirely covered by ferralitic soils. These soils are believed to have formed during oxic conditions. They are of a high porosity, high permeability and a low organic matter content which makes them unconsolidated and thus prone to erosion.

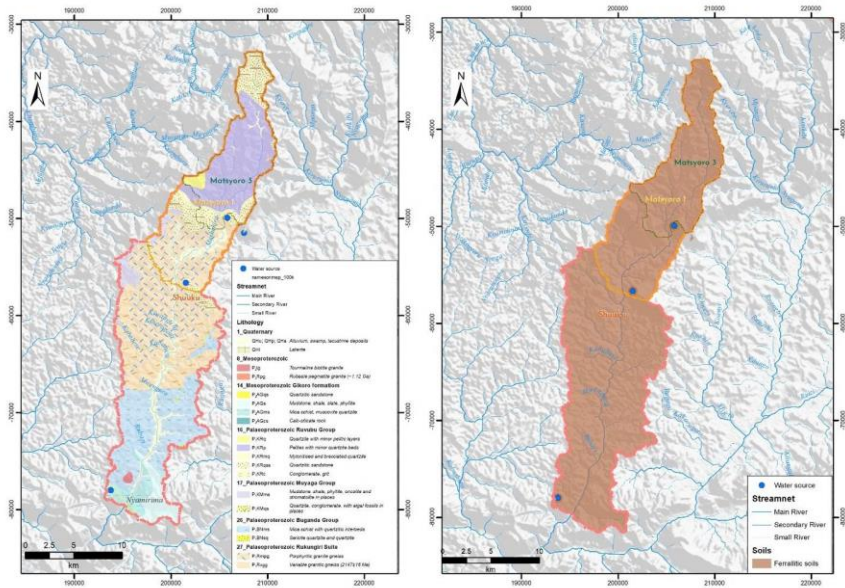


Figure 5: Geology and Soils for Kitakure Water Source Catchment



Plate 5: The soils and rocks within the project area near the Kitakure River

#### 5.1.4 Hydrology

Sheema District is located within the Lake Victoria Drainage sub-basin, and within Lake Victoria Water Management zone. Sheema District has no lake but a few small rivers and numerous seasonal streams that drain the low lying areas. The seasonal streams and small rivers are interconnected through a network of wetlands that covers most of the low lands as shown in the map below. The vast majority of the wetlands are covered with papyrus or are seasonally wet. Analysis of the maps from NEMA shows that 68.9% of the wetlands are seasonal while 17.2% is covered with sedges/papyrus. Thus, only 13.9% of the wetlands is permanent.

With neither lakes nor major rivers, the streams, springs and groundwater are important sources to supply water for domestic and commercial use in the District. The available small rivers are connected to a system of wetlands where they drain to. On the steep slopes are streams and springs which drain to the valleys and eventually the wetlands. The flow rate for R. Kitakure and Kyarwera in Matsyoro is 52.9l/s and 302.0l/s respectively during a dry season. In Shuuku side, the Nyakabwera and Ruhorobero springs have a flow rate of 8.4l/s and 13.9l/s respectively during a dry season.

**Commented [UA8]:** What are the flow rates of the river during the rain seasons (especially at the intake point)

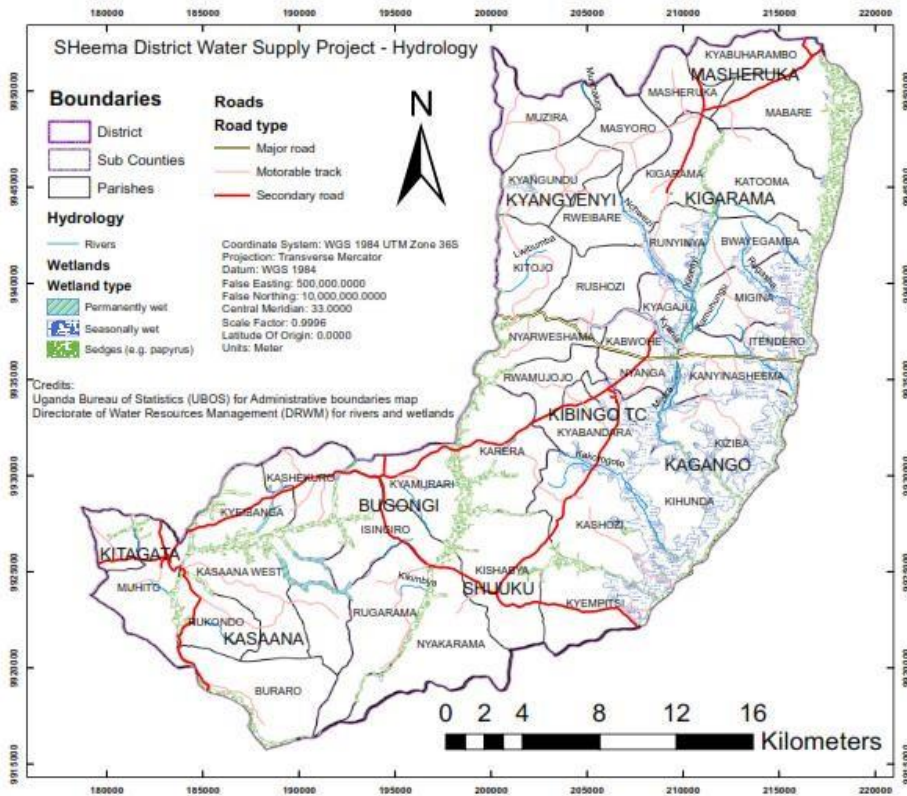


Figure 6: The general hydrology of Sheema District

### 5.1.5 Water Resources

The project area generally stands at a low slope gradient running into perennial rivers/streams which forms the water collection points in and around the project area boundary. The major surface water bodies within or close to the project area are streams that feed into Rivers of Kitakure, Migyera-Ibiri and Matsyoro. Boundaring the rivers are swamps which form part of the drainage eco-system surrounding the project area. The pictures below show River Kitakure.



Plate 67: River Kitakure which is the main water resource within the project area

#### 5.1.6 Noise Levels

There are no cases of noise pollution at the proposed intake. Thus the project site indicates a generally pristine environment with respect to ambient noise. However, as would be expected due to the increased human activities and construction activities noise levels are likely to increase.

The levels are based on land use Category D (Residential plus Industry or small scale production and commerce) for which daytime and night limits are 60 and 50 dBA, respectively according to the National Environment (Noise Standards and Control) Regulations 2003. All measurements were conducted during daytime.

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#### 5.1.7 Air Quality

The ambient air quality is assumed to be good as there are no major industrial sources of air emissions. The primary sources of air emissions in the area are automobiles (vehicles and motor cycles). Fugitive dust is attributed to vehicular movements along loose surface/murram roads, which dust levels, are exacerbated during dry, sunny and windy periods. Air quality measurements indicated a reasonably clean environment with respect to air quality

All the assessed parameters were within the within permissible values in accordance with the NEMA (Draft Air Quality Standard for Ambient Air) and IFC, 2007 Standard. There were no detectable levels of NO, NO<sub>2</sub>, CO, H<sub>2</sub>S, Cl<sub>2</sub>, ClO<sub>2</sub> and SO<sub>2</sub> at all measurement locations.

### 5.2 Biological Environment

#### 5.2.1 Flora

The project area's natural vegetation has been degraded and largely replaced by crop lands, farmlands and tree plantations such as Eucalyptus. The grasslands cover 19.7% of the land use. Pastures and tropical trees are common under this land use class. Open grazing areas have scattered stands of planted eucalyptus that are used as building materials and fuel wood.

The vegetation in the catchment area is short-savannah woodlands with scattered trees covering the hills. This vegetation merges into marsh and papyrus in river valleys throughout the catchment. Eucalyptus woodlots are

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common in the swampy valleys which presents water reliability issues. Some areas are predominantly covered by grassland, short herbs and shrubs. The natural vegetation is largely simplified and/or cleared to open up space for agriculture. Most of the plant species recorded are classified at Least Concern by IUCN status and these included: *Cyperus papyrus L.*, *Cassia mimosoides*, *Ageratum conyzoides*, *Digitaria abyssinica*, *Hyparrhenia filipendula*, *Melinis repens*, *Guizotia scabra*, *Andropogons chirensis*, *Perenni rufus*, *Conyza floribinda*, *Cyperus latifolius*, *Pavetta ternifolia*, *Melanthera scandens*, *Panicum trichocladum*, *Paspalum scrobiculatum*, *Kalanchoe crenata*, *Ocimum lamiifolium*, *Phragmites mauritanus*, *Polygonumsp.*, *Phoenix reclinta*, *Euphorbia candelabrum*, *Vernonia amygdalina*, *Diospyros abyssinica*, *Croton megalocarpus*, *Euphorbia tirucalli*, *Water lilies* and *Vossia cuspidata* and other vegetation useful for making handicrafts among others. All are fairly common and widely occurring species as shown in the plate below.



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Plate 7: The vegetation types (*Cyperus papyrus*) within the project area of Kitakure River

### 5.2.2 Fauna

There is generally low species diversity across the catchments probably due to disturbance that already exists from cultivation, cattle ranching, infrastructure for human settlement and the eucalyptus savannah that provides very few micro habitats for exploitation by different butterfly species and communities. Butterflies belonging to three families Pieridae, Nymphalidae and Hesperidae were encountered across the project area. *Belenois creona* and *Mylothris rubricosta* family Pieridae were the most encountered followed by *Bicyclus vulgaris* and *Ypthima asterope* family Nymphalidae.

Reptiles and amphibians are a unique group of vertebrates and are very sensitive to changes in their environment such as habitat loss and modification. The Amphibians recorded included: Flat-backed Toad (*Amietophrynus maculatus*), African Common Toad (*Amietophrynus regularis*) and Reed frog (*Africalus quadrivittatus*). One of the common reptiles encountered was the Monitor lizard (*Varanus exanthematicus*). There were no endangered amphibians and reptiles recorded, and even if they did occur, it is not likely that there will be a large population in the kind of landscape of such species.

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Plate 8: *Amietophrynus maculatus* and *Afrixalus quadrivittatus* within the project area

Birds are some of the most widely used indicator taxon for monitoring human mediated impacts on the environment. Most of the birds recorded in the area were encountered close to this natural habitat mix. There is a long stretch of wetlands across several villages within the catchment areas, with several streams flowing through that provides refuge to bird communities as a natural habitat. One endangered species according to IUCN red list i.e. Grey Crowned Crane (*Balearica regulorum*) was recorded. Generally, the following bird species were recorded: Black-and-white Mannikin (*Lonchura bicolor*), Common Waxbill (*Estrilda astrild*), Bronze Mannikin (*Lonchura cucullata*), African Fire finch (*Lagonosticta rubricate*), Fan-tailed Widowbird (*Euplectes axillaris*), Spectacled Weaver (*Ploceus ocularis*), Grey-headed Sparrow (*Passer griseus*), Fork-tailed Drongo (*Dicurus adsimilis*), White-crested Helmet-shrike (*Prionops plumatus*), Collared Sunbird (*Hedydipnacollaris*), Grey-backed Camaroptera (*Camaroptera brachyuran*), Ross' Turaco (*Musophaga rossae*), Hadada Ibis (*Bostrychia hagedash*), African Pied Wagtail (*Motacilla aguimp*) among others. Common migrant species included: Grey Heron (*Ardea cinerea*), Ring-necked Dove (*Streptopelia capicola*) and Cattle Egret (*Bubulcus ibis*). All with the exception of the Grey Crowned Crane (*Balearica regulorum*) are listed as Least Concern (LC) on the IUCN red list of threatened species.



Plate 9: Left to Right-*Passer griseus*, *Ardea alba* and *C. Motacilla aguimp*

### 5.2.3 Land Use

The major land use in the project area is subsistence agriculture, growing mainly annual crops such as Maize, Irish potatoes, Sweet potato and beans. Eucalyptus woodlot on hilltops and valleys along wetlands. The woodlots are primarily for sale for building materials although sometimes, fuel wood is also harvested. Other crops grown include wheat, barley in the higher areas, vegetables in the wetlands, tree tomatoes (as a fruit) and bananas. Settlements are concentrated on the higher areas or hill tops while gardens are on lower slopes and in the valleys.

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Patches of small scale farmlands, woodlots and wetland changed from one use/cover to another from one period to another. Small scale farmland gained from all the land use/covers, but lost to all the land use/cover apart from grassland. Small-scale farmland mainly exchanged its acreage with the woodlots. Patches of small scale farmlands, woodlots, and wetland changed to use/cover form one period to another. Although the tropical high forest lost more than it gained, it only gained and lost to small-scale farmland and woodlots; while grassland mainly lost to small-scale farmland and woodlots. In order to reduce on land use/cover change, the terraces that used to control land degradation should be rehabilitated and stabilised; while other soil and water conservation practices like trenches and grass bands, should be included within the terrace.



Plate 10: Subsistence crop growing within the project area of Matsyoro.

## 5.3 Social Environment

### 5.3.1 Population

- ❖ The total population of Sheema District as per the 2014 National Population & Housing Census (NPHC) provisional results was 211,720 of which 111,069 were females and 100,651 were males.

The 2018 total population for Kitakure water source catchments projected from UBOS's 2014 population by parish census figures and annual population growth rate of Sheema district is 1.2%, for Sheema District is 177,243. During the design stage, Initial Year of 2020 and the Future Year of 2030 and Ultimate year of 2040 were considered. The basic data for the domestic population are the UBOS Population and Housing Census 2014 figures. It is expected that the institutional, Industrial and commercial activity will grow at the same rate as the domestic population.

### 5.3.2 Economic Activities

#### a) Agriculture

Agriculture is the main economic activity within the project area, most households practice subsistence farming while commercial farming is practised at a lower rate, depending on land size and ownership. The good soils and climate within the catchment areas favour cultivation of crops such as bananas, beans, cereals, tea, millet and coffee, and fruits such as pineapples. Cattle grazing is also practiced within the catchment area, but at a small scale.

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Plate 11: Cultivation of banana within the project area

The catchment areas are endowed with streams and wetlands most of which feed into River Rwizi. The area has Kyarwera wetland, Kandekye wetland, Kibimba wetland, Nyakiraguru River, Kibimba River and Kitakure River. Fishing is practiced on Kyarwera wetland but on a small scale.

#### b) Tourism

The project area has a big potential for the tourism industry that includes among others: Kitagata Hot Springs; the hills of Kyangyenyi and the **Malsyoro** ranges.

#### c) Commercial activities

Community members practice a number of commercial activities, which include; retail and wholesale shops, bars and restaurants, lodges and hotels, petrol stations and other small enterprises such as, flour making/milling, winery and honey selling.



Plate 12: Drying of the harvested Coffee within the project area

#### d) Industries

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This project area has small scale industries that include coffee factories and maize mills.



Plate 13: Some of the Coffee factories within the project area

#### e) Trading and retail business

There are retail and small business trade in trading centres selling groceries, solar phone charging, alcohol, soft drinks, tailoring, and produce. Other business are small drug shops, bars, motorcycle and bicycle repairs, shoe repairs and entertainment.

#### 5.3.3 Sanitation

The sanitation situation in the catchment area is has improved where the total latrine coverage is at 95% according to the Ministry of Health (Sanitation and Hygiene Situational Analysis January 2014). There are settlements at the upstream of which most of the populations do not have latrines. Open defecation was reported to be common in some parts of the project area of Sheema. During the field visits and consultations with communities it was observed that most households lacked latrines or proper sanitation facilities.

During the site visits, open defecation along streams, water source points (springs), access roads, paths and gardens was commonly seen in the project area. In some villages where there has been attempts to install latrines they are sited near streams or at the banks. The consultant was informed that the District Health officer working with the subcounty Health Inspector and Health Assistants conducted some sensitization and enforcement to improve the sanitation situation within the area. A new pit was being dug on the higher ground within the recommended 30m distance from the stream. Village Health Teams (VHTs) are employed in each sub county to sensitize and create awareness regarding sanitation and hygiene in the project district.



Plate 14: The type of the pit latrines within the project area of Matsyoro

Some of the challenges and reasons given for poor latrine coverage was the rugged terrain and rocky surface that makes it difficult to dig pit latrines using hoes. Poor sanitation and open defecation pose a serious threat to the quality of the water resources in the catchment subsequently affecting the downstream users as well. When it rains all the storm water washes the faecal matter into the streams and rivers and other water

**Commented [UA9]:** Sanitation is a big issue in the project area, which a high risk on water pollution and contamination of water born disease

**Commented [CN10R9]:** The project will come up with sanitation and hygiene promotion activities to ensure the sanitation status is improved.

**Commented [AMCMU11R9]:** It is important to integrate the cooperation between VHTs and the developers during operation phase to ensure efficiency and to enhance the impacts. This should be specified in the SEP

sources, while pit latrines dug along streams and in water logged areas with high water table contaminates the water sources through direct contact and seepage into ground water. [The project will construct public sanitation facilities (one per sub county) in an area agreed upon by the district/sub county authorities to augment the sanitation situation in public places as well as continuous sensitization using Information, Education and Communication (IEC) materials will be used to further demonstrate the importance of good sanitation practices within the project area.]

#### 5.3.4 Existing Water Sources

The project area is currently served by water schemes like Shuuku- Matsyoro GFS I, Masyoro I & II water supply scheme located in Sheema North and Shuuku water supply scheme in Sheema South. The existing Matsyoro water supply scheme, located in Kyangyenyi, Kigarama and Masheruka sub-counties, has 2 separate lines Masyoro I and II. The two schemes are gravity flow schemes and were constructed in 1990-1992. Water sources that currently supply these water supply systems (Masyoro I and II) are located in Masyoro Parish of Kyangyenyi Sub-county and Masheruka Parish of Masheruka Sub-county respectively.

Currently, the two schemes supply water to 40% of the population of the sub-counties of Kyangyenyi, Kigarama and Masheruka. The other water sources identified were Katojo GFS, Katagata GFS (which supplies Kabwohe town), Kamahembe GFS all these get water from Kyangyenyi Hills. The Shuuku Gravity Flow Scheme was constructed in late 80's and reconstructed early 2003 to increase on its capacity, the system serves less than 40% population of the sub-counties of Shuuku, Kashozi, Sheema and Rugarama. This system currently has dry zones. The capacity of these two schemes have been stretched beyond limits.



Plate 15: The Matsyoro System which is part of the Shuuku- Matsyoro GFS Phase I

#### 5.3.5 Solid Waste Management

Waste generated by homesteads in the project area is largely domestic organic waste. The organic waste is taken back to plantations or gardens to use as manure and mulch or fed to livestock. In rural growth centres, waste is collected in small heaps and left to rot. Plastic and other synthetic waste is dumped anyhow and small amounts can be found in rural growth centres, in roads and the watercourses. Some of the synthetic waste especially metal & plastic is taken occasionally as "scrap". Plastic waste is sometimes collected and burnt.

Commented [UA12]: Is it enough?

Commented [CN13R12]: Continuous sensitization using IEC materials and sanitation demos will also be used to promote good hygiene and sanitation practices.

Commented [AMCMU14R12]: This should be added to the capacity assessment (TABLE 5) and to the SEP.

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Plate 16: Indiscriminate Solid Waste Disposal within the project area

### 5.3.6 Transport and Communication Networks

The major type of transport to the proposed project area is road transport. The road to the project area is a loose access murrum road. The modes of transport on this road are mainly public commuter taxis, motorcycles and privately owned vehicles. Across the Kitakure river is a temporary bridge made of poles to ease crossing



Plate 17: The existing temporary bridge made of poles to ease crossing near the proposed intake on River Kitakure



Plate 18: The existing access road to the project area (which connects to Buhweju District)

### 5.3.7 HIV/AIDS and other communicable diseases

According to the Uganda National Institute of Public health Report July 2022, HIV/AIDS still presents a serious threat to socio economic development of Sheema district even when the district HIV positivity rate decreased but remained persistently >3% yearly with the significant reduction in the trend of HIV positivity rate from 2.0% in 2017 to 1.7% in 2021. During the construction stage of the proposed project, there is usually an influx of people in the area due to the employment opportunities offered by the project. A major ~~factory~~ construction project site can have far reaching impacts on the surrounding communities resulting from increased trade, migrant labour and mobility of populations, which all lead to the rise of HIV/AIDS prevalence rates and other communicable diseases like Tuberculosis and –Viral Hepatitis among others. It is also likely that due to improved incomes, there will be a higher probability of engaging in risky sexual behaviours by the workers with the communities. Further still, the construction activities might lead to creation of stagnant water thereby providing breeding places for mosquitoes which in turn will lead to increased malaria cases in the area. The project should therefore put control measures in place to guard against the increase of the diseases in the area that are likely to emerge as a result of the project.

### 5.3.8 Employment

Along the project area, the main employment opportunities are limited to farming and animal grazing. According to the results from the socio economic survey, 1% of the households were salaried workers. Paid employment in the district is mainly at the various local government offices, schools, health facilities and in Non-Governmental Organizations.

During community consultations, the project was looked at as a source of employment for the community especially during both the construction and operation phase. However, based on the low educational levels of the majority of people in the area, most of them can only be employed as casual labourers during construction. However, during the operation phase, plumbers, office attendants, managers, supervisors, mechanics will all be required. The employment opportunities are therefore regarded as of high value since they are not easy to come by in the area.

### 5.3.9 Trading

Small scale businesses are a common activity for the people living in the trading centres. Trade and businesses include retail shops, carpentry, maize mills, restaurants, sale of agriculture produce like matooke, vegetables, tomatoes, and milk among others. Some of the products are sold from roadside markets along the road. The markets have specific days in the project area. Brick making, stone quarrying and sand harvesting are common economic activities along the project area in the district. Boda-boda riding was also a common activity in the district especially in trading centres.

### 5.3.10 Food security

Matooke, sweet potatoes, Posho, millet, rice and cassava were the most common carbohydrates consumed by households in the project area while meat, beans and groundnuts were the most consumed proteins. Greens were the most common vitamins consumed by households within the project area.

The above results portray a highly subsistence way of living which makes life so dependent on land and natural forces with poor or limited planning for the future. The project planners should therefore ensure that, there is limited damage to food crops as population solely relies on subsistence agriculture for survival.

Commented [UA15]: Be more specific on employment opportunities during operation phase

Commented [AMCMU16R15]: Noted. Identified gaps should be added in table 5 (above)

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### 5.3.11 Security and Public Health

Security in the project area was reported to be stable. According to the different stakeholders consulted there has not been any insurgency or threats to security in the area for a long time.

Locally, the police, the Sub County and the LC systems are in control. Several police posts were cited along the proposed project. Other organs in place are the District Internal Security Offices (DISO) which works hand in hand with the Gombolola (Sub County) Internal Security Offices (GISO) in matters of security intelligence. To the project, cooperation with the security organs in place would be paramount to the security of the project's resources and the area in general. There are also a number of health facilities in the project area ranging from Health Centre II to Health Centre IV and all these aim at increasing access to timely and quality maternal, child and reproductive healthcare services and the HIV counseling and testing services

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### 5.3.12 Gender

Generally women in the project community are considered inferior and are involved in the entire house hold work, farming, and apiary, charcoal burning, fetching wood fuel and stone quarrying for their livelihood. Men range with cattle for months in search for pasture and water. Most families are being taken care of by women since men are busy grazing.

Like in many other rural parts of the country, men in the district are the major owners of land and main decision makers as regards land and other household property. From consultations with local authorities it was revealed that land belongs to the family and the man as the head of the household has a right to make all decisions. Women do not inherit land and have little say over land. However, it was revealed that crops on any given land belong to both men and women although men still have the upper hand over them. The trend is the same along the project area.



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## 6 PROJECT NEED AND ANALYSIS OF ALTERNATIVES

### 6.1 Introduction

This Section evaluates available options to the proposed action, so as to arrive at the most environmentally friendly alternative, which maximizes economic, social and technical benefits resulting into minimal or insignificant environmental impacts. Abstraction of surface water and piped water supply system activities need proper and adequate management in terms of construction activities, occupation health and safety, solid waste management, water quality control, biodiversity management plans, socio-economic issues and re-alignment issues. During review of the engineering designs for the Shuuku-Matsyoro WSS II, the EIA team was actively involved. The environmental considerations were crucial in the process. The developer has further prepared an ESIA report which would be submitted and approved by NEMA and the funders.

### 6.2 No Project Alternative

Analysis of the “no project option” as an alternative provides an environmental baseline against which impacts of the proposed action can be compared. This alternative means that the project area will be left in its original state. The alternative ignores all positive impacts likely to be realized in Sheema District due to the proposed Shuuku-Matsyoro WSS II like Income to material/ equipment suppliers, consultants and contractors; availability of skilled and unskilled job opportunities for residents, especially youths, in the project area during construction; improved quality and quantity of water supplied; reduced morbidity and increased productivity of households; and increased enrolment of children in educational institutions; better livelihood opportunities and induced development and employment opportunities. Besides, project development and operation will provide considerable economic opportunity for material/ equipment suppliers, construction contractors and other project-relevant professionals. The challenges brought about by using unsafe water like spread of communicable diseases and moving longer distances especially by women and children to collect water from wells and springs will be lessened, ~~and Small scale irrigation scheme development in the area.~~

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This option implies that the existing situation prevails (status quo remains) i.e. no construction of Shuuku-Matsyoro WSS II. This option is mostly applicable in situations where the proposed project area is in ecologically or socially sensitive areas and the negative impacts will be of significance and no proper mitigation measures can be formulated to eliminate or minimize the impacts to manageable or acceptable levels. Shuuku-Matsyoro WSS II runs through less ecologically sensitive and no households will be displaced. The land will be secured by Sheema District Local Government in consultation with Kyangenyi Sub-County specifically, the land for the intake points, reservoir tanks, sedimentation tank and for the water offices. The transmission lines will pass along road reserves and to some extent in people’s croplands. However, ~~Resettlement Action Plan (RAP) will be conducted and the Project Affected Persons (PAPs) will be identified and will be compensated where applicable the land amounting to about 4 acres was secured by the Sheema District Local Government without any encumbrances.~~

The No Project Option is the least preferred option from both the socio-economic, health and partly environmental perspective because individuals, institutions and the business communities would be subjected to continuous access to unsafe and unreliable water sources and lack of access to sanitation systems. On this basis, the ‘No Project Alternative’ is rejected as option to be carried forward for the Project and project implementation option is maintained.

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### 6.3 Alternative water sources

Selection of an intake (water source is a complex and lengthy process that involves the examination and balancing of a number of technical and environmental planning issues. One of the most important factors considered here is the yield (amount of water that can sustain supply for a long/specific period of time). The analysis of alternative sites looks at other possible sites that could have suitably been used to implement the project. The alternative water sources were considered and have been discussed exhaustively in sections below.

### 6.4 Water Resources Assessment

#### 6.4.1 Point Water Sources

The localities rely on springs, boreholes, shallow wells, and streams as their main water supplies. Because individuals are compelled to draw water directly from open water bodies or engage in illicit activities there, low safe water access and functionality have an influence on open water sources. However, these streams easily dry up during the dry periods. Communities also depend on rainwater harvesting in the institutions like schools and the health centres however, this water source is only reliable during the rainy season.

#### 6.4.2 Shallow wells

No wells were identified as potential water sources for the Shuuku-Matsyoro water supply project. Whereas groundwater sources are available, the yields of the available wells are generally low with more than 63% of the wells analysed having low yields. Using these wells for the project would require a battery of at least many wells spread in different geographical locations with successful drilling. Although the groundwater is likely to have a minimum water treatment system, the groundwater-based design with a battery of production wells will most likely have a longer transmission pipeline and a generally higher pumping costs.

#### 6.4.3 Surface Water Assessment

There are a number of streams and rivers within project area. Some people also rely on these streams for water supply like washing clothes and making of bricks especially during the rainy seasons in some cases. However, these streams easily dry up during the dry periods. Rainwater harvesting is done by the institutions like schools, markets and the health centers within the project area and this water source is only reliable during the rainy season.

#### 6.4.4 Ground Water Potential

According to the Victoria [Water Management Zone \(WMZ\) –\(2012\)](#), the success rate of drilling boreholes with yields of more than 0.5m<sup>3</sup>/h in Sheema District varies from 50% to more than 75%. However, most of the boreholes failed the water quality test. The Victoria WMZ report described the water quality of the boreholes as being marginal to poor water quality with the quality parameters exceeding Maximum Acceptable Values (MAV). Figure below is an extract of the drilling success map of Sheema showing also water quality at sub-county level. Since the success rates in the maps are indicative and the maps scale used is not suitable for detailed siting, data from 19 boreholes drilled in Sheema district are analysed further in the following sections.

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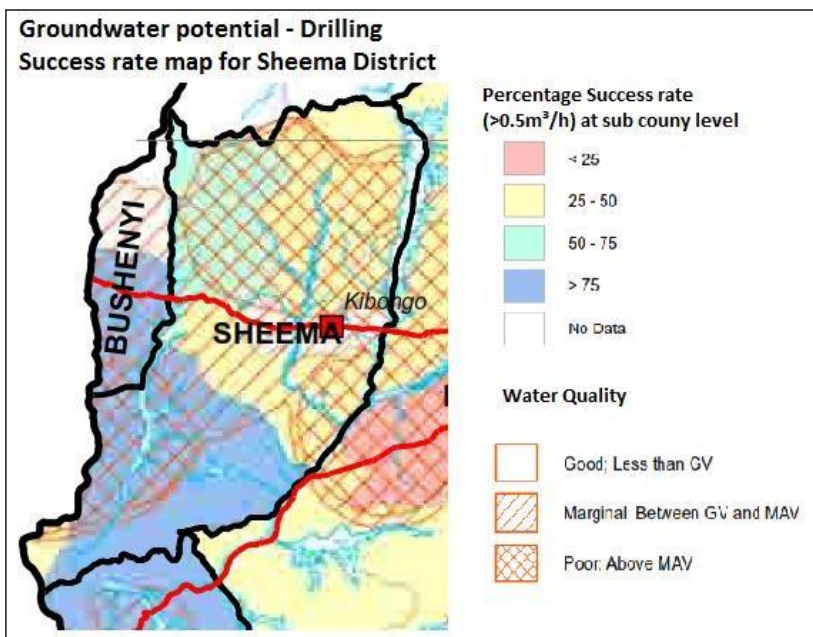


Figure 7: Drilling success rate map for Sheema District.

Source: Extract from Drilling Success rate Map for Victoria Water Management Zone (Victoria WMZ, 2012).

#### 6.4.5 Review of existing borehole data

A total of 19 boreholes within the project area were reviewed. Only 13 wells had water strikes during drilling translating into 68% success of getting water. Further, only 10 wells had an appreciable constant flow ranging from 0.6m<sup>3</sup>/h to 7m<sup>3</sup>/h. The distribution of the well yields in Sheema District is as presented in the table below.

Table 1816: Summary of yield distribution of Boreholes in Sheema District

Yield range	No. of boreholes	Percentage (%)
Above 10m <sup>3</sup> /h	0	0
Between 5m <sup>3</sup> /h to 10m <sup>3</sup> /h	1	10
Between 3m <sup>3</sup> /h to 5m <sup>3</sup> /h	1	10
Between 0.6m <sup>3</sup> /h to 3m <sup>3</sup> /h	8	80



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report (Victoria WMZ, 2012) present a discouraging potential of using groundwater for water supply. Therefore, it will not be further considered as a feasible option to satisfying the water demands.

#### 6.4.6 Field based water resources potential estimates

Based on the information obtained from district water personnel and some of the community, the only reliable sources of water are the nearby swamps which are used for domestic and livestock watering. The area is mountainous with limited potential of groundwater water such as boreholes except protected springs. Protected springs provide good quality water. Some of these are seasonal while others are temporal or remain with very minimal discharge to sustain the water demand even up to a village level.

#### 6.5 Environmental and Social Considerations

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

- **Noise and proximity of housing:** The proposed water scheme infrastructure was judged to lie sufficiently distant from dwellings and settlements; that adequate separation distances could be achieved to avoid noise nuisance during both the construction and operation phase given the nature of the development. In addition, apart from the vehicle movements, the noise in this kind of project is minimal.
- **Site Topography:** The project areas especially for the intake is located on a lower altitude compared to the end users. More so the main reservoir will be located on a high altitude compared to end water users.
- **Land ownership:** The proposed site for the intake and other water infrastructure was secured by MWE and Sheema District Local Government. The transmission lines will pass along road reserves but where peoples land will be affected, local leaders and the local communities have been engaged. Resettlement Action plan (RAP) shall be conducted for survey, valuation and subsequent compensation for those whose property will be affected during the construction especially the transmission lines and for some of the water infrastructures. They are no resettlement issues.
- **Community Opinion:** Water supply systems elsewhere in Uganda have not attracted local concern and resentment among the local residents. Likewise, in the case of the Shuuku-Matsyoro Water Supply System phase II, the development would not have much significant negative impact on the dwelling and settlements. The communities consulted welcomed the proposed project.

#### 6.6 Technical and Design Considerations

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

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

#### **6.7 The Action Alternative as Described in this ESIA**

This option implies that MWE continues with the implementation of the proposed project as per the project designs and recommendations by different stakeholders. We have made a comprehensive Environmental study for the proposed project area. Details of the study are the subject of this ESIA report. The study has found no significant issues (environmental, economic or social) to stop the implementation of the project. Mitigation measures for the identified negative impacts of this alternative have been thoroughly discussed throughout this Report. If they are implemented as proposed, the project will not do any damage to the environment. It is here thus we recommend that this alternative is the most appropriate.

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## 7 STAKEHOLDER ENGAGEMENT

### 7.1 Introduction

Consultation with relevant stakeholders and regulatory institutions was carried out to ensure participation of relevant stakeholders, as recommended by the National Environment Act, No.5 of 2019, EIA Regulations (2020), and conduct of Environmental Practitioners (2001) and guidelines for EIAs in Uganda. The consultations aimed to identify and take note of environmental and social concerns and views of all the stakeholders at an early stage so that appropriate mitigations are incorporated in the final implementation plan for the proposed project.

Stakeholders meetings were held at Sheema District, Kyangyenyi Sub County. The consultation process ensured that their concerns were captured and have been addressed during ESIA. A wider intensive consultation process was carried out during the Environmental and Social Assessment.

Informal conversational interviews and observations were the key data collection methods applied. The consultation process ensured that their concerns were captured and addressed. A wider intensive consultation process was carried out during the Environmental and Social Assessment. In general, the majority of stakeholders supported the project and found it to be beneficial.

### 7.2 Stakeholder Consultations

The primary purpose of the stakeholders' consultations was to provide an overview of the project to the relevant agencies, stakeholders and all the communities where the Shuuku-Matsyoro Water Supply System II components are to be located and therefore impact on the communities. It further helps them to understand how the MWE and the project team will operate to the highest possible environmental, social, health and safety standards prior, during and after the construction of the Water Supply System related infrastructure.

The specific objectives of the Consultations were:

- i) obtain an understanding of the number and types of stakeholders in the socio-economic study area
- ii) To provide information about the project and to tap stakeholders' information on key environmental and social baseline information in the project area
- iii) To provide opportunities to stakeholders to discuss their views, opinions and concerns
- iv) To manage expectations and misconceptions regarding the project
- v) To discuss potential impacts and verify significant or major environmental, social and health impacts identified.
- vi) To inform the process of developing appropriate mitigation and management measures as well as institutional arrangements for effective implementation.
- vii) To inform stakeholders about the engagement process and grievance management
- viii) To provide a mechanism for ongoing stakeholders engagement and ways in which the stakeholders can continue to participate in the stakeholders engagement process
- ix) Ensure regulatory requirements and project standards are met.

Stakeholder consultations and Public participation during the ESIA process were conducted in line with the requirements of the National legislation and regulations. According to the National Environment (Environmental and Social Assessment) Regulations, 2020, Part III under section "Procedure for Undertaking Scoping and Environmental and Social Impact

Study”, Sub-section 16; “Stakeholder consultation during the environmental and social impact study”, stakeholder consultation is crucial during the ESIA study.

### 7.3 Stakeholder Identification and Analysis

#### 7.3.1 Stakeholder Identification

A stakeholder may be defined as ‘any individual or group who is potentially affected by the project or can themselves affect the project. To develop an effective stakeholder involvement programme, it is necessary to determine exactly who the stakeholders are based on their roles, influence, objectives and priorities specific to the project. The ESIA team formulated a stakeholder matrix and identified key stakeholders who were engaged during the study. A stakeholder engagement plan was drafted and populated with additional stakeholders during the ESIA study. The study targeted individuals, groups/institutions and communities that have a stake in the priority water project. Thus, only such entities as identified in the stakeholder analysis were selected to participate in the consultation process.

When identifying and prioritizing stakeholders, the following aspects were considered:

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

#### 7.3.2 Stakeholder Analysis

The stakeholder categories and sub categories identified are presented in Table 16-18 below.

**Table 16-18: Stakeholder Matrix**

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Category	Stakeholder	Description and key attributes
Funder	African Development Bank (AfDB)	<ul style="list-style-type: none"> <li>▪ To ensure that the Banks Operational Safeguards have been observed and implemented as appropriate.</li> <li>▪ Support the project with funding</li> </ul>
National Level Stakeholders	Ministry of Lands Housing and Urban Development (MoLHUD)	<ul style="list-style-type: none"> <li>▪ Approves all reports presented by the consultant regarding valuation</li> </ul>
	Ministry of Gender, Labour and Social Development (MoGLSD)	<ul style="list-style-type: none"> <li>▪ Protection of human rights and vulnerable social groups.</li> <li>▪ Occupational and community health and safety of roads.</li> <li>▪ Approval and monitoring of the social safeguards</li> <li>▪ Approval of permits like workplace permits, OHS</li> </ul>
	Ministry of Water and Environment (MWE)	<ul style="list-style-type: none"> <li>▪ Overall mandate to monitor, assess and regulate water resource</li> <li>▪ Monitor and guide the use of wetlands for sustainability and other water bodies within the project areas</li> <li>▪ Approval of the Water abstraction permits</li> <li>▪ The implementer of the Project</li> <li>▪ Overseeing and monitoring the project activities</li> </ul>



	NEMA	<ul style="list-style-type: none"> <li>▪ Regulation of the environmental aspects of the project(s).</li> <li>▪ Legally mandated to handle certain critical environmental issues</li> <li>▪ Provide the necessary permits and approvals for quarries, borrow pits and other auxiliary sites</li> <li>▪ Work closely with the project team to handle all matters related to environmental protection</li> <li>▪ Overall clearance of ESIA and other project briefs about the project facilities.</li> <li>▪ Monitor and supervise the ESIA compliance</li> </ul>
Local Governments	District (Sheema District Local Government)	<ul style="list-style-type: none"> <li>▪ Mobilize various stakeholders including the communities/beneficiaries</li> <li>▪ Monitoring and supervision support for the implementation of the projects.</li> <li>▪ Offer security to the project team <a href="#">and project infrastructure</a>(RDCs Office)</li> <li>▪ Review the ESIA and give comments (Environment Office)</li> </ul>
	Kyangyenyi Sub County (Technical and political staff)	<ul style="list-style-type: none"> <li>▪ Make decisions that may affect the project,</li> <li>▪ Offer support and supervision of the project</li> <li>▪ Help in the identification of the location of the water and sanitation facilities.</li> </ul>
	Local Councils	<ul style="list-style-type: none"> <li>▪ Mobilize communities</li> <li>▪ Offer support in the planning, implementation and operation of the project</li> <li>▪ Offer support in the identification of the locations of the water and sanitation facilities</li> <li>▪ Monitoring of the projects</li> <li>▪ Provide social justice to vulnerable communities</li> <li>▪ Incorporate information about the project in their teachings, gatherings/meetings for acceptance especially regarding water and hygiene-related information.</li> </ul>
	<a href="#">System Operator</a>	<ul style="list-style-type: none"> <li>▪ <a href="#">Operation and maintenance of the water system</a></li> <li>▪ <a href="#">Billing of the water consumers</a></li> <li>▪ <a href="#">Offering security to the water facilities</a></li> <li>▪ <a href="#">Cooperation with other stakeholders involved in the project such as MWE, VHTs,...</a></li> </ul>
Different Community groups	Traders, landlords, tenants, business people, affected persons (Landowners who offered land for the	<ul style="list-style-type: none"> <li>▪ Develop construction (works) schedules in their respective areas.</li> <li>▪ Participate in the scheduled meeting regarding the project activities and progress</li> </ul>

	project installation) facilities'	<ul style="list-style-type: none"> <li>▪ Identify mitigation measures of the environmental and social issues</li> <li>▪ Monitor the progress of the project activities</li> <li>▪ Input in the planning and identification of water and sanitation facilities.</li> </ul>
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### 7.3.3 Formal Meeting with the Stakeholders

The project had an inception workshop where all the stakeholders were invited as a start meeting to inform all the stakeholders about the project. MWE organized the meeting to inform all stakeholders about the project, its objectives, the intended activities, the project extent, and the related studies to be undertaken, including ESIA, water-related studies, source of water among others. The main object was to solicit, potential impacts and possible mitigation measures and also solicit initial community responses. The stakeholders were able to express comments and queries during these meetings as seen in the minutes in the table below.



Plate 19: Consultants and MWE Officials interacting with the RDC and CAO at SDLG



Plate 20: Consultants, MWE officials, Sub county officials and local community members during the site visit to one of the existing Matsyoro system under phase I



Plate 21: Consultants, MWE officials, RDC, Sub county officials and local community members during the site visit to the proposed Kitakure Intake

### 7.3.4 Key informant interviews

Key informant interviews (KIIs) were held with individuals who were assumed to have specific information related to the project. Some of these were pre-set while others were identified during the interactions with other stakeholders. Some of such stakeholders included; The Local Council V-Five (LCV) Chairperson's office of Sheema, the District Engineers office, the District Health Office, Community Development Officer (CDO), District Environment Officers among others.

### 7.3.5 Community Meetings

Communities were sensitized about the project to ensure the participation and active involvement of the local community members in the baseline survey and subsequent water interventions. Mobilization of the communities was done through the chairpersons of the respective villages. Both women and men attended these meetings and a number of issues were raised. All the community meetings were conducted in local and understandable language (Runyakirara).

### 7.3.6 Feedback from the Stakeholders Consultations

In relation to the project, the main findings from the engagements and public participation were largely categorized into two parts; the envisaged impacts (Both negative and positive) and general concerns on the project. The main findings from the engagements are presented below; For example, according the local leaders and community members, the establishment of the water scheme is expected to have the following benefits:

- Improved access to clean and safe water
- Improved health conditions due to access to safe clean water
- Employment during construction and operation of the water scheme
- Eradication of poverty and improved livelihoods of the local people
- Reduced expenditure on water and medical bills due to diseases
- Reduced time spent walking long distances to wells and Springs
- Reduction of child mortality
- Ensure environmental sustainability

However, some concerns were raised as regards to the project and these include:

- Poor waste management practices at construction sites
- Destruction of existing vegetation especially when establishing the intake
- Soil erosion due to loss of vegetation
- Land degradation,

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- Dust and vehicle emissions,
- Increase in noise and injuries on duty,
- Increased spread of communicable disease,
- Visual impacts, Issues of land use and destruction of peoples crops along distribution lines.

However, there were issues that cut across during the community consultation meetings and these are:

- *Signing of the Compensation Data Capture Forms by the PAPs* - Signing such forms does not relinquish one's rights to land and improvements. It only depicts that such PAP was present during the data collection and affirms all that is recorded on such form.
- *Property to be assessed* - Land, structures (or improvements) and Perennial crops will be assessed. However, the project designs were developed in such a way that there is no physical displacement of PAPs.
- *Payment of compensation awards whether in cash or at bank accounts* - This varies with the magnitude of the compensation awards. However, bank accounts are preferred for safety and easier accountability.
- *Connection to water for households far away from the built system* - Upon completion of the water system, households will be encouraged to apply to the operator for water connection and water pipes will be extended.

Stakeholder engagements will continue throughout the implementation and operational stage with different stakeholders. It is likely that more relevant agencies and stakeholders will be identified during these phases, and will be engaged accordingly.

Many of the comments captured from stakeholders presented views on the expected benefits and concerns on the adverse impacts the proposed project may have on the environment and the existing activities. A summary of key environmental and social issues and recommendations raised by stakeholders are presented in the Table 197 below.

**Table 219: A summary of key environmental and social issues raised by stakeholders**

SN.	POSITION	REMARKS/Issues	Response
1.	Team leader (SE/MWE)	<ul style="list-style-type: none"> <li>• Before the funders release any funds, they need the assessments done and a Certificate issued NEMA.</li> <li>• Some water sources are working but not to full capacity like Matsyoro and Migyera ebiri</li> <li>• We bless your activities and intentions</li> </ul>	<ul style="list-style-type: none"> <li>• Before construction, ESIA assessments will be done and submitted to NEMA to approve the project (Certification)</li> <li>• These will be assessed as well and notify DWO-Sheema</li> </ul>
1	Resident District Commissioner (RDC) and Principal Assistant Secretary (PAS)	<ul style="list-style-type: none"> <li>• Phase II of the project is welcome</li> <li>• The land for the project is already secured</li> <li>• The sources are protected</li> <li>• Some political leaders have been sabotaging the project because of their political indifferences but this time we shall deal with them</li> <li>• There are many villages which were not reached by</li> </ul>	<ul style="list-style-type: none"> <li>• According to the design report for Shuuku-Matsyoro WSS Phase II, the project will reach most of the unserved villages</li> </ul>

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		water as planned in Phase I, Hope they will be covered	
2	District Environment Officer <a href="#">(DEO)</a>	<ul style="list-style-type: none"> <li>• It is good that the Environment office is being consulted for guidance.</li> <li>• It should be a continuous process and engagement.</li> <li>• There should be provisions in the ESMP for monitoring and this should be costed.</li> <li>• Facilitation should be provided for in the Contractor's BoQs</li> </ul>	<ul style="list-style-type: none"> <li>• Engagement of all key stakeholders is paramount in project implementation and it will be continuous.</li> <li>• The ESMP has been developed and costed <u>and therefore, the DEO will have the responsibility of monitoring its implementation</u></li> </ul>
3.	District Water Officer <a href="#">(DWO)</a>	<ul style="list-style-type: none"> <li>• Water should be pushed to hard to reach areas especially on top of the hills.</li> <li>• There are water sources which were identified in Phase I, but were not constructed. Hope they will be constructed because the areas where they sit were already secured</li> <li>• <b>He's ready to work and give technical advice to the contractor at any time</b></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Water supply will flow the design for Shuuku-Matsyoro WSS phase II</u></li> <li>• <u>Cooperation with District water officer is granted?</u></li> <li>• <u>The District Water Officer is focal person from the District Local Government side and therefore, will be actively involved in the project implementation during both construction and operation phases where he will offer his technical advice</u></li> </ul>
4	Sub County officials	<ul style="list-style-type: none"> <li>• The project is welcome in the area since it was promised that phase II will cater for those who missed out on phase I.</li> <li>• Some people are angry because they missed on the phase I project.</li> <li>• Phase II will help to support the water supply in areas where phase I did not reach.</li> <li>• The sub county will offer all the necessary support in the project implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Water supply will flow the design for Shuuku-Matsyoro WSS phase II</li> </ul>
5	District Councilor	<ul style="list-style-type: none"> <li>• This phase will continue to solve the problem of water in the area</li> <li>• The operator should be sensitive to the needs of the people.</li> <li>• Phase I has defects already even before commissioning.</li> </ul>	<ul style="list-style-type: none"> <li>• The defects are being addressed by the Umbrella organization under the Ministry.</li> <li>• The Contractor <u>and the water System Operator</u> will follow the needs of the people</li> </ul>

5	Local Community Members	<ul style="list-style-type: none"> <li>• Some community members especially in areas where phase I did not reach are still suffering to access water.</li> <li>• Some communities feel marginalized because they were not part of the phase I.</li> <li>• They expect to benefit from the upcoming extensions and intensifications</li> <li>• Water should be used to enhance value in the community.</li> <li>• Issues on land consent should be clear (consent letter should be signed)</li> <li>• Gender issues should be incorporated while implementing the project</li> <li>• Sustainability should be considered (will the water be for free or at a fee, and if at a fee, how much will it be, it should be affordable)</li> </ul>	<ul style="list-style-type: none"> <li>• Water supply will flow the design for Shuuku-Matsyoro WSS phase II</li> <li>• Land consent letters will be signed with the land owners before construction.</li> </ul> <p>• <a href="#">The water system operator will charge the consumers of the water. However, the tariffs will be agreed on amongst the different stakeholders including the District Local Government, System Operator and the Ministry of Water and Environment</a></p>
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All the stakeholders consulted supported the project on the basis that it would induce development in their area/district and lead to the establishment of more related projects. However, it was mentioned that the developer should be able to mitigate all project related negative impacts such as waste generation, noise, destruction of crops during trench digging and pipe installations and any other negative impact as would be realized.

#### 7.4 Public Disclosure and Consultation Plan

Public Consultation and Disclosure Plan (PCDP) is a key element in the engagement and essential for collective involvement of stakeholders in the proposed development. Disclosure refers to the provision of relevant and adequate project information to enable stakeholders understand risks, impacts and opportunities of the project. Consultation is an inclusive and appropriate process that provides stakeholders with opportunities to express their views which should be considered, responded to and incorporated into the decision-making process. In the context of the proposed development, stakeholder consultation aimed at:

- Generating good understanding of the project;
- Enabling stakeholders to engage and participate in proposed project design;
- Understanding what local community expect throughout the life of the project;
- Optimizing local benefits of the project;
- Developing effective mitigation measures and management plan;
- Characterizing environmental, health and socio-economic impacts of the project.

The proposed project is within the jurisdiction of Sheema District Local Government headed by a Local Council V (LCV) Chairman and Chief Administration Officer (CAO) who is the

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political head and technical head respectively. Various district offices whose functions would be relevant to the project include offices of Natural Resources/Environment, District Health Inspector, District Planner, Community Development Officer, District Health Officer, District Water Officer and District Engineer. Equally important are village-level local council administration (LC I and LC III). Leaders at these levels of local administration are closer to residents and therefore important in effective community mobilization, sensitization and dispute resolution given that the proposed project is going to benefit communities.

Like stakeholder identification, public consultations and information disclosure is a continuous process throughout the ESIA exercise. KIIs and FGDs were utilized for PCDP. A scoping exercise was undertaken and then the consultative meetings with the Kyangyenyi sub county and were aimed at disclosing key project information and to generate a master list of Stakeholders to be consulted. Key stakeholder concerns were also identified so that they could be considered in the implementation of the project. Key issues identified are outlined in Table 17 above.

Grievance Redress Mechanism (GRM) as a key element of the PCDP to actively identify, manage and follow up grievances received to ensure that appropriate resolutions and actions are taken by relevant authorities especially MWE, Sheema District Local Government and Kyagyenyin Sub County.

In order to ensure transparency and accountability, a GRM shall be established by the Project Support Team in line with the guidance provided in the ESMF. The GRM shall have a clear set of goals and objectives and a well-defined scope for its interventions, especially geographical area coverage to ensure its accessibility and effectiveness. A set of procedures for receiving, recording, and handling complaints shall be available in the GRM. This will be managed by a National Grievance Redress Committee (GRC) consisting of a MWE Chair, the assigned Resettlement Social Development Specialist, the Project's Environmental Focal Point, the chair of the community mediation board, a member of a recognized non-government organization, and a community leader. The GRC members shall be qualified, experienced, and competent personnel who can win the respect and confidence of the affected communities.

GRCs shall also be established at District and Lower Local Government Levels as appropriate. For easy accessibility, GRCs shall also be formed at or closer to project implementation site at Sheema District. Grievances shall be first reported and handled at the lowest level or project site, and referred to the next level if not resolved. The GRM shall include procedures for:

- Recording, registering, and sorting grievances;
- Conducting an initial assessment of grievances;
- Referring grievances to appropriate units or persons;
- Determining the resolution process;
- Making decisions, including parameters and standards for accurate and consistent decision making;
- Directing relevant agencies responsible for implementing decisions;
- Notifying complainants and other affected parties of eligibility, the resolution process, and outcomes;
- Tracking, monitoring, documentation, and evaluation; and
- A Grievance Log, that shall summarize all grievances registered, resolution reached, and feedback provided.

Depending on the nature and the severity of the complaint/s, the GRC in consultation with the Project Affected Persons (PAPs) or Complainant, shall identify and decide on an approach for grievance resolution. Where appropriate, complainants shall be given the choice of selecting an affordable approach with which they are comfortable and confident and that is

beneficial to them. For construction-related complaints, it will be the Contractor's responsibility to address them. Usually these kinds of complaints are described as environmental and social impacts and include issues related to dust, flooding, blasting (noise, vibration, and evacuation), lost access, and dangers to life, damage caused to public roads from heavy machinery, deteriorating water quality and quantity, damage to property and crops, soil erosion, workers misbehaviour, defilement/child abuse, and others.

### 7.5 Workers Grievance Redress Mechanism

In accordance with the Employment Act (2006), the MWE/RWSSD shall ensure that the Contractor has provided contracts to all workers and has established a GRM and grievance redress committee with workers' representation. It is the responsibility of the Contractor(s) to ensure that Workers GRMs and with redress and appeal processes and institutions is in place and shared with MWE/RWSSD before the commencement of the Construction Phase.

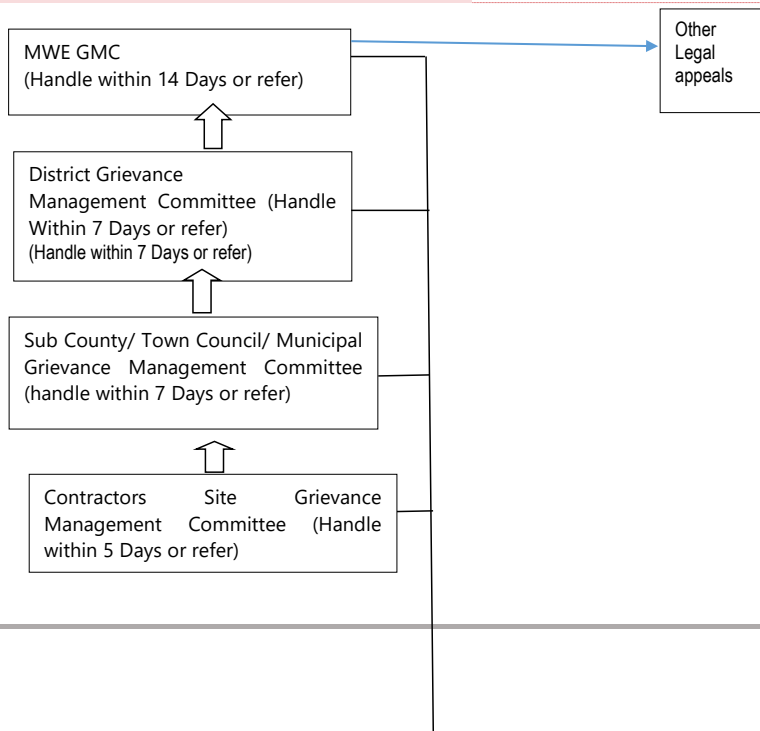
The steps in grievance handling for the PAPs and the community in general are outlined in Table below and once received, all grievances will be responded to in a maximum of ~~20~~ 19 days.

**Table 2220: Grievance handling steps**

#	Step	Responsibility
1	Receive Grievances and Provide PAPs with a Grievance Acknowledgement Form	MWE, RAP Implementation Consultant, and GMCs
2	Grievance Registration and Acknowledgement	MWE, RAP Implementation Consultant, and GMCs
3	Grievance Sorting and Logging in database and tracking system	MWE, and RAP Implementation Consultant
4	Grievance Assignment	MWE
5	Grievance Processing and Feedback (30 days)	MWE, RAP Implementation Consultant, and GMCs
6	Corrective Actions, Grievance Follow Up and Closure	MWE

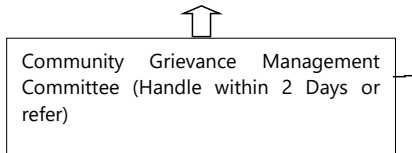
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### 7.6 Flow of Appeals or Referral of Grievances and Timelines



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### Grievance Types

The Project grievance mechanism classifies grievances into five types, as described in the following sections.

- **Cadastral Survey Grievances**

Cadastral Survey Grievances may require the Cadastral Surveyor to rectify errors in the initial surveys, subdivision of plots, or boundary markings.

- **Valuation Grievances**

Valuation Grievances arise out of compensation package disagreements and may include the values determined for land, crops & trees, buildings, and other structures as well as errors of omission.

- **Family and Land Ownership Disputes**

Family and Land Ownership Disputes usually include:

- Disagreements between spouses
- Disagreements between the **Household** and other family members
- Inheritance uncertainty in cases where the HoH recorded during the surveys has since passed away
- Oppression of widows or children by family members
- Competing land ownership claims

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- **Legal Grievances**

Legal Grievances require legal support services as part of RAP Implementation and they include:

- Processing Letters of Administration for deceased cases (where the legal owner or the HoH that was recorded during the surveys has since passed on)
- Incapacitated PAPs
- Absentee PAPs requiring Power of Attorney
- Cases requiring Guardianship Orders
- Misidentification of ownership
- Processing family consents

- **Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) and Violence Against Children (VAC) related grievances**

As per the WB Good Practice Note (GPC) on Gender, “gender-based violence is an umbrella term for any harmful act that is perpetrated against a person’s will and that is based on socially ascribed (i.e. gender) differences between males and females. It includes acts that inflict physical, sexual or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private). Women and girls are disproportionately affected by GBV across the globe”.

In order to proactively protect women from GBV during the land access and resettlement process, the Project will apply a series of differentiated measures to ensure engagement of women in Project activities and more specifically, to ensure open and easy access to the grievance mechanism for Project Affected Women. Therefore, the following measures will be implemented:

- Focus group and one on one discussions with Project Affected Women including discussions specifically related to accessing the grievance redress mechanism and raising awareness of any Gender Based Violence (GBV) risks
- As part of the financial management program, attendees will be sensitized on the GBV
- Establishment of a grievance redress mechanism with procedures and channels to enable confidential reporting of GBV incidents
- Engage with Local Council 1 (LC1s) and other community members to raise awareness on preventing and reporting GBV.

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**Grievance Database Management and Tracking**

All received grievances shall be registered and logged into the grievance register for further management and tracking. An acknowledgement receipt shall be issued to the complainant. MWE shall keep written records of all complaints for effective grievance management.

All decisions reached at the different resolution levels shall be communicated to the complainant and other stakeholders by the Chairperson of the respective GMC. It will be the responsibility of the Grievance Officer (GO) to deliver the communications. Evidence of communication of decisions to complainants shall be acknowledged by way of signing a dispatch form or acknowledgement of a file copy.

Agreed corrective action will be undertaken by the responsible agency/ part for example a Local government, MWE, contractor or authorized sub-contractors in close consultation with the complainant within the agreed timeframe and completed action recorded in the grievance database. To verify satisfaction, the Grievance Committee will upon receipt of a completion report from the GO verify that corrective actions have been implemented. A signature of the complainant will be obtained on the consent form. If the complainant is not satisfied with the outcome of corrective action, additional steps may be undertaken to reach agreement or an appeal will be lodged by the complainant.

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As part of the broader community engagement process, MWE shall also report back periodically to communities and other stakeholder groups as to how the company has been responding to the grievances it has received (i.e., time to respond, percentage of closed/resolved cases, number of complaints monthly).

## 8 ANTICIPATED ENVIRONMENTAL AND SOCIAL IMPACTS

### 8.1 Introduction

Key potential environmental and social impacts of the project for each stage of the project cycle are assessed in this chapter and an Environmental and Social Management Plan (ESMP) is provided in the Chapter 9. The ESMP seeks to translate mitigation measures into actions. Prediction and analysis of possible positive and negative impacts of both the construction and operation of the water treatment plant and intake works at River Kitakure in Nyamitoma, Matsyoro parish are discussed. Impact analysis involved determination of nature of impact, its magnitude, extent, duration of potential impacts. For the proposed development, potential positive and negative impacts were identified both for the construction phase and operation phases. Throughout this report, impacts have been characterized as:

- a) "Positive" when they;
  - Enhance socio-economic welfare e.g. health, employment.
  - Enhance quality of existing environment.
- b) "Negative" when they;
  - Reduce socio-economic welfare of people,
  - Reduce quality of existing environment,
  - Reduce economic value e.g. of surrounding property.

An improvement in potable water supplies and sanitation may generate interrelated improvements in health, economic and social welfare of the community. However, in addition to the many possible beneficial impacts, adverse impacts may arise from these improvements. The impact of potable water supply and sanitation on health depends on the quality and quantity of the piped water supply; the proportion of population covered; and the utilization of the water and sanitation facilities by the population. In this chapter, prediction and analysis of possible positive and negative impacts of construction and operation of the water extraction and treatment system, water reservoir and establishment of transmission lines is presented, with main focus on the proposed construction and operation of the water treatment plant and intake works at River Kitakure. Table 2149 below provides a summary of the Positive benefits that will be realised as a result of implementation of this project.

**Table 222: Positive Impacts of the Proposed Project**

No.	Impact	Remarks
1.	Increased access to clean water	<ul style="list-style-type: none"> <li>▪ Elimination of current water shortages.</li> <li>▪ Improvement of water quality.</li> <li>▪ Reduce the time spent and distance travelled to fetch water, which would signify an improvement in the general living conditions of the people.</li> <li>▪ Improvements in public and household sanitation.</li> <li>▪ Awareness of personal hygiene.</li> <li>▪ Overall improved health conditions for the beneficiary population.</li> <li>▪ Income generating activities for the poor will increase as result of availability of reliable supply of water in public places e.g. commercial water service providers.</li> </ul>
2.	Employment opportunities and increased household	<ul style="list-style-type: none"> <li>▪ The use of appropriate labour intensive methods for some of the construction activities (e.g. construction of the intake point and Reservoir and sanitary</li> </ul>

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	incomes and revenues	<p>facilities) would present employment opportunities for local people and generate direct income benefits to local households.</p> <ul style="list-style-type: none"> <li>Some people will be employed in the digging of the transmission and distribution network, sand and stone quarries, and sale of earth materials to the proposed project and in the service sector around the project site.</li> <li><u>Plumbers, office assistants, managers, supervisors, security guards will all be required and recruited during the operation phase</u></li> </ul>
3.	Income to material/equipment suppliers and contractors	<ul style="list-style-type: none"> <li>Earth materials needed for construction, for example, aggregate (stones and sand) will be obtained from quarry operations.</li> <li>Number of equipment and materials (such as gravel, bricks, plumber, steel reinforcement and cement for civil works) will be sourced locally within the district and the neighbouring districts.</li> </ul>
4.	<u>Increased Public Revenue / Taxes</u> <u>Skills development and capacity building</u>	<ul style="list-style-type: none"> <li><u>People</u> who have never worked on such projects would acquire such <u>skills</u>, which they would use to <u>seek employment in future</u>.</li> <li>The Project would provide <u>grassroots management</u> opportunities for the local people to both be involved in the management of the water supply and protect their local environment.</li> </ul>
5.	<u>Increased Public Revenue / Taxes</u>	<ul style="list-style-type: none"> <li><u>These will include indirect taxes resulting from the construction and operation of the water system like Value Added tax (VAT) on materials, Pay As You Earn (PAYE) and the remitted National Social Security Fund (NSSF) remitted from the employers</u></li> </ul>
65.	Boost to the local Economy	<ul style="list-style-type: none"> <li>Provision for direct employment opportunities to the workforce thus contributing towards alleviation of poverty and income generation for the local community;</li> <li>Stimulation of business activities related to contracting works for local entrepreneurs (sub-contractors);</li> <li>Providing trading opportunities for local communities and other small enterprises in the area;</li> <li>Providing opportunities for provision of basic and other services for the contractors and immediate community. The project will consider employment of locals.</li> </ul>
76.	Gender Benefits	<ul style="list-style-type: none"> <li>The expected reduction in water collection distances and times will be particularly beneficial to women and children, especially girls, who bear the burden of fetching water and have to walk long distances or queue for long periods.</li> <li>It will mean more opportunities for girls to attend schools and more time for women to engage in other economically and educational beneficial activities.</li> <li><u>Reduction of Gender Based Violence (GBV) and sexual harassment cases because of the time and distances reduced to fetch water</u></li> </ul>

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87.	Health Benefits	<ul style="list-style-type: none"> <li>Direct health benefits of the project to the affected population will result in a reduction in the incidence of water-related diseases <u>and other communicable diseases</u> particularly diarrhoea, <u>Covid,</u> typhoid, intestinal worms, skin and eye problems, and dysentery and cholera.....</li> <li>Loss of productivity resulting from sickness related to water-borne diseases and expenditure on related medical care will therefore reduce.</li> </ul>
98.	Improved service delivery	<ul style="list-style-type: none"> <li>The proposed project would result in bringing improved water and sanitation services closer to the people.</li> </ul>
109.	Eradication of poverty and improved livelihoods of the local people	<ul style="list-style-type: none"> <li>The proposed project would result in an increase in the volume of <u>safe water for production</u> which could result in improved <u>health and</u> livelihoods of the local people.</li> <li>Water is indispensable for survival and improving the quality of life – for health (drinking, eating and bathing) and for economic development (agro-processing and business). The project would, therefore increase productive activities through reduced sick days and time saved in fetching water.</li> </ul>
11.	Ensure environmental sustainability	<ul style="list-style-type: none"> <li>Implementation of catchment and water source protection measures would ensure reliability to the water source.</li> </ul>
12.	Develop a global partnership for development	<ul style="list-style-type: none"> <li>The Project would provide opportunities for the GoU and the different Implementing Agencies (IAs) to work together to achieve the sustainable development goals (SDG) specifically SDG 6.</li> </ul>
13.	Increase in investment in the area standard of living	<ul style="list-style-type: none"> <li>MWE will invest heavily in the construction <u>and operation</u> of the water supply systems which would involve use of locally available materials.</li> <li>The business community could take advantage of the proposed development to establish businesses that would otherwise be impossible without safe piped water.</li> </ul>

## 8.2 Anticipated Potential Benefits

### 8.2.1 Positive Impacts during Construction Phase

Impacts of construction phase for of the proposed water supply system may be permanent but majority of the environmental impacts attributed to construction works are temporary in nature, lasting mainly during the construction phase or quite often little beyond the construction period. However, if these issues are not properly addressed, the impacts (positive or negative) may continue even after the construction phase for longer duration.

#### ❖ Employment Opportunities

The design, feasibility and planning phase provided financial benefit and employment for local consultants. This is a positive but short-term and reversible socio-economic impact. Contract provisions for the construction works require most of the labour force (at least 50%) to be drawn from the local population with particular emphasis on youth and women. Since construction is estimated to take a certain number of months, this phase will provide short-

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term job opportunities for local people. The project is estimated to employ around 120 workers during the construction phase.

Furthermore, indirect opportunities for employment will be stimulated in the other sectors related to construction, such as manufacturers of local raw materials and finished products and providers of services. It is also anticipated that indirect employment opportunities will be created within local communities through the provision of services to the construction teams, such as the sale of food and beverages.

**Enhancement measures**

- The contractor should involve local leaders in recruitment process to ensure full and fair participation of local communities. Wherever feasible, local people should be considered for job opportunities commensurate with their level of skills. Adequate occupational health and safety standards should be provided to ensure the work environment is conducive. A training programme for artisans (builders, plumbers) in the project area could be facilitated by the project to ensure skills transfer during the construction period.

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- ❖ Income to material/ equipment suppliers and contractors

The scale of construction works is moderate in the proposed project area. Although some of the equipment and materials required for the project will be sourced nationally or even internationally to ensure quality is achieved, a number of equipment and materials (such as gravel, bricks, plumber, steel reinforcement and cement for civil works) can be sourced locally within Sheema district and the neighbouring districts. Local suppliers of materials and equipment involved in the project will benefit financially. This is a positive but short-term and reversible impact.

**Enhancement measures**

- Earth materials needed for construction, for example, aggregate (stones and sand) will be obtained from quarry operations. Conscious or unwitting purchase of these materials from unlicensed operations indirectly promotes environmental degradation at illegal quarry sites and can cause medium to long-term negative impacts. It should therefore be a contractual obligation for contractors to procure construction materials from quarries legitimately licensed by the respective district authorities.

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- ❖ Acquisition/improvement of skills

People who have never worked on such projects would acquire such skills, which they would use to seek employment in future, and as a benefit from the capacity building incorporated in the program, the implementing authorities would have adequate capacity for managing the environmental and social assessment and permitting processes. The Project would provide grassroots management opportunities for the local people to both be involved in the management of the water supply and protect their local environment.

**Enhancement measures**

- The Local leaders will play a vital role in screening and recommending those seeking for employment to weed out wrong elements who may instead cause serious setbacks to the project in terms of offering labour both skilled and unskilled.

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- ❖ Increased Public Revenue / Taxes

The implementation of the project will increase revenue and taxes for both the central and local authorities. This includes indirect taxes resulting from the construction and operation of the project such as Value Added Tax (VAT) on materials and services, Pay As You Earn (PAYE)

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for construction workers and other formally employed persons who will form by far the majority of created employment opportunities) as well as revenue to pension funds such as National Social Security Fund (NSSF).



#### ❖ Impacts on Local Capacity

The scale of the construction and operation of the project with the logistics involved and speeds of construction that will be required, while maintaining construction, health and safety standards will involve considerable management and planning skills and will contribute to capacity building within the country's engineering and construction sector. Co-operation between international suppliers of specialized equipment and contractors and local contractors and sub-contractors and companies will result in the transfer of skills and will also build additional local capacity. However, opportunities for the local communities shuld be maximized to ensure sustainability of the project

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#### ❖ Boost to the Local Economy

The workforce will get most of their food and other necessities from the surrounding area and this will provide a market for the local agricultural producers, and craft producers and other small businesses (local shops). This will in turn increase the incomes of the local people, which can be invested in other (productive) activities and be used for paying school fees, medical expenses and other domestic needs. The project will stimulate local economic activities by:

- Provision for direct employment opportunities to the workforce thus contributing towards alleviation of poverty and income generation for the local community;
- Stimulation of business activities related to contracting works for local entrepreneurs (sub-contractors);
- Providing trading opportunities for local communities and other small enterprises in the area;
- Providing opportunities for provision of basic and other services for the contractors and immediate community. The project will consider employment of locals.

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#### ❖ Capacity Building

It is expected that for the construction of the proposed water supply system, some degree of capacity building will be provided (organised and un-organised) through the transfer of new technologies and new skills to (un-skilled) labour. This will happen through on-the-job training as well as through exposure to modern water quality practices, management and logistics procedures. Local sub-contractors and companies will also benefit from the transfer of skills and will also build additional local capacity. Water services like reparation of pipes, plumbing will be needed and this calls for training of the different labourfoce to undertake such

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#### ***Enhancement measures***

- To maximise capacity building for local communities, programs and technical training courses as well as on-the- job training will be provided in specific skills areas for suitable candidates from local communities to enhance minimum levels of education and the possibility of being employed during operational phase.

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### 8.2.2 Positive Impacts during Operational Phase

#### I. Improved health status of households in the project communities

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The provision of an adequate, safe water supply and sanitation facilities has positive impacts on the health of users by greatly reducing the incidence of communicable enteric and infectious related diseases, which, in many instances occur in communities due to lack of adequate sanitation and potable water supply. Both potable water supplies as well as safe disposal of human excreta are needed to break the chain of transmission of diseases. Changes in water supply may affect different groups of disease in different ways; one group may depend on changes in water quality, another on water quantity and availability and another on indirect effects of standing water which is related to sanitation. Therefore, improvement in water supply in several of the poor informal settlements will directly contribute to improved public health in the proposed project area.

**Enhancement measure**

- \* Educate users on the proper use of water, regular cleaning and effective maintenance of both the household and public facilities.

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**II. Educational enrolment and attendance**

~~Construction and~~ Operation of the proposed water system will lead to considerably increased and consistent access to safe water for the proposed project communities. In relation to increased provision of potable water supply, time savings are the most immediate and easily measured benefits although its magnitude will depend on the conditions prevailing before constructing the piped water supply. Consequently, time spent on searching and waiting for water by women and children will be saved. This will enable children, especially the girl child to regularly and promptly attend school, while mothers will get more time to prepare their children for school. Assuming other factors are available (such a scholastic material, teachers) school attendance and performance will improve.

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**III. Acquisition of new skills**

Most water supply and sanitation projects are built through the labour of local residents who are directed by a small cadre of sub-professional or supervisory personnel from outside the community. Community participation can also have a great impact on the effectiveness and sustainability of water supply and sanitation programs. It can also help to minimize many of the potential negative environmental impacts associated with them.

**Enhancement measure**

- \* ~~The system operator should prepare the capacity building plan where local community members will be trained to perform some works related to management and maintenance of the water infrastructure and the locals should~~ Where the required skills are available locally, the local people should be given first priority commensurate to their level of training.

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**IV. Improvement in household economic status**

The increased provision of potable water supply and sanitation has positive beneficial impact on health and ultimately directly and indirectly on productive and economic benefits.

- Livestock and poultry keeping: Improved water supply would lead to an increase in poultry and livestock keeping in homesteads. A permanent water source near or on the farm will permit an increase in cattle and improve the production of milk and beef. Those farmers who previously felt water to be a crucial constraint preventing them from keeping such livestock as grade cows and pigs, poultry like chicken or expanding their activities in this regard, may find it feasible to do so.
  - Small scale gardens: The increased provision of piped potable water supply may have
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positive beneficial impact on the irrigation of small scale gardens if there is excess water available and it can be used for irrigation of small scale garden plots near each household or tap. This will have positive beneficial impacts on increasing agricultural productivity and perhaps also improving nutrition status of households.

- Small scale industries: The ample availability of piped potable water supply may lead to improvements in the small scale industrial development and increased production.

#### **Enhancement measure**

- Water supply should be set taking into consideration the different levels of users. The users should also be facilitated to access water and educated to avoid wasteful use of the resources.

### **V. Employment opportunities**

Operation of the constructed water supply system will create additional long-term technical and non-technical job opportunities for professionals, casual labourers, private work opportunities for plumbers, etc. Staffing will be required in the area to operate the constructed water supply system by: Operating the system in accordance with the service standards; Maintaining the system; Developing the system; Billing the consumers; Collecting revenue; Receiving applications for and making new connections; Making extensions to the system or assets; Attending to all customers; Keeping records of the operations of the system; and Writing status reports for the operations of the system.

#### **Enhancement measure**

- Wherever feasible, local qualified people will be considered for job opportunities and for capacity building related to water infrastructure maintenance and management. Adequate occupational health and safety standards should be provided to ensure the work environment is conducive.

### **VI. 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 and also the risks of Gender based Violence and sexual harassment. 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).

### **VII. Attainment of the Sustainable Development Goals; SDGs**

The effect of providing safe water and hygienic sanitation services since public toilets will be constructed would help in the attainment of all other Sustainable Development Goals (infant mortality, poverty reduction, improved health and increased school enrolment rate).

### **VIII. Increase in investment in the area**

Through the MWE investing heavily in the construction of the proposed water system which would involve use of locally available materials, the business community will take advantage of the proposed development to establish businesses that would otherwise be impossible without piped water.

### **IX. Environmental sustainability**

The skill for managing water supply and sanitation facilities would result in building social capital which could be extended to better manage the local environment and water resources. The project would include environmental awareness which could be deployed

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to manage the environment better.

**X. Combat HIV/AIDS, malaria, and other diseases**

The Project would result in prevention of vector borne diseases related to water sources (such as guinea worms, Onchocerciasis, and schistosomiasis) and diseases related to excreta contaminated water and poor hygiene (cholera, typhoid, and diarrhoeal diseases) and other diseases such as COVID and Ebola... due to the increased provision of safe and clean water. Safe drinking water, personal/household hygiene and improved sanitation would reduce infant/child morbidity and mortality; improve their nutritional status and their ability to perform better in schools. The marginal price of improved hygiene and sanitation promotion would make them cost effective health interventions.

### 8.3 Anticipated Negative Impacts

#### 8.3.1 Negative Impacts during Construction

##### a) Soil Degradation

The laying of water pipeline from the water treatment plant and associated facilities will result in direct disturbance of soil. Site preparation will involve clearing of strips of vegetation to allow for excavations to begin. Soils excavated may be heaped besides the trenches hence exposed to agents of erosion such as wind and storm water. However, prolonged storage of topsoil can lead to a loss in fertility of the soil as nutrients become leached out by rainfall. This process can lead to impaired vegetation growth once the soil is reinstated. In addition, prolonged topsoil storage can lead to the loss in viability of the seed bank contained within this soil. Also equipment engaged in activities might cause light contaminations of soil due to leakage of fuels and lubricants from equipment. Topsoil stripping during levelling and grading of the right of way (ROW) and the excavation of subsoil during trenching will break up the soil structure. Depending on the nature of the soil, this may lead to a temporary increase in erosion.

*Impact significance:* These are short term and direct impacts. Given that similar activities have already taken place and considering the project footprint and terrain, receptor *sensitivity* is assessed to be **very Medium**. The impact *intensity* is **Medium** given that MWE will employ a well-qualified contractor to carry out the construction activities of the project giving rise to **Moderate** impact significance.

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

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##### Mitigation strategies:

- Topsoil and subsoil will be stockpiled for re-use in backfilling and reinstatement;
- To preserve soil structure: there will be minimum handling of soils; loose tipping of soils, that is, without compaction will be employed and temporary spoil heaps will not be higher than 3m;
- Contractor will avoid use of old equipment or even damaged equipment that is most likely to have oil leakages thus contaminate the soils;
- The contractor will be required to develop a waste management plan prior to start of construction activities;
- Contractor will ensure that equipment is properly maintained and fully functional in accordance with the manufacturer's recommendations;
- During reinstatement, the trench back-fill material will be compacted to a level similar to the original surrounding soils to avoid subsidence as a consequence of rain water channelling.

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- Recreation of a stable landform that mirrors the pre-disturbed condition as this will minimise the risk of preferential erosion and therefore facilitate natural re-vegetation.
- Topsoil will be protected through separation from subsoil and storage in a manner that, as far as possible, retains the soil structure and minimises the risk of topsoil loss. The trench will be subsequently backfilled with subsoil, followed by topsoil. In order to prevent loss of fertility and degradation of the seed bank within stored topsoil (where present), the topsoil will be stored for as short a time as possible, allowing for engineering constraints.
- In the re-establishment of the pre-construction condition, vegetation cover particularly the variety and distribution pattern of plant species that existed before will be used.
- Wherever practical, the subsoil will be graded during reinstatement to reflect the original profile across the working width and all other construction areas. In steep areas with highly erodible soils, the ground will be carefully profiled to ensure that the integrity of the pipeline is not compromised.
- Upon completion of subsoil and topsoil reinstatement, disturbed areas will be inspected jointly by the construction contractor and MWE personnel for slope stability, relief, topographic diversity, acceptable surface water drainage capabilities, and compaction.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of negligible significance.

#### b) Generation of Noise

Due to the nature of the construction process, noise levels will fluctuate in line with the combination of machinery or equipment being used at any one time. Noise and vibrations will mainly result from use of equipment like excavators and including bulldozers, graders and dump trucks during site preparation and construction activities. However, noise levels will also vary depending on time and distance as the construction spread progresses along the pipeline route thus the local residents will not, therefore, be continually exposed to the noise levels for extended periods.

Construction traffic associated with the pipeline construction will be routed via main roads and along the ROW as far as is possible. Some minor roads will have to be used for access to the pipeline spread itself and some new access roads will be created.

The increase in traffic movements on minor roads may cause a noticeable increase in daytime noise levels through small villages; this effect will be localised and temporary, and will, for the most part, be restricted to the construction phase of the project. A number of roads will require repair prior to use for construction vehicle access. These repairs will help to reduce noise levels generated by such access, and other vehicular movements.

**Impact significance:** Due to the intermittent and short-term nature of the activities, the **intensity** of impact is assessed as **low** and **sensitivity** of the receptors as **medium**, given that most of the proposed routes for the water pipelines are located in relatively noisy mixed residential and commercial areas of the project area and its neighbourhood. This results into **moderate** impact significance.

		Sensitivity of receptor			
		Very low 1	Low 2	Medium 3	High 4
Intensity	Very low 1	1 Negligible	2 Minor	3 Minor	4 Minor

<b>Low 2</b>	2 Minor	4 Minor	6 Moderate	8 Moderate
<b>Medium 3</b>	3 Minor	6 Moderate	9 Moderate	12 Major
<b>High 4</b>	4 Minor	8 Moderate	12 Major	16 Major

**Mitigation strategies:**

- Contractor will be careful when selecting the working equipment to avoid use of old equipment or damaged equipment with high level of noise emissions that would have a negative impact in the environment.
- Contractor will ensure that equipment is properly maintained and fully functional in accordance with the manufacturer’s recommendations.
- The contractor should ensure that noise levels emanating from machinery, vehicles and noisy excavation and construction activities are kept at a minimum for the safety, health and protection of people in the nearby areas.
- Regular maintenance, monitoring and, where necessary, the use of silencing equipment will be employed with the aim of reducing noise emissions.
- The selected contractor will be required to submit detailed information on the noise levels which will be generated by the specific methods and equipment proposed and to identify actions required to minimise the noise impact.
- Pumps, generators and other mobile equipment will be sited as far as practicable from housing and other noise sensitive locations, work will not be carried out Sunday during service time or hours.
- During periods of inactivity, equipment will be switched off whenever possible. A limited number of construction activities may have to continue on a 24-hour basis. These include horizontal direction drilling, pipeline cleaning and hydrostatic pressure testing which are relatively low noise activities.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**c) Improper Management of Construction Waste**

Solid waste and spoil will be generated at the site during site preparation and construction phases. The waste may consist of timber or metal cuttings, excavated materials, paper/cement bags and solvent containers among others. Some of the waste materials such as cement, adhesives and cleaning solvents contain hazardous substances, while some of the waste materials including metal cuttings and plastic containers are not biodegradable and can have long-term and cumulative effects on the environment. Other wastes which will be generated by non-construction activities because of the presence of the workers at the site include food debris, contaminated water from washing, cleaning equipment, construction tools and vehicles.

**Impact significance:** Extent of this impact will be local to areas where waste is dumped or their immediate neighbourhoods. The impact *intensity* is assigned *low* due to the lack of a well streamlined waste management system in Sheema. The *sensitivity* of receptors is assessed as *‘low’* given that similar activities have and are taking place in the area and that an experienced contractor will be hired. This gives rise to minor impact significance.

	Sensitivity of receptor			
	Very low 1	Low 2	Medium 3	High 4

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

*Mitigation strategies:*

- The wastes will be properly segregated and separated to encourage recycling of some useful waste materials, that is, some excavated material can be used as backfills.
- The contractor and MWE will work hand in hand with the District to facilitate sound waste handling and disposal from the site including the reuse by local community members. All wastes must be taken to the approved dumpsites and proof of safe disposal should be secured.
- Hazardous wastes such as paints, cement, adhesives will be managed through a third party contractor certified by NEMA. The contractor and MWE should work hand in hand to facilitate sound waste handling and disposal from the site.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**d) Contamination of Water Resources**

**D)**

110 There is a potential for pollution from chemical contaminants at all stages of the project. Spillage of fuel, lubrication oil or wastewater is potentially important at the watercourse crossings, pump station, and block valves during construction and testing. Contaminants introduced by construction could migrate into key receptors such as the Kitakure River/wetland. Activities associated with construction have the potential to produce groundwater and surface water contamination including the workers' excrement if not well managed on site. The principal potential contaminants associated with the construction activities are as follows: Fuels and lubricating oils, Domestic wastes, Welding wastes and field welding and coating materials, Paints and solvents, Hydro testing chemicals if used (e.g. biocides, oxygen scavengers and corrosion inhibitors). Removal of vegetation whose root systems bind the soil may increase the rate of erosion by water or wind in the area. During heavy rainfall, the loss of the moisture retaining function of the vegetation may lead to increased surface run-off, carrying with it eroded soil particles into the Kitakure River. During construction, there may be need to stockpile assorted materials on site. There is a potential pollution risk if construction materials are not stored or handled responsibly such as to lead to stockpiles wash away. The fuels (mainly diesel) and lubricating oils required by the construction equipment have the potential to contaminate nearby water resources (Kitakure River) if they leak or are spilled during handling or use. Transportation of pollutants with runoff would affect the water quality hence the communities/ livestock depending on it. General wastes may have the same effect if not handled properly.

*Impact significance:* The gently sloping terrain makes soil erosion and sedimentation likely impacts. The *sensitivity* of the receptor is *medium* because of the Kitakure River close to the site. The *intensity* of the impact is assessed as *medium*. Given the size of Kitakure River, intensive sedimentation would have far reaching effects in addition to its flooding nature during the rainy season but the activities taking place in its catchment already largely

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contribute to the sediment transport. This results in moderate impact significance.

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

**Mitigation strategies:**

The contractor will have a contractual obligation to develop and implement a Construction Management Plan (CMP) to include the following:

- Equipment, materials and chemicals must not be stored within 30 m of a watercourse bank;
- Construct a proper drainage system around the site and to the final storm water retention or disposal point to stop direct run off into the nearby land and water courses;
- All construction equipment will be kept in good operating condition to avoid oil or fuel leakages that might contaminate water resources;
- Materials like sand and aggregates will be kept in bounded areas to avoid being washed away into water resources by runoff;
- MWE will ensure the contractor complies with its environmental management policies e.g. the National Environment (Wetlands, River Banks and Lakeshore management regulations, 2000).
- MWE will ensure the Contractor has a Spill Management Plan and adheres to it. Annex 4 outlines the procedures of spill management
- River crossing points have already been determined through pipeline routing surveys to ensure that the crossing points minimise the impact on sensitive hydrological and ecological features. This includes adequate design controls to minimise the impact on the hydraulic regime of the rivers. The contractor will put in place temporary crossings to minimise the impact.
- Any cleaning and hydro test water which could cause contamination of surface (or ground) waters will be tested and treated as necessary prior to discharge, including debris and sediment removal.
- Washing will not be done along the working area but will be restricted to workers' camps and on paved areas to control runoff;
- The pipeline construction activities at certain river crossings, in particular the Kitakure River, will reflect their highly seasonal flow regimes. Wherever possible, construction of the pipeline crossings will be undertaken during periods of low flow.
- Sanitation facilities like latrines for workers will be constructed in a manner that will not affect the water resources.

Adoption of the above mitigation measures will reduce impact intensity to “low” resulting in a residual impact of moderate significance.

**e) Air Pollution**

The most significant issues that could potentially impact on air quality and climate during construction are combustion gas emissions and nuisance dust. During the construction

phase there will be an increase in road traffic associated with material and equipment haulage. The principal sources of combustion gases are the exhausts of vehicles and construction equipment, power generation at the work camps and pipe storage yards and waste incineration. Dust will be generated as a result of vehicle movements and typical construction activities (e.g. stripping, compacting and trenching etc.).

Construction activities and vehicle movements can cause dust agitation in addition to that already caused by the wind. It is likely that this will be exacerbated as a result of clearance of the ROW. Once airborne, dust will generally travel downwind before resettling. The distance travelled depends primarily on wind speed and particle size. For example, smaller particles and strong winds result in greater dilution effects but mean that the dust is deposited over a larger area. Dust may cause nuisance on a local scale in certain areas along the pipeline due to the nature of the fine clayey, silty and sandy soils that are present. The potential impacts are nuisance to people in the area, coverage of crops (possibly leading to reduced yields) and deposition on natural vegetation and small animals, including bees.

Although emissions of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) are generally accepted as contributing to global warming the effect has not been quantified. To reduce the threat of global warming it is widely agreed that emissions of greenhouse gases need to be reduced on a global scale. Each individual greenhouse gas has a different potential effect on climate per unit released. Global Warming Potential (GWP) provides a means of equating the potential contribution to global warming arising from different process units/activities which can generate different emissions. GWP is measured in terms of equivalent emissions of CO<sub>2</sub>; hence the GWP factor of CO<sub>2</sub> is 1. CH<sub>4</sub> has a GWP factor of 21 –that is, an emission of 1 kg of methane (CH<sub>4</sub>) is defined as having 21 times the GWP of an emission of 1 kg of CO<sub>2</sub>. Construction vehicles/activities are unlikely to contribute significantly to greenhouse gas emissions due to their relatively small scale, intermittence and temporary nature, and as such are not considered further in this assessment.

The long-term impact of nuisance dust will decline as stripped areas of land re-vegetate. Due to the temporary nature of construction, dust emissions are not anticipated to have a long-term impact on local air quality. The above impacts would mostly be linear and spatial in extent limited to road routes. They would therefore affect roadside communities, communities neighbouring the proposed site and road users. The manageability of the impact is high since typical impacts are well understood in conventional infrastructure construction industry and the ability to adapt to the impact is high because construction activities have been going on in the area.

**Impact significance:** Due to the intermittent and short-term nature of the activities, the **intensity** of impact is assessed as **low** and **sensitivity** of the receptors as **low** resulting in **minor** impact significance.

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



High 4	4 Minor	8 Moderate	12 Major	16 Major
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**Mitigation strategies:**

- Travel speeds of construction vehicles along the road especially at trading/ business centres will be controlled using humps and travel speeds will not exceed 30km/h;
- Trucks will be covered during haulage of construction materials to reduce on spillage of materials;
- Wherever dust suppression is necessary, water will be sprayed over dusty areas;
- It will be ensured that all equipment leaving the site, clean up their tires in case they are dirty;
- Construction work will be undertaken by an experienced and duly registered contractor with a verifiable sense of environmental awareness and responsibility;
- Workers will be provided with PPE (dust masks, safety goggles) and the use of PPE shall be enforced;
- All construction equipment and trucks will be kept in good operating condition by regular servicing to reduce noise and exhaust emissions; and
- As part of the bidding processes, contractors will be required to provide their environment management plans that meet mitigation actions proposed in this ESIA.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**f) Occupational Health and Safety Risks for the Workforce**

Construction traffic, excavation machinery, blasting of rocks and trenches may pose accident risk to workers either when equipment is operated by inexperienced workers or when in a poor mechanical condition or falls into the trenches. Inadequate Occupational Health and Safety (OHS) could also result from insufficient medical capability at the construction site; or neglect of safety equipment, precautions and procedures.

**Impact significance:** Accidents could cause considerable ecological damage, financial loss and harm to human life. While largely reversible, some impacts such as loss of human life are irreversible. The receptor *sensitivity* is considered *high* given that such impacts may be irreversible once they occur. The impact *intensity* is considered to be *low* since MWE will procure a qualified contractor who is aware of OHS measures. Nevertheless, this gives rise to an impact of *moderate* significance.

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

**Mitigation strategies:**

- All construction workers will be oriented on safe work practices and guidelines and ensure that they adhere to them.
- Training will be conducted on how to prevent and manage incidences. This should

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involve proper handling of electricity, water etc. and sensitization on various modes of escape, conduct and responsibility during such incidences. All must fully be aware and mentally prepared for potential emergency.

- Regular drills will constantly follow on various possible incidences. This will test the response of the involved stakeholders. Such drills will keep them alert and they will become more responsive in the case of incidences.
- Signage will be used to warn staff and/ or visitors that are not involved in construction activities of dangerous places.
- Personnel will only undertake tasks for which they are trained/ qualified. A formal 'permit to work' system will be in place and strict instructions will be given for operators of equipment.
- Supervision of works will be done regularly to ensure that safety conditions are met while any deviation from safety regulations is immediately reclaimed following the best practices regarding safety at work equipment.
- Communication line shall be ensured in between workers and drivers of heavy equipment.
- Evacuation procedures will be developed by the contractor to handle emergency situations.
- [Provision of first aid kits on the sites](#)
- Adequate OHS personnel protective gear will be provided for the employees. The guide below should be useful:

**Hearing** (Over 85 dB(A) for 8 hours a day requires hearing protection)

- Ear Muffs: One size fits all, comfortable, less ear infection risk
- Ear Plugs: Small, lightweight, can get dirty and cause infection

**Face/Eye** (Working with any chemical or using any mechanical equipment)

- Face Shield: Protect face from splashing and particles
- Safety Glasses: Protection from solids (cutting, sanding, grinding)
- Safety Goggles: Protects eyes from splashing

**Hand** (Use correct gloves for the job)

- Chemical Gloves: (Nitrile, Latex, PVC)
- Gloves for other use: special gloves for cutting, burning, abrasions/ blisters

**Body**

- Overalls: Can protect against dust, vapours, splashes

**Foot Protection**

- If electrical hazard present, ensure boots offer protection
- Safety Toe/Steel Toe Boots: Always worn when potential for falling hazards exists
- Water/Chemical Resistant Boots: Use in a spill situation
- Non-slip boots for working on wet/slippery floors.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**g) Risk of Accidents [to community](#)**

The water pipelines will have to be laid across existing roads that are used by motorists and cyclists in addition to pedestrians. The trenches created for the pipe crossing can lead to accidents if proper signage is not put in place. Construction traffic accidents would be a significant social impact and likely to affect public members like children, women, disabled, elderly people and livestock, etc. The duration of the risk will be short-term occurring only during the construction phase. Although some effects of the accidents (e.g. minor injuries)

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may be reversible, some, for example, loss of human life are irreversible.

*Impact significance:* The receptor sensitivity is **medium** given the number of pedestrians and commercial activities along the roads while the intensity is **medium** given the temporary nature of the construction activities, however, some of the impacts may be irreversible. The impact significance is thus assessed to be **major**.

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

**Mitigation strategies:**

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

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**h) Landscape and Land Use Impacts**

The aspects of the project that will impact on the landscape of the area are the temporary use of land for construction (right of way (ROW), roads, construction camps and pipe

yards) and the permanent adoption of land for the pump station, block valves and access roads, etc. During construction, the ROW and the temporary facilities will be visible from the time of vegetation or topsoil removal until reinstatement is complete and vegetation has re-established fully. This will inevitably have visual impact in the area that is surrounded mainly by subsistence farming activities.

*Impact significance:* Duration of the impact will be long-term and the extent of the impact will be local. The *intensity* of the impact is *low* given that the kind of the proposed sewage treatment system, that is, waste stabilisation ponds, blends well with the environment. *Sensitivity* of the receptor is rated *high* given that such a system (for phase I) has ever been established in the area and its neighbourhood. Therefore, significance of the impact is *moderate*.

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

*Mitigation strategies:*

- The contractor will be required by MWE to develop and implement a Reinstatement Plan.
- Reinstatement of the water pipeline will be done in such a way as return the visual integrity of the landscape as closely as possible to its previous condition.
- In areas where grading of the working width impacts on the local topography, reinstatement will be undertaken in a manner which is generally sympathetic to the existing contours. However, at locations along the route where extensive grading will be required to provide a level working area, it may not be possible to return the topography to its pre-existing form as this may exacerbate erosion risks given the type of soils in these areas and would preclude access to the sewer line for inspection, maintenance or emergency response.
- Wherever possible the removal of existing mature trees will be avoided, provided that the integrity of the pipeline is not jeopardised.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**i) Social Misdemeanour by Construction Workers**

While most workers may originate from the local community where they have families, there might be others from distant places and working away from their families. With some disposable income to spend, this might induce illicit sexual relationships, with attendant risk for spread of HIV/AIDS. Irresponsible sexual relationships in project communities can break families and heighten risk of contracting HIV/AIDS. Illicit sexual relationships can be short-term but have long-term and irreversible effects. [But also people working closely together may increase the risk of communicable diseases like COVID, Ebola, air born diseases and water born diseases.](#) The Code of Conduct for Contractors has to be signed by contractor upon award of contract and copies displayed for workers to view. It

ought to be translated into predominant local language of the workforce.

**Impact significance:** Duration of the impact will be short-term or long-term depending on whether HIV/AIDS is contracted and the extent of the impact will be local or national depending on origin of construction workers. The **intensity** of the impact is **very low** given the small size of the project and other similar construction activities have ever taken place in the area. **Sensitivity** of the receptor is rated **high** given that some of the outcomes have a long-term effect. Therefore, significance of the impact is **minor**.

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

**Mitigation strategies:**

- As a contractual obligation, contractors shall be required to have an HIV/AIDS policy and a framework (responsible staff, action plan, etc.) to implement during project execution.
- A sensitisation programme for the would-be affected local communities will be conducted prior to commencement of and during the project implementation.
- A code of conduct (appropriate to behaviours in workplace and with respect to relations with local community) will be developed and approved by MWE which will be signed by all workers on the project.
- Local workers will preferentially be employed, paid directly through their banks and access to bars by workers from outside the project area in the local communities controlled.
- All construction workers shall be orientated and sensitized about responsible sexual behaviour in project communities.
- [Screening of workers recruited of the different communicable diseases to prevent spread among other workers](#)

**j) Slope Failure due to Earthworks**

In steep areas, earthworks could lead to slope instability and accelerated erosion or gullyng resulting into scarring of landscapes and increased sediment transport to surface waters or wetlands or gardens. Slope failure would affect downhill property and land uses. Risk of this potential impact actually occurring will be more prevalent in sections along the roads to the construction sites characterised by hilly terrain.

**Impact significance:** The likelihood of the impact occurring is high in the steep area. Duration of the impact will be short-term and effects reversible hence **intensity** of the impact is **low** and **sensitivity** of the receptors **medium**. Impact significance is therefore **moderate**.

		Sensitivity of receptor			
		Very low 1	Low 2	Medium 3	High 4

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

**Mitigation strategies:**

- Weak slopes should be protected using engineered structures.
- Areas susceptible to erosion and slope failure are protected using temporary or permanent drainage works.
- The eroded channels will be backfilled and restored to natural contours.

When mitigation recommendations are instituted, significance of residual impact will be minor.

**k) Impact on Ecological Environment**

Overall, the wider project area lies in a landscape that is heavily influenced by human activity; with human settlements, cultivated areas and farmlands and eucalyptus plantations as the major components of the landscape. The habitats in the area are represented by disclimax successional vegetation types which develop in areas of relatively high human influence. Such disclimax communities result when human modified systems supplant natural ecosystems and undergo continuous cycles of burning, clearing, cultivation, grazing followed by regrowth. They do not provide stable habitats for fauna. Although agricultural landscapes are generally much more simplified habitats than natural habitats, they continue to support considerable amounts of biodiversity as they provide food sources for birds for example.

All fauna encountered and recorded are listed as Least Concern (LC) on the IUCN Red List of Threatened species. The Grey crowned crane (*Balearica regulorum*) was reported by the locals to have disappeared from the project area overtime (not encountered during the transect walks) and is listed as Endangered (EN) on the IUCN Red List of Threatened Species. It is the only species in this category that was reported by locals to have existed within in the project area. Its generalist feeding strategy makes it highly adaptable and has allowed it to persist in human modified habitats. The most significant threat to its survival is the loss of critical nesting sites which occur in wetlands (most wetlands have been converted into farmlands).

**Impact significance:** The likelihood of the impact occurring is high and duration of the impact will be long term as long as the plant is constructed and remains operation. Given that the natural habitats have reduced in extent and the project could eat into some semi natural areas resulting in reduction in diversity and abundance of species found in the immediate vicinity by way of direct destruction or displacement, the **intensity** of the impact is **medium** and **sensitivity** of the receptors **low**. Impact significance is therefore **moderate**.

		Sensitivity of receptor			
		Very low 1	Low 2	Medium 3	High 4
Intensity of impact	Very low 1	1 Negligible	2 Minor	3 Minor	4 Minor
	Low	2	4	6	8

	2	Minor	Minor	Moderate	Moderate
Medium 3	3	Minor	6 Moderate	9 Moderate	12 Major
High 4	4	Minor	8 Moderate	12 Major	16 Major

**Mitigation strategies:**

- Clearing of vegetation in the natural habitat (wetland areas) will be minimised or avoided. If this cannot be avoided, then restoration of areas not needed for permanent project activities will be done.
- Unnecessary human presence in the natural habitats and project site will be minimised;
- Invasive species if observed along the revegetation sites will be removed.
- Environmental awareness programs for the construction workers, with special focus on threatened species will be conducted.
- Hunting and poaching of wild life will be strictly prohibited.
- Prevention and minimization of pollution (e.g. noise, water) through strict implementation of planned pollution control measures will be exercised.

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**Impacts of Project Construction on Climate Change**

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Vehicle emissions containing greenhouse gasses will be generated during construction activities. Quantities generated will depend on type, age and number of equipment used during construction. These emissions would have a cumulative negative effect on local air quality and global climate change. Though emissions of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) are generally accepted as contributing to global warming the effect has not been quantified. Global Warming Potential (GWP) provides a means of equating the potential contribution to global warming arising from different process units/activities which can generate different emissions. GWP is measured in terms of equivalent emissions of CO<sub>2</sub>; hence the GWP factor of CO<sub>2</sub> is 1. CH<sub>4</sub> has a GWP factor of 21 – that is, an emission of 1 kg of methane (CH<sub>4</sub>) is defined as having 21 times the GWP of an emission of 1 kg of CO<sub>2</sub>. Construction vehicles/ activities are unlikely to contribute significantly to greenhouse gas emissions due to their relatively small scale, intermittence and temporary nature, and as such are not considered further in this assessment.

**Impact significance:** The above impacts would mostly be local and would be small on a global scale though cumulative in nature. The manageability of the impact is high since typical impacts are well understood in conventional infrastructure construction industry and the ability to adapt to the impact is high because similar construction activities have ever taken place in the area. The *intensity* of impact is assessed as *low* and *sensitivity* of the receptors as *low*. The impact significance is therefore *minor*.

		Sensitivity of receptor			
		Very low 1	Low 2	Medium 3	High 4
Intensity of impact	Very low 1	1 Negligible	2 Minor	3 Minor	4 Minor
	Low 2	2 Minor	4 Minor	6 Moderate	8 Moderate

<b>Medium 3</b>	3 Minor	6 Moderate	9 Moderate	12 Major
<b>High 4</b>	4 Minor	8 Moderate	12 Major	16 Major

**Mitigation strategies:**

During construction, mitigation actions recommended for minimisation of project impacts on climate are:

- Optimizing workzone traffic management: Proper traffic management practices will limit GHG emissions due to traffic congestion caused by road construction works.
- Managing overloading: Trucks hauling construction materials will be optimally loaded in order to lower GHG emissions than over-loaded ones.
- Use of existing material sources: Wherever feasible use will be made of existing borrow pits rather than opening new sites will reduce embodied carbon associated with opening up new areas.
- Use of equipment in good mechanical condition: The contractor will ensure that all motorised equipment is in good mechanical condition and regularly services to reduce emissions they generate.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**m) Impact of Climate Change on Project Construction**

Climate change would impact on construction activities both during the dry spells for activities that are water demanding. These would be slowed down and alternative sources will have to be sought increasing the cost and related impacts of hauling water from a distance. During intense rainfall, some project areas may be inaccessible given the terrain and some of construction activities may be delayed.

**Impact significance:** The manageability of the impact is high since typical impacts are well understood in conventional infrastructure construction industry. Considering that a competent contractor will be hired by MWE, the *intensity* of impact is assessed as *low* and *sensitivity* of the receptors as *low*. The impact significance is therefore *minor*.

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

**Mitigation strategies:**

Construction activities will be rescheduled depending on the prevailing weather conditions in order to keep within the project construction period as much as possible.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.



**n) Conflicts due to influx of immigrant labour**

The project will attract immigrant labour into the project area. Like any other project with mass recruitments, the behaviour of workers on and off site will include the use of abusive and vulgar language, destruction of property, lack of respect to the locals, engagement in sexual relations with underage girls and married women. This is a potential source of conflict between immigrant labour and resident community.

*Impact significance:* The impact of conflicts because of influx of immigrant labour, though localized, temporary, readily reversible and noncumulative, can be immense in magnitude, thus the significance is moderate.

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

**Mitigation Measures**

- The Contractor should develop guidelines for behavioural conduct, including penalties for its workers.
- Workers must be sensitized on proper social behaviour and conduct with regard to community norms prior to starting work. Workers should be sensitized to avoid engaging in sexual relations with underage girls and married women. In case of misunderstandings between workers and the local community, local leadership should always be sought as a first priority in solving these issues. Similarly, in liaison with local leaders, the local leaders, and the Project Management Team (PMT) Contractor should prepare local communities – psychologically and otherwise – for the newcomers. The Local leaders Contractor efforts should be focused on instilling attitudes of tolerance, support and understanding towards the local communities by the newcomers.

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**o) Risk of violence against children**

Because of higher disposable income earned from being employed on the project, workers may engage in sexual acts with underage children particularly the girl child. This may result in early pregnancies. One of the major consequences arising from this would be an increase in number of girl children dropping out of school. This may psychologically disorient the life of the child and her family. Given that the project employees shall be recruited from many parts of the country and from different cultural and sexual backgrounds, it is possible that some of them introduce foreign sexual behaviours in the project area such as having sex with young boys. This is child molestation.

*Impact significance:* The magnitude of the impact is expected to be moderate because of the medium number of workers on average per site are expected to be involved in the works, most of which are casual workers to be recruited locally.

		Sensitivity of receptor			
		Very low 1	Low 2	Medium 3	High 4

Intensity of impact	<b>Very low</b> 1	1 Negligible	2 Minor	3 Minor	4 Minor
	<b>Low</b> 2	2 Minor	4 Minor	6 Moderate	8 Moderate
	<b>Medium</b> 3	3 Minor	6 Moderate	9 Moderate	12 Major
	<b>High</b> 4	4 Minor	8 Moderate	12 Major	16 Major

**Mitigation Measures**

- Employers at both the construction ~~and operation~~ phase should have a strict employment code of conduct.
- At the induction of employees, the employer should emphasize that molestation of children especially the girl child is punishable by taking the culprit to court.
- An employer who tries to shield or cover up for the employee caught in the act will equally be prosecuted, according to the penal code.
- Monitoring school attendance
- Sensitization in schools and the project communities
- Reporting mechanisms in place such as a whistleblowing system

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**P) Risk of Child Labour**

It is generally anticipated that local labour will be employed especially for casual activities. This anticipation is very high on the side of community leaders and members in the project area. For example, children from the refugee camps have often been used in informal sectors like loading Matooke (banana) on trucks, construction sites, stone quarries, animal grazing, and as domestic house workers because of the harsh environment. However, although this could be viewed as a good gesture that is likely to improve household income, if not properly managed and coordinated, could potentially result into abuse of children. Child labour is condemned by all international conventions including those of the International Labour Organization (ILO) and the United Nations (UN) as well as the Ugandan laws. This is short term and direct impact but Reversible. The receptor Sensitivity is accessed to be low

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*Impact significance:* The intensity of the impact is considered to be low because the contractor and Local governments are greatly aware of the side effects. The impact sensitivity is medium especially in short run but can be handled immediately.

		Sensitivity of receptor			
		Very low 1	Low 2	Medium 3	High 4
Intensity of impact	<b>Very low</b> 1	1 Negligible	2 Minor	3 Minor	4 Minor
	<b>Low</b> 2	2 Minor	4 Minor	6 Moderate	8 Moderate
	<b>Medium</b> 3	3 Minor	6 Moderate	9 Moderate	12 Major
	<b>High</b> 4	4 Minor	8 Moderate	12 Major	16 Major

**Mitigation Measures**

- The project implementation team should put a mechanism in place to identify the presence of all persons under the age of 18 and ensure that they are not employed on

the project.

- Put notices on work sites (NO CHILD LABOUR) in order to silence agitations
- Engage District Community Development Office (DCDO), Gender Officers, Parish Chiefs among others.
- Monitoring school attendance
- Sensitization in schools
- Reporting mechanisms in place such as a whistleblowing system

**q) Risk of Sexual harassment and Gender Based Violence (SGBV)**

Influx of construction workers from outside the Project area pose social risks that can become significant negative impacts such as defilement of minors leading to teenage pregnancies and school drop-outs, social tension in some homes if husbands earn salaries and resort to drinking, disruption of marriages due to fraternization of contract workers with women in the community triggering gender-based violence. Other related risks include sexual harassment at the workplace that can discourage women from taking up employment opportunities. Use of vulgar language by construction works can affect the social fabric especially children that can copy such behaviour and teach it to fellow pupils.

*Impact significance:* The intensity of the impact is considered to be low because the contractor and Local governments are greatly aware of the side effects. The impact sensitivity is medium especially in short run but can be handled immediately.

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

**Mitigation Measures:**

- Sensitizations should include the men to champion the GBV/DV fight and should as well target awareness creation sessions for women and girls since they are the most prone.
- Promote good relationships and improved communication skills amongst couples and positive parenthood through the various stakeholder engagements.
- Emphasize GBV in codes of conduct for contractors and these should be disclosed in local language (Lusoga) and be widely publicized to all workers and community members in the project area.
- Accessible grievance reporting, referral pathways and support systems should be established for and popularized for workers and community members.
- Deliberate measures to ensure that the Resettlement Action Plan (RAP) takes into account gender dynamics including GBV at household and community levels especially during compensation payments.
- Social management plans should be developed to include aspects of GBV.
- All construction workers shall be orientated and sensitized about responsible sexual behaviour in project communities.
- The Contractor should have a “No sexual harassment” policy and mainstream it to ensure strict adherence to established mechanisms to avoid the emergence of these

challenges.

- Contractor should restrict access to the workers' camps to only authorized persons.
- The contractor shall involve police in case of illicit behavior.
- MWE should ensure that social safeguards personnel are recruited as part of the project implementation personnel to supervise contractors and to continuously engage communities concerning SGBV.

**r) Increase in HIV/AIDS and STDs and other communicable diseases**

Like any other project with mass recruitment, influx of immigrant labour is bound to occur. Most often these workers will not come with their families and some may be single. This will encourage the formation of new social networks with the resident community; increasing the risk of prostitution and the spread of HIV/AIDS and STDs and communicable diseases like Ebola, COVID among others. Additionally, sex workers may camp in the project area to engage in prostitution with construction workers.

There is therefore a risk of increased exposure to HIV/AIDS infections due to risk factors such as high influx of workers; increased alcoholism due to high money exchange among locals. The construction workers themselves are MARPs (Most at Risk Population) that are vulnerable to HIV infections, stigmatization, non-compliance to ART/V protocols hence affecting Viral Load Suppression (VLS). If measures are not put in place, a part of the project area will be exposed to HIV, STI/Ds infections and other risks. In long run, it will reverse the achievements made in the fight against HIV/AIDS.

*Impact significance:* The intensity of the impact is considered to be low because the contractor and Local governments are greatly aware of the side effects. The impact sensitivity is medium especially in short run but can be handled immediately.

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

**Mitigation Measures**

- Sensitize workers on proper social behaviour and conduct with regard to community norms, HIV/AIDS and other sexually transmitted diseases. HIV/AIDS policies should be developed at the workplace;
- Establish and implement Contractors' HIV/AIDS Workplace Policy;
- Free HIV/AIDS testing, counselling and condom distribution be encouraged for both workers, sex workers and local community;
- The pathways for transmission of HIV/AIDS and STIs are well known, foreseeable and can be mitigated. Social bonds are not readily controlled, and the permanence of HIV/AIDS transmission makes this particular impact of social bonding both negative and also positive. Social bonds leading to lasting marriages and children occur in such situations; early pregnancies and sexual exploitation can also occur. It is therefore important to tackle the issue of social bonding with firmness and fairness, forbidding powerful relationships, which lead to exploitation of mostly women and children.

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- while encouraging relationships that may lead to permanent situations;
  - Develop and implement Joint HIV/AIDS action plan with Area HIV/AIDS actors such as Health Centres, UNHCR, District Health Office (DHO), etc.

#### s) Labour Exploitation

The construction works for the water project will require a number of employees for its various works though details of the specific labor needs will be clearer during works. It is estimated that, about 120 workers will be recruited in the project for its various works and these to include: Civil engineers, works supervisors, Human resource managers; Clerks of works, Laborers; Security

Other staff shall include Skilled Workers like drivers, masons, carpenters, operators, technicians, admin staff, foremen, mechanics, welders and Unskilled Workers mostly the casual Labourers, cleaners, kitchen and traffic control.

#### Proposed Mitigation measures

- Contractor should verify the age of every applicant before they are recruited in order to eliminate any cases of Child Labor
- Contractor should ensure that they pay hired labour on time or have a solid justification for delayed payment
- The contractor should stick to the agreed working hours
- Contractor shall discuss the work schedule with the local labour obtained from the project area so as not to clash with cultural norms

#### t) Crime, Drug Abuse and Prostitution

The water supply system implementation will attract a number of workers on the site who may have different behaviours and habits. These may result in the increase in the number of crimes, drug abuse and prostitution

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#### Proposed Mitigation measures

- Contractor should involve local (LC) leaders in labour recruitment to reveal criminal record.
- The hired labour shall be made to sign the code of conducts to hold them accountable
- Contractor should work with local authorities and police to contain criminal activities.

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### 8.3.2 Anticipated Negative Impacts during Operation Phase

#### a) Stress of Water Resources

The provision of a potable water supply may increase the consumption of water. Provision of taps or household connections may increase water use significantly. This may consequently lead to a drop in the amount of water received by downstream users on Kitakure River and its water quality as a result of establishment of a water intake and treatment plant. However, an assessment of water use and demand was done as part of the detailed design and dry spells effects were factored into the water requirements. Thus the abstraction of water resource for the purpose of the project should not have a heavy impact on available global water resource.

**Impact significance:** Duration of the impact will be long-term depending on the recharge from the catchment and the extent of the impact will be local. The **intensity** of the impact is **low** given that there are also plans to put in place catchment management measures that would contribute in recharging the affected water resources. **Sensitivity** of

the receptor is rated **low** resulting in a **minor** impact significance.

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

**Mitigation strategies:**

- MWE will acquire water abstraction permits with conditions to guide the amount of surface water to be abstracted.
- A water source protection plan is being prepared to protect the catchment areas for the water source.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**b) Land Pollution, Waste and Drainage Problems**

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Improved water supply comes with an increase in the amount of wastewater and sullage generated from the water treatment plant (domestic waste and backwash water, etc.), households and industrial or commercial facilities. Poor disposal or management of the wastewater generated will lead to land and/ or water pollution and related drainage problems. In cases where household are connected to piped water and not to sewerage system, they may use septic tanks whose cesspool or soak pit overflow may lead to contamination of soil and/or groundwater.

**Impact significance:** This is a direct negative impact, short-term and local in extent since there are plans to establish wastewater treatment and disposal systems in the project area. The likelihood of the impact occurring is high if water users are not educated on techniques for safely disposing of wastewater or sullage from their households especially in informal settlements. The **intensity** of the impact is **medium** and **sensitivity** of the receptor is rated **medium** given that the water treatment plant is located close to the downstream of River Kitakure resulting in a **moderate** impact significance.

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

	<b>High 4</b>	4 Minor	8 Moderate	12 Major	16 Major
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**Mitigation strategies:**

- MWE will acquire a wastewater or effluent discharge permit from DWRM with conditions to control discharge of untreated or partially treated effluent to the environment.
- A good drainage system should be built during the construction of the project and properly managed by the system operator, during the operation phase, -as part of the operation and maintenance (O&M) around the water supply site, public stand pipe and water treatment plant. The drainage and/ or soak pit as often as needed should be cleaned by the respective households or user-communities. Households or user-communities will be sensitised about proper drainage systems and their use.
- Households and commercial facilities will be encouraged to render sanitation waste like food waste free of pathogenic organisms through composting technique and so make it useful as agricultural fertilizer.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**c) Negative Impacts on Water Vendors**

In many developing countries due to the great distance to traditional water source waters, fetching water is done by water vendors. The same conditions exist in Sheema District where some community members rely on water vendors for water supply with a 20-litre jerry can costing between Ug. Shs 200 and 500. By introduction of piped potable water supply project, those people previously engaged in fetching water for others as a paid occupation, are thrown out of their job.

*Impact significance:* The **intensity** of the impact is **very low** given that there will still be households not connected to the piped water and with increasing population of Sheema, there will be more alternative jobs. **Sensitivity** of the receptor is rated **low** resulting in a **minor** impact significance.

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

*Mitigation strategy:* Identify such people and encourage them to work as casual labourers at the proposed project facilities.

**d) Occupational Health and Safety Risks**

During maintenance of the water transmission network and water treatment plant by

workers of the System Operator, occupational health and safety problems may arise. These may include: lifting of heavy and sharp objects and transportation of materials for maintenance, storage as well as handling and use of dangerous substances.

- Inadequate lighting and ventilation in workplaces when the intervention has to be done late in the day;
- Lack of adequate training (or neglect of safety precautions/ guidelines) in use of equipment and tools;
- Misuse of equipment and materials for functions they are not designed;
- Lack of safety signage in specific areas;
- Electrical hazard; and
- Eye hazards such as splashes.
- Fire risks

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**Impact significance:** Duration of the impact would be long-term lasting entire life of the affected person or short-term depending of the hazard exposed to. The **intensity** of the impact is **low**. However, **sensitivity** because it may involve loss of life or permanent damage of a person's limb on the receptors will be **high**, thereby giving a **moderate** impact significance.

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

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**Mitigation strategies:**

- The primary measure to mitigate OHS impacts is prevention which entails identification of risks and instituting pro-active measures to avoid them. In part this can be achieved by following Good International Industry Practice (GIIP) or national guidelines. For unavoidable risks, personal protective equipment (PPE) will be provided to workers.
- All staff will be oriented on safe work practices and guidelines and ensure that they adhere to them.
- Installation of fire extinguishers at the facilities
- Staff will be trained on how to prevent and manage incidences. This should involve proper handling of electricity, water etc. and sensitization on various modes of escape, conduct and responsibility during such incidences.
- Regular safety trainings will constantly follow on various possible incidences.
- Signage will be used to warn staff and/ or visitors that are not involved in facility work of dangerous places.
- Provision of First Aid kits at the water supply facilities
- Evacuation procedures will be developed to handle emergency situations.
- Adequate OHS protective gear will be provided for all laboratory staff.
- The treatment plant will be provided with a first aid kits shall be provided.
- In addition to tree planting around the site, the facility will be fenced off with a razor wire to stop unauthorised people from accessing the site and to keep out animals and for avoidance of vandalism at the site.
- Provision of sanitation facilities around the water supply facilities

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Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**e) Risk of Accidents to Community**

The development is expected to increase the traffic along the access roads due to maintenance vehicles carrying workers as well as tools and equipment for construction and maintenance/repair of the pipeline and other water supply system infrastructure. These impacts would mostly be linear and spatial in extent limited to road routes. They would therefore affect roadside communities, communities neighbouring the proposed site and road users. Other accidents may include the outburst of the pipes along the transmission and distribution networks....

**Impact significance:** The *intensity* of impact is assessed as *low* and *sensitivity* of the receptors as *low* given that there will be a few vehicles at the beginning of the project and the community will get used as the number increases in addition to the fact that the road network is being improved on. Therefore, significance of the impact is *minor*.

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

**Mitigation strategies:**

- Travel speeds of vehicles along the road especially at trading/ business centres will be controlled using humps and setting travel speeds not exceeding 40 km/h;
- All construction equipment and trucks will be kept in good operating condition by regular servicing to reduce noise and exhaust emissions;
- Adequate and appropriate signs including speed limits will be installed along the roadway in proximity to the access roads.

Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

**f) Impacts of Project Operation on Climate**

The water treatment plant requires energy and in the event that the grid power is not available, diesel generators will be used to supply energy. The generators will contribute to gases like CO<sub>2</sub>, CO and CH<sub>4</sub>.

**Impact significance:** The above impacts would mostly be local extent and intermittent in nature only happening when the generators are running. Therefore, the *intensity* of impact is assessed as *very low* and *sensitivity* of the receptors as *low*. The impact significance is therefore *minor*.

	Sensitivity of receptor			
	Very low	Low	Medium	High

		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Intensity of impact</b>	<b>Very low 1</b>	1 Negligible	2 Minor	3 Minor	4 Minor
	<b>Low 2</b>	2 Minor	4 Minor	6 Moderate	8 Moderate
	<b>Medium 3</b>	3 Minor	6 Moderate	9 Moderate	12 Major
	<b>High 4</b>	4 Minor	8 Moderate	12 Major	16 Major

*Mitigation strategies:* MWE will ensure that the generators are well serviced and maintained to minimise GHG emissions.

### g) Impact of Climate Change on Project Operation

A changing climate would impact water supply through changes precipitation patterns and storm-related damages. Dry spells will lead to an overall decrease in the availability of water and communities may revert to unsafe water sources. Changes in climate may also result in more intense rainfall events resulting into heavy storms. Stormwater-related effects include surge damage, wind damage and flooding which could pose a direct threat to the water infrastructure.

*Impact significance:* The water shortage may force communities to use unsafe sources leading to impacts some of which are irreversible, for example, death resulting from water borne diseases and poor sanitary conditions. The *intensity* of impact is assessed as *low* and *sensitivity* of the receptors as *high*. The impact significance is therefore *moderate*.

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		<b>Sensitivity of receptor</b>			
		<b>Very low 1</b>	<b>Low 2</b>	<b>Medium 3</b>	<b>High 4</b>
<b>Intensity of impact</b>	<b>Very low 1</b>	1 Negligible	2 Minor	3 Minor	4 Minor
	<b>Low 2</b>	2 Minor	4 Minor	6 Moderate	8 Moderate
	<b>Medium 3</b>	3 Minor	6 Moderate	9 Moderate	12 Major
	<b>High 4</b>	4 Minor	8 Moderate	12 Major	16 Major

#### *Mitigation strategies:*

- Catchment management and source protection plan is being developed to ensure that in cases of extreme weather conditions, the water resources are not greatly affected. The intervention measures will be community based activities where the Water Source Protection Committees (WSPCs) will be vital in their implementation
- The communities will be encouraged to use the toll-free calling line to report any damages during extreme weather conditions.

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Adoption of the above mitigation measures will reduce impact intensity to “very low” resulting in a residual impact of minor significance.

### h) Waste Management

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The major sources of wastes (solid/liquid) are dead plants, containers like empty water bottles, garbage from offices, living rooms and canteen, spoil of oil, human effluents and the sewerage/sludge and sediments when it rains.

*Impact significance:* Therefore the intensity of impact is anticipated to be **low** and the sensitivity of the receptor is anticipated to be **medium**. This results in **moderate** impact significance.

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

**Mitigation Measures**

- Plastic/polythene papers to be collected in bins and disposed of appropriately or through recycling;
- All generated waste to be handled and managed by a NEMA licenced handler.
- Do not discharge any untreated wastewaters or sludge within the environment

*Impact significance after mitigation:* No further impacts are envisaged after application of the above mitigations.

**i) Aesthetics and landscape**

During the operation phase there will be visual intrusion on site due to constructed structures which might impact on the project site's aesthetics and landscape.

*Impact significance:* The impact intensity is **low**, and the environmental sensitivity is **low**. This results in **minor** impact significance.

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

**Mitigation / Enhancement Measures**

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- In order to abate the impact on aesthetics and landscape it is important that areas such as pockets of the river ecosystem, tourism sites e.g. bird watching sites be restored in case they are disturbed;
  - To maintain the ecological integrity of the project area, it is recommended that only disturbed sites that are susceptible to erosion be planted with native plants common to the area.

Impact significance after mitigation: No further impacts are envisaged after application of the above mitigations.

#### **8.4 CUMMULATIVE IMPACTS**

Cumulative effects can be defined as “the impacts on the environment that result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions” (Council on Environmental Quality, US 1978). Below are some of the envisaged cumulative effects:

##### ***a) Physical Impacts***

Predicted physical impact is increasing recession area and water pollution. Also, activities like clearing of vegetation may increase the intensity and frequency of erosion/land degradation. This results in increased sediment concentration in the nearby valley-like seasonal swamp during the rainy season hence hindering other water usage purposes downstream.

##### ***b) Biological Impacts***

Changes in the physical and chemical characteristics of water from increased runoff inevitably affect distribution and abundance of aquatic biota. This can be attributed to increased nutrients leached from flooded soils and vegetation, enhanced productivity throughout the food chain.

##### ***c) Socio-economic Impacts***

The development of proposed project over the time would generate many employment opportunities directly as well as indirectly in the form of various service providers e.g. operation and maintenance.

A reliable drinking water supply would generate long-term economic benefits, including benefits to the local economy and spur up development in the area. Construction activities would generate short-term economic benefits and residents of Sheema District in the project area will benefit from this and once the earnings received are well utilised, the benefactors' livelihood would have been transformed for the better.

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## 9 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

### 9.1 Introduction

This environmental and social management plan (ESMP) for proposed construction works and operation of the water supply and sanitation facilities under this project, identifies the potential environmental and social aspects that should be monitored. It identifies parties responsible for monitoring actions, associated costs, indicators and training or capacity building needs and reporting. Various aspects of the ESMP are detailed in sections below.

### 9.2 Institutional Arrangements

#### 9.2.1 Institutional Structure and Responsibilities

There will be three parties involved with the ESMP, that is, the client (MWE - and a project manager will lead the client team) with ultimate responsibility for E&S performance on the project; the Supervising Engineer (with an Environment and Social Specialist on their team) responsible for monitoring and supervising the implementation of the ESMP and contract requirements; and the Contractor (with an Environment and Social Officer) who has responsibility for implementing the ESMP. During the operation, the Environment and Social audit will be annually undertaken by competent professionals to ensure compliance with the existing environment and social requirements. This will be through hiring of consultants registered by the National Environment Management Authority (NEMA). Implementation of ESMP during operation phase will be done by the System Operator, and monitored/supervised by local government.

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Therefore, the institutional responsibility of ensuring that this ESMP is implemented will rest with MWE having a key role of reviewing consultants' reports for compliance with the ESMP, among others. The Project Manager shall have the ultimate responsibility for implementation of ESMP and will therefore ensure that resources are duly provided. Other roles will be:

- Monitoring implementation of mitigation actions by contractors
- Coordinating training and capacity building where planned

MWE should ensure that the Project Management team (PMT) all its personnel to be involved in implementation of this ESMP are adequately qualified and were appointed based on their qualification and suitability for respective roles. There is thus no training provided for them under this ESMP and therefore, this should be included in the capacity building plan for the System operator and if needed for the staff of local government in charge of supervising the installed water infrastructure.

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Monitoring of the implementation of this ESMP is the responsibility of the Contractor under the guidance, supervision and monitoring by the Supervising Engineer. The Environmentalist and Social Specialist for the Supervising Engineer will supervise the contractor's monitoring activities.

The Contractor's Environment and Social Officer 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.

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Subcontractors will be required by a condition of their subcontract with the main contractor to actively manage environmental and social issues associated with their subcontract works and comply fully with all the applicable statutory regulations and the main contractor's environmental and social management plans. For significant aspects of work such as earthworks, the contractor may require subcontractors to provide their own Environmental and Social Management Plans and/or Method Statements for review by the Contractor's Environmental consultant/Officer. These ESMP's shall be approved by the Resident Engineer in consultation with MWE for adequacy before being implemented.

The Sheema District Environmental Officers (DEOs) are responsible for overseeing environmental protection on behalf of NEMA. The DEO will have implementation and monitoring roles during execution of this ESMP. Usually, these officials lack adequate facilitation so the project will need to provide auxiliary financial assistance for them to have effective participation in this project.

### 9.2.2 Monitoring and Reporting Arrangements

Monitoring will verify if predicted impacts have actually occurred and check that mitigation actions recommended in the ESIA are implemented and their effectiveness. Monitoring will also identify any unforeseen impacts that might arise from project implementation.

Monitoring will be undertaken by MWE and Environmental Officers who represent NEMA at local administrative level. Monitoring by NEMA in this case can be considered "third party monitoring" but this is its regulatory mandate according to National Environment Act (2019).

Another government agency that may undertake "third party monitoring" is the Occupational Health & Safety Department in Ministry of Gender, Labour & Social Development (MGLSD). This unit has authority to inspect any facility for compliance with national requirements on safety in workplaces. The project shall make no funding to MGLSD since this is provided for in its annual budget.

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Monitoring will be done through site inspection, review of site records (Accident Log, issuance of PPE, waste records, trainings and inductions, permits and approvals, etc.) review of grievances logged by stakeholders and *ad hoc* discussions with potentially affected persons (construction workers, residents near the project facilities) by the Ministry of Water and Environment (MWE) through the supervising consultant. At each monitoring, a discussion with a chairperson of environment committee of the area's local council (LC) could provide insight into views and grievances community has about the project. During operation phase implementation of ESMP should be done by the System Operator, while monitoring will be done at 2 level; locally by the local government and by the MWE at national level.

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Monitoring will be undertaken continuously on a daily basis over the construction and operation period.

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Environmental Compliance Audits will be necessary both during construction and project operation. While construction audits will aim to verify compliance to impact mitigation requirements, post-construction audits are a regulatory requirement within 12 months and not more than 36 months after completion of construction, according to ESIA Regulations (2020).

Since construction duration is estimated to be 1½ years, this ESMP has included a budget for 1½ year's construction audit and a separate provision so that from year 2 to year 5 full environmental audits are done by registered auditors but funded by the system operator as per Uganda requirements.

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Both construction and post-construction audits can be conducted internally (by MWE) or by a consultant hired by MWE. If undertaken by a hired consultant, a budget has been proposed for both in this ESMP.

Concise monthly and annual monitoring reports should be compiled by the Contractor (during construction) and quarterly monitoring annual reports should be compiled by the system operator (during operation phase). All reports will be ~~and~~ submitted to MWE. The report will highlight the different activities undertaken to manage environmental and social aspects of the project in line with contract specifications, laws, standards, policies, and plans of Uganda and World Bank Safeguard policies. The report will be discussed during the monthly progress meetings. The Environmentalist and Social Specialist for the Supervising Engineer will approve the Contractor's monthly environmental and social monitoring report that will then be transmitted to MWE for final approval. MWE's Environmental Management and Social Specialist will also independently monitor the implementation of the ESMP and/or verify the accuracy and content of the Contractor's monitoring report and then report to MWE. The report will also be shared with The AfDB and other relevant stakeholders. Approval of the environmental monitoring report will be the basis for the Supervising Engineer to approve payment of the respective environmental and social BoQ items.

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Construction- and post-construction phase auditing should culminate in reports that MWE shall share with AfDB, NEMA or other interested stakeholders. Note that while MWE is under no obligation to disclose construction phase audits, annual post-construction audits must be submitted to NEMA as a regulatory requirement as per ESIA Regulations (2020) to check on the compliance with the Environment and Social Impact Assessment (ESIA) approval conditions of the Environment Impact Assessment (EIA) Certificate.

### 9.2.3 Grievance Redress Mechanism

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This section describes avenues for affected persons to lodge a complaint or express a grievance against the project, its staff or contractors during project implementation. It also describes the procedures, roles and responsibilities for addressing grievances and resolving disputes. Every aggrieved person shall be able to trigger this mechanism to quickly resolve their complaints.

The objectives of the grievance process are:

- Ensure that appropriate and mutually acceptable corrective actions are identified and implemented to address complaints;
- Verify that complaints are satisfied with outcomes of corrective actions;
- Avoid the need to resort to judicial proceedings.

The grievance mechanism will be fed from three main sources:

- Community residents and the respective local leaders.
- Supervising engineer, clerk of works or contractor.
- Monitoring team who will forward issues/concerns identified in the field.

Steps of the grievance process are described below.

#### a) *Step 1: Receipt of complaint*

A verbal or written complaint from a complainant will be received by the Clerk of Works or Supervising Engineer and recorded in a complaints log s(he) keeps on site. During operation, the grievance log should also be maintained at the facilities where grievances can be recorded and forwarded to the managers of the system operator. The log will indicate grievances, date lodged, action taken to address complaint or reasons the grievance was not acted on; information provided to complainant and date the grievance was closed. Grievances should

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be lodged at any time, either directly to the Clerk of Works/ Project Office or through the Local Council Chairperson. The process for lodging a complaint is outlined below:

- Supervising Engineer receives complaint(s) from complainant and records it in log (in English).
- Supervising Engineer reads the recorded complaint translating it into local language for the complainant to confirm correct detail of complaint has been documented.
- Complainant signs the log to confirm grievance was accurately recorded.

Written complaints will be received and person delivering the complaint fills in log with his or her details (name, contact, etc.); date of delivery and then the person receiving the complaint also signs against the record.

**b) Step 2: Determination of corrective action**

If in his/her view, a grievance can be solved at this stage, the Clerk of Works/ Project Office and the supervisors during the operation will determine a corrective action in consultation with the aggrieved person. Remedial action(s) and timeframe within which they must be accomplished has been described and the officials/party like the Contractor and the system operator responsible for implementing them during the construction and operation respectively will be recorded in the complaint log.

Grievances will be resolved and status reported back to complainants within 5 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 not more than 1 month from lodging a grievance.

136 **c) Step 3: Meeting with the complainant**

The proposed corrective action and the timeframe in which it is to be implemented will be discussed with the complainant within 5 days of receipt of the grievance. Consent to proceed with the corrective action will be sought from the complainant and witnessed by a local council chairperson (LC Chairman).

**d) Step 4: Implementation of corrective action**

Agreed corrective action will be undertaken by the project or its contractor and the system operator during the construction and operation respectively within the agreed timeframe. The date of the completed action will be recorded in the log against the complainant's grievance.

**e) Step 5: Verification of corrective action**

To verify satisfaction, the aggrieved person will be asked to return if not satisfied with the corrective action.

**f) Step 6: Action by MWE and project contractors**

If the Clerk of Works cannot solve the grievance, he will refer it to MWE (and contractor) through the Supervising Engineer. If MWE (and Contractor) or cannot solve the grievance, then it can be referred to the local government structures ranging from LC I to LC V or the Courts of Law. Therefore, the MWE will only receive and respond to grievances that will have failed to be resolved on site by the contractor or the operator who will in turn refer such to the local authorities if they (MWE) cannot resolve them.

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**Table 2422: Environmental and Social Management and Monitoring Plan Activities and Criteria**

Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
<b>Construction Phase</b>							
<a href="#">Construction phase (CP1)</a>	Traffic Disruptions	Preparing a Traffic Management Plan to minimize the risk of traffic disruption, especially in areas where the major roads will require re-construction of culvert crossings. Using appropriate safety signs during construction (e.g. 'Heavy Trucks Turning', 'Road Diverted', 'Half Road Closed', etc.)	Contractor, Supervision consultant & Police	Throughout the Construction period	Presence of the Traffic Management Plan with the contractor and on site	Included in Contractor's cost	Daily
CP23	Vegetation Removal	<ul style="list-style-type: none"> <li>✓ Minimize vegetation clearance and protect water &amp; soils from pollution</li> <li>✓ Landscaping and re-vegetation after construction along the channel</li> </ul>	Contractor	Monthly	Visual inspection	14,000,000	Daily

Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
CP34	Soil erosion and degradation	<ul style="list-style-type: none"> <li>✓ Clearance of vegetation will be limited to areas that will be required for construction purposes. This will serve to minimize land disturbance as much as possible.</li> <li>✓ Excavation of trenches will be done in a phased manner such that soil is not exposed for a long time before the channel is lined.</li> <li>✓ Excavated material will be collected routinely such that heaps of exposed soils are not left in the Project area for long.</li> </ul>	Contractor, Supervision Consultant & MWE	Throughout the Construction period	<p>Evidence of sedimentation of eroded soil downstream of construction site.</p> <p>Number of complaints from neighboring communities regarding deposition of eroded soil.</p>	13,800,000	Daily

Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
CP45	Flow Diversions during construction	<ul style="list-style-type: none"> <li>✓ Phasing of the rehabilitation and expansion works such that the majority of works are undertaken during the dry season to reduce the risk of constrictions in the drainage system during the rainy season.</li> <li>✓ Construction will not be started where critical access roads or channel sections cannot be completed before the start of rainy season and the bidding documents shall reflect this emphasis.</li> <li>✓ The Contractors will use best available methods of construction to minimize the risk of blockages and constrictions during construction. Some of the methods that can be employed for channel diversion include: a) controlled release of flow through a pipe to downstream of the section under rehabilitation and expansion after damming; b) restriction of the flow to one proportion of the flow channel area as construction is completed in the other flow area</li> </ul>	Contractor & Supervision Consultant	Throughout the Construction period	Occurrence of flooding in Project area during construction period	Included in Contractor's cost	Daily

Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
CP56	Generation of Wastes	<ul style="list-style-type: none"> <li>✓ The principles of an integrated solid waste management system will be implemented i.e. reduction at source, reuse and recycle.</li> <li>✓ A waste management plan should be developed by the Construction Contractors, and approved by MWE to ensure that measures for handling all Project-generated waste are in place.</li> <li>✓ Waste transportation vehicles will be covered to avoid spillage or waste getting blown off during haulage.</li> <li>✓ Construction waste shall not be left in stockpiles along roads, but removed and reused or disposed of on a regular basis.</li> <li>✓ Human waste will be properly managed through provision of onsite portable toilets, with consideration for the number of workers on site during construction. Separate toilets will be provided for female workers.</li> <li>✓ Any hazardous wastes generated by construction activities (e.g. emptying pit latrine contents) will be collected and transported off</li> </ul>	Contractor, Supervision Consultant & MWE	Throughout the Construction period	Submit waste management plan with adequate acceptable measures. Records from licensed waste contractor with logs on source of waste, weight, final destination of waste, handling of waste at final disposal point.	Included in Contractor's cost	Daily

Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
CP67	Accidents and Construction hazards	<ul style="list-style-type: none"> <li>✓ Preparation and approval of a Health and Safety Plan that sets out the measures to be taken to ensure the safety of the workers and the local community during the works.</li> <li>✓ Provision of <u>First Aid kits</u>.</li> <li>✓ Orient all construction workers on safe work practices and ensure that they are adhered to.</li> <li>✓ Safety training will be conducted routinely on how to prevent and manage incidences on site, and measures to protect the general public from construction site hazards</li> <li>✓ Use of PPE for different work environments.</li> <li>✓ Procedure for reporting and/or responding to incidents.</li> <li>✓ Emergency evacuation procedure</li> <li>✓ All tasks will be performed by qualified and authorized personnel.</li> </ul>	Contractor, Supervision Consultant	Throughout the Construction period	<ul style="list-style-type: none"> <li>Records of incidents and accidents on site.</li> <li>Observance of site safety rules by workers.</li> <li>Use of requisite PPE by workers.</li> <li>Response to emergency incidents on site.</li> <li>Availability of first aid kits on the various sites.</li> </ul>	15,650,000	Daily

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Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
CP8	Air quality and pollution	<ul style="list-style-type: none"> <li>✓ Sensitization of local residents will be undertaken prior to the start of the rehabilitation and expansion works.</li> <li>✓ Delivery vehicles will be switched off when not in use so as to minimize the release of fugitive emissions;</li> <li>✓ Contractor's vehicles and machinery will be regularly serviced and maintained to optimum working conditions to minimize potential emissions.</li> <li>✓ Trucks delivering materials will be covered with tarpaulin to reduce the risk of fugitive dust emissions, especially in busy residential and commercial areas;</li> <li>✓ Waste from site to be transported by licensed companies for waste transportation</li> <li>✓ Regularly monitor air quality to track changing parameters and inform timely interventions</li> </ul>	Contractor, Supervision Consultant & MWE	Throughout the Construction period	Number of complaints of excessive fumes or dust registered. Levels of dust and fugitive emissions released to the atmosphere as a result of construction activities	8,400,000	Daily

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Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
CP9	Noise Pollution and Vibrations	<ul style="list-style-type: none"> <li>✓ Sensitisation of local residents prior to the start of the rehabilitation and expansion works. It will be particularly important to:</li> <li>✓ The Contractors on site made aware of, and adhere to, the regulatory noise limits for a construction site</li> <li>✓ Construction workers provided with appropriate PPE such as ear plugs and ear muffs for protection against excessive noise.</li> <li>✓ Construction activities limited to daytime, especially in residential areas to minimize disturbance of residents.</li> <li>✓ Construction works near public institutions such as schools should be harmonized with school programmes to consider works during holidays and weekends.</li> <li>✓ Project machines and vehicles will be turned off when not in use.</li> </ul>	Contractor, Supervision Consultant & MWE.	Throughout the Construction period	Number of complaints of excessive noise and vibration. Routine inspection and maintenance records	11,730,000	Daily

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Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
CP10	Water Pollution	<ul style="list-style-type: none"><li>✓ Planning and management of stockpiles to minimize potential for “wash-out” and generation of sediment-laden runoff during rainy seasons.</li><li>✓ Fuel handling and oil spill measures will be implemented to prevent, control and address spill or leaks.</li><li>✓ All equipment and vehicle repairs will be carried out under shelter to minimize potential soil and oil pollution during rainy seasons.</li><li>✓ Regular maintenance of operating machinery to keep it in good working condition, and hence minimize oil and lubricant spills</li></ul>	Contractor, Supervision Consultant & MWE.	Throughout the Construction period	Occurrences of impediment to water flow, especially in wetland areas	Included in Contractor’s cost	Monthly



Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
	Public Health Issues	<ul style="list-style-type: none"> <li>✓ All Contractors shall be required to develop guidelines for behavioral conduct, including penalties. This should be reflected either as independent document or component to the Contractor's Human Resource Manual</li> <li>✓ Workers must be sensitized on proper social behaviour and conduct with regard to community norms prior to starting work;</li> <li>✓ workers should be sensitized to avoid engaging in sexual relations with underage girls and married women;</li> <li>✓ In case of misunderstandings between workers and the local community, use of local leadership should always be sought as a first priority in solving these issues;</li> <li>✓ Similarly, <del>in liaison with local leaders, contractors</del> should prepare local communities – psychologically and otherwise – for the newcomers; efforts be focused on instilling attitudes of tolerance, support and understanding towards the newcomers in the local communities</li> </ul>	Contractor, Supervision Consultant & MWE.	Throughout the construction phase	Guidelines for behavioral conduct, and No. of penalties awarded to workers for misbehavior	15,860,000	Monthly

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Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
CP11	Disruption of Socio-economic Activities and utility services	<ul style="list-style-type: none"> <li>✓ Project implementation will be done in close consultation with the respective utility service companies such as MWE, UNRA, UMEME and telecommunication companies.</li> <li>✓ All identifiable utility service lines in the right of way will be relocated in the pre-construction phase prior to the commencement of works to avoid interruptions from damage during the construction phase.</li> <li>✓ During construction, the Contractor will have to prepare a work schedule, which will be closely monitored and supervised by MWE.</li> <li>✓ The communities to be affected by any interference in service provision (water, road, electricity, or telecommunication signals); will be given ample warning and alternatives provided by service provider.</li> </ul>	Contractor(s) /MWE and service providers	Before construction phase kicks off	All the utility service lines in the right of way are relocated and communities are informed in advance, Recorded number of service infrastructure damaged as a result of Project implementation. Number of complaints recorded from community members regarding interference with service infrastructure due to Project activities.	36,500,000	Monthly

Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
<b>TOTAL COST (Construction Phase)</b>							
		<b>OPERATIONAL PHASE</b>					

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Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
OPI	Occupational Health and Safety Risks	<p><u>The primary measure to mitigate OHS impacts is prevention which entails identification of risks and instituting pro-active measures to avoid them. In part this can be achieved by following Good International Industry Practice (GIIP) or national guidelines. For unavoidable risks, personal protective equipment (PPE) will be provided to workers.</u></p> <p><u>All staff will be oriented on safe work practices and guidelines and ensure that they adhere to them.</u></p> <p><u>Installation of fire extinguishers at the facilities</u></p> <p><u>Staff will be trained on how to prevent and manage incidences. This should involve proper handling of electricity, water etc. and sensitization on various modes of escape, conduct and responsibility during such incidences.</u></p> <p><u>Regular safety trainings will constantly follow on various possible incidences.</u></p> <p><u>Signage will be used to warn staff and/ or visitors that are not involved in facility work of dangerous places.</u></p> <p><u>Provision of First Aid kits at the water supply facilities</u></p> <p><u>Evacuation procedures will be developed to handle emergency situations.</u></p> <p><u>Adequate OHS protective gear will be provided for all laboratory staff.</u></p>	MWE under the Engineering and Technical Services Directorate	Throughout the O&M phase	<p>Number of complaints registered from community about potential hazards as a result of Project activities.</p> <p>Records of incidents amongst community residents as a result of Project activities.</p>	Included in the MWE annual operational budget	Per Quarter

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Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
OP2	Loss of income from Project-related activities	<ul style="list-style-type: none"> <li>✓ All people taken on to work on this Project will be informed about its duration and phasing beforehand, so that they can plan accordingly.</li> <li>✓ The MWE Supervising Engineers will take note of Consultants, Contractors and sub-contractors that produce quality work, in line with their contracts and industry best practice during the construction phase, and prioritize them for available maintenance work during the life of the Project.</li> <li>✓ Unskilled labourers taken on from the local communities surrounding the Riverbanks of Kitakure will be kept on for <u>cleaning, guarding, maintenance works of the water supply system channel, and other water facilities</u> where possible.</li> <li>✓ Where feasible, upon discussion with the local area leaders, committees will be selected along the densely populated sections along the channel with the aim of promoting vigilance against garbage.</li> </ul>	MWE under the Engineering and Technical Services Directorate	Throughout the O&M phase	Number of O&M workers from the local communities surrounding the Kitakure River	Included in the MWE annual operational budget	Annually

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Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
OP3	Risk of accidents to community	<p>Travel speeds of vehicles along the road especially at trading/business centres will be controlled using humps and setting travel speeds not exceeding 40 km/h;</p> <p>All construction equipment and trucks will be kept in good operating condition by regular servicing to reduce noise and exhaust emissions;</p> <p>Adequate and appropriate signs including speed limits will be installed along the roadway in proximity to the access roads.</p> <p>Side rails will be installed along the channel crossings to enhance community safety and minimize the risk of falling into the channel.</p> <p>Community sensitization to allow proper usage of the crossing points and avoid accidents when crossing after a heavy downpour.</p> <p>Community sensitization to instil a sense of ownership of the project and project infrastructure so as to encourage community vigilance and hence reduce vandalism or theft of metal work fabrication, such as safety railings</p>	<p>MWE under the Engineering and Technical Services Directorate and Directorate of Gender and Labour and the System Operator</p>	Throughout the O&M phase	Number of complaints registered from community about potential hazards as a result of Project activities. Records of incidents amongst community residents as a result of Project activities	Included in the MWE annual operational budget	Annually

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Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
OP4	Air pollution	<ul style="list-style-type: none"> <li>✓ The vehicles will be switched off when not in use so as to minimize the release of fugitive emissions.</li> <li>✓ The vehicles and machinery will be regularly serviced and maintained to optimum working conditions to minimize potential emissions.</li> </ul>	MWE <del>under the Engineering and Technical Services Directorate</del>	Throughout the O&M phase	Number of complaints of excessive fumes registered. Levels of emissions released to the atmosphere as a result of faulty equipment.	Included in the MWE annual operational budget	Quarterly

Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
OP5	Disturbance due to noise pollution and vibrations	<ul style="list-style-type: none"> <li>✓ The Contractors and workers for operation and maintenance should be especially mindful when carrying out construction near sensitive receptors such as business centres.</li> <li>✓ Maintenance activities will be limited to daytime, especially in residential areas to minimize disturbance of residents.</li> <li>✓ Regular care and maintenance of vehicles and equipment must be undertaken to ensure they run smoothly so as to minimize emissions of noise.</li> <li>✓ Project machines and vehicles will be turned off when not in use</li> </ul>	MWE under the Engineering and Technical Services Directorate	Throughout the O&M phase	Number of complaints of excessive noise registered. Noise level measurements	Included in the MWE annual operational budget	Quarterly

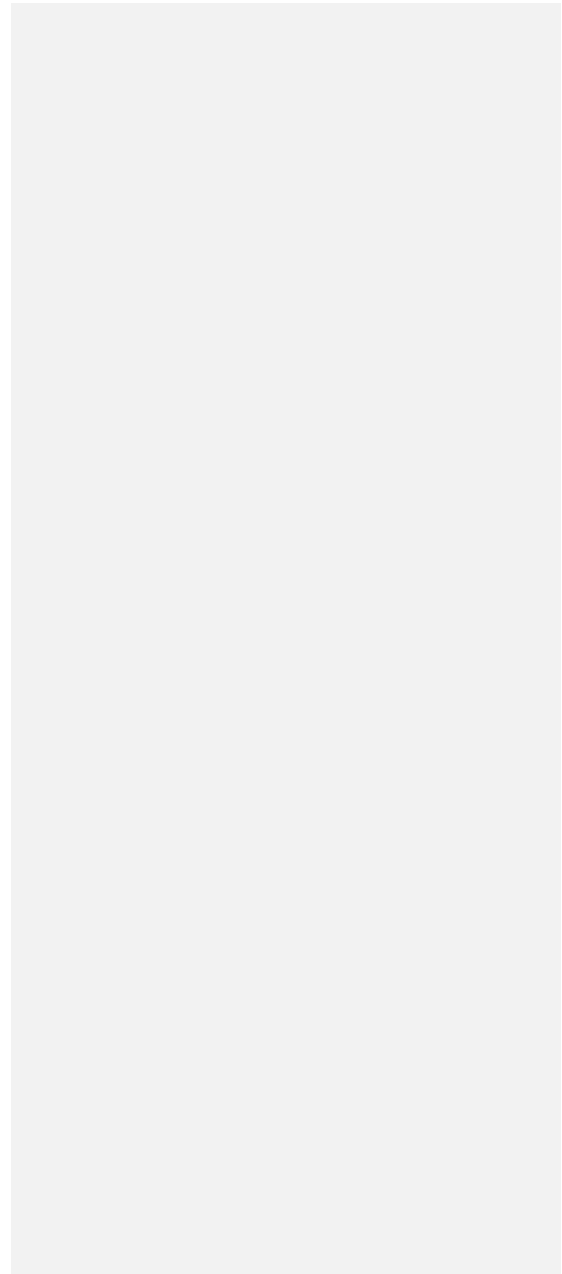


Ref. No	Anticipated Impacts	Mitigation Measures	Responsibility	Monitoring Period	Monitoring Indicators	Cost (UGX)	Frequency
OP6	Improper waste management from the water supply system operation and the channel maintenance	<ul style="list-style-type: none"> <li>✓ A waste management plan will be developed by the System Operator/Maintenance Contractor, and approved by MWE to ensure that measures for handling all operation and maintenance waste (dredged material and waste debris) are in place.</li> <li>✓ The principles of an integrated solid waste management system will be implemented i.e. reduction at source, reduce, reuse and recycle</li> <li>✓ Waste transportation vehicles will be covered to avoid spillage or waste getting blown off during haulage.</li> </ul>	<p>MWE under the Directorate of Public Health and Environment</p> <p>The local leaders/authorities where the Kitakure River traverses</p>	Throughout the O&M phase	<p>Number of complaints of dumping Project waste in unlicensed areas registered</p> <p>Sediment and waste debris deposition in the wetlands and receiving water bodies</p>	Included in the MWE annual operational budget	Weekly
E&S annual Audit		✓					yearly

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**Note:** External Monitor can be a lead Agency and or Authorities like NEMA, District Environment Officers or a NEMA Certified Consultant whom the developer and Contractor will contact on matters arising like noise, biodiversity, air and water quality monitoring. Lead Agencies will make their own arrangements on inspections on site to ensure compliance with set guidelines and standards.



## CONCLUSIONS AND RECOMMENDATIONS

The Shuuku-Matsyoro WSSS II is being proposed by the Ministry of Water and Environment for Kyangyenyi Sub County both in Sheema district. This is envisaged to bring an end to water stress and overreliance on a few low yielding boreholes and springs within the project area of Shuuku and Matsyoro and neighbouring community. It is also envisaged that, the area experiences scarcity of safe clean water and high growing population. Further still, the project will also address the focal area of access to clean water as stipulated under the Uganda Vision 2040 and the National Development Plan III. The project also contributes towards achieving SDG (*specifically SDG 6 on clean water and sanitation*). Several beneficial impacts envisaged will include:

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

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

- Soil erosion during construction phase.
- Destruction of vegetation and crops during construction phase.
- Increased noise nuisance during construction phase by workers and equipment.
- Increased sediment loads into the downstream beyond water sources especially during construction phase.
- Improper disposal of cut out spoil and other construction wastes.
- Other concerns include occupational safety hazards, and HIV/AIDS risk associated with construction labour.

All land issues were addressed by the Sheema District Local Government (SDLG) since the land required for the project is already secured (as attached as 6), will be undertaken to address all compensation issues that are anticipated and an ESMP has also been presented in the preceding Chapter to ensure positive impacts are enhanced while negative impacts are mitigated. Resettlement issues are not anticipated. The current designs did not consider the need for a wastewater treatment plant. The water source being surface water based, a substantial amount of **wastewater and sludge will be generated in sedimentation tanks** thus there is need to put in place a wastewater treatment plant to enable wastewater to be treated before final disposal especially if water treatment chemicals are to be used.

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

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

- Undertake Annual Environmental Audits and submit reports to NEMA.
- Maintaining good house-keeping through the duration of the construction phase.
- Screening unsightly aspects from public view including excavations (where practical), construction material storage areas, waste storage areas and ablutions.
- Erect fencing around **construction project sites** to act as screens minimizing the effect of wind in generating dust emissions.
- The re-vegetation of all areas of natural vegetation with indigenous species that have been disturbed as a result of construction activities and maintain the 200m buffer zone.
- **Designation of storage of construction materials and fuel storage areas.**
- Effective control of waste and containment of storm water especially during rainy season.
- Implement dust suppression measures (use of water) when appropriate.
- Train workers on issues of HIV/AIDS and child labour should not be permitted.
- Adhere to Occupational Health and Safety Act, 2006 provisions e.g. monitoring noise levels and provision of protective equipment to staff.
- At least 75 % (subject to availability) local labour from Sheema district should be used and 95% (subject to availability and skills levels) local contractors should be used.
- The Developer (DWD) monitors compliance together with stakeholder wide monitoring group comprising technical staff from local government institutions.
- **Fencing is recommended in order to prevent contamination of the water source and for security of hydraulic structures and installations for the intake on River Kitakure.**
- **Prepare a water source protection plan to be implemented by MWE and other stakeholders like the District Local Government and development partners** for the catchment area of the water sources.

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

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## ANNEXES





## Annexe 1. Approved Terms of Reference for ESIA by NEMA



**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)**

**NEMA/4.5**

6<sup>th</sup> March, 2023

The Permanent Secretary,  
Ministry of Water and Environment,  
Directorate of Water Development,  
Rural Water Supply and Sanitation Department,  
Plot 3-7, Kabalega Crescent, Luzira,  
P. O. BOX 20026, Kampala, Uganda  
E-mail: nmalizah@yahoo.com

NEMA House  
Plot 17, 19 & 21, Jinja Road.  
P.O.Box 22255, Kampala, UGANDA.

Tel: 256-414-251064, 251065, 251068  
342758, 342759, 342717

Fax: 256-414-257521 / 232680

E-mail: info@nemaug.org

Website: www.nemaug.org

**RE: REVIEW OF THE SCOPING REPORT AND TERMS OF REFERENCE PERTAINING TO THE PROPOSED CONSTRUCTION OF SHUUKU-MASYORO WATER SUPPLY AND SANITATION SYSTEM PHASE II IN SHEEMA DISTRICT.**

This is in reference to the Terms of Reference (**EIATOR10119**) for carrying out the Environmental and Social Impact Assessment (ESIA) for the above-mentioned project, which was submitted to this Authority, on 28<sup>th</sup> February, 2023, for review and approval. This Authority has finalized the review and grants formal APPROVAL of the said TOR.

Please note that the approval of the TORs DOES NOT grant permission to start implementing any of the proposed project activities. This is not a Certificate of approval.

In addition, you are advised to consider the key aspects below during the conduct of the environmental impact study and the preparation of the ESIA report.

- i. Ensure that the project description is comprehensive for each of the project components, including the designs of the different project components, In addition, clearly indicate the chemicals that will be used in the water supply system and how these will be stored, handled and associated waste disposed of.
- ii. Undertake geotechnical and hydrogeological investigations of the proposed project sites/water sources so as to inform the design and construction of the Water Supply and Sanitation System.
- iii. Carry out comprehensive consultations with all the relevant stakeholders including Sheema District Local Government, Directorate of Water Resources Management, and the local community in the neighborhood of the proposed project sites. The views of the stakeholders consulted should be well documented/ addressed and lists of persons consulted appended in the EIA report.

- iv. Ensure that the relevant local government departments including, the Environment, water, Physical Planning and the Engineering departments, are consulted and concerns that may arise taken into account and incorporated in the design, construction and operation of the project.
- v. Study the land tenure and identify potential project affected persons/properties at the proposed sites. Propose plans for land acquisition and/or compensation where required, including resettlement action plans, where applicable.
- vi. Provide current baseline information of the project sites, the associated project components and their neighborhood, accurate GPS coordinates clearly indicating the boundaries of the project sites and the associated components and images/maps of the project sites.
- vii. Provide site specific baseline information. In particular, assess site baseline soils and air quality taking into account key parameters relevant to the nature of the project. Append the results of the analysis from an accredited laboratory to the ESIA report.
- viii. Carry out an evaluation of all the negative impacts associated with the proposed Shuuku Masyoro Water Supply and Sanitation System and provide detailed mitigation and environmental management and monitoring plans that relate to the identified environmental impacts from the proposed project. In particular, the following issues should be comprehensively assessed and appropriate mitigation actions provided in the ESIA.
  - a. Potential waste streams from the construction and operation of the Piped Water Supply and Sanitation System and management of such waste, as well as measures for preventing pollution of the environment and degradation of any sensitive ecosystems that may be within the vicinity of the project sites;
  - b. Occupational health and safety issues likely to arise from the operation of the factory.
- ix. Provide a clear and legible copy of the site layout plan (preferably on A-3 sized paper) showing the equipment, clear boundaries of the project sites and the associated components in relation to its environs.
- x. Include in the ESIA report comprehensive analysis of alternative /options to selected project location, design and technology among others.
- xi. Append to the ESIA report authentic copies of land ownership and acquisition documents.
- xii. Indicate the project cost of the project and append a certificate of valuation issued by a qualified and registered valuer in accordance with the provisions of Schedule 5,

3(f) of the National Environment (Environmental and Social Assessment) Regulations, 2020.

- xiii. Provide evidence of payments of the 30% ESIA fees as required under regulation 49 (2) of the National Environment (Environmental and Social Assessment) Regulations, 2020.

**Note that** only registered Environmental practitioners including the team leader should be contracted to carry out the ESIA for the proposed project.

This is therefore, to recommend that you carry out the ESIA study for the proposed Shuuku Masyoro Piped Water Supply and Sanitation System incorporating the guidance provided above.

We look forward to your cooperation and receipt of copies of the ESIA report for proposed further consideration.



Waiswa-Ayazika  
**FOR: EXECUTIVE DIRECTOR**






## Annexe 2. Records of Stakeholder Engagement

### STAKEHOLDER CONSULTATION AND ENGAGEMENT

NAME OF THE PROJECT: CONSULTANCY SERVICES FOR ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT (ESIA) AND WATER SOURCE PROTECTION PLANS OF NYABUHIKYE-KYIKYENKYE, PHASE II (IBANDA DISTRICT), SHUUKU-MATSYORO, PHASE II (SHEEMA DISTRICT) AND REHABILITATION OF EARTH DAMS IN KASENSERO (MUBENDE DISTRICT) AND KOTOMOL (AGAGO DISTRICT).

DISTRICT: .....

10/10/2023

NO.	NAMES	DESIGNATION	CONTACT	SIGNATURE
1.	Tusine K.A. Joseph	SE / MWE	0772462267	
2.	ANDREW NYAMBO	ESIA	0715027708	
3.	ABITEGEKA JACKLINE	SOCIOLOGIST	0771947755	
4.				
5.				
6.				
7.				
8.				
9.				
10.				

### STAKEHOLDER CONSULTATION AND ENGAGEMENT

NAME OF THE PROJECT: **CONSULTANCY SERVICES FOR ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT (ESIA) AND WATER SOURCE PROTECTION PLANS OF NYABUHIKYE-KYIKYENKYE, PHASE II (IBANDA DISTRICT), SHUUKU-MATSYORO, PHASE II (SHEEMA DISTRICT) AND REHABILITATION OF EARTH DAMS IN KASENSERO (MUBENDE DISTRICT) AND KOTOMOL (AGAGO DISTRICT).**

DISTRICT: SHEEMA 10<sup>th</sup> 02/2023

NO.	NAMES	DESIGNATION	CONTACT	SIGNATURE
1.	BWERARE LYNCHIFFE	PAS - SHEEMA	0782658376	[Signature]
2.	Muhindo Pulkeri g mwine	RDC "	0772578381	[Signature]
3.	Tunyashya Patrice	DTRO	0772834865	[Signature]
4.	BIRUNGI B. RETHEMAH	Engineer RWSRCS MWE	0701672047	[Signature]
5.	TUMUNDE MISAKI	Chief of Cell. Kuyahyeny	0774661585	[Signature]
6.	NGABIRANO CLEMENTINE	SOCIOLOGIST - RESRCC	0706316352	[Signature]
7.	ABITEGEKA ARNOLD	E.H.O - RWSRCS/MWE	0789873824	[Signature]
8.	SAM ORIKUNDA	DRDC	0781194700	[Signature]
9.	TUMUHARWE ROBERTI BABU	Chief of Cell. MATSYORO	0716818999	[Signature]
10.	NAREEBA KIZO	Water Technician	0782801307	[Signature]
	Eng. Tumusiime M. Fred	DNO - Sheema	0772458641	[Signature]

### STAKEHOLDER CONSULTATION AND ENGAGEMENT

NAME OF THE PROJECT: CONSULTANCY SERVICES FOR ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT (ESIA) AND WATER SOURCE PROTECTION PLANS OF NYABUHIKYE-KYIKYENKYE, PHASE II (IBANDA DISTRICT), SHUUKU-MATSYORO, PHASE II (SHEEMA DISTRICT) AND REHABILITATION OF EARTH DAMS IN KASENSERO (MUBENDE DISTRICT) AND KOTOMOL (AGAGO DISTRICT).

DISTRICT: SHEEMA

10/02/2023

NO.	NAMES	DESIGNATION	CONTACT	SIGNATURE
1.	RWAMUSANGA B. PAUL	vice chairman LC2	0776827635	
2.	Muhangi Evalist	committee	0775395399	
3.	GUMISI RIZA YOKANA	PLUMBER	0773422570	
4.	Mushabe John	Chairman LC1 Nyakabanda	0771828520	
5.	Serestino Taremuka	Area councillor Masyo Parish	0780327811	
6.	Mutungye Allen	Chairman Water Users Committee	0782540787	
7.	Sempala Moses	R.D.C's Driver	0783322455	
8.	Katanda Lawrence Bwira	Gen. Sec. Masyo LC1	0772425255	
9.	AKAFUKWASA CASBERG	VILLAGE MATE	0778352451	
10.	BIRUNGI NUKEEN	Lady Councillor	0787023717	
11.	ABITELIKA JACQUELINE	Environment & Social Specialist	0771947755	





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## Annexe 3. Chance Finds Procedure on Physical Cultural Resources Management

The Physical Cultural Resources Policy (PCRs) would be triggered because of the excavation/rehabilitation works that may encounter PCRs. To meet the requirements of this policy, a Chance Finds Procedure has been developed to indicate a real risk of causing undesirable adverse environmental and social effects on the physical and intangible cultural resources, and that more substantial planning may be required to adequately avoid, mitigate or manage potential effects. Chance find procedures will be used as follows:

- i. Stop the construction activities in the area of the chance find;
- ii. Delineate the discovered site or area;
- iii. Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the Directorate of Museums and Monuments (DMM) take over;
- iv. Notify the project/ supervisory Engineer who in turn will notify the responsible local authorities and the Directorate of Museums and Monuments under the Ministry of Tourism, Wildlife and Antiquities (within 24 hours or less);
- v. The Directorate of Museums and Monuments would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the Directorate of Museums and Monuments (within 24 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
- vi. Decisions on how to handle the finding shall be taken by the Directorate of Museums and Monuments. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;
- vii. Implementation of the authority decision concerning the management of the finding shall be communicated in writing by the DMM;
- viii. Construction work could resume only after permission is given from the responsible local authorities and the Directorate of Museums and Monuments concerning safeguard of the heritage;
- ix. These procedures must be referred to as standard provisions in construction contracts, when applicable. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered are observed;
- x. Construction work will resume only after authorization is given by the responsible local authorities and the National Museum concerning the safeguard of the heritage.
- xi. Relevant findings will be recorded in MWE Implementation Supervision Reports (ISRs), and Implementation Completion Reports (ICRs) will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.



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## Annexe 4. Outline of the Spill Management Plan

The plan should be developed in order to specify the procedures of handling spills during the construction of the Shuuku-Matsyoro WSS II in Sheema. The plan will ensure enhancement of the ability to handle spills, prevent the impacts of the spills and reduce loss resulting from spills, protect the safety of lives of personnel working in the project area and maintain social stability. The plan will include detailed spill management information for all areas of the Project i. Including Project site, storage areas, site offices and camps where required. The Spills Management plan should be a working document used in training and practice. The Contractor must submit the Spill Management Plan as part of their safety management plan to MWE/Supervising consultant for review and approval.

The Spill Management plan should be prepared to establish a Spill Management system based on an environmental risk assessment undertaken in accordance with the National Environment (Waste Management) regulation of 2020, part XII- Section 98(1), the National Environment (Environmental and Social Assessment) Regulations, 2020, the oil spill regulations made under the Act, the Occupational Safety and Health act of 2006 Part XII- Section 86 (a, b) which calls for adequate and readily accessible means of drenching with water for any employee who is splashed with corrosive liquids and sufficient means of flashing or irrigating the eyes. A lead agency shall, in consultation with the Authority, provide for Spill Management systems, contingency plans and other plans for minor incidents of acute pollution that may occur or cause damage within the jurisdiction of the lead agency in accordance with the National Environment Act NO.5 of 2019, Part VII Section 92 (1). The Plan must include, though limited to the following Objectives:

### Objectives

- To ensure sufficient measures of controlling and preventing any spill along the construction areas
- To train all the workers in safety drills and spills management for quick and efficient response to scenarios that can lead to pollution or damage to the environment

### Mitigation measures

- The contractor should draw prevention plans for all areas of work in the Spill Management Plan. Prevention plans must include training requirements, procedures and prevention equipment locations. Prevention equipment must meet the requirements of National Safety and Health Act and Regulations and be on site and readily available.
- Identify existing and potential dangers to spills at site and the measures that will be taken to reduce, eliminate or control those dangers, including procedures to be followed in case of spill.
- Identify internal and external resources that may be required to respond to the spill at site.
- Develop a Spill Management Plan for all physical areas of its performance of the work at site as well as its site office and storage areas.
- Test Spill Management Plans prior to commencing the work and at a minimum annually throughout the performance of the work.
- All contractor employees on the project must be trained and aware of their responsibilities in the prevention of spill and in the event of a spill.

### Roles and responsibilities

- The contractor must at all times take all precautions appropriate to maintain the health and safety of all the sites.

- 
- The contractor is responsible for the adequacy, stability and safety of all site operations and construction methods and must comply with workplace safety and health laws in accordance with the OSH Act 2006.
  - Before commencing the work, the contractor must identify their dedicated on site safety supervisor, who must attend a pre-job meeting at the MWE's office to review safety measures for the work and be approved by the Supervising consultant/ safety representative.
  - The safety supervisor of the consultant must have no other duties assigned. The dedicated on site safety supervisor will be responsible for, but not limited to, the identification and control of potential safety hazards including spills at the work sites.
  - All contractor employees on the project must be trained and aware of their responsibilities in preventing spills and in the event of a spill.

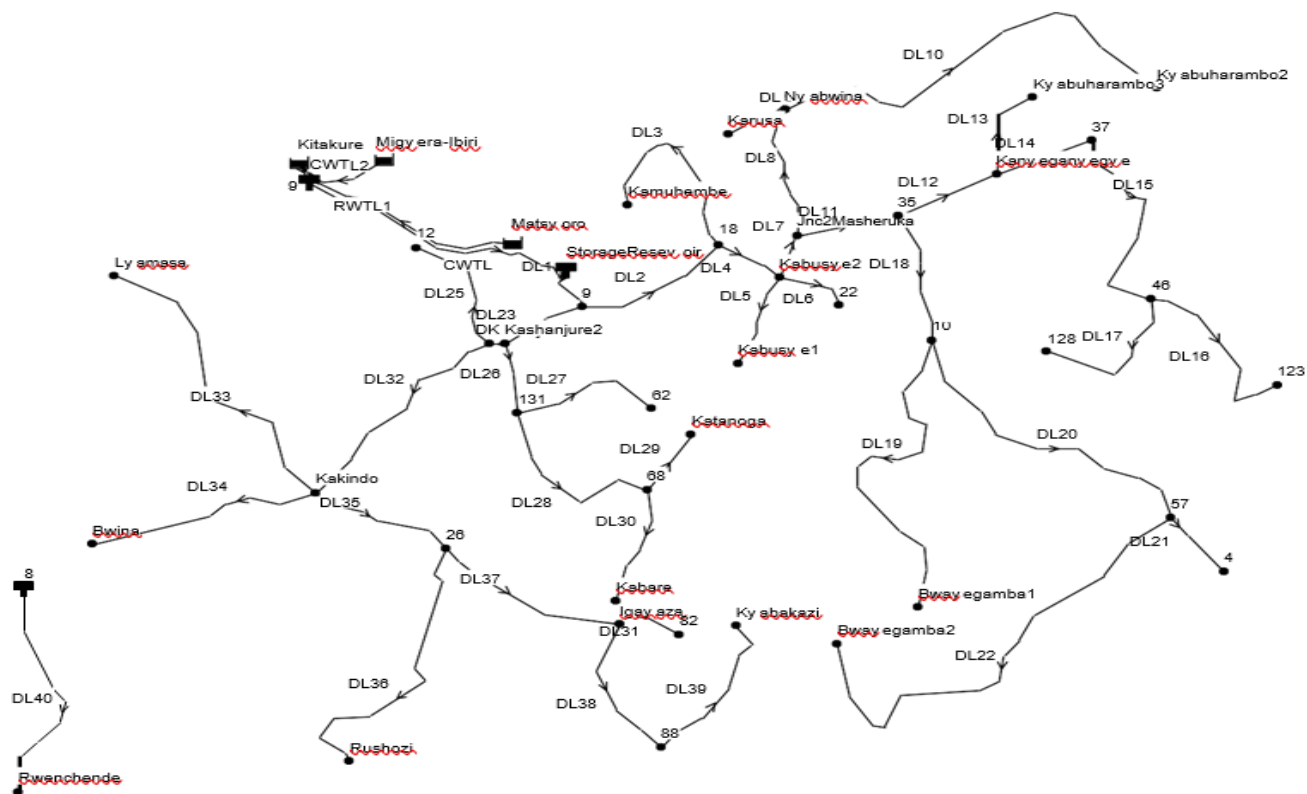
The Health, Safety and Environment Coordinator is responsible for the following roles;

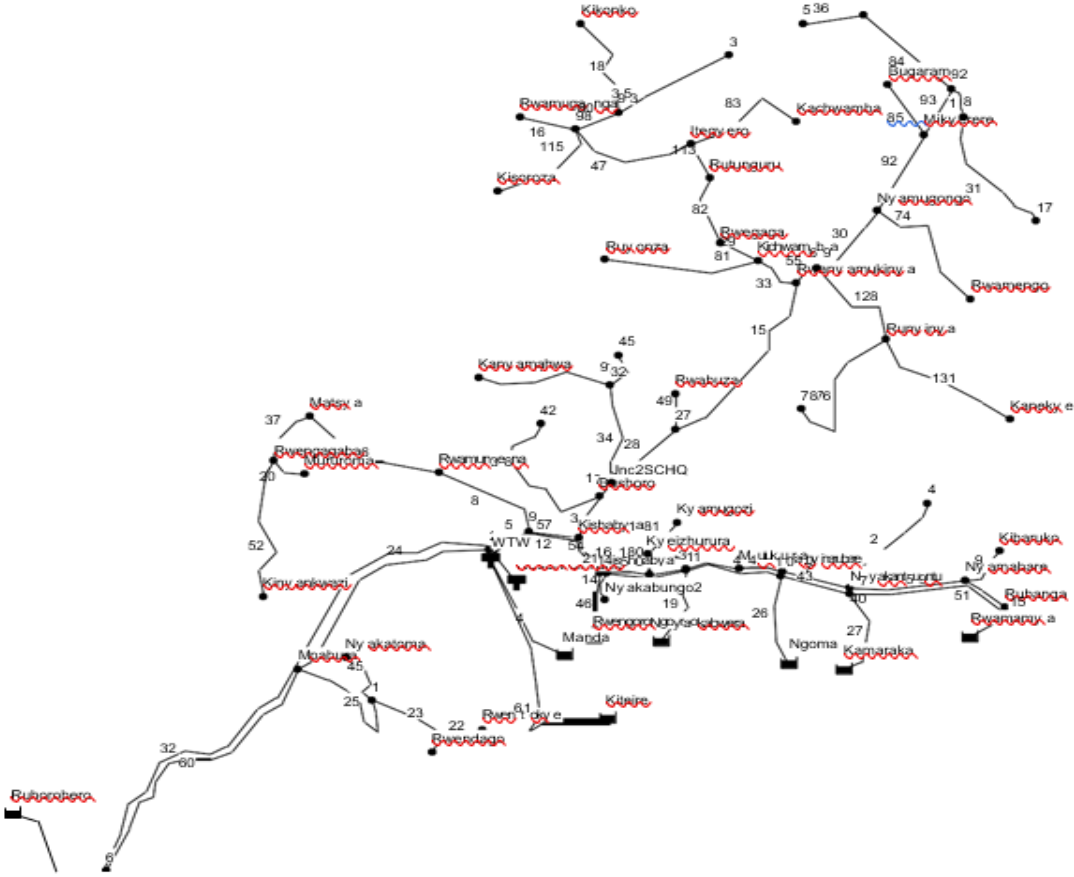
- Responsible for providing risk, health, safety and environmental information.
- Responsible for compliance with legislation and obtaining authority from the Supervising Consultant to inform and liaise with National Government and Regulatory authorities.
- Responsible for providing OHSE advice & support and information to the contractor and the Incident Response Team (IRT) at the spill site.
- Responsible for advising and maintaining the spill management responses in line with the Contractor emergency response procedures.

#### **Means of verification**

- Well-developed site spill management measures to protect the public from the hazards present on the project which contain hazards to the public, post the required signage to inform the public of the hazards present, maintain good housekeeping as required.
- Records of spill accidents in and around the project sites
- Presence of weekly health and safety performance report including safety information and statistics on spill management
- A write up of risks facing contractors' personnel and their responses.
- A list of dates for annual testing of Spill Management plans
- Records of safety drills and Spill Management trainings undertaken.

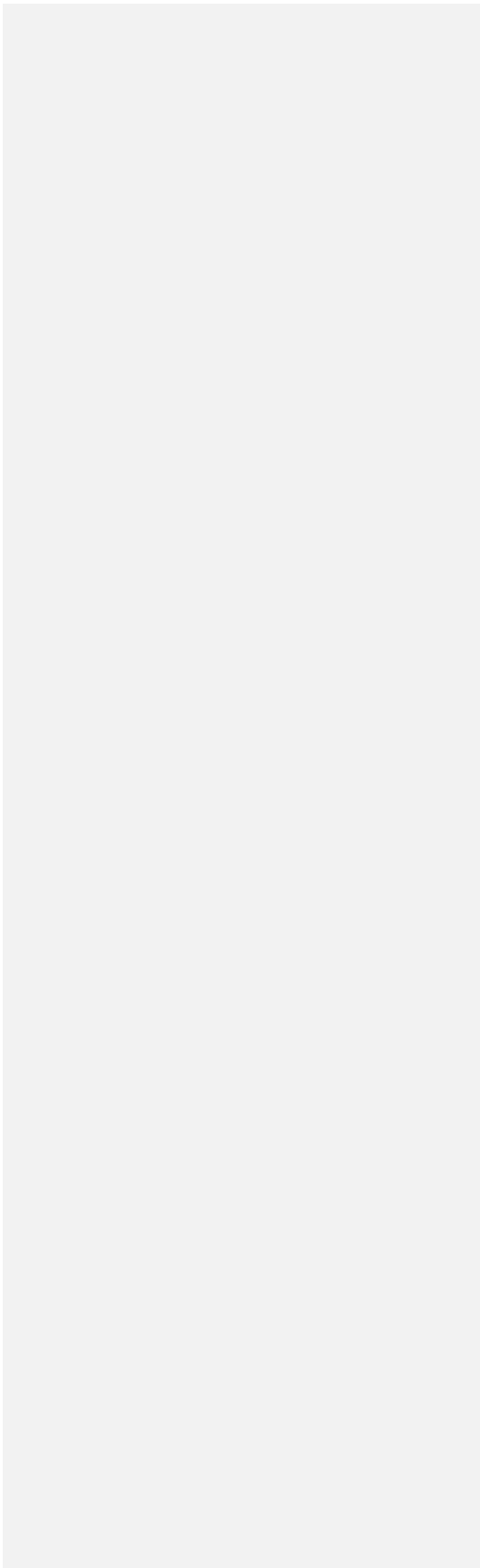
## Annexe 5. General Layout and Layouts of the Transmission and Distribution System







# Annexe 6. Land Ownership Documents



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Annexe 7. CERTIFIED VALUATION CERTIFICATE

Annexe 8. PROOF OF PAYMENT OF THE 30%  
ESIA REVIEW FEES

