



# MINISTRY OF WATER AND ENVIRONMENT

## ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED MORIKISWA MINI SOLAR POWERED PIPED WATER SUPPLY SYSTEM, TORORO DISTRICT



### FINAL REPORT

SUBMITTED BY:

**Ministry of Water and Environment**

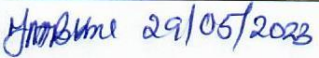
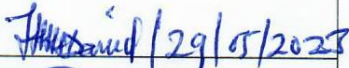

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**May 2023**

## ESIA TEAM AND DECLARATION

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

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## **ACKNOWLEDGEMENTS**

This Environmental Project Brief for the Proposed Morikiswa Water Supply System was developed through a consultative process involving different stakeholders. The Environmental and Social Impact Assessment Team acknowledges the efforts put in by the different stakeholders without whose help, this report would not have been successfully developed. The team acknowledges the assistance accorded to them by the Tororo District Local Government (TDLG) during the field visit. The Team is grateful to the Senior Assistant Secretaries, LC III Chairpersons, Parish Chiefs, LC1 Chairpersons and the local community members for the support and guidance given while in the field.

## TABLE OF CONTENTS

ESIA TEAM AND DECLARATION.....	i
ACKNOWLEDGEMENTS .....	ii
LIST OF TABLES.....	viii
LIST OF FIGURES.....	ix
LIST OF PLATES.....	ix
LIST OF ACRONYMS.....	x
EXECUTIVE SUMMARY .....	xi
1 INTRODUCTION .....	1
1.1 Project Background .....	1
1.2 Project Objectives .....	2
1.2.1 Project Development Objectives.....	2
1.2.2 Objectives of the Environmental Project Brief.....	2
1.3 Justification of the Proposed Project.....	3
1.3.1 Demand for Better Water Supply Services .....	3
1.3.2 Consistency of the Project with National Priorities / Plans.....	3
1.4 Details of the Developer and Investment Cost .....	4
1.4.1 Details of the Developer .....	4
1.4.2 Investment Cost .....	4
1.5 Study Methodology .....	4
1.5.1 Environmental Screening.....	4
1.5.3 Field Visits and Inspections .....	5
1.5.3 Literature Review .....	5
1.5.4 Community and Stakeholder Consultations.....	5
1.5.5 Flora Assessment.....	7
1.5.6 Birds Assessment.....	8
1.5.7 Water Quality Measurements and Analysis .....	10
1.5.8 Noise Measurements .....	10
1.5.9 Impact identification and assessment .....	10
1.6 Structure of the Environmental Project Brief Report.....	14
2 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK .....	16
2.1 Introduction .....	16
2.2 Policies Relevant to the Proposed Project.....	16
2.3 Legal Framework Relevant to the Proposed Project .....	20
2.4 Institutional Framework.....	26

## ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

2.4.1 Ministry of Water and Environment.....	26
2.4.2 National Environment Management Authority .....	27
2.4.3 Ministry of Gender Labour & Social Development .....	27
2.4.4 Local Administration Structures .....	28
2.4.5 African Development Bank.....	28
2.5 Permits/licenses to be obtained .....	28
3 ENVIRONMENTAL AND SOCIO-ECONOMIC BASELINE CONDITIONS.....	29
3.1 Project Location and its Environs.....	29
3.2 Biophysical Environment .....	30
3.2.1 Geology and Soils.....	30
3.2.2 Climate .....	30
3.2.3 Drainage .....	31
3.2.4 Topography.....	31
3.2.5 Flora.....	31
3.2.6 Birds.....	33
3.3 Noise Level .....	39
3.4 Existing Water Supply Situation .....	40
3.4.1 Water sources .....	40
3.4.2 Existing piped water systems .....	40
3.4.3 Water Quality .....	41
3.5 Existing Sanitation Situation.....	42
3.5.1 Solid waste management.....	42
3.5.2 Sewerage services .....	42
3.5.3 Access to toilets/latrines .....	42
3.5.4 Pit latrine construction problems .....	43
3.5.5 Water and sanitation challenges .....	43
3.6 Socio-Economic Profile .....	43
3.6.1 Administrative Arrangement.....	43
3.6.2 Population .....	43
3.6.3 Access to Infrastructure.....	46
3.6.4 Education.....	47
3.6.5 Economic Activities and Income.....	48
3.6.6 Land use and Land Tenure Systems.....	50
3.7 Assessment of water use, demand and affordability .....	50
3.7.1 Water source during wet and dry seasons .....	50

## ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

3.7.2 Population’s willingness to pay for Water .....	50
3.7.3 Distance to the water source.....	51
4 PROJECT DESCRIPTION .....	52
4.1 Introduction .....	52
4.1.1 Water Source and Intake .....	52
4.1.2 Transmission System .....	53
4.1.3 Storage Reservoirs .....	54
4.1.4 Main Reservoir Site Works .....	55
4.1.5 Service Connections.....	55
4.1.6 Valves and Fittings .....	56
4.1.7 Summary of the water supply components.....	56
4.2 Sanitation facilities .....	56
4.3 Proposed project activities.....	57
4.3.1 Pre-construction phase .....	57
4.3.2 Construction phase .....	57
4.3.3 Operation and maintenance phase .....	58
4.3.4 Decommissioning phase .....	58
5 STAKEHOLDER CONSULTATION AND CONCERNS.....	59
5.1 Introduction .....	59
5.2 Consultation findings.....	59
5.3 Key concerns from stakeholder and recommendations .....	65
6 PROJECT NEEDS AND DISCUSSION OF ALTERNATIVES .....	67
6.1 Introduction .....	67
6.2 The Project Need.....	67
6.3 The “No- Action” Alternative .....	67
6.4 Water Source Alternatives .....	67
6.5 Power Source Alternatives.....	67
6.6 Design Considerations .....	68
6.7 The Action Alternative .....	68
7 POTENTIAL ENVIRONMENTAL, HEALTH, SOCIAL AND ECONOMIC IMPACTS .....	69
7.1 Introduction .....	69
7.2 Potential positive impacts .....	69
7.2.1 Pre-construction and construction phase.....	69
7.2.2 Operation phase.....	70
7.2.3 Decommissioning phase .....	71

7.3 Potential negative impacts .....	71
7.3.1 Pre-construction and construction.....	71
7.3.2 Operational/ maintenance phase.....	76
7.3.3 Decommissioning phase .....	77
7.4 Evaluation of impacts .....	78
8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN.....	81
8.1 Introduction .....	81
8.2 Integration of Safeguards into Procurement Process (Contracts) .....	81
8.2.1 Bidding .....	81
8.2.2 Bill of Quantities (BoQs) .....	81
8.2.3 Safeguards Clauses .....	82
8.2.4 Procurement of the Contractor .....	82
8.2.5 Staffing .....	82
8.2.6 ESMP Monitoring and Reporting.....	82
8.2.7 Project Reporting Commitments .....	83
8.3 Contractor Management Plans and Method Statements .....	83
8.3.1 Labour Force Management Plan .....	83
8.3.2 Quality Management Plan .....	83
8.3.3 Erosion Control Plan .....	83
8.3.4 Waste Management Plan .....	84
8.3.5 Occupational Health and Safety Plan .....	84
8.3.6 Community Health and Safety Plan.....	85
8.3.7 HIV/AIDS and Gender Management Plan.....	85
8.3.8 Traffic and road safety Management plan.....	85
8.3.9 Cultural Heritage Management Plan .....	86
8.3.10 Stakeholder Engagement Plan (SEP) .....	86
8.4 Grievance Redress Mechanism (GRM) .....	87
8.4.1 Grievance Procedure and Rationale .....	87
8.4.2 Steps of the Grievance Process.....	88
8.4.3 Capacity Building for the Grievance Officer and Grievance Committee .....	91
8.4.4 Other alternatives.....	91
8.5 Capacity Building and Trainings.....	92
8.6 Required Approvals, Permits and Licenses .....	92
8.7 Environmental and Social Monitoring Plan.....	93
8.8 Roles and Responsibilities.....	93

## ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

8.8.1 Project Developer (MWE) .....	94
8.8.2 Project Development Partner (AfDB).....	94
8.8.3 NEMA and Lead Agencies.....	94
8.8.4 Project Contractor .....	95
8.8.5 Tororo District Local Government .....	95
8.9 The Monitoring Team.....	95
8.10 Enforcement of Compliance .....	96
8.11 Environmental and Social Management and Monitoring Plan (ESMMP) Matrix .	96
9 CONCLUSION AND RECOMMENDATIONS.....	110
9.1 Conclusions .....	110
9.2 Recommendations .....	110
BIBLIOGRAPHY.....	111
ANNEXES.....	112
Annex I: Summary of the project investment cost .....	112
Annex II: List of affected villages in the project area .....	113
Annex III: List of Stakeholders Consulted.....	114
Annex IV: List of birds encountered in the proposed project area .....	120
Annex V: Other items to be considered during preparation of the BoQs .....	123



## LIST OF TABLES

Table 1: Categories of stakeholders that were consulted during the ESIA study .....	7
Table 2: Maximum Permissible Noise Levels for Construction sites .....	10
Table 3: Classification of impact evaluation .....	11
Table 4: Determination of impact significance.....	12
Table 5: Impact assessment criteria and rating scale.....	12
Table 6: Criteria for rating impact intensity and likelihood.....	13
Table 7: Policies relevant to Morikiswa Solar Powered Mini-Piped Water Supply System .....	16
Table 8: Ugandan laws and regulations relevant to the Proposed Morikiswa Mini Water Supply System .....	20
Table 9: AfDB Operational Safeguard (OS) Policies.....	25
Table 10: Permits/certificates/ licenses to be obtained .....	28
Table 11: Location of proposed project facilities in Morikiswa RGC.....	30
Table 12: Forest generalists (F) species recorded across sites .....	35
Table 13: Water birds (water specialists (W) and wetland non-specialists (w*)).....	36
Table 14: The three grassland species recorded along the proposed water system project area.....	37
Table 15: The three Aerial feeders recorded in various in various areas.....	37
Table 16: Details of species of conservation concern recorded across sites .....	38
Table 17: Palearctic Migrants (PM) and Afrotropical Migrants (AM) across sites.....	38
Table 18: Critical habitat matrix generated across the project areas.....	39
Table 19: Noise levels in at selected project sites .....	40
Table 20: Ground water quality in the Morikiswa area .....	42
Table 21: Domestic Population projections in the project area .....	44
Table 22: Non-domestic population in the project area .....	45
Table 23: Institutions in the Project Area.....	47
Table 24: Income level of respondents in the Sub-counties.....	50
Table 25: Water supply system capacity for the proposed Morikiswa mini piped water supply scheme.....	53
Table 26: Transmission and distribution details.....	53
Table 27: Summary of transmission system Kanang C borehole to Kisoko Tank .....	53
Table 28: Summary of transmission system of Maundo borehole to Maundo Reservoir.....	54
Table 29: Reservoir Specifications.....	55
Table 30: Dimensions of the tanks proposed to be installed.....	55
Table 31: Summary of the project service connections .....	55
Table 32: Summary of the dimensions for the proposed water supply system .....	56
Table 33: Stakeholder concerns and views.....	59
Table 34: Evaluation of anticipated negative impacts.....	78
Table 35: Environmental and Social Management and Monitoring Plan.....	97
Table 36: Stakeholder Engagement Action Plan.....	<b>Error! Bookmark not defined.</b>

**LIST OF FIGURES**

Figure 1: A view of the proposed project extent.....29  
Figure 2: Monthly Temperature and sunshine hours variation in Tororo District.....31  
Figure 3: Number of species recorded in various locations along the proposed project area.....34  
Figure 4: Number of species recorded in various ecological categories (FF-Forest specialist, F-Forest Generalist, f-forest edge species, W-Water specialist, w-Water non-specialist, G-Grassland specialist and Ae-Aerial feeder). .....35  
Figure 5: Total and served population in the project area over the design period.....46

**LIST OF PLATES**

Plate 1: Stakeholder engagements in Morikiswa area..... 6  
Plate 2: Cassava garden and pine plantation surrounding Kanang C borehole.....33  
Plate 3: Some of the birds within the Morikiswa project area ..... 34  
Plate 4:Poranga Borehole in Kanang C ..... 40  
Plate 5: Gravel roads and railway line in the project area .....46  
Plate 6: Accessibility to Hydroelectric Power .....47  
Plate 7: Drilled Boreholes in the project area .....52

## LIST OF ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
APHA	American Public Health Association
CDO	Community Development Officer
DN	Norminal Diameter
DWD	Directorate of Water Development
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
EHS	Environment, Health and Safety
EPB	Environmental Project Brief
GDP	Gross Domestic Product
GoU	Government of Uganda
HIV	Human Immunodeficiency Virus
HDPE	High Density Polyethylene
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
LC	Local Council
MWE	Ministry of Water and Environment
MDLG	Moroto Distict Local Government
NEMA	National Environment Management Authority
NDPIII	Third National Development Plan
NEA	National Environment Act
OSH	Occupational Safety and Health
PPE	Personal Protective Equipment
RGC	Rural Growth Center
uPVC	Unplaticised Polyvinyl Chloride
TDS	Total Dissolved Solids
UK	United Kingdom
WASH	Water Sanitation and Hygiene

## **EXECUTIVE SUMMARY**

### **Introduction**

Tororo is one of the districts in Uganda witnessing a rapidly increasing population, yet with inadequate water supply in both urban areas and rural growth centers (RGC). The gap between the total population and the population with access to safe water is significant and increases annually thus creating high water demands. Extending safe water to the unserved population in the district, therefore, can be a stimulus to the district's productivity, and improvement in the quality of life.

Ministry of Water and Environment (MWE) and Tororo District Local Government, plans to develop Morikiswa mini solar powered piped water supply system in Kisoko, Petta and Nagongera Sub-counties in Tororo District. The proposed water supply project shall ensure sustainable access to safe water in the project area. This will contribute to creating a more stable socio-economic environment and hence boost commercial development of the area. The project will also contribute to improvement of Water Sanitation and Hygiene (WASH) services, which are critical for health and socio-economic development. The project shall also reduce walking distances to access water, thereby saving time for the education of the children.

The proposed project is listed under Schedule 4 (*Projects for which Project Briefs are required*) of the National Environment Act, 2019 under Category 4, "Utilisation of water resources and water supply", Part (b) "Abstraction or utilisation of ground water of less than 1,000 m<sup>3</sup> per day." It also falls under Category 2 according to the African Development Bank (AfDB) integrated social safeguard system of 2015. The Environmental and Social Impact Assessment (ESIA) for the proposed Morikiswa Solar Powered Mini-piped water supply system, is the subject of this report.

### **Methodology for the ESIA**

The ESIA study was undertaken by NEMA Certified Environmental Practitioners in accordance with the National Environment (Environmental and Social Assessment) Regulations, 2020, and other relevant legislation of Uganda. The Consultants undertook the task of preparing an Environmental and Social Impact report by way of a Project Brief (EPB) for the proposed project by clearly defining the assignment into a number of discrete activities. The study involved the following activities;

- Screening of the project by way of looking at the proposed design and the legal framework both national and for the funder to ascertain the type and level of environmental and Social assessment to be done;
- Literature review/desktop studies were done. Documents looked at included national laws, policies, strategies and plans as well as reports for the water sector. African Development Bank document on environmental and social safeguard policies were also reviewed. The feasibility and design report for the proposed project was also reviewed to get information used in this report.
- Field visits and inspection of the project area including proposed pipeline routes and project sites. These visits also involved assessment of the vegetation and faunal status of those areas. Noise level assessments were also

carried out.

- Stakeholder consultation being key in the ESIA process was also done. Community members who will benefit/be affected by the proposed project were engaged as well as leaders at the district and local level.
- From the above activities, impacts both negative and positive as well as mitigation and enhancement measures were generated. These were evaluated in order to rank them as major, minor or moderate. This ranking helps to give importance to the impact visa-vis the proposed project.

### **Policy and legal framework**

The policies relevant to the proposed Morikiswa Solar Powered Mini-Piped Water Supply System that were reviewed include the following:

- The National Environment Management Policy for Uganda (2014)
- The National Water Policy (1999)
- The National Health Policy (1999)
- The National Land Policy (2013)
- The National Land-Use Policy (2007)
- The National Employment Policy for Uganda (2011)
- The National Environment and Social Safeguards Policy (2018)
- The Climate Change Policy (2015)
- The National Forestry Policy (2001)
- The National Gender Policy (2007)
- The National Cultural Policy (2006)
- The National Policy for Conservation and Management of Wetlands (1995)
- HIV/AIDS at Work Policy (2007)
- The National Child Labour Policy (2006)
- Uganda Vision 2040
- Third National Development Plan (NDPIII) 2020/21-2024/25

Several laws and regulations were also reviewed to check how the proposed project is affected by such laws and regulations. The following are some of the laws and regulations that were reviewed.

- The Constitution of the Republic of Uganda; 1995; amended as at 15th February 2006, Government of Uganda.
- The National Environment no. 5 2019
- The Water Act, Cap 152 and The Water Resources Regulations, 1998
- The Land Act, Cap 227
- The Occupational Safety and Health Act, 2006
- The Workers' Compensation Act (2000)
- The Town and Country Planning Act, 2014
- The Public Health Act Cap 281
- The Local Governments Act Cap 243
- The Traffic Control and Road Safety Act (1998)
- National Forestry and Tree Planting Act (2003)

- The National Children’s Act (1997)
- The National Environment (Environmental and Social Assessment) Regulations, 2020
- The National Environment (Wetlands, River Banks and Lake Shores Management) Regulations, 2000
- National Environment (Conduct and Certificate of Environment Practitioners Regulations (2003)
- The National Environment (Waste Management) Regulations (2020)
- The Water (Waste Discharge) Regulations, 1998
- The National Environment (Control of Smoking in Public Places) Regulations, 2004.
- i. The National Environment (Noise Standards and Control) Regulations, 2003.
- ii. National Air Quality Standards, 2006 (Draft)

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

### **Institutional framework**

The ESIA study also looked at the different institutions and their roles in proposed Morikiswa Solar Powered Mini-piped water supply system development. The institutional framework for the proposed project includes Ministry of Water and Environment, National Environment Management Authority (NEMA), Ministry of Gender, Labour and Social Development (MoGLSD), Local Administrative structures in Tororo District and African Development Bank.

### **Environmental and socio-economic baseline**

The proposed project will cover villages in three sub-counties of Kisoko, Petta and Nagongera Sub-counties in Tororo District. Tororo District is located in Eastern Uganda. It borders with the Republic of Kenya to the East, Bugiri District to the West, Butaleja District to the North and Busia District to the South and Mbale to the North East.

Tororo District is underlined by the eastern volcanic rocks of Cretaceous to Miocene age (135 — 5.30 Ma) which comprise generally soda-rich agglomerates, lavas and tuffs extruded by central volcanoes that are represented by Mountain Elgon, that is the Mesozoic and Cainozoic rocks (DGSM, 2008). The soils of Tororo District are sandy clay-and loam-type, with low contents of carbon, nitrogen and phosphorus.

Tororo District is characterized by sub-humid and orographic climate which is mainly brought about by its location close to the Elgon Mountain ranges. It has bi-modal rainfall with wettest season extending from March to May followed by a light dry ‘season which runs from June to August with the second and light rain season is November and December. Tororo District has on average 11.1 sunshine hours with the highest received in the month of February while May has the lowest number of sunshine hours of 10.8 hours monthly. The average sunshine hours that most solar systems need to generate

electricity is 4.5 hours per day at peak sun. The sun in Tororo is capable of sustaining the solar system so that electricity can be generated to power the Morikiswa Water Supply System.

Tororo District has distinct types of vegetation, that vary from medium altitude forests and swamps to savannahs. The medium altitude forests found in the district include the moist semi deciduous type located in Busitema Sub-county. A section of the forest occupies part of the Malaba river valley and is surrounded by swamps. The rest of the district in various parts is covered by wooded savannah or swamps. Natural forests in Tororo have been cleared to create fields for crops and livestock production. Around the proposed project area, vegetation is characteristic of semi-urban and agricultural/grazing landscapes, dominated by grasses, shrubs, weeds, crops and a few trees.

### Proposed project description

The proposed project is designed to last until 2042 with an estimated 15,350 people being served by then. The water supply systems will have an intake capacity of 611 m<sup>3</sup>/day using two boreholes, one of 5.5m<sup>3</sup>/day at Maundo and another of 28.8 m<sup>3</sup>/day in Kanang C Parish. The system will have two reservoir tanks with an existing one of 100 m<sup>3</sup> in Kanang C to be used on top of the one to be installed at Maundo hill. The transmission line will be 6,290 m in length while the total length of the distribution will be 5.6 km.

Component	Borehole at Maundo	Borehole at Kanang C
	MDD 99m <sup>3</sup> /day	MDD 518m <sup>3</sup> /day
<b>Intake Capacity, m<sup>3</sup>/day</b>	611	611
<b>Solar Panel 330W</b>	32	32
Head, H(m)	76.2m	76.2m
Flow, Q (m <sup>3</sup> /hr)	5.5 m <sup>3</sup> /hr	28.8 m <sup>3</sup> /hr
<b>Transmission Mains (m)</b>	1790	4500
<b>Storage tanks (m<sup>3</sup>)</b>	m <sup>3</sup>	m <sup>3</sup>
Reservoir (m <sup>3</sup> )	85	100
<b>Distribution Mains (m)</b>	4,340	1,293
<b>Source:</b> Project Estimates May, 2022		

### Stakeholder concerns and views

During the stakeholder consultations, the ESIA Study Team interacted with different stakeholder who gave their views, concerns and recommendations regarding the proposed Morikiswa Solar Powered Mini-piped Water Supply System. Some of the key issues that came out of the consultation are outlined on the next page. The Developer should consider these issues and be integrated in the project design as well as overall implementation and management as some might hinder the progress of the project.

- There is high rate of failure of water supply systems mainly due to water sources

like boreholes that dry up during the dry season, and cannot supply water consistently. The developer should therefore, consider using a water source that will sustainably supply water to the community.

- The project is welcomed but almost all the people consulted as it will help in addressing issues surrounding water in the Morikiswa area including poor water quality, long distances and domestic violence among others.
- Most of the boreholes in the area dry up during the dry season.
- There is need for close collaboration between the developer and the district leaders to ensure project sustainability.
- The community is willing to pay for the water services.
- The current water sources are unsafe for people, they put them at a risk of getting diseases like diarrhoea.
- There is violence at the boreholes including fights due to the large number of people using the boreholes.

## **Potential environmental, health and socio-economic impacts**

### **Positive impacts**

The proposed project will have a positive impact on the people in Petta, Nagongera and Kisoko Sub-counties and Tororo District as whole. During the field survey and stakeholder engagements, several issues like sharing of water sources with animals that directly and drying of boreholes, were raised. The situation is likely to improve with the construction of Morikiswa Solar Powered Mini-piped Water Supply System. The following are the positive impacts that are envisaged to be as a result of construction of the water supply system.

### ***Pre-construction and construction phase***

- **Job creation:** The construction of Morikiswa Solar Powered Mini-piped Water Supply System will provide different job opportunities to the people of Pette and Kisoko Sub-counties and Tororo District in general. Such jobs will be technical and casual jobs for non-skilled labourers.
- **Market for goods and services:** Among the goods/materials that will be needed include; sand, bricks, metal bars, gravel, clay, oil and fuel, food for the workers and catering services among others.
- **Improving on the tax base:** The tax base of the Tororo District and Uganda is envisaged to be improved due to goods, services, and jobs that will come out of the project. The project employees will pay tax in form of Pay As You Earn (PAYE), withholding tax and Value Added Tax (VAT) on goods and services.

### ***Operation phase***

- **Improved water quality:** During the stakeholder consultations, it was highlighted that the water quality in the existing sources of water is poor and some are shared with animals which puts people at the risk of getting diseases like diarrhoea.
- **Increased amount of water available:** The water system will supply water equivalent to 611m<sup>3</sup>/day up to the year 2042 which will provide enough water



to the communities in Petta, Nagongera and Kisoko Sub-counties, Tororo District. This will allow for use of water in activities like farming, animal husbandry and small-scale industries.

- **Increase in the tax base:** The improved agriculture productivity will improve the incomes of the people involved who will in turn pay taxes to the local government in Tororo District. They will pay direct taxes and indirect taxes for the farm and fish inputs they will buy from market.
- **Reduces cases of violence:** Cases of domestic violence against women and children when they take long to return home from fetching water were reported. This will reduce with the commissioning of the water supply system as water will be brought closer to the people through community serving points.
- **Reduced distance of travel for water:** The distance travelled to collect water will be reduced as the water will be brought closer to the people.

### *Decommissioning phase*

**Job creation:** During the decommissioning of Morikiswa Solar Powered Mini-piped Water Supply System, many jobs will be created which will include excavation and removal of the water pipes, transportation of the waste among others.

### **Evaluation of negative impacts**

The negative impacts were evaluated and the table below lists those that were found to be of major significance as far as the proposed project is concerned. Care must be taken during the implementation of the project to see that the mitigation measures are implemented so as to abate the consequences that might result from such impacts.

Impact	Receptor(s)	Mitigation measures	Severity
<b>Pre-construction and Construction Phases</b>			
Degradation of wetland habitats	Wetland vegetation, soil and biodiversity	-Excavation and dredging should be restricted to areas that have been planned to be dredged to avoid destruction of wetland vegetation.  -Restoration of degraded part of the wetland should be done to avoid loss of species.	Moderate
Loss of land	Project affected persons in the community	-Compensation should be done for land and trees lost by the owners neighbouring the project infrastructure. These should be compensated based on the laws and regulations of Uganda.	Moderate
Noise pollution and vibrations	Communities in Morikiswa area	-The noise level should be kept within NEMA acceptable limits; 60dB is the limit for a construction site during day (6am-10pm) -Construction works should be carried out during times of the day when the noise impact is less felt e.g., from 6:00 am to 6:00 pm. -Vehicle and equipment should be maintained according to manufacturers' specifications.	Minor

## ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Receptor(s)	Mitigation measures	Severity
		-Adequate noise prevention devices, e.g., mufflers should be installed on noise generating sources.	
Risk of accidents	Communities in Morikiswa area	-Work sites (especially excavation sites) should have proper protection with clear marking of safety borders and signals and fence off all dangerous areas. -Riparian neighbours should be informed about the construction program in advance and adhere to it. -Access to restricted work sites (including those with operation of mechanical and electric equipment) should be confined to persons with permits. -Appropriate traffic management plans should be implemented with the help of local police when (partial) closure of roads is required. -The site should be registered as work place with Ministry of Labour, Gender and Social Development. -Provide appropriate PPE like masks, gloves, Helmets, overalls to all workers in risky areas.	Moderate
Human/body waste disposal	Water sources, communities in Morikiswa area	-Provide the workers with segregated (male and female) mobile toilet facilities. -The waste should be disposed of by a licensed wastewater handler to a designated waste collection site.	Moderate
Increased incidences of HIV/AIDS and other diseases	Communities in Morikiswa area especially women and young girls	-The contractor is encouraged to employ people from the local community for the casual jobs. -Provide Condoms for use during sexual activities to all workers and people in the community. -All workers should be sensitised to ensure awareness of and sensitivity to the local cultures, traditions and lifestyles. -HIV/AIDS impact mitigation plan that will involve providing a comprehensive range of services including the identification of possible HIV/AIDS cases, testing with pre- and post-counselling, the treatment of associated infections	Moderate
Loss of crops and trees	Communities along the transmission routes and project sites	-Limit project activities to extent for which the project is designed to minimize losses; -Compensation should be done for PAPs whose crops will be destroyed; -Destroyed trees should be replanted after construction of the project infrastructure.	Moderate
Air pollution due to dust emissions	Communities in the project area including markets and homesteads	-The contractor should employ best practicable dust management strategies for the construction and operational phase inclusive of minimising exposed surfaces; adoption of dust suppression measures such as regular pouring of water on the surfaces and other suitable surface stabilisers. -Trucks and equipment should also be regularly serviced to ensure that they do not emit dangerous fumes/gases.	Moderate
<b>Operational Phase</b>			
Reduction in ground water level	Ground water acquirers	-The design of the water supply system should cater for changes in precipitation due to climate change.	Moderate

## ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Receptor(s)	Mitigation measures	Severity
		-Reservoir should be installed that can store enough water to cater for the needs of the communities during times of storage.	
<b>Decommissioning Phase</b>			
Loss of water supply	Communities along the transmission routes	-Provide alternative water sources before decommissioning the water supply system	Major
Risks due to soil excavation	Communities along the transmission routes and other project sites	-Excavated soil should be contained to avoid wash out and erosion; -Any excess soil should be disposed of at gazetted sites. The soil shall not accumulate on site, to cause odour, fly, or rodent problems. -Excavated soils should be reused as much as possible as filling material and should be contained after excavation.	Moderate
Loss of Vegetation	Wetlands, compounds, crop gardens, bushlands	-Working areas should be zoned out and vegetation clearance should be limited to zoned areas to reduce ecological degradation; -Disturbed natural sites should be restored through environmental rehabilitation, restoring top soils and (re-) introduction of genetic species to re-establish the natural local ecology.	Moderate

### Environmental and Social Management and Monitoring Plan (ESMMP)

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

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

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

The total cost of implementing the ESMMP is estimated at Uganda Shillings Two Hundred Fourteen Million Four hundred Fifty thousand only (UGX 214,450,000), as reflected in the ESMMP matrix as follows:

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
<b>A: Pre-construction and construction phases</b>						
<b>A1:</b> Loss of land	<b>A1-1:</b> Compensation should be done for land and trees lost by the owners neighbouring the project infrastructure.	List of people compensated	Project Contract and finance officer	Petta and Kisoko Sub-counties authorities, LCI District Labour Officer	Monthly	To be determined based on number to be compensated
<b>A2:</b> Noise pollution	<b>A2-1:</b> The noise level should be kept within NEMA acceptable limits; 60dB is the limit for a construction site during day (8 am-5 pm).	Reports on the noise level monitoring	Project environment, health and safety lead	Project Engineer, DEO, LCI's	Daily	5 million
	<b>A2-2:</b> Construction works should be carried out during times of the day when the noise impact is less felt e.g., from 8:00 am to 5:00 pm.	Schedule for construction works	Site engineer	Project engineer, DEO, LCI's	Daily	2 million
	<b>A2-3:</b> Vehicle and equipment should be maintained according to manufacturers' specifications.	Log for maintenance of all the vehicles and equipment	Site engineer	Project engineer, DEO, LCI's	Monthly	3.5 million
	<b>A2-4:</b> Adequate noise prevention devices, e.g., mufflers should be installed on noise generating sources.	Equipment installed with noise dampening equipment	Contractor site engineer	Project engineer, DEO, LCI's	At the beginning of the construction phase	2.5 million
	<b>A2-5:</b> Engines of vehicles and machinery while not in use should be switched off.	Absence of idling vehicle or equipment not in use	Contractor site engineer Project environment, health and safety lead	DEO, LCI's	Daily	2 million
	<b>A2-6:</b> Workers who may unavoidably have to work with noise generating equipment, e.g., earthmoving	Workers with PPE for noise protection	Contractor	Project engineer, DEO, LCI's	Daily	3 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	equipment should be provided with ear plugs and advised to put them on.					
<b>A2:</b> Pollution from oils and fuels	<b>A2-1:</b> Cleaning wastes should be collected and stored in appropriate containers to be disposed of at approved sites.	-Containers for storing waste oils and fuels -Disposal receipts by a designated facility	Contractor	Project engineer, DEO, LCI's	Daily	6 million
	<b>A2-2:</b> Vehicles should preferably be parked on paved platforms.	Paved parking areas	Contractor	Project engineer, DEO, LCI's	Daily	5.5 million
	<b>A2-3:</b> Fuel storages should not leak, and should be periodically monitored, and repaired or replaced when necessary.	Leka proof fuel and oil storages	Contractor	Project engineer, DEO, LCI's	Daily	3.5 million
	<b>A2-4:</b> Sites for cleaning, fuelling and maintaining vehicles should be paved so as to prevent leakage	Paved areas for maintenance of equipment and vehicles	Contractor	Project engineer, DEO, LCI's	Start of the Construction phase	6.5 million
	<b>A2-5:</b> Vehicles and equipment should be maintained, fuelled and cleaned at workshops/sites with adequate leakage prevention.	Paved workshops	Contractor	Project engineer, DEO, LCI's	Start of the Construction phase	2 million
<b>A3:</b> Risk of accidents	<b>A3-1:</b> Work sites (especially excavation sites) should have proper protection with clear marking of safety borders and signals and fence off all dangerous areas.	Clearly marked and zoned off works sites	Contractor	Project engineer, DEO, LCI's	Daily	4.5 million
	<b>A3-2:</b> Riparian neighbours should be informed about the construction program in advance and adhere to it.	-Copy of communique made to the community -Receipts from communication companies in the area	Project Engineer	DEO, LCI's District Engineer	Monthly	4.5 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	<b>A3-3:</b> Access to restricted work sites (including those with operation of mechanical and electric equipment) should be confined to persons with permits.	Restricted areas on site	Contractor	Project Engineer	Weekly	5.5 million
	<b>A3-4:</b> Appropriate traffic management plans should be implemented with the help of local police when (partial) closure of roads is required.	Copy of traffic management plan	Contractor	Traffic Police	Beginning of construction phase	1.5 million
	<b>A3-5:</b> The site should be registered as work place with Ministry of Labour, Gender and Social Development.	Copy of registration certificate	Contractor	MoGLSD	At the start of construction phase	500,000
	<b>A3-6:</b> Provide appropriate PPE like masks, gloves, Helmets, overalls to all workers in risky areas.	Workers with PPE on site	Contractor	Project engineer, DEO, LCI's	Daily	2 million
<b>A4:</b> Solid waste pollution	<b>A4-1:</b> The Contractor should prepare a Solid Waste Management Plan, which should contain.	Copy of the solid waste management plan	Contractor	Project engineer, DEO, LCI's	At beginning of the construction phase	3 million
	<b>A4-2:</b> The Contractor should maintain records of types, quantities, origin, (temporary) storage, transport and elimination/reuse of solid waste	Records for solid waste generated	Contractor	Project engineer, DEO, LCI's	Monthly	1 million
	<b>A4-3:</b> Any waste including excess soil should be disposed of at gazetted sites. The solid waste shall not accumulate on site, to cause odour, fly, or rodent problems.	-Copy of receipts for waste disposal	Contractor	Project engineer, DEO, LCI's	Monthly	2.5 million
	<b>A4-4:</b> Excavated soils should be reused as much as possible as filling material and should be contained after excavation.	Back-filled excavated areas	Contractor	Project engineer, DEO, LCI's	Weekly	2.5 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	<b>A4-5:</b> Provisional material storage on site should be designed and undertaken in such a way as to ensure that soils and underground water are not polluted.	Designated area for waste collection	Contractor	Project engineer, DEO, LCI's	Weekly	3 million
	<b>A4-6:</b> Licensed recycling companies should be used to externally recycle, recover or dispose of waste.	Copy of licenses for companies contracted	Contractor	Project engineer, DEO, LCI's	Monthly	5 million
<b>A5:</b> Human/body waste disposal	<b>A5-1:</b> Provide the workers with segregated (male and female) mobile toilet facilities.	Mobile toilets in place	Contractor	Project engineer, DEO, LCI's	Monthly	3 million
	<b>A5-2:</b> The waste should be disposed of by a licensed wastewater handler to a designated waste collection site.	Copy of licenses for companies contracted	Contractor	Project engineer, DEO, LCI's	Monthly	5 million
<b>A6:</b> Increased incidences of HIV/AIDS and other diseases	<b>A6-1:</b> The contractor is encouraged to employ people from the local community for the casual jobs.	List of employees and their area of residence	Contractor	Project engineer, District Labour Officer, LCI's	Monthly	3.5 million
	<b>A6-2:</b> Provide Condoms for use during sexual activities to all workers and people in the community.	Number of condoms issued	Contractor Ministry of Health	Project engineer, District Labour Officer, District Health Officer LCI's	Monthly	4.5 million
	<b>A6-3:</b> All workers should be sensitised to ensure awareness of and sensitivity to the local cultures, traditions and lifestyles.	Reports on the sensitization workshops	Contractor	Project engineer, District Labour Officer, District Health Officer LCI's	Once	1.5 million
	<b>A6-4:</b> HIV/AIDS impact mitigation plan that will involve providing a comprehensive range of services including the identification of possible	Copy of the HIV/AIDS mitigation plan	Contractor	Project engineer, District Labour Officer, District Health Officer	At the start of the construction	4.5 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	HIV/AIDS cases, testing with pre- and post-counselling, the treatment of associated infections.			LCI's		
<b>A7:</b> Loss of crops and trees	<b>A7-1:</b> Limit project activities to extent for which the project is designed to minimize losses.	Extent of the project activities	Contractor	Project engineer, LCI's	Weekly	3.5 million
	<b>A7-2:</b> Compensation should be done for PAPS whose crops will be destroyed;	-List of PAPS compensated -Copies of compensation agreements	Project contracts and finance officer	Project engineer, District Labour Officer, LCI's	Weekly at the beginning of the construction works	6 million
	<b>A7-3:</b> Destroyed trees should be replanted after construction of the project infrastructure.	Number of trees replanted	Contractor	Project engineer, DEO, LCI's	Monthly	5 million
<b>A8:</b> Siltation and sedimentation	<b>A8-1:</b> Work should be carried out under mild weather and strong rains or winds should be avoided.	Schedule for project activities	Contractor	Project engineer	Monthly	2 million
	<b>A8-2:</b> Topsoil should be removed and stored in separate piles and reinstated after refilling of trenches, to enable natural re-vegetation.	Trenches filled up with waste soils	Contractor	Project engineer	Weekly	1.5 million
<b>A9:</b> Disruption and loss of livelihood activities	<b>A9-1:</b> Local communities should be informed about the construction program in advance and adhere to it	-Copy of communique to the community -Receipts for adverts on communication platforms	MWE	LCI's District Engineer, District Water Officer	Monthly	3.5 million
	<b>A9-2:</b> In case access roads have to be closed, local communities should be informed in advance	Same as in <b>A9-1</b>	Same as in <b>A9-1</b>	Same as in <b>A9-1</b>	Same as in <b>A9-1</b>	Same as in <b>A9-1</b>
	<b>A9-3:</b> Access roads in the neighbourhood should be maintained and cleaned of earth and sand on a daily basis	Clear roads	Contractor	Project engineer	Weekly	2 million



ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	<b>A9-4:</b> Temporary access ways should be provided with the approval of local authorities where access roads are closed	Alternative routes in place	Contractor, Project Engineer	District Engineer	At start of construction	4 million
	<b>A9-5:</b> Works should be carried out under mild weather; avoiding strong rains or winds	Schedule for project activities	Contractor	Project engineer	Monthly	2 million
	<b>A9-6:</b> Obstruction of access to and use and occupation of roads, footpaths and bridges should be reduced.	Alternative routes in place	Contractor, Project Engineer	District Engineer	At start of construction	4 million
	<b>A9-7:</b> Where livelihoods and property are affected, valuation and prompt compensation should be undertaken for the PAPs	List of people compensated	MWE	District Labour officer CDO's LCI's	Monthly	4 million
<b>A10:</b> Injuries to workers and community	<b>A10-1:</b> Work sites (especially excavation sites) should have proper protection with clear marking of safety borders and signals and fence off all dangerous areas	Clearly marked working sites	Contractor	Project engineer, LCI's, District Engineer DEO	Weekly	2.5 million
	<b>A10-2:</b> Riparian neighbours should be informed about the construction program in advance and adhere to it	Copy of communication made to riparian communities	Contractor, Project engineer	LCI's, District Engineer, DEO	Weekly	3 million
	<b>A10-3:</b> Access to restricted work sites (including those with operation of mechanical and electric equipment) should be confined to persons with permits	Restricted areas on site	Contractor	Project Engineer	Weekly	5.5 million
	<b>A10-4:</b> Appropriate traffic management plans should be implemented with the help of local police when (partial) closure of roads is required	Copy of the traffic management plan	Contractor Project Engineer	Uganda Police, Tororo -Traffic Division District Engineer	Weekly	5 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	<b>A10-5:</b> The site should be registered as work place with Ministry of Labour, Gender and Social Development	Copy of the registration certificate	Contractor	Project Engineer MoGLSD	Before start of construction	3 million
	<b>A10-6:</b> Provide appropriate PPEs like masks, gloves, Helmets, overalls to all workers in risky areas.	Number of workers with PPE's	Contractor	District Labour officer DEO	Weekly	3.45 million
<b>A11:</b> Exploitation of workers	<b>A11-1:</b> Casual workers should be recruited through the Local Council system	Number of workers recruited from the local population	Contractor	LCI's	Monthly	3 million
	<b>A11-2:</b> Workers should be paid timely according to agreed rates used in the area	Payment schedules for workers	Contractor	Project Engineer, District Labour Officer DEO	Monthly	2.5 million
	<b>A11-3:</b> The Contractor and the Developer should follow the national labour laws of Uganda	Labour laws followed	Contractor	District Labour Officer	Monthly	2.5 million
	<b>A11-4:</b> Children should not be employed in any activity of the proposed development, be it during construction or operation and maintenance.	Absence of children as employees	Contractor	District Labour officer	Monthly	3 million
<b>A12:</b> Air pollution due to dust emission	<b>A12-1:</b> The contractor should employ best practicable dust management strategies for the construction and operational phase inclusive of minimising exposed surfaces; adoption of dust suppression measures such as regular pouring of water on the surfaces and other suitable surface stabilisers	Copy of dust management plan	Contractor	Project engineer DEO	Weekly	5 million
	<b>A12-2:</b> Trucks and equipment should also be regularly serviced to ensure	Servicing log for the vehicles and equipment	Contractor	Project Engineer, DEO	Monthly	6 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	that they do not emit dangerous fumes/gases.					
<b>B: Operation/maintenance phase</b>						
<b>B1:</b> Reduction in ground water level	<b>B1-1:</b> The design of the water supply system should cater for changes in precipitation due to climate change	Copy of comprehensive water assessment study	MWE	DEO	Quarterly	10 million
	<b>B1-2:</b> Reservoir should be installed that can store enough water to cater for the needs of the communities during times of scarcity.	Number of reservoirs	MWE, Contractor	DEO, District Engineer	Design stage	--
<b>B2:</b> Inflation of prices of good and amenities	<b>B2-1:</b> Work with local authorities such that prices of services and goods are standardized	Standardised prices for goods	District Production Officer District Water Officer	LCI's, Project Engineer	Quarterly	--
<b>B3:</b> Risk of water pipeline burst leading to wastage of water	<b>B3-1:</b> Regular monitoring of the transmission line for any leakages	Monitoring report for leakages	Tororo MWE	District Water Officer	Quarterly	--
<b>B4:</b> Safety of workers during repairs	<b>B4-1:</b> Workers should be provided with Personal Protective Equipment (PPEs)	Number of workers with PPE's	Tororo	District Labour Officer	Monthly	3 million
	<b>B4-2:</b> Work sites (especially excavation works) should have clear markings of safety borders and signals. Dangerous areas should be fenced off	Clearly marked and fenced off working areas	MWE	DEO, District Water Officer	Every time there are repairs to be done	--
	<b>B4-3:</b> First aid services should be put in place in case of emergencies	Copy of an MOU with a designated health facility to handle emergency cases	MWE	District Water Officer	Quarterly	--

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
				District Labour Officer		
	<b>B4-4:</b> All workers should be trained in Environment, Health and Safety (EH&S) and awareness should be carried out once a week and preferably during toolbox meetings	Training reports for workers indicating number of workers trained	MWE	District Water Officer District Labour Officer	Quarterly	1 million
	<b>B4-5:</b> The Contractor should recruit EH&S personnel during construction	EH&S personnel under contract employed	MWE	District Water Officer District Labour Officer	Yearly	500,000
	<b>B4-6:</b> The Contractor should inform riparian neighbours about the construction programme in advance and adhere to it	Copy of communication made to riparian communities	MWE	LCI's, District Engineer, DEO	In case of repairs and emergency works	3 million
	<b>B4-7:</b> The operator should confine access to restricted work sites (including areas with mechanical and electric equipment) to persons with permits.	Restricted areas on site	MWE	District Engineer, DEO	In case of repairs or emergency works	--
<b>C: Decommissioning phase</b>						
<b>C1:</b> Risk of flooding	<b>C1-1:</b> Inform the community about the impending decommissioning exercise.	Communication on the impeding decommissioning activities	MWE	District Engineer, DEO, District water Officer	Start of decommissioning	--
<b>C2:</b> Solid waste generation	Same as those for Construction phase under solid waste pollution.					
<b>C3:</b> Loss of water supply	<b>C3-1:</b> Provide alternative water sources before decommissioning the water supply system	Alternative water sources in place	MWE	District Water Officer	Before start of decommissioning	--

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
<b>C4:</b> Waste pollution	<b>C4-1:</b> Waste should be collected in a designated place and disposed of by a NEMA registered solid waste handler	-Receipts for disposal of waste -Contract with licensed waste handler	MWE	DEO, District Engineer	Throughout decommissioning phase	--
	<b>C4-2:</b> Licensed recycling/waste disposal companies to externally recycle, recover or dispose of waste should be contracted.	Copy of license for the waste handling company	MWE	DEO, District Engineer	Monthly	3 million
	<b>C4-3:</b> Temporary storage of contaminated soils on site should be designed and implemented so as to minimize underground pollution.	Designated places for storing soil	MWE	DEO, District Engineer LCI's	Throughout this phase	2.5 million
<b>C5:</b> Risk dues to soil excavation	<b>C5-1:</b> Excavated soil should be contained to avoid wash out and erosion	Contained soil piles	MWE	DEO, District Engineer LCI's	Throughout this phase	3.0 million
	<b>C5-2:</b> Any excess soil should be disposed of at gazetted sites. The soil shall not accumulate on site, to cause odour, fly, or rodent problems.	-Receipts for disposal of waste -Contract with licensed waste handler	MWE	DEO, District Engineer	Throughout decommissioning phase	--
	<b>C5-3:</b> Excavated soils should be reused as much as possible as filling material and should be contained after excavation.	Filled up trenches	MWE	DEO, District Engineer	Throughout decommissioning phase	--
<b>C6:</b> Loss of vegetation	<b>C6-1:</b> Working areas should be zoned out and vegetation clearance should be limited to zoned areas to reduce ecological degradation	Zoned off working areas	MWE	DEO, District Engineer, District Labour Officer, LCI's	Throughout decommissioning phase	2.5 million
	<b>C6-2:</b> Disturbed natural sites should be restored through environmental rehabilitation, restoring top soils and	Number of restored areas	MWE	DEO, District Engineer,	Throughout decommissioning phase	5 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

<b>Impact</b>	<b>Mitigation measures</b>	<b>Monitoring indicator (s)</b>	<b>Responsible stakeholder</b>	<b>Monitoring stakeholder (s)</b>	<b>Frequency of monitoring</b>	<b>Cost estimates (UGX)</b>
	(re-) introduction of genetic species to re-establish the natural local ecology.			District Labour Officer, LCI's		
<b>Total</b>						<b>214,450,000</b>

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

Item	Indicative Costs
Grievance Redress Mechanism	23,000,000
Stakeholder Engagement	26,000,000
Environment and Social Audit	35,000,000
Capacity Building and Trainings	20,000,000
Sub-total	104,000,000
<b>Grand Total, including ESMMP (UGX 214,450,000)</b>	<b>318,450,000</b>

### Conclusions and recommendations

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

This ESIA study therefore recommends that:

- It is not necessary to carry out a full ESIA for this project as a Project Brief is deemed sufficient and the proposed mitigation measures would be sufficient to ensure sustainable implementation of the proposed project;
- Many times, Project Contractors do not comply with the recommendations given in the project environmental report. This could tantamount to violation of the law with possible halting of the whole project by the relevant authorities, including NEMA. A copy of this report would be availed to the Project Contractor, and advised to follow its recommendation.
- The project ought to be approved for implementation by the relevant authorities to enable fulfilment of the project main objective of improving access to safe water in the area

## **1 INTRODUCTION**

### **1.1 Project Background**

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

Tororo is one of the districts in Uganda witnessing a rapidly increasing population, yet with inadequate water supply in both urban areas and rural growth centers (RGC). The gap between the total population and the population with access to safe water is significant and increases annually thus creating high water demands. Extending safe water to the unserved population in the district, therefore, can be a stimulus to the district's productivity, and improvement in the quality of life.

The Government of Uganda has embarked on improving safe water coverage and supply across the entire country. The Water and Environment Sector Development Plan of Uganda prioritizes the construction of piped water supply systems in Rural Growth Centres to replace the currently overstretched hand-pumped borehole service technology.

As a result, the GoU, through the Ministry of Water and Environment (MWE) and Tororo District Local Government, secured funding to establish Morikiswa mini solar powered piped water supply system in Kisoko, Petta and Nagongera Sub-counties in Tororo District. The proposed water supply project shall ensure sustainable access to safe water in the project area. This will contribute to creating a more stable socio-economic environment and hence boost commercial development of the area. The project will also contribute to improvement of Water Sanitation and Hygiene (WASH) services, which are critical for health and socio-economic development. The project shall also reduce walking distances to access water, thereby saving time for the education of the children.

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

From the initial environmental project screening that was undertaken, the proposed project was identified as one among those that require an Environmental and Social Impact Assessment by way of a Project Brief as per Section 112 of the National Environment Act. The proposed project is listed under Schedule 4 (*Projects for which Project Briefs are required*) of the National Environment Act, 2019 under Category 4,



“Utilisation of water resources and water supply”, Part (b) “Abstraction or utilisation of ground water of less than 1,000 m<sup>3</sup> per day.”

The proposed project also falls under Category 2 according to the African Development Bank (AfDB) integrated social safeguard system of 2015. As the funder, AfDB requires all investment projects that are likely to have detrimental site-specific environmental and/or social impacts to undergo an ESIA and the proposed Morikiswa Mini-solar Piped Water Supply System will have such impacts. This Environmental Project Brief presents the findings from the Environmental and Social Impact Assessment that was conducted for the proposed project and mitigation measures have been suggested as outlined in the Environmental and Social Management Plan (ESMP).

## **1.2 Project Objectives**

### **1.2.1 Project Development Objectives**

The overall objective of the project is to establish a mini solar-powered piped water supply system in three sub-counties of Kisoko, Petta and Nagongera in Tororo District.

### **1.2.2 Objectives of the Environmental Project Brief**

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

The main objectives of this Environmental Project Brief include the following:

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

The purpose of this report is to provide NEMA and the Lead Agency with sufficient and relevant information on the proposed project as basis for approval and subsequent award of certificate with conditions for implementation of the project.

### **1.3 Justification of the Proposed Project**

#### **1.3.1 Demand for Better Water Supply Services**

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

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

#### **1.3.2 Consistency of the Project with National Priorities / Plans**

The main factor motivating the implementation of the proposed project is the increasing demand for safe water supplies in the local communities in Tororo District and Uganda at large. Hence, the project addresses the national priority of increasing access to safe water by making efficient use of the available sources. This, in addition to the country's firm commitment to eradicate poverty, ensures that the project is firmly embedded within the country's national priorities. The NDPIII highlights pollution as the major problem with water resources caused by bacterial and chemical contamination of both ground and surface water resource. This has led to inadequate sanitation facilities, unsafe disposal of municipal and industrial waste in urban and rural areas. To this effect, the GoU, through the MWE has set a target of increasing safe water supply from 70% to 85% in rural areas and 74% to 100% in urban areas (NDPIII). This is also in line with the Vision 2040 target of having 100% of the population having safe water supply. The proposed project will contribute towards the extension of clean water to a domestic population of 15,374 by 2042.

## 1.4 Details of the Developer and Investment Cost

### 1.4.1 Details of the Developer

<b>Project Title:</b>	Proposed Solar Powered Mini-piped Water Supply System in Kisoko, Petta and Nagongera Sub-counties in Tororo District
<b>Developer:</b>	Ministry of Water and Environment
<b>Address:</b>	Plot 21/28 Port Bell Road, Luzira, P.O. Box 20026 Kampala, Uganda
<b>Contact Person:</b>	<b>Name:</b> Eng. Olweny Lamu <b>Designation:</b> Assistant Commissioner Research and Development <b>Mobile:</b> +256-772-453-395 <b>Email:</b> lolweny@yahoo.co.uk

### 1.4.2 Investment Cost

The cost estimate was based on the design assumptions and the preliminary engineering design. The total cost of the project is estimated at Three Billion Eight Hundred Sixty-three Million Six Hundred Forty-seven Thousand Two Hundred Eighty-two Uganda Shillings only (UGX 3,863,647,282), **inclusive of taxes**. The detailed cost for each of the proposed project infrastructure are indicated in the table attached under Annex I.

## 1.5 Study Methodology

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

### 1.5.1 Environmental Screening

This is the stage at which the project was identified as among those that require an Environmental and Social Impact Assessment by way of a Project Brief as per Section 112 of the Act. The proposed project falls under Schedule 4 of the National Environment Act, 2019. The proposed project is listed in **Category 4 - Utilization of water resources and water supply (b) Abstraction or utilization of groundwater of less than 1000 m<sup>3</sup>/day**. The project does not warrant a full Environmental and Social Impact Assessment (ESIA) by way of scoping to be done as it will have an output of 611 m<sup>3</sup>/day at the ultimate year of 2042. Only projects for which more than 1000 m<sup>3</sup>/day of water is to be abstracted from ground water (Category 4 (b) under Schedule Five), are required to under a full ESIA.

### **1.5.3 Field Visits and Inspections**

Field visits and inspections were carried out by the Study/Assessment Team so as to get acquainted with the project activities in the study area, and also map out sampling sites. The areas that were visited included all the project affected villages in Kisoko, Petta and Nagongera Sub-counties. The proposed water abstraction sites in Kanang 'C' Village, Ramogi Parish, Petta Sub-county and Maundo Village, Nyasirenge Parish, Paya Sub-county, the reservoir site in Bendo Zone, Kisoko Parish, Kisoko Sub-county and the proposed water transmission routes were visited.

### **1.5.3 Literature Review**

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

- The Engineering Design report for Morikiswa Mini Water Supply System;
- The Feasibility report for Morikiswa Mini Water Supply System;
- The relevant development and environmental legislation of Uganda;
- International, regional, provincial or communal environmental related guidelines;
- International Finance Cooperation (IFC) Performance Standards;
- Third Uganda National Development Plan (NDPIII);
- Uganda Vision 2040;
- Water and Environment Sector Development Plan 2015/16-2019/20.
- African Development Bank Group's Integrated Safeguards System of 2013
- African Development Bank Group Environmental and Social Assessment Procedures (ESAP)

### **1.5.4 Community and Stakeholder Consultations**

#### **a. Objectives of Consultation**

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

The objectives of the consultation were:

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

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

## b. Identification of Stakeholders

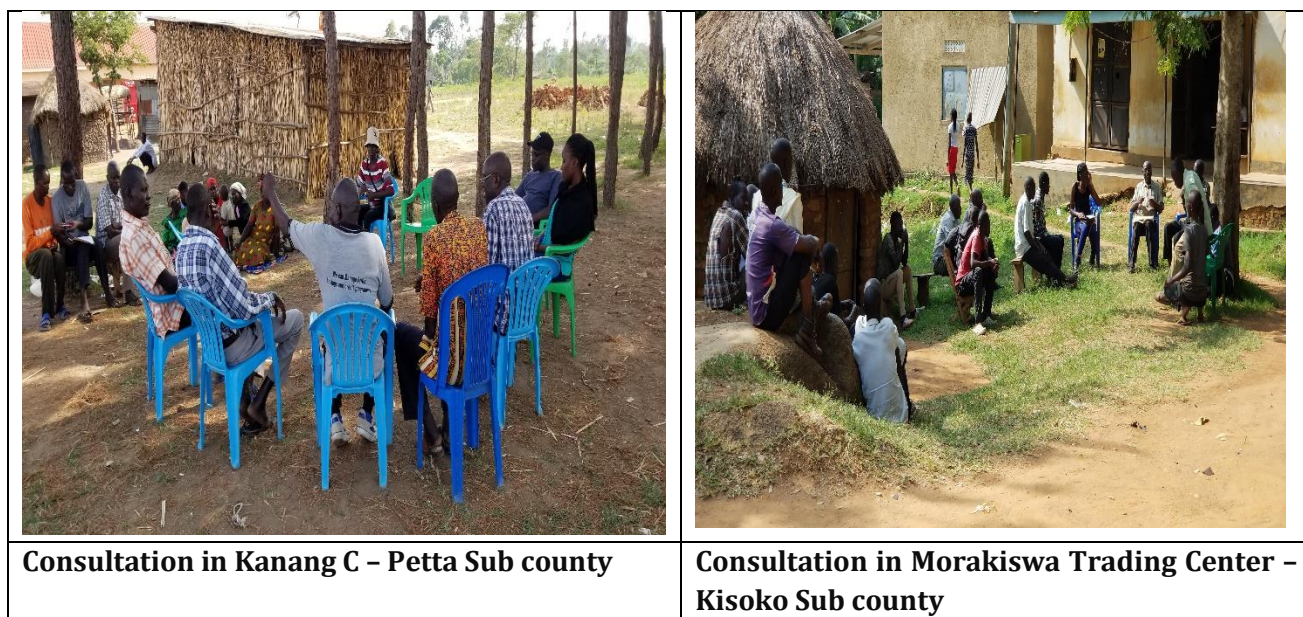
A fair representation of the key project stakeholders was identified. The identification was based on the different activities involved in the project, the sectors the project lies in and the administrative locations of project components. The main considerations in the stakeholder group selection process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

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

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

## c. Consultation Activities

To ensure in depth explorations and insights into the feelings and thoughts of the various interest groups, a purely qualitative and participatory approaches was employed during the consultation. These were conducted through meetings with representatives (Plate 1). The relevant local authorities that were consulted include the area LC1 Chairperson, the District water Officer and Environment Officer.



**Plate 1: Stakeholder engagements in Morikiswa area**

The Assessment Team consulted the relevant project stakeholders. Necessary consultation tools and aides, such as area maps indicating the project design, location of project components and project information briefs were displayed and shared during community consultations and other stakeholder consultative meetings.

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

Stakeholder's views and their concerns are given in Section Five (5) of this report. These views and concerns were taken into consideration during impact identification and mitigation measures were also proposed. In summary, 96 stakeholders were consulted; 72 males and 24 females in a total of 12 meetings. Refer to the Table 1 below and the attached list of names of participants in the annex.

**Table 1: Categories of stakeholders that were consulted during the ESIA study.**

Stakeholders	Sex	Date of consultation
District leaders: 1. CAO 2. Water officer 3. District Environmental officer	male male female	10/03/2023
Petta Sub-county leaders: 4. LCIII Chairman Parish chiefs: 5. Parish chief for Mbula - Hannington Omolo 6. Parish chief - Zakaria Obbo	Male Male male	10/03/2023
7. Wilbrod Ngangotek - Resident, Petta Sub-county, Tororo	male	10/03/2023
Group discussion: 8. LCI Chair, Machali East 9. Community member	Male Male	10/03/2023
10. Group Discussion: residents of Kanansi zone, Lamogi Parish, Petta S/C (refer to list of participants)	11 males 5 females	10/03/2023
11. SAS (Subcounty chief), Kisoko S/C	Female	10/03/2023
12. Group Discussion: Kisoko village, Kisoko S/C	4 male, 2 female	10/03/2023
13. Group Discussion: Rudam zone, Kisoko S/C (refer to list of participants)	27 males 1 female	11/03/2023
14. Group Discussion: Odopony zone, Namwaya Parish, Nagongera S/C (refer to list of participants)	14 males	11/03/2023
15. Group Discussion: Maruki Trading Centre, Sopi Sopi S/C (refer to list of participants)	8 males 14 females	11/03/2023

### 1.5.5 Flora Assessment

It is important to understand the vegetation of the project area as this will play an important role in re-vegetation of places that will be excavated/laid bare during the project activities. It will be necessary that sites are restored to as much as practically possible to conditions they were in before project activities. Further, knowing the fauna in the project affected areas helps to understand whether the affected areas provide

habitats to endangered/ threatened fauna species, and in that case require protection. During the field visits, observation for flora and fauna species at the proposed sites for water abstraction, reservoir and along transmission routes.

### **1.5.6 Birds Assessment**

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

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

An analysis of birds of conservation concern was conducted based on various categories as listed below.

Global, Regional and National Red-listed species

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

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

### ***Habitat specialization***

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

- FF - Forest specialist (species of typical forests interior)
- F - Forest generalist (species less specialized also occur in small patches of forests)
- f - Forest visitor (non-forest birds that also commonly use trees (Bennun *et al* 1996))
- G – Grassland species

- W - Water specialist (Wetland specialist)
- w - Water bird- non specialist (Wetland visitor)
- Ae – Aerial feeder

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

### ***Migratory classifications***

Bird species with migratory tendency were also considered as derived from the Uganda Bird atlas (Carswell *et al.* 2005). There are of two categories of migrant species as considered below.

- Afro-tropical migrants (AM), these complete their migration journey within Africa
- Pale-arctic migrants (PM), these breed in Palearctic region between May and August but found in Uganda in the northern winter (October and March).

However, some species can be both Afro-tropical and Pale-arctic migrants.

### ***Critical area assessment the project area***

The criteria proposed under the International Finance Corporation (International Finance Corporation 2012) were followed in identification of critical habitat for birds in the project area of Influence.

Guidance Note 54 (GN54), under Performance Standard 6 defines a critical habitat as:

“... areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and /or (v) areas associated with key evolutionary processes.”

Selected locations along the water supply system were ranked from 1 to 9, with the most critical site being assigned 9 (rank nine) and 1(rank one) to the less critical sites. Total ranks were calculated to determine the most critical sites.



### 1.5.7 Water Quality Measurements and Analysis

The physico-chemical quality of water in the project was analysed in terms of pH, turbidity, conductivity, total dissolved solids (TDS), total alkalinity, nitrogen, phosphorus, total hardness and chloride following procedures certified by the International Organization of Standardization – ISO and standard methods according to APHA/AWWA/WEF (1998). Because the proposed water abstraction boreholes were not yet installed, water samples from an existing borehole (Pagore Borehole) at Kanang ‘C’ Trading Center at GPS coordinates (N00.784213° E034.106667°) and used as a representation of water quality in the project area.

### 1.5.8 Noise Measurements

Baseline noise measurements in the project area were carried out at various location. The noise results were compared to permissible limits (Table 2), according to the National Environment (Noise standards and Control) Regulations, 2003.

**Table 2: Maximum Permissible Noise Levels for Construction sites**

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

### 1.5.9 Impact identification and assessment

#### *a. Impact description*

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

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

Each of these characteristics will be addressed for each impact. Consideration of the above gives a sense of the relative **intensity** of the impact. The **sensitivity** of the receiving

environment is determined by specialists based on the baseline data collected during the study.

**b. Impact evaluation**

Each impact will be evaluated using the criteria listed in Table 3.

Table 3: Classification of impact evaluation

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

To provide a relative illustration of impact significance, it is useful to assign numerical or relative descriptors to the impact intensity and receptor sensitivity for each potential impact. Each is assigned a numerical descriptor of 1, 2, 3, or 4, equivalent to very low, low, medium or high. The significance of impact is then indicated by the product of the two

numerical descriptors, with significance being described as negligible, minor, moderate or major, as illustrated in Table 4. This is a qualitative method designed to provide a broad ranking of the different impacts of a project. Illustrations of the types of impact that would be assigned the different grades of significance are given in Table 5.

Table 4: Determination of impact significance

			Sensitivity of receptor			
			Very low	Low	Medium	High
			1	2	3	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

Table 5: Impact assessment criteria and rating scale

Impact Rating	Impact Description
Major	<ul style="list-style-type: none"> <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> <li>Causing mortality to individuals of a species classified as globally or regionally endangered</li> <li>Major expedience 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> </ul>
Moderate	<ul style="list-style-type: none"> <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 returning to normal in the medium term</li> <li>Elevated contribution to global air pollution problem partly due to preventable releases</li> <li>Frequent breaches of water/air quality and noise guidelines</li> <li>Causing localised nuisance both on and off site</li> </ul>

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Minor	<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> </ul>
Negligible	<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> </ul>

The textural description of the descriptors ranging from “Very low” to “High” is presented in Table 6.

Table 6: Criteria for rating impact intensity and likelihood

Criteria	Rating scales
Intensity (the expected magnitude or size of the impact)	<p><b>Very Low</b>- where the impact affects the environment in such a way that natural, and</p> <p>/or cultural and social functions and processes are negligibly affected and valued, important, sensitive or vulnerable systems or communities are negligibly affected.</p>
	<p><b>Low</b>- where the impact affects the environment in such a way that natural, and/or cultural and social functions and processes are minimally affected and valued, important, sensitive or vulnerable systems or communities are minimally affected. No obvious changes prevail on the natural, and / or cultural/ social functions/ process as a result of project implementation.</p>
	<p><b>Medium</b> - where the affected environment is altered but natural, and/or cultural and social functions and processes continue albeit in a modified way, and valued, important, sensitive or vulnerable systems or communities are moderately affected.</p>
	<p><b>High</b> - where natural and/or cultural or social functions and processes are altered to the extent that they will temporarily or permanently cease, and valued, important, sensitive or vulnerable systems or communities are substantially affected. The changes to the natural and/or cultural / social- economic processes and functions are drastic and commonly irreversible.</p>
Probability	<b>None</b> – where the impact will not materialize

Criteria	Rating scales
	<b>Low</b> – where the possibility of the Impact materializing is very low (<20%)
	<b>Medium</b> – where there is a good possibility (30%-60% chance) that the impact will occur.
	<b>High</b> – where it is most likely (60% -100% chance) that the impact will occur.

### ***c. Impact significance***

Determination of the potential impact severity was premised on the product of the intensity of the impact and the sensitivity of the receiving environment. Illustration of impact severity involved assigning numerical or relative descriptors to the impact intensity and receptor sensitivity for each potential impact. As such, each is assigned a numerical descriptor of 1, 2, 3, or 4, was determined as being equivalent to very low, low, medium or high respectively. The illustrations of the types of impact that would be assigned the different grades of severity are shown in table below. The severity of impact will then be established by the product of the two numerical descriptors, with severity described as negligible, minor, moderate or major.

## **1.6 Structure of the Environmental Project Brief Report**

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

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

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

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

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

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

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

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

## ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

- Chapter 7: Evaluation of the identified environmental and social impacts and recommendation of appropriate mitigation measures for all significant negative environmental impacts predicted.
- Chapter 8: An Environmental, Social Management and Monitoring Plan for addressing negative impacts and assessing effectiveness of mitigation measures, scheduling monitoring frequency and assigning responsibility.
- Chapter 9: Conclusions and recommendations arising from the ESIA.

## 2 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

### 2.1 Introduction

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

### 2.2 Policies Relevant to the Proposed Project

The policies relevant to the proposed Morikiswa Solar Powered Mini-Piped Water Supply System are presented in Table 7.

Table 7: Policies relevant to Morikiswa Solar Powered Mini-Piped Water Supply System

Policy Title	Policy Goal	Relevance to Morikiswa Mini-Piped Water Supply System
The National Environment Management Policy for Uganda (2014)	The overall policy goal is to ensure sustainable development which maintains and promotes environmental quality and resource productivity for socio-economic transformation. The policy sets out in one of its key objectives to integrate, in a participatory manner, environmental concerns in all development policies, plans, activities and budgets at national, district and local levels.	Environment and Social Impact Assessment (ESIA) by way of a Project brief has been conducted for the proposed the Construction of Morikiswa Mini Water Supply System (this Report). If the proposed impact mitigation measures are put in place, the project will promote economic and social development in a sustainable way. These have been developed in consultation with different stakeholders of the proposed project.
The National Water Policy (1999)	To promote an integrated approach to manage the water resources in ways that are sustainable and most beneficial to the people of Uganda	The proposed project seeks to increase on the amount of safe water supply in Morikiswa RGC in Tororo District.
The National Gender Policy (1997)	Provides a framework and mandate for all stakeholders to address the gender imbalances within their respective sectors.	The gender policy recommends that integration of gender issues in national policies and projects will improve national welfare, contribute towards sustainable

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

<b>Policy Title</b>	<b>Policy Goal</b>	<b>Relevance to Morikiswa Mini-Piped Water Supply System</b>
		development, and improve the work of government ministries. The project will consider gender aspects during the different phases of its implementation.
The National Health Policy (1999)	To prevent transmission of diseases through Primary Health Care (PHC) including Sanitation and Hygiene.	The proposed project will help to improve the sanitation through improved provision and access to safe water to the communities.
The National Land Policy (2013)	The Policy was developed to ensure efficient, equitable and optimal utilisation and management of Uganda's land resources for poverty reduction, wealth creation and overall socio-economic development.	Some project infrastructure like transmission lines, reservoirs and boreholes will be located on people's land. Unless where the land is given freely by the community, affected land should be compensated following provision of Uganda's Land laws
The National Land-Use Policy (2007)	The Policy has an overall goal of achieving sustainable and equitable socio-economic development through optimal land management and utilization in Uganda	The location of the project components are of a small scale and will not compromise the existing land use plan
The National Employment Policy for Uganda (2011)	The overall goal is to promote productive and decent employment for all women and men in conditions of freedom, equity, security and human dignity	The proposed Morikiswa Water Supply System will employ many people who will include casual and technical personnel, including those from the affected community.
The National Environment and Social Safeguards Policy (2018)	The Policy was formulated to ensure that environmental and social concerns are integrated in all stages of project development and all levels including national, district and local levels, with full participation of the people as means of minimizing environmental and social impacts	The proposed project has developed an EBP (this report) in line with the principles outlined in the Policy.
The Climate Change Policy (2015)	The main 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	The proposed water supply system will extend water to people and the long run help them overcome the challenges posed by climate change and also build their resilience to such effects.



ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Policy Title	Policy Goal	Relevance to Morikiswa Mini-Piped Water Supply System
	economy. The policy has set out adaptation priorities among them; to effectively address the challenges posed by climate change impacts on biodiversity and ecosystems so as to ensure ecosystem health and provision of ecosystem services that are crucial to sustainable and resilient development.	
The National Forestry Policy (2001)	The National Forestry Policy was formulated to ensure an integrated forest sector that achieves sustainable increases in the economic, social and environmental benefits from forests and trees by all the people of Uganda, especially the poor and vulnerable.	The proposed project developer will ensure that all trees that are affected replaced following the procedure provided for in the policy and other laws regarding forestry.
The National Gender Policy (2007)	The current gender policy overall goal is to achieve gender equality and women's empowerment as an integral part of Uganda's socio-economic development. Its main purpose is to establish a clear framework for identification, implementation and coordination of interventions designed to achieve gender equality and women's empowerment in Uganda. And as, the attainment of the gender equality goal will depend on the extent to which public and private sector institutions and agencies engage both women and men as providers and or producers and beneficiaries of services and investments.	Throughout the project cycle, gender equality will be paramount. The developer will ensure that women and other gender rights are respected.
The National Cultural Policy (2006)	The Constitution of Uganda recognizes the diversity of the culture of Uganda with over 60	The project sites including pipeline routes do not pass through any cultural site. If there is any cultural site or artifacts that are

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Policy Title	Policy Goal	Relevance to Morikiswa Mini-Piped Water Supply System
	indigenous communities recognized. Due to that diversity the National Cultural Policy was approved in 2006 with the aim of promoting culture and enhance its contribution to community empowerment. One of the specific objectives of the Policy is to conserve, protect and promote Uganda's tangible and intangible cultural heritage.	discovered during construction or operation of the proposed water supply system, relevant agencies and authorities will be contacted to collect them.
The National Policy for Conservation and Management of Wetlands (1995)	The National Policy for conservation and management of wetlands was drafted in 1995 with an overall aim of promoting the conservation of Uganda's wetlands in order to sustain their ecological and socio-economic functions for the present and future wellbeing of the people. The Policy recognizes that Wetland resources form an integral part of the environment and their conservation must be pursued in the context of an interaction between conservation and the overall development strategies and activities and that planned activities close or in wetlands should under an ESIA.	The Developer shall obtain a certificate of approval of ESIA and shall comply with all provisions in the policy regarding wetlands protection. All activities of the project shall aim at minimizing impacts to the wetlands close to the project sites and along pipeline routes. The Contractor will ensure that the wetlands are protected from encroachment and degradation.
HIV/AIDS at Work Policy (2007)	The policy provides the principles and a framework for a multi-sectoral response to HIV/AIDS at work places.	Response to HIV/AIDS issues will be integrated in the development of the water supply system. This will entail among others; non segregation of HIV/AIDS positive people during employment, provision of HIV/AIDS counselling and support services to the project staff.
The National Child Labour Policy (2006)	Protection of children from hazardous work that jeopardizes their health, safety and morals.	The Developer will ensure that no children will be employed by the Project.
Uganda Vision 2040	Aims at having sustainable socio-economic development that does	The proposed Morikiswa Mini-solar piped water supply system will contribute to

## ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Policy Title	Policy Goal	Relevance to Morikiswa Mini-Piped Water Supply System
	not compromise environmental quality. In order to achieve a sustainable socio-economic development, government prioritized industrialization (value addition) as the key factor.	attaining this vision whereby the water supplied will be a key input in sectors like industrialisation, agriculture and related socio-economic development of the country.
Third National Development Plan (NDPIII) 2020/21-2024/25	The goal of NDPIII is to increase Average Household Incomes and Improve the Quality of Life of Ugandans. Some of the ways this will be achieved is to increase water coverage to 85% and 100% in rural and urban areas respectively by the year 2025.	The NDPIII highlights solar powered mini-piped water scheme projects as one of the core projects for achievement of the objectives of the plan hence spur development in the country. Morikiswa mini piped water supply system is one of the systems for Tororo District in Eastern Uganda.

### 2.3 Legal Framework Relevant to the Proposed Project

The Ugandan laws and regulations, and the AfDB Operational Safeguard Policies, are presented in Table 8 and 9, respectively.

Table 8: Ugandan laws and regulations relevant to the Proposed Morikiswa Mini Water Supply System

Legal Framework	Provision(s)	Proposed Actions/Comments
The Constitution of the Republic of Uganda; 1995; amended as at 15th February 2006, Government of Uganda.	The State shall promote sustainable development and public awareness of the need to manage land, air and water resources in a balanced and sustainable manner for the present and future generations. Chapter 15, Article 237, Clauses (1) (2) (a) & (b) gives the Government the powers as guided by the Parliament to acquire land anywhere within the country and place it to the best use to benefit the citizens of the country, where deemed necessary.	The developer observes the Constitutional provisions. This is why the developer commissioned the ESIA process prior to implementation of the project. The waterworks, as well as distribution to neighbouring areas will be done while following mitigation measures. All land acquisitions will adhere to provisions of the 1995 National Constitution.
The National Environment no. 5 2019	Section 112 (1), requires a developer of a project to submit an acceptable EIA/EPB Report in accordance with the guidelines in the Fourth Schedule of this Act.	An EPB has been conducted for proposed Project so that it promotes economic and

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Legal Framework	Provision(s)	Proposed Actions/Comments
		social development in a sustainable way.
The Water Act, Cap 152 and The Water Resources Regulations, 1998	Under section 18 (2), a person wishing to construct any works or take and use water may apply to the Director of Water Development Directorate in a prescribed form for a permit to do so. Under Section 31 (1) of the Act, a person commits an offence who, unless authorized under this Part of the Act, causes or allows wastes to come in contact with, or be discharged into water or allows water to be polluted	The developer will ensure that waste generated during project implementation does not negatively impact water resources in the project area.
The Land Act, Cap 227	Section 42 states that Government or Local Government may acquire land in accordance with the provisions of Article 26 and clause 237 of the constitution. Section 74 (i) states that where it is necessary to execute public works on any land (for example construction of road), an authorized undertaker shall enter into mutual agreement with occupier or owner of the land in accordance with this act, and where no agreement is reached, the Minister may; compulsorily acquire land in accordance with Section 43 of the Act.	All the required land for the proposed project will be acquired in accordance with this Act.
The Occupational Safety and Health Act, 2006	The Act aims at ensuring the existence of safety and health at all work places and work environment.	The project shall adhere to occupational safety and health rules according to the mitigation measures suggested in this report.
The Workers' Compensation Act (2000)	This requires compensation to be paid to a worker injured or acquired an occupational disease or has been harmed in any way in the course of his/her work.	The developer shall ensure that all contractors and sub-contractors provide personal protective equipment (PPE) to employees to minimize accidents and injuries. Additionally, compensation will be paid to those affected.
The Town and Country Planning Act, 2014	The Town and Country Planning Act govern land use and land planning in urban and rural areas.	The developer shall use established guidelines for planning schemes, to acquire land as well as

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Legal Framework	Provision(s)	Proposed Actions/Comments
		safeguarding the natural environment.
The Public Health Act Cap 281	Section 7 provides local authorities with administrative powers to take all lawful, necessary and reasonable practicable measures for preventing the occurrence of, or for dealing with any outbreak or prevalence of, any Infectious, communicable or preventable disease, to safeguard and promote the public health.	The developer/ Contractor shall provide for adequate sanitary facilities, proper solid and liquid waste management and provide and operate first Aid services especially in public places; and shall ensure that such facilities are available in all other privately allocated and developed areas requiring such to possess them. Anybody falling sick and needing services beyond the first Aid shall be referred to the nearest health centre. The developer /Contractor will implement HIV/AIDS prevention and control plan as part of the mitigation measures.
The Local Governments Act Cap 243	Provides for the system of local governments based on the decentralization of district for the enforcement of environmental law. The functions of the Municipal Councils include: land surveying and administration, physical planning, environmental protection (forests and wetlands, streams and so forth and ensuring proper sanitation	The developer shall work closely with Tororo District local government administration, including other lower local governments at sub county and village levels in carrying out activities related to the project for example monitoring the implementation of the Environment and Social Management and Monitoring Plan (ESMMP) for the project.

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Legal Framework	Provision(s)	Proposed Actions/Comments
The Traffic Control and Road Safety Act (1998)	<p>This Act requires that, among other things: The use of motor vehicles on any road should comply with road signs and speed limits, the employer to keep record of drivers and their activities. All motor vehicles, trailers or equipment, including tyres and lights, are in good repair and in efficient working order; drivers of motor vehicles should have valid licenses and should not drink and drive. Motor vehicles used on a road should not be with a load greater than the load capacity declared by the manufacturers.</p>	The developer / contractor should ensure that all motor vehicle usage is conducted in line with this Act.
National Forestry and Tree Planting Act (2003)	The act provides the conservation and sustainable management of forests for the benefit of the people of Uganda by safeguarding forests, their biodiversity and environmental benefits that accrue from forests and trees.	The Developer shall implement the project following the provisions of this Act so that the benefits accruing from any Forest Reserve, which is bordering the project sites or pipeline routes are not compromised.
The National Children's Act (1997)	Section 8 of the Act prohibits employment of Children. It states 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.	No children will be employed during the Project cycle.
The National Environment (Environmental and Social Assessment) Regulations, 2020	<p>Regulation 6(1) requires the developer of a project under section 112 of the Act and set out in Schedule 4 of the Act to undertake scoping and an environmental and social impact study in accordance with these Regulations.</p> <p>Regulation 16(1) requires the developer to carry out consultations with relevant stakeholders, communities likely to be affected by the project and the public while undertaking the environmental and social impact study.</p>	<p>The study has been conducted in line to the provisions of the Regulations.</p> <p>Various stakeholders in the project area were consulted to find out their views on the proposed project.</p>
The National Environment (Wetlands, River Banks and	Regulation 12(1) prohibits any person from carrying out an activity in a wetland without a permit issued by the Executive Director of NEMA.	The proposed project activities shall not be carried out in or near any wetland.

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Legal Framework	Provision(s)	Proposed Actions/Comments
Lake Shores Management) Regulations, 2000	Under regulation 34(1), a developer desiring to conduct a project which may have significant impact on a wetland (for example dredging), river bank or lake shore, shall be required to carry out an environmental impact assessment in accordance with sections 20, 21, and 22 of the NES.	
National Environment (Conduct and Certificate of Environment Practitioners Regulations (2003)	Regulation 176 (1) states that no person shall conduct an EIA or carry out any activity relating to the conduct of an environmental impact study, or environmental audit as provided under the Act, unless the person has been duly certified and registered in accordance with the regulations	The Consultants who carried out this assessment are certified practitioners by NEMA.
The National Environment (Waste Management) Regulations (2020)	Regulations outline the requirements for the management of hazardous and non-hazardous waste including transport, storage, treatment, and disposal and licensing of waste contractors. Regulations require waste disposal in a way that would not contaminate water, soil, and air or impact public health.	The Project Developer should be aware of regulation requirements and legal standards when designing waste storage facilities, likely avoiding wetland and riverine areas.
The Water (Waste Discharge) Regulations, 1998	The water (Waste Discharge) Regulations of 1998, are aimed at regulating the effluent or discharge of wastes on to land or into water. Under regulation 5(1), a waste discharge permit is required for a person who owns a facility which discharges or will discharge effluent or waste into the aquatic environment or on land. The alum sludge and backwash water from the water treatment works will have to be discharged responsibly.	In case of any waste discharged, a waste discharge permit shall be acquired from the relevant authorities.
The National Environment (Control of Smoking in Public Places) Regulations, 2004.	Section 3 entitles every person to a healthy environment, free from second-hand smoke. It further obliges all persons to safeguard the health of non-smokers. Sections 4 & 5 prohibit smoking in public places.	The developer/Contractor shall enforce a no-smoking ban in all public work places during construction and operation phases of the project and will ensure that there are clear signs indicating that smoking is restricted and prohibited in such areas.

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Legal Framework	Provision(s)	Proposed Actions/Comments
The National Environment (Noise Standards and Control) Regulations, 2003.	Regulations 6 & 7 (II) sets permissible noise levels, Part III (Regulations 8, 9, 10 & 11) calls for the control and mitigation of noise; Regulation 9 specifically prohibits the generation of noise by place and time. Part IV instructs for a license for noise in excess of permissible levels.	Contractor and developer must enforce noise standards and working hours at the site allocated for development, both during the construction stage, as well as during operation and maintenance.
National Air Quality Standards, 2006 (Draft)	The Standards provides for permissible limits air quality parameters such as carbon dioxide, Nitrogen oxides, Sulphur oxides, Volatile Organic Compounds and particulates	The Developer and Contractor must implement and enforce mitigation measures for air pollution during the entire lifecycle of the project

**Table 9: AfDB Operational Safeguard (OS) Policies**

Operational Safeguard/Performance Standard	Key issue	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/treatment site, reservoir sites and some areas along the proposed pipeline route will be compensated prior to start of construction works.



<b>Operational Safeguard/Performance Standard</b>	<b>Key issue</b>	<b>Relevance/Applicability</b>
<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 and resource efficiency	Manage and reduce pollution in AfDB funded projects. It covers a range of key impacts including pollution, waste, and hazardous materials for which there are agreed international conventions, as well as comprehensive industry-specific and regional standards, to be followed to safeguard the environment and humans from being polluted as a result of the development activities.	The project will set up a waste management plan to handle liquid and solid wastes, including those of hazardous nature.
<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 to enable workers express their complaints, among others.

## 2.4 Institutional Framework

### 2.4.1 Ministry of Water and Environment

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

#### ***2.4.1.1 The Directorate of Water Resources Management***

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

#### ***2.4.1.2 The Directorate of Water Development***

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

#### **2.4.2 National Environment Management Authority**

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

#### **2.4.3 Ministry of Gender Labour & Social Development**

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

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

#### 2.4.4 Local Administration Structures

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

#### 2.4.5 African Development Bank

The implementation of the proposed Morikiswa Solar Powered Mini-piped Water Supply System is being funded by the African Development Bank under the overall framework of the Water Supply and Sanitation Program Phase III in the Ministry of Water and Environment. Throughout the development of the water supply system, the AfDB will monitor and provide guidance to ensure that all the necessary environmental and social safeguards as provided for under the AfDB Integrated Safeguard System are adhered to.

#### 2.5 Permits/licenses to be obtained

During the implementation of the project, the developer together with contractors will be required to obtain licenses, permit or certificates so as to carry out certain activities. Table 10 provides some of the permits/certificates/licenses to be obtained.

**Table 10: Permits/certificates/ licenses to be obtained**

Permits/certificates/licenses	Organisation	Purpose	Responsibility	Stage
Noise emission certificate	NEMA	To get permission to emit noise that is beyond the acceptable limits	Contractor	Construction
Wastewater discharge	NEMA	In case of discharge of wastewater	Contractor	Construction and operation
Water abstraction permit	DWRM	For abstraction of water from underground aquifers that will be supplied	Developer	Operation
Registration of work place certificate	MoGLSD	Any workplace should be registered as a workplace. This is to certify that it is suitable for people to work from	Developer, Contractor	All stages of the project
ESIA certificate	NEMA	To set out conditions to be followed while implementing the project to help prevent destroying the environment	Developer	Construction
Clearance of machinery	MoGLSD	All machinery that associated with high risks should be inspected before they are used. These include tractors, cranes etc	Contractor	Construction and operation

### 3 ENVIRONMENTAL AND SOCIO-ECONOMIC BASELINE CONDITIONS

#### 3.1 Project Location and its Environs

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

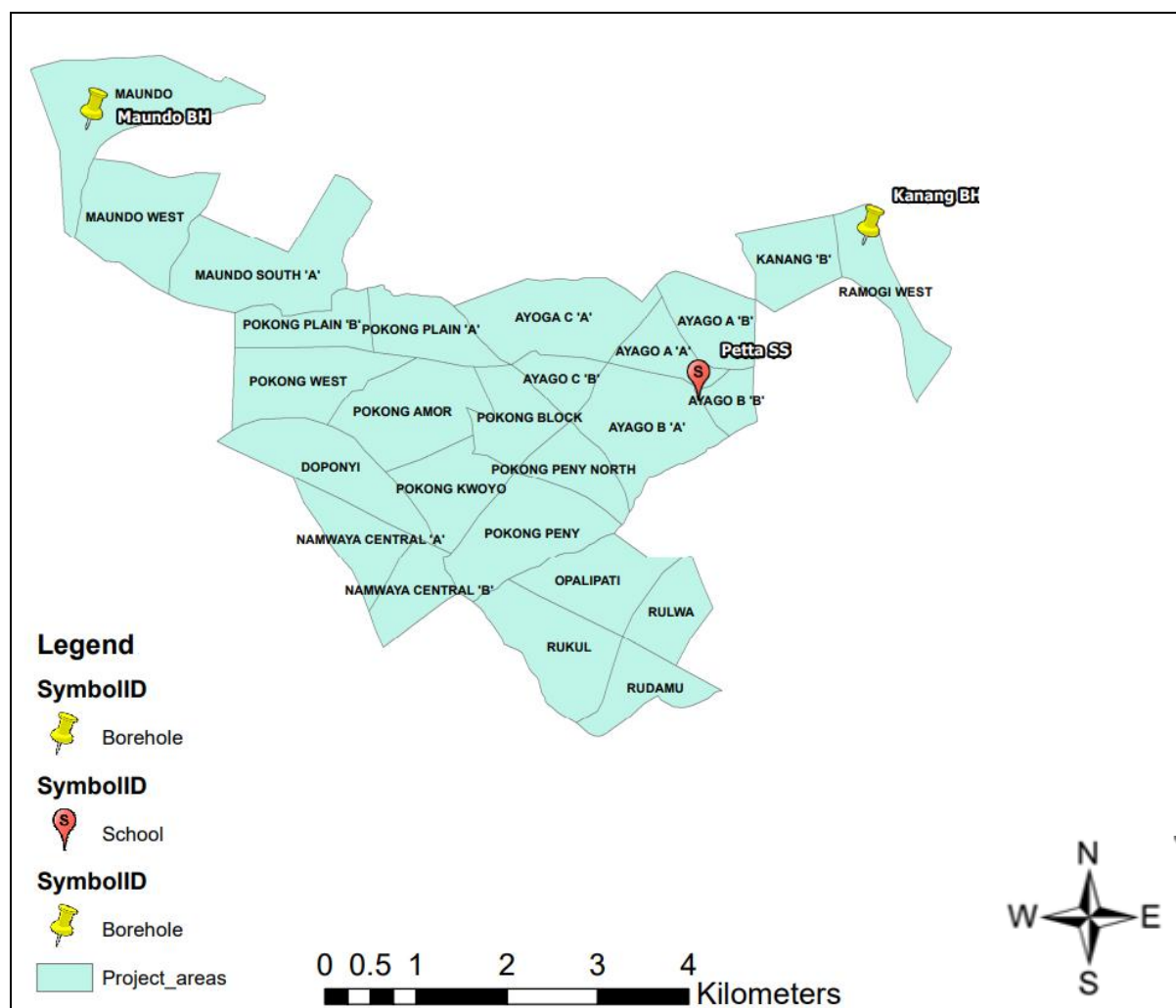


Figure 1: A view of the proposed project extent

The proposed project boreholes and reservoir tanks that will be constructed to supply water in the project area are located at GPS coordinates as presented in Table 11.

**Table 11: Location of proposed project facilities in Morikiswa RGC**

Borehole No.	Village	Parish	Sub-county	Coordinates	Remarks
DWD 90938	Kanang C	Ramogi	Petta	N00.784312 E034.106058	Installed
DWD 90937	Maundo	Nyasirenge	Paya	N00.796033 E034.029334	Installed
	Bendo Zone	Kisoko	Kisoko	N00.743450 E034.110299	Existing Kisoko Reservoir
	Maundo	Nyasirenge	Paya	N00.785951 E034.043370	Proposed Maundo Reservoir

## 3.2 Biophysical Environment

### 3.2.1 Geology and Soils

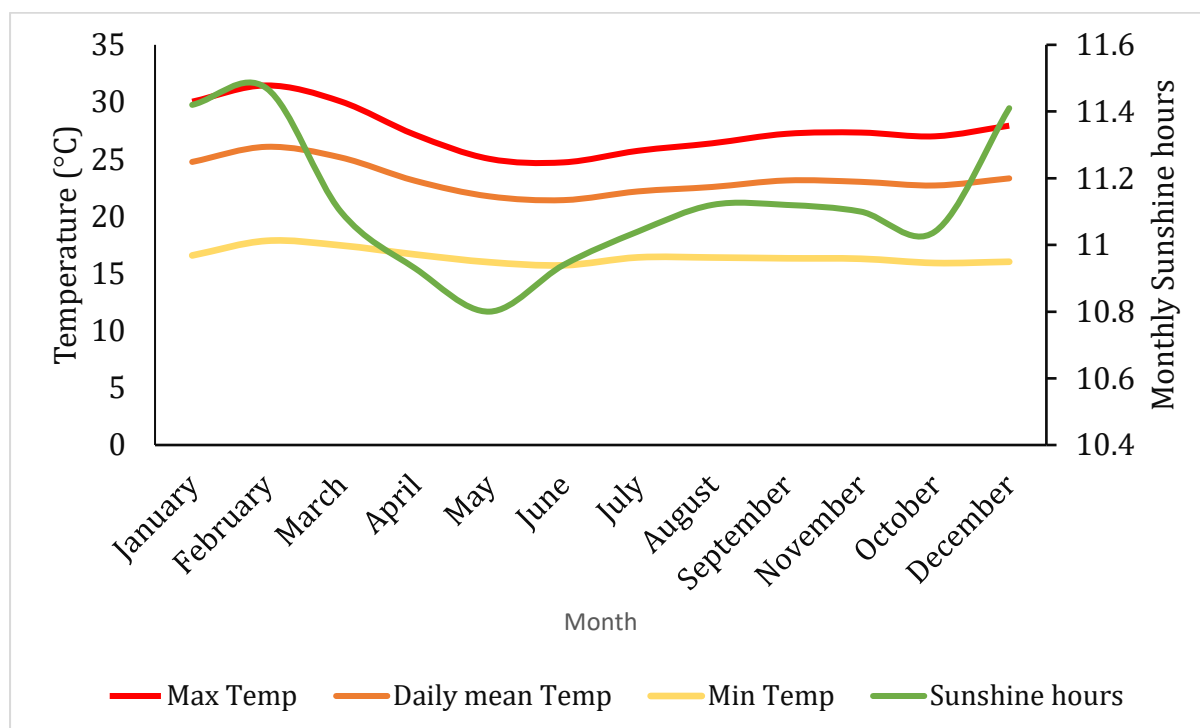
Tororo District is underlined by the eastern volcanic rocks of Cretaceous to Miocene age (135 — 5.30 Ma) which comprise generally soda-rich agglomerates, lavas and tuffs extruded by central volcanoes that are represented by Mountain Elgon, that is the Mesozoic and Cainozoic rocks (DGSM, 2008). The area hosts carbonite resources related to the Carbonatite ring complexes along the Kenya — Uganda border. This is underlain by sediments of the Bugisu Series associated with Mt. Elgon. The tertiary pre-Elgon volcanic rocks, which include Tororo rock and Osukuru hills, are known to be very rich in minerals, which have potential for the growth of industries (cement, fertilizers and fungicide industries). The soils of Tororo District are sandy clay- and loam-type, with low contents of carbon, nitrogen and phosphorus.

### 3.2.2 Climate

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

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

Tororo District has on average 11.1 sunshine hours with the highest received in the month of February while May has the lowest number of sunshine hours of 10.8 hours monthly (Figure 2). The average sunshine hours that most solar systems need to generate electricity is 4.5 hours per day at peak sun. The sun in Tororo is capable of sustaining the solar system so that electricity can be generated to power the Morikiswa Water Supply System.



**Figure 2: Monthly Temperature and sunshine hours variation in Tororo District**

### 3.2.3 Drainage

The upland areas of Kanang, Ramogi are well drained and streams of water flow from these areas towards the lowland in the West. There are a few streams such as Ayago flowing through Petta Central where it divides its course into two distributaries. One of the distributaries flows westwards to Sa Pa'jakongo in Nangongera Town Council via Pakoi lowlands and the other flows northwards to Sa Pa'Kisa wetland.

### 3.2.4 Topography

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

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

### 3.2.5 Flora

Tororo District has distinct types of vegetation, that vary from medium altitude forests and swamps to savannahs. The medium altitude forests found in the district include the moist semi deciduous type located in Busitema Sub-county. A section of the forest occupies part of the Malaba river valley and is surrounded by swamps. The rest of the

district in various parts is covered by wooded savannah or swamps. Natural forests in Tororo have been cleared to create fields for crops and livestock production.

Around the proposed project area, vegetation is characteristic of semi-urban and agricultural/grazing landscapes, dominated by grasses, shrubs, weeds, crops and a few trees. The following vegetation species were identified in the different locations of project components:

### **Proposed Maundo borehole abstraction site – DWD 90937**

The site consisted of regenerating vegetation. The area was dominated by *Panicum maximum*, *Conyza sp*, *Tridax procumbens*, *Euphorbia heterophylla*, *Senna sp.*, *Lodes vitiginea*, *Sida acuta*, *Chloris gayana*, *Gomphrena celosioide* and *Cynodon dactylon*. *Fleugea virosa*, *Pseudocedrella odorata*, *Markhamia lutea*, *Mangifera indica*, *Albizia Zygia*, *Albizia coriaria*, *Artocarpus heterophyllus*. A garden of *Musa sp*, *Cymbopogon citratus*, and *Manhot esculenta*.

### **Invasive species**

Only *Lantana camara* was recorded with invasive character along the fence of the bore hole at GPS Coordinates N00.796033° E034.029334°

### **Conservation status of *Milicia exclesa***

It is noted that most of the mature *Milicia exclesa* trees were harvested in Maundo area for timber, leaving behind young trees only. The existing young trees are also under immense pressure to provide timber and charcoal production.

### **Vegetation along the distribution route**

The vegetation cover was dominated by regenerating, *Bidens pilosa*, *Cynodon dactylon*, *Panicum maximum*, *Euphorbia heterophyllus*, *Agave sisalana*, *Paspalum scrob*, *Paspalum scrobiculatum*, *Solanum incanum*, *Commelina benghalensis*, *Saccharum officiarum*. *Markhamia lutea*, *Maesopsis eminii*, *Pseudocedrella odorata*.

### **Invasive Species**

*Senna sp* was located at N00.75842° E034.05213°.

### **Proposed Kanang C borehole abstraction site - DWD 90938**

Generally, 95% of the vegetation surrounding abstraction point is modified by anthropogenic activity leaving insignificant remnant of indigenous tree species and pronominally exotic tree species.

South of the extraction point, *Pinus carribea hunderencis* plantation exists. The plantation is stocked well with 75% closed crown cover. There are relics of indigenous tree species

such as; *Acacia sp*, paper mulberry, *Albizia coriaria*, *Markhamia utile*, and shrubs species such as *Leucaena Leucocephala* at the edges and outside plantation are scattered over among grass species such as *Solanum sp*, *hyparrhenia rufa*, *Panicum maximum*, *Cynodon dactylon*, *Digitaria macroblephara*. The garden that surrounds the abstraction point is planted with a very open small scale food crop (cassava, maize and banana) vegetation (Plate 2).



**Plate 2:** Cassava garden and pine plantation surrounding Kanang C borehole

### **Vegetation along the distribution route**

The vegetation along the transmission route included *Manhot esculenta*, *Musa sp*, *Saccharum officiarum* *Artocarpus heterophyllus*, *Mangifera indica* *Bidens*. Some gardens along the route were dominated by *Biden pilosa*, *Cynodon dactylon*, *Panicum maximum*, *Euphorbia heterophyllus*, *Agave sisalana*, *Paspalum scrob*, *Paspalum scrobiculatum*, *solanum incanum*, *Commelina benghalensis*, *Markhamia lutea*, *Maesopsis eminii*, *Pseudocedrella odorata*, *Amaranthus sp*, *elaesi guineensis*, *Oxalis sp*, *Sida acuta*.

### **Invasive species**

Only *Lantana camara* was recorded with invasive character 20 meters away from the abstraction point.

### **3.2.6 Birds**

A total of fifty-four bird species (54 species) were recorded from the three locations along Morikiswa mini piped water supply system. The habitat sampled supports various categories of birds such as specialists, for example; Waterbirds (herons and storks) and Grassland species (whydahs and egrets). There were also a good number of generalist species such as Common Bulbuls, Tawny Flanked Prinia and sunbirds. Of the three locations surveyed, species richness was highest at Maundo abstraction site (33 species), followed by Kanaga C abstraction area (30 species) and lowest at Kisoko water reservoir area.



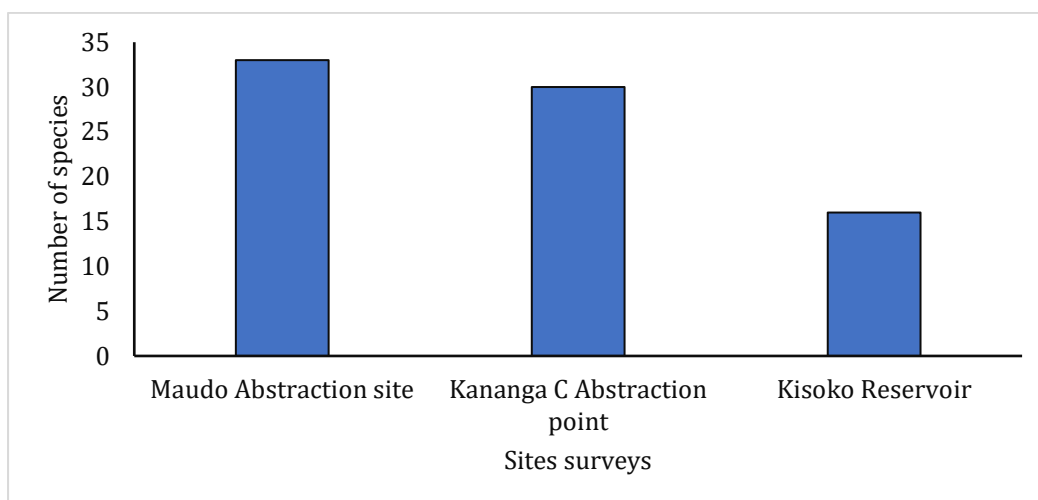


Figure 3: Number of species recorded in various locations along the proposed project area



Plate 3: Some of the birds within the Morikiswa project area

Among the fifty-four species, Common Bulbul *Pycnonotus barbatus* and Red-billed firefinch *Lagonosticta senegala* were the most abundant species. Other common species were Red-eyed Dove *Streptopelia semitorquata* and Tawny Flanked *Prinia subflava*. On the other hand, the least abundant species were, African Mourning Dove *Streptopelia decipiens*, African Open-billed Stork *Anastomus lamelligerus* and Pin-tailed Whydah *Vidua macroura*.

The bird community surveyed supports species of various ecological categories such as tree species, grassland species, Aerial feeders and water birds. Figure 4 shows that majority of the species recorded were forest edge species (f), followed by wetland visitors (w\*).

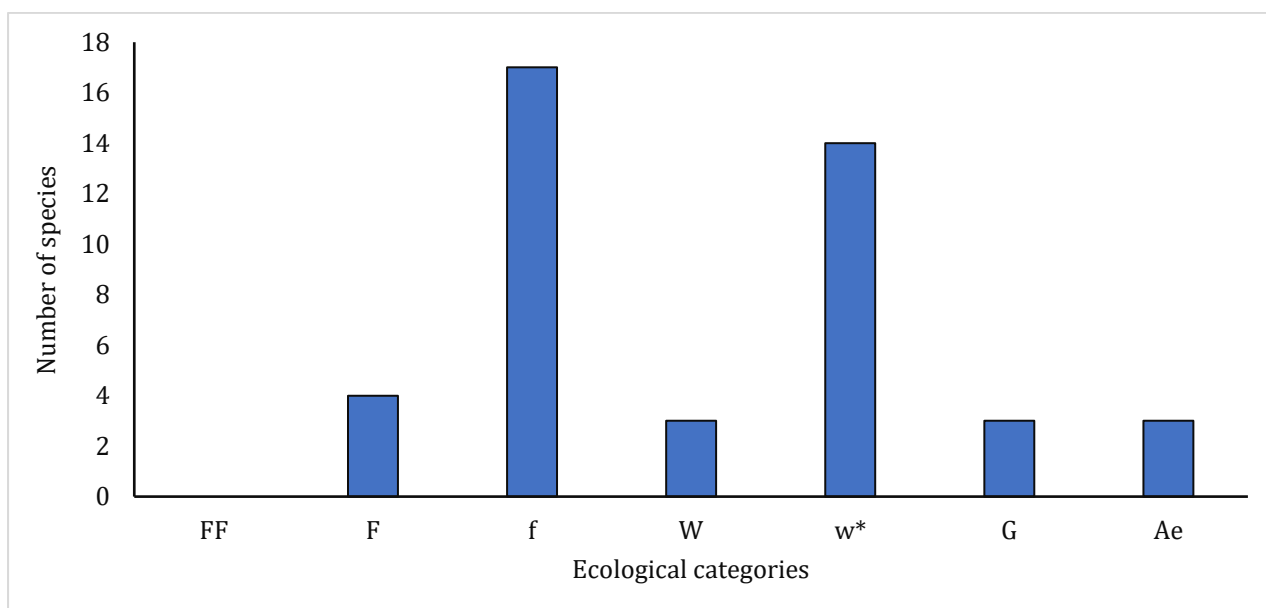


Figure 4: Number of species recorded in various ecological categories (FF-Forest specialist, F-Forest Generalist, f-forest edge species, W-Water specialist, w-Water non-specialist, G-Grassland specialist and Ae-Aerial feeder).

### Forest species

No forest interior species were recorded; this is because of absence of natural primary forests in the sampled areas. However, there were four forest generalists (these are being listed in Table 12 and seventeen forest edge species. Forest edge species do not depend on forests but do need trees, therefore, the few remaining trees in the project areas are important for them. The most important site for the forest generalist was Kisoko reservoir area followed by Kananga abstraction point (Table 12). Forest species and tree species are of conservation concern because of deforestation despite the need for carbon sequestration.

Table 12: Forest generalists (F) species recorded across sites

2016 No <sup>a</sup>	COMMON NAME <i>Scientific Name</i>	Ecology	Red list	Kananga C Abstraction site	Maudu Abstraction site	Kisoko Reservior
319	LIZARD BUZZARD <i>Kaupifalco monogrammicus</i>	F	LC	5		5
69	BLUE-SPOTTED WOOD DOVE <i>Turtur afer</i>	F	LC	4		1
132	ROSS'S TURACO <i>Musophaga rossae</i>	F	LC			4
594	OLIVE-BELLIED SUNBIRD <i>Cinnyris chloropygius</i>	F	LC			2

a- According to WCS(2016), LC-Least Concern

### Water birds (W and w\*)

The seven water birds recorded are shown in Table 13. These included three water specialists (W) and four non-water specialists (w). The most important site for water birds was Maudo abstraction areas (7 species). The remaining two sites recorded few or no species. Hammerkop *Scopus umbretta* and Hadada Ibis *Bostrychia hagedash* were the most abundant water species whereas on the other hand, African Open-billed Stork *Anastomus lamelligerus* and Sacred Ibis *Threskiornis aethiopicus* were the least common. Water birds are important for human wellbeing and to the environment in many ways for example; Water birds can maintain the diversity of other organisms, control pests, be effective bio-indicators of ecological conditions, and act as sentinels of potential disease outbreaks. They also provide important provisioning (meat, feathers, eggs, etc.) and cultural services to many indigenous communities, therefore care must be taken so as to spare the few remaining habitats for these species.

Table 13: Water birds (water specialists (W) and wetland non-specialists (w\*))

2016 No	COMMON NAME <i>Scientific Name</i>	Ecology	Red list	Kananga C abstraction site	Maudo Abstraction site	Kisoko Reseoir
171	HAMERKOP <i>Scopus umbretta</i>	w*	LC			
196	HADADA IBIS <i>Bostrychia hagedash</i>	w*	LC			
181	RUFOUS-BELLIED HERON <i>Ardeola rufiventris</i>	W	R-NT, U-VU			
183	GREY HERON <i>Ardea cinerea</i>	W	R-NT			
184	BLACK-HEADED HERON <i>Ardea melanocephala</i>	w*	LC			
191	SACRED IBIS <i>Threskiornis aethiopicus</i>	W	LC			
163	AFRICAN OPENBILL STORK <i>Anastomus lamelligerus</i>	w*	LC			

a- According to WCS (2016), LC-Least Concern

### Grassland species (G)

The three grassland species recorded are listed in Table 14. The most important area for these species was Maudo abstraction point, followed by Kananga areas. All the grassland species recorded are not listed Globally by IUCN (IUCN 2023) nor at country level (WCS 2016) as threatened species. Grassland species are of conservation concern due to bush burning and overgrazing.

Table 14: The three grassland species recorded along the proposed water system project area

2016 No	COMMON NAME <i>Scientific Name</i>	Ecology	Red list	Kananga C abstraction site	Maudo Abstraction site	Kisoko Reservoir
182	CATTLE EGRET <i>Bubulcus ibis</i>	G	LC			
163	AFRICAN OPENBILL STORK <i>Anastomus lamelligerus</i>	AwG	LC			
709	PIN-TAILED WHYDAH <i>Vidua macroura</i>	G	LC			

a- According to WCS(2016), LC-Least Concern

### Aerial Feeders (Ae)

The three Aerial feeding species are listed in Table 15. Basically, these are insectivores, therefore, benefiting from the rich insect life in various locations along the project. All the Aerial feeding species recorded are not listed Globally by IUCN (IUCN 2023) nor at country level (WCS 2016) as threatened species. There were also two migratory species among the recorded aerial feeders. Aerial feeders perform a number of ecosystem services such as vector control (These birds feed on vectors such as mosquitoes and houseflies).

Table 15: The three Aerial feeders recorded in various in various areas

2016 No	COMMON NAME <i>Scientific Name</i>	Ecology	Red list	Kananga C Abstraction site	Maundo Abstraction site	Kisoko Reservoir
91	AFRICAN PALM SWIFT <i>Cypsiurus parvus</i>	Ae	LC			
880	BARN SWALLOW <i>Hirundo rustica</i>	Pw,Ae	LC			
100	COMMON SWIFT <i>Apus apus</i>	P,Ae	LC			

a-According to WCS (2016), b-relative abundance level, LC-Least Concern

### Species of conservation concern

None of birds recorded in the study areas are listed globally by IUCN (IUCN 2023). However, five of them were listed important regionally as Near-threatened and Regional responsibility (Table 18). Red-list data is used by many groups such as governments, developers and conservation organization to support conservation actions and priorities. Natural resource planners rely on red-list data to better understand their environment and how project impact on them be minimized.

Table 16: Details of species of conservation concern recorded across sites

2016 No <sup>a</sup>	COMMON NAME <i>Scientific Name</i>	Ecology	Red list	Kananga C Abstraction site	Maundo Abstraction site	Kisoko Reservoir
18 1	RUFIOUS-BELLIED HERON <i>Ardeola rufiventris</i>	W	R-NT, U-VU			
18 3	GREY HERON <i>Ardea cinerea</i>	W	R-NT			
81 7	GREY-CAPPED WARBLER <i>Eminia lepida</i>	fw	R-RR			
87 0	WHITE-HEADED SAW-WING <i>Psalidoprocne albiceps</i>	f	R-RR			
29 8	BROWN SNAKE EAGLE <i>Circaetus cinereus</i>		R-NT			

a- according to WCS 2016,

### Migrants

In total, five migrant species were recorded. These included three Palearctic migrants and two Afro-tropical migrants. Migrant species were most abundant in the Maundo abstraction areas and Kananga C. No migrants were recorded in areas near Kisoso Reservoir (Table 17). Migratory birds provide ecosystem benefits that include pest control, pollination of plants and serve as food sources for other wildlife. They are also as a source of recreation for millions of bird watchers and enthusiasts.

Table 17: Palearctic Migrants (PM) and Afrotropical Migrants (AM) across sites

2016 No <sup>a</sup>	COMMON NAME <i>Scientific Name</i>	Ecology	Migrants	Kananga C abstraction site	Maundo Abstraction site	Kisoko Reservoir
470	WOODLAND KINGFISHER <i>Halcyon senegalensis</i>	A	AM			
916	WILLOW WARBLER <i>Phylloscopus trochilus</i>	f	PM			
880	BARN SWALLOW <i>Hirundo rustica</i>	w,Ae	PM			

2016 No <sup>a</sup>	COMMON NAME <i>Scientific Name</i>	Ecology	Migrants	Kananga C abstraction site	Maundo Abstraction site	Kisoko Reservoir
100	COMMON SWIFT <i>Apus apus</i>	Ae	PM			
163	AFRICAN OPENBILL STORK <i>Anastomus lamelligerus</i>	wG	AM			

a- According to WCS(2016), b-relative abundance level, LC-Least Concern

### Critical sites

All the three project sites are highly modified as a result of human settlement, agriculture and over grazing. In fact, the number of bird species recorded in these areas is below average those usually recorded in healthier habitats. Although there were few species of regional conservation importance, none of the recorded species was listed by the IUCN (2023). Given the above justifications, none of these areas qualify a critical site as far as birds are concerned (Table 18).

Table 18: Critical habitat matrix generated across the project areas

IFC Critical habitat Criteria	Kananga C Abstraction site	Maundo Abstraction site	Kisoko Reservoir
Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species	1	1	1
Criterion 2: Endemic or restricted-range species	1	1	1
Criterion 3: Migratory or congregatory species	2	3	1
Criterion 4: Highly threatened and/or unique ecosystems	2	2	1
Criterion 5: Key evolutionary processes	1	1	1
<b>Total Ranks</b>	<b>7</b>	<b>8</b>	<b>5</b>

### 3.3 Noise Level

The noise levels recorded at the different sites in the project area are presented in Table 19. The results showed that baseline noise levels are within the permissible standards for residential and commercial areas.

Table 19: Noise levels in at selected project sites

Site	Noise Reading			Background noise sources/Remarks
	Maximum dB(A)	Minimum dB(A)	Avg. Noise level Leq dB(A)	
DWD 90938 – Kanang C	62	55	57	People, background music
DWD 90937 – Maundo	55	48	52	Vehicles
Kisoko Reservoir	59	50	56	People activities and vehicles
Proposed Maundo Reservoir	54	46	50	

### 3.4 Existing Water Supply Situation

#### 3.4.1 Water sources

Domestic water supply sources in the project area include springs, wells, taps and boreholes (Plate 4). Institutions use water from boreholes that have been drilled within their compounds. Further, some households and institutions harvest rainwater from their roofs. The majority of the commercial consumers use vendors as their primary supply source.



Plate 4: Poranga Borehole in Kanang C

#### 3.4.2 Existing piped water systems

There are two piped water systems within the project area; one is supplying Tororo Municipality and surrounding areas, while the other supplies Lwakhakha Town and its surroundings. These areas were not included in the design for this project. Both water

supplies systems for Tororo Municipality and Lwakhakha Town abstract water from River Malaba, treat, pump into reservoirs and supply by gravity to the respective areas.

The water supply system by NWSC is a surface water-based system for Tororo municipality and its environs. The system effectively covers Morukatipe Parish in Osukuru sub-county and Mella Parish in Mella project area, which were part of the original project area. NWSC draws water from River Malaba at a point near Malaba town, treats it nearby and then pumps it through pipes laid along the Malaba-Bugiri road to reservoirs near Tororo municipality. The water then gravitates to supply the entire area around the municipality.

Lwakhakha Water Supply System is a surface water-based system. Its intake is adjacent to that of the Tororo GFS in Soono village, Bumbo sub-county. The water flows by gravity to a treatment works nearby and onto a main reservoir near Lwakhakha town. There are a number of small sized reservoirs situated along the transmission main that are used to supply the communities living in this area. From the reservoir the water gravitates to supply the whole town and neighbouring area. The areas of supply are in Bumbo and Bumwoni sub-counties.

### 3.4.3 Water Quality

The water samples obtained from the boreholes sampled portray satisfactory physio-chemical characteristics (Table 20). With this water quality, minimal treatment would be necessary. The water is generally of good quality when compared to the set standards for potable water in Uganda with only iron being above the set limit for all the parameters that were analysed.

Parameter	Unit	National Standard for un-treated portable water	DWD 2742	DWD 2731
pH	-	5.5-9.5	6.79	6.8
Electrical Conductivity (EC)	µm	2500	364	479
Total dissolved Solids (TDS)	mg/L	1200	260	255
Total suspended Solids (TSS)	mg/L	0	0	0
Color: Apparent	PtCo	50	23	27
Turbidity	NTU	25	7	4
Alkalinity: Total as CaCO <sub>3</sub>	mg/L	500	165	130
Bio Carbonate: as CaCO <sub>3</sub>	mg/L	500	78	160
Hardness: Total	mg/L	600	54	68
Magnesium as Mg <sup>2+</sup>	mg/L	100	28	34



Fluoride-F	mg/L	1.5	0.18	0.05
Chloride: Cl <sup>-</sup>	mg/L	250	25	20
Calcium: Ca <sup>2+</sup>	mg/L	150	40	54
<b>Iron: Total</b>	<b>mg/L</b>	<b>0.3</b>	<b>0.45</b>	<b>0.65</b>
Nitrate: N	mg/L	45	0	0
Sulphate: SO <sub>4</sub> <sup>2-</sup>	mg/L	400	10	20

Table 20: Ground water quality in the Morikiswa area

### 3.5 Existing Sanitation Situation

#### 3.5.1 Solid waste management

There are no formal solid waste management systems. There exists a solid waste dump site close to the markets used by the residents to dispose and burn the solid waste collected from various parts of the Project area. However, the waste disposal too is in a sorry state. There were evidences of some sorting of mainly plastic materials done at the waste disposal site.

#### 3.5.2 Sewerage services

Morikiswa is mainly served by pit latrines since there is no central piped sewerage facilities. There are two units of public toilet (pit latrine) which were constructed by Ministry of Water and Environment, though functional, they are in a dire state and need repair as they have cracks along the walls at the time of the visit with the fee of UGX 200.

On the issue of de-sludging the filled-up latrines, the tenderer for the market said that they often hire the services of private cesspool emptiers to occasionally de-sludge the latrines at a cost of US\$ 300,000 per cesspool emptier of 4-5m<sup>3</sup> capacity. However, they also said that the town council had requested them to make use of the nearby Town council lagoon for Tororo to reduce the haulage cost to Sewerage system to reduce the de-sludging costs of the latrines.

#### 3.5.3 Access to toilets/latrines

The population is mainly served by pit latrines with majority of the respondents (88%) having access to private latrines/toilets while 12.8% reported not to having. In all the Morikiswa area, the type of latrine facility were the traditional pit latrines. In some cases, the households shared the latrines with their neighbours, tenants and customers.

In all the Project area, the type of latrine facility were the traditional pit latrines. In some cases, the households shared the latrines with their neighbours, tenants and customers, 8 households in Morisikwa. Household improvement campaign is required in the Project area to enable the respondents construct their own latrine and avoid sharing of the latrine facility.

### **3.5.4 Pit latrine construction problems**

The respondents reported that they had construction problems related to floods, rocky/hard soil, collapsible soil and generally lack of construction materials across all the Project area. In 76% of the cases, there were rocky formation that hindered the construction of pit latrines.

Generally, the observation on the existing latrines showed that there were latrines built with permanent materials, temporary, handwashing, hygiene, drying rack, outdoor bath shelter, water pot covered with a lid, clean compound among others. This showed that the sanitation was being observed.

### **3.5.5 Water and sanitation challenges**

Below are some of the major water and sanitation challenges in Morikiswa area, these hinder proper provision of sanitation services in the area.

- Hard rock that affects pit latrine coverage in the communities.
- Lack of drainage channels.
- Some people living in the Centre are not willing to take part in water and sanitation activities.
- Lack of disposal pits for the waste materials.
- Limited water sources that due to high population density.
- On probing further about the willingness to pay and ability to pay for the water services, they noted that some of the communities are partially willing and able to pay for the water services.
- On the question of what should be done to expand demand for improved water services.

## **3.6 Socio-Economic Profile**

### **3.6.1 Administrative Arrangement**

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

### **3.6.2 Population**

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

## ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Determination of the baseline data for the domestic population was carried out using available data from UBOS (2014) national housing and population census, and additional data collected during the feasibility study. The collected data revealed that the growth rate of Tororo District is 2.73%. Using the UBOS data, the domestic population of the Project Area for the base year is 8,969. The population of the project area in the ultimate year (15,374 persons) will be almost twice that in the base year (Table 21). The systems have been designed to cater for that increase in the population of the area.

Table 21: Domestic Population projections in the project area

Sub-county	Parish	Village	Population				
			2022	2027	2032	2037	2042
KISOKO	MORIKISWA	RUDAMU	123	140	160	183	209
KISOKO	MORIKISWA	RUKUL	107	122	140	160	183
KISOKO	MORIKISWA	OPALIPATI	92	105	120	137	157
KISOKO	MORIKISWA	RULWA	139	159	182	208	238
KISOKO	MORIKISWA	OMWONYOLE	125	143	164	188	215
KISOKO	MORIKISWA	RUGWING	154	176	201	230	263
KISOKO	MORIKISWA	PODAKA	152	174	199	228	261
KISOKO	MORIKISWA	PASAYA A	90	103	118	135	154
KISOKO	MORIKISWA	PASAYA B	116	132	151	173	198
KISOKO	PEI- PEI	MAKAUR LC	193	220	252	288	330
KISOKO	PEI- PEI	PEI- PEI A	95	109	125	143	164
KISOKO	PEI- PEI	PEI- PEI B	96	110	126	144	165
PETTA	RAMOGI	KANANGA B	201	230	263	301	344
PETTA	RAMOGI	KANANGA A	217	249	285	326	373
PETTA	RAMOGI	KANANGA C	193	221	253	289	331
PETTA	RAMOGI	RAMOGI WEST	71	82	94	108	124
PETTA	PETTA	PETTA CENTRAL N	172	197	225	257	294
PETTA	PETTA	PETTA SOUTH	191	219	251	287	328
PETTA	PETTA	AYAGO C	236	270	309	354	405
PETTA	PETTA	AYAGO B	301	345	395	452	517
PETTA	PETTA	AYAGO A	328	375	429	491	562
NAGONGERA	NAMWAYA	ODOPONYI	156	179	205	235	269
NAGONGERA	NAMWAYA	NAMWAYA CENTRAL	478	547	626	716	819
NAGONGERA	MAUNDO	POKONG ROCK	288	330	378	432	494
NAGONGERA	MAUNDO	POKONG PENY NORTH	222	254	291	333	381
NAGONGERA	MAUNDO	POKONG PENY	328	375	429	491	562

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Sub-county	Parish	Village	Population				
			2022	2027	2032	2037	2042
NAGONGERA	MAUNDO	POKONG KWOYO	208	238	272	311	356
NAGONGERA	MAUNDO	POKONG AMOR	595	680	778	890	1,018
NAGONGERA	MAUNDO	POKONG WEST	389	445	509	582	666
NAGONGERA	MAUNDO	POKONG PLAIN	455	521	596	682	780
NAGONGERA	MAUNDO	MAUNDO SOUTH	629	720	824	943	1,079
NAGONGERA	MAUNDO	MAUNDO WEST	258	295	338	387	443
NAGONGERA	MAUNDO	MAUNDO CENTRAL	519	593	678	776	888
NAGONGERA	MAUNDO	WIDUNYI	252	288	330	378	432
NAGONGERA	MAUNDO	MAUNDO NORTH	561	642	735	841	962
NAGONGERA	MAUNDO	BIRANGA	239	274	313	358	410
<b>TOTAL</b>			<b>8,969.00</b>	<b>10,262.00</b>	<b>11,744.00</b>	<b>13,437.00</b>	<b>15,374.00</b>

The non-domestic population consists of commercial, industrial and institutional establishments. The current and project non-domestic population is presented is summarized in Table 22. An overview of the population to be served by the project over the design period is depicted in Figure 5.

Table 22: Non-domestic population in the project area

Description	No.	2022	2027	2032	2037	2042
Eating Places	4	4	5	5	6	7
Lodges	3	3	3	4	5	5
Bars	2	2	2	3	3	4
Shops	5	5	6	7	8	9
Abattoirs	1	1	1	1	2	2
Butcheries	1	1	1	1	2	2
Dry Processing Mills	1	1	1	1	2	2
Markets	1	1	1	1	2	2
Offices	2	2	2	3	3	4
Police Posts	1	1	1	1	2	2
Churches	545	545	627	722	831	956
Mosques	263	263	303	348	401	461
Prison						1

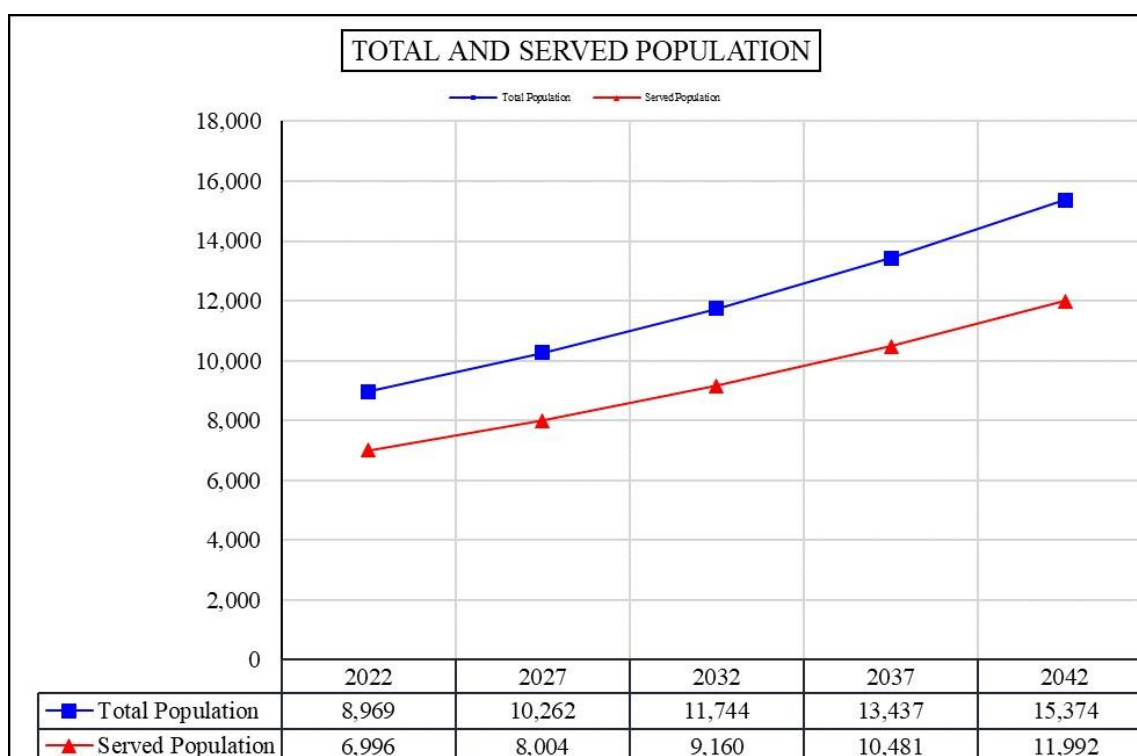


Figure 5: Total and served population in the project area over the design period

### 3.6.3 Access to Infrastructure

*Transport network:* The access roads in the project area are mainly gravel roads and are generally well-maintained except, for certain stretches which become difficult to pass during rainy season. In addition, the railway line from Malaba – Kampala also traverses the project areas (Plate 5).



Plate 5: Gravel roads and railway line in the project area

*Communication:* The project area enjoys a good network coverage of telecommunication network. The major mobile telephone operators (MTN and Airtel) have services within the project area. The use of voice, data and mobile money has been incorporated into the daily life of the people in the area. There are several radio stations within Tororo town and neighboring Mbale City which are accessible in the project area. TV networks of several local and international channels are also accessible.

*Access to electricity:* Most parts of the project area connected to the national electricity grid. However, many households and institutions utilize solar to power their energy needs. Nevertheless, wood fuel is the main source of cooking energy because it is much affordable and accessible to most households and institutions in terms of cost in the project area.



**Plate 6:** Accessibility to Hydroelectric Power

### 3.6.4 Education

Majority of the population in the Project area have at least attained primary level of education (86.7%), Secondary (10.3%), not at all (1.8%), only 1.2% attained University Education, Table 23. It was therefore logical to expect that written project promotional materials can widely be used as a means of communication in the Project area since the majority of the people can read and write.

Education was also an important factor in enhancing the project activities appreciation/adoption. The project is dealing with people that have a basic level of educational background. The following was noted in Morisikwa project area; the highest level of education was primary level for the household heads. The project area has a number of education institutions such as Petta-Ramogi Primary School, Petta Community Secondary School, Kisoko High School, Kisoko Boys Primary School, and Makaur Primary School among others.

Table 23: Institutions in the Project Area

<b>Type of Institution</b>	<b>Number</b>
Pre-primary	05
Primary	03
Secondary school	01
Drug shops	06
Subcounty headquarter	02
Morikiswa Trading Centre TC	01

(Source: Field survey, 2021)

### **3.6.5 Economic Activities and Income**

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

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

#### ***Employment of Households***

The households are engaged in various forms of income generating activities. This has enabled them to earn revenue to meet their daily cash demands/requirements. In the feasibility study (March, 2022), it is reported that that at least a member of the household in each of the Project area earns some income. Sixty-nine percent of the respondents were farmers, 11% practiced informal trade, 15% were civil servants and 5% were Boda cyclists (motorcyclists) (*LHM Ground Water Exploration & Geomapping Services Ltd, 2022; Feasibility Study*).

#### ***Level of Service Based on the Ability to Pay***

The level of service to be provided will depend on both the ability to pay as well as the demand for the service. In this situation, the limit of expenditure for water is 5% of the household income. In order to determine the demand based on Ability to pay, the following conditions should be fulfilled:

- The population should be able to pay the connection costs to get a house connection. This was confirmed during the socio-economic study that showed that the population is willing to pay connection fees ranging from 20,000-155,000/= in Morisikwa project area (*LHM Ground Water Exploration & Geomapping Services Ltd, 2022; Feasibility Study*).
- The population should be able to pay the monthly water bills, commensurate with their level of service. This was also confirmed during the socio-economic study that revealed that the population is willing and able to pay monthly water Bill of 3,000-15,000/= in Morisikwa , 4,000-40,000/= (*LHM Ground Water Exploration & Geomapping Services Ltd, 2022; Feasibility Study*).

#### ***Type of housing structures and Ownership***

According to a feasibility study by LHM Ground Water Exploration & Geomapping Services Ltd, 2022, a large proportion of the structures are temporary which implies that the majority of the people in the Project area have low-income levels. Some small

representative fraction had semi-permanent houses and smallest number of people were living in permanent houses. The survey also established that although the majority of the population own their dwellings that they occupy (98%), 2% of the respondents rent the housing structures that they were currently occupying.

### ***Materials used for building in project areas***

According to the LHM Ground Water Exploration & Geomapping Services Ltd, 2022, the feasibility study in Morikiswa shows that 58.7 % of the buildings were constructed using mud/earth /grass, 41.30% were built with burnt brick/iron sheet/cement and 0% were built of blocks /tiles. The majority of the respondents 98% own land in the project area and only 2% rent land in the area. This implies that since the land owners in the project area are also the PAPs, they should be sensitised to provide land space for the water project whether they will be compensated or not. After all they are the direct beneficiaries of the project.

### ***Socio-Economic House hold occupation of building***

During the feasibility study, it was found that in all the Sub-counties, the households occupy on average 4 rooms across all the Sub- counties (LHM Ground Water Exploration & Geomapping Services Ltd, 2022). The implication of this on the water supply is that the demand for water in the project area is high by the high population resulting in high demand for yard connections and water vending which is good for sustainability and O & M of the system.

### ***Average monthly income***

Monthly income of households gives an indication of their ability to pay for services like water. According to World Bank, households in developing countries pay not more than 5% of their income on water. In the survey during the feasibility study for Morikiswa water project, household members were asked questions on the incomes and expenditures to establish if they were willing and able to pay for water services. It was found that the respondents were spending money on school fees, Government taxes, clothes for households, Domestic servants, voluntary contributions depending on the income they earned. Based on these findings, the communities within Morisikwa are capable of paying for the water services.

The survey revealed that the respondents earned monthly, seasonally and saved at the end of the month in all the Sub-counties. The summary of the average income saved in the Moriikiswa is shown in the Table 24.



Table 24: Income level of respondents in the Sub-counties

	Monthly	Seasonal	Savings
Morisikwa	375,000	727,188	90,780

(Number, n Morisikwa =35)

### 3.6.6 Land use and Land Tenure Systems

The main land uses in Tororo District are crop farming and livestock rearing, and agro forestry. Others include bee keeping (apiary management), mushroom growing, physical settlements, woodlots and quarrying/mining activities. The district also has various land cover types including grasslands, natural forests and woodlands. The district suffers vegetation loss as a result of encroachment caused by land clearance for agriculture (mainly production of food for Household use). Vegetation has also been lost due to Infrastructural, farming, settlement and urbanization. Small trading centres are rapidly expanding due to increased rural-urban migration. All these activities, coupled with a growing population, have heavily impacted land use in Tororo District. With the land uses and land tenure systems elaborated above clears shows that there is need for more water for production and domestic use.

### 3.7 Assessment of water use, demand and affordability

Demand for water in the project area is high. This is reflected in the activities done which use water and the prolonged dry seasons. water is used for domestic and activities outside the home such as businesses, restaurants, subsistence farming, brewing, brick making, car washing among others. However, they may use less water from the project during rainy season partly due to the presence of alternative rain water sources.

The major source of water for domestic and business use is boreholes (80%) while traditional wells (15%) and rainwater harvesting is 5% overall (*LHM Ground Water Exploration & Geomapping Services Ltd, 2022; Feasibility Study*).

#### 3.7.1 Water source during wet and dry seasons

Water sources vary according to seasons. During wet season, households draw water from different sources compared to the limited sources during dry season. Although the major source of water in the project area is boreholes during both wet and dry season (91.7%) and (94.5%) respectively, households tend to rely more on community boreholes during the dry season. During the wet season, a few households rely on streams and harvested rain water (1.4%) and (1.4%) respectively (*LHM Ground Water Exploration & Geomapping Services Ltd, 2022; Feasibility Study*).

#### 3.7.2 Population's willingness to pay for Water

People in Morikiswa are willing to pay for piped water. On average, 97.9% indicated that they are willing to pay for a piped water. The respondents were willing to pay for piped water and they advanced various reasons for their choice. The reasons for desiring piped water advanced by the respondents were:-

- It reduces distance to safe water thereby avoiding overcrowding. This reduces the time spent to collect water from far distance;
- The other communities were sharing the water sources with the schools. This reduces on the aquifer recharge and increases the duration of the facilities;
- Others agreed that it saved time and improved on business activities. This time saved can be used for other productive activities within the Project area;
- The piped water improved personal hygiene; easy accessibility. This can reduce the expenditure on health and can lead to increased revenue;
- It increased personal hygiene conditions. This would reduce the disease burden;
- The piped water supply system promotes small scale irrigation system. The production of food crop increases and this improves nutritional value of the people within the Project area;
- For better services, it is costless and can be commercialized;
- Others submitted that it would simplify access to safe water, it was only used by household members only, easy animal rearing. Money paid can be used for maintenance of the water source.

### **3.7.3 Distance to the water source**

The average distance to the water source is 100meters during wet season. However, the longest distance moved is on average 1200 meters during both wet and dry season in the Project area in search of clean and safe water (*LHM Ground Water Exploration & Geomapping Services Ltd, 2022; Feasibility Study*). The Morikiswa water project will supply water nearer to the households hence reducing on the hitherto long distance to the water source and also to save time that used to be taken for fetching water in the long distance for other activities.

## 4 PROJECT DESCRIPTION

### 4.1 Introduction

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

#### 4.1.1 Water Source and Intake

Currently two boreholes are expected to supply the water intended to meet the demand of the Project area. The water resources assessment indicated that the yield of the borehole DWD 90938 located in Kanang 'C' Village, Ramogi Parish, Petta Sub-county is 28.5m<sup>3</sup>/hr and a yield of 5m<sup>3</sup>/h for borehole DWD 90937 located in Maundo village, Nyasirenge Parish, Paya Sub-county. These boreholes will be pumped using the installed solar energy and national grid with a total pumping hour of 18 hours combined with solar pumping of on average 6 hour per day.



**Plate 7:** Drilled Boreholes in the project area

The intake will have the pump house and shall be fenced. The water from the boreholes shall be pumped to the reservoir located on a hill and elevated to a height of 12.5m above ground level. The intake and the raw water mains system will be sized on the basis of the maximum day water demand of 611m<sup>3</sup>/day at the ultimate design period. The system will be designed to a capacity of the Morikiswa Solar Mini-Piped Water Supply System and in future, the system is recommended to be connected to the national electric grid. The intake was designed to cater for the project area water demands as described in Table 25.

**Table 25: Water supply system capacity for the proposed Morikiswa mini piped water supply scheme**

Description	Quantity (m <sup>3</sup> /d)	Comment
Maximum Day Demand	611	Maximum Day Demand revised to 611m <sup>3</sup> /day due to low population
Transmission Main	611	Maximum Day Demand
<i>Source: Project Estimates, 2022</i>		

#### 4.1.2 Transmission System

The components of the system include intake, transmission, reservoir, distribution lines and public stand pipes, as summarized in Table 26.

**Table 26: Transmission and distribution details**

No.	Pipe Description	Pipe Material	Length (m)
1	Transmission line Kanang C - Kisoko Tank	OD 110 HDPE PN16	4500
2	Transmission line Maundo	OD 75 HDPE PH 16	1790

The detailed design specifications of the transmission systems from the Kanang 'C' and Maundo boreholes are provided in Tables 27 and 28 respectively.

**Table 27: Summary of transmission system Kanang C borehole to Kisoko Tank**

Parameter	Transmission main
Depth of pump in BH 90938	92.55
Flow (m <sup>3</sup> /hr)	28.8
Flow (m <sup>3</sup> /s)	0.0080
Ground Level at intake (m.a.s.l)	1,127.00
Ground Level at reservoir (m.a.s.l)	1,221.00
Ground Elevation intake tank and reservoir (m)	1,237.16
Reservoir Inlet Above Bottom Reservoir Level (m)	3.66
Height of Reservoir Above Ground (m)	12.5
Static head (m)	1246
Friction Coefficient, Cwh	140
Pipe Diameter (m)	0.0900
Velocity (m/s)	1.26
Length of Pipe (m)	4,540
Friction Loss (m)	83.61
Fittings losses - 10% (m)	8.36
Total dynamic head (m)	92

Residual Head (m)	1154
Pipeline Specifications	
<i>Source: Project estimates 2022</i>	

**Table 28: Summary of transmission system of Maundo borehole to Maundo Reservoir**

Parameter	Transmission main
Depth of pump in BH 90937	108.3
Flow (m <sup>3</sup> /hr)	5.5
Flow (m <sup>3</sup> /s)	0.0015
Ground Level at intake (m.a.s.l)	1,116.00
Ground Level at reservoir (m.a.s.l)	1,139.00
Ground Elevation intake tank and reservoir (m)	1,155.16
Reservoir Inlet Above Bottom Reservoir Level (m)	3.66
Height of Reservoir Above Ground (m)	12.5
Static head (m)	1164
Friction Coefficient, C <sub>wh</sub>	140
Pipe Diameter (m)	0.0614
Velocity (m/s)	0.52
Length of Pipe (m)	1,790
Friction Loss (m)	9.89
Fittings losses - 10% (m)	0.99
Total dynamic head (m)	11
Residual Head (m)	1153
Pipeline Specifications	
<i>Source: Project estimates 2022</i>	

#### 4.1.3 Storage Reservoirs

The required storage capacities are shown in Table 29. The established reservoir capacity is 150 m<sup>3</sup> that is capable of satisfying the water demand during the ultimate design period at 2042. This design is proposed to use an existing Kisoko Tank of 100 m<sup>3</sup> capacity. Therefore, the remaining size of tank to design for is 80m<sup>3</sup> that will be placed at Maundo hill.

Table 29: Reservoir Specifications

No	Tank/System	Demand (m <sup>3</sup> /d)	Calculated Tank Size (30%MDD)	Existing Tank (m <sup>3</sup> )	Proposed Tank (m <sup>3</sup> ) in Phase	Tank Height (m)
1	Cold pressed steel	611	183	100	85	12.5

Source: Project Estimates

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

- i. Internal ladder of galvanised steel,
- ii. Wall mounted level indicator,
- iii. Vents on the tank roof,
- iv. Roof level access cover of galvanised steel.

The sizes of the tanks are as indicated in Table 30. The access covers shall be at least 1000 mm above the finished level of the roof and shall be lockable. The roof vents shall be similarly set out and shall be fitted with vermin proofing and mosquito proofing fabric.

Table 30: Dimensions of the tanks proposed to be installed

No	Proposed Tank (m <sup>3</sup> )	Tank Height (m)	Dimensions (m)			Pipe Sizes (DN, mm)			
			Length	Width	Depth	Inlet	Outlet	Overflow	Drain
1	85	12.5	4.76	4.88	3.66	100	100	100	100

Source: Project Estimates based on 8 hour of solar pumping and 10 hours of UMEME

#### 4.1.4 Main Reservoir Site Works

The site works at the reservoirs consists of the following:

- i. The general earthworks, The site pipe work,
- ii. The site drainage,
- iii. Miscellaneous works.

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

#### 4.1.5 Service Connections

The service connections will include house connections, yard taps and standpipes. A total of 64 No. service connections are to be made in the initial year 2022, then 83 taps in 2032 increasing to 109 in the ultimate year 2042, as summarized in Table 31.

Table 31: Summary of the project service connections

Year	Served Population				Number of Service Connections			
	House Conn	Yard Tap	Stand Pipe	Total	House Conn	Yard Tap	Stand Pipe	Total
2022	90	179	8,251	<b>8,520</b>	18	19	27	<b>64</b>
2032	117	235	10,804	<b>11,156</b>	23	24	36	<b>83</b>
2042	154	307	14,144	<b>14,605</b>	31	31	47	<b>109</b>

Source: Project Estimates, 2022

#### 4.1.6 Valves and Fittings

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

- i. Section Valves - Section valves will not be provided to facilitate maintenance of the pipes by isolating one section from the others since the pipe network is limited in length.
- ii. Air Valves – 1 Air valve shall be installed to release air from the pipeline, during normal operation (degassing due to changes in pressure) and during the pipe filling process. The air valves shall be installed at peaks/crests within the pipe network.
- iii. Wash outs – no washouts will be installed on pipelines to drain the pipe section especially during cleaning out of sediments in the pipe. They are usually provided at pronounced low points or valleys in the pipeline.

#### 4.1.7 Summary of the water supply components

The components of the proposed project are summarized in Table 32.

Table 32: Summary of the dimensions for the proposed water supply system

Component	Borehole at Maundo	Borehole at Kanang C
	MDD 99 m <sup>3</sup> /day	MDD 518 m <sup>3</sup> /day
<b>Intake Capacity, m<sup>3</sup>/day</b>	611	611
<b>Solar Panel 330W</b>	32	32
Head, H(m)	76.2m	76.2m
Flow, Q (m <sup>3</sup> /hr)	5.5 m <sup>3</sup> /hr	28.8 m <sup>3</sup> /hr
<b>Transmission Mains (m)</b>	1790	4500
<b>Storage tanks (m<sup>3</sup>)</b>	m <sup>3</sup>	m <sup>3</sup>
Reservoir (m <sup>3</sup> )	85	100
<b>Distribution Mains (m)</b>	4,340	1,293
<b>Source:</b> Project Estimates May, 2022		

#### 4.2 Sanitation facilities

A total of 1 unit of 2 stance VIP latrine will be constructed in future within the project area, with each stance estimated to be used by 35 people. The toilet was selected based on the level of activity including the possibility of willingness to use the facilities. The locations of these facilities will be determined by the local council/ district authorities however consideration should be put to areas which can be easily accessible by many people to reduce on the time taken for a user to visit the toilets.

The toilets have been designed to hold more than a year's sludge before de-sludging. The amount of the faecal sludge generated is very insignificant to warrant the establishment

of a sludge treatment facility. The sludge from the facilities shall be disposed off according to the acceptable practice.

Because of the low incomes earned by residents in Tororo district, it may not be possible for the residents to pay for a cesspool emptier to dispose off their sewage since most of the emptier's located in Tororo town are very few and not more than three (3) in number. This leads to the cost of hauling sewage for disposal to be very expensive and may result to the local populations also abandoning using the toilets.

### **4.3 Proposed project activities**

The implementation of the proposed project will be done in stages which will involve different tasks and activities. The project will start with pre-construction phase then the construction, operation and maintenance and the decommissioning phase at the end of the project life cycle.

#### **4.3.1 Pre-construction phase**

This phase of the project involves mobilization of resources and preparing of the necessary paper work to enable the project to move on smoothly. The phase specifically involves the following activities;

- Designing of the propose water system;
- Feasibility studies to ascertain the conditions under which the project is most likely to be sustainable or to be attained for the planned period,
- Carrying out the environmental and social impact assessment;
- Acquiring of land through compensation of affected persons;
- Acquiring of other necessary clearances like from MoGLSD and other entities;
- Bringing on board the different stakeholders through engagements;
- Sourcing of funds for the project implementation;
- Procuring of contractors to construct and also supervise the project construction phase.
- Clearing of the project sites for construction.

#### **4.3.2 Construction phase**

This phase involves the actual setting of the project infrastructure on the acquired sites. It involves the following activities and tasks.

- Construction of project water supply pipelines, reservoirs and other infrastructure
- Procuring of construction materials
- Employment of workers including technical and casual labourers.
- Excavation of the ground to install pipes and other structures;
- Transportation of raw materials like sand, cement, iron bars, pipes, tanks etc;
- Transportation of waste materials likes oils, fuels, soil, plant debris etc.
- Clearing of structures like houses that are in the proposed project route
- Clearing of vegetation
- Installation of solar systems
- Installation of generators and water pumps
- Use of toilet facilities by workers



### **4.3.3 Operation and maintenance phase**

This phase will involve the following activities;

- Pumping of water
- Sourcing for employees both technical and casual labourers
- Use offices for running the water system.
- Selling of water to the people
- Maintenance and repair of the water supply system
- Connecting new clients on the water supply system
- Transportation of pipes.
- Buying of chemical like chlorine and alum for treating water
- Dosing of water with chemicals during treatment
- Disconnecting water for those who default
- Use of toilet facilities at the offices

### **4.3.4 Decommissioning phase**

The decommissioning phase is likely to be at the end of the design period for the water system in 2042. This phase is likely to involve the following activities.

- Stopping of water supply to the community
- Removal of pipes from underground
- Excavation of the ground to remove structures like pipes
- Laying off workers
- Employing workers to do the decommissioning
- Disposal of wastes including chemical and pipes
- Transportation of waste

## 5 STAKEHOLDER CONSULTATION AND CONCERNS

### 5.1 Introduction

The ESIA Team carried out stakeholder consultation, which is one of the key aspects to be considered during the ESIA study according to the National Environment (Environmental and Social Assessment) Regulations of 2020. The consultations were aimed at seeking views of the different stakeholder regarding the proposed project and also identify impacts. The stakeholder consultation process considered the community members who will benefit from the proposed project, decision makers, leaders in Tororo District and the different Sub-counties of Kisoko, Nagongera and Petta. The concerns/views of the different stakeholders are indicated in Table 33.

### 5.2 Consultation findings

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 community. Table 33 outlines some of the major concerns and comments from the consulted stakeholders. A full list of consulted people is shown in Annex III.

Table 33: Stakeholder concerns and views

Stakeholders	Views/Concerns	Commitments by the Developer
District Leaders (CAO, Water officer and Environment Officer)	<ul style="list-style-type: none"> <li>• The leadership of Tororo District welcomed the project and anticipated that this water project will benefit the target area and reduce on the water stress experienced in the district since the existing reservoirs cannot supply adequate water to meet community demand.</li> <li>• They also noted that there are many distribution networks in the district e.g., in Paya, Kirewa, Nowir among others which have been non-functional which could be an issue of low water supply.</li> <li>• The sources dry in the dry season.</li> <li>• The district leadership anticipates that the implementation of this project will be done expeditiously.</li> <li>• Expect the project will reduce burden on women and children carrying water for longer distances hence creating more time for other constructive work such agricultural production and attending school.</li> </ul>	<ul style="list-style-type: none"> <li>• Noted</li> <li>• The communities have been engaged about this project, and stakeholder engagement will be a continuous process during the implementation of this project</li> <li>• Engagement of the community will continue to address any issue which may arise</li> <li>• It is hoped the project will provide regular supply of water in the area for all the time. So, most of the water related</li> </ul>

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Stakeholders	Views/Concerns	Commitments by the Developer
	<ul style="list-style-type: none"> <li>• Booster pumps should be installed along the water distribution network to improve on water supply to distant areas</li> <li>• They pledged to work closely with the consultant to ensure the success of the project.</li> <li>• The demand for water is high and the community is willing to pay in order to access the utility.</li> <li>• There is need for close collaboration between project partners and the district leaders during the course of the project implementation but most especially during the design of the project.</li> <li>• The technology used in the water system should be improved to increase water supply avoid the present situation faced in Tororo district.</li> <li>• The water situation is worse in the rural areas</li> <li>• We used to share water supply with Malaba but NWSC gave them their water and they are now enjoying.</li> <li>• There is water rationing which is not based human decision.</li> </ul>	<p>problems will be addressed by the project</p>
<p>Kisoko Sub County (Principal Assistant Secretary)</p>	<ul style="list-style-type: none"> <li>• The project is very good for the community to support their health and livelihood.</li> <li>• NWSC no longer operates in the area. Therefore, it will solve the problem of water scarcity.</li> <li>• Most of the institutions in the area do not have clean water. The project should be connected to such institutions.</li> <li>• A lot of money is spent to repair and maintain boreholes. The project will help to reduce on these costs.</li> <li>• The community shows willingness to pay for the water services. Public taps should be installed especially to supply water to low income earners.</li> </ul>	<p>The developer commits to providing clean water to the community at a continuous basis with minimal interruptions.</p> <p>The proposed project has been designed to cater for any eventualities including repair and maintenance in terms of costs up to the year 2042.</p>

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Stakeholders	Views/Concerns	Commitments by the Developer
<p>Petta Sub-county leaders (LCIII Chairman, Parish chiefs)</p>	<ul style="list-style-type: none"> <li>• The sub-county is water stressed.</li> <li>• The project is welcome in the area since it will solve the water scarcity issue faced by the sub-county.</li> <li>• There are many boreholes in the area which are non-function especially in the dry season.</li> <li>• The existing functional boreholes don't supply sufficient water for the community e.g., some boreholes can supply 3-5 jerrycans of water and then left to rest for 5hours before the next collection</li> <li>• In the rainy season they depend on harvested water which is also unreliable as it gets spoilt quickly</li> <li>• Women and children move long distances to collect water</li> <li>• During functions, they hire water bowsers or tanks from Tororo which is very expensive (UGX 250,000 per trip)</li> <li>• Cases of domestic violence in the area as a result of women delaying at the water sources because of low flow of water from the borehole and high population. The problem will be solved when this project is implemented in the sub-county</li> <li>• They should make water is supplied to all the people equally because they are all suffering.</li> </ul>	<p>The boreholes selected as water sources have been studied and are able to cater for the water demands of the Morikiswa area up to the year 2042.</p> <p>Women and children will no longer have to move long distances for water as it will be extended in homes. For those that wont get in their homes, community water serving taps will be installed. This will also reduce on the cases of domestic violence and rape cases.</p>
<p>Resident, Petta Sub-county), Tororo</p>	<ul style="list-style-type: none"> <li>• Water access has not been easy here. There is one natural source near the rock</li> <li>• We have some boreholes but some of them don't have water for all the year.</li> <li>• Some boreholes dry up and water scarcity increases</li> <li>• Most of the people here are mixed farmers. Animals also use water from the same boreholes and therefore the demand for water is extremely high.</li> <li>• The boreholes have their own shortcomings. They are a source of bad behaviors for boys and girls who come to fetch water and end up in unplanned relationships especially they go</li> </ul>	<p>The boreholes selected as water sources have been studied and are able to cater for the water demands of the Morikiswa area including Petta Sub-county up to the year 2042.</p>

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Stakeholders	Views/Concerns	Commitments by the Developer
	<p>there in the late evenings because that is when pressure for water has decreased</p>	
<p>LCI Chair, Machali East; Community member</p>	<ul style="list-style-type: none"> <li>• Most constructed boreholes do not function during the dry season</li> <li>• There are many diseases related to water such as diarrhoea as a result of shortage of water.</li> <li>• Even the animals (cattle) lack water. We walk a distance of about six kilometers to get water for the animals.</li> <li>• The water sources are shared with animals.</li> <li>• As a result of water scarcity, people are willing to let lines pass their lands despite numerous land disputes and conflicts in the area.</li> </ul>	<ul style="list-style-type: none"> <li>• Noted Sufficient water serving points will be installed to the meet the population demands and other uses.</li> </ul>
<p>Residents of Kanang C Zone, Lamogi Parish, Petta S/C</p>	<ul style="list-style-type: none"> <li>• The population is high and the water supply is not adequate for all of them.</li> <li>• We have one borehole with good water yield but it serves many people - over 4000 people.</li> <li>• Some boreholes are dug in places which don't have water.</li> <li>• Use of unsafe water has led people to get many diseases</li> <li>• Water at the boreholes only comes in the morning</li> <li>• We share water with animals whereby some animals are hostile and hit the children who go to fetch water.</li> <li>• Water from the borehole is also used for constructions of houses.</li> <li>• Water scarcity in the area has come up with other problems related domestic and gender-based violence. Some women and children delay at the borehole and get problems with their husbands thinking they have been with other men. Other problems include rapes, unwanted pregnancies, school drop outs, and family break ups. The youth too delay at the water sources and get spoilt. So we need more sources of water to solve these problems.</li> </ul>	<p>The proposed water supply system has been designed to cater for population up to the year 2042.</p>

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Stakeholders	Views/Concerns	Commitments by the Developer
	<ul style="list-style-type: none"> <li>• When the borehole is broken/spoilt, it takes long to be repaired as the people suffer hence the need for more water sources.</li> <li>• There is violence at the borehole including fights as the people scramble for the water.</li> </ul>	
Rudam zone, Kisoko S/C	<ul style="list-style-type: none"> <li>• There is water scarcity in the area. There is a line water in the water but it is not functional. Two schools in the area spend approximately 1.5 million shillings on water per month buying from water vendors. Therefore, water is urgent need for water in the area.</li> <li>• Distance to the borehole that serves the community is long.</li> <li>• The population using the borehole is high.</li> <li>• Most boreholes are not functional and there is no water in the dry season.</li> <li>• Although we are in urgent need for water, some people cannot afford to pay for the water service.</li> <li>• There are fights for water at the borehole.</li> <li>• Projects like this of water are politicized. The politicians want to personalise them for their own benefit and eventually they fail.</li> <li>• During the dry season, some dams are not functional because they are clogged up. They need to be repaired or opened. Moreover, there is only one dam.</li> <li>• Participants are not aware of the existence of the sanitation facility at the market.</li> </ul>	
Namwaya Parish	<ul style="list-style-type: none"> <li>• There is no safe water in our areas. There is one natural water source which is contaminated but used by 1000 people. The water source dries up during the dry season.</li> <li>• There is no borehole in the area.</li> <li>• NWSC provided water at Koi area but it did not last long. The facility broke up.</li> <li>• They get water from one borehole that served four zones and moreover it is distant from the community.</li> </ul>	<ul style="list-style-type: none"> <li>• Noted.</li> <li>• The issues will be raised to MWE to ensure the project provides sufficient water by increasing water sources in the area and also reduce the distance</li> </ul>

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Stakeholders	Views/Concerns	Commitments by the Developer
	<ul style="list-style-type: none"> <li>• Water from the spring well in the community is shared with animals including pigs. The spring well is not protected and also dries up during the dry season.</li> <li>• The population is high and the sources of water are few.</li> <li>• People move for long distances in search for water resulting in delay in meals for school going children, fights at the source by the strong people and people moving at night to fetch water.</li> <li>• There is a pipeline in the area but it is not functional.</li> </ul>	<p>between the water sources.</p> <ul style="list-style-type: none"> <li>• A big water reservoir will be installed which will store and supply enough water in the project area.</li> </ul>
Morikiswa Parish, Kisoko Sub county	<ul style="list-style-type: none"> <li>• The borehole that was drilled in the zone should be constructed after compensating with the landowner.</li> <li>• The community pays UGX 2000 for operation and maintenance of the boreholes.</li> <li>• The community appreciates the project and believe it will help to provide clean water.</li> <li>• Lack of water has increased domestic violence in the area. Women lack water to prepare food and other domestic activities and are beaten by their husbands hence the violence.</li> </ul>	<ul style="list-style-type: none"> <li>• Noted</li> <li>• The issues regarding the cost for operation and maintenance will be raised with MWE which should be commensurate with the incomes of the communities.</li> </ul>
Various views from local vendors, Petta, Nagongera and Kisoko S/Cs	<ul style="list-style-type: none"> <li>• The project is welcome because natural water sources dry up in the dry season</li> <li>• Most water sources are non-functional</li> <li>• The demand for water is high and therefore the community is willing to pay for the water</li> <li>• The sub-county is water stressed</li> </ul>	<ul style="list-style-type: none"> <li>• Noted</li> <li>• The issues will be raised with the MWE especially with respect to increase number of water sources</li> </ul>

Stakeholders	Views/Concerns	Commitments by the Developer
	<ul style="list-style-type: none"> <li>• The existing boreholes do not supply sufficient water for all the communities</li> <li>• There is need for more water sources because some boreholes get spoilt and they take long to be repaired.</li> <li>• Two schools in Kisoko S/C spend approximately 1.5 million shillings on water per month buying from water vendors. Therefore, water is urgent need for water in the area.</li> <li>• In Namwaya parish, there is one natural source which is contaminated, used by many people and dries up in the dry season. The water source is also shared with animals especially pigs.</li> <li>• The population in the project area is high and the water sources are very few. Therefore, there is need for more water sources to meet the increasing demand for water.</li> <li>• There is water scarcity in the project area and water vending is very expensive.</li> </ul>	<p>in the project area which will ensure regular water supply which will also cater for water vending.</p>

### 5.3 Key concerns from stakeholder and recommendations

During the stakeholder consultations, the ESIA Study Team interacted with different stakeholder who gave their views, concerns and recommendation regarding the proposed Morikiswa Solar Powered Mini-piped Water Supply System. Some of the key issues that came out of the consultation are outlined below. The Developer should consider these issues and be integrated in the project design as well as overall implementation and management as some might hinder the progress of the project.

- The project is welcomed but almost all the people consulted as it will help in addressing issues surrounding water in the Morikiswa area including poor water quality, long distances and domestic violence among others.
- There is high rate of failure of water supply systems mainly due to water sources like boreholes that dry up during the dry season, and therefore cannot supply water consistently. The developer should therefore, consider using a water source that will sustainably supply water to the community.
- There is need for close collaboration between the developer and the district leaders to ensure project sustainability.



## ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

- The community is willing to pay for the water services.
  - i. The current water sources are unsafe for people, they put them at a risk of getting diseases like diarrhoea.
  - ii. There is violence at the boreholes including fights due to the large number of people using the boreholes.

## **6 PROJECT NEEDS AND DISCUSSION OF ALTERNATIVES**

### **6.1 Introduction**

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

### **6.2 The Project Need**

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

### **6.3 The “No- Action” Alternative**

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

### **6.4 Water Source Alternatives**

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

### **6.5 Power Source Alternatives**

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

complemented by hydropower from the national grid. Given that solar power is dependent on the sunshine, the project area is sufficient to support a solar system.

### **6.6 Design Considerations**

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

- Well-designed drainage system
- Sufficient walkways within established infrastructure especially at the pumping station
- Consideration of solid waste management and other waste refuse
- Proper landscaping
- Sufficient sanitary facilities for workers
- Well-built and firm reservoir
- Well maintained power supply system for example regular maintenance of the Solar Panels
- Use of batteries that are not polluting to humans and the environment
- Well maintained water transmission line

### **6.7 The Action Alternative**

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

## **7 POTENTIAL ENVIRONMENTAL, HEALTH, SOCIAL AND ECONOMIC IMPACTS**

### **7.1 Introduction**

The proposed project for the development of Morikiswa Solar Powered Mini-piped Water Supply System will be associated with various impacts both negative and positive. For the project to be sustainable, benefit the target population and have little impact on the environment, the negative impacts have to be mitigated while the positive impacts will have to be enhanced. These impacts will be spread through the proposed project cycle from pre-construction, construction, operation/maintenance to decommissioning of the water supply system. The impacts that were identified during the assessment associated with the proposed project are given in the following sections.

### **7.2 Potential positive impacts**

The proposed project will have a positive impact on the people in Petta, Nagongera and Kisoko Sub-counties and Tororo District as whole. During the field survey and stakeholder engagements, several issues like water scarcity and associated issues like travelling long distances to water sources, some of which are of poor quality and shared with animals. The situation is likely to improve with the construction of Morikiswa Solar Powered Mini-piped Water Supply System. The following are the positive impacts that are envisaged to be as a result of construction of the water supply system.

#### **7.2.1 Pre-construction and construction phase**

##### ***Job creation***

The construction of Morikiswa Solar Powered Mini-piped Water Supply System will provide different job opportunities to the people of Pette and Kisoko Sub-counties and Tororo District in general. Such jobs will be technical and casual jobs for non-skilled labourers. The casual labourers will be involved in clearing vegetation, digging up trenches for the pipelines, mixing sand, cooking food among others.

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

- The jobs for non-skilled labourers should ring-fenced for the people from the community;
- Give priority to residents of Petta and Kisoko Sub-counties who qualify for the technical jobs;
- Offer contracts to workers more so those for the technical jobs with clear terms of employment;
- All workers should be registered with the labour office of Tororo District.

##### ***Market for goods and services***

The construction of the water supply system will require different materials and services to be completed. Among the goods/materials that will be needed include; sand, bricks, metal bars, gravel, clay, oil and fuel, food for the workers among others. Services will include catering, hotel, laundry, mechanical service among others. If outsourced from the project area, they will help improve the income of the people in the area as well as improve the portfolio of the service providers.

**Enhancement measures:**

- Unless they cannot be outsourced from the project area, all services and good for the project should be outsourced from Tororo or the neighbouring areas.
- The Contractor should consider buying construction materials from the local people (where the quality meets the required standards)
- The Contractor should consider sourcing food items for the construction staff from local food suppliers.

***Improving on the tax base***

The tax base of the Tororo District and Uganda is envisaged to be improved due to goods, services, and jobs that will come out of the project. The project employees will pay tax in form of Pay As You Earn (PAYE), withholding tax and Value Added Tax (VAT) on goods and services.

**Enhancement Measures:**

- Good and services should be outsourced from Tororo District
- All workers should be given contracts with proper terms of employment

**7.2.2 Operation phase**

***Improved water quality***

During the stakeholder consultations, it was highlighted that the water quality in the existing sources of water is poor and some are shared with animals which puts people at the risk of getting diseases like diarrhoea.

**Enhancement measures:**

- Where possible, provide watering points for animals;
- The water should be continuously treated with the right chemicals to maintain the quality.

***Increased amount of water available***

The water system will supply water equivalent to 611 m<sup>3</sup>/day up to the year 2042 which will provide enough water to the communities in Petta and Kisoko Sub-counties, Tororo District. This will allow for use of water in activities like farming, animal husbandry and small-scale industries.

**Enhancement measures:**

- Promote catchment protection by encouraging planting of tree and promoting sustainable agriculture.
- Install barriers like fences on the water sources to ensure that the water is not polluted.

***Increase in the tax base***

The improved agriculture productivity will improve the incomes of the people involved who will in turn pay taxes to the local government in Tororo District. They will pay direct taxes and indirect taxes for the farm and fish inputs they will buy from market.

**Enhancement measures:**

- Encourage farmers to procure items from the local markets in Tororo and Morikiswa area

***Reduces cases of violence***

Cases of domestic violence against women and children when they take long to return home from fetching water was reported. This will reduce with the commissioning of the water supply system as water will be brought closer to the people through community serving points.

**Enhancement measures**

- Put at least community water point in each village to serve the people and also to prevent congestion.
- Ensure continuous supply of water throughout the day.
- Encourage people to store water in preparation for scarcity

***Reduced distance of travel for water***

The distance travelled to collect water will be reduced as the water will be brought closer to the people.

**Enhancement measures**

- Install community water serving points in each village
- Ensure continuous supply of clean water to the people throughout the day
- The water services should be made affordable for everyone at low tariffs.

**7.2.3 Decommissioning phase**

***Job creation***

During the decommissioning of Morikiswa Solar Powered Mini-piped Water Supply System, many jobs will be created which will include excavation and removal of the water pipes, transportation of the waste among others.

**Enhancement measures:**

- Priority should be given to people in proposed project area.

**7.3 Potential negative impacts**

**7.3.1 Pre-construction and construction**

***Loss of land***

Some members of the community will lose their land due to setting project infrastructure like reservoirs and water pipelines. The community uses some of this land for agriculture and cattle grazing.

**Mitigation measures:**

- Compensation should be done for land and trees lost by the owners neighbouring the project infrastructure. A resettlement action plan should be carried out, and the property should be compensated based on the laws and regulations of Uganda.

Compensation should be done as guided by the Government Valuer in conjunction with land/property owners.

### ***Noise pollution***

Project equipment and vehicles will cause noise pollution to the neighbouring communities in Petta and Kisoko Sub-counties. This could become a nuisance to the community if the equipment and vehicles are not properly used.

#### **Mitigation measures:**

- The noise level should be kept within NEMA acceptable limits; 60dB is the limit for a construction site during day (6am-10pm)
- Construction works should be carried out during times of the day when the noise impact is less felt e.g., from 6:00 am to 6:00 pm.
- Vehicle and equipment should be maintained according to manufacturers' specifications.
- Adequate noise prevention devices, e.g., mufflers should be installed on noise generating sources.
- Engines of vehicles and machinery while not in use should be switched off.
- Workers who may unavoidably have to work with noise generating equipment, e.g., earthmoving equipment should be provided with ear plugs and advised to put them on.

### ***Pollution from oils and fuels***

There will be pollution from oil and fuels in water resources and soil in case of an oil and fuel spill. The spills could be from the equipment being used during construction. Based on the amount spilled, it could lead fish kills in the water resources as well as degradation of vegetation habitats. The oil and fuel could also pollute the soil leading loss of flora and fauna in the soil.

#### **Mitigation measures:**

- Cleaning wastes should be collected and stored in appropriate containers to be disposed of at approved sites.
- Vehicles should preferably be parked on paved platforms.
- Fuel storages should not leak, and should be periodically monitored, and repaired or replaced when necessary.
- Sites for cleaning, fuelling and maintaining vehicles should be paved so as to prevent leakage
- Vehicles and equipment should be maintained, fuelled and cleaned at workshops/sites with adequate leakage prevention (e.g., impermeable surface, settlers and oil separators).

### ***Risk of accidents***

Vehicles and trucks that will be used during construction of the water supply system could cause accidents along the roads leading to the project site. Even though the traffic is not a lot, there are some people using them; pedestrians and motorists as well as cattle. Injuries could also occur to people who access excavated areas with ditches. Equipment that will be used could also injure workers who are operating them.

**Mitigation measures:**

- Work sites (especially excavation sites) should have proper protection with clear marking of safety borders and signals and fence off all dangerous areas.
- Riparian neighbours should be informed about the construction program in advance and adhere to it.
- Access to restricted work sites (including those with operation of mechanical and electric equipment) should be confined to persons with permits.
- Appropriate traffic management plans should be implemented with the help of local police when (partial) closure of roads is required.
- Provide appropriate PPE like masks, gloves, Helmets, overalls to all workers in risky areas.

***Solid waste pollution***

Large amounts of waste in form of soil/clay, vegetation, concrete, papers etc, will likely be produced during the construction of the water supply system. These if not properly disposed of will pollute the environment and become a nuisance to the community.

**Mitigation measures:**

- The Contractor should prepare a Solid Waste Management Plan, which should contain:
  - An inventory of the types and quantities of waste to be produced.
  - The most appropriate waste management approach for each type of waste including details on (temporary) storage, transport and final destination of the waste.
  - An assessment of any opportunities for reducing solid waste generation, particularly hazardous and undesirable (persistent and non-reusable) types of wastes.
- The Contractor should maintain records of types, quantities, origin, (temporary) storage, transport and elimination/reuse of solid waste, and make these available to the works supervisor upon his request, as proof of proper waste management practices.
- Any waste including excess soil should be disposed of at gazetted sites. The solid waste shall not accumulate on site, to cause odour, fly, or rodent problems.
- Excavated soils should be reused as much as possible as filling material and should be contained after excavation.
- Provisional material storage on site should be designed and undertaken in such a way as to ensure that soils and underground water are not polluted.
- Licensed recycling companies should be used to externally recycle, recover or dispose of waste with special attention to solar batteries.

***Human waste disposal***

The workers on the construction of water supply system will discharge human waste including excreta which if not properly disposed will increase the risk of spreading diseases like Cholera in the area.

**Mitigation measures:**

- Provide the workers with segregated (male and female) mobile toilet facilities.



- The waste should be disposed of by a licensed wastewater handler to a designated waste collection site.

#### ***Increased incidences of HIV/AIDS and other diseases***

Workers on the project are likely to associate with people in the community. Some will start relationships that will involve getting into sexual acts that could lead to spread of HIV/AIDS and other sexually transmitted diseases.

#### **Mitigation measures:**

- The contractor is encouraged to employ people from the local community for the casual jobs.
- For those who cannot abstain, provide Condoms for use during sexual activities to all workers and people in the community.
- All workers should be sensitised to ensure awareness of and sensitivity to the local cultures, traditions and lifestyles.
- HIV/AIDS impact mitigation plan that will involve providing a comprehensive range of services including the identification of possible HIV/AIDS cases, testing with pre- and post-counselling, the treatment of associated infections, referral of appropriate cases, education to promote better quality of life and promotion of precautions, provision of condoms and the application of HIV/AIDS occupational exposure policies should be put in place and implemented.

#### ***Loss of crops and trees***

Crop gardens and tree plantations were identified along the proposed pipeline routes and sites for reservoirs. These are likely to be cut down during excavation of trenches for laying the water supply pipes. This will most likely lead to loss of source of livelihood to the affected person. The crop gardens are source of food and income in case of crops like cassava and bananas.

#### **Mitigation measures:**

- Limit project activities to extent for which the project is designed to minimize losses;
- Compensation should be done for PAPs whose crops will be destroyed;
- Destroyed trees should be replanted after construction of the project infrastructure.

#### ***Disruption and loss of livelihood activities***

Excavation activities in busy areas like Morikiswa, Kisoko and Petta will disrupt economic activities that are taking place in such areas. People are likely to lose their crops which will be removed to pave way for laying of water pipes. Disruption and destruction of livelihood activities will cripple the income of the people involved.

#### **Mitigation measures:**

- Local communities should be informed about the construction program in advance and adhere to it;
- In case access roads have to be closed, local communities should be informed in advance;

- Access roads in the neighbourhood should be maintained and cleaned of earth and sand on a daily basis;
- Temporary access ways should be provided with the approval of local authorities where access roads are closed;
- Works should be carried out under mild weather; avoiding strong rains or winds;
- Obstruction of access to and use and occupation of roads, footpaths and bridges should be reduced;
- Where livelihoods and property are affected, valuation and prompt compensation should be undertaken for the PAPs

### ***Injuries to workers and community***

Workers and communities are likely to get injuries from the machines that will be used and falling in trenches that will be excavated. Children in the communities are at a high risk of falling into the trenches causing injuries sometimes that could lead to crippling or death. Therefore, measures should be put in place to ensure that such scenarios do not occur in the communities.

### **Mitigation measures:**

- Work sites (especially excavation sites) should have proper protection with clear marking of safety borders and signals and fence off all dangerous areas;
- Riparian neighbours should be informed about the construction program in advance and adhere to it;
- Access to restricted work sites (including those with operation of mechanical and electric equipment) should be confined to persons with permits;
- Appropriate traffic management plans should be implemented with the help of local police when (partial) closure of roads is required;
- The site should be registered as work place with Ministry of Labour, Gender and Social Development;
- Provide appropriate PPEs like masks, gloves, Helmets, overalls to all workers in risky areas.

### ***Exploitation of workers***

There is a possibility of exploitation of workers that will be employed during the proposed project. This could be in form of employing children and under age people because they can be easily paid lower wages. Even those within the required working age, could be exploited by paying them wages no commensurate to the work and effort they put in or defaulting on their payments by the contractors.

### **Mitigation measures:**

- Casual workers should be recruited through the Local Council system;
- Workers should be paid timely according to agreed rates used in the area;
- The Contractor and the Developer should follow the national labour laws of Uganda;
- Children should not be employed in any activity of the proposed development, be it during construction or operation and maintenance.

### ***Air pollution due to dust emissions***

Air pollution during the construction phase of the project will be from vehicles, machinery and dust emissions from dry surfaces during the dry season. With increased vehicular traffic on roads due to trucks ferrying materials and workers, dusty marram roads and vehicles will emit dust and vehicle fumes. These are largely comprised of particulate matter which can cause respiratory disorders if exposed for a long period of time.

#### **Mitigation measures:**

- The contractor should employ best practicable dust management strategies for the construction and operational phase inclusive of minimising exposed surfaces; adoption of dust suppression measures such as regular pouring of water on the surfaces and other suitable surface stabilisers. Also, scheduling earthwork should be done with due consideration to weather conditions.
- Trucks and equipment should also be regularly serviced to ensure that they do not emit dangerous fumes/gases.

## **7.3.2 Operational/ maintenance phase**

### ***Reduction in ground water level***

The demand for water from the boreholes is anticipated to increase which could subsequently cause a drop in the water levels in the boreholes supplying water. The reduction in water level could also trigger conflicts within the community.

#### **Mitigation measures:**

- The design of the water supply system should cater for changes in precipitation due to climate change.
- Reservoir should be installed that can store enough water to cater for the needs of the communities during times of shortages.

### ***Risk of water pipeline bursts leading to water wastage***

There is a likelihood of pipes bursting during operation which will lead to water wastage as well as depriving of people to access to water causing loss to MWE. The bursts could be due to faults on the water supply network or aging of the pipes.

#### **Mitigation measures:**

- Regular monitoring of the transmission line for any leakages

### ***Safety of workers during repairs***

During repairs to the pipeline, reservoirs and booster pumps, workers could be exposed to risk of injuries due machines they use like excavators and generators. Such injuries like electrocution from generators could lead to serious injuries of death of workers.

**Mitigation measures:**

- Workers should be provided with Personal Protective Equipment (PPEs);
- Work sites (especially excavation works) should have clear markings of safety borders and signals. Dangerous areas should be fenced off;
- First aid services should be put in place in case of emergencies;
- All workers should be trained in Environment, Health and Safety (EH&S) and awareness should be carried out once a week and preferably during toolbox meetings;
- The Contractor should recruit EH&S personnel during construction;
- The Contractor should inform riparian neighbours about the construction programme in advance and adhere to it;
- The Developer and Contractor should confine access to restricted work sites (including areas with mechanical and electric equipment) to persons with permits.

**7.3.3 Decommissioning phase**

***Solid waste generation***

Solid waste mostly soil will be generating during decommissioning of the water supply system. These if not properly managed will degrade the environment for example solar batteries.

**Mitigation measures:**

Same as those for Construction phase under solid waste pollution.

***Loss of water supply***

Decommissioning of the proposed project will deprive people of the increased and reliable water supply which could put them at risk of water related diseases. The fact that, the population would have increased by then, will just exacerbate the problem of water borne diseases in the project areas.

**Mitigation measures:**

- Provide alternative water sources before decommissioning the water supply system

***Waste pollution***

Solid waste in form of metals, pipes and soils will be generated which become a nuisance to the community if not handled in proper way.

**Mitigation measures:**

- Waste should be collected in a designated place and disposed of by a NEMA registered solid waste handler;
- Licensed recycling/waste disposal companies to externally recycle, recover or dispose of waste should be contracted.
- Temporary storage of contaminated soils on site should be designed and implemented so as to minimize underground pollution.

**Risks due to soil excavation**

Soil excavation will expose the soil to erosion especially during the wet season. Opening of trenches poses a risk of injuries to the community if they fall into them leading to body harm.

**Mitigation measures:**

- Excavated soil should be contained to avoid wash out and erosion;
- Any excess soil should be disposed of at gazetted sites.
- Excavated soils should be reused as much as possible as filling material and should be contained after excavation.

**Loss of vegetation**

Vegetation will be lost as removal of waste pipes is being carried out which could further expose the soil to erosion and also lead to loss of habitats to birds and amphibian species especially in wetlands.

**Mitigation measures:**

- Working areas should be zoned out and vegetation clearance should be limited to zoned areas to reduce ecological degradation;
- Disturbed natural sites should be restored through environmental rehabilitation, restoring top soils and (re-) introduction of genetic species to re-establish the natural local ecology.

**7.4 Evaluation of impacts**

The negative impacts were evaluated based on the criteria that was explained under Section 1.5.9 and the results of the evaluation are presented in Table 34. The evaluation was based on expert judgement, field observation as well as comments from the stakeholder engagements that were done during the ESIA study.

Table 34: Evaluation of anticipated negative impacts

Impact	Receptor(s)	Extent	Duration	Intensity of impact	Sensitivity of receptor	Severity
<b>Pre-construction and Construction Phases</b>						
Degradation of wetland habitats	Wetland vegetation, soil and biodiversity	Limited area	Temporary	2	4	Moderate
Loss of land	Project affected persons in the community	Limited area	Temporary	2	3	Moderate
Noise pollution and vibrations	Communities in Morikiswa area	Locally	Temporary	2	2	Minor
Pollution from oils and fuels	Water sources, soil and communities	Limited area	Temporary	2	3	Moderate
Risk of accidents	Communities in Morikiswa area	Locally	Temporary	2	4	Moderate
Solid waste pollution	Community	Locally	Temporary	2	3	Moderate
Human/body waste disposal	Water sources, communities in Morikiswa area	Locally	Temporary	3	3	Moderate

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Receptor(s)	Extent	Duration	Intensity of impact	Sensitivity of receptor	Severity
Increased incidences of HIV/AIDS and other diseases	Communities in Morikiswa area especially women and young girls	Locally	Temporary	2	4	Moderate
Loss of crops and trees	Communities along the transmission routes and project sites	Limited area	Temporary	2	4	Moderate
Siltation and sedimentation	Water sources and gardens	Locally	Long term	2	2	Minor
Disruption and loss of livelihood	Communities in the project area including markets and homesteads	Limited area	Temporary	2	3	Moderate
Injuries to workers and community	Workers and community members including pedestrians	Limited area	Temporary	4	2	Moderate
Exploitation of workers	Workers	Limited area	Temporary	2	2	Minor
Air pollution due to dust emissions	Communities in the project area including markets and homesteads	Limited area	Short term	2	3	Moderate
<b>Operational Phase</b>						
Reduction in ground water level	Ground water acquirers	Locally	Long term	2	4	Moderate
Inflation of prices of other amenities	Communities along the transmission routes	Locally	Short term	2	2	Minor
Risk of water pipeline bursting leading to water wastage	Communities along the transmission routes	Locally	Temporary	2	2	Minor
Safety of workers during repairs	Workers	Limited area	Temporary	3	3	Moderate
<b>Decommissioning Phase</b>						
Risk of flooding	Communities along the transmission routes	Limited area	Short term	2	3	Moderate
Solid waste generation	Communities along the transmission routes and other project sites	Limited area	Short term	3	3	Moderate
Loss of water supply	Communities along the transmission routes	Locally	Temporary	4	4	Major

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

<b>Impact</b>	<b>Receptor(s)</b>	<b>Extent</b>	<b>Duration</b>	<b>Intensity of impact</b>	<b>Sensitivity of receptor</b>	<b>Severity</b>
Waste pollution	Communities along the transmission routes and other project sites	Limited area	Temporary	2	3	Moderate
Risks due to soil excavation	Communities along the transmission routes and other project sites	Locally	Temporary	3	3	Moderate
Loss of Vegetation	Wetlands, compounds, crop gardens, bushlands	Limited area	Short term	3	3.	Moderate

## **8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN**

### **8.1 Introduction**

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

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

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

### **8.2 Integration of Safeguards into Procurement Process (Contracts)**

#### ***8.2.1 Bidding***

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

#### ***8.2.2 Bill of Quantities (BoQs)***

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



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

### ***8.2.3 Safeguards Clauses***

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

### ***8.2.4 Procurement of the Contractor***

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

### ***8.2.5 Staffing***

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

### ***8.2.6 ESMP Monitoring and Reporting***

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

### **8.2.7 Project Reporting Commitments**

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

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

### **8.3 Contractor Management Plans and Method Statements**

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

#### **8.3.1 Labour Force Management Plan**

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

#### **8.3.2 Quality Management Plan**

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

#### **8.3.3 Erosion Control Plan**

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

An erosion control plan should be overlaid on the project grading plan(s) or site plan if there is not a grading plan. The erosion control plan needs to show what Best Management Plans (BMPs) will be used and where, as well as the total disturbance area. The plan must include measures to prevent erosion, contain sediment and control drainage. The erosion control plan must also include installation details of the BMPs as well as notes. Construction sites often have areas where soil disturbing activities such as clearing, grading, or cut/fill work has stopped for a period of time. Bare areas that are not actively under construction need some type of temporary cover to prevent or minimize erosion in the event of rainfall. Applicable areas include topsoil stockpiles, rough graded areas, sediment basin dikes, ditches, temporary earthen structures, and graded areas undergoing settlement. The following controls may be considered:

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

#### ***8.3.4 Waste Management Plan***

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

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

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

#### ***8.3.5 Occupational Health and Safety Plan***

The Contractor will have to prepare a document that presents the framework for

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

### ***8.3.6 Community Health and Safety Plan***

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

### ***8.3.7 HIV/AIDS and Gender Management Plan***

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

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

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

### ***8.3.8 Traffic and road safety Management plan***

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

### **8.3.9 Cultural Heritage Management Plan**

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

### **8.3.10 Stakeholder Engagement Plan (SEP)**

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

#### *8.3.9.1 Purpose of SEP*

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

#### *8.3.9.2 Stakeholder Categorization*

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

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

#### *8.3.9.3 Information Needs*

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

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

8.3.9.4 Disclosure Mechanisms

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

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

A template of a stakeholder engagement plan is depicted in Table 35.

Table 35: Stakeholder Engagement Plan template

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

**8.4 Grievance Redress Mechanism (GRM)**

**8.4.1 Grievance Procedure and Rationale**

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

The aim and purpose of this system is to make the grievance handling procedures accessible, prompt and affordable to the PAPs given the generally low values of some of the properties to be affected; and also provide an alternative to the costly and time-consuming formal courts procedures for handling grievances and disputes. The objective of the grievance handling systems and procedure is to establish for the community

members and PAPs mechanisms for raising complaints related to compensation for loss of land and other livelihood properties and assets and having such complaints resolved as amicably as possible through acceptable and binding corrective actions.

**8.4.2 Steps of the Grievance Process**

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

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

*Receipt of Complaint/Grievance*

A verbal or written complaint from a PAP or community member will be received by the Grievance Officer (GO) (refer to Table 36 for the roles of the GO) or an assigned contact officer in a given administrative jurisdiction/authority near to community level and recorded in a grievance log which will be held in the Sub-county. The contact officer at the sub-county will be the Sub-county Chief.

**Table 36: Role of a Grievance Officer**

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

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

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

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

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

#### *Determination of Corrective Action*

If in their judgment, the grievance can be solved at this stage, the GO and a representative of a local independent civil society/organization will determine a corrective action in consultation with the aggrieved person. A description of the action; the time frame in which the action is to take place; and the party responsible for implementing the action will be recorded in the grievance data base.

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

#### *Meeting with the Complainant*

The proposed corrective action and the timeframe in which the grievance is to be implemented will be discussed with the complainant within 30 days of receipt of the grievance. Written agreement to proceed with the corrective action will be sought from



the complainant (e.g., by use of an appropriate consent form). If no agreement is reached, Step 2 will be re-visited.

#### *Implementation of Corrective Action*

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

#### *Verification of Corrective Action*

To verify satisfaction, the aggrieved person will be approached by the GO to verify that the corrective action has been implemented. A signature of the complainant will be obtained and recorded in the log and/or on the consent form (see Step 3). If the complainant is not satisfied with the outcome of the corrective action additional steps may be undertaken to reach agreement between the parties. If additional corrective action is not possible alternative avenues may be pursued.

#### *Action by the Local Leaders and Project Contractors*

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

#### *Action by the Grievance Committee*

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

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

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

Once the Grievance Committee has determined its approach to the lodged grievance, this will be communicated to the GO, who will communicate this to the complainant. If satisfied, the complainant signs to acknowledge that the issue has been resolved satisfactorily. If the complainant is not satisfied however, the complainant notes the

outstanding issues, which may be re-lodged with the Grievance Committee or the complainant may proceed with judicial proceedings.

#### *Action by Developer (MWE)*

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

#### *Alternative Action by Chief Government Valuer (CGV)*

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

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

#### *8.4.3 Capacity Building for the Grievance Officer and Grievance Committee*

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

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

#### *8.4.4 Other alternatives*

The other alternative recourse suggested as a last resort is for the complainant to seek redress from formal courts of law. The Land Act, Cap 227 establishes Land Tribunals at regional/district level. It empowers the Land Tribunals to determine disputes relating to amount of compensation to be paid for land acquired compulsorily for public interest.

The affected person may appeal to a higher ordinary court. The Land Acquisition Act allows for any person to appeal to the High Court within 60 days of the award being made. The Land Act, Cap 227 also states that traditional authority mediators can play a role in settling land disputes.

### 8.5 Capacity Building and Trainings

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

Training will be conducted with the following primary objectives:

- Train the project beneficiaries and other government staff interested in the general safeguard requirements built into the E&S safeguards.
- Introduce the participants to the safeguard requirements of the AfDB and of the country.
- Examine the specific safeguard requirements of the AfDB funded projects.

The following outcomes are expected as the result of training.

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

### 8.6 Required Approvals, Permits and Licenses

Several approvals and licenses will be required before commencement of certain construction activities. Securing of approvals requires preparation of the relevant documentation and payment of fees. This needs to be done during mobilization to ensure that all approvals are secured in a timely manner to avoid construction delays. It is important to ensure that all materials (sand and aggregates) are sourced from quarries, borrow pits and sand mines approved by NEMA and compliant with environmental laws. For all new materials sites to be opened up, NEMA approval must be secured while all existing sites should undertake/provide proof of having undertaken environmental compliance audits. For the success of the Morikiswa WSS, the following permits and licenses may be required by the project as presented in Table 37.

Table 37: Approvals, permits and licenses that may be required by the project

Approvals, Permits and Licenses Required	Issuing Authority	Party responsible for acquiring permit/license	Legal Framework
Water Abstraction Permit	DWRM	MWE Contractor	Water Act, cap 152
Wastewater Discharge permit	DWRM	MWE Contractor	Water Act, cap 152
Waste Disposal Permit	NEMA	MWE Contractor	National Environment Act Cap 153; National Environment (Waste Management) Regulation

## ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Waste Transportation License	NEMA	Contractor	National Environment Act Cap 153; National Environment (Waste Management) Regulation
Storage of Hazardous/ Non-Hazardous Waste	NEMA	Contractor	National Environment Act Cap 153; National Environment (Waste Management) Regulation
License to emit noise in excess of permissible noise levels	NEMA	Contractor	National Environment Act Cap 153
Blasting, importation, storage and transportation of explosives	Ministry of Internal Affairs	Contractor	Explosive Act, Cap 298
Mining Permit, Extraction of minerals, opening up of quarries and sand pits	MEMD/ NEMA approval	Contractor	Mining Act, Cap 148
Permit for Storage of Petroleum Products and dispensing license	MEMD	Contractor	Petroleum Act, Cap 2003
Work Permits	Ministry of Internal Affairs	Contractor MWE	Immigrations Act, Cap 66
Permit if the water transmission line is to cross the UNRA road (Road Permits)	UNRA	MWE	The Uganda National Roads Authority (General) Regulations 2017
Traffic Diversions consent	Uganda Police	Contractor	Traffic and Road Safety Act 1998
RAP approval conditions for this project	Chief Government Valuer	MWE Contractor	The Land Act Cap 227

### 8.7 Environmental and Social Monitoring Plan

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

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

### 8.8 Roles and Responsibilities

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

### **8.8.1 Project Developer (MWE)**

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

The Project Developer will:

- i) Have overall responsibility for environmental and social compliance;
- ii) Ensure that appropriate resources are allocated to facilitate environmental and social management of the project, including financial and human resources;
- iii) Review for quality and approve the CESMP for project implementation;
- iv) Ensure that adequate supervision for implementation of the ESMP is provided at all times;
- v) Check that penalties for non-compliances with contractual environmental commitments are actioned; and e.g., Supervising Engineer is required to have an Environmental & Social Management Specialist by contractual obligation. The Contractor's Environmental Specialist, Social Development Specialist and Health & Safety Specialist will ensure that the provisions in this ESMP are implemented within the sites under their supervision and to collect and transmit relevant information to the Supervising Engineer.
- vi) Undertake regular compliance audits, including the mandatory Annual Environmental Compliance Audit in accordance with the National Environment Act.

### **8.8.2 Project Development Partner (AfDB)**

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

Therefore; the AfDB will;

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

### **8.8.3 NEMA and Lead Agencies**

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

#### **8.8.4 Project Contractor**

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

#### **8.8.5 Tororo District Local Government**

Although the contractor will have the primary role in delivering on the measures set out in the ESMMP, Tororo District Local Government will have the ultimate responsibility for ensuring that the measures are delivered. In this respect, Tororo District Local Government will review and approve contractor plans for delivery of the actions contained in the ESMP and subsequently during project operation, review contractor performance through monitoring, audits and inspection to ensure that all proposed mitigation measures are implemented as well as ensuring regulatory compliance.

### **8.9 The Monitoring Team**

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

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

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

- Compile a monitoring report indicating all non-conformances to mitigation measures.

### **8.10 Enforcement of Compliance**

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

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

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

The ESMMP matrix (Table 38) provides a detailed guidance for managing impacts, monitoring indicators, indicative costs for impact mitigation, responsibility for implementing the mitigation measures, the monitoring institution and the monitoring frequency. The Contractor and Developer/Operator must ensure that the ESMMP is implemented, and should allow the monitoring institution to carry out the

**Table 38: Environmental and Social Management and Monitoring Plan**

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
<b>A: Pre-construction and construction phases</b>						
<b>A1:</b> Loss of land	<b>A1-1:</b> Compensation should be done for land and trees lost by the owners neighbouring the project infrastructure.	List of people compensated	Project Contract and finance officer	Petta and Kisoko Sub-counties authorities, LCI District Labour Officer	Monthly	To be determined based on number to be compensated
<b>A2:</b> Noise pollution	<b>A2-1:</b> The noise level should be kept within NEMA acceptable limits; 60dB is the limit for a construction site during day (8 am-5 pm).	Reports on the noise level monitoring	Project environment, health and safety lead	Project Engineer, DEO, LCI's	Daily	5 million
	<b>A2-2:</b> Construction works should be carried out during times of the day when the noise impact is less felt e.g., from 8:00 am to 5:00 pm.	Schedule for construction works	Site engineer	Project engineer, DEO, LCI's	Daily	2 million
	<b>A2-3:</b> Vehicle and equipment should be maintained according to manufacturers' specifications.	Log for maintenance of all the vehicles and equipment	Site engineer	Project engineer, DEO, LCI's	Monthly	3.5 million
	<b>A2-4:</b> Adequate noise prevention devices, e.g., mufflers should be installed on noise generating sources.	Equipment installed with noise dampening equipment	Contractor site engineer	Project engineer, DEO, LCI's	At the beginning of the construction phase	2.5 million
	<b>A2-5:</b> Engines of vehicles and machinery while not in use should be switched off.	Absence of idling vehicle or equipment not in use	Contractor site engineer Project environment,	DEO, LCI's	Daily	2 million



ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
			health and safety lead			
	<b>A2-6:</b> Workers who may unavoidably have to work with noise generating equipment, e.g., earthmoving equipment should be provided with ear plugs and advised to put them on.	Workers with PPE for noise protection	Contractor	Project engineer, DEO, LCI's	Daily	3 million
<b>A2:</b> Pollution from oils and fuels	<b>A2-1:</b> Cleaning wastes should be collected and stored in appropriate containers to be disposed of at approved sites.	-Containers for storing waste oils and fuels -Disposal receipts by a designated facility	Contractor	Project engineer, DEO, LCI's	Daily	6 million
	<b>A2-2:</b> Vehicles should preferably be parked on paved platforms.	Paved parking areas	Contractor	Project engineer, DEO, LCI's	Daily	5.5 million
	<b>A2-3:</b> Fuel storages should not leak, and should be periodically monitored, and repaired or replaced when necessary.	Leka proof fuel and oil storages	Contractor	Project engineer, DEO, LCI's	Daily	3.5 million
	<b>A2-4:</b> Sites for cleaning, fuelling and maintaining vehicles should be paved so as to prevent leakage	Paved areas for maintenance of equipment and vehicles	Contractor	Project engineer, DEO, LCI's	Start of the Construction phase	6.5 million
	<b>A2-5:</b> Vehicles and equipment should be maintained, fuelled and cleaned at workshops/sites with adequate leakage prevention.	Paved workshops	Contractor	Project engineer, DEO, LCI's	Start of the Construction phase	2 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
<b>A3:</b> Risk of accidents	<b>A3-1:</b> Work sites (especially excavation sites) should have proper protection with clear marking of safety borders and signals and fence off all dangerous areas.	Clearly marked and zoned off works sites	Contractor	Project engineer, DEO, LCI's	Daily	4.5 million
	<b>A3-2:</b> Riparian neighbours should be informed about the construction program in advance and adhere to it.	-Copy of communique made to the community -Receipts from communication companies in the area	Project Engineer	DEO, LCI's District Engineer	Monthly	4.5 million
	<b>A3-3:</b> Access to restricted work sites (including those with operation of mechanical and electric equipment) should be confined to persons with permits.	Restricted areas on site	Contractor	Project Engineer	Weekly	5.5 million
	<b>A3-4:</b> Appropriate traffic management plans should be implemented with the help of local police when (partial) closure of roads is required.	Copy of traffic management plan	Contractor	Traffic Police	Beginning of construction phase	1.5 million
	<b>A3-5:</b> The site should be registered as work place with Ministry of Labour, Gender and Social Development.	Copy of registration certificate	Contractor	MoGLSD	At the start of construction phase	500,000
	<b>A3-6:</b> Provide appropriate PPE like masks, gloves, Helmets, overalls to all workers in risky areas.	Workers with PPE on site	Contractor	Project engineer, DEO, LCI's	Daily	2 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
<b>A4:</b> Solid waste pollution	<b>A4-1:</b> The Contractor should prepare a Solid Waste Management Plan, which should contain.	Copy of the solid waste management plan	Contractor	Project engineer, DEO, LCI's	At beginning of the construction phase	3 million
	<b>A4-2:</b> The Contractor should maintain records of types, quantities, origin, (temporary) storage, transport and elimination/reuse of solid waste	Records for solid waste generated	Contractor	Project engineer, DEO, LCI's	Monthly	1 million
	<b>A4-3:</b> Any waste including excess soil should be disposed of at gazetted sites. The solid waste shall not accumulate on site, to cause odour, fly, or rodent problems.	-Copy of receipts for waste disposal	Contractor	Project engineer, DEO, LCI's	Monthly	2.5 million
	<b>A4-4:</b> Excavated soils should be reused as much as possible as filling material and should be contained after excavation.	Back-filled excavated areas	Contractor	Project engineer, DEO, LCI's	Weekly	2.5 million
	<b>A4-5:</b> Provisional material storage on site should be designed and undertaken in such a way as to ensure that soils and underground water are not polluted.	Designated area for waste collection	Contractor	Project engineer, DEO, LCI's	Weekly	3 million
	<b>A4-6:</b> Licensed recycling companies should be used to externally recycle, recover or dispose of waste.	Copy of licenses for companies contracted	Contractor	Project engineer, DEO, LCI's	Monthly	5 million
<b>A5:</b> Human/body	<b>A5-1:</b> Provide the workers with segregated (male and female) mobile toilet facilities.	Mobile toilets in place	Contractor	Project engineer, DEO, LCI's	Monthly	3 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

<b>Impact</b>	<b>Mitigation measures</b>	<b>Monitoring indicator (s)</b>	<b>Responsible stakeholder</b>	<b>Monitoring stakeholder (s)</b>	<b>Frequency of monitoring</b>	<b>Cost estimates (UGX)</b>
waste disposal	<b>A5-2:</b> The waste should be disposed of by a licensed wastewater handler to a designated waste collection site.	Copy of licenses for companies contracted	Contractor	Project engineer, DEO, LCI's	Monthly	5 million
<b>A6:</b> Increased incidences of HIV/AIDS and other diseases	<b>A6-1:</b> The contractor is encouraged to employ people from the local community for the casual jobs.	List of employees and their area of residence	Contractor	Project engineer, District Labour Officer, LCI's	Monthly	3.5 million
	<b>A6-2:</b> Provide Condoms for use during sexual activities to all workers and people in the community.	Number of condoms issued	Contractor Ministry of Health	Project engineer, District Labour Officer, District Health Officer LCI's	Monthly	4.5 million
	<b>A6-3:</b> All workers should be sensitised to ensure awareness of and sensitivity to the local cultures, traditions and lifestyles.	Reports on the sensitization workshops	Contractor	Project engineer, District Labour Officer, District Health Officer LCI's	Once	1.5 million
	<b>A6-4:</b> HIV/AIDS impact mitigation plan that will involve providing a comprehensive range of services including the identification of possible HIV/AIDS cases, testing with pre- and post-counselling, the treatment of associated infections.	Copy of the HIV/AIDS mitigation plan	Contractor	Project engineer, District Labour Officer, District Health Officer LCI's	At the start of the construction	4.5 million
<b>A7:</b> Loss of crops and trees	<b>A7-1:</b> Limit project activities to extent for which the project is designed to minimize losses.	Extent of the project activities	Contractor	Project engineer, LCI's	Weekly	3.5 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	<b>A7-2:</b> Compensation should be done for PAPs whose crops will be destroyed;	-List of PAPS compensated -Copies of compensation agreements	Project contracts and finance officer	Project engineer, District Labour Officer, LCI's	Weekly at the beginning of the construction works	6 million
	<b>A7-3:</b> Destroyed trees should be replanted after construction of the project infrastructure.	Number of trees replanted	Contractor	Project engineer, DEO, LCI's	Monthly	5 million
<b>A8:</b> Siltation and sedimentation	<b>A8-1:</b> Work should be carried out under mild weather and strong rains or winds should be avoided.	Schedule for project activities	Contractor	Project engineer	Monthly	2 million
	<b>A8-2:</b> Topsoil should be removed and stored in separate piles and reinstated after refilling of trenches, to enable natural re-vegetation.	Trenches filled up with waste soils	Contractor	Project engineer	Weekly	1.5 million
<b>A9:</b> Disruption and loss of livelihood activities	<b>A9-1:</b> Local communities should be informed about the construction program in advance and adhere to it	-Copy of communique to the community -Receipts for adverts on communication platforms	MWE	LCI's District Engineer, District Water Officer	Monthly	3.5 million
	<b>A9-2:</b> In case access roads have to be closed, local communities should be informed in advance	Same as in <b>A9-1</b>	Same as in <b>A9-1</b>	Same as in <b>A9-1</b>	Same as in <b>A9-1</b>	Same as in <b>A9-1</b>
	<b>A9-3:</b> Access roads in the neighbourhood should be maintained and cleaned of earth and sand on a daily basis	Clear roads	Contractor	Project engineer	Weekly	2 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	<b>A9-4:</b> Temporary access ways should be provided with the approval of local authorities where access roads are closed	Alternative routes in place	Contractor, Project Engineer	District Engineer	At start of construction	4 million
	<b>A9-5:</b> Works should be carried out under mild weather; avoiding strong rains or winds	Schedule for project activities	Contractor	Project engineer	Monthly	2 million
	<b>A9-6:</b> Obstruction of access to and use and occupation of roads, footpaths and bridges should be reduced.	Alternative routes in place	Contractor, Project Engineer	District Engineer	At start of construction	4 million
	<b>A9-7:</b> Where livelihoods and property are affected, valuation and prompt compensation should be undertaken for the PAPs	List of people compensated	MWE	District Labour officer CDO's LCI's	Monthly	4 million
<b>A10:</b> Injuries to workers and community	<b>A10-1:</b> Work sites (especially excavation sites) should have proper protection with clear marking of safety borders and signals and fence off all dangerous areas	Clearly marked working sites	Contractor	Project engineer, LCI's, District Engineer DEO	Weekly	2.5 million
	<b>A10-2:</b> Riparian neighbours should be informed about the construction program in advance and adhere to it	Copy of communication made to riparian communities	Contractor, Project engineer	LCI's, District Engineer, DEO	Weekly	3 million
	<b>A10-3:</b> Access to restricted work sites (including those with operation of mechanical and electric equipment) should be confined to persons with permits	Restricted areas on site	Contractor	Project Engineer	Weekly	5.5 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	<b>A10-4:</b> Appropriate traffic management plans should be implemented with the help of local police when (partial) closure of roads is required	Copy of the traffic management plan	Contractor Project Engineer	Uganda Police, Tororo -Traffic Division District Engineer	Weekly	5 million
	<b>A10-5:</b> The site should be registered as work place with Ministry of Labour, Gender and Social Development	Copy of the registration certificate	Contractor	Project Engineer MoGLSD	Before start of construction	3 million
	<b>A10-6:</b> Provide appropriate PPEs like masks, gloves, Helmets, overalls to all workers in risky areas.	Number of workers with PPE's	Contractor	District Labour officer DEO	Weekly	3.45 million
<b>A11:</b> Exploitation of workers	<b>A11-1:</b> Casual workers should be recruited through the Local Council system	Number of workers recruited from the local population	Contractor	LCI's	Monthly	3 million
	<b>A11-2:</b> Workers should be paid timely according to agreed rates used in the area	Payment schedules for workers	Contractor	Project Engineer, District Labour Officer DEO	Monthly	2.5 million
	<b>A11-3:</b> The Contractor and the Developer should follow the national labour laws of Uganda	Labour laws followed	Contractor	District Labour Officer	Monthly	2.5 million
	<b>A11-4:</b> Children should not be employed in any activity of the proposed development, be it during construction or operation and maintenance.	Absence of children as employees	Contractor	District Labour officer	Monthly	3 million
<b>A12:</b> Air pollution due	<b>A12-1:</b> The contractor should employ best practicable dust management	Copy of dust management plan	Contractor	Project engineer DEO	Weekly	5 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
to dust emission	strategies for the construction and operational phase inclusive of minimising exposed surfaces; adoption of dust suppression measures such as regular pouring of water on the surfaces and other suitable surface stabilisers					
	<b>A12-2:</b> Trucks and equipment should also be regularly serviced to ensure that they do not emit dangerous fumes/gases.	Servicing log for the vehicles and equipment	Contractor	Project Engineer, DEO	Monthly	6 million
<b>B: Operation/maintenance phase</b>						
<b>B1:</b> Reduction in ground water level	<b>B1-1:</b> The design of the water supply system should cater for changes in precipitation due to climate change	Copy of comprehensive water assessment study	MWE	DEO	Quarterly	10 million
	<b>B1-2:</b> Reservoir should be installed that can store enough water to cater for the needs of the communities during times of scarcity.	Number of reservoirs	MWE, Contractor	DEO, District Engineer	Design stage	--
<b>B2:</b> Inflation of prices of good and amenities	<b>B2-1:</b> Work with local authorities such that prices of services and goods are standardized	Standardised prices for goods	District Production Officer District Water Officer	LCI's, Project Engineer	Quarterly	--
<b>B3:</b> Risk of water pipeline burst leading to	<b>B3-1:</b> Regular monitoring of the transmission line for any leakages	Monitoring report for leakages	Tororo MWE	District Water Officer	Quarterly	--



ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
wastage of water						
<b>B4:</b> Safety of workers during repairs	<b>B4-1:</b> Workers should be provided with Personal Protective Equipment (PPEs)	Number of workers with PPE's	Tororo	District Labour Officer	Monthly	3 million
	<b>B4-2:</b> Work sites (especially excavation works) should have clear markings of safety borders and signals. Dangerous areas should be fenced off	Clearly marked and fenced off working areas	MWE	DEO, District Water Officer	Every time there are repairs to be done	--
	<b>B4-3:</b> First aid services should be put in place in case of emergencies	Copy of an MOU with a designated health facility to handle emergency cases	MWE	District Water Officer District Labour Officer	Quarterly	--
	<b>B4-4:</b> All workers should be trained in Environment, Health and Safety (EH&S) and awareness should be carried out once a week and preferably during toolbox meetings	Training reports for workers indicating number of workers trained	MWE	District Water Officer District Labour Officer	Quarterly	1 million
	<b>B4-5:</b> The Contractor should recruit EH&S personnel during construction	EH&S personnel under contract employed	MWE	District Water Officer District Labour Officer	Yearly	500,000
	<b>B4-6:</b> The Contractor should inform riparian neighbours about the construction programme in advance and adhere to it	Copy of communication made to riparian communities	MWE	LCI's, District Engineer, DEO	In case of repairs and emergency works	3 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

Impact	Mitigation measures	Monitoring indicator (s)	Responsible stakeholder	Monitoring stakeholder (s)	Frequency of monitoring	Cost estimates (UGX)
	<b>B4-7:</b> The operator should confine access to restricted work sites (including areas with mechanical and electric equipment) to persons with permits.	Restricted areas on site	MWE	District Engineer, DEO	In case of repairs or emergency works	--
<b>C: Decommissioning phase</b>						
<b>C1:</b> Risk of flooding	<b>C1-1:</b> Inform the community about the impending decommissioning exercise.	Communication on the impending decommissioning activities	MWE	District Engineer, DEO, District water Officer	Start of decommissioning	--
<b>C2:</b> Solid waste generation	Same as those for Construction phase under solid waste pollution.					
<b>C3:</b> Loss of water supply	<b>C3-1:</b> Provide alternative water sources before decommissioning the water supply system	Alternative water sources in place	MWE	District Water Officer	Before start of decommissioning	--
<b>C4:</b> Waste pollution	<b>C4-1:</b> Waste should be collected in a designated place and disposed of by a NEMA registered solid waste handler	-Receipts for disposal of waste -Contract with licensed waste handler	MWE	DEO, District Engineer	Throughout decommissioning phase	--
	<b>C4-2:</b> Licensed recycling/waste disposal companies to externally recycle, recover or dispose of waste should be contracted.	Copy of license for the waste handling company	MWE	DEO, District Engineer	Monthly	3 million
	<b>C4-3:</b> Temporary storage of contaminated soils on site should be designed and implemented so as to minimize underground pollution.	Designated places for storing soil	MWE	DEO, District Engineer LCI's	Throughout this phase	2.5 million

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

<b>Impact</b>	<b>Mitigation measures</b>	<b>Monitoring indicator (s)</b>	<b>Responsible stakeholder</b>	<b>Monitoring stakeholder (s)</b>	<b>Frequency of monitoring</b>	<b>Cost estimates (UGX)</b>
<b>C5:</b> Risk dues to soil excavation	<b>C5-1:</b> Excavated soil should be contained to avoid wash out and erosion	Contained soil piles	MWE	DEO, District Engineer LCI's	Throughout this phase	3.0 million
	<b>C5-2:</b> Any excess soil should be disposed of at gazetted sites. The soil shall not accumulate on site, to cause odour, fly, or rodent problems.	-Receipts for disposal of waste -Contract with licensed waste handler	MWE	DEO, District Engineer	Throughout decommissioning phase	--
	<b>C5-3:</b> Excavated soils should be reused as much as possible as filling material and should be contained after excavation.	Filled up trenches	MWE	DEO, District Engineer	Throughout decommissioning phase	--
<b>C6:</b> Loss of vegetation	<b>C6-1:</b> Working areas should be zoned out and vegetation clearance should be limited to zoned areas to reduce ecological degradation	Zoned off working areas	MWE	DEO, District Engineer, District Labour Officer, LCI's	Throughout decommissioning phase	2.5 million
	<b>C6-2:</b> Disturbed natural sites should be restored through environmental rehabilitation, restoring top soils and (re-) introduction of genetic species to re-establish the natural local ecology.	Number of restored areas	MWE	DEO, District Engineer, District Labour Officer, LCI's	Throughout decommissioning phase	5 million
<b>Total</b>						<b>214,450,000</b>

Further, the following other costs (Table 39) should be clear in the BoQs during the bidding process. Additional details on the main activities are presented in Annex V.

Table 39: *Other cost items to be included in the BoQs during the bidding process*

Item	Indicative Costs
Grievance Redress Mechanism	23,000,000
Stakeholder Engagement	26,000,000
Environment and Social Audit	35,000,000
Capacity Building and Trainings	20,000,000
<b>Sub-total</b>	<b>104,000,000</b>
<b>Grand Total, including ESMMP (UGX 214,450,000)</b>	<b>318,450,000</b>

## **9 CONCLUSION AND RECOMMENDATIONS**

### **9.1 Conclusions**

The sanitation and hygiene situation needs to be improved to commensurate with the proposed water supply improvement. A strategy for both household and public sanitation and hygiene needs to be developed by all stakeholders. Activities for household level included home improvement campaigns, hygiene education, and promotion of toilet technologies that were sustainable such as lined pits which can be emptied and or ecological sanitation toilets.

In this study, the need for the project was examined, its compatibility with the surroundings and economic benefits evaluated and environmental impacts assessed and analysed. Adverse impacts were identified, mitigation measures to avoid, reduce and minimise these impacts have been suggested, either as part of the design, or as measures to be implemented. Good practice measures were also identified in order to minimize the impact of the proposed development further. The proponent has agreed to these mitigation measures and they are, therefore, expressed as commitments.

Overall, the negative impacts of this project are rated by this study as largely insignificant (moderate); however, adequate mitigation measures have been proposed to address them. There some that are of major significance and these should also be dealt with the mitigation measures suggested in this ESIA. When mitigation actions and environmental and social monitoring plans are implemented, the project would have minimal residual environmental effects. Hence the project can be implemented in a sustainable way.

### **9.2 Recommendations**

This study therefore recommends that:

- It is not necessary to carry out a full ESIA for this project as a Project Brief is deemed sufficient and the proposed mitigation measures would be sufficient to ensure sustainable implementation of the proposed project;
- Many times, Project Contractors do not comply with the recommendations given in the project environmental report. This could tantamount to violation of the law with possible halting of the whole project by the relevant authorities, including NEMA. A copy of this report would be availed to the Project Contractor, and advised to follow its recommendation.
- The project ought to be approved for implementation by the relevant authorities to enable fulfilment of the project main objective of improving access to safe water in the area.

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**ANNEXES**

**Annex I: Summary of the project investment cost**

Bill No	Description	Investment Costs (Ushs)
	<b>GENERAL</b>	
TOR G-1	General Items	13,335,100
TOR G-2	Method Related Charges	24,234,000
TOR G-3	Day Works	6,944,200
	<b>WATER SUPPLY AND EQUIPMENT</b>	
TOR W-1	Borehole Pump Station	412,225,933
TOR W-2	Borehole Pumping Mains	279,581,494
TOR W-3	Reservoir Tank and Site Works	441,582,111
TOR W-5	Distribution Network	481,294,349
TOR W-6	Mechanical	376,745,900
TOR W-7	Borehole electrical works	901,788,878
TOR W-8	Guard House	19,900,015
TOR W-9	Consumer Connections	18,983,800
TOR W-10	Tools and Equipment	10,278,000
	<b>Sub-Total 1</b>	<b>2,976,615,780</b>
	Allow for 10% contingency	297,661,578.0
	<b>Sub-Total 2</b>	<b>3,274,277,358</b>
	Allow for 18% VAT	589,369,924.4
	<b>Grand Total</b>	<b>3,863,647,282</b>

**Annex II: List of affected villages in the project area**

<b>S/County</b>	<b>Parish</b>	<b>Village</b>
KISOKO	MORIKISWA	RUDAMU
KISOKO	MORIKISWA	RUKUL
KISOKO	MORIKISWA	OPALIPATI
KISOKO	MORIKISWA	RULWA
KISOKO	MORIKISWA	OMWONYOLE
KISOKO	MORIKISWA	RUGWING
KISOKO	MORIKISWA	PODAKA
KISOKO	MORIKISWA	PASAYA A
KISOKO	MORIKISWA	PASAYA B
KISOKO	PEI- PEI	MAKAUR LC
KISOKO	PEI- PEI	PEI- PEI A
KISOKO	PEI- PEI	PEI- PEI B
PETTA	RAMOGI	KANANGA B
PETTA	RAMOGI	KANANGA A
PETTA	RAMOGI	KANANGA C
PETTA	RAMOGI	RAMOGI WEST
PETTA	PETTA	PETTA CENTRAL N
PETTA	PETTA	PETTA SOUTH
PETTA	PETTA	AYAGO C
PETTA	PETTA	AYAGO B
PETTA	PETTA	AYAGO A
NAGONGERA SC	NAMWAYA	ODOPONYI
NAGONGERA SC	NAMWAYA	NAMWAYA CENTRAL
NAGONGERA SC	MAUNDO	POKONG ROCK
NAGONGERA SC	MAUNDO	POKONG PENY NORTH
NAGONGERA SC	MAUNDO	POKONG PENY
NAGONGERA SC	MAUNDO	POKONG KWOYO
NAGONGERA SC	MAUNDO	POKONG AMOR
NAGONGERA SC	MAUNDO	POKONG WEST
NAGONGERA SC	MAUNDO	POKONG PLAIN
NAGONGERA SC	MAUNDO	MAUNDO SOUTH
NAGONGERA SC	MAUNDO	MAUNDO WEST
NAGONGERA SC	MAUNDO	MAUDO CENTRAL
NAGONGERA SC	MAUNDO	WIDUNYI
NAGONGERA SC	MAUNDO	MAUNDO NORTH
NAGONGERA SC	MAUNDO	BIRANGA



**Annex III: List of Stakeholders Consulted**

**STAKEHOLDER CONSULTATIONS**

Name of Agency/stakeholder/community: <del>ESIA FOR</del> PETA S/C TORORO			
Purpose of consultation (tick appropriate box):	Scoping:		ESIA: <input checked="" type="checkbox"/>
	Sensitization:		RAP: <input type="checkbox"/>
	Environmental Audit		Other (specify):
DATE: 10/03/2023			
PROJECT NAME: <del>HA</del> PETA S/C ESIA FOR PIPED WATER TORORO			
PROPONENT:			
NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
Ngangatek Wilbroed	resident	0772288234	
Omoro Hannington	PI chief	0770671676	
BOB HENRY	LCM C/PERSON	0754834744	
Okuni Julius	LCI	0778390922	
Quoni David		0752341221	
BBO ZAKARIA	plc	0781168263	

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**STAKEHOLDER CONSULTATIONS**

Name of Agency/stakeholder/community: <u>KANANSI, PETA S/C</u>			
Purpose of consultation (tick appropriate box):	Scoping:		ESIA: <input checked="" type="checkbox"/>
	Sensitization:		RAP: <input type="checkbox"/>
	Environmental Audit		Other (specify):
DATE: <u>10/03/2023</u>			
PROJECT NAME:			
PROPONENT: <u>Group Discussion KANANSI &amp; PETA S/C</u>			
NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
1. <u>Aluka Osinde Akisfin</u>	<u>Member</u>	<u>0712946672</u>	<u>MAJ</u>
2. <u>Okunmy Bonard</u>	<u>"</u>	<u>0758644936</u>	
3. <u>Obonyo John</u>	<u>"</u>	<u>0754815604</u>	
4. <u>Osuna Samwini</u>	<u>"</u>	<u>0756650553</u>	<u>OSU</u>
5. <u>OFWONO OLWO</u>	<u>member</u>	<u>0785042000</u>	<u>OFW</u>
6. <u>OFWONO - Joseph</u>	<u>member</u>	<u>0705595143</u>	<u>OFW</u>
7. <u>Ongweni Stephen</u>	<u>Member</u>	<u>0771451796</u>	<u>OSG</u>
8. <u>Okwone APOLLO</u>	<u>member</u>	<u>0785318336</u>	<u>OKW</u>
9. <u>Omonkor Joseph</u>	<u>"</u>	<u>0789789049</u>	<u>OMO</u>
10. <u>AYPPT Catherine</u>	<u>"</u>		<u>AYP</u>
11. <u>AMUANA Alwio</u>	<u>"</u>		
12. <u>MYAMERE JULIET</u>	<u>"</u>		<u>MYA</u>
13. <u>JAMET Okecho</u>	<u>"</u>		<u>JAM</u>
14. <u>AKOTH Suzan</u>	<u>"</u>		<u>AKO</u>
15. <u>Aboldo ROSA Mary</u>	<u>"</u>	<u>0706446937</u>	<u>ABO</u>
16. <u>ISAYA OPALLA</u>	<u>"</u>		

## STAKEHOLDER CONSULTATIONS

Name of Agency/stakeholder/community: <u>KISOKO SUB - COUNTY</u>			
Purpose of consultation (tick appropriate box):	Scoping:	<input type="checkbox"/>	ESIA: <input checked="" type="checkbox"/>
	Sensitization:	<input type="checkbox"/>	RAP: <input type="checkbox"/>
	Environmental Audit	<input type="checkbox"/>	Other (specify):
DATE: <u>10<sup>th</sup> March, 2023</u>			
PROJECT NAME: <u>Proposed Morikiswa Min Piped WSS</u>			
PROPONENT:			
NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
<u>IKOPICIA ANORI</u>	<u>SAS</u>	<u>0772454943</u>	<u>AN</u>

## STAKEHOLDER CONSULTATIONS

Name of Agency/stakeholder/community: <u>KISOKO</u>			
Purpose of consultation (tick appropriate box):	Scoping:	<input type="checkbox"/>	ESIA: <input checked="" type="checkbox"/>
	Sensitization:	<input type="checkbox"/>	RAP: <input type="checkbox"/>
	Environmental Audit	<input type="checkbox"/>	Other (specify):
DATE: <u>10/03/2023</u>			
PROJECT NAME: <u>MORIKISWA MINI SOLAR POWERED PIPED WSS</u>			
PROPONENT: <u>LHM Ground Water</u>			
NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
<u>OWORI BERNARD</u>	<u>FARMER OMUONTOLE</u>	<u>0789733940</u>	<u>BE</u>
<u>OWINO SILVER</u>	<u>FARMER OMUONTOLE</u>	<u>-</u>	<u>W</u>
<u>OPIYO NOAH</u>	<u>FARMER OMUONTOLE</u>	<u>-</u>	<u>OE</u>
<u>OPOYI CATHERINE</u>	<u>FARMER</u>	<u>0770380935</u>	<u>CA</u>
<u>OWINO CHARLES</u>	<u>PARISH HIEF</u>	<u>0786441491</u>	<u>OW</u>
<u>TOLOFISA OCHAYE</u>	<u>FARMER</u>	<u>-</u>	<u>TO</u>

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

**STAKEHOLDER CONSULTATIONS**

NAGONGERA S/C TORORO

Name of Agency/stakeholder/community: **OBOPONY ZONE Namwaya PARISH**

<b>Purpose of consultation</b> (tick appropriate box):	Scoping:		ESIA: <input checked="" type="checkbox"/>	
	Sensitization:		RAP: <input type="checkbox"/>	
	Environmental Audit		Other (specify):	




DATE: **11/03/2023**

PROJECT NAME:

PROPOSER:

	NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
1	OKOTH MARTIN	PWD	-	
2	Okwari John M		0702820114	
3	OSUNNA PATRICK			TH
4	Owin O Siliver		0740227883	
5	Can. Martin L. Oduro	Priest.	0772946470	
6	Obbo FRED			
7	Ochieng Sedi			Jog
8	Ochola Hamington	Farmer	0703991421	HO
9	omollo victor			
10	odio okoth			OT
11	Oketho vasini			
12	Okuma moses		0744611259	
13	Owor CHARLES		0775951689	
14	Ochieng Peter Jassa		0771340571	Jung
	othino			

### STAKEHOLDER CONSULTATIONS

Name of Agency/stakeholder/community: <b>TOPORO DISTRICT HQS</b>			
Purpose of consultation (tick appropriate box):	Scoping:		ESIA: <input checked="" type="checkbox"/>
	Sensitization:		RAP: <input type="checkbox"/>
	Environmental Audit		Other (specify):
DATE: <b>10/03/2023</b>			
PROJECT NAME: <b>ESTD FOR MORIKISWA MINI-PIPED WATER PROJECT</b>			
PROPONENT:			
NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
<b>Lgbose Khamiga</b>	<b>Asst. Dir</b>	<b>0753088771</b>	
<b>Nicholas Asodis</b>	<b>WTA</b>	<b>0784304991</b>	
<b>OKOTH KIYONG</b>	<b>TORL CAO</b>	<b>0777059818</b>	

Group Discussion of 9 ZONES :

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1) RUDAM, OPALIPATI, RULWA, PODAKA, PASAYA, "A"  
PASAYA, "B", OMUDNYOLE, & RUNGWING, & RUKU LI, ZONE

**STAKEHOLDER CONSULTATIONS**

Name of Agency/stakeholder/community: <u>RUDAM ZONE</u>			
Purpose of consultation (tick appropriate box):	Scoping:	<input type="checkbox"/>	ESIA: <input checked="" type="checkbox"/>
	Sensitization:	<input type="checkbox"/>	RAP: <input type="checkbox"/>
	Environmental Audit	<input type="checkbox"/>	Other (specify):
DATE: <u>11/03/2023</u>			
PROJECT NAME: <u>1</u>			
PROPONENT: <u>RUDAM</u>			
NAME OF PERSON/OFFICIAL MET:	DESIGNATION	CONTACT(TEL/EMAIL)	SIGN / INITIAL
1 Ofwono Leonard	Rulwa zone	0777397530	<i>[Signature]</i>
2 OKOTH VICENT	Rungwing	0751836604	<i>[Signature]</i>
3 OPAI FRANCIS	RUDAM	0778037777	<i>[Signature]</i>
4 OKONGO ALONSO	Rulwa zone	0778755040	<i>[Signature]</i>
5 OPMONO PATRICK	RUKU	0770461595	<i>[Signature]</i>
6 ONYANCIO GODFREY	Rudma zone	07410136181	<i>[Signature]</i>
7 Oworu ceat	Rulwa	0774188483	<i>[Signature]</i>
8 Othieno Francis	peasant	0705175465	<i>[Signature]</i>
9 OMAKA PHILIP	RULWA	0787745980	<i>[Signature]</i>
10 OKECH ALOCHAK	RULWA	077099368	<i>[Signature]</i>
11 OKEYA JOHN	RUDAM	0757882407	<i>[Signature]</i>
12 Oboyo Christopher	Rudam	0775694161	<i>[Signature]</i>
13 OFWONO NOAH	RUDAM	0774672370	<i>[Signature]</i>
14 OBOYI MOSES	RUDAM	0783366173	<i>[Signature]</i>

**Annex IV: List of birds encountered in the proposed project area**

2016 No	COMMON NAME <i>Scientific Name</i>	Ecology	Red list/ Migrants	Kananga C Abstruction site)	Maundo Abstractio n site	Kisoko Reserver
914	COMMON BULBUL <i>Pycnonotus barbatus</i>	f		6	3	6
665	RED-BILLED FIREFINCH <i>Lagonosticta senegala</i>			6	2	6
841	TAWNY-FLANKED PRINIA <i>Prinia subflava</i>	fw		6	6	
62	RED-EYED DOVE <i>Streptopelia semitorquata</i>	f		6	4	1
631	BAGLAFECHT WEAVER <i>Ploceus baglafecht</i>	f		6	5	
717	NORTHERN GREY-HEADED SPARROW <i>Passer griseus</i>			5	2	4
91	AFRICAN PALM SWIFT <i>Cypsiurus parvus</i>	Ae			4	6
319	LIZARD BUZZARD <i>Kaupifalco monogrammicus</i>	F		5		5
676	RED-CHEEKED CORDON- BLEU <i>Uraeginthus bengalus</i>			6	4	
1037	AFRICAN THRUSH <i>Turdus pelios</i>	f		3		6
171	HAMERKOP <i>Scopus umbretta</i>	w			2	5
705	BRONZE MANNIKIN <i>Spermestes cucullata</i>			5	2	
196	HADADA IBIS <i>Bostrychia hagedash</i>	w			6	
359	SPECKLED MOUSEBIRD <i>Colius striatus</i>			3	3	
413	GREY WOODPECKER <i>Mesopicos goertae</i>	f		6		
470	WOODLAND KINGFISHER <i>Halcyon senegalensis</i>	A		3	3	
607	VARIABLE SUNBIRD <i>Cinnyris venustus</i>	f		6		
621	BLACK BISHOP <i>Euplectes gierowii</i>	w		4	2	
629	FAN-TAILED WIDOWBIRD <i>Euplectes axillaris</i>	w			6	
733	AFRICAN PIED WAGTAIL <i>Motacilla aguimp</i>	w		2		4
742	YELLOW-FRONTED CANARY <i>Crithagra mozambica</i>				6	

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

828	WINDING CISTICOLA <i>Cisticola marginatus</i>	w			6	
181	RUFOUS-BELLIED HERON <i>Ardeola rufiventris</i>	W	R-NT, U-VU		6	
183	GREY HERON <i>Ardea cinerea</i>	W	R-NT		6	
69	BLUE-SPOTTED WOOD DOVE <i>Turtur afer</i>	F		4		1
428	YELLOW-FRONTED TINKERBIRD <i>Pogoniulus chrysoconus</i>	f			5	
600	MARICO SUNBIRD <i>Cinnyris mariquensis</i>			2		3
634	SPECTACLED WEAVER <i>Ploceus ocularis</i>	f		5		
817	GREY-CAPPED WARBLER <i>Eminia lepida</i>	fw	R-RR		5	
870	WHITE-HEADED SAW- WING <i>Psalidoprocne albiceps</i>	f	R-RR		5	
916	WILLOW WARBLER <i>Phylloscopus trochilus</i>	Pf	PM	1	4	
125	EASTERN GREY PLANTAIN- EATER <i>Crinifer zonurus</i>				4	
132	ROSS'S TURACO <i>Musophaga rossae</i>	F				4
298	BROWN SNAKE EAGLE <i>Circaetus cinereus</i>		R-NT			4
316	WAHLBERG,S EAGLE <i>Hieraetus wahlbergi</i>			4		
608	COPPER SUNBIRD <i>Cinnyris cupreus</i>	fw		3		1
616	GROSBEAK WEAVER <i>Amblyospiza albifrons</i>	fw			4	
646	BLACK-HEADED WEAVER <i>Ploceus cucullatus</i>				4	
814	GREY-BACKED CAMAROPTERA <i>Camaroptera brachyuran</i>	f		4		
818	RED-FACED CISTICOLA <i>Cisticola erythrops</i>	w			4	
880	BARN SWALLOW <i>Hirundo rustica</i>	Pw,Ae	PM		4	
933	NORTHERN YELLOW WHITE-EYE <i>Zosterops senegalensis</i>	f		4		
958	RUPPELL'S STARLING <i>Lamprotornis purpuroptera</i>			1	3	
100	COMMON SWIFT <i>Apus apus</i>	P,Ae	PM	3		



ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

104	WHITE-BROWED COUCAL <i>Centropus superciliosus</i>					3
184	BLACK-HEADED HERON <i>Ardea melanocephala</i>	w				3
191	SACRED IBIS <i>Threskiornis aethiopicus</i>	W				3
52	SPECKLED PIGEON <i>Columba guinea</i>				2	
182	CATTLE EGRET <i>Bubulcus ibis</i>	G				2
590	BRONZE SUNBIRD <i>Nectarinia kilimensis</i>	f			2	
594	OLIVE-BELLIED SUNBIRD <i>Cinnyris chloropygius</i>	F				2
61	AFRICAN MOURNING DOVE <i>Streptopelia decipiens</i>				1	
163	AFRICAN OPENBILL STORK <i>Anastomus lamelligerus</i>	AwG				1
709	PIN-TAILED WHYDAH <i>Vidua macroura</i>	G			1	
	Number of species				30	33
						16

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

**a) Grievance Redress Mechanism Main Activities**

<b>S/N</b>	<b>ACTIVITY</b>	<b>Indicative COST (UGX)</b>
1.	Preparations for and attending monthly meetings for project workers and the contractor's representatives.	1000000
2.	Gender sensitisations for project contractor about employment considerations for both men and women	3000000
3.	Gender mainstreaming on the project including gender inspections and monitoring	2000000
4.	Establishment of grievance mechanism structures and committees in the project	2000000
5.	Establishment of grievance office and orientation of office personnel	1000000
6.	Rent for GRM office	1000000
7.	Remuneration and facilitation for the grievance officer	4000000
8.	Stakeholder sensitization on the grievance procedure	1000000
9.	Stipends and refreshments for GRM committee members	1000000
10.	Community sensitisations and engagements about grievance mechanism redress	2000000
11.	Office facilities, stationery and other secretarial services for GRM offices and committees	4000000
12.	Monitoring and Evaluation by the project staff and the district team	1000000
13.	GRAND TOTAL	23,000,000

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

**b) Stakeholder Engagement Plan Main Activities**

ITEM	ACTION PLANNED	TARGETED PERSONS	ENGAGEMENT APPROACHES	ISSUES FOR DISCUSSION	Indicative Cost (UGX)
1	Engagement and consultative meetings With district leaders	- HIV Focal Person, - Health Centers III or IV Heads, Population offices in the Districts, LC5s, RDC, CDO, LABOUR OFFICE DPC, DISTRICT ENGINEERS	-Face to face meetings -Informal working sessions/KIIs -Data/information sharing -Distribution of IEC materials -Media coverages through radio and TV spots	<ul style="list-style-type: none"> <li>Mitigation of likely impacts of the project.</li> <li>Baseline environmental, economic &amp; social information.</li> <li>Project views/concerns.</li> <li>Grievance management</li> <li>Mitigation/monitoring</li> </ul>	3,000,000
2	Engagement with LCI, LCII, LCIII, LCIV Chairpersons	Project affected persons	-Face to face meetings -panel discussions -Information leaflets and fliers, -Observations -photographs -Information dissemination and sharing	<ul style="list-style-type: none"> <li>Project impacts</li> <li>Affected PAPs</li> <li>Grievances</li> <li>Police records</li> </ul>	5,000,000
3	Engagement with Employer's workforce	Project affected persons	Focus group discussions	<ul style="list-style-type: none"> <li>Regulatory requirements/ permits and licenses;</li> <li>mitigation and monitoring</li> <li>Grievance management</li> </ul>	3,000,000
4	Local Community Engagements at village levels	Project affected persons	-Community gatherings -Focus group discussions	<ul style="list-style-type: none"> <li>impacts and expectations</li> <li>Local solutions</li> <li>Links and ties with the local community</li> <li>Compensation of PAPs</li> </ul>	2,000,000
5	Radio talk shows	Project affected persons	Discussions		2,000,000
6	Formation of GMCs	Project affected persons	Community meetings	<ul style="list-style-type: none"> <li>impacts and expectations</li> <li>Local solutions</li> <li>Links and ties with the local community</li> </ul>	3,000,000

ESIA Project Brief for the Proposed Morikiswa Solar Powered Mini Piped Water Supply System

ITEM	ACTION PLANNED	TARGETED PERSONS	ENGAGEMENT APPROACHES	ISSUES FOR DISCUSSION	Indicative Cost (UGX)
7	Project safety campaigns	Project affected persons	Community meetings and schools	<ul style="list-style-type: none"> <li>Project safety incidences, mitigation measures</li> </ul>	5,000,000
8	NGOs in HIV/AIDS, GBV and Child protection & awareness sector	Groups; women, children elderly	Key informant interviews Case studies, photographs	<ul style="list-style-type: none"> <li>Project impacts and expectations from the proposed project</li> </ul>	3,000,000
<b>Total</b>					<b>26,000,000</b>

**c) Environmental and Social Audit**

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

The Environmental and Social Audit should include the following activities:

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

**d) Capacity Building and Trainings**

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