



**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE
PROPOSED REDEVELOPMENT OF GOGO HYDROPOWER PLANT IN MIGORI
COUNTY, KENYA**



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BASIC PROJECT DATA		
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LIST OF ACRONYMS

ART	Antiretroviral Therapy
CC	Climate Change
CeC	County Executive Committee Member
CDM	Clean Development Mechanism Project
CIDP	County Integrated Deveopment Plan
EMCA	Environmental Management and Coordination Act
ERC	Energy Regulatory Commission
EPRA	Energy and Petroleum Regulatory Authority
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EU	European Union
FGDs	Focus Group Discussions
GoK	Government of Kenya
HTC	HIV Testing and Counselling
KENGEN	Kenya Electricity Generating Company
KETRACO	Kenya Electricity Transmission Company
KFS	Kenya Forestry Services
KII	Key Informant Interview
KP	Kenya Power
KWS	Kenya Wildlife Service
MCA	Member County Assembly
NAGRIP	National Agriculture and Rural Inclusive Growth Project
NGOs	Non-Governmental Organisations
NEMA	National Environment Management Authority
PMTCT	Prevention of Mother to Child Transmission
SEP	Stakeholder Engagement Plan
ToR	Terms of Reference
WRA	Water Resources Authority

SIGNATURE PAGE**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT**

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EXECUTIVE SUMMARY

The Gogo Hydropower Plant (Gogo HPP) was commissioned in 1958 and has an installed capacity of 2 MW (two Kaplan turbine type units of 1,000 kW each). The plant is located at the Kuja River in Migori County in Western Kenya (latitude 0°54'32.40"S and longitude 34°20'52.80"E), about 35 kilometres from Migori Town and about 25 km from the new Awendo substation. The plant draws water from Kuja River in a catchment area of 3,062 km². The reservoir of Gogo dam is very silted, which restrains the energy production of the plant. The power generated from the station is fed into the 33 kV network via the Gogo-Awendo distribution line. The plant has maintained low load factors due to frequent breakdowns and transmission line trips. The generated electricity from the plant is evacuated via an unstable 33 kV distribution line. The station experiences long forced outages due, in part, to worn-out parts.

The study aimed at carrying out an Environmental and Social Impact Assessment (ESIA) for the Redevelopment of the Gogo Hydropower Plant so as to establish the positive and negative project impacts and propose mitigation measures for the negative impacts. Impacts identified are presented in three phases namely: Construction, operation and decommissioning. Some of the positive impacts identified include: increased access to energy, enhanced security in the area, production of renewable/clean/green energy, employment opportunities to local communities, economic benefits to the local and national economies and the provision of a stable power supply.

Kenya is currently experiencing electrical power shortage due to various factors including climate change, inadequate investment in the power sector and rapid economic growth. The proposed redevelopment of Gogo hydropower plant project may serve as one of the committed power generation projects that are expected to meet Kenya's short to medium term power needs.

The redevelopment of the hydropower plant aims to achieve a power output of above 8.7 MW by utilizing the available river discharge along river Kuja and optimize the hydropower plant components.

This ESIA has analyzed potential environmental and social impacts of implementing the power plant during construction and operational phase based on both the requirement of the EMCA (1999) and those of the World Bank Operational Policy and Environmental and Social Frameworks. The study has demonstrated that with relatively easy and cost-effective mitigation measures, the negative environmental and social impacts can be kept at acceptable levels. Therefore, it is concluded that with implementation of the mitigation measures contained in the Environmental and Social Management Plan (ESMP), the project redevelopment will not pose any serious adverse and negative environmental impacts. Ultimately, it will be possible to successfully mitigate the impacts related to the redevelopment since the power plant will be designed, constructed and operated according to the latest international recognized standards.

In a nutshell the following was noted about the project:

The project brings about both positive and negative impacts during the different phases.

Specifically, key negative impacts that require careful management during the plant construction, operation and decommissioning phases include:

- Increased siltation of River Kuja during construction;
- Loss/disturbance to wildlife especially birds that may roost on the electricity pylons

- Waste generation/Increased spoil due to accumulation of silt dredged from the dam;
- Increase in human wildlife conflicts as people source for water because of presence of hippopotamuses and crocodiles.
- Conflicts over water use during construction phase of the project
- The risk to public safety and environmental quality (soil, air and water) due to dredging, oil spill, equipment failure or damage.
- Impacts associated with noise and vibration generated by the power plant during operation. This may require a potential buffer zone around the power plant site if the noise levels generated exceed recognized Kenya occupational exposure limits / WHO guideline levels.
- Increased risk of disease with influx of immigrant workers
- Health and safety risks especially drowning in the dam.
- Loss of habitat.
- Change in landscape/visual character.
- Noise and vibration.
- Risk of fire.

Mitigation measures for the foreseen negative impacts have been outlined in the ESMP in this report and should be strictly adhered to.

The following observations were made concerning the project:

- Project harmony and Support of Government Policies (Green Energy and Environment): The proposed project is in line with the government's big Four Agenda, Kenyan constitution 2010 and policies touching on green energy sources, employment creation, income generation and rural development. KenGen should ensure adherence to the environmental laws and regulations from the onset of the project.
- Compliance with the existing Legislation, Conventions, Treaties, Covenants and Standards: This project is not in contravention of any of the existing laws and standards. Further to this, KenGen will ensure that the relevant laws and standards are upheld throughout the project cycle.
- Project impacts Reversibility/Irreversibility: The project is likely to be more beneficial than harmful when well executed. The foreseen social and environmental impacts can be prevented or reversed by use of environmental conservation measures and the mitigation measures proposed in the project study report.
- Geographical Extent of the Impacts: The foreseen negative social and environmental impacts are subtle and on a local scale when compared with the positive impacts of the project which are national.
- Project sensitization and acceptability: After project sensitization, the local communities and their leadership have promised to support the project. The Gogo neighbouring communities accept the project and the local leaders and political leaders are looking forward to a speedy completion of the study so that the project can be licensed. The local people and the political and religious leaders are receptive to the project.
- Occupational health hazards during construction and project operational phase: This includes accidents and any injuries to human health. Such impacts in the unlikely event if they occur are significant and irreversible, and it is therefore critical that KenGen puts in place all the proposed mitigation measures on occupational health and safety during construction while

during operation, the community members should be capacity built on occupational health and safety. The dam area should also be fenced to protect the people from accidents such as accidental falls and drowning.

- Land Acquisition and loss of livelihood: KenGen intends to use its current land establishment for the redevelopment. There is no anticipated displacement of communities, families or individuals hence there will be no loss of or displacement of livelihoods occasioned by land acquisition. It is however anticipated that some facilities may require limited extra land. The identified parcel of land is barren and currently not cultivated, with no assets like crops or trees of value. It is recommended that this is done and negotiated with a land owner on a willing seller, willing buyer basis and related payments for the land must be done before project commencement. Involvement of the County Lands Department in the process will be critical.
- It was noted that most attacks emanating from human wildlife conflicts especially the hippopotamuses and crocodiles occur when the community members are fetching water from the river. The Kenya Wildlife Services have committed to map out the wildlife hotspots in the area. KWS would also offer technical support in management of wildlife and also manage complaints arising from human wildlife conflicts.

Recommendations.

Following the ESIA study, the recommendations include:

- NEMA should review the report and provide comments. However, it is the opinion of the ESIA team that the project should be licensed since the study has found it to be ecologically, economically and socially sound;
- Project Designs should be approved by the relevant authorities before construction works commences and construction works should be in line with relevant regulations, policies and laws;
- Environmental audits should be undertaken and submitted to NEMA regularly once the project is operational to ensure compliance with relevant legal and regulatory requirements.
- Downstream ecology should be protected by ensuring the Kuja River flows are regulated throughout the operation period and continuous monitoring should be emphasised.
- Adherence to ESMP: In addressing the environmental issues, the contractor and KenGen must follow the mitigation guidelines provided under ESMP. This will ensure sustainable development of the project.
- Watershed Management for the Kuja upstream areas should be prioritized focusing on agro-forestry and riparian areas rehabilitation with indigenous species and sensitization of the local communities on the same.

1. CHAPTER ONE : INTRODUCTION

1.1 Project Background

Kenya Electricity Generating Company PLC (KenGen) is a public liability company, registered under the Companies Act of the Laws of Kenya. KenGen was incorporated in 1954 with its core business being the development, management and operation of power generation plants. The Company is the leading electric power producer in Kenya accounting for close to 60% of the total electric power supplied to the national grid and is listed on the Nairobi Stock Exchange. KenGen is owned 70% by the Government of Kenya and 30 % by private shareholders. Currently, the Company has a total installed capacity of 1,796 MW comprised of hydropower 818 MW, geothermal 699 MW, thermal 253.5 MW and wind 25.5 MW.

Kenya is currently experiencing a shortage of power supply due to adverse weather, inadequate investment in the power generation and rapid economic growth. KenGen therefore intends to redevelop Gogo Hydropower plant which was commissioned in 1958. The plant has an installed capacity of 2MW (two Kaplan turbine type units of 1,000 kW each). The project aims to achieve a power output of approximately 8.7 MW. The Gogo power plant re-development will be funded by the European Union through the Delegation of the European Union to Kenya and KenGen will be the implementing agency.

In Kenya, all new projects are required to undertake Environmental and Social Impact Assessment (ESIA) study at the planning stage to ensure that all significant environmental impacts are taken into consideration at the implementation stage. Power generation plants are listed in the second schedule of the Environmental Management and Coordination Act (EMCA) of 1999 as projects that are required to be subjected to ESIA study.. The scope of the assessment covers pre-construction phase and construction works of the proposed redevelopment project which include ground preparation, civil works, structural works, equipment installation, as well as the utilities required, waste generation and disposal, operational and decommission phases of the hydropower plant. The study is to be carried out within the Legal Framework and Policies in Kenya as stipulated in the EMCA (1999).

1.2 Project Description

Hydro power plants are designed to convert potential energy into mechanical energy through water turbines, which then generate electricity. In a hydropower plant, water flows through a pipe, or penstock, then pushes against and turns blades in a turbine to spin a generator to produce electricity. Therefore, hydropower plants are usually located on or near a water source. The volume of the water flow and the change in elevation or fall often referred to as head from one point to another determine

the amount of available energy in moving water. In general, the greater the water flow and the higher the head, the more electricity a hydropower plant can produce.

The Gogo Hydropower Plant (Gogo HPP) was commissioned in 1958 and has an installed capacity of 2 MW (two Kaplan turbine type units of 1,000 kW each). The plant has a gross head of about 20 m and a current design discharge of 11 m³/s. The plant is located at the Kuja River in Uriri Sub-county, Migori County in South Western Kenya (latitude 0°54'32.40"S and longitude 34°20'52.80"E), about 35 km from Migori Town and about 25 km from the new Awendo substation.

The power plant consists of a gravity dam, an underground power conduit with a surge tank and a power house with two identical Kaplan turbines. The plant draws water from Kuja River in a catchment area of 3,062 km² which is impounded by the gravity dam. The plant is owned and operated by KenGen. It was originally designed to supply the South Nyanza Mines at Macalder. Currently, the reservoir of Gogo dam is very silted, which has reduced the energy production of the plant. The power generated from the station is fed into the 33 kV network via the Gogo-Awendo distribution line. The plant has maintained low load factors due to frequent breakdowns and transmission line trips. The generated electricity from the plant is evacuated via an unstable 33 kV distribution line. The station experiences long forced outages due, in part, to worn-out parts. The proposed project aims to achieve a power output of 8.7 MW by utilizing the available river discharge and optimizing the hydropower plant components and some additional downstream land for the new powerhouse location.

The Estimated total cost of the project including the associated infrastructure is KeS 2,650,000,000 (KeS 2.65 billion Shillings).

The dilapidated hydropower plant needs to be redeveloped to enhance its efficiency. The recyclable materials from the old hydropower plant can be reused in the new power house or sold as scrap metals to traders. The tunnel and penstock can be left in place for future use. The powerhouse building can be reused for equipment storage and workshop.

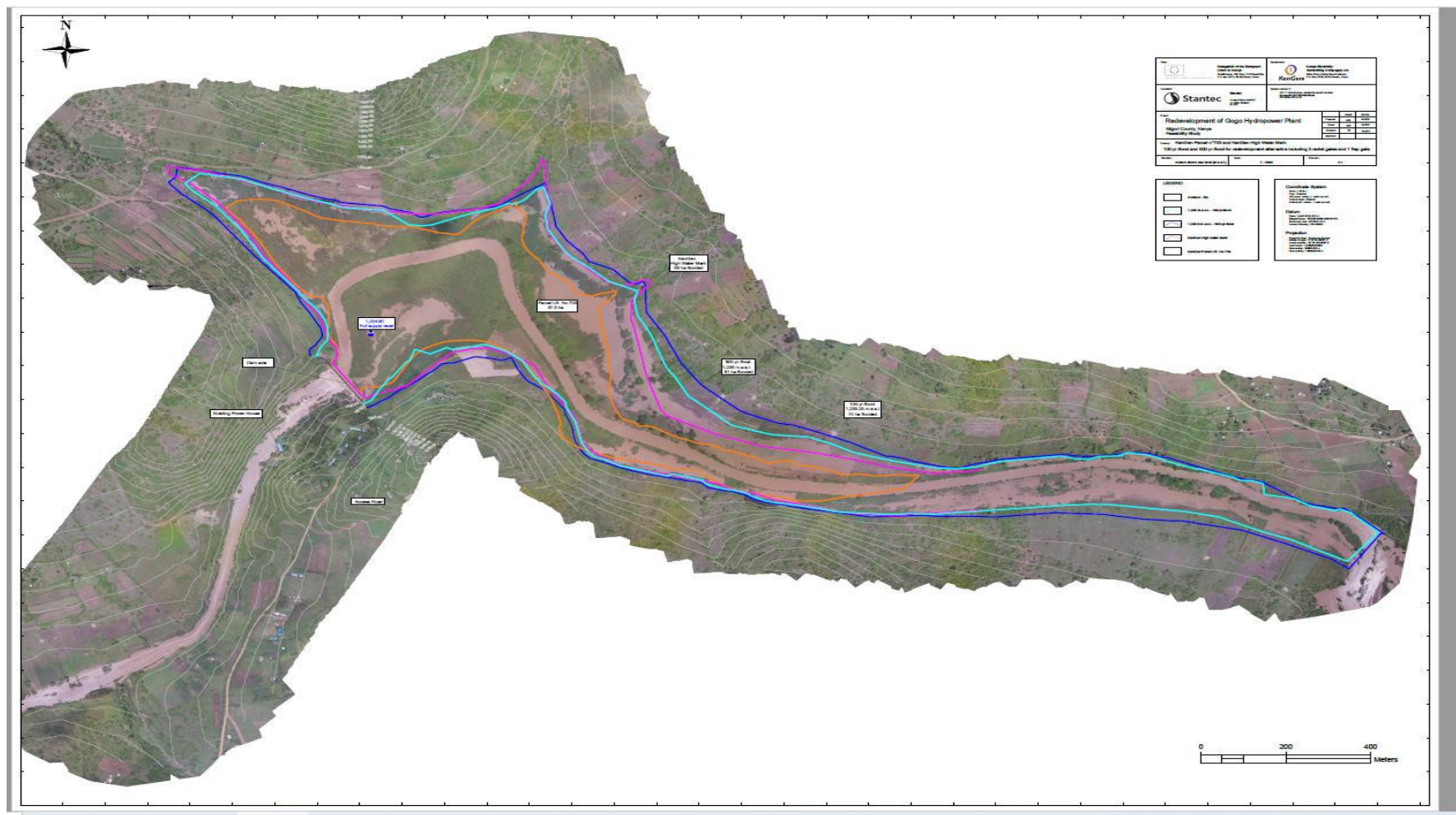
The redeveloped hydropower project components are as per the attached datasheet (Table 1).

Table 1 Gogo Hydropower Redevelopment Project Data Sheet

Project Data Sheet	
Location	
Location	At Gogo Falls, on the Kuja River about 30 km North-West of Migori, capital of Migori County, Kenya.
Coordinates (ARC1960)	Intake : 9899899 N, 650098 E Powerhouse : 9899899 N, 650098E
Road Access	From Migori, the project is accessible from A1 or C13 (tarmac roads) through several rural roads i.e., Migori-Myarongi Rd or C19-Macalder Mines.

Project Data Sheet	
Hydrology	
Catchment Area	3059 km ²
Average Annual Inflow	41.0 m ³ /s
Mean Annual Rainfall on Catchment Area	1400 mm
Peak flow for 10-year flood	615 m ³ /s
Peak flow for 100-year flood	1010 m ³ /s
Peak flow for 500-year flood	1330 m ³ /s
Reservoir	
Full Supply Level (FSL)	1234.9 masl
Minimum Operating Level (MOL)	1233.4 masl
Reservoir Capacity at FSL	100,000 m ³
Reservoir Area at FSL	10 ha
Maximum Water Level (500-year flood with all gates open)	1235.9 masl
Dam	
Crest level	1236.5 masl
Total Length (including Spillway)	190 m
Total length of ungatted spillway	94 m
Ungatted spillway crest level	1233.4 masl (principal spillway without flashboards) 1234.9 masl (principal spillway with flashboards) 1234.9 masl (secondary spillway)
Number of gates	3x radial gates 7.90 m (w) x 5.2 m (h) 1x flap gate 6.0 m (w) x 3.5 m (h) 1x bottom outlet 3.0 m (w) x 3.0 m (h)
Equipment	Pedestrian bridge, Hoist system and stoplogs
Water Intake	
Type	Lateral inlet headrace tunnel portal type
Inlet Dimensions (w x h)	16 m x 4.5 m (two water passages)
Sill level	1228.0 masl
Equipment	Trashracks and stoplogs
Headrace tunnel	
Length	440 m
Type and dimension	Horseshoe tunnel with straight side and flat slab Ø4.4 m
Surge tank	
Slab	1219.2 masl
Diameter	16.5 m
Maximum water level	1240.4 masl
Penstock	
Length	85 m
Type and dimension	Steel penstock Ø3.6 m Bifurcation : 2 x Ø2.6 m
Powerhouse	
Type	Surface
Dimensions (l x w)	32 m by 16.2 m including the service bay
Main Floor Elevation	1219.2 masl
Generator room elevation	1214.0 masl
Turbine axis elevation	1208.9 masl
Tailrace channel	
Length and width	50 m x 25 m
Longitudinal Slope	1V:2H followed by a slope of 0.5%
Hydro mechanical Equipment	

Project Data Sheet	
Number and type	2 vertical axis Kaplan turbines
Rated Discharge	2 x 25 m ³ /s
Rotating speed	300 rpm
Altitude of the upstream water level	1234.9 masl
Altitude of the downstream water level at nominal flow	1212.4 masl
Design gross head at nominal flow	22.5 m
Minimal gross head with maximal downstream water level	16.70 m
Turbine minimum operating flow per unit	6.1 m ³ /s
Generators	
Number	2
Frequency	50 Hz
Active power with two units in operation at Q _n	4290 kW per unit
Design power factor (Cos φ)	0.9
Transformers	
Number	2
Rated Power	5300 kVA
Primary/Secondary Voltage	6.6 / 33 kV
Substation	
Type	Conventional
Dimensions(l x w)	40 m x 30 m
Voltage Level	33 kV
Energy power	
Maximum Plant Discharge	50 m ³ /s
Installed Capacity	8.6 MW
Yearly energy	32.3 GWh/yr
Capacity factor	43%



5

1.3 ESIA Study objectives

The EIA study objectives were to comply with the NEMA's requirements for full EIA study as per the terms of reference for the assignment. The EIA study objectives included to:

Conduct an Environmental and Social Impact Assessment to identify positive and negative impacts of the proposed project and propose the most appropriate interventions during construction, operation and decommissioning of the project.

Collect baseline socio-economic and environmental data of the project area and potential impact expected from project construction, implementation, operation, and decommissioning

Develop an ESMP including implementation mechanisms and review the power plant design and its compliance to environmental requirements

Develop an Environmental and Social Monitoring Program

Identify and contact stakeholders to seek their views on the proposed project.

Facilitate public open/public meetings for the stakeholders to air their views.

1.4 Scope of the ESIA

The ESIA scope includes:

- Environmental, social, labor, gender, health, safety, risks and impacts
- The Project and related and associated facilities (where relevant)
- Risks and impacts that may arise for each activity in the Project cycle, including site establishment, construction, operation and decommissioning
- Role and capacity of the relevant parties including government, contractors and suppliers
- This ESIA has identified potential beneficial and adverse, direct and indirect, and cumulative impacts of the Project related to the bio-physical and socio-economic environment.

1.5 Project Justification

Electricity consumption in Kenya is currently forecasted to grow by an annual average of approximately 7.3% per year over the long term, while annual peak load is forecasted to grow by an annual average of approximately 7.5%¹. The national electrification rate averages at 20% whereby 51% of urban households are connected to the national grid as compared to only 8% of the rural households. Electricity is mainly used for lighting. Hydro power remains the largest single source.

With 56% of grid connected electricity being generated by hydro power, surges and power cuts are common during the dry seasons when the river regimes are at their lowest. In recent times, the reserve margins have decreased with increased demand and more erratic rains, the seasonal breakdowns have become more frequent. Furthermore, the recipients at the end of the lines often suffer voltage drops that trigger power outages.

¹Power Generation and Transmission Master Plan, Kenya, Long Term Plan 2015 – 2035 Vol. I

KenGen has a total installed capacity of 1,796 MW comprised of hydropower 818 MW, geothermal 699 MW, thermal 253.5 MW and wind 25.5 MW. Ken Gen generates most of its power from hydro dams and to a smaller extent, geothermal sources. The Kenya's Energy Least Cost Power Development Plan for the period 2021-2030 notes that the country has a current installed capacity (grid connected) of 1,429MW while the electricity demand by end of 2017 was 1,710MW and the same is projected to rise to 9,790MW by 2037.

Therefore, in order to alleviate the current energy deficit, Kenya has been embarking on projects geared towards promoting investments in the energy sector. This thus calls for power projects that will help reduce the dependence on non renewable sources of energy. Implementation of power projects such as the proposed Gogo Hydro power plant project will contribute immensely towards alleviating the country's energy deficit.

In addition, some of the policies developed in Kenya such as the Feed in Tariff policy, 2008 (Rev.2012) target alternative sources of energy such as wind, geothermal, co-generation and biomass generated electricity. These policy initiatives are hoped to attract private sector investments as well as help enhance national energy security while contributing to employment and income generation.

The decision to redevelop the Gogo Hydropower plant project is a good investment in terms of economic development. The proposed project is a renewable energy project and will result in a reduction of anthropogenic emissions of greenhouse gases.

2. CHAPTER TWO: ESIA STUDY METHODOLOGY

2.1 ESIA Study Approach

The study was based on the project objectives outlined in the Feasibility Study for the Redevelopment of the Gogo Hydropower Plant and was structured into broad areas as detailed below.

- Desk Review/Preparation Stage for the study
- Inception/Kick Off Meeting
- Reconnaissance and Screening visit
- Scoping visit
- Field Surveys and Socio – Economic Baseline Survey
- Public Participation and Stakeholder Consultation
- Preparation of Environmental and Social Management Plan
- ESIA Report Disclosure
- Submission of the report to NEMA for Licensing

2.2 Detailed Study Activities and Tasks

2.2.1 Inception/Kick Off Meeting

An inception/kick off meeting was virtually held between the Consultant (Stantec) and the Client (KenGen) on 17th September, 2020. The European Union which is funding the Feasibility study was also represented. The meeting was aimed at:

- Introducing the consultants team assigned to the project
- Presentation by the Consultant of the following components as per TOR:
 - ✓ Proposed methodology of the study, work plan, deliverables and time schedule for all the tasks
 - ✓ ESIA study methodology
 - ✓ Design approach for Gogo and the possible design options
 - ✓ Geotech & Topo investigations methodology
- Discussion of proposed workshops and public participation dates
- Agreement on commencement dates of activities including an initial site visit dates and itinerary for:
 - ✓ Plant inspection
 - ✓ Reconnaissance and screening visit and
- Establishing Communication protocol
- Discussing consultant's data and information requirements

2.2.2 Screening and Reconnaissance Visit

Screening is the process of assessing the viability of a project for an Environmental and Social Impact Assessment (ESIA) and evaluating the extent of assessment required. A comprehensive reconnaissance survey of the area was performed from the 19th to 23rd September 2020, to survey the proposed redevelopment location to develop an impression of the topography, flora and fauna and also map out the sensitive sites such as forests, hill tops, wetlands, Important Bird Areas, Biodiversity hot spots within the project area, as well as to conduct the preliminary scoping for Environmental and Social impacts. The visit also conducted preliminary engagements with some key stakeholders to help with stakeholder identification and analysis. The visiting team made an observation of the settlement pattern and physical boundaries of the project area and initiated communication links with local leaders in order to establish channels for future engagements. From the reconnaissance survey it was evident that due to the magnitude and type of the project, a comprehensive ESIA had to be carried out.

2.2.3 Scoping Study

A scoping visit study was carried out between 30th November and 4th December, 2020. It was aimed at conducting preliminary assessment of the potential social and environmental impacts of the project, suggest possible mitigation measures to minimise negative impacts and to inform the development of a detailed and comprehensive Terms of Reference of the ESIA Study. The scoping report together with the ESIA Terms of Reference were submitted to NEMA before a full ESIA study could be conducted.

2.2.4 Desktop Study/Literature Review

This entailed the identification and Description of Guidelines and Standards. This was aimed at identifying and considering the regulations and standards governing environmental quality, solid and liquid waste management, health and safety, protection of sensitive areas, land use and control at the national and local levels and ecological and socio-economic issues including compliance.

Key institutions involved in development issues in the project area were consulted. These institutions included the County Government offices in Migori, National Environmental Management Authority (NEMA), Kenya Forest Service, Kenya Wildlife Service, County Environmental Office, Water Resources Authority (WRA), County Irrigation Office, County Agricultural Office, Department of Agriculture and Fisheries, Education, Public Health, Social Protection, Kenya Power, local CBOs and NGOs and Local Leaders of Migori County, political leadership including the Member of Parliament Uriri, Member of County Assembly former councillors and officers drawn from the

Ministry of Interior . The EIA regulations issued in accordance with the provisions of Environmental Management and Coordination Act (EMCA) of 1999 were applied in the process.

The following Acts were reviewed and considered in this study.

- The Constitution of Kenya, 2010;
- The Environmental Management and Coordination Act, 1999;
- Environmental (Impact Assessment and Audit) Regulations, 2003(Legal Notice No. 101) and Environmental Impact Assessment and Audit Regulations (Amendment) 2019
 - ✓ Environmental Management and Coordination (EMC) (Water Quality) Regulations, 2006 (Legal Notice No.121)
 - ✓ EMC (Waste Management) Regulations, 2006
 - ✓ EMC (Conservation of Biological Resources, Access and Benefit Sharing) Regulations, 2006
 - ✓ EMC Controlled Substances (Ozone Depleting Substances) Regulations, 2007
 - ✓ EMC (Noise and Excessive Vibrations Regulations, 2009)
 - ✓ EMC (Wetlands, Lakeshores and Riverbanks) Regulations, 2009
- Wildlife (Conservation and Management) Act 2013;
- The Occupational Safety and Health Act, 2007;
- Work Injury Benefits Act (WIBA), 2007;
- Employment Act 2007;
- The Climate Change Act, 2016
- The County Governments Act 2012;
- Urban Areas and Cities Act No. 13 of 2011;
- The Penal Code (Cap. 63);
- The Public Health Act (Cap. 242);
- The Water Act 2016;
- National Environment Action Plan 2009 – 2013;
- Sessional Paper No. 1 of 1999;
- Physical Planning Act, 1999
- Explosives Act, Cap 115
- Energy Act, 2019
- Land Act 2012
- The Local Government Act (cap 265)

Other relevant laws that govern protection of the environment and executed by different arms of the government that were studied and reviewed include:

- The Agriculture Act, and the Agriculture (Basic Land Usage) Rules, 1986
- The Food, Drugs and Chemical Substances Act –as revised in 1992
- The Government Land Act (Cap 280)

The study also referred to the following policies and papers which have a bearing on the project:

- European Investment Bank (EIB) Standards, with specific reference to the EIB Guidelines on Hydropower Development
- The World Bank's Environmental and Social Framework and Operational Policies relevant to the project
- The International Hydropower Association Sustainability Guidelines and Sustainability Assessment Protocols
- African Development Bank Integrated Safeguard Systems (Policy statements and Operational Safeguards)
- National Environmental Action Plan (NEAP)
- Environmental and Development Policy (Session Paper No.6 1999)
- The World Commission on Environmental and Development (The Brundtland Commission of 1987)
- International Conventions and Treaties

2.2.5. Description of baseline environmental and mitigation measures

This was aimed at gathering data for the description of the environmental conditions, potential impacts and design of mitigation measures and development of an Environmental and Social Management Plans as part of the ESIA study report for use during self-audit of the project during the operation phase.

The ESIA team carried out a due diligence to identify the significant environmental issues in the project area. The data collected has been collated and presented as information on baseline characteristics of the existing environment within and around the proposed dam area and hydropower plant site. The study has distinguished between positive and negative impacts, direct and indirect impacts, immediate and long-term impacts and identified irreversible impacts which have been used in formulating appropriate recommendations and conclusions. The consultant collected data on the physical and biological environment; analysed safety, risks, and sand waste management implications by the project. The process of collecting this information ensured public consultation and participation throughout the ESIA study process.

Questionnaires, observations, interviews and photographs were used to collect data. Relevant secondary data from all environmental and social institutions in the project area was gathered. The tools used for data collection included:

- Household survey questionnaire
- Key Informant Interview Guides
- Focus Group Discussion Schedules
- Observation checklist
- Public consultation guide
- Digital Camera

The consultant used ODK to collect, enter and store the data and MS Excel for analysis of the data for presentation. The consultant drew inferences from the qualitative and quantitative data collected based on professional understanding and experience and the findings from the analysis formed part of the basis of the recommendations and conclusions made. Consequently, separate ESMPs have been developed for different phases of the project.

2.2.6 Description of physical environment

This activity was conducted to enable the study provide a detailed description of the project's physical environmental conditions. The study team collected, collated and has presented information on:

- Climate
- Topography
- Hydrology
- Drainage
- Geology
- Air quality
- Soil and soil erosion
- Wetlands, among others.

Assessment data collection tools used included:

- Observation checklist
- Public consultation guide
- Digital Camera

Additionally, the process of evaluating the changes in sediment load of the river water was included as this is a likely cause of change of river morphology and increased turbidity.

2.2.7 Description of biological environment

An activity was conducted to obtain data on the biological environmental conditions and information collected has been collated and presented on:

- Flora and fauna types and their diversity
- Sensitive habitats
- Endangered species
- Protected areas etc.

The methodologies used to collect the data included both quantitative (field sampling) and qualitative (desk-based literature review and FGDs) methods on the biodiversity in River Kuja and its environs. To supplement this, other data collection tools used included:

- Observation checklist
- Public consultation guide
- Digital Camera

2.2.8 Field Sampling /Ecological Surveys

- Flora: Both terrestrial and aquatic plants were sampled within the project area and along the banks of the Kuja river. Belt, random and meander transect walks methodology were applied. Each sampling zone was geo-referenced using GPS and all vegetation occurring within a plot/enclosure identified and recorded.
- Fauna of the project area was sampled through random field transects and aerial sweep netting for flying adult insects e.g. dragon flies, damsel flies, etc. and those resting in vegetation. Some specimens were identified instantly on site while those that were not identified on site were kept in butterfly envelopes for further identification in the laboratory.
- Large and small mammals, amphibians and reptiles were visually observed, photographed and identified either in the field or later in the laboratory using identification keys. The presence of mammals; birds; amphibians; and reptiles was also confirmed through:
 - ✓ Spoor;
 - ✓ Droppings;
 - ✓ Hairs/feathers;
 - ✓ Animal diggings; and
 - ✓ Local knowledge /Indigenous knowledge

2.2.9 Identifying Occupational Safety & Health concerns

This task aimed at identifying, analysing, and describing the occupational health and safety concerns that are likely to arise as a result of the proposed redevelopment of the Gogo dam.

Data on occupational safety and health concerns was collected, collated and given descriptions and used in conducting an analysis of safety, risks, health, sanitation and waste management implications brought about by the project. Data collection tools for the gathering information were developed and included:

- Household questionnaire
- Observation checklist
- Public consultation guide
- Digital Camera

2.2.10 Carry out survey to collect data on anticipated new challenges

This task was aimed at providing information on anticipated and potentially new challenges with the redevelopment of the proposed Gogo Dam Power Plant Project.

Data was collected in relation to:

- Flooding
- Siltation
- Potential conflict over access and use of water resources with other projects in the Kuja river.

All significant social and environmental changes expected due to the proposed project were identified and have been analysed and described by the consultant. These encompasses environmental changes as a result of interaction between the proposed project and the environment that are likely to bring about changes in the baseline environmental conditions.

2.2.11 Specify through maps at appropriate scales and boundaries of the study area for assessment.

The project area has been mapped out showing appropriate scales of the boundaries of the area to be affected environmentally.

2.2.12 Identification of potential environmental impacts that could result from the project

The task was aimed at identifying potential positive and negative environmental impacts that would result from project implementation. A distinction and description has been made of the positive and negative, direct and indirect and long term and immediate impacts resulting from the proposed redevelopment of the Gogo Power Plant Project. The unavoidable or irreversible impacts have been quantitatively described in terms of their environmental costs and benefits and the economic values have been assigned appropriately.

2.2.13 Socio-economic situational analysis

The study collected socio-economic data on the status of the Project Affected Persons of the Gogo Hydropower redevelopment project. The socioeconomic status was measured by assessing their income, wealth, education, and occupation. Other data used included demographics (population in the area & demographic patterns); land use patterns, livelihood activities; existing social infrastructure (schools, churches, health facilities, social centres and halls, markets, shopping centres, etc.); employment; labour availability across seasons; historical and cultural heritage sites; communication networks and households whose land is likely to be affected by the project.

Data was also collected on economic production activities, consumption, and the distribution of goods among household members and was used for benchmarking the likely impact of the project on the social economic status of households. A social economic survey was also used to reveal existing social inequalities in resource access, and people with influence, privileges, power and control of communally owned resources. Knowledge of social stratification and inequalities gave an indication of the likely impact on the project beneficiaries (access to irrigation and domestic water) and how the negative impacts will be mitigated.

Social capital and reciprocal relationships were assessed by looking at social organizations, and member interests/likely role in the management of water resources. Social interactions that could threaten the project such as conflict and unhealthy competition were also investigated.

The data was collected using a socio-economic baseline survey tool. The consultant used questionnaires, checklists, consultation guides and a digital camera as data collection tools. The survey was conducted within and around the proposed dam and power plant. The consultant sampled and collected primary data from 10 villages from Kajulu II Sub Location. The survey also utilised the household information contained in the 2019 Kenya National Population and Housing Survey to develop a sampling framework within the sub-location of study. The respondents were selected through a simple random sampling method.

The data for socio-economic survey was collected and stored using the ODK application and analysed using MS Excel.

2.2.14 Gender Analysis

The study investigated existing social and economic inequalities in the access to, and control of household and community resources, and the likely impact of the project on men, women and children. Through survey questions and focus group discussions, the study investigated:

- Gender stratification, social economic roles and responsibilities

- Access and control of household resources according to gender
- Potential impacts of the project on division of labour
- Potential impacts of the project along gender economic interests and gender economic empowerment/marginalization
- Likely impact of power generation

2.2.15 Stakeholder analysis

This activity aimed at identifying and assessing key people, groups of people and institutions that could lay claim on the Redevelopment of Gogo Power station and suggest how diverse interests would be considered and managed. The analysis aimed at stakeholder management which entailed identifying, recognizing and acknowledging the stakeholders; determining their influence and interest; establishing consultation, communication and engagement modes with them.

Discussions and engagements were held with various stakeholders guided by the following questions:

- What interests do the stakeholders have in the outcome of the Gogo Dam Power Plant Redevelopment Project? Is it positive or negative?
- What motivates the stakeholders mostly?
- What information do stakeholders want from the project?
- How do stakeholders want to receive information? What is the best way of communicating messages to them?
- What is the stakeholder's current opinion of the project? Is it based on good information?
- Who influences the opinion of stakeholders about the project? Are some of these influencers important stakeholders in their own right?
- If stakeholders are not likely to be positive, what will win them around to support the Gogo project?
- If it's not possible to win stakeholders, how are we going to manage their opposition?
- Who else might be influenced by their opinion? Do these people become stakeholders in their own right?

2.2.16 Social Aspects and Beneficiary Participation.

- **Beneficiary participation**

Beneficiary participation is an important component in the process. It is vital in order to ensure ownership and hence sustainability. The Consultant incorporated beneficiaries and all aspects of principles for social impact assessment such as integrating the beneficiaries and incorporating a bottom-up approach through consultations at all levels.

- **Enhancing Project Affected Persons and stakeholder participation in the development process for the proposed power plant redevelopment project**

- ✓ **Local leaders project orientation and consultative meetings**

Elected local leaders, religious, administrative and community-based were identified to have an important role to play in the mobilization of the community to participate in the development of the project. The consultant in consultation with the client held several meetings and conducted consultations with the Migori County administration key among the Governor, area Member of Parliament and area Member of County Assembly; national government line ministries/departments, community leaders, opinion leaders and current scheme officials to explain the proposed expansion of the project. This gave an opportunity for the leaders to give their views and inputs on the proposed expansion as a way of deepening local ownership of the process. Subsequent ad hoc leaders ‘consultative meetings will be held to address emerging issues before a final study report is published.

- ✓ **Community sensitization meetings**

Community sensitization meetings were held within the project areas with the following objectives:

- Explain to the community and create awareness on the proposed project development in general and in particular the scope of the project; stakeholders of the project; development approach; expected benefits to the community; anticipated roles and responsibilities of the community and other stakeholders; role of consultant and role of the client.
- Discuss with the community matters relating to project membership and ownership.
- Discuss with the community, the likely social and environmental impacts of the project and how these will be addressed if they occur.
- Obtain feedback from the communities on their views and expectations on the project, issues of concern to them and their proposals on how these issues could be effectively addressed.

2.2.17 Requirements for Public Consultation

During the study, consultations and community meetings were held with key stakeholders such as local people, downstream water users, local government in the project area, Community Based Organizations (CBO’s), NGO’s and vulnerable groups such as the elderly, women, widows, youth, people living with disabilities within the study area. While ensuring that these meetings were accessible to all People Affected by the project (PAP’s) and interested parties, the study ensured that the views of affected and interested parties were taken into consideration, in particular with respect to requests and comments regarding environmental and social issues. These are reflected in the ESIA report.

Documentary evidence for the list of participants with their signatures, the minutes and pictures of these activities are provided as an annexe in this report. The methods, locations and frequency of public consultation was proposed by the Consultant(s) and approved by the client before conducting the meetings.

2.2.18 Institutional Capacity of the Implementation agencies

The study assessed the institutional assessment to identify the institutions responsible for the sustainable operation of the power generated and carried out a capacity assessment and needs of the agencies; and appropriate recommendations have been made in this report. The institutions were identified and consulted to determine their role and functional capacity in managing the extra power to be generated by the redeveloped Gogo power plant. The scope of the assessment entailed identification of technical, core and enabling environment capacities, shortcomings that could undermine the implementation and sustainability of the project.

The core capacities assessed included capabilities in management and leadership, attitude and ability to formulate strategies, resource use and implementation of activities in line with strategies; capabilities in coordination and resolving conflicts of interest, creating cooperative relationships with others and monitoring progress. The technical capacity assessment focused on techniques, and particular knowledge of running the project, and assessment skills for solving problems; while an assessment of the enabling environment focused on the administration systems, infrastructure and tools, regulations and laws, behavioural modalities and institutional values.

Based on the findings of these analyses above, the study has proposed an institutional arrangement plan for implementation, monitoring and management during the construction and operation stages of the Gogo power redevelopment.

2.2.19 Analysis of project alternatives

The Consultant has carried out an evaluation of the project's alternatives alongside the proposed development alternative in order to select the most appropriate alternative. This was undertaken through an analysis of the project alternatives in terms of site, technology, scale and route options. The No action alternative was also considered. Only the alternative with the least adverse impacts will be selected on the basis of fewer negative impacts and the cost-benefit analysis.

2.2.20 Make appropriate conclusions and recommendations

The study provides conclusions and recommendations based on a description and analysis of all concerns that arose as a result of both the construction and subsequent operations of the proposed

facility. The recommendations and conclusions propose corrective and remedial measures to be implemented under the ESMP.

2.2.21 Compilation of the Report

An ESIA Study report has been prepared in the format prescribed in the EIA guidelines of 2003.

2.2.22 Public disclosure

This involves the disclosure of the findings, conclusions and recommendations of the ESIA report to stakeholders and the public. Findings of the ESIA report are disclosed during a stakeholder workshop to be held once the ESIA has been completed.

2.2.23 Presentation of Report to NEMA

After incorporating feedback and comments from the public disclosure workshops and consultations, a final ESIA Study report is submitted to NEMA for project approval and licensing.

3. CHAPTER THREE: POLICY, LEGAL AND REGULATORY FRAMEWORK

This chapter presents the national and international legal framework for environmental and social protection for hydro-power projects. In addition, reference has been made to World Bank Environmental and Social Safeguards and Operational Policies.

3.1. POLICY FRAMEWORK

Policy	Key Provisions	Relevance to Gogo Hydropower Plant
Kenya Vision 2030	This is Kenya's economic blueprint covering the periods 2008-2030. It aims to transform Kenya into a newly industrializing middle-income country by providing high quality life to all citizens by the year 2030. It outlines specific environmental management strategies among them to harmonize environment related laws for better environmental planning and governance.	Access to electricity is a major driver of industrialisation. With enhanced power supply, more people can be connected to the grid.
Sessional Paper No. 6 of 1999 on Environment and Development	Every person in Kenya is entitled to a clean and healthy environment and has a duty to safeguard and enhance the environment. As envisioned in Sessional Paper No. 6 of 1999 on Environment and Development, Kenya should strive to move along the path of sustainable development to meet the needs of the current generation without compromising the ability of the resource base to meet those of future generations. The overall goal is hence to integrate environmental concerns into the national planning and management processes and provide guidelines for environmentally sustainable development. The policy paper emphasizes that environmental	Access to clean source of power through hydroelectricity will reduce pollution and use of fuel wood, charcoal and fossil based fuels.

	<p>impact assessment must be undertaken by the developer as an integral part of a project preparation. It also proposed for periodic environmental auditing to investigate if developer is fully mitigating the impacts identified in the assessment report.</p>	
<p>Water Catchment Management Policies</p>	<p>The policy on water catchment management is important because the benefiting communities need to conserve the catchment areas for sustained flow of the water resource. Water catchment managed policies have been supported by two Sessional Papers namely:</p> <ul style="list-style-type: none"> • Sessional paper No. 1 of 1968; and • Kenya Forest Development Policy Sessional Paper No. 9 of May 2005. <p>Sessional Paper No. 9 encourages the involvement of the private sector, communities and other stakeholders' participation in forest management in order to conserve water catchments areas and reduce poverty.</p>	<p>The National Government, Migori County offices and Kanyamkago Community has and will continue to be involved in all the project phases as community involvement is an important aspect for acceptance and sustainability of the Gogo power project.</p>
<p>National Climate Change Action Plan (NCCAP) 2018-2022</p>	<p>The National Climate Change Action Plan (NCCAP) 2018-2022 is a five-year Plan to guide Kenya's climate change actions, including the reduction of greenhouse gas emissions.</p> <p>Climate Change Action Plan (NCCAP) 2018-2022 sets out bold measures to ensure that our development remains sustainable in the event of any adverse climate change impacts, including droughts, floods, and other extreme climate events that have in the recent past</p>	<p>The project will provide a renewable source of energy, mitigate flooding and reduce loss of vegetation.</p>

	<p>occasioned far-reaching negative implications on the economy of Kenya.</p> <p>Kenya's priority climate actions are in the six mitigation sectors set out in the UNFCCC; agriculture, energy, forestry, industry, transport, and waste. In order to achieve climate change actions that simultaneously advance economic and sustainable development objectives, NCCAP 2018-2022 is guided by the following principles: Responsiveness, Equity and social inclusion, Consultation and cooperation and Fairness.</p>	
<p>National Environmental Action Plan (NEAP)</p>	<p>The NEAP for Kenya was prepared in 1994. It was a deliberate policy to integrate environmental considerations in to the country's social and economic development process. The integration was achieved through multi-sectoral approach and a comprehensive framework to ensure that environmental management and conservation of natural resources is an integral part of societal decision-making process.</p> <p>The Rio Declaration on Environment and Development Agenda 21 - a programme of action for sustainable development worldwide, the Rio Declaration on Environment and Development was adopted by more than 178 governments at the United Nations Conference on Environment and Development, known as the Earth Summit, held in Rio de Janeiro, Brazil, 3rd -14th June 1992. Principle No. 10 of the Declaration underscored that Environmental issues are best handled</p>	<p>KenGen as the proponent has prepared the Environment Impact Assessment for the project. The report outlines the methods that will be used by the project to re-use and recycle of waste including waste water, use of low non waste technologies, increased public awareness and appreciation of clean environment.</p>

	<p>with the participation of all concerned citizens, at the relevant level.</p> <p>At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided. The foregoing discussion is relevant to the proposed development because EMCA demands that the public must be involved before any development project that is likely to have adverse impacts on the environment is implemented by a Proponent. The Act has further established a Public Complaints Committee (PCC) where issues raised by the public in regard to any proposed development can be addressed.</p>	
<p>Poverty Reduction Strategy Paper (PRSP)</p>	<p>The PRSP has the twin objectives of poverty reduction and economic growth. The paper articulates Kenya's commitment and approach to fighting poverty, with the basic rationale that the war against poverty cannot be won without the participation of the poor. The proposed project, during and after implementation, will offer jobs to many Kenyans as a way of contributing to this noble objective of reducing poverty.</p>	<p>With increased power supply in the area, members of the community will be involved in more economic activities which improve the livelihoods of the people especially the youth</p>

3.2 LEGAL FRAMEWORK

Legal Framework	Key Provisions	Relevance to Gogo Hydropower Project
The Constitution of Kenya, 2010	<p>In article 69 of the Constitution of Kenya 2010, the State undertakes to carry out the following:</p> <ul style="list-style-type: none"> • Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits; • Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya; • Encourage public participation in the management, protection and conservation of the environment; • Protect genetic resources and biological diversity; • Establish systems of environmental impact assessment, environmental 	<p>The constitution of Kenya provides for sound environmental management and sustainability. By having a renewable source of energy, trees will be protected and also there will be a reduction in the over dependence on fossil fuels thus reducing greenhouse gases emission</p>

	<p>audit and monitoring of the environment;</p> <ul style="list-style-type: none"> • Eliminate processes and activities that are likely to endanger the environment; and • Utilize the environment and natural resources for the benefit of the people of Kenya. • Section 42 states that “Every person has the right to a clean and healthy environment. 	
<p>The Environmental Management and Coordination Act, 1999 (Revised in 2015)</p>	<p>The Environmental Management and Coordination Act (EMCA), 1999 provides for the establishment of an umbrella legal and institutional framework under which the environment in general is to be managed. EMCA is implemented by the guiding principle that every person has a right to a clean and healthy environment and can seek redress through the High Court if this right has been, is likely to be or is being contravened.</p>	<p>Environmental Management and Coordination Act (EMCA), 1999 in its Second Schedule 4(b) requires river diversions and water transfer between catchments undergo Environmental Impact Assessment (EIA). This report has been compiled to comply with EMCA and the Environmental (Impact Assessment and Audit) Regulations. EMCA has provided for the development of several subsidiary legislations and guidelines that govern environmental management which are relevant to the proposed project as reviewed below.</p>

	<p>Section 58 of the Act makes it a mandatory requirement for an ESIA study to be carried out by proponents intending to implement projects specified in the second schedule of the Act. Such projects have a potential of causing significant impacts on the environment. Similarly, section 68 of the same Act requires operators of existing projects or undertakings to carry out environmental audits in order to determine the level of conformance with statements made during the ESIA study. The proponent is required to submit the ESIA and environmental audit reports to NEMA for review and necessary action.</p>	
<p>The Environmental Management and Coordination (Waste Management) Regulations, 2006</p>	<p>These Regulations were published in the Kenya Gazette Supplement No. 69, Legislative Supplement No. 37, and Legal Notice No. 121 of 29th September 2006. The regulations provide details on management (handling, storage,</p>	<p>The proposed project, during construction, will generate substantial volumes of spoil materials among other wastes which will need to be disposed as per the guidelines in the regulations.</p>

	<p>transportation, treatment, and disposal) of various waste streams i.e.:</p> <ul style="list-style-type: none"> ▪ domestic waste; ▪ industrial waste; ▪ hazardous and toxic waste; ▪ pesticides and toxic substances; ▪ biomedical wastes; and ▪ radioactive waste. <p>Regulation No. 4 (1) makes it an offence for any person to dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.</p> <p>Regulation 6 requires waste generators to segregate waste by separating hazardous waste from non-hazardous waste for appropriate disposal. Regulation 17 (1) makes it an offence for any person to engage in any activity likely to generate any hazardous waste without a valid</p>	
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	Environmental Impact Assessment license issued by NEMA.	
The Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006	These regulations aim to enhance the preservation of biodiversity and safeguarding of endangered and rare plant and animal species within any human activity area. Section 4 of the legislation expressly prohibits any activity which may have an adverse effect on any ecosystem, lead to the introduction of alien species in a given area or result in the unsustainable utilization of available ecosystem resources.	Efforts will be made to ensure that there will be minimum interference of the species found in the area. In the event a rare, endangered or endemic animal species is spotted in the area, it will be moved to a safe location when construction is ongoing. For plant species where possible, they will be left intact in their habitat unless its extremely impossible to save them. Seeds and seedlings of such a species will be collected for future planting.
The Environmental Management and Coordination Act (Water Quality) Regulations, 2006	These Regulations were published in the Kenya Gazette Supplement No. 68, Legislative Supplement No. 36, and Legal Notice No. 120 of 29 September 2006. The Regulations provide for the sustainable management of water resources including the prevention of water pollution and the protection of water sources (lakes, rivers, streams,	During the construction, operation and maintenance phases, the proposed water transfer from the river will require compliance with the standards established under these regulations

	<p>springs, wells, and other water sources).</p> <p>It is an offence under Regulation No. 4 (2), for any person to throw or cause to flow into or near a water resource any liquid, solid, or gaseous substance or deposit any such substance in or near it, as to cause pollution.</p> <p>Regulation No. 11 further makes it an offence for any person to discharge or apply any poison, toxic, noxious or obstructing matter, radioactive waste or other pollutants or permit the dumping or discharge of such matter into the aquatic environment unless such discharge, poison, toxic, noxious or obstructing matter, radioactive waste or pollutant complies with the standards for effluent discharge into the environment as contained in the third schedule to the regulations.</p>	
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<p>The Environmental Impact Assessment and Audit Regulations, 2003</p>	<p>The Environmental (Impact Assessment and Audit) Regulations, 2003 state in Regulation 3 that “the Regulations shall apply to all policies, plans, programmes, projects and activities specified in Part IV, Part V and the Second Schedule of the Act”. Regulation 4(1) further states that: “...no Proponent shall implement a project:</p> <ul style="list-style-type: none"> a) likely to have a negative environmental impact; or b) for which an environmental impact assessment is required under the Act or these Regulations, unless an environmental impact assessment has been concluded and approved in accordance with these Regulations...” 	<p>This ESIA report has critically examined the effects of the project activities on the people and their property, physical and biological components of the environment, and has identified both negative and positive impacts. Mitigation measures have been outlined in the ESMP.</p>
<p>Environmental Management (Noise and Excessive vibration Pollution Control)</p>	<p>This law has given general prohibitions on excessive vibrations, and permissible noise levels. It gives provision related to</p>	<p>This law should be adhered to since noise resulting from access road and transmission line construction may disturb neighbouring communities and local fauna.</p>

Regulation 2009, Legal Notice 61.	noise from certain sources such as radio and television, and other sound amplifiers, parties and social events, hawkers, peddlers, touts street preachers, machinery, noise from motor vehicle, construction at night and noise, excessive vibrations from construction, demolition, mining or quarrying sites.	
The Environmental Management and Co-Ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009, Legal Notice No. 19	The regulations seek to ensure the protection of wetlands, catchment areas, river banks, lake shores, and sea shores. The regulations require project proponents with projects likely to affect wetlands, river banks, lake shores or sea shore to conduct Environmental Impact Assessment	River Kuja is a critical resource in the area and the project should not adversely impact on wetlands within its location and should be careful not to cause pollution that may affect other areas downstream..
The Occupational Safety and Health Act, 2007	This is an Act of Parliament to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for	The security and safety of people working in the project site is of paramount importance and should be ensured. KenGen and the contractor will comply with all the provisions of the Act throughout the project cycle.

	<p>connected purposes. The Act has the following functions among others:</p> <ul style="list-style-type: none"> • Secure safety and health for people legally in all workplaces • Prevents employment of children in workplaces where their safety and health are at risk. • Encourages entrepreneurs to set achievable safety targets for their enterprises. • Promotes the reporting of workplace accidents, dangerous occurrences and ill health with a view to finding out their causes and preventing of similar occurrences in future. • Promotes the creation of a safety culture at workplaces through education and training in occupational safety and health. 	
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<p>Work Injury Benefits Act (WIBA), 2007</p>	<p>This is an act of Parliament (No. 13 of 2007) to provide for compensation to workers for injuries suffered in the course of their employment. It outlines the following:</p> <ul style="list-style-type: none"> • Employer's liability for compensation for death or incapacity resulting from accident; • Compensation in fatal cases; • Compensation in case of permanent partial incapacity; • Compensation in case of temporary incapacity; • Persons entitled to compensation and methods of calculating the earnings; • No compensation shall be payable under this Act in respect of any incapacity or death resulting from a deliberate self-injury; and 	<p>The contractor will abide by all the provisions of the WIBA. Similarly, the same will be required of KenGen during the operation and decommissioning phases of the project.</p>
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	<ul style="list-style-type: none"> • Notice of an accident, causing injury to a workman, of such a nature as would entitle him for compensation shall be given in the prescribed form to the director. 	
Public Health Act (CAP 242)	<p>This is an Act of Parliament to make provision for securing and maintaining health. This act has several sections as outlined below:</p> <ul style="list-style-type: none"> • Section 115 of this act prohibits causing nuisance or other conditions liable to be injurious or dangerous to health. • Section 118 provides a list of nuisances that includes any noxious matter, or wastewater, flowing or discharged from any premises, wherever situated, into any public street, or into the gutter or side channel of any watercourse, irrigation channel or bed thereof not 	<p>Gogo power plant redevelopment will comply with all relevant provisions of the Public Health Act throughout its life cycle.</p>

	<p>approved for the reception of such discharge.</p> <ul style="list-style-type: none"> Sections 136 – 143 Breeding places for mosquitoes: The civil and building contractors will ensure that during construction, breeding places of mosquitoes and nuisance yards are kept free from bottles, whole or broken. The project area shall not be overgrown by grass, the wells etc. to be covered together with the less pits. Section 163 – Powers of entry and inspection: It should be noted that a medical officer, health inspector or a police officer above the role of an inspector shall enforce compliance and offences are punishable by law. 	
The Public Health (Drainage and Latrine) Rules	Rule 85 provides that every owner or occupier of every workshop, workplace or other premises where persons are	The project construction and operation activities are bound to expose both workers and members of the general public to situations injurious to health. All activities of the project are

	<p>employed shall provide proper and sufficient latrines for use by employees. Rule 87 requires every contractor, builder or other person employing workers for the demolition, construction, reconstruction, or alteration of any building or other work in any way connected with building to provide in some approved position sufficient and convenient temporary latrines for use by such workers. Rule 91 provides that no person shall construct a latrine in connection with a building other than a water closet or a urinal, where any part of the site of such building is within 200 feet of a sewer belonging to the local authority that is at a suitable level, and where there is sufficient water supply</p>	<p>thus expected to abide by this act to ensure a healthy environment. Enough toilet facilities should be provided at the camp site during construction.</p>
<p>The Water Act 2002 (and 2016 Revision)</p>	<p>The Government of Kenya formulated the National Policy on Water Resources Management in 1999. This was put in place upon realizing that the arrangement then on water supply was inappropriate. The</p>	<p>The Act provides conditions relating to the construction of works in its Second Schedule. As such, KenGen will observe these conditions.</p> <p>Under the Water Act 2016 revision, KenGen should ensure that a Water abstraction permit for the project is obtained from</p>

	<p>National Water Policy has four broad objectives that include:</p> <ul style="list-style-type: none"> a) To preserve, conserve and protect available water resources and allocate them in a sustainable, rational and economic way; b) To supply water of good quality and in sufficient quantities to the various water needs, while ensuring safe disposal of wastewater and environmental protection; c) To establish an efficient and effective institutional framework to achieve the systematic development and management of the water sector promoting and supporting the participation of users; d) To develop a sound and sustainable financing mechanism for effective water supply and sanitation development. 	<p>WRA. WRA offices at Kisii County will be responsible for issuance of water rights and enforcement of any conditions attached.</p>
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	<p>The National Policy on Water finally transformed to become the Water Act 2002 focusing on: the management, conservation, use and control of water resources and for the acquisition and regulation of rights to use water; to provide for the regulation and management of water supply and sewerage services. The Act also provides for national monitoring and information systems on water resources. The Act regulates abstraction and storage of water from water courses depressions or channels.</p> <p>Section 18 of this Act provides for the national monitoring and information systems on water resources. Following on from this, sub-Section 3 mandates the Under then 2016 Water Act Revision; Water Resource Authority (WRA) which is a state corporation was established under Section 11 of the Water Act, 2016. The Act came in to effect on 21st April, 2017 vide</p>	
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	Legal Notice No. 59, the Authority is an Agent of the National Government responsible for regulating the management and use of water resources.	
Energy Act 2019	<p>The Act establishes an energy commission, which is expected to become the main policy maker and enforcer in the energy sector. This commission among other things shall be responsible for:</p> <ul style="list-style-type: none"> • Issuing all the different licenses in the energy sector. • Prescribing the licensing processes • Setting and enforcing energy policies • Collecting and disseminating energy data • Public education and enforcing energy conservation With this act, all the different aspects of energy e.g. electricity, petroleum and renewable energy are brought under one ambit unlike the case as was 	KenGen generates power that Kenya power distributes as the supplier. All the necessary licences and permits will be sourced before project implementation.

	<p>before. i. Generation, Transmission, Distribution The act prescribes the manner with which licenses shall be obtained for generating, transmitting and distributing electricity. It clearly exempts private users from these licensing requirements for any power less than 1MW generated at the user's premises. However, a license is required if:</p> <ul style="list-style-type: none"> • The power requires a transmission system from the generation site to the consumption site or • The power will be distributed to others (members of the public) <p>The specific requirements e.g. how much to pay for a license shall be determined by the energy commission. There is an unclear clause exempting power up to 3MW from some licensing issues, but this seems to be excluded by the specific exemptions that</p>	
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	<p>use the 1MW figure. Section 41(A) makes provisions for treating several licenses belonging to the same licensee as one e.g. if you have several wind energy sites and you wish to compile one amalgamated annual report. The act requires electrical installations to be done by a registered electrician. The act also requires that all accidents and fatalities at energy facilities be reported officially to the commission.</p>	
<p>The Wildlife Conservation and Management Act, 2013</p>	<p>This Act became operational on 10 January 2014. One of its guiding principles is the devolution of the conservation and management of wildlife to landowners and managers in areas where wildlife occurs, through in particular the recognition of wildlife conservation as a form of land-use, better access to benefits from wild life conservation, and adherence to the principles of sustainable utilization. Section 25 of the act provides for</p>	<p>The area has some small terrestrial mammals, birds, reptiles and amphibians. Any critically endangered, vulnerable, nearly threatened or protected species found within the project area will have to be managed in line with this Act.</p>

	<p>compensation for injuries and damages caused by wildlife (species listed in its third schedule) to humans and their properties respectively. Such compensation claims are to be reviewed and awarded by County Wildlife Conservation and Compensation Committees at the ruling market rates: provided that no compensation shall be paid where the owner of the livestock, crops or other property failed to take reasonable measures to protect the properties from damage by wildlife or land use practices are incompatible with the ecosystem-based management plan for the area.</p> <p>The act in its sixth schedule lists various animal and tree species that are nationally considered as critically endangered, vulnerable, nearly threatened and protected. It also lists in its seventh schedule, national invasive species for</p>	
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	<p>which control is required. Section 48 restricts activities involving the above listed species without a permit from KWS. KWS can make recommendations to the responsible cabinet secretary, to prohibit the carrying out of any activity which: is of a nature that may negatively impact on the survival of species listed in the sixth schedule; or is specified in the notice or prohibits the carrying out of such activity without a permit issued by KWS.</p>	
<p>The Physical Planning Act, 1996</p>	<p>The Act provides for the preparation and implementation of physical development plans and for connected purposes. It defined development, in section 3(a), as the making of any material change in the use or density of any buildings or land or the subdivision of any land.</p> <p>In order to promote health, safety, order, amenity, convenience and the general welfare of all its inhabitants, as well as efficiency and economy in the process of</p>	<p>For each development component of Gogo hydropower plant redevelopment the stipulated procedure laid down by this Act shall be complied with before the activities begin.</p>

	<p>the development and improvement of communications, the Act provides that every local authority must have a physical development plan “...The basis for disposing of land acquired, or to be acquired under the plan by a local authority or relevant authority. Section 29 of the Act vests powers in the local authorities to control development in their respective areas of jurisdiction, with a legal mandate to vet development applications and approval or disapproval thereof.</p> <p>Section 30 states that any person who carries out a development within an area of a local authority without development permission shall be guilty of an offence and the development shall be invalid. Until such permission is granted, no development activity shall be carried out by the proponent. The act also gives the local authority power to compel the</p>	
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	<p>developer to restore the land on which such development has taken place to its original conditions within a period of ninety days. If no action is taken, then the council will restore the land and recover the cost incurred thereto from the developer. In addition, the same section also states that no person shall carry out development within the area of a local authority without development permission granted by the local authority.</p> <p>Section 36 states that if in connection with development application a local authority is of the opinion that, the proposed activity will have an injurious impact on the environment, the applicant shall be required to submit together with the application an Environmental Impact Assessment report. The environmental impact assessment report must be approved by the National Environment Management Authority (NEMA) and followed by annual</p>	
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	<p>environmental audits as spelled out by EMCA 1999. Section 38 states that if the local authority finds out that the development activity is not complying to all laid down regulations, the local authority may serve an enforcement notice specifying the conditions of the development permissions alleged to have been contravened and compel the developer to restore the land to its original condition.</p>	
<p>The Penal Code (Cap. 63)</p>	<p>Section 191 of the Penal Code makes it an offence for any person or institution that voluntarily corrupts, or fouls water for public springs or reservoirs rendering it less fit for its ordinary use. Similarly, section 192 prohibits making the atmosphere in any place noxious to the health of persons/institutions in dwellings or business premises in the neighborhood or those passing along a public way.</p>	<p>KenGen and the contractor will ensure strict adherence to the Environmental Management Plan throughout the project cycle in order to mitigate any possible negative impact associated with dust, noise, and effluent discharge.</p>

<p>The Land Act, 2012</p>	<p>This is an Act of Parliament intended to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land-based resources, and for connected purposes. Parts 1 and 2 of section 4 of the Act outline the main guiding principles in land management and administration, binding to all land actors including state officers. These principles are to be applied when enacting, applying or interpreting any provisions of this Act; and when making or implementing public policy decisions.</p> <p>The act vests the management of land on the National Land Commission (NLC). In the discharging of their functions and the exercising of their powers under this Act, the Commission and any State officer or public officer shall be guided by the following values and principles;</p>	<p>The Gogo power plant redevelopment project poses no danger of human displacement and the design has ensured that people upstream will not be affected by flooding. From the designs, its evident that the flood events will be similar or lower than the flood events with the existing dam. Currently some hectares of land are drowned for several hours or some days during extreme events and as a fact extreme events (> 100yr flood) haven't happened since the dam was constructed but statistically could happened in the future. The rehabilitation of the dam considers a 500-year event for safety reasons.</p> <p>The redevelopment includes a gated spillway with 4 gates that will open partially or totally during extreme and thus has an improved impact during heavy flood.</p>
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	<ul style="list-style-type: none"> i. Equitable access to land; ii. Security of land rights; iii. Sustainable and productive management of land resources; iv. Transparent and cost-effective administration of land; v. Conservation and protection of ecologically sensitive areas; vi. Elimination of gender discrimination in law, customs and practices related to land and property in land; vii. Encouragement of communities to settle land disputes through recognized local community initiatives; viii. Participation, accountability and democratic decision making within communities, the public and the Government; ix. Technical and financial sustainability; 	
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	<p>x. Affording equal opportunities to members of all ethnic groups;</p> <p>xi. Non-discrimination and protection of the marginalized; and</p> <p>xii. Democracy, inclusiveness and participation of the people; and</p> <p>xiii. Alternative dispute resolution mechanisms in land dispute handling and management.</p> <p>Section 110(1) of the Act provides that land may be acquired compulsorily under this if the Commission certifies, in writing, that the land is required for public purposes or in the public interest as related to and necessary for the fulfillment of the stated public purpose.</p> <p>In such an acquisition, this Act, in section 111(1) provides that just compensation shall be paid promptly in full to all persons whose interests in the land have been determined.</p>	
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	<p>The procedure for land acquisition is laid out in Part VIII of the Act. Elements for consideration under this procedure include the following:</p> <ul style="list-style-type: none"> • The Act requires that the owners, residents and their spouses to also be notified; as opposed to just the owners; • The inspector would also have to get the consent of the occupier and give them not less than seven days' notice to enter the premises; • The Commission shall have the power of a court to summon and examine witnesses and compel the production and delivery to the Commission of documents of title to the land; • Separate award of compensation to every person. An award is final and conclusive evidence of the size of 	
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	the land, the value in the opinion of the Commission and the amount of compensation payable, whether the person attends the inquiry or not.	
The Land Registration Act, Act No. 3 of 2012	<p>This is an Act of Parliament intended to revise, consolidate and rationalize the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes.</p> <p>Land registry: Section 7(1) of the Act provides for the establishment of a land registry in each registration unit which shall keep registers of the following regarding land:</p> <ul style="list-style-type: none"> • A land register, in the form to be determined by the Commission; • The cadastral map; • Parcel files containing the instruments and documents that support subsisting entries in the land register. • Any plans which shall, after a date 	<p>These provisions are essential to any new land acquisition or transaction processes arising from the implementation of the project. The land under which Gogo hydropower project is situated is under a 50-year leasehold which is renewed after it lapses. There will be no need to acquire new land and therefore much as this Act was interrogated, there was evidence that it is not triggered.</p>

	<p>appointed by the Commission, be geo-referenced;</p> <ul style="list-style-type: none"> • The presentation book, in which shall be kept a record of all applications numbered consecutively in the order in which they are presented to the registry; • An index, in alphabetical order, of the names of the proprietors; and • A register and a file of powers of attorney. <p>Maintenance of documents, including land title deeds: Further, section 9(1) provides that the Registrar shall maintain the register and any document required to be kept under this Act in a secure, accessible and reliable format. These documents include:</p> <ul style="list-style-type: none"> • Publications, or any matter written, expressed, or inscribed on any substance by means of letters, figures or marks, or by more than one of those means, that may be used for the purpose 	
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	<p>of recording that matter;</p> <ul style="list-style-type: none"> • Electronic files; and • An integrated land resource register. <p>The register, as provided for in part 2 of section 9, shall contain the following particulars:</p> <ul style="list-style-type: none"> • Name, personal identification number, national identity card number, and address of the proprietor; • In the case of a body corporate, name, postal and physical address, certified copy of certificate of incorporation, personal identification numbers and passport size photographs of persons authorized and where necessary attesting the affixing of the common seal; • Names and addresses of the previous proprietors; • Size, location, user and reference number of the parcel; and • Any other particulars as the Registrar 	
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	may, from time to time, determine.	
The Land and Environment Court Act, 2012	<p>This is an Act of Parliament to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes. The principal objective of this Act is to enable the Court to facilitate the just, expeditious, proportionate and accessible resolution of disputes governed by this Act.</p> <p>Section 13 (2) (b) of the Act outlines that in exercise of its jurisdiction under Article 162 (2) (b) of the Constitution, the Court shall have power to hear and determine disputes relating to the environment and land, including disputes:</p> <ul style="list-style-type: none"> • Relating to environmental planning and protection, trade, climate issues, land use planning, title, tenure, 	Any land or/and environmental cases arising from the project will be handled in accordance with the provisions of this act, if amicable settlement outside the courts is not reached between the parties.

	<p>boundaries, rates, rents, valuations, mining, minerals and other natural resources;</p> <ul style="list-style-type: none"> • Relating to compulsory acquisition of land; • Relating to land administration and management; • Relating to public, private and community land and contracts, chooses an action or other instruments granting any enforceable interests in land; and • Any other dispute relating to the environment and land. <p>Section 24 (2) also states that the Chief Justice shall make rules to regulate the practice and procedure, in tribunals and subordinate courts, for matters relating to land and environment. Section 30 (1) states that all proceedings relating to the environment or to the use and occupation and title to land pending before any Court or</p>	
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	<p>local tribunal of competent jurisdiction shall continue to be heard and determined by the same court until the Environment and Land Court established under this Act comes into operation or as may be directed by the Chief Justice or the Chief Registrar.</p>	
<p>Explosives Act, Cap. 115</p>	<p>This is an Act of Parliament that regulates the manufacture, storage, sale, transport, importation, exportation and use of explosives. Some of the key provisions of this act relevant to the project include:</p> <p>Section 8(1): No person, other than the manufacturer, shall sell, deal in or dispose of any explosive unless he is in possession of a license granted under this Act;</p> <p>Section 9(1): No person shall purchase or otherwise acquire blasting materials except under the authority of, and to the extent authorized in, a written permit issued by an inspector.</p> <p>Section 11 (1): No person shall use, or cause to be used, any blasting materials at</p>	<p>Use of explosives during the construction phase has been envisaged in the project design. The contractor will abide by all relevant provisions of this act and its rules. All licenses required for handling, transporting, storage and the use of the explosives must be obtained and remain valid throughout the construction period.</p>

	<p>a depth of ten meters or more, measured from the surface along or down a shaft, well or tunnel, unless he is in possession of a valid miner's blasting certificate issued to him under the Mining Act, or is under the immediate supervision of the holder of such a certificate; and</p> <p>Section 13(1): No person shall convey explosives or cause them to be conveyed within Kenya, except under and in accordance with a permit in writing issued by an inspector.</p>	
Explosives (Blasting Explosives) Rules	<p>These rules provide detailed requirements for ensuring the safe packaging, licensing and construction of magazines, storage and reporting accidents related to handling explosives.</p>	<p>Use of explosives during the construction phase has been envisaged in the project design. The contractor will abide by all relevant provisions of this act and its rules. All licenses required for handling, transporting, storage and the use of the explosives must be obtained and remain valid throughout the construction period.</p>
Licenses and Permits	<p>For the project to commence, permits and licenses are needed. The project will be assessed by NEMA to determine</p>	<p>The project needs the following licenses and permits:</p> <ul style="list-style-type: none"> • National Environment and Management Authority Licence upon presentation of an Environment and Social Impact Assessment report.

	<p>compliance with Environmental and Social Impact management requirements. The Proponent should comply with the legislation through the acquisition of the appropriate licenses and permits.</p>	<ul style="list-style-type: none"> • Electricity generating License from ERC • Water Use permits from Water Resources Authority <p>As per the Water Resources Management Rules 2007; the project will also need authorisation from WRA for:</p> <ul style="list-style-type: none"> • Temporary abstraction for construction; • Temporary Diversion of water from a water course during construction.
The Standards Act Cap 496	<p>The Act is meant to promote the standardization of the specification of commodities, and code of practice; to establish a Kenya Bureau of Standards, to define its functions and provide for its management and control.</p>	<p>KenGen will ensure that commodities and codes of practice utilized in the project adhere to the provisions of this Act.</p>
The Lakes and Rivers Act Chapter 409 Laws of Kenya	<p>This Act provides for protection of rivers, lakes and associated flora and fauna.</p>	<p>The provisions of this Act may be applied in the management of the project.</p>
Climate Change Act , 2016	<p>Passed by Parliament in 2016, the Act aims to provide for a regulatory framework for enhanced response to climate change; and to provide for mechanism and measures to achieve low carbon climate development, and for connected purposes. It shall be applied for the development, management,</p>	<p>The power plant is a clean energy development project and will contribute to reduction of reliance on fossil fuel and thus lower the impacts of climate change. The project will comply with provisions of the Act.</p>

	<p>implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya.</p> <p>This Act shall be applied in all sectors of the economy by the national and county governments to, among others, mainstream climate change, and promote low carbon technologies; build resilience and enhance adaptive capacity to the impacts of climate change; mainstream and reinforce climate change disaster risk reduction into strategies and actions of public and private entities; mainstream the principle of sustainable development into the planning for and decision making on climate change response; integrate climate change into the exercise of power and functions of all levels of governance; promote low carbon technologies, improve efficiency and reduce greenhouse gas emissions intensity</p>	
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	by facilitating approaches and uptake of technologies that support low carbon, and climate resilient development; and mobilize and transparently manage public and other financial resources for climate change response.	
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3.3. INTERNATIONAL SOCIAL AND ENVIRONMENTAL SAFEGUARDS

The Gogo power plant redevelopment project is being funded by the European Union and like most development partners the World Bank Group's (WBG) guidelines for environmental and social suitability of the project will be adhered to for purposes of funding. The following international guidelines and standards are applicable to this project regarding Financing as highlighted below:

- The World Bank Safeguard Policies and the Environmental and Social Framework
- European Investment Bank (EIB) Standards
- The International Hydropower Association Sustainability Guidelines and Sustainability Assessment Protocols

3.3.1 World Bank Operational Policies

The operational policies provide mechanisms for screening projects to determine the appropriate type and extent of environmental assessment to be undertaken. The World Bank Guideline classifies proposed projects as class A, B, C and F1 depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. The project sponsor and promoter are responsible for any environmental due diligence required by the safeguard policies. There are ten safeguard policies that the bank regards as critical to ensure identification, minimization and mitigation of potential social and environmental impacts of development projects, which are: Environmental Assessment; Physical Cultural Property; Projects in Disputed Areas; Forests; Indigenous Peoples; Projects involving International Waters; Involuntary Resettlement; Natural habitats; Pest management; and Safety of Dams.

The discussion below presents the safeguard policies relevant to the proposed Gogo Hydropower Project. WBG Safeguard policies on disputed areas, projects involving International Waters, Forests and Pest Management are not discussed since the project does not trigger these policies.

Operational Policy	Provisions	Relevance to Gogo Hydropower Plant
Environmental Assessment: OP/BP 4.01	<p>Environmental Assessment is used to identify, avoid, and mitigate the potential negative environmental impacts associated with the Bank's lending operations. This guideline stipulates that an environmental impact assessment must be carried out before implementation of category A projects. Category A projects are those that are likely to have significant adverse impacts and irreversible environmental impacts. Conversely, category B projects are those with limited impacts that can be mitigated and require an initial environmental evaluation or project appraisal document with an Environmental Management Plan EMP covering all negative impacts. The World Bank Categorizations criteria is outlined below:</p> <p>Category A: A proposed project is classified as Category A if it is likely to have significant adverse impact on the environment. A project with complicated impact or unprecedented impact which is difficult to assess is also classified as Category A. The impact of Category A projects may affect an area broader than the sites or facilities subject to physical construction.</p>	<p>Relevance to the project</p> <p>Gogo Hydropower project is categorized as category B under World Bank categorization criteria. The project impacts will not be adverse and will be mitigated as they are site specific. The project does not traverse into any protected habitat or international water ways.</p>

	<p>Category B: A proposed project is classified as Category B if its potential adverse environmental impact is less adverse than that of Category A projects. Typically, this is site-specific, few if any are irreversible, and in most cases normal mitigation measures can be designed more readily.</p> <p>Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impact. Projects that do not correspond to one of the above are, in principle, classified as Category C.</p>	
Natural Habitats: OP/BP 4.04	<p>This policy guideline requires infrastructure development to take into account the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. OP 4.04 prohibits projects, which would lead to significant loss or degradation of any critical natural habitats, whose definition includes those natural habitats, which are legally protected, officially proposed for protection, or unprotected but known to have high conservation value. The WB therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work. The WB supports, and expects borrowers to apply, a precautionary approach to natural resource</p>	<p>This policy is triggered by any project (including any sub-project under a sector investment or financial intermediary) with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project).</p>

	management to ensure opportunities for environmentally sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. They comprise many types of terrestrial, freshwater, coastal, and marine ecosystems including areas slightly modified by human activities but retaining their ecological functions and most native species.	
Safety of dams - OP 4.37	The safeguard policy on dams states that, for the life of any dam, the owner is responsible for ensuring that appropriate measures are taken, and sufficient resources provided for the safety of the dam, irrespective of its funding sources or construction status. As there are serious consequences of malfunction, the WB is concerned with the safety of the new and existing dams. The Bank also requires that the borrower adopts and implements certain dam safety measures for the design, bid tendering, construction, operation, and maintenance of the dam and associated works. The WB distinguishes between small and large dams, where small dams are normally less than 15 meters in height. This category includes, for example, farm ponds, local silt retention dams, and low embankment barriers. For small dams, generic dam safety measures designed by qualified engineers are usually	The current Gogo dam Hydropower is regarded as a small dam as the embankment is only for creation of a barrier to divert the water flow for energy production. Redevelopment of the dam will not cause any changes in flood levels during low floods and will reduce the impacts during heavy flood events since the redevelopment includes a gated spillway with 4 gates that will open partially or totally depending on the level of floods.

	adequate. For large dams, the WB requires certain guidelines to be met.	
Involuntary Resettlement: OP/BP 4.12	<p>The objective of this policy is to:</p> <ul style="list-style-type: none"> • Avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; • Assist displaced persons in improving their former living standards, income earning capacity, and production levels, or at least in restoring them; • Encourage community participation in planning and implementing resettlement; and • Provide assistance to affected people regardless of the legality of land tenure. <p>This policy covers not only physical relocation, but also any loss of land or other assets resulting in the relocation or loss of shelter; loss of assets or access to assets; and loss of income sources or means of livelihood, whether or not the affected people must move to another location. The policy requires that those who are affected by the project leading to loss of land or property should be well compensated by the proponent. Those land parcels and other assets affected by the project must be adequately addressed through the Resettlement Action Plan (RAP). When projects result in involuntary resettlement, OP 4.12 describes the details</p>	<p>WB OP 4.12.(6a) requires an institution of measures to ensure that displaced persons are (i) informed about their options and rights, (ii) consulted on, offered choices and provided with technically and economically feasible resettlement alternatives, and (iii) provided prompt and effective compensation at full replacement costs. WB OP 4.12(8) requires that particular attention be paid to the needs of vulnerable groups among those displaced such as those below the poverty line, the landless, the elderly, women and children, indigenous peoples, and ethnic minorities. WB. OP 4.12 (13a) stipulates that any displaced persons and their communities and any host communities receiving them should be provided with timely and relevant information, consulted on resettlement options and offered opportunities to participate in planning, implementing and monitoring resettlement. WB OP 4.12 (12a) states that payment of cash compensation for lost assets may be appropriate where livelihoods are land-based but the</p>

	<p>and elements that a resettlement plan should include such as objectives, potential impacts, socio-economic studies, legal and institutional framework, eligibility, valuation and compensation for losses, resettlement measures, relocation planning, community participation, and grievance redress procedures, implementation schedule, costs and budgets, and monitoring and evaluation. This report should conform to the WB policy requirement on contents and structure.</p>	<p>land taken for the project is a small fraction (less than 20%) of the affected asset and the residual is economically viable. WB OP 4.12 paragraphs (6b & c) state that in case of physical relocation, displaced persons are provided with assistance (such as moving allowances) during relocation.</p> <p>Redevelopment of Gogo Hydropower project poses no danger of human displacement since the project is in KenGen land.</p>
<p>Safety of electrical transmissions (Operational Policy, OP/BP4.37)</p>	<p>The objectives of this policy are as follows: For new electrical transmissions, it is to ensure that experienced and competent professionals design and supervise construction; the borrower adopts and implements electrical transmission safety measures for the electrical transmission and associated works. For existing electrical transmissions, it is to ensure that any electrical transmission that can influence the performance of the project is identified, an electrical transmission safety assessment is carried out, and necessary additional electrical transmission safety measures and remedial work are implemented.</p>	<p>It is proposed that a transmission line be constructed to evacuate the power to the Awendo Sub Station. This will be subject to the provisions of OP/BP4.37</p>

<p>Physical Cultural Resources: OP/BP 4.11</p>	<p>The objective of this policy is to assist projects to avoid or mitigate adverse impacts of development projects on physical cultural resources. For purposes of this policy, "physical cultural resources" are defined as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above ground, underground, or underwater. The cultural interest may be at the local, provincial or national level, or within the international community.</p> <p>This policy applies to all projects requiring a Category A or B Environmental Assessment under OP 4.01, project located in, or in the vicinity of, recognized cultural heritage sites, and projects designed to support the management or conservation of physical cultural resources.</p>	<p>There are no Physical cultural resources and cultural heritage sites within the project's area of influence and thus OP 4.01 is not triggered.</p>
<p>Indigenous Peoples: OP/BP 4.10</p>	<p>The objective of this policy is to i. Ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples; ii. Ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or</p>	<p>There are no Indigenous Peoples identified to be living in the project area, hence OP/BP 4.10 is not triggered.</p>

	compensated; and iii. Ensure that indigenous peoples receive culturally appropriate and gender and inter-generationally inclusive social and economic benefits.	
Projects in International Waters: OP 7.50	<p>The policy applies to the following types of projects: a) Hydroelectric, irrigation, flood control, navigation, drainage, water and sewerage, industrial and similar projects that involve the use or potential pollution of international waterways; and b) Detailed design and engineering studies of projects under (a) above, include those carried out by the Bank as executing agency or in any other capacity.</p> <p>This policy is triggered if (a) Any river, canal, lake or similar body of water that forms a boundary between, or any river or body of surface water that flows through two or more states, whether Bank members or not; (b) Any tributary or other body of surface water that is a component of any waterway described under (a); and (c) Any bay, gulf strait, or channel bounded by two or more states, or if within one state recognized as a necessary channel of communication between the open sea and other states, and any river flowing into such waters.</p>	<p>There are no transboundary rivers, canals, lakes or similar body of water in this area. It is only dominated by small springs, streams and rivers that are used by residents mainly for domestic use. The project will not trigger policy OP.50</p>

Projects in Disputed Areas: OP 7.60	This policy is triggered if the proposed project will be in a "disputed area".	The consultant did not come across any disputed area along the proposed project.
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3.3.2 World Bank Environmental and Social Framework

The Environmental and Social Framework describes 10 Environmental and Social Standards (ESS) which the project should conform to are described in the table below:

Framework	Provisions	Relevance and Implications for Gogo Hydropower Plant
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	This guideline requires that for a project of this magnitude, an environmental and social assessment is conducted including stakeholder engagement; that stakeholder engagement and disclosure of appropriate information in accordance with ESS10 is undertaken; develop an Environmental and Social Commitment Plan (ESCP), and implement all measures and actions set out in the legal agreement including the ESCP; and conduct monitoring and reporting on the environmental and social performance of the project against the ESSs.	An Environmental and Social Impact Assessment Study (ESIA) has been conducted for Gogo Hydropower redevelopment Project. A key output of the ESIA is an Environmental and Social Management Plan (ESMP) and a monitoring plan. A comprehensive stakeholder engagement has been conducted and the final ESIA report has been subjected to public validation and disclosure process before submission to National Environment Management Authority (NEMA) for approval
ESS 2: Labour and Working Conditions	It requires the proponent to give equal treatment to men and women in the workplace and give them equal opportunities in the economic sphere. There must not be any discrimination of employees on any ground; Labour practices must be fair; Forced labour is prohibited; and Children must not be engaged in hazardous or exploitative labour.	Applicable to Gogo project since during construction a labour force will be required. There will be no children hired for any form of labour. Adults workers will be paid a salary commensurate to their work.

Framework	Provisions	Relevance and Implications for Gogo Hydropower Plant
ESS 3: Resource Efficiency and Pollution Prevention and Management	<p>This standard recognizes that project and other economic activities often generate increased levels of air, water and land pollution, and endeavors to direct the proponent toward avoiding or minimizing adverse impacts on human health and the environment. This may be achieved by avoiding or minimizing pollution from project activities, reducing project related greenhouse gas emissions (GHG) which threaten the public health and welfare of current and future generations, and by promoting sustainable use of resources, including water and energy. The proponent should consider ambient conditions and apply technically and financially feasible principles of resource efficiency and pollution prevention, as well as techniques that will avoid or minimize adverse impacts on health and the environment during the life of the project. The proponent also needs to comply with both the county, national and international environmental laws related to pollution, wastes, hazardous materials, resource use and GHG emissions.</p>	<p>KenGen seeks to increase efficiency in power generation by redeveloping Gogo hydropower plant and (possibly) enhancing the dam capacity, and reducing GHG through clean energy. The project must also put in place measures to control pollution, waste management, optimal use of resources and compliance with national law and other guidelines</p>

Framework	Provisions	Relevance and Implications for Gogo Hydropower Plant
ESS 4: Community Health and Safety	<p>This standard requires the proponent to avoid or minimize risks and adverse impacts to the health and safety of the local community arising from the proposed project activities. The proponent must see to it that the design, construction and operation of its equipment and decommissioning of the infrastructure do not increase community and third-party exposure to incidents and injuries. Transportation and disposal of hazardous materials, if not done safely, may expose the community to adverse effects. Degradation of natural resources such as adverse impacts on water quality and quantity may result in health-related impacts to Migori community members hence environmental due diligence is key. The proponent needs to evaluate risks and impacts to the health, safety and resources of the affected communities during all project stages and establish appropriate measures favoring prevention and avoidance. Necessary measures to prevent major accidents and limit their consequences in major accident prevention / emergency preparedness plan and management system including internal and external emergency plan should also be identified and implemented.</p>	<p>There will be migration into the area (influx) with attendant social and security concerns; heavy vehicular movement (light and heavy vehicles); evacuation and desilting of the dam and other impacts on community health and safety which will require assessment and development of mitigation measures. The ESIA has put in mitigation measures for management of influx impacts.</p>

Framework	Provisions	Relevance and Implications for Gogo Hydropower Plant
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	<p>The objective of this standard is to avoid or minimize adverse social and economic impacts from land acquisition or restrictions on land use. This would mean avoiding or minimizing displacement of persons, using alternative project designs and avoiding forced evictions. Other objectives are to improve or restore livelihoods and standards of living and to improve living conditions for displaced persons.</p>	<p>Redevelopment of the power plant will be done on land belonging to KenGen thus there will be no physical displacement as a result of land acquisition. However, any need for more land will involve direct engagement with relevant land owners. Compensation for the same will be agreed on negotiations based on market value, compensation for assets based on professional valuation and done in a manner that does not leave the land owners worse than they are; and payments should be done before project commences.</p>

Framework	Provisions	Relevance and Implications for Gogo Hydropower Plant
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	<p>This standard seeks to protect and conserve biodiversity, maintain the benefits from ecosystem services, and promote the sustainable management of living natural resources. The proponent should avoid adverse impacts to priority system services that are of relevance to the affected community where it has direct management control or significant influence over them. Conservation needs must, as far as is possible, be integrated with development priorities.</p>	<p>KenGen will ensure that there is conservation of biodiversity, ecosystem services and sustainable management of living natural resources during all project stages. Mitigation measures will be put in place.</p>

ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	<p>This standard's objectives are to ensure that a development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource based livelihoods of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities. It also requires that measures be put in to avoid adverse impacts of projects or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts.</p> <p>ESS 7 also serves to promote sustainable development benefits and opportunities in a manner that is accessible, culturally appropriate and inclusive; and improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation throughout the project's life cycle.</p> <p>It also requires project to obtain the Free, Prior, and Informed Consent (FPIC) of affected indigenous communities, and to recognize, respect and preserve their culture, knowledge, and practices and to offer them an opportunity to adapt to changing conditions in a manner and in a timeframe acceptable to them.</p>	<p>This safeguard is not triggered, no Indigenous Peoples have been identified in the project area.</p>
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Framework	Provisions	Relevance and Implications for Gogo Hydropower Plant
ESS 8: Cultural Heritage	This standard requires the proponent to protect cultural heritage from adverse effects that its activities may cause and seek to preserve it. Project activities such as removing non-replicable cultural heritage may deny the host country the benefits accruing from the use of its cultural heritage (e.g., tourism) if adverse effects are generated and if the cultural heritage is not preserved.	No cultural sites or physical cultural resources have been identified in the project area. However, the project will continuously engage the community and seek their involvement should a cultural resource be encountered during implementation.
ESS 9: Financial Intermediaries	Applies to Financial Intermediaries (FIs) that receive financial support from the Bank. FIs include public and private financial services providers, including national and regional development banks, which channel financial resources to a range of economic activities across industry sectors.	The Safeguard not applicable in this project.

Framework	Provisions	Relevance and Implications for Gogo Hydropower Plant
ESS 10: Stakeholder Engagement and Information Disclosure	<p>ESS 10 requires a project to establish a systematic approach to stakeholder engagement that will help identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties.</p> <p>It also requires for an assessment of the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance.</p> <p>It also promotes and provides a means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them; and ensures that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.</p> <p>ESS 10 should be read in conjunction with ESS 1 and applies to all projects supported by that can potentially receive or have received World Bank's support.</p>	<p>The standard is applicable to Gogo power plant redevelopment which has engaged with stakeholders as an integral part of the project's ESIA study. A Stakeholder Engagement Plan (SEP) for the ESIA study was developed and applied throughout the study; and a detailed Stakeholder Engagement Framework will be developed after the study that can be applied throughout the project's life cycle.</p>

3.3.3 World Bank Environmental, Health and Safety (EHS) Guidelines

The General EHS Guidelines are a technical reference documents with general and industry specific examples of Good International Industry Practice. They contain measures and performance levels that are generally considered to be achievable and should be tailored to the risks and hazards of a project based on the results of an environmental assessment. The guidelines which are relevant and applicable to Gogo hydro power plant redevelopment project are described below.

✓ Environmental Guidelines

These include guidelines on Air Emissions and Ambient Air Quality, Energy Conservation, Wastewater and Ambient Water Quality, Water Conservation, Hazardous Materials Management, Waste Management, Noise and Contaminated Land.

✓ Occupational Health and Safety

This guideline in Gogo project will be applicable in protection of workers from Physical Hazards, Chemical Hazards, Biological Hazards, Radiological Hazards. It will also be applicable in the provision and use Personal Protective Equipment (PPE), and deployment of a Special Hazard Environments Monitoring.

✓ Community Health and Safety

Issues to be addressed in Gogo dam project in relation to community health and safety will include Water Quality and Availability, Structural Safety of Project Infrastructure, Life and Fire Safety (L&FS), Traffic Safety, Transport of Hazardous Materials, Disease Prevention and Emergency Preparedness and Response.

✓ Construction and Decommissioning

This guideline provides for the assessment and minimization of impacts on the environment during the different phases of the project including construction and decommissioning and shall be applicable to Gogo project.

✓ **World Bank Guidelines on pollution prevention, natural habitats and environmental assessment**

These guidelines focus on promoting sustainable development by highlighting the importance of environmental pollution prevention and raising economic benefits through the use of cleaner production and good management techniques. The guidelines are to ensure reduction of pollution emissions from the production processes, mainly through a combination of cleaner production and end of pipe treatment.

3.4 World Commission on Dams

The World Commission on Dams (WCD) was established in May 1998 as a result of the local and international controversies arising from dams. Its mandate includes:

- i) Review the development effectiveness of large dams and assess alternatives for water resources and energy development;
- ii) Develop internationally acceptable criteria, guidelines and standards for the planning, design, appraisal, construction, operation, monitoring and decommissioning of dams.

The WCD framework has seven strategic priorities which are widely acknowledged as a framework for dialogue. The seven strategic priorities are described in the table below:

Table 2 World Commission on Dams Priorities

Strategic Priority 1 - Gaining Public Acceptance
In order to develop water and energy resources in an equitable and sustainable manner, it is essential that there is public acceptance. This includes recognizing the rights, addressing the risks and safeguarding the entitlements of all interested groups, by ensuring that they are informed about the issues at stake, able effectively to participate in decision making processes, and that there is demonstrable acceptance of key decisions. Care should be taken to include the most vulnerable parties, such as women, the poor and certain indigenous groups, and that decision making processes are guided by their free, informed and prior consent.

Strategic Priority 2 - Comprehensive Options Assessment

The most appropriate development initiatives for a particular area can only be identified by assessing food, water and energy needs and clearly defining program objectives. The full range of policy, institutional and technical options, which may well include alternatives to dams, should then be comprehensively assessed in a participatory process that accords the same significance to social and environmental considerations as to economic and financial factors. This process of assessment should continue throughout the planning, development and implementation of the project.

Strategic Priority 3 - Addressing Existing Dams

Dams and the context in which they operate are not static over time. Their benefits and impacts may be transformed by changes in priorities for water use, physical and land use changes in the river basin, technological developments, and changes in public policy expressed in environmental, safety, economic and technical regulations. Management and operational practices should be continuously assessed and adapted to changing circumstances, in order to optimize the benefits, address social issues and improve measures to limit and restore damage to the environment. This process should extend beyond the life of the project, so that the performance, benefits and impacts of all existing large dams can be monitored and evaluated on a long-term basis, and appropriate action taken to improve all aspects of their service delivery.

Strategic Priority 4 - Sustaining Rivers and Livelihoods

Dams transform the landscapes they inhabit, with potentially irreversible effect. It is essential to understand, protect and restore ecosystems at river basin level, in order to minimise their negative impact, limit and mitigate harm to the health and integrity of the river system and those dependent upon it, and promote equitable human development and the welfare of all species. These are key issues when selecting sites and designing projects. Governments should develop national policies for maintaining in their natural state selected rivers with high ecosystem functions and values and look for alternative sites on tributaries when assessing proposals for dams on undeveloped rivers.

Strategic Priority 5 - Recognizing Entitlements and Sharing Benefits

Rather than benefiting from them, many of those affected by dams are aware only of their negative impacts. To redress the balance, a process of joint negotiation with such groups is required, based on recognition of rights and assessment of risks. The aim of these negotiations is to agree on legally enforceable mitigation and development provisions, which recognise entitlements that improve livelihoods and quality of life. States and developers are responsible for resettling and compensating all affected people and satisfying them that their livelihoods will be improved by moving from their current situation. Legal means, such as contracts and accessible recourse at national and international levels, should be used to ensure that responsible parties fulfill their commitments to agreed mitigation, resettlement and development provisions.

Strategic Priority 6 - Ensuring Compliance

In order to win and maintain public trust and confidence, governments, developers, regulators and operators must meet their commitments for planning, implementing and operating dams. Compliance with applicable regulations, criteria and guidelines, and project-specific negotiated agreements should be ensured at all critical stages of project planning and

Implementation. A set of regulatory and non-regulatory mechanisms, incorporating incentives and sanctions, and flexible enough to accommodate changing circumstances, is needed to enforce social, environmental and technical measures. A clear, consistent and common set of criteria and guidelines to ensure compliance should be adopted by sponsoring, contracting and financing institutions, and compliance subjected to independent and transparent review. Legislation, voluntary integrity pacts, debarments and other instruments should be used to eliminate corrupt practices

Strategic Priority 7 - Sharing Rivers for Peace, Development and Security

The storage and diversion of water on transboundary rivers can cause considerable tension within and between countries. As specific interventions for diverting water, dams require constructive co-operation, and states or political units within countries need to agree on the use of resources in order to promote regional co-operation and peaceful collaboration. Rather than focusing on allocating water as a finite resource, states need to work on sharing rivers and their associated benefits. This will involve negotiating a wide range of issues and making provision in national water policies for basin agreements in shared river basins. These agreements should be based on the principles of equitable and reasonable use, no significant harm, prior

information and the Commission's strategic priorities. If an objection by a riparian state to a proposal for a new dam on a shared river is upheld by an independent panel, construction should not be carried out. Furthermore, where a government agency plans the construction of a dam on a shared river in contravention of the principle of good faith negotiations between riparian's, external financing bodies should withdraw their support for projects and programs promoted by that agency.

Source: World Commission on Dams (2001)

The WCD was discontinued in 2001 after having undertaken its stated mandate. The WCD framework has become a key benchmark in international dam building. The World Bank, Lending Institutions and the International Hydropower Association, have encouraged the WCD's strategic approaches.

3.5 European Investment Bank (EIB) Standards

The EIB adopted an Environmental Statement in 1996 to underline its commitment to protecting and improving the natural and built environment according to EU policy. It aligns the Bank's operations with support for sustainable development both within the EU and outside. The environmental and social standards of the EIB, lastly updated in 2018, are intended to protect and enhance the natural environment, not only for its own sake but also to improve the quality of life, economic development and social wellbeing that results from environmental sustainability. The standards relate to three aspects as follows:

- (i) The technical characteristics of a project, in terms of planned and actual emissions and other environmental performance indicators; (ii). The characteristics of the host environment and its immediate neighborhood, including its habitat and associated flora and fauna; (iii). The processes adopted and the management arrangements applied for project development, implementation and operation that have a bearing on the environmental and social impacts and outcome of a project.

For projects in regions outside the EU as for the current power plant, the Bank requires that all projects comply with national legislation, including international conventions ratified by the host country, as well as EU standards. Where EU standards are more stringent than national standards, the higher EU standards are required, if practical and feasible.

The following is a summary of the standards requirements.

Table 3 EIB Environmental and Social Standards

EIB Standard	Summary requirements	Relevance/Implication to Gogo Hydropowr Plant
1: Assessment and Management of Environmental and Social Risks and Impacts	The standard underscores the importance of managing environmental and social impacts and risks throughout the life of an EIB sponsored project through the application of the precautionary principle. The standard's requirements allow for the development of an effective environmental and social management and reporting system that is objective and encourages continual improvements and developments.	The project has conducted an ESIA, with stakeholder engagement, public consultations and disclosure coupled with engagement throughout the life of the project. An ESMP been developed for all phases of the project.
2: Pollution prevention and abatement	Aim is to avoid and minimize pollution from EIB-supported operations. It outlines a project-level approach to resource efficiency and pollution prevention and control in line with best available techniques and internationally disseminated practices.	Potential pollution to both edaphic and aquatic environment exists in the project, especially at construction phase. Pollution mitigation measures, optimal use of resources has been put in place.
3: Biodiversity and ecosystems	Acknowledging the intrinsic value of biodiversity, this standard outlines the approach and measures the promoter has to take to protect and conserve all levels of biodiversity. The standard applies to all habitats (marine and terrestrial) whether or not previously disturbed or legally protected. It focuses on major threats and supports the sustainable use of renewable natural resources and the equitable sharing of benefits from the project's use of natural resources.	Detailed aquatic habitat assessment has been conducted to inform biological/biodiversity management and monitoring plan for the project.

EIB Standard	Summary requirements	Relevance/Implication to Gogo Hydropowr Plant
4:Climate-related standards	Requires promoters to ensure that all projects comply with appropriate national and, where applicable, EU legal requirements, including multilateral agreements, related to climate change policy.	The feasibility study has considered the project's climate change impacts.
5: Cultural heritage	<p>EIB recognizes the central role of cultural heritage within individual and collective identity, in supporting sustainable development and in promoting cultural diversity.</p> <p>Consistent with the applicable international conventions and declarations, this standard aims toward the identification, management and protection of tangible and intangible cultural heritage that may be affected by project activities. It emphasizes the need for the implementation of a “chance-find procedure”, which outlines the actions to be taken if previously unknown cultural heritage is encountered.</p>	There is no site of cultural importance within the immediate area of influence. The closest is Thim Lich Oinga which is about 5km away from the project area.
6:Involuntary Resettlement	<p>This standard recognizes that projects sometimes necessitate land acquisition, expropriation and/or restrictions on land use, resulting in the temporary or permanent resettlement of people from their original places of residence or their economic activities or subsistence practices.</p> <p>It is therefore rooted in the respect and protection of the rights to property and to adequate housing, and of the standard of living of all affected people and communities. The standard seeks to mitigate any adverse impacts arising from their loss of assets or restrictions on land use. It also</p>	The risk of displacement occasioned by land acquisition is not triggered since KenGen will use its registered parcel of land for redevelopment. However, incase of more land requirement, engament will be with individual land owners who should be compensated fairly using market rates and based on negotiations before the project commences.

EIB Standard	Summary requirements	Relevance/Implication to Gogo Hydropowr Plant
	aims to assist all affected persons to improve or at least restore their former livelihoods and living standards and adequately compensate for incurred losses.	Flood mitigation will be developed; impacted land owners to be engaged individually, damage professionally assessed and requisite payments made to the impacted.
7: Rights and interests of vulnerable groups	The EIB seeks to protect all vulnerable project-affected individuals and groups, whilst seeking that these populations duly benefit from EIB operations. The standard requires that there is full respect for the dignity, human rights, aspiration, cultures and customary livelihoods of vulnerable groups including indigenous peoples. It requires the free, prior and informed consent of affected indigenous groups.	The project area has no indigenous groups. Those considered vulnerable in the area are households including those headed by women and children, People Living With Disabilities (PLWD) and the elderly.
8: Labour standards	<p>Good labour practices and the use of appropriate codes of conduct are important to ensure the fair treatment, non-discrimination and equality of opportunity of workers.</p> <p>This standard aims to ensure that promoters of EIB projects comply with the core labour standards of the International Labour Organisation (ILO) and with national labour and employment laws.</p> <p>The standard also requires the establishment, maintenance and improvement of worker-management relationships.</p>	The project will follow national labour laws e.g. Employment Act. 2007 and relevant international standards, establish a worker grievance mechanism, fair wage policy, no child labour, no forced labour amongst other fair employment practices.

EIB Standard	Summary requirements	Relevance/Implication to Gogo Hydropowr Plant
9: Occupational and public health, safety and security	Promoters are expected to protect and secure public and occupational health, safety and security and promote the dignity of the affected community in relation to project-related activities, with particular attention to vulnerable groups. The standard also requires promoters to adhere to the international norms and relevant human rights principles when using security services.	The project will follow national laws and regulations like Occupational and Health and Safety policies (OSHA), WIBA, security policies.
10: Stakeholder engagement	This standard requires project promoters to uphold an open, transparent and accountable dialogue with all project affected communities and relevant stakeholders in an effective and appropriate manner. The value of public participation in the decision-making process is stressed throughout the preparation, implementation and monitoring phases of a project. The right to access a remedy, including through grievance resolution, is actively required.	There has been public consultations and participation and continuous engagement of the community throughout the ESIA study and a public disclosure was conducted through community and Institutional stakeholders workshop. This will be continued through all phases of the project.

KenGen will ensure that the hydropower plant complies with the highest and stringent international practices in addition to Kenyan legal requirements.

3.6 International Hydropower Association Sustainability Guidelines

The International Sustainability Guidelines were published in 2004 with the main aim of promoting environment, social and economic considerations in assessing new energy projects, new hydro projects and the management of existing hydropower facilities.

The principles set out in the IHA Sustainability Guidelines entail a number of elements that include:

- The role of governments
- The decision-making processes
- Hydropower - environmental aspects of sustainability
- Hydropower - social aspects of sustainability
- Hydropower - economic aspects of sustainability

In order to assist in decision making and to ensure the sustainability of hydropower projects, the IHA has a position that Environmental Assessments (EAs) should be applied at the project level from the prefeasibility stage to the post-construction auditing stage. The IHA encourages governments and project proponents, through the use of key criteria, to ensure the appropriate management of environmental and social issues throughout the lifetime of the project by adopting strategies to maximize positive outcomes and reduce the severity or avoidance of negative social, economic and environmental impacts.

3.7 Multi - Lateral Agreements and Conventions

Agreement/Convention	Provisions	Relevance for Gogo Hydropower Plant
Convention on Biological Diversity (1992)	This was ratified on 11th September 1994. Agenda 21 – a programme of action for sustainable development worldwide, the Rio Declaration on Environment and Development was adopted by more than 178 governments at the United Nations Conference on Environment and Development, known as the Earth Summit, held in Rio de Janeiro, Brazil from 3rd to 14th June 1992. Principle No. 10 of the declaration underscore that environmental issues are best handled with participation of all concerned citizens at all the relevant levels. At the national level, each individual shall have appropriate access to information that is concerning environment that is held by public authorities. States shall	In line with the spirit of the convention, there has been an integration of biodiversity considerations into the proposed water project as the associated activities will have an impact on the plant species in the area.

	encourage and facilitate public participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy shall be provided. The foregoing discussion is relevant to the proposed development because EMCA demands that public must be involved before any development project that is likely to have adverse impacts to the environment is initiated by a proponent. The Act has further established Public Complaints Committee (PCC) where the issues raised by the public in regard to any proposed development can be addressed.	
Conservation of Biological Diversity Regulations, 2006	Kenya has a large diversity of ecological zones and habitats including lowland and mountain forests, wooded and open grasslands, semi-arid scrubland, dry woodlands, inland aquatic, and coastal and marine ecosystems. In addition, a total of 467 lake and wetland habitats are estimated to cover 2.5% of the territory. In order to preserve the country's wildlife, about 8% of Kenya's land area is currently under protection.	The proposed transmission line to Awendo substation does not pass through any known protected area which is specified in this regulation. However small mammals, birds, insects, amphibians and reptiles found in the area will be conserved.
World Commission on Environment and Development	The Commission commonly referred to as —the Brundtland Commission focused on the environmental aspects of development, in particular, the emphasis on sustainable development that produces no lasting damage to biosphere, and to particular ecosystems. In addition, environmental sustainability is the economic and social sustainability. Economic sustainable development is development for which progress towards environmental and social	The Gogo hydropower project is an environmentally sensitive project aimed at producing clean energy.

	sustainability occurs within available financial resources. While social sustainable development maintains the cohesion of a society and its ability to help its members work together to achieve common goals, while at the same time meeting individual needs for health and well-being, adequate nutrition, and shelter, cultural expression and political involvement.	
Montreal Protocol, 1987	The Montreal Protocol on Substances that deplete the ozone layer (1987) was ratified on November 9, 1988. This treaty was designed to protect the ozone layer by phasing out the production of a number of substances believed to be responsible for ozone depletion.	The Gogo hydropower project is an environmentally sensitive project aimed at producing clean energy and reducing dependence on fossil fuels and thus reducing the carbon footprint.
United Nations Framework Convention on Climate Change (1992)	International environmental treaty produced at the United Nations Conference on Environment and Development (UNCED), informally known as the Earth Summit, held in Rio de Janeiro in 1992. The treaty is aimed at reduced emissions of greenhouse gas in order to combat global warming.	The project seeks to provide a sustainable and efficient renewable energy source.
The Paris Agreement of 2015	A legally binding international treaty on climate change which was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016. Its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. To achieve this long-term temperature goal, countries aim to reach global peaking of greenhouse gas	The project is a Clean Development Mechanism project that will lead to a reduction of carbon emissions that normally come from other sources of energy. KenGen can investigate the options and the means of selling Carbon Credits.

	emissions as soon as possible to achieve a climate neutral world by mid-century.	
The 1985 Vienna Convention for the protection of the Ozone Layer	Vienna Convention seeks to protect human health and the environment against the effects of ozone depletion. It establishes a general obligation on the parties to protect the ozone layer (Article 2) and emphasizes the need for international cooperation. The machineries to be used in the project have to be well maintained and eco-friendly (newer models of machines are more eco-friendly than previous versions).	The Gogo power plant redevelopment project seeks to replace an old dilapidated almost obsolete plant with a highly efficient new model. The contractor will be advised to use efficient and well-maintained models of machines to reduce Greenhouse Gas emissions and release of ozone depleting substances into the atmosphere..

<p>The Bonn Convention on migratory species of wildlife animals (1979)</p>	<p>The Bonn convention is primarily concerned with migratory species of animals. Article III provides a guideline on how to deal with endangered migratory species whereas Article IV gives an overview of the subject of agreement for all migratory species. Matters of dispute settlement are discussed in Article XIII. Parties must protect them, conserve and restore their habitat, mitigate obstacles to migration and control other factors that might endanger them.</p>	<p>The Gogo power plant redevelopment project is on the River Kuja which has fish species and thus water flows in the river should not be totally stoppoed during construction.</p>
<p>Ramsar Convention, 1971</p>	<p>The Convention on wetlands is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. It was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975, and it is the only global environmental treaty that deals with a particular ecosystem. The Convention's member countries cover all geographic regions of the planet.</p>	<p>Degradation of wetlands should be avoided even with inception of the project.</p>

3.8 INSTITUTIONAL FRAMEWORK

Table 4 Institutional Framework

Institution	Function /Relevant section	Relevance to the project
KenGen	Power generation	KenGen is the project proponent and in this project, it has the responsibility of ensuring all activities at the plant, both by own staff and by contractors, adhere to all applicable national laws and regulations.
Energy and Petroleum Regulatory Authority (EPRA), formerly Energy Regulatory Commission	<ul style="list-style-type: none"> • Review of government policy on petroleum; • Governing the petroleum sector with a focus on licensing. • Identifying gaps in EHS and developing interventions to address the gaps to ensure that EHS clearly understands standards the rules that it is expected to regulate. This will include the review and enhancement of existing standards. • Generation, importation, exportation, transmission, distribution, supply and use of electrical energy with the exception of licensing of nuclear facilities 	EPRA regulates the energy sector including renewable energy through the licensing of generation, transmission and distribution works as well as professional technicians in electrical installation works.

Institution	Function /Relevant section	Relevance to the project
	<ul style="list-style-type: none"> • Production, conversion, distribution, supply, marketing and use of renewable energy. 	
Kenya Power	<ul style="list-style-type: none"> • Owns and operates • most of the electricity transmission and distribution system in the country and retails electricity. • Purchase electricity from KenGen and other independent power producers • Building and maintaining the power distribution network 	Kenya Power is a major player in the supply and sale of electricity with KenGen being a key generator. Therefore, it plays a major role in consumer safety.
National Environment Management Authority (NEMA)	<p>General supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment.</p> <p>In addition to NEMA, the Act provides for the establishment and enforcement of environmental quality standards to be set by the Cabinet Secretary in consultation with the Authority, which will govern the</p>	NEMA must approve the project before implementation and participates in subsequent stages of construction environmental management and annual audits review.

Institution	Function /Relevant section	Relevance to the project
	discharge, limits to the environment by the proposed project.	
Ministry of Environment and Natural Resources	The Ministry facilitates good governance in the protection, restoration, conservation, development and management of the environment and natural resources for equitable and sustainable development.	This Ministry is responsible for policies and programs aimed at improving, maintaining, protecting, conserving and managing the richness of Kenya's natural resources including water, forestry, wildlife and environment.
County Government of Migori	It constitutes various developmental approvals departments such as the planning department.	KenGen should present the revised facility drawings and plans to the relevant county government departments for approval prior to the project implementation.
Kenya Wildlife Service	Conservation and management of wildlife	KWS will be involved in management of wildlife in the immediate surrounding since the project area has hippos and crocodiles. KWS will be crucial in management of any problematic wildlife encounters.
Water Resources Authority (WRA)	A government authority regulating the management and use of water resources	WRA regulates water resources through the issuing of permits while ensuring the sustainable and equitable allocation of the water resources.

Institution	Function /Relevant section	Relevance to the project
Ministry of Energy and Petroleum	Its aim is to facilitate the provision of clean, sustainable, affordable, reliable, and secure energy services for national development while protecting the environment	The ministry should be part of the project implementation.
Kenya Electricity Transmission Company (KETRACO)	Planning, designing, construction, operation and maintenance of high-voltage electricity transmission lines	KETRACO will be involved in evacuation of power from the plant.
Rural Electrification and Renewable Energy Corporation (REREC) formerly Rural Electrification Authority (REA). Name changed after enactment of the Energy Act, 2019	Promote, stimulate, facilitate and improve modern energy access for productive uses in rural areas in order to stimulate rural economic and social development.	KETRACO may need to be consulted if the need arises to connect power to the local community neighbouring Gogo hydropower station.
Land and Environment Court	The court is mandated to hear and determine disputes relating to the environment and the use and occupation of, and title to land.	Land and environment disputes resolution.

4. CHAPTER FOUR: CONSULTATIONS AND PUBLIC PARTICIPATION

4.1 Introduction

The Constitution of Kenya (2010) dictates that Consultation and Public Participation (CPP) is a central part of governance and in this case project development and implementation. Public Participation is also a mandatory requirement as stipulated by EMCA 1999 Section 58, on Environmental and Social Impact Assessment (ESIA) for achieving the fundamental principles of sustainable development.

This chapter describes the consultation and public participation process followed by Stantec Consultants and the feedback from the consultations. Consultations were held with the local leadership, local residents and key institutions and their views sought through interviews and public meetings. This process was undertaken as stipulated by Environment Management and Coordination Act, 1999.

4.2 Objectives of the Public Consultation Process

The overarching importance of public consultation was to receive feedback and collect data from the stakeholders and impacted community members on the environmental and social setting of the project, interrogate the potential impacts that can arise from the project, assess the community's willingness to embrace the project, obtain individual and community goodwill, seek community participation and ownership, and finally develop sustainable mitigation measures and integrate this into project planning and implementation for the proposed Gogo Dam Hydropower redevelopment.

Towards the fulfilment of the terms of reference of the ESIA, public participation is a participatory process to ensure that all the stakeholders, including the target beneficiaries and persons affected by the proposed project are involved through the provision of data and information, pointing out issues of concern and suggesting solutions on how the concerns can be addressed. Specifically, the public consultations objectives included:

- Facilitation of open and inclusive approach for engagement and providing timely and transparent project information to the stakeholders;
- Identification of stakeholders and local leaders with whom further dialogue can be continued in subsequent stages of the project.
- Provision of an opportunity for stakeholders to provide feedback on the project and raise their concerns;

- To reduce conflict through the early identification of contentious issues and design mitigation responses; and
- To aid in project planning and development of impact mitigation measures and monitoring plans to address identified issues and concerns

4.3 Modes for Public Consultation and Sensitisation

Consultation meetings were held with identified stakeholders and community members through the following modes:

Courtesy Calls

Courtesy calls were paid to the office of the Governor, Migori County and the Deputy County Commissioner, Uiri Sub County.

Key Informant Interviews

These were conducted using structured interview guides. This approach was widely used in gathering sociological and environmental data and opinions, priorities, and concerns from key stakeholders including government departments, county officials, political leaders and county government staff.

Focus Group Discussions

This mode was used during consultations with special interest and vulnerable groups including men, women, youth, irrigation water users and people living with disabilities.

Public Meetings

One (1 no.) public meeting was held with residents from various villages of the project area. With the support and guidance of the area Chief and Assistant Chief, community mobilization and the consultation programme was developed and implemented considering the project's area of influence. A virtual meeting was held with the area MP Uiri constituency.

4.4 Stakeholder Identification and Analysis

In project development, it is vital to ensure that all relevant stakeholders are consulted during project implementation so as to get their views and feedback and gain their support and advice. Stakeholder's identification and analysis was undertaken to determine the stakeholders who will be impacted directly or indirectly by the proposed redevelopment of Gogo Hydro Power Project and those who can contribute to or hinder its implementation.

The stakeholders were categorized into two main categories namely; primary stakeholders, and secondary stakeholders. Primary stakeholders were classified as those who will be directly impacted by the project either positively or negatively. They consisted of the local community within Gogo's primary zone of influence. Secondary stakeholders on the other hand were those who have influence

on the project intervention or those that are affected indirectly by the proposed project. They included the National Government line ministries, County Government, Regulatory Authorities and the Civil Society Organizations.

Table 5 Stakeholder Groups Consulted

Stakeholders		Consultation Methods
Primary Stakeholders	<ul style="list-style-type: none"> Landowners and immediate community members living next to Gogo Hydro Power Plant and likely to be impacted by the Project's infrastructure; Community members living in villages with close proximity to Gogo Hydro Power Plant Irrigation Water Users downstream who rely on water from River Kuja water 	<ul style="list-style-type: none"> Public Meeting One (1 no) held at Gogo PEFA Church Compound Five (5 no.) Focus Group Discussion Conducted with: <ul style="list-style-type: none"> Women group; Elderly men group; Youth Group; People Living With Disabilities (PLWD) Lower Kuja Irrigation Water Users Association
Secondary Stakeholders	<p>National Government officials and line ministries and departments; County Government officials; and Regulatory bodies. The following stakeholders were identified and consulted on the proposed project:</p> <ul style="list-style-type: none"> Deputy County Commissioner, Uriri Sub County; Senior Chief, West Kanyamkago Location Assistant Chief, Kajulu II Sub Location County Fisheries Officer, Migori Director of Education Social Development Officer Department of Environment, Natural resources and Ecosystem Conservation offices, Ecosystem Conservation Environment Officer County Public Health Officer CEC: Department of Agriculture Fisheries Department NAGRIP 	Key Informant Interviews (KII)

Stakeholders		Consultation Methods
	<ul style="list-style-type: none"> • Energy & Water: Water and Sanitation: Migori Water and Sanitation Company • Director Physical Planning and Urban Development • Ward Administrator Mr Lazarus Abila • Uriri Sub County Administrator Mr Kennedy Adong • Kenya Power • National Environment Management Authority, County Director (Mr James Siaji) • Kenya Forest Service; • Kenya Wildlife Services; • National Irrigation Authority – Scheme Engineer • Water Resource Management Authority (WARMA) • Kenya Rural Roads Authority (KeRRA) 	
	<p>Elected political leaders: Member of County Assembly, West Kanyamkago Member of Parliament, Uriri</p>	

4.5 Public Consultations and Engagements During the ESIA Study

This section presents the findings from the stakeholders in regards to the project and with key objective of informing the ESIA study. The issues discussed during the Key Informant Interviews, Public Meeting and Focus Group Discussions are presented in this section.

The following tables present summaries of the issues and comments raised from the stakeholders and responses provided by KenGen (the project proponent), and the ESIA consultants. Minutes and attendance lists of the public meetings, FGD's and KII's are presented in appendices to this report.

Table 6 Issues/Concerns and Responses Matrix from the Public Meeting and FGDs

Issue	Comments and Responses
Fear of displacement and Land Acquisition	It was clarified that the project will be done on KenGen land without displacement of people or crops destruction. In the event any community member has his/her land directly or indirectly impacted, they will be engaged adequately.
Increased human – wildlife conflict	It was noted that KenGen has a similar problem in the other areas of operation. Kenya Wildlife Service is being consulted on how to mitigate the human - wildlife conflict.
Flooding as a result of back flow and raised dam wall - an damage to crops	It was clarified that the dam wall will not be raised instead the silt will be removed to increase the depth of dam and enhance its water holding capacity. She also clarified that KenGen will seek funds from a Financial Institution to redevelop the dam and the project's feasibility on a cost benefit analysis must be conducted. This includes consideration for environmental and social issues, financial, and technical viability.
Increase of accidents on the roads	It was clarified that the contractors will erect signage /Speed limits/bumps to control vehicle movement and ensure the limits are adhered to.
Access to Electricity	It was stated that electricity distribution is the mandate of Kenya Power and KenGen can only engage and share with them the community request and feedback.

Issue	Comments and Responses
Provision of clean portable water	KenGen has always supported community projects and the request for clean water provision has been noted and will be reviewed. The community should put it in as a CSR project request for consideration.
Employment opportunities	It was clarified that during construction, people who do construction are mostly foreigners because they have the expertise. They come with their own few experts but semi skilled and unskilled labour is offered mostly by the local people. A stakeholders' coordination committee (all inclusive) is usually formed and one of its manadates is to deal with employment issues during project implementation. A Community Liaison Officer working for KenGen is normally recruited to link the community and ensures issues are addressed.
Business Opportunities	Supply of materials and items during construction will be done competitively and transparently. Attempts will be made to ensure that capable vulnerable groups and individuals particularly women, people living with disabilities are considered. It will be important for those interested to bid when the tenders are floated.
Water volume and cleanliness during construction	During construction, a bypass will be created to enable water to flow to ensure minimal interference with flow and cleanliness.
Impact on farming along the river banks	It was clarified that there will be minimal or no interference with those farming on their parcels of land along the river. Those farming on KenGen land will be impacted and appropriate consultations will be held with those impacted and ample notice will be provided before construction commences.
Compensation for private impacted land and crops/assets	It was stated that KenGen will deal with the issue of damaged crops on a case by case basis. Through computer simulation, KenGen would be able to determine who will be affected by the project and those impacted will be engaged adequately. Further KenGen has a property team who will know which peoples' farms are affected and to what extent. She reiterated that if there is anyone to be compensated, this will be discussed before construction.

Issue	Comments and Responses
Construction or repair of footbridge	A new bridge will not be constructed but the footbridge will be rehabilitated to make it safer for use.
Construction of roads	KenGen does not have mandate to construct roads but will make attempts to improve the roads used by the project and also liaise with other government agencies and county government in regard to rehabilitation of roads.
Schedule of construction – time	Once the feasibility study is done and funds secured, there will be a tendering process in line with Public Procurement Processes that can take up to a year. The target start date is sometime in year 2022. A community member raised a concern that 2022 is an election year and it is always an unpredictable period, a concern which was noted.
Pollution – oil spill, noise, dust	It was clarified that the oil spill sometimes experienced in the water is due to broken seals in the power plant which need to be replaced hence the need to redevelop the plant. New and more efficient machines will eliminate the problem of oil spill.
Impact on community members who may have currently encroached on KenGen land	KenGen intends to use its land for the project. In case there are community members currently living on KenGen's land, this will be reviewed and those impacted engaged appropriately. KenGen's property team will conduct a survey to determine extent of encroachment.
Involvement of people living with disabilities	The project will make efforts to involve and ensure participation of all vulnerable groups and individuals as appropriate.

Table 7 Issues raised by Key Informants

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
Governor	<ul style="list-style-type: none"> Electricity is a key enabler for development. Fully supports the redevelopment of Gogo Power plant. Always been the desire of the county government to redevelop it. Electricity supply is unstable and inadequate to spur economic growth and operate industries for dairy, poultry, potatoes processing. County does not have access to clean and safe drinking water leading to high instances of water borne diseases. Due to high power tariffs, pumping of water gets very expensive. Gogo should be expanded and handed over to the County Government to manage. 		<ul style="list-style-type: none"> KenGen intends to use its land for the project. In case there are community members currently living on KenGen's land, this will be reviewed and those impacted engaged appropriately. The power plant was handed over to KenGen and it would not be possible to hand it over to the county. Any discussions on that are beyond the scope of the team and can only be done at the highest levels of government. Power distribution is the mandate of Kenya Power who will be engaged on the request to first consider Migori County before supplying surplus to other areas. Gogo plant is part of Western Hydros which serve western Kenya that currently has a shortage. Lower Kuja Irrigation Scheme has been identified as a key stakeholder and will be engaged adequately.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> • Glad that there would be no displacement of communities as a result of land acquisition. • Hoped for increased CSR activities and support for community projects. • The foot bridge should be improved. County Government can partner with KenGen to build a better and bigger bridge to enhance movement across River Kuja. A bridge will open up and improve economic activities, improve access to the renowned tourism site at Thim Lich Ohinga, and enhance safety of those crossing the river • Redeveloped power plant should supply Migori County before other areas of the country 		<ul style="list-style-type: none"> • KenGen has always supported community projects through schools' infrastructure and scholarships and will continue to do so. • The current footbridge will be revamped though the scope of the project does not include construction of a new bigger bridge.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
MP, Uriri Constituency	<ul style="list-style-type: none"> Supports the project Thanked KenGen for the development of the area through schools' infrastructure, bursaries, road construction and other CSR activities. MP should be involved in community meetings for mobilisation of the critical people to avoid politicisation; enhances acceptance and support. Literacy levels are low in the area and hence need to have proper engagements to ensure wide participation of community members. Share the minutes of the consultations with the community for his information; input from the meetings should go to the feasibility report. 	<ul style="list-style-type: none"> KenGen should consider last mile electricity connection for local community members As a CSR programme, KenGen should include power supply to the community in this project before selling to Kenya Power. KenGen should consider giving rebates to community members for power connection. Appreciates that power distribution is the mandate of Kenya Power but KenGen has the ability to lobby and engage Kenya Power for connection of the area. Improve the access roads. Suggested that KenGen can write a letter to KeNHA to consider as part of CSR for the Isebenia – Kisii A1 road construction, the contractor 	<ul style="list-style-type: none"> Feedback from community meetings will be part of the ESIA report; a public disclosure meeting will be held with the community once the draft ESIA report is ready. The minutes will be shared with the MP. The few targeted community members were met because of Covid 19 regulations, a bigger baraza can be held once the situation eases. The chief and assistant were involved and mobilised the community members. Dam desiltation issue was raised during community consultations, the possible presence of body parts in the silt was highlighted and the community will consult and provide feedback during public disclosure meeting. CSR activities are customized as per community suggestions and priorities The plan is to evacuate the power to Awendo substation and the transmission line should be done along the current line where there is

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> As part of participation, two more public meetings should be held to ratify the report. Latest Commission for Revenue Allocation (CRA) report classifies West Kanyamkago Ward where Gogo power plant is located as a hardship area. During rainy seasons, the area is hard to access due to bad roads. Dry season presents difficulties in accessing water, women have to wake up very early and walk long distances to fetch water; food production is severely threatened leading to hunger, experience water shortage despite proximity to the river. High incidences of waterborne diseases have led to loss of lives 	<ul style="list-style-type: none"> can improve the road connecting Gogo to the A1. Improve the partnership KenGen has with Gogo schools e. g build a model school with adequate facilities to improve education standards. Consider desiltation of the river from Sukari Industries all the way to Gogo Non-technical work during construction should be left for the locals. Where the local people have the skills for technical work, they should be prioritized. All employment positions should be advertised locally even for technical opportunities and give community members an equal opportunity. 	<ul style="list-style-type: none"> already a wayleave and there will be no need for land acquisition Priority for employment opportunities will be given to local staff. All casual work will be done by locals, in case there are qualified community members for skilled jobs, they will be given priority. Already 8 community members (some students and some recently graduated) were recruited to conduct a three days' socio-economic survey. KenGen has a policy that ensures involvement of community members in project implementation and prioritization for employment. A Stakeholders Coordination Committee is usually formed to manage community issues throughout the project implementation, key amongst them being employment.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> Area has no electricity yet power is generated there. Together with other stakeholders have tried to lobby Kenya Power for connection to institutions like schools without success. Fear of flooding. Human - wildlife conflicts have been a long standing problem in the area and will escalate. Transmission line for power evacuation can be expensive and due to land acquisition. Did not have any concerns on biodiversity. On water supply for community, his office has sunk 2 boreholes and another by the county government but the yields were very low. 	<ul style="list-style-type: none"> Desilted materials can be used for filling in the quarries and gully in the area. Deposit the silt in the farms to improve productivity - identify community members who would be interested in the silt to use for farming. The issue of presence of body parts, if found in area during project implementation, can be raised during public participation for more community feedback. KenGen can get a piece of land to be used for burying any remains that may be excavated from the dam. The technical design should ensure no flooding and related impacts of displacement occur. 	<ul style="list-style-type: none"> There will be continued engagements, consultations, collaboration and feedback on the project.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> Kenya Power issues are a big debate particularly some agreements that it entered that makes it buy power expensively. Parliamentary Energy Committee is currently working on legislation and policy towards removing the monopoly of Kenya Power in electricity distribution. This would allow government parastatals like KenGen to sell or distribute power directly to the consumers and have the leeway to determine the applicable tariff. 	<ul style="list-style-type: none"> Involve Kenya Wildlife Service in management of human – wildlife conflict. The dam area should be secured leaving small entry points left for community members to access the river to fetch water. Fence off the whole dam area and take out water to specific points for community access, minimize community access to the dam area. For transmission line, the project should avoid acquisition of way leaves and settled areas where the community may need to be compensated. Ensure KenGen CSR projects and activities are not global but localized to respond to immediate community needs. Examples of development of schools 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
		infrastructure, water points, last mile water connections, tractor to plough for the community members, funding for irrigation – projects that would have an impact on community members.	
MCA, West Kanyamkago	<ul style="list-style-type: none"> • Supports the project and if needed, he will always be available for engagement and consultation with residents of the Ward. • Thanked KenGen for support for infrastructure development in schools and provision of bursaries/scholarships • There is low connectivity to electricity in the area • Displacement as a result of land acquisition for the project. • Land in the area have title deeds and are mostly ancestral and many have 	<ul style="list-style-type: none"> • Need for consideration for improved power supply and connection in the area. KenGen should engage Kenya Power to consider connecting the area to the grid. • Pleased that KenGen will not acquire more land. However, in case of need for extra land, those impacted should be engaged appropriately and given fair compensation. Land issues in the area are sensitive and should be handled cautiously. 	<ul style="list-style-type: none"> • The issue of land is being taken seriously and KenGen will use its land but will ensure adequate engagement with any impacted community member

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<p>not undergone succession. Ownership normally controlled by a family patriarch to protect land from risk of unplanned and irresponsible sale occasioned by poverty.</p> <ul style="list-style-type: none"> • Foresees positive impacts including improvement of roads in the area, employment opportunities, more support for community projects by KenGen including increase in number of sponsored students. • Gender issues - tradition still has a great impact on how women are treated and creates a barrier in their access to and appropriation of property and education. There are government policies in place and local administrators put efforts to ensure equitable access to education by both boys and girls and even 	<ul style="list-style-type: none"> • To minimise conflict, priority should be given to immediate impacted community members when recruiting for various employment opportunities • To enhance support and for management of impacts, the project implementers ensure broad and wide public participation • To improve education standards in the area, community leaders should be involved to sensitise and encourage pupils to work hard in school • Create an environment to enable women participate in consultations and meetings. Due to low literacy levels, use of local language enhances their participation. Hold meetings and engagements with 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<p>protect women's rights to property. Women are allowed to attend meetings and participate.</p> <ul style="list-style-type: none"> • During long rains, the area faces a lot of erosion and roads get washed away and interferes with travel. • Human - Wildlife conflict - hippos damage crops, crocodiles attack residents. • High levels of poverty in the area leads to high rates of school drop outs and early marriage • The area is dry, almost semi-arid and food production is always low 	<p>women only to ensure their voices are heard.</p> <ul style="list-style-type: none"> • Involve Kenya Wildlife Service in managing human – wildlife conflicts • The footbridge in its current state is not safe particularly for small children, consider improving it. 	
DCC, Uriri	<ul style="list-style-type: none"> • Supports the project and will provide needed assistance from National Government • Concern for the current security of the plant being a critical government installation. She promised to follow 	<ul style="list-style-type: none"> • Appreciates regular updates provided by KenGen and consultants on the project's progress • Need for community and stakeholder consultations to ensure public participation. Constantly use 	<ul style="list-style-type: none"> • The DCC was provided with the mobile number of the in charge Gogo Power plant for coordination of a visit and follow upon security issues of the plant

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<p>up with the officer responsible for Security of Government Buildings in the Sub County to understand the current protection arrangements for the plant. She also promised to visit the plant now that she had fully settled in the Sub County.</p> <ul style="list-style-type: none"> • Security issues that will be caused by influx of workers and those seeking opportunities during the project's construction phase. • Her office was quite busy then since they were making preparations for logistical and security support for the KCPE and KCSE national exams 	<p>the chief and his assistant as entry points to the community and to organise meetings.</p> <ul style="list-style-type: none"> • Ensure concerns raised by the community are addressed properly, involve the chief and assistant chief in responding or resolving. • Concerns for security caused by influx of workers and those seeking opportunities during the project's construction phase. • During the next phase of the ESIA, a courtesy call should be paid to the County Commissioner to brief him on the status. As the DCC, she has already provided a brief to the County Commissioner. 	<ul style="list-style-type: none"> • The County Commissioner, will be briefed through a courtesy call during the public disclosure workshop
Chief West Kanyamkago and Assistant	<ul style="list-style-type: none"> • They will cooperate with KenGen and ensure that the project does not fail 	<ul style="list-style-type: none"> • Address boundary issues through surveying by Lands Department, engagement with the impacted 	<ul style="list-style-type: none"> • KenGen intends to use its land for the project. In case there are community members currently

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
Chief, Kajulu II	<ul style="list-style-type: none"> See their roles to be: coordination between the community and the KenGen, create awareness in the community on project activities, mobilisation of the community, community security matters, response to natural disasters like floods, from accidents, vetting of local security for KenGen, security by local communities to make sure the community poses no threat to the project, consultations and joint responsibility for security, and conflict resolution in the project, and coordination and consultation with the Deputy County Commissioner. Boundaries of KenGen's Gogo power plant land are not clear, there is possibility that some community 	<ul style="list-style-type: none"> community members with the support of the chief and his assistant. Be transparent, explain what is possible and proper description of the project; describe the benefits through engagement and consultations with the community members. Involve the chief and his assistant. Clear employment procedure and sensitise community on requirements, qualifications, transparency by the contractor in advertising available vacancies, KenGen should be open about the opportunities that exist in the power plant Opportunities should first be given to those living closest to the power 	<ul style="list-style-type: none"> living on KenGen's land, this will be reviewed and those impacted engaged appropriately. Immediate stakeholders will be incorporated in a stakeholders' coordination committee during project implementation, which normally deals with how available opportunities should be shared. During construction a bypass will be created for the river to ensure no interference with the water flow and cleanliness downstream.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<p>members have encroached and are farming on part of the land.</p> <ul style="list-style-type: none"> • Unrealistic community expectations • Employment expectations - if this expectation is not met, conflict may arise. • Area characterized by low literacy levels and the community members will need to be sensitized a lot in order to understand and appreciate processes. • Floods during rainy season restricts movement • Fear of restriction of water use and particularly for animals • Influx of foreigners will lead to an increase in social vices such as insecurity, alcoholism, prostitution, immorality, increase in Corona, HIV-AIDS, STIs and other disease, 	<p>plant and those living on KenGen land before opening to other areas.</p> <ul style="list-style-type: none"> • Have local representation in KenGen Committees to • Set up a disease control centre where testing, counseling, awareness creation, treatment and preventive measures will be carried out. • Create outlets for clean water for community consumption and discourage community members from accessing the river. • Erect speed bumps and set speed limits for drivers. There can also be agreement on a specific route to be used by the project vehicles. • Erect signage along the road and at the construction site for safety purposes. 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<p>breakup of families and conflict, interference with community culture</p> <ul style="list-style-type: none"> • Interference with biodiversity • Impact on aquatic life - hippos, crocodiles, fish species • Increased human - wildlife conflicts • Accidents on the site and along the roads particularly due to heavy vehicle movement. • Pollution - air pollution arising from dust from excavation activities and increased vehicular movement in the area and water pollution. Water pollution will impact both on animals and human beings. • Damage to and felling of trees some which are used as herbs by the community. • Blasting using explosives 	<ul style="list-style-type: none"> • Put in place measures to protect young girls – area has a low income and high poverty levels and young girls can be easily influenced by workers who have money. • Set up tree nursery for seedlings production for planting in the area. • The silt can be disposed across the dam on KenGen land, community member can offer a disposal area but at a cost to the company, members may want the silt as manure for farming, company should cater for transport costs • Engage the county government to offer an idle parcel of land near Gogo for disposal and then the community members who want the soil can collect from there. 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> During construction, removal of silt will negatively impact aquatic life particularly fish, crocodiles and hippos by contaminating the water and increasing its turbidity. However this will be shortlived since once desilting of the dam is complete, there will be an increase in fish population in the river, the dam will also act as a breeding ground for fish. 	<ul style="list-style-type: none"> Liaising with KenGen to explore ways of securing the site either through local security guards police or organised groups. 	
CeC, Agriculture	<ul style="list-style-type: none"> Pollution during dredging Impact on breeding site for aquatic fauna Turbidity will increase killing aquatic life Risk of electrocution 	<ul style="list-style-type: none"> Control soil erosion and siltation of the river Give dredged soil to willing farmers to improve on their soil fertility Use the dredged soil to back fill pits left by murram quarrying during road construction Soil can be tested to assess its suitability for brick and molding materials 	<ul style="list-style-type: none"> Protection of catchment upstream of Kuja River will reduce incidences of soil degradation and reduce erosive power of water from the river and from floods. The CeC is willing to take up the silt and use it in his farm. The client is engaging with the CeC on the same. For increased turbidity, the impact will be short lived and obstruction of water flow will be

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
		<ul style="list-style-type: none"> Enhance corporate Social responsibility Connect local schools, health care facilities, churches, mosques to electricity 	temporary and not total. There will be a provision of water to flow downstream.
Ecosystem Conservation Environment Officer	<p>onal Health and Safety - increase in road occupational accidents during project activities</p> <p>nce with water levels and water flow rate</p> <p>Kuja will negatively affect irrigation downstream. This will also limit intake of water project and reduce access to water for communities</p> <p>sity: Impact on plant and wildlife diversity with a potential of extinction of various tree species during clearing and activities</p> <p>Increase in disease incidence especially of malaria and HIV</p> <p>: from oil spillage, noise, poor waste management</p>	<ul style="list-style-type: none"> Regulate the movement of trucks by enforcing stringent speed limits and good driving practices. Good road management practices such as sprinkling of water on the road to reduce dust Identify indigenous trees affected during project activities and collaborate with the Department of Environment in tree planting and increasing forest cover especially of the affected species To minimize accidents the project area should be fenced and provide PPEs to workers 	<ul style="list-style-type: none"> There will be regulation of traffic and speed limits will be adhered to; Signagages will be erected especially near schools and hospitals; The Lower Kuja irrigation scheme will not be affected since in hydropower generation there is no abstraction water, the water is released after power is generated; Where possible indigenous trees will not be interfered with but where vegetation is cleared, replanting should occur in project designated areas; Public health officers will capacity build the community on disease prevention, containment and control.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
		<ul style="list-style-type: none"> All workers coming into the project area should be tested for COVID and have mitigation measures against its spread (hand washing, wearing of masks etc). Increased awareness of project activities within the local community in good time prior to operations - sensitize the community on traffic, OHS, noise, vibration, and other types of pollution likely to reduce or manage conflicts and complaints about project activities. Minimize impacts that affect water levels or flow to protect water users downstream and those who rely of the water project as a source for domestic use. 	<ul style="list-style-type: none"> Safety and disease control measures such as use of face masks and sanitizers for control of COVID will be employed.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
		<ul style="list-style-type: none"> Desiltation to be well thought out to protect river areas and river banks. These activities should not create new water paths. Disposal of desiltation waste should ideally be on KenGen land at a location that it cannot flow back to the river . 	
Fisheries Department	<ul style="list-style-type: none"> Breeding patterns of fish may be interrupted Increased turbidity of water Farming activities will be interrupted Increase in social evils Human wildlife conflicts Permanent loss of some invertebrates 	<ul style="list-style-type: none"> Sensitisation and awareness creation Public participation Fencing of the dam area CSR activities should include communal water points Dredged materials disposal through use in agricultural farms, rehabilitation and reclaiming of quarried land 	There will be diversion of water during construction activities to minimise disturbance of Kuja river flows.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
National Irrigation Authority	<ul style="list-style-type: none"> Water flow will be affected Most of the streams are seasonal. The upstream streams may be affected by regulation and the backflow of the water may lead to bursting of streams and flooding Flooding downstream due to bursting of banks of streams Irrigation activities will be affected Flooding will suffocate plants, sweeping away the vegetation and killing of animals by drowning The dredged material has a bad smell and will affect the people living there 	<ul style="list-style-type: none"> KenGen, Water Resources Management Authority and National Irrigation Authority should cooperate and share their timetables /work schedules /work plans and activities Should construct when National Irrigation Authority has minimal water needs. Schedule water release times for use in the scheme Disposal of siltation should be on a good site that does not interfere with the environment and the be haulage process, and material can be used as manure but it should be tested for viability, engage with NIA to know if they can use it for upland crops. 	<ul style="list-style-type: none"> Hydropower generation is a non abstractive water use therefore there will be no effects on volume of water flowing downstream; The desited dam will have a higher capacity to hold water thus reduce downstream flooding; The dredged material will be disposed off at a NEMA designated site. The CeC agriculture expressed interest on the silt for agricultural use as manure in his farm
Kenya Power	<ul style="list-style-type: none"> Concerns on pollution - noise, dust 		The redeveloped dam has a higher water volume holding capacity and thus there will be no backflow

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> Water backflow can cause flooding and increased displacement 		
Kenya Forest Service	<ul style="list-style-type: none"> Vegetation clearance and cutting of trees Pollution – water, noise, dust, oil spillage Displacement of people 	<ul style="list-style-type: none"> Rehabilitation of the site must be done after the project - trees cut should be replaced. KenGen should have a tree nursery in the area and give tree seedlings to the community, assist the community to set up own nurseries so that they can be selling seedlings. Work together with Community Forest Associations for establishment of the nurseries. The dredged materials can be given to volunteer as manure for farming; dispose in the quarries; dump in gazette forests. Organise a site visit for KFS to be able to offer sound professional advise. 	<ul style="list-style-type: none"> KenGen intends to use its own land and hence there is no risk of displacement through land acquisition.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
Department of Public Health and Sanitation	<ul style="list-style-type: none"> • Disruption of families through displacements. This will cause disruption of lives and strife. • Compensation to displaced in terms of money can also result in disruption of families because of money issues and conflict. • Relocation of people away from infrastructure such as access to safe water and sanitation facilities can increase burden to health facilities due to increased disease in the family unit. • Increased influx of people in the area during construction and operation has the potential to increase of STIs, HIV and alcoholism and therefore increase the burden of the nearest health facility. 	<ul style="list-style-type: none"> • Increased awareness, proper compensation process, and continuous education on finance and health components • Sanitation (Community Led Total Sanitation) can be a major point for CSR activity in the project area • Utilize community health volunteers in the project area to give project information, create awareness on health campaigns, and mitigate negative impacts of the project. Community health volunteers oversee 100 households per volunteer, which is the standard for rural areas. • The project should ensure compliance with the Public Health Act 	KenGen intends to use its own land and hence there is no risk of displacement through land acquisition.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> Clearing of land and expansion of dam will interfere with farms and increase breeding areas for mosquitoes. This can increase malnutrition as well as malaria incidences both of which increase burden to nearest health care facility. Employment opportunities increases the likelihood for improved lifestyle and this will have an impact on the demand of services 		
NAGRIP	<ul style="list-style-type: none"> Interruption of water supply during construction. 		<ul style="list-style-type: none"> There will be a diversion to ensure no interference with water flow downstream during construction Engagement with National Irrigation Authority and stakeholders on water needs downstream for farming
NEMA: County	<ul style="list-style-type: none"> Water quality concerns Give considerations for line regulations, water issues, wetland 	<ul style="list-style-type: none"> Conduct a thorough Environmental Impact Assessment and do a report Do an adequate EMMP 	Water analysis has been conducted during the study period and will be done again on

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
Director of Environment	<p>regulations; water quality regulation; standards, parameters, and effluents</p> <ul style="list-style-type: none"> Noise and vibrations Emissions – consider air quality regulations Follow up with Monitoring Handling of water is a key concern Vegetation may not be adversely affected Concerns on disposal of materials from dredging of the dam 	<ul style="list-style-type: none"> Dredged materials handling: Don't interfere with water flow Restore the water quality to preconstruction stage after construction Balance development with conservation If the community has to pick the dredged soil, they should be trained on its management, should be tracked and monitored closely including the amount taken; site for disposal should be assessed so that we don't transfer problems Incase an individual is taking the siltation materials, an agreement should be drafted with KenGen and include the volume an individual is willing to take. 	<p>completion of the dam to assess if there are pollutants that have been introduced.</p> <p>Wastes generated will be disposed as per NEMA guidelines;</p> <p>For flora and fauna , a comprehensive ecological survey of the area has been conducted.</p>

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
		<ul style="list-style-type: none"> • NEMA will advice accordingly once the report is written. • Start early, proper planning • Conduct wide consultations • Share what has been discussed with other departments • Any waste handling should be done through NEMA • Any water issues should go through WRA. • Maintain law and order in conflict resolution • Water quality within and along will be monitored for some time • Take care of occupational health and safety • There should be mitigation measures for the fauna • The ESIA report should be comprehensive on flora and fauna 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
		<ul style="list-style-type: none"> Any complaints by community should come directly to NEMA who will investigate through a fact finding mission Corrections will normally involve either stopping the project until corrective action is taken and or provide remediation plans. 	
Sub County Administrator, Uriri	<ul style="list-style-type: none"> Hippos and crocodiles menace will increase Water pollution during dredging Interference with aquatic life, killing of fish Possibility of displacement Social vices will increase - crime rates, theft, alcoholism Reduction in number of employees due to automation of the system 	<ul style="list-style-type: none"> Involve the local administration from the beginning of the project Create awareness about the project Capacity building the community on how to use their money Taking action on the wrong doers through arrest and action by Government agencies like the Police, County government and local administrators in collaboration with community. 	<ul style="list-style-type: none"> KenGen will use its current land and there is no risk of displacement as a result of land acquisition. Diversion of the river during construction to ensure minimal interference with flow and cleanliness downstream.

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<p>Water pollution during dredging of the dam. How will the material be transported to the community?</p> <ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • KenGen and local administrator should control the work force • The dredged soil can be used for agricultural purposes. Can be heaped in a common place for the community to pick. Need to discuss if this can be provided by a member of the community. It is effective manure in agricultural lands, community collects manure from far off places. 	
Ward Administrator	<ul style="list-style-type: none"> • The project is long overdue and should be fast tracked • Expansion of the project will have enormous positive impacts • Interfering with the ecosystems especially the aquatic life/breeding places for fish, crocodiles • Human wildlife conflicts especially hippos and crocodiles 	<ul style="list-style-type: none"> • Capacity building the community to create awareness of the dangers and risks involved • Kenya Power and Lighting Company should improve the signage e.g. put danger/hatari etc on the on power lines and danger spots. • Following policies and legislations 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> • Deforestation • Land degradation through quarrying for materials • Noise, dust and air pollution • Social vices may increase like theft, unwanted pregnancies, family discords; • Population explosion • Heavy traffic to the area • Dredging of the dam will kill aquatic life, Increase water turbidity • Risk of occupational hazards such as for people work in the power house. • Noise pollution • Occupational health and safety • Death of birds and bats when they hit power lines • Poor water and sanitation supply 	<ul style="list-style-type: none"> • Public health education • Informal settlements must be controlled through County Government Department of planning. • Use of personal protective equipment • Camp sanitation should be ensured • Insulation of power lines by Kenya Power and Lighting Company. • The dredged materials can be taken to quarries; when Midida road was being constructed, some areas were quarried and left open and can be filled up, engage farmers to see those interested in taking the soil. The soil is very fertile and thus through NARIGP can be used to enhance soil fertility. 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
		<ul style="list-style-type: none"> • If Possible Kenya Power and Lighting Compant should aim at having the locals connected to the power grid to improve on their lives • KenGen company should give back to the community through CSR projects to enhance their relationship especially improvement of education, health, infrastructure and road networks. 	
Department of Energy and Water: Acting MD, MIWASCO	<ul style="list-style-type: none"> • Water shortages during construction activities can limit access for Uriri and Nyatike residents who heavily rely on Gogo Macalder Water Project and also restrict farming in the irrigation scheme. • Construction activities and operation can increase flooding downstream, which is already severely affected by floods during rainy seasons. 	<ul style="list-style-type: none"> • In the event that activities will impact water supply, the company should increase awareness in the local area and provide alternative sources for domestic use for severely affected regions. • Construction during seasons when farming is not intensive, and irrigation scheme is not fully dependent on the river. 	<p>KenGen intends to use its won land hence there is no risk of displacement occasioned by land acquisition.</p> <p>Diversion of the river during construction will ensure normal flow downstream and prevent pollution.</p>

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> Potential displacement of people and damage to crops downstream due to flooding Increase of wildlife in Gogo area and along the river, especially upstream, leading to human - wildlife conflicts. Increase in conflict within local communities if capacity building and employment of locals is not done during construction activities and operations. Despite the Last mile connectivity project, most of Uriri is not connected to the electricity grid Displacement of people from ancestral lands Diversion of the river could separate families 	<ul style="list-style-type: none"> During construction, operation, it would be beneficial for communities downstream if KenGen could control outflow to support downstream activities. This includes increasing flow during dry seasons and decreasing it during rainy season by damming. The sediment dredged during Gogo redevelopment has high potential for use in agriculture and can be distributed to locals to use on farmlands. However, the material should also be tested to verify its usability. If it is unsuitable for agricultural use, there is potential to use it as backfill for many abandoned mines in the county. 	
Water Resources	<ul style="list-style-type: none"> Back flow of River Kuja and the streams that feed into it. 	<ul style="list-style-type: none"> Restoration of the destroyed vegetation by aggressive 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
Management Authority	<ul style="list-style-type: none"> • Flooding within areas where some communities have settled and use the water resource. • Temporary interruption of irrigation water. • Borders of riparian land will change hence people's land shall be affected. • Some natural vegetation will be submerged. • Clearing of vegetation, and excavation of part of land • As a result of dredging there will be a lot of sediment/silt generated. • Soil contamination through poor disposal of the silt 	<ul style="list-style-type: none"> • afforestation in and around the project site. • Dispose dredged materials by directing the silt deposits carrying rich top soils to the farm lands to improve their soils, silt can be used for agricultural activities. • Consult members of the Lower Kuja Irrigation scheme on whether they are willing to use the silt as manure. • The project is welcome as it will contribute to the national grid to improve power availability. • Improvement of water quality and supply • Biodiversity will increase 	
Kenya Wildlife Services	<ul style="list-style-type: none"> • Possible blockage of wildlife migration routes especially hippos and crocodiles. 	<ul style="list-style-type: none"> • The project area is not a wildlife protected area so there is no statutory requirement. 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> Increased water coverage will lead to increase of wildlife population around the wetland area, introducing more wildlife into the community which will increase human - wildlife conflict. There are already reported deaths due to hippos and crocodile attacks and this may increase. Damning may impact and change the breeding sites particularly for crocodiles Interference with migration paths particularly hippos which move upstream into some river Kuja tributaries Loss of reeds grazing area for hippos - though this habitat regenerates quite quickly, need to 	<ul style="list-style-type: none"> The dredged material should not be disposed along the river bank Loss of habitat - it is difficult to plant riparian vegetation but mitigation would include: <ul style="list-style-type: none"> - Public awareness creation on the impacts - Community relies on the river water - is it possible to bring water to the community to avoid human - wildlife conflict as community members collect water? - Natural path diversion, create a channel around the dam to allow hippos and other animals to pass and travel downstream Awareness creation on wildlife issues and protection 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<p>consider what can be done to limit the impact or increase regeneration</p> <ul style="list-style-type: none"> • Loss of habitat for wildlife animals • Impact downstream at the estuary - risk of drying up when dam is filling up • Small fish like cat fish may be affected during dredging though impact may be minimal and the fish also has very high resilience levels • Possible displacement due to land acquisition • There is possible negative effect of power line on birds but needs to be properly investigated 	<ul style="list-style-type: none"> • Management and response to human - wildlife conflict • Nature of impacts - if the impacts are many and deemed major and extensive, KenGen can seek to collaborate with KWS to manage the impacts and incidences of conflicts. • Since there will be a new ecosystem created, there will be continuous monitoring and frequent surveys of the impacts • Collaboration with KenGen on wildlife issues • There is possible negative effect of power line on birds but needs to be properly investigated • The effect of dredging on wildlife also need to be properly 	

Key Informant	Concerns/Comments/Issues/ Impacts	Proposed Mitigation Measures	Responses/Comments by KenGen and Consultants
	<ul style="list-style-type: none"> The effect of dredging on wildlife also need to be properly studied to inform mitigation measures. 	studied to inform mitigation measures.	

4.5.1 Public Disclosure Workshops

Public Disclosure is the process through which the consultants give the findings of the Environmental and Social Impact Assessment for the purposes of interrogation by the client and the project stakeholders. It involves presentation of study scope, delineation of the project area, results of public participation, analysis of positive and negative social and environmental impacts, rating of the impacts, mitigation measures of the negative impacts, analysis of project alternatives and review of Environmental and Social Management and Monitoring Plans. The conclusions and recommendations given by the consultant are presented. The issues raised by the client and stakeholders including project beneficiaries are addressed during the meeting. The client and the key stakeholders give their comments for incorporation in the final document before it is submitted to NEMA for review and comments.

The ESIA disclosure consultations was divided into two categories one for the community members; and another for key institutional stakeholders.

a. Community Disclosure Meetings

Two community meetings were held on 27th July 2021 as highlighted below.

- **Gogo Community**

The first meeting was held at Midida Assistant Chief's camp for the Gogo community and surrounding villages. It was attended by 67 (Appendix 3) community members who were invited including the area Member of Parliament and Member of County Assembly. The number however was much larger due to community members coming in order to have audience with their leaders. Due to Covid 19 Prevention Protocols, the numbers attending the actual meeting were limited to those who were mobilised by the area chief (Attendance List attached in Appendix 3).

- **Lower Kuja Irrigation Scheme , Nyatike**

The second community meeting was held at Agenga Chief's Camp targeting the farmers and members of the Lower Kuja Irrigation Scheme in Nyatike. The meeting was attended by 41 farmers (Appendix 3).

b. Institutional Stakeholders Workshop

A disclosure workshop with Institutional stakeholders was held on 28th July, 2021 at Twin Breeze hotel in Migori from 11.00 am to 1.00pm. The workshop was attended by 31 stakeholders

(Appendix 3) representing various National and County government departments and relevant parastatals.

In line with the Ministry of Health guidelines on COVID 19 prevention, the meetings were held in open spaces and strict social distancing was observed. The participants were provided with masks, sanitizers and hand washing facilities. Handling of paper materials was minimised and the registration was done by a research assistant.

4.5.1.1 Disclosure Meetings Records/Feedback

a. Gogo Community

Questions and Concerns raised by stakeholders after presentation of the ESIA findings	Responses by KenGen Staff and the Consultants
What will happen if the project leads to flooding on individual parcels of land. Will this be mitigated?	The consultants clarified that according to the project design, flooding levels will decrease significantly especially during seasons of heavy rains since the dam volume will increase and have a better ability to regulate the water flow.
Where will the workers live/stay and where will tracks needed for the project construction be parked?	The workers from the area will be commuting from their own places. For immigrant workers a camp can be established at the Gogo power plant land and has clear delineated boundaries. No extra land was taken.
Land: The young people in the area feel that their ancestors gave a small piece of land but KenGen ended up fencing off a bigger parcel	KenGen staff clarified that the land under KenGen was legally acquired and it has a title deed
The community requests for improvement of the health centres and schools by KenGen	The liaison officer Mr. Peter Ngachuro clarified that KenGen has always worked with the local community at Gogo especially on the scholarship programs and improvement of access roads. He reiterated that they will continue working together on a priority basis for the suggested projects.
Will people be displaced by floods as it normally happens when it rains?	The consultants clarified that over time what has caused flooding is vegetation growth (reeds and others) reducing the water holding capacity of the dam and causing displacement of people living close to the dam area. With the redevelopment, this will decrease

Questions and Concerns raised by stakeholders after presentation of the ESIA findings	Responses by KenGen Staff and the Consultants
	\
<p>Due to the dam, population of wild animals - hippos and crocodiles increased leading to instances of human – wildlife conflict. Community members have sustained injuries, and crops are constantly damaged.</p> <p>Kenya Wildlife Service never responds to reports and complaints of human – wildlife conflict – crop damages, attacks on human beings</p>	<p>The consultants clarified that with the redevelopment of the dam, KenGen will liaise with Kenya Wildlife Services to address their complaints and KWS will map out the wildlife hotspots and sensitise the community on the same.</p>
<p>Remarks by Area MP. Hon. Mark Nyamita</p> <ul style="list-style-type: none"> Hon Mark Nyamita indicated that he had looked through the ESIA report and it captures the community concerns and welcomes the project in the area but wants it done in a way that will leave the community satisfied. <p>He requested that:</p> <ul style="list-style-type: none"> The report/feedback from the community should be given to KenGen as it is. All the concerns by the community should be reported verbatim; The community requests for Corporate Social Responsibility (CSR) activities should be well captured and documented by the consultants. The community wants to partner with KenGen but all their requests should be captured. The community requests include: <ul style="list-style-type: none"> Construction of a motorable bridge across River Kuja Well-equipped permanent schools A well-equipped hospital Improvement of roads within the area Enhanced scholarships for secondary education <p>He gave an example that KeNHA which is a public body like KenGen is currently constructing the Isebania – Kisii – Ahero highway and managed to secure an ambulance for every county the road cuts through, and has rehabilitated Nyabondo Hospital as part of CSR. He remarked this is possible by KenGen while redeveloping Gogo power plant.</p> <ul style="list-style-type: none"> When KenGen is doing requests for financiers, the community projects should be budgeted and catered for in the project proposal to possible financiers. KWS and KPLC should be involved in this project and there will be need for a discussion with all government entities involved in the project. He stated that he wants to be a member of project's community stakeholder committee and will not just send a representative. Consideration for employment opportunities for the community should be both for the project itself and also at KenGen headquarters Kenya Power should consider last mile power connection to the residents. A certain radius should be well lit to improve security, and trade. KenGen in its profits and revenue from sale of power should set aside a budget for electrification of the area. Stakeholders will study the engineering design to determine the level of spillage, height of wall and other structural aspects to ensure safety and flood impact KenGen land should be clearly demarcated before the project commences 	

Questions and Concerns raised by stakeholders after presentation of the ESIA findings	Responses by KenGen Staff and the Consultants
<ul style="list-style-type: none"> • He noted that the average cost of land is estimated at Kes. 250,000 to Kes. 300,000 in the ESIA report. However, if KenGen were to acquire land from community members, the price must vary depending on agreement with land owners, market rates at time of acquisition must apply and compensation for the loss of their land. Repeated section deleted • Measures to resolve disputes related to land should be put in place. 	
<p>Remarks by Commissioner Hesbon; Migori Public Service Board</p> <p>He indicated that he supports the project but community requests listed below should be considered;</p> <ul style="list-style-type: none"> • Improvement and tarmacking of the roads to increase connectivity – the roads include Oyani, Ongoro, Thim Lich Oinga. • There should be electricity connection within a particular radius to light up the area. • A motorable bridge should be constructed across River Kuja. • Gogo secondary school should be more equipped and infrastructure improved and if possible branded with KenGen colours . • Improve the infrastructure at Gogo primary school. • Employment for the projects should be for both skilled and non-skilled workers. • Put in place measures to deal with possible water outflow and spillage. <p>KenGen should sign MOUs with relevant arms of government and community in regard to various aspects of the project.</p>	
<p>Remarks by Hon. Florence Oile, Nominated MCA</p> <p>She requested that when writing the ESIA report, the community requests and comments should be captured verbatim.</p> <p>She indicated that:</p> <ul style="list-style-type: none"> • The cost of a motorable bridge should be put in KenGen's financial proposal for the project. • KenGen should support schools – infrastructure, equipment. • There should be more partnership between KenGen and the community. • KenGen should consider provision of more scholarships to students. • Employment opportunities for community members in the project should be both skilled and non-skilled workers. 	
<p>Remarks by Hon. Peter Mijungu, area MCA</p> <p>He commented that he was happy with the way KenGen and Consultants have engaged with the leadership including the Governor of Migori.</p> <ul style="list-style-type: none"> • The request for a motorable bridge across river Kuja should be included in the project • Poverty levels in the area is high and the scholarship program should be extended to more students to improve education standards. 	

b. Lower Kuja Irrigation Scheme Stakeholders

The Scheme chairman and stakeholders noted that concerns raised during earlier consultations have been well addressed in the ESIA report presented during the disclosure workshop.

Questions and Concerns the Stakeholders	Responses by KenGen Staff and the Consultants
<p>The following concerns were highlighted:</p> <ul style="list-style-type: none"> • Reduction of water volumes especially during construction and dry seasons • Flooding • Power connectivity • Requests for CSR projects e.g. scholarships are well captured. However, the scholarship bar has been set so high for pupils from the area. • Sharing of employment opportunities • Disiltation and use of the dredged materials as manure and disposal of any human remains; use of the • Sedimentation and its impact in the downstream of River Kuja where the irrigation is located. • Riparian conservation • River pollution and impact on water quality 	<p>KenGen Staff and the consultants' clarification was as captured below:</p> <ul style="list-style-type: none"> • Hydropower generation is a non abstractive water use and therefore there will be no changes in the water volumes. • Flooding intensity will reduce since the dam will have a higher capacity. • The Liaison officer will work closely with the community as it has always happened in identification of needy bright students who qualify for the scholarships • Soil analysis has been conducted and some sections of the soil were found to have high Cadmium levels; the same will be done after dredging and the materials dredged should be analysed for safety of use as manure; • The ESIA has recommended for protection of upstream catchment to avoid soil erosion and siltation of the dam.

c. Institutional Stakeholders Workshop

The questions raised and feedback by stakeholders included:

Institutional Stakeholders Concerns	Responses by KenGen Staff and Consultants Team
<p>Human – Wildlife Conflict: A concern was raised on the constant human – wildlife conflict in the area and how this will be mitigated and what actions will be taken on animals that will be found in River Kuja during construction.</p>	<p>Response and comments by Chrispine Ngesa, of Kenya Wildlife Service</p> <ul style="list-style-type: none"> • He reiterated that indeed, there is human wildlife conflicts in the area; hippopotamuses and crocodiles attack people and many fatalities have been reported when people are fetching water in the river

Institutional Stakeholders Concerns	Responses by KenGen Staff and Consultants Team
	<ul style="list-style-type: none"> • KWS officer suggested that he can liaise with KenGen to map out the wild animals' hotspots along River Kuja. • He can offer technical support in management of human wildlife conflicts • He proposed that in partnership with KenGen, KWS can set a post for wardens within the project area to enable quick response • Indicated that the Wildlife Conservation and Management Act 2013 gave provision for formation of Wildlife Research and Training Institute headed by a Director and thus in subsequent meetings he can be invited as a stakeholder on behalf of the institute • Eng Kirui confirmed that KWS have been working very well with KenGen at Olkaria power plant and other sites.
<p>Oil spill: need to indicate the mitigation measures which have been employed before and which will be employed during the inception of the redeveloped power plant.</p>	<p>KenGen staff concurred that Oil spills have been accidentally occurring due to the old machines that have gear boxes and bearings. The new machinery being installed will have oil free bearings and gear boxes.</p>
<p>For flora and fauna diversity, the ESIA should indicate which among them are globally threatened as per the IUCN Red List Category. The ESIA should also indicate which fragile habitats were identified in the area</p>	<p>This has been clearly outlined in an ecological survey report of the area</p>
<p>Dam wall: a stakeholder was interested in knowing if the current dam wall and embankment can support the flow of water once the dam is redeveloped and what actions will be taken during project implementation to provide a possible collapse.</p>	<p>KenGen Staff Response: In the dam design, the structural strength of the current wall has been tested and its been found to be adequate for the increased water velocity. The dam is able to handle the inflows which will not change.</p> <p>Apart from a comprehensive structural design for the dam, simulations using models of the various water flows have been done to ensure it can hold the water and lower the risk of dam collapse. The design will also include a gated spillage to control sedimentation.</p> <p>Materials for the dam construction will be of high quality and will undergo stringent quality assessment.</p> <p>KenGen conducts annual internal audits for their dams and also independent audits which are submitted to NEMA.</p> <p>EPRA also conducts audits to ensure safety and quality.</p>
<p>Socio – economic baseline study: Where did the study get the HIV prevalence rate of 14.3% for Migori county and why did the ESIA study not obtain data disaggregated to the sub county level?</p>	<p>Response by the Consultants: The prevalence is a national data by National Aids and STIS Control Programme (NAS-COP) and Ministry of Health and also confirmed by the Department of Public Health. The national data has not been disaggregated to the sub county level and by gender. It was</p>

Institutional Stakeholders Concerns	Responses by KenGen Staff and Consultants Team
	not within the ESIA study to conduct a HIV prevalence and relied on literature review and key informants' feedback.
<p>Provision of water for the community: What will be nature of CSR for water provision to the community? Who will be responsible for management of the water supply? Will water points/kiosks be provided? How far will the water provision go considering that there is East, west and South Kanyamkago?</p>	<p>Response: Provision of water for the community has been a request made to KenGen and has also been proposed as one mitigation for human – wildlife conflict. There will be further discussions between KenGen and the community and this will depend on availability of finances and community priorities for CSR projects.</p>
<p>Employment opportunities: For employment of the local people will it include; skilled, semi-skilled, technical and casual labour?</p> <p>It was also noted that education levels are very low in the area and there should be a deliberate effort to uplift standards through scholarships so that eventually the community has qualified residents who can also benefit from technical work at the power plant.</p>	<p>Response: Non skilled work will be reserved for community members, where there are semi-skilled and skilled opportunities, community members will be given priority where qualified. The contractor will of course come with some technical people.</p> <p>KenGen staff reiterated that they have always offered scholarships to the best deserving student in the area and those who get First Class Honours in the University among the scholarship holders are automatically employed by KenGen.</p>
<p>Security: A concern was raised on security for workers and communities during construction owing to the influx into the area.</p>	<p>Security will be improved during the construction period</p>
<p>Land boundaries: there is still uncertainties on the boundaries between KenGen land and neighbouring private parcels.</p>	<p>KenGen Staff Response: KenGen land is clearly demarcated and has beacons. KenGen will work with community members and leaders together with the County Lands Department to ascertain the boundaries before construction commences.</p>
<p>What is the scope of Gogo Power Redevelopment?</p>	<p>KenGen Staff Response: It includes a total overhaul, replacement and modernisation of the turbines, engines and power plant. The obsolete and old machinery will be replaced. The current output is 2MW and will be enhanced to a maximum of 10MW.</p>
<p>Pollution: a stakeholder raised a concern of high rate of pollution of River Kuja by heavy metals leaching into the river from gold mining activities in the area and the impact is heavily borne by farmers at Lower Kuja Irrigation Scheme. This poses health risks, products from the farms may soon be banned from some markets particularly if the products were to be exported. He wanted to know what actions the county government of Migori and the</p>	<p>Response by area MCA present: while concurring with the comments he stated that Mining is a National Government function and the County Government and the Assembly have very limited action. However, there are discussions with the national government to address the issue which has been going on for a very long time.</p>

Institutional Stakeholders Concerns	Responses by KenGen Staff and Consultants Team
County Assembly were taking to address the heavy pollution by mining activities.	
Protection of Riparian Land: what is the plan to sensitise community on riparian protection?	Response: The riparian land is well regulated in law. KenGen will liaise with community members and Community Based Organisations (CBOs) and government agencies to sensitise community on riparian protection.
<p>Remarks by West Kanyamkago Ward Member of County Assembly</p> <p>He Indicated that he:</p> <ul style="list-style-type: none"> • Supports the project and welcomes everyone to the ward to implement the project • Thankful of the support KenGen provides to community through CSR activities • The community requests and meeting minutes should be captured verbatim • Requested that KenGen should consider the construction of a motorable bridge across River Kuja • Noted that the area is characterised by high levels of poverty • KWS rarely responds or takes action on reported cases of human – wildlife conflict. The residents can no longer grow maize and other crops due to damage from wild animals e.g. monkeys. • Asked Kenya Power to be responsive and repair power lines that have fallen in some areas and pose hazards to community members. There is a line from Sibuoche to Milimani which has been lying across the road for a while, reported to Kenya Power with no response or action for over 6 months. • ESIA study is a legally defined process which allows for interpretation of data and feedback. However, community engagements and responses are recorded verbatim in the minutes of consultation records. 	
<p>Remarks by a nominated Member of County Assembly</p> <ul style="list-style-type: none"> • Gogo hydro power plant is not just for West Kanyamkago but has great benefits to the whole of Migori County. • Requested KWS to act promptly on reported cases of human – wildlife conflict. • Pollution of River Kuja is indeed a threat to markets for farmers • Ensure the ESIA report captures community requests and comments verbatim 	
<p>Remarks by County Director NEMA (Migori) Mr James Siaji</p> <p>Mr James Siaji was contacted virtually and his concerns were:</p> <ul style="list-style-type: none"> • Destruction of upper catchment of River Kuja and its impacts on the project • Disposal of excavated silt • Safety and continued breeding fish species. • Corporate Social Responsibility activities • Increased turbidity on River Kuja <p>RESPONSES</p> <ul style="list-style-type: none"> • Protection of catchment upstream of Kuja River will reduce soil erosion and reduce siltation of the river. • On the dredged soils the following suggestions will be further discussed: <ul style="list-style-type: none"> ○ The CeC is willing to take up the silt and use it in his farm. The client is engaging with the CeC on the same ○ Give dredged soil to willing farmers to improve on their soil fertility ○ Use the dredged soil to back fill pits left by murram quarrying during road construction • For increased turbidity, the impact will be short lived and obstruction of water flow will be temporary and not total. There will be a provision of water to flow downstream. • The KenGen liaison officer will engage the community on priority corporate Social responsibility activities. 	
Remarks by County Environment Officer	

Institutional Stakeholders Concerns	Responses by KenGen Staff and Consultants Team
<ul style="list-style-type: none"> Watershed management is a priority and not just for River Kuja but also upstream and stressed on inter county collaboration. Stressed on collaboration with all government bodies in watershed management There is also focus on conflict resolution mechanism for water users To support reforestation, Migori County has developed a Sustainable Forest Management Policy On the disposal of dredged materials, please liaise with Lands and Environment Departments even as we engage with CeC Agriculture. 	
National Irrigation Authority official Concerned on the mitigation measures for water resource conflicts and water quality and their impacts on the Lower Kuja Irrigation Scheme.	Response by the consultants: The concerns are captured in the Environmental and Social Management Plan(ESMP).
Remarks by Kenya Power and Lighting Company official He indicated that: <ul style="list-style-type: none"> There is normally a confusion between Kenya Power and Rural Electrification and Renewable Energy Corporation (REREC) formerly Rural Electrification Authority. He will follow up on the fallen poles and line. Admitted that there have been challenges but currently trying to improve service delivery and customers should continue to report issues and they will be addressed. Gave an assurance that once the plant is refurbished, they will encourage more applications to take up the generated power and thus improve electricity connectivity in the area. 	
Remarks by Assistant County Commissioner – Uriri He thanked KenGen and consultants for a very comprehensive study that can be used as an example for projects in other areas. Land issue is sensitive and the community should be continuously engaged Engage adequately on the risk of flooding and develop mitigation measures There is need for continuous engagement to address emerging issues for the project	
Comments by Public Health Officer <ul style="list-style-type: none"> Noted that open defecation was highlighted as an issue in the ESIA and agreed this poses a risk to water quality. The county government of Migori has also identified this as a community problem and will be rolling out a programme to address the issue. Will work with community members and government agencies in the area to address. 	

5. CHAPTER FIVE: BASELINE ENVIRONMENTAL AND SOCIO-ECONOMIC CONDITIONS

5.1.1 Boundaries and Coverage

Migori County is subdivided into eight (8) Sub counties as the National Government Administrative Units with two (2) divisions, and seven (7) locations and nineteen (19) sub locations. The Gogo hydropower project is located in Uriri sub-county, West Kanyamkago Location and Kajulu II sub location.

The electoral units in which Gogo hydro power is located are Uriri Constituency represented by a Member of Parliament (MP), and West Kanyamkago Ward represented by a Member of County Assembly (MCA). Other wards in the Constituency include North Kanyamkago, Central Kanyamkago, East Kanyamkago, and South Kanyamkago.

The sub-county is mainly inhabited by two ethnic tribes namely Luo & Abakuria who live harmoniously with Kiswahili being a common language in the Sub County region. In addition, there are other ethnic community such as Somali, Kisii and Abasuba in this sub county region.

5.1.2 Study Area and Sample Size

The structured household interviews were conducted within Kajulu II Sub location where the Gogo Power Plant is located. The project area is predominantly rural based and the questionnaires were administered at household level where every fourth household was included in sampling. The study collected quantitative and qualitative information.

According to 2019 Population Census, Kajulu II sub location has a total population of 6,474 and 1,353 households. The sample size (n) for the household survey was 230 households drawn from randomly chosen 8 villages derived from an estimated household number (N) of 1,353 households.

The households for the survey were selected randomly through:

- 10 randomly chosen villages;
- On a selected village, a location was chosen near the centre of the village; a random direction (vector) was selected from the centre by spinning a bottle;
- The first household within the direction (vector) was selected for an interview and thereafter, every fourth household was interviewed until the end of the vector at the edge of the village.

5.1.3 Population and Demography

According to the 2019 Kenya Population and Housing Census, Migori County had a total population of 1,116,436, comprising 536,187 male, 580,214 females, and 35 listed as intersex. The total population represents a 1.99% increase over a period of 10 years compared to a population of 917,170 in 2009; and a total of 240,168 households with an average household size of 4.6.

Uriri Sub County which is the location of the project has a population of 141,448 with 68,127 males, 73,318 females and 3 classified as intersex; with a total of 30,094 households and an average household size of 4.7. Kajulu II sub location where the project area is has a total population of 6,474 and 1,353 households.

The county has an average population density of 427 persons per km² with Suna East constituency recording the highest density population of 598 persons per km² and Nyatike constituency having the lowest of 260 persons per km². Uriri, the sub county of the project has a density of 361 persons per km² and a land area of 392.1 km².

5.1.4 Households Demographics

The survey covered 230 randomly selected households with 41.3% being male and 58.7 being females. The majority of the households were headed by men at 55.5% while female headed households were 44.5%. It is a relatively high number of female-headed households and this can be attributed to information from community consultations that there are a high number of widows in the project area.

• Age Distribution

The respondent age range was distributed as highlighted in the chart below. Age range of 26 – 35 years was the highest at 28.7% followed by 36 – 45 years at 19.10%. Respondents who were 46 – 55 years old constituted 17%; 56 – 65 years were 9.1%; above 65 years old were 16.1%. There was a relatively high number of youthful (18 – 25 years) respondents at 10%.

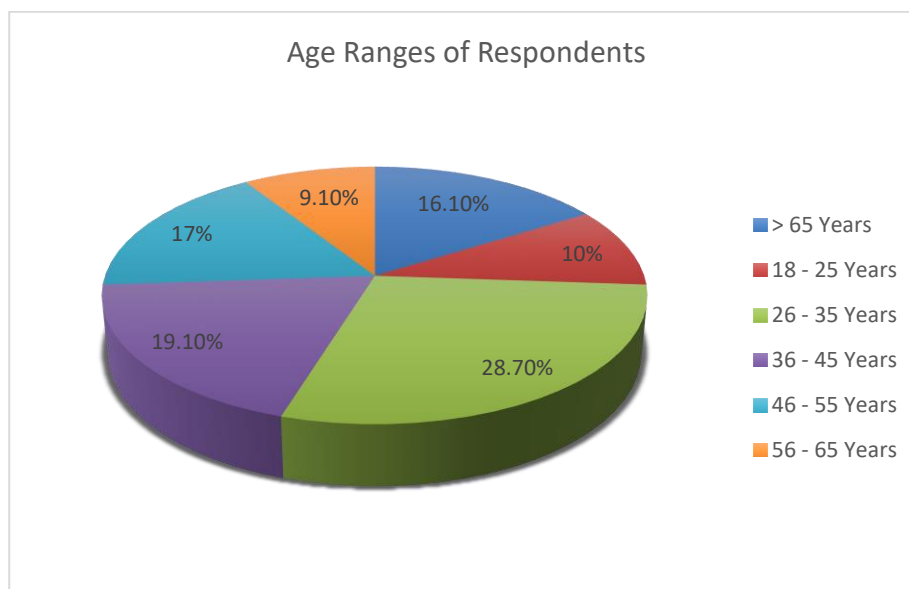


Plate 2 Household Age distribution

5.1.5 Land Tenure in the area

Land Ownership Categories

There are two categories of land ownership in the County, that is, public and private. The public land is under leasehold tenure system while the private land is individually owned under freehold tenure system.

In a Key Informant Interview with the County Director of Physical Planning and Urban Development, he confirmed that community members have freehold land title deeds. There are also public land registered with different government departments and agencies. He also confirmed that the land in the project area is adjudicated and title deeds issued to land owners. The records are available at the County's Land Registry and can be obtained through a formal search process.

During the survey, 98.3% of households confirmed ownership with documents of the parcels where they live/have built and farm, with only 1.7% reporting non ownership. Further, 70.2% of the households reported acquiring the parcels through inheritance while 28.8% acquired through purchase.

Value of Land

The County Director of Physical Planning and Urban reported that the average price of land in the project area is Kshs. 250,000 – Kshs. 300,000 per acre. This is negotiable between the concerned parties.

Related to this he reported that land issues are sensitive but the community is generally receptive to development projects and since parcels are privately held, land acquisition is through willing buyer – willing seller. The community is also very sensitive to activities that degrade the environment.

Land Dispute Resolution

There is a Land Management Committee at the County which is responsible for resolving land ownership disputes. The process of resolution however starts at the community level through involvement of elders and local administrators before escalation to the County level. If a dispute cannot be resolved through arbitration and negotiation, parties are advised to seek redress in court.

Mean Holding Size

The mean holding size of land in the county is 3 acres for the small-scale farmers and 7 acres for the large farms. The small-scale farms are mainly utilised for subsistence farming while the large-scale farms are utilised for livestock and cash crop farming. The large farms are mainly found in Rongo, Nyatike, Kuria and Awendo sub - counties. In urban areas, the mean holding size is 0.25 acres which is mainly used for commercial and residential purposes.

5.1.6 Settlement Patterns

The County is characterised by both rural and urban settlements. However, the predominant settlement pattern is rural in nature where over 85% of the population live. The 2019 Population and Housing Census, indicates that only 15% of the population is settled within the major urban

and peri-urban centres while 85% live in the rural setting. The project area is characterised by majorly rural settlement which are scattered and dispersed. Land use is majorly for subsistence agriculture and residential homes.

5.1.7 Irrigation Schemes

The county has one irrigation scheme at the Lower Kuja in Nyatike Sub County. It is currently under lot 1 with 625ha under development. The project is intended to cover six lots with 7,717 ha of land when fully implemented. There is no irrigation scheme within the immediate project area though small scale irrigation of vegetables is practiced along the river.

5.1.8 Agriculture

Agricultural activities occupy approximately 63% of the total land with 60% under food crop cultivation and the remaining 40% under cash crop cultivation. High potential regions of Uriri, Awendo, Kuria East, Rongo and parts of Suna East and Kuria West sub-counties are used for both food and cash crops production. The main food crops produced in the county include cereals (maize, sorghum, rice, millet); pulses (beans, cow peas, green grams, soya beans), roots and tubers (sweet potatoes, cassava). Livestock farming is practiced in the county with the rearing of traditional breeds such as Zebu, and a few exotic breeds mainly crosses of Friesian and Ayrshire, and East African goat. Most of the livestock are bred for their sentimental value and are used only in emergencies to cover medical and transport costs, pay school fees, entertain guests and pay dowry.

In the project area, as indicated in the chart below, 73.5% of households surveyed practice both livestock and crop farming; 24.8% practice crop farming alone and only 1.7% do not practice any type of farming.

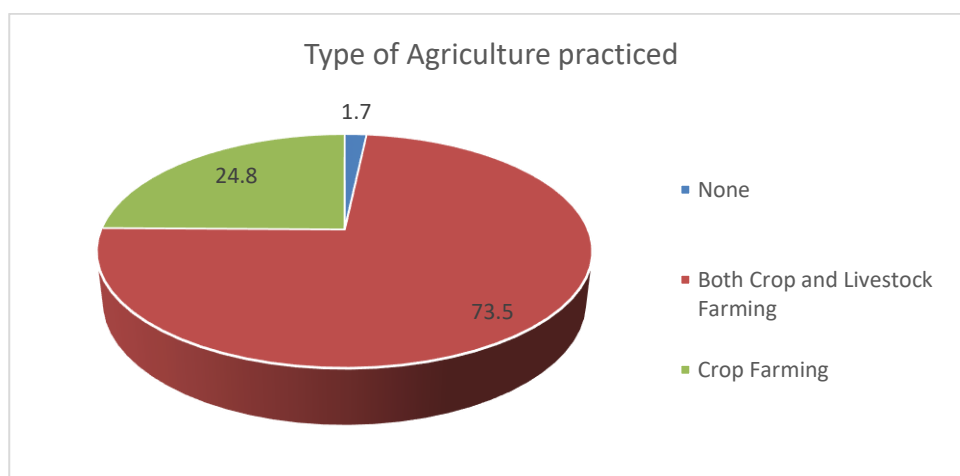


Plate 3 Types of Agriculture

The main cash crops grown in the county includes sugar cane and tobacco. Sugarcane is majorly grown in Awendo, Rongo, Suna East and West sub-counties while Tobacco covers Kuria East and west and parts of Rongo sub-counties. However, other cash crops such as coffee and tea are grown but to a small scale. The county has good climatic condition that is favourable for growing of horticultural crops such as fruits, vegetables, flowers and ornamental plants. Already approximately 7,500 ha is under horticultural cultivation where cabbages, capsicum and tomatoes are majorly produced.

The households surveyed in the project area indicated the main food crops produced are maize at 97%; followed by cassava at 57%; beans at 53%; potatoes at 30%; millet 15% and sorghum at 2%. There is also production of vegetables particularly traditional ones at 12%; kales 10% and tomatoes at 7%.

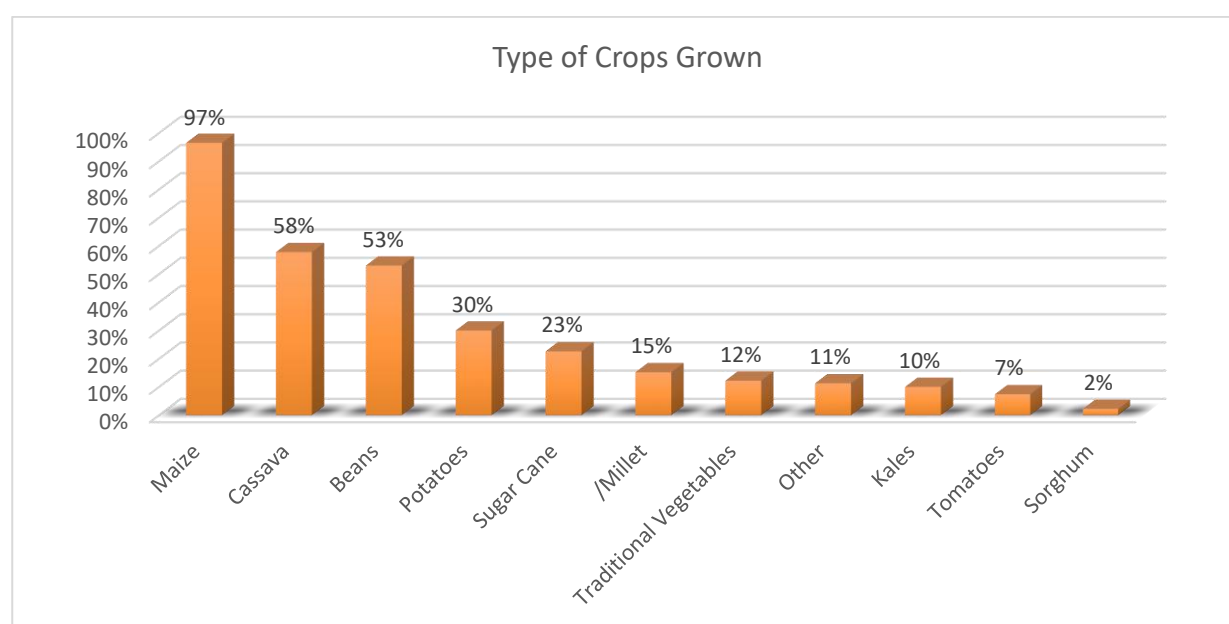


Plate 4 Types of crops grown

Provision of labour for cultivation

From the survey, 89.6% of respondents feel that women provide labour and are heavily involved in farm cultivation and related activities; while 78% felt that men provide the labour. Male and female children are involved at 53% and 47.8% respectively.

This data shows the role of women and the burden they bear in agriculture on top of performing reproductive roles and domestic chores.

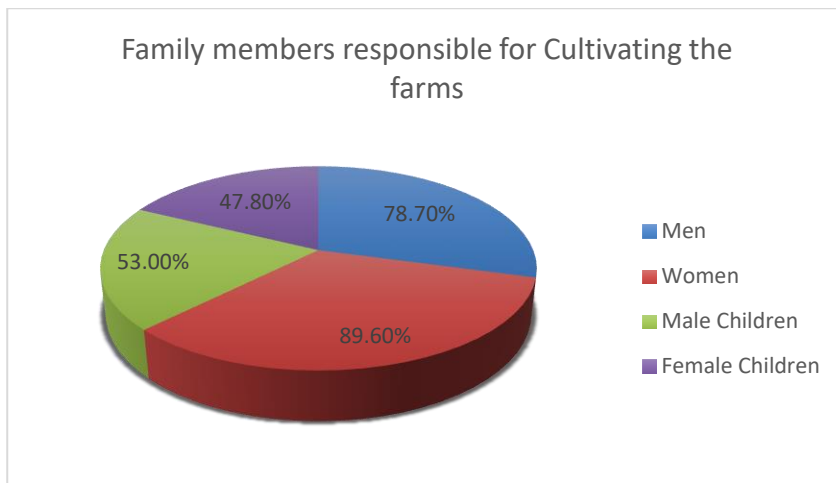


Plate 5 Labour provision by family members

As demonstrated in the data below, 70% of households do not employ casual labourers for crop farming while 28% normally use casual labourers. This points to the fact that the households rely on labour provided by family members for crop farming which is mainly for subsistence and only a small number can afford to hire casual labourers. Only 2% of the households indicated that they do not cultivate at all.

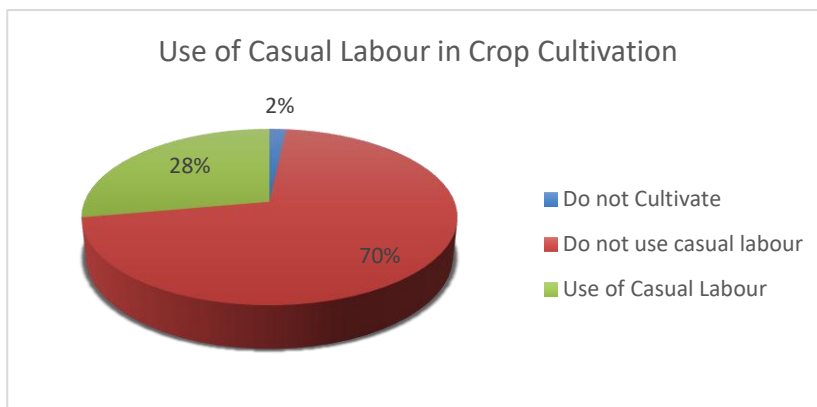


Plate 6 Use of casual labour

Use of Fertilizer in Farming

There is widespread application of fertiliser in crop farming with 60% of households reporting usage; 38% reported they do not apply fertiliser and 2% do not practice farming. The high dependence on fertiliser indicates that the soils may not be very fertile and poses a risk of pollution of river Kuja by chemicals from surrounding farms. This calls for capacity building and awareness creation on proper usage and application of fertilisers and other chemicals.

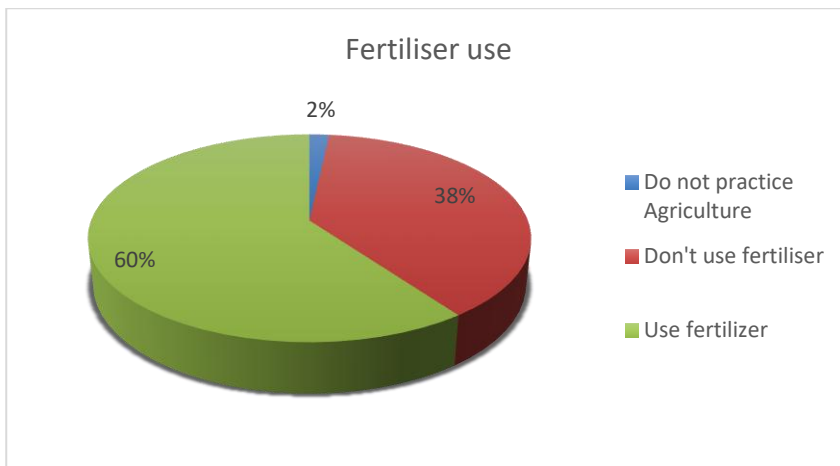


Plate 7 Use of fertilizers

In regard to livestock rearing in the project area, majority of households at 67.8% keep cattle; 29.60% rear goats; 10.9% rear seep; 5.2% rear donkeys and pigs are kept on a low scale at 1.7%. A significant number of 44.3% keep poultry and majorly indigenous/local chicken and improved breeds.

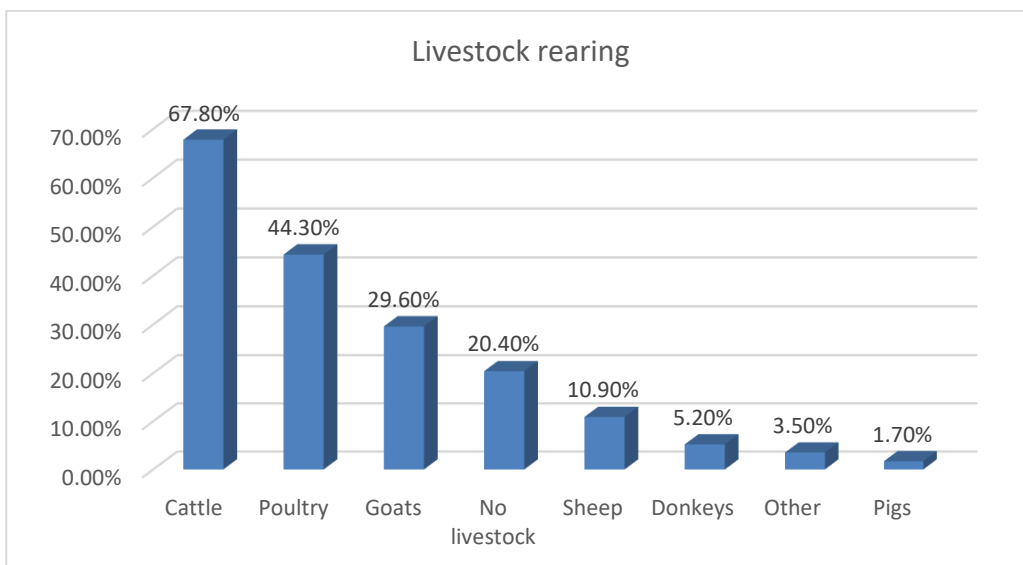


Plate 8 Livestock rearing

Provision of labour for livestock rearing

From the figure below, labour for livestock rearing is basically provided by men while women are also significantly involved. Male and female children are involved with the males more engaged. The children's involvement in this activity may raise their vulnerability and have negative impact on their school attendance and other child development activities.

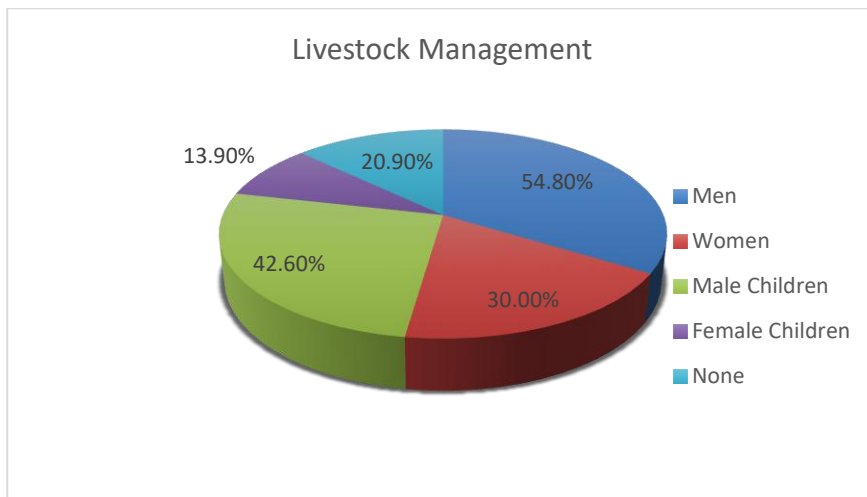


Plate 9 Labour in livestock management

From the figure below, 92% of households do not hire casual labour for livestock rearing. This means that the households rely majorly on family members to rear livestock. Only 6% of households can afford to hire casual labour and 2% do not rear livestock.

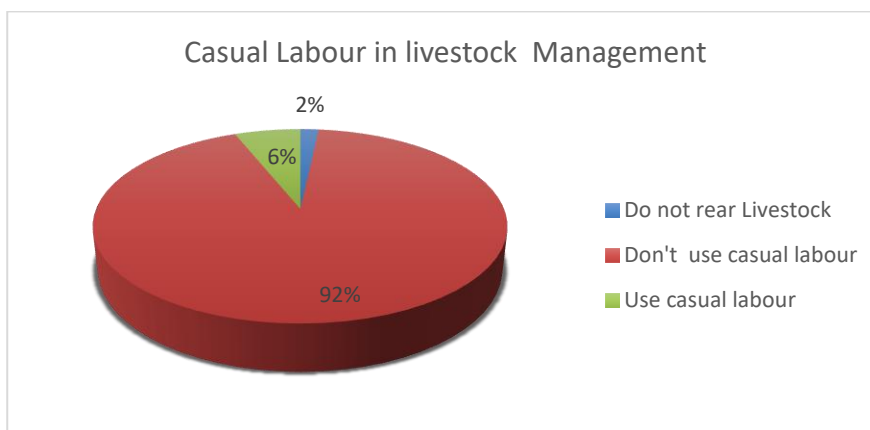


Plate 10 Casual labour in livestock management

5.1.9 Fisheries

The county boasts of its proximity to Lake Victoria which supports about 40% of its population hence contributing to 60% of the source of livelihood of people along the shores of the lake.

Small scale fishing activity is undertaken at River Kuja where the Gogo Hydro Project is located.

5.1.10 Migration

The predominant form of migration in the County is rural to urban migration. This is driven by factors such as the availability of employment and business opportunities, better living standards and better amenities. From the households surveyed, 97.8% reported that they do not migrate with only 2.2% reporting possibility of migration.

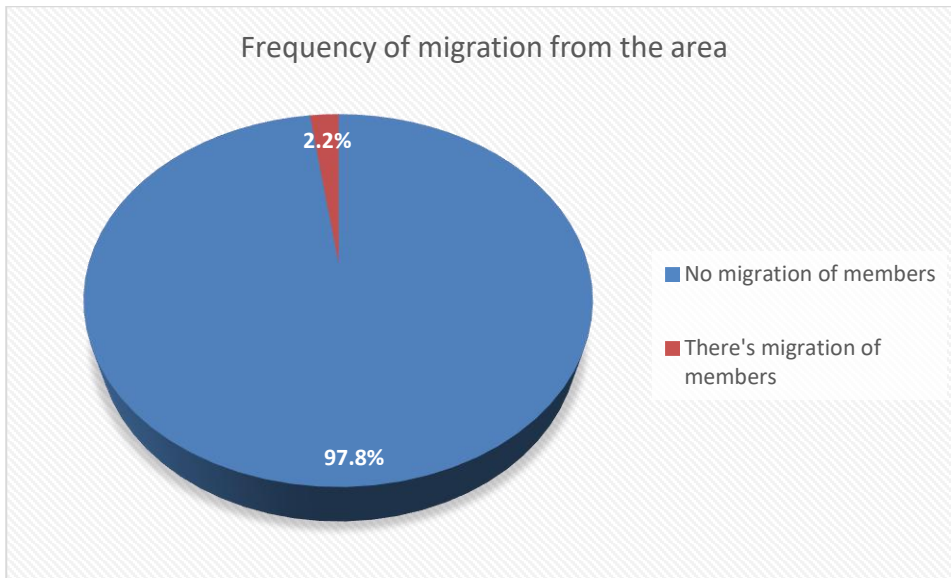


Plate 11 Frequency of human migration from the area

Reasons for migration

For reported cases of migration, as indicated in the below chart, reasons for this would be incidents of conflict at 40%; employment at 20%; water shortage at 20% and famine at 20%.

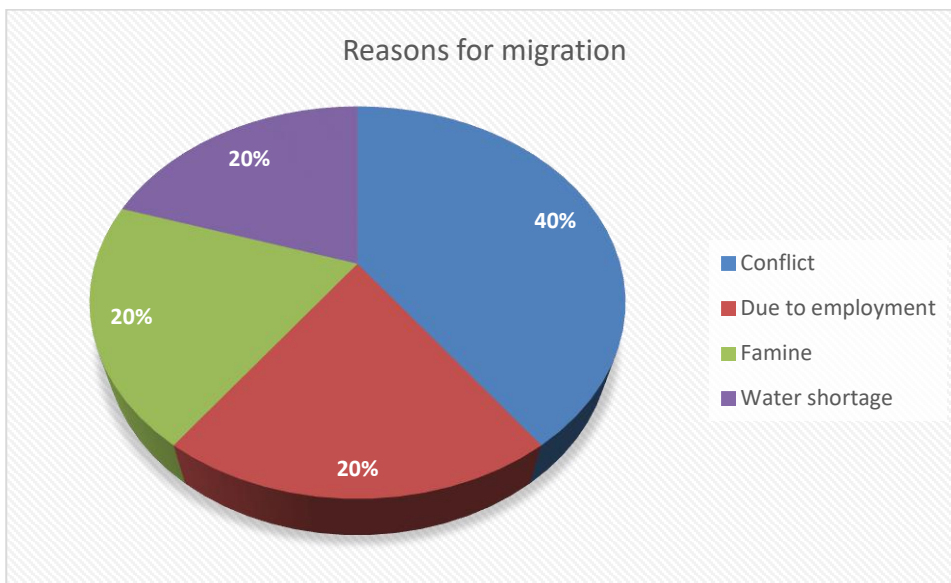


Plate 12 Reasons for migration

There are also reported incidents of migration into the area occasioned by floods in other part of the county during long rains in April and November; and for farming purposes as indicated in the chart below. There is also movement in the area during the months of February and August.

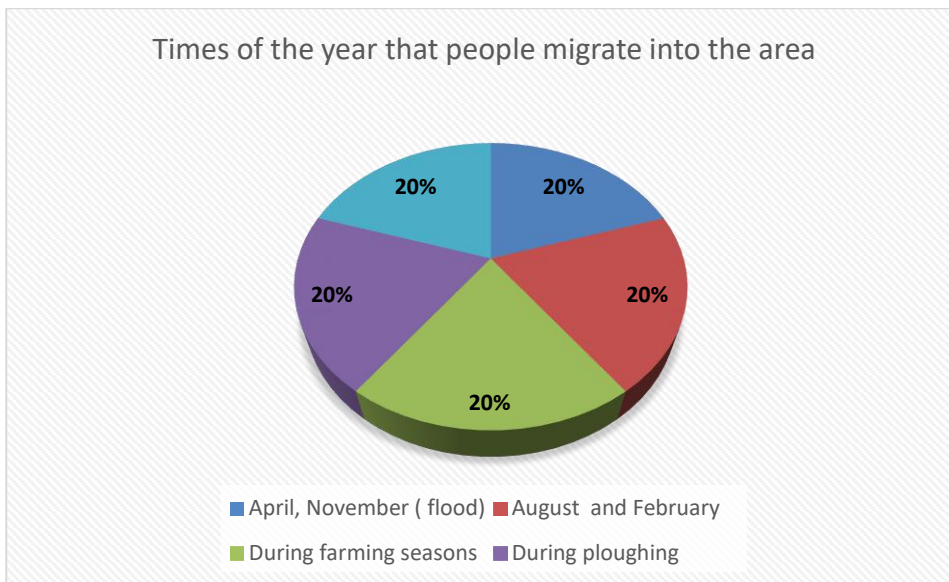


Plate 13 Times of the year when migration occurs

5.1.11 Conflicts

The project area is relatively peaceful with over 85% reporting having experienced no conflicts. The conflicts experienced are generally minor and relate to personal disputes, land related and potential differences during election periods.

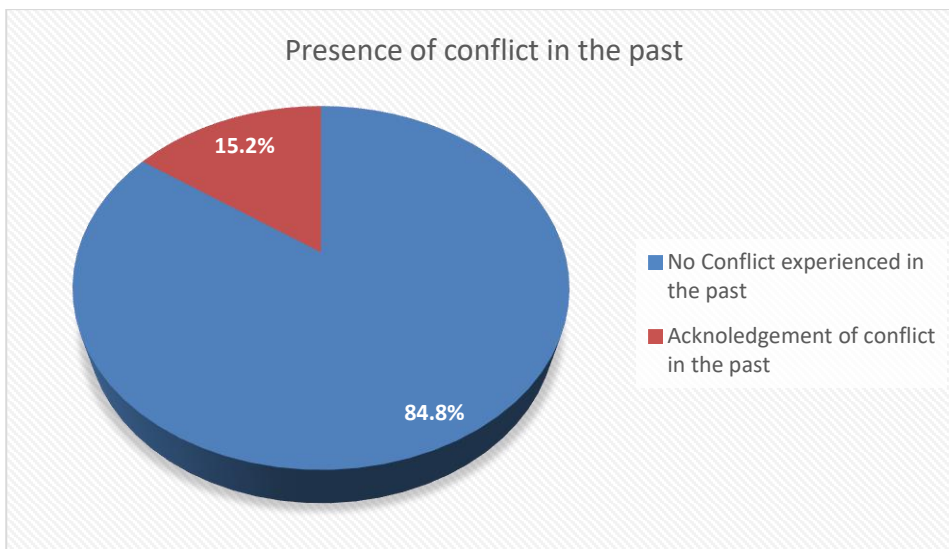


Plate 14 Presence of conflicts in the area

During the FGDs, it emerged that elders play a key role in resolving conflicts in the community and particularly land disputes. Data from Household survey was in concurrence with this with high rates of conflicts resolutions reported. The unresolved conflicts were just 4.8% .

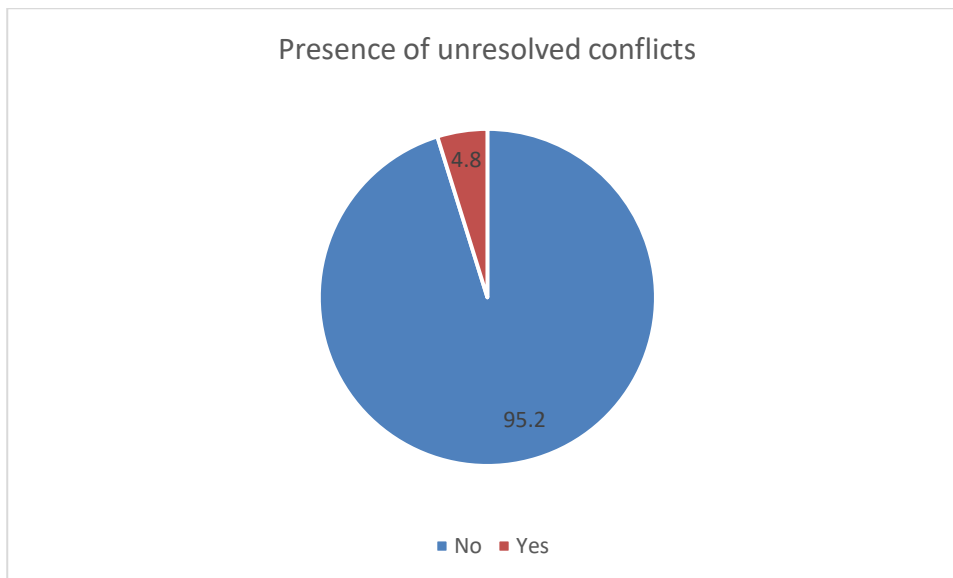


Plate 15 Presence of unresolved conflicts

5.1.12 Ethnicity and Religion

The Uriri sub-county is inhabited by two main ethnic groups namely the Luo and Abakuria who live harmoniously with Kiswahili being a common language in the Sub County. In addition, there are other ethnic communities such as Somali, Kisii and Abasuba. The project area is predominantly inhabited by the Luo community.

The majority of residents are Christians, and the Anglican and Roman Catholic Churches are the most established Christian denominations. Other Christian denominations include the African Inland Church (AIC), and the Seventh Day Adventists (SDA). There are also a number of evangelical churches and independent African Christian churches. There are some denominations considered as indigenous religions which combine aspects of Christianity with traditional religious beliefs examples being Legion Maria and Roho Israel, found mostly in rural areas.

Islam is another religion practiced with the largest number found in Migori town and the neighbouring regions. There are also residents who adhere to Hinduism and Sikhism and are mostly Indians who reside in Migori Town.

The residents of the project area predominantly follow various denominations of Christianity. All the respondents interviewed reported that they practice Christianity.

5.1.13 Housing characteristics

Approximately 90% of the county's population live in rural areas with mud walled structures being the predominant mode of housing. According to the Basic Report on Well Being in Kenya 2015/2016, 71.5%, 6%, 4.1%, 6.7% and 4.8% of the county population live in mud/cow dung walled houses, brick walled houses; cement blocks walled houses, houses with cement finishing and use corrugated iron sheets for walling respectively. Further, for roofing, 92.6% of the population use corrugated iron sheets whereas 5.5% use grass. For flooring, 12.2 % of the population use earth, 52.7% use mud/cow dung and 33.5% use cement. The low usage of cement is attributed to high poverty levels.

Almost all the households, at 99.6%, reported that they own the houses and structures in which they live with 0.4% reporting non ownership. Further, 82.2% reported that they live in their ancestral homes while 17.8% not living in their ancestral homes. In the project area, 80.4% of the household reported that the floors are made of earth and mud; 17.8% made of cement and only 3% have tiled floors.

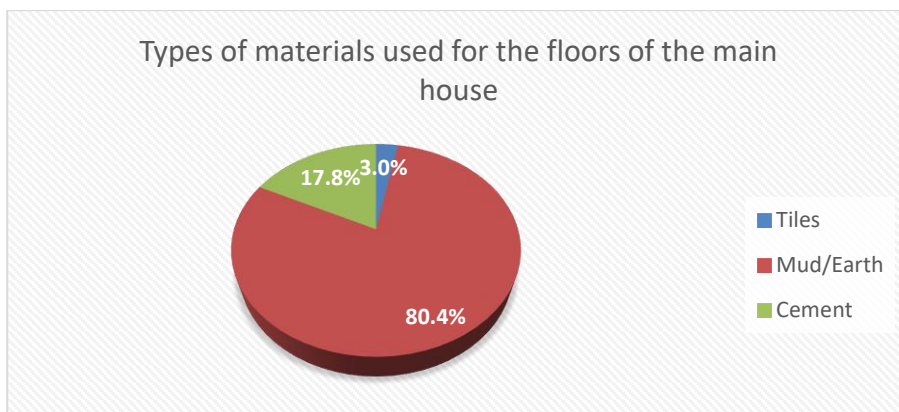


Plate 16 House flooring materials

For roofing, 96.5% reported use of iron sheets which reflects Migori County's coverage of 92.6% as indicated in the Basic Report on Well Being in Kenya 2015/2016,

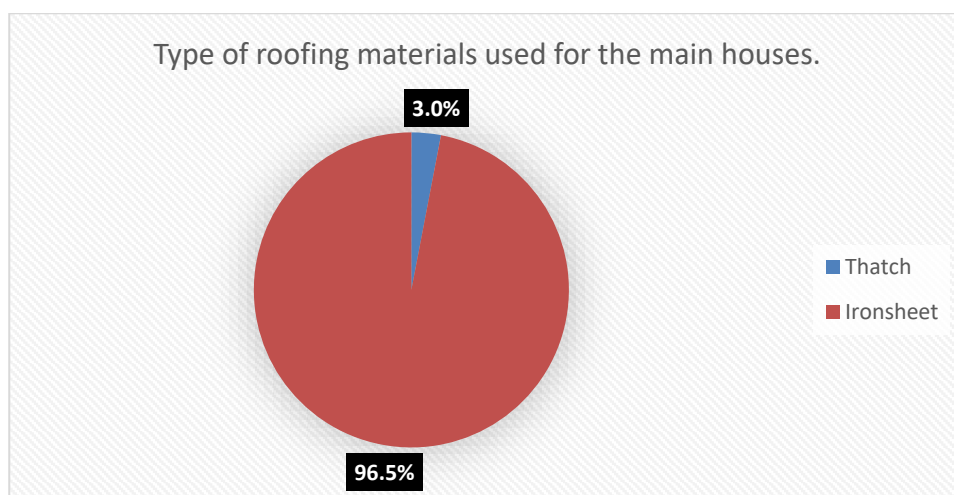


Plate 17 Roofing materials

For walling, 84% reported that walls are made of mud/earth, 11% cement, 8% brick and only 1% have stone walled houses.

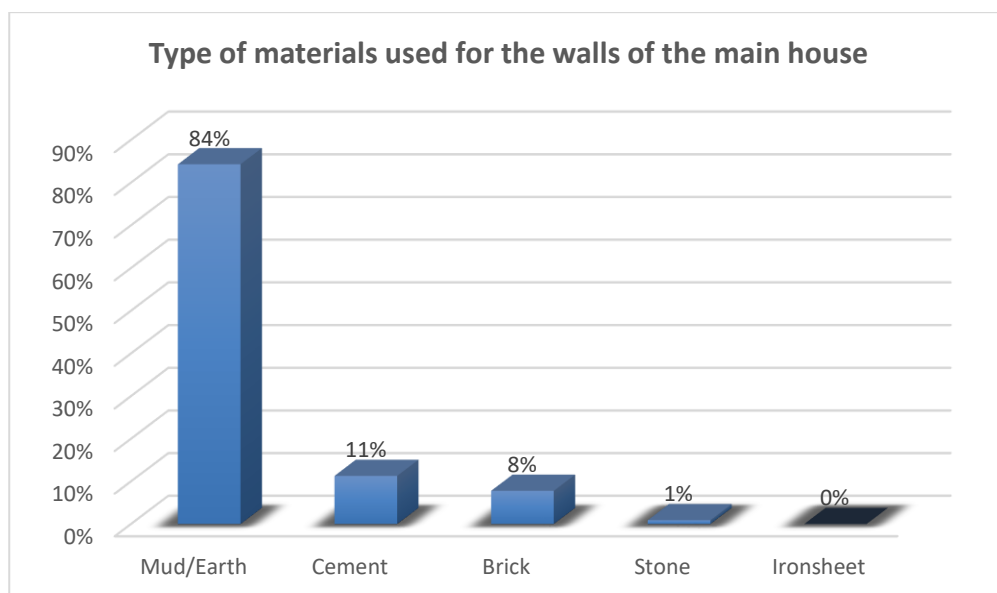


Plate 18 Walling materials

5.1.14 Education

The County has 816 Early Childhood Development Education (ECD) centres, 670 and 1174 ECDE teachers employed by the county government and community respectively. Total enrolment stood at 109,990 with a gender parity of 1:1 pupils over the same period in 2017. The Teacher –Pupil ratio and literacy levels stood at 1:60 and 87.6% respectively.

As of 2017, the county had 817 primary schools comprising 616 public and 201 private primary schools with a combined enrolment of more than 254,000. The total number of teachers over the same period was 5918. There are over 217 secondary schools in the county with an enrolment of

73,907 of 100,000 secondary school going population. This represents an average enrolment of 74% of the children eligible for secondary school education. The average net attendance at secondary school stood at 11.8 per cent with gender parity index of 2:0.

There were a total of 23 vocational technical training institutions with a student population of 1,200 and 108 trainers as at the start of 2017 respectively. However, most of these institutions recorded low enrolment attributed to inadequate provision and relevant technical skills that are responsive to the labour market, inadequate facilities, training tools and training materials. There are also satellite campuses for Moi and Kenyatta Universities. The County has 103 adult and continuing education centres distributed across the 8 Sub counties with Uriri Sub county having 8 centres.

Households Education Levels

Majority of respondents at 76.1% reported that the highest level of education attained is primary school with 13% being secondary school graduates. 1.7% reported having been to college diploma or university and 9.1% reported to have never been to school.

During Key Informant Interviews and community consultations, high levels of poverty and cash crop farming especially tobacco which is fast growing may be contributing to high school dropout rates and low levels of education attainment.

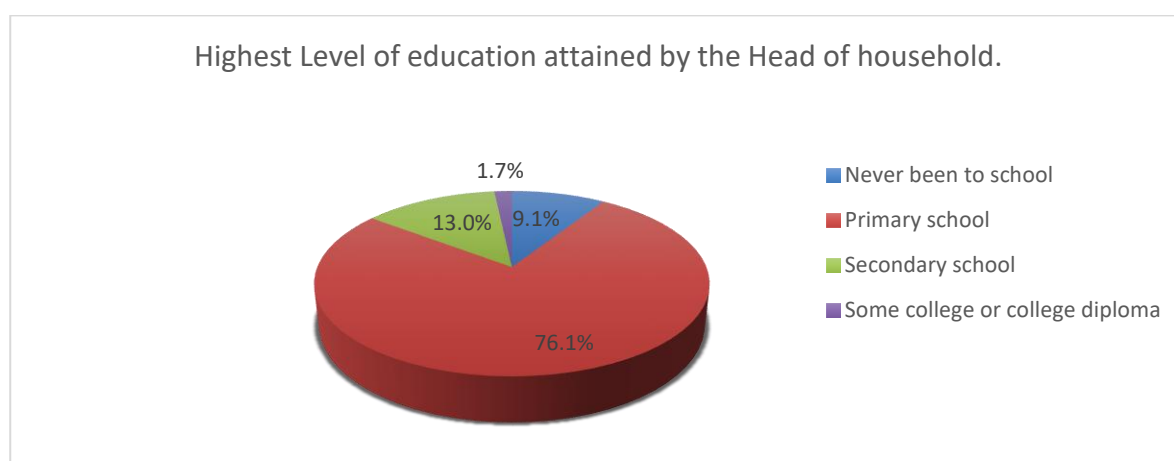


Plate 19 Education level of household head

5.1.15 Economic Activities

The community practices mixed farming whereby they grow plants and keep animals within the same piece of land. Mixed cropping is practiced where different crops are grown within the same farm. Mixed types of livestock are kept in the same farm. Fishing is practiced on a small scale. Mining of gold at a non-commercial scale is practiced at Macalder.

5.1.16 Transport and Communication

Migori County borders Tanzania and is traversed by 163.6 km of tarmacked road. The roads which have been tarmacked since 2013 include Road A1 that links Kenya with Tanzania through Isebania and the Rongo-Riosir road that links Migori and Kisii Counties. Other tarmacked roads within the county include Isebania – Kehancha – Kegonga – Ntimaru road (E166), the Muhuru Bay – Kehancha road (C13), the Rapogi – Ogwedhi road (D202), Toku Bridge, the Uriri– Oria road, and approach roads (E205) and the Kanga - Kitere Road. The rest of the road network in the county is made up of 2,888 kilometers out of which 60% is gravel and 40% is earth. There are three airstrips, namely, Lichota, Macalder and Kehancha in Suna West, Nyatike and Kuria West sub counties respectively. There is limited water transport through the use of boats rather than ferries despite the fact that 478 km² of the county land mass is comprised of water. Water transport is a favorable means between Migori and destinations such as Mwanza in Tanzania, Homa-Bay County and major islands within the lake. Railway transport is not available and other means of transport are motorbikes and bicycles. The main mode of transport in the project area is by road. From Key Informant Interviews and household survey, the roads are in poor condition and the situation worsens during rainy seasons when the roads are eroded, become muddy and impassable. The respondents rated the roads condition as poor at 89.6% with 10% feeling that the roads are in moderate condition and 0.4% feeling the conditions are good. This explains the many requests received from community members and varied stakeholders during consultations for improvement of roads during the project implementation.

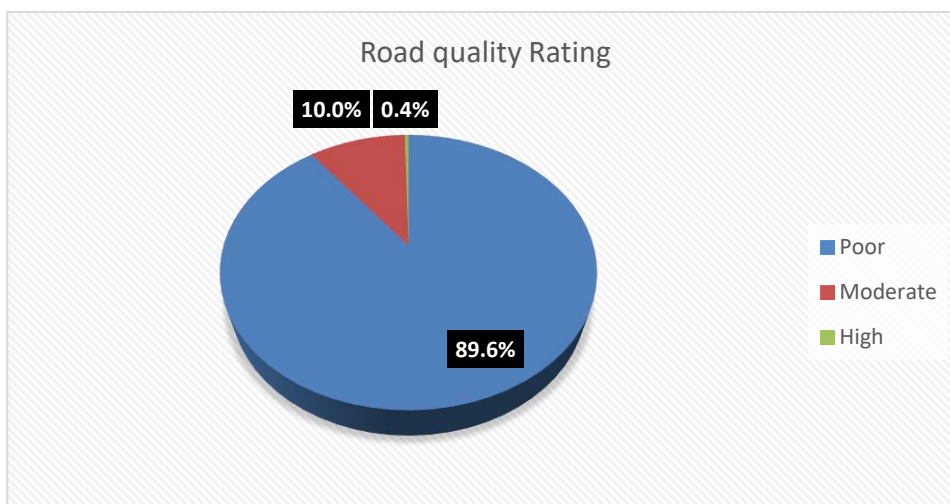


Plate 20 Quality of roads in the area

In regard to communication, the project area is well covered by Safaricom and Airtel mobile phone networks.

5.1.17 Health Profile

Access

According to the CIDP (2018 – 2022), Migori County has one (1) Referral Hospital, eleven (11) Sub-county Hospitals, twenty (20) health centres, ninety-five (95) dispensaries, eight (8) Faith Based Organisation (FBOs) - run health facilities, ten (10) private run hospitals, nine (9) nursing homes, and fifty-six (56) private clinics. These facilities are manned by 19 doctors, 424 nurses and 64 clinical officers. The doctor - population ratio stands at 1: 55,000 and 1: 1,500 for nurse-population ratio.

Some key health indicators include malaria prevalence which stands at 53%; skilled delivery at 47%, immunization coverage at 84%, latrine coverage at 57% and community health services coverage at 44%.

During a KII, the County Public Health Officer reported that there 291 Community Units (Level I health facility) in the county. There are 15 Sub County Hospitals (Level III); and one County Referral Hospital (Level IV) with no Level V facility.

Emergency Response

The Public Health Officer reported that there are 3 Sub county hospitals within Uriri Sub County served by one ambulance which is stationed at Migori Referral Hospital, several kilometres away. Emergency response services are therefore not adequate emergency response services. Within Uriri Sub County, only Rapogi mission hospital has an ambulance, but the hospital does not have capacity to handle emergencies.

It is will be crucial for the project to establish its own emergency response structure since it is evident the public system is inadequate.

In the project area, 95.2% of the households reported reliance on public/government health centres/hospitals with 2.2% able to access private health care institutions. There were 1.3% of respondents who rely on herbalists; 0.9% rely on pharmacies and 0.4% accessing private clinics. The high reliance on public health institutions indicates the need to improve these centres as a majority cannot afford the private facilities which sometimes offer better services as compared to public facilities.

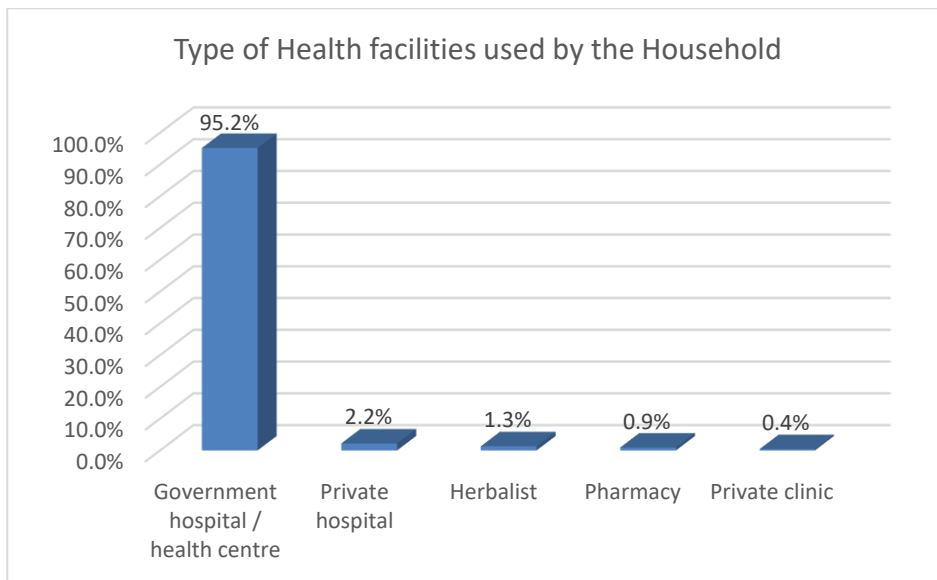


Plate 21 Health facilities

The respondents also indicated that a lot of time is spent on traveling to access these health facilities. 66.1% live between 0 – 5Km from the nearest facility; 24.3% live between 5 – 10 Km from the nearest; 7.4% reside 10 – 15 Km from the nearest facility; 0.9% are 15 – 20K away; and 1.3% reported that they live more than 20KM away from the nearest facility.

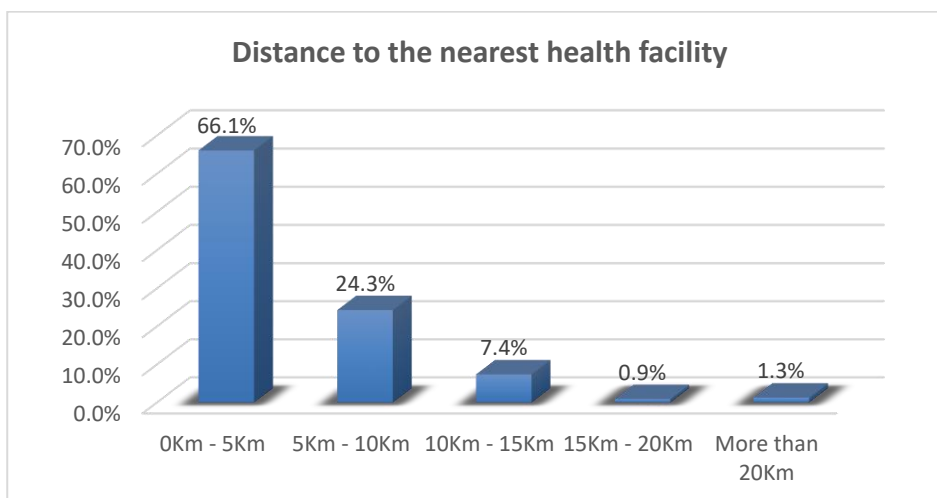


Plate 22 Distance from the nearest health facility

Satisfaction with services

43% reported a dissatisfaction with services at the public health facilities; 3% were very dissatisfied; 28% were indifferent; 21% were satisfied and 5% very satisfied. Reasons for dissatisfaction were lack of drugs at 72%; delays in being attended to at 9%; long distance at 7%; expensive services at 3%; unfriendly doctors and nurses at 3%; and other reasons at 21%.

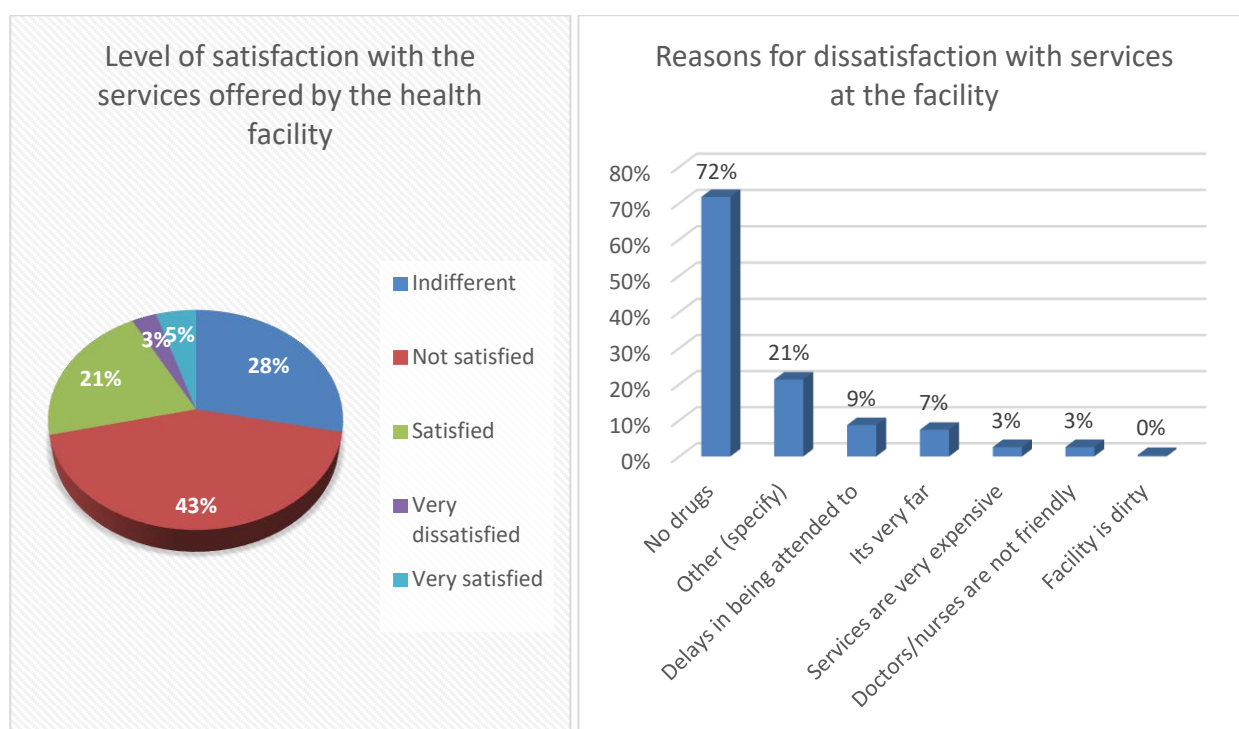


Plate 23 Satisfaction levels with health facilities and reasons for dissatisfaction

Morbidity

The most common diseases in the county are Malaria at 53% prevalence, respiratory tract infections at 16%, diseases of the skin, diarrhoea at 7%, intestinal worms/typhoid at 3.2%, accidents/fractures and sexually transmitted infections.

During a Key Informant Interview (KII), the County Public Health Officer reported the some of the prevalent health conditions in the project area include Malaria, diarrhoeal diseases such as typhoid and respiratory tract infections such as Tuberculosis.

In the project area, most households at 98% reported having suffered malaria infection in the 12 months prior to the study. 73% of households reported having experienced flu and cough; diarrhea at 49%; skin diseases at 15%; pneumonia and typhoid both at 10%; 7% reported having had cholera; and 6% reported incidents of intestinal worms. Other conditions included eye infections at 2% and accidents at the farm at 1%. There were no reported incidents of Covid 19 virus. 13% of the households reported having experienced or been involved in accidents.

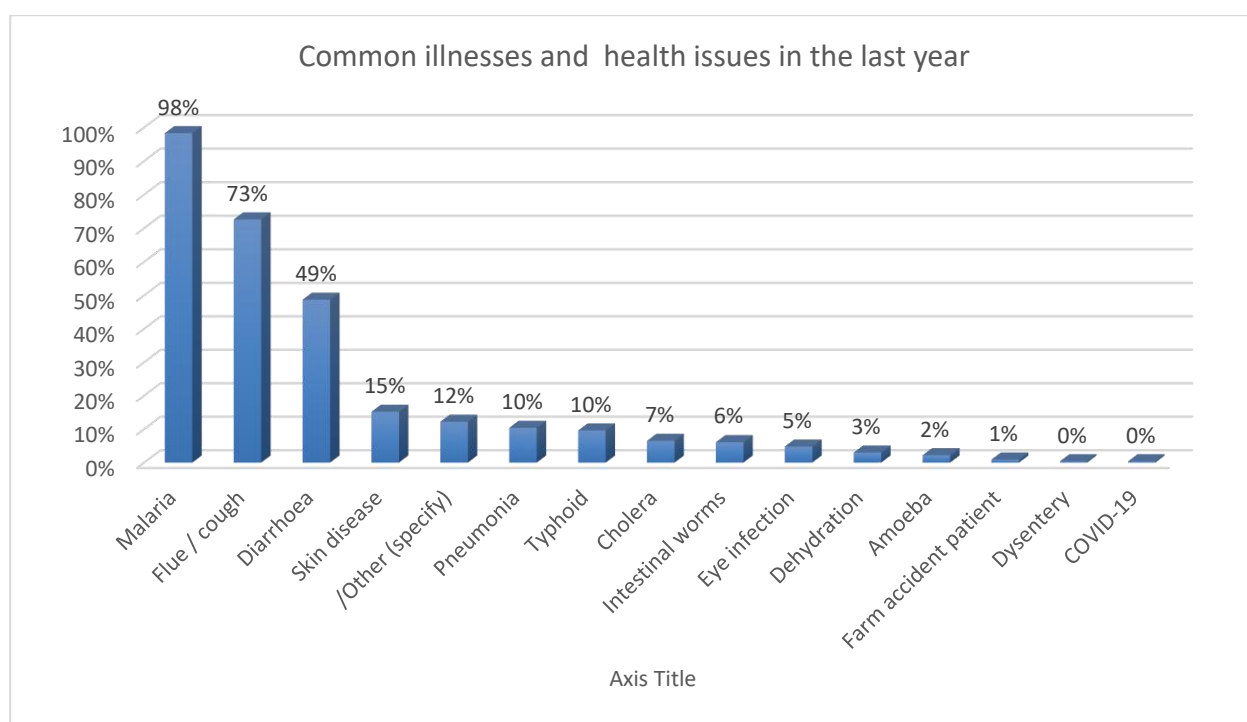


Plate 24 Common illnesses

Persons Living With Disability

The National Population and Housing Census 2019 indicates that 2.2% of the population live with various forms of disabilities. Further, the report indicates that 1.2% have seeing difficulties; 0.6% hearing; 1.2% have mobility difficulties; 0.7% have cognition difficulties; 0.4% have self-care difficulties; and 0.3% have communication difficulties.

During the survey, 31% of the households reported that they have family members or relatives living with various forms of disabilities. Further, of those living with disabilities, 61% were reported to be household heads.

The seemingly high number of people living with disabilities and particularly household heads was put into perspective during a meeting with people living with disability. Apart from physical disabilities, the community members see disability to include all those with terminal and various illnesses and are not able to walk, or involve in productive activities like farming, employment, businesses amongst others.

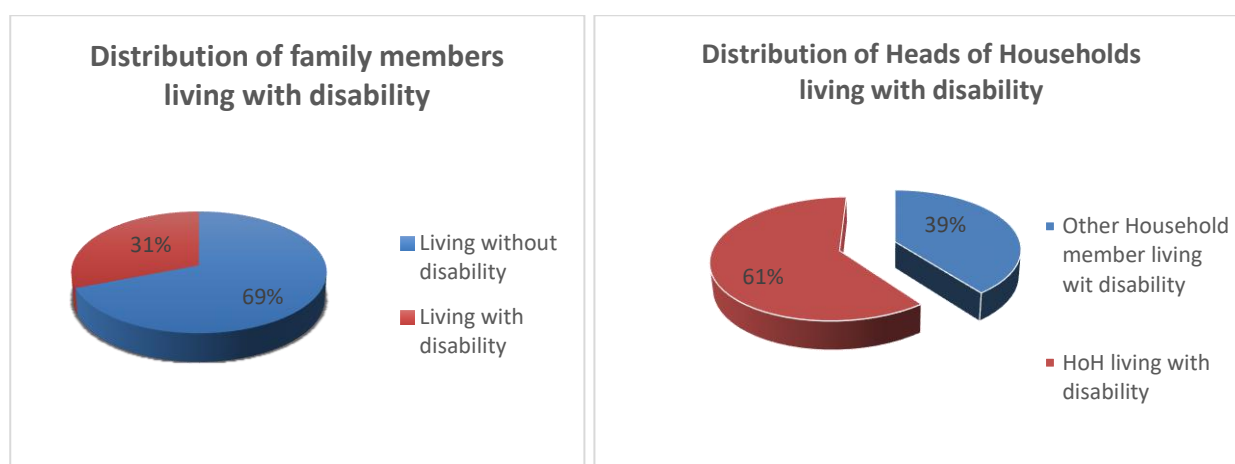


Plate 25 Persons Living with Disability

Immunization Coverage

Immunization coverage in the County is generally lower than the national average. This is mainly attributed to low literacy levels, lack of knowledge on the importance of immunization, low-income levels, long distances to the nearest health facility and births outside the health facilities.

Maternal Health Care

Most of the deliveries in the county are still performed outside health facilities. For instance, in 2016 and 2017, only 59.6% and 57.8% deliveries were performed in health facilities. The low rate of skilled deliveries is attributed to low-income levels, illiteracy, influence from traditional birth attendants, low uptake of ante-natal care services and long distances to available health facilities.

Access to Family Planning Services

The uptake of family planning in the county is still low (54.5 per cent) a factor attributed to differing perceptions among spouses on contraceptive use, low levels of education especially among the rural folk, misconception and fears of side effects associated with the use of contraceptives, cultural practices such as polygamy and low access to contraceptive services.

HIV/AIDs Prevalence Rates

By the end of 2013, the county had a HIV prevalence of 14.7 % as compared to the national rate of 5.6 per cent. This placed Migori County as one of the 9 counties that contributed to the highest HIV incidences across the country. Children constituted 12% of those living with HIV with 6,786 new adult infections reported. Adult and children ART coverage stood at 89% and 37% respectively. Approximately 1,876 adults and 682 children died of AIDS related conditions in 2013 in the county (Kenya HIV County Profiles 2014).

However, as at 2017, the prevalence rate had dropped to 14.4%, a fact attributed to the availability of HIV services, adequately trained HTC personnel, adequate PMTCT services and support from other partners in the provision of HIV related services. Free Voluntary Counselling and Testing

(VCT) services are available at all public health facilities and most private health facilities, VCT centres as well as other institutions such as colleges in the county.

According to the Public Health Officer, there is a lack of data on HIV/AIDS prevalence rate by gender at the sub county. As stated in the CIDP, he confirmed that Migori is at approximately 14% HIV prevalence. The contributing factors to the HIV/AIDS prevalence include gold mining and fishing activities. However according to him, Uriri sub county and the project area is not as affected by HIV/AIDS like other areas in the county since some of the major contributing factors/activities of fishing and gold mining are not largely practised in the sub county.

The most vulnerable groups in regards to HIV/AIDS infection according to the Public Health Officer are adolescent girls given the high levels of teenage pregnancy in the sub county. Contributing factors to the high levels of teenage pregnancy and school drop out in Uriri are cultural issues and tobacco farming. Tobacco is a fast growing cash crop compared to sugarcane and it is contributing to school dropout especially among boys is high. Parents also reportedly not keen to follow on the children's education affairs.

Immunization of children

Immunization coverage in the County is generally lower than the national average. This is mainly attributed to low literacy levels, lack of knowledge on the importance of immunization, low-income levels, long distances to the nearest health facility and births outside the health facilities.

5.1.18 Employment

In the 2019 Population Census, the labour force age- group (15–64 years) stands at 567,493 which is over 50% of the total population. Further, over 70% are youth who are expected to be part of the labour force. Employment opportunities in the county however, are very limited. The majority of those in the labour force are semi-skilled and have only had primary school education though a good number have also attained an 'O' Level certificate. Most of the population may therefore not possess the necessary qualification and skills to be absorbed in the formal sector.

5.1.19 Human Development Index

According the United Nations Development Programme (UNDP) Human Development Report, 2020, Human Development Index value for Kenya DI in 2019 was 0.601. The Migori County Human Development Index was 0.45 according to the County CIDP 2018 – 2022. This inequality is informed by its politics, economics and social organization and manifests itself in the lack of access to services, resources, power, voice and agency.

5.1.20 Gender Equity Analysis

The Migori County Integrated Development Plan (2018-2022) indicates that the County gender development index stands at 0.69 compared to the national indicator of 0.65. This index reflects the gender-based disadvantage in the three dimensions of reproductive health, empowerment and access to the labour market and the impact on development arising from inequality

From the FGDs and KIIs, it was evident that gender challenges in the county and by extension the project area include:

- Gender inequalities in resource allocations and leadership due to outdated cultural beliefs and practices;
- Women have been discriminated against when it comes to access to ownership of property and finances;

While from the survey, 70% of women constitute the agricultural workforce they have very little control over the land and animals and registration of titles in their names is a challenge. This imposes a great constraint on their ability to make major land and other resources and assets related decisions. There is also a preference of sending boys to school though this seems to vary from family to family and availability of resources. However, when there is limited resource, the boy is preferred to the girl in schooling matters.

5.1.21 Water

The major water resources in the county comprise surface, ground and rain water. Surface water consists of Lake Victoria with a total water mass of 475 km² and several rivers with the major ones being Kuja, Migori, Sare, Oyani, Riana, Tebesi, Misadhi and Ongoche. All these rivers drain into Lake Victoria. Ground water resources comprise of boreholes, shallow wells and springs. The quality of water from these sources – especially surface water is relatively poor and usually requires treatment prior to domestic use.

The main water supply and access sources include piped water schemes, boreholes, shallow wells, springs and water dams with access ranging between 200 m and 500m

The County has six urban water supply schemes:

- Migori Water Supply
- Awendo Water Supply
- Rongo Water Supply
- Kehancha Water Supply
- Macalder Water Supply in Nyatike Sub County
- Uriri Water Supply in Uriri Sub County.

Other piped water schemes include Sony Sugar Company Water Supply in Awendo Sub County, Nyasare Water and Sanitation Company Ltd in Suna East Sub County, Nyaduong C WUA in Suna East Sub County, Nyaprosomy Community Water Project in Nyatike Sub County and Rapogi Community Water Project in Uriri Sub County among others.

In the project area, there is Gogo Macalder Water Supply which covers up to Nyatike Sub County by World Vision (K) in collaboration with UNICEF. During consultations, community members and stakeholders raised issue with the fact that the immediate community does not adequately benefit from this water project despite drawing water from River Kuja. The feeling is that the communities downstream are benefiting more. However, at the time of consultations, the water pump was broken down and there was no water being supplied.

Water Sources in the Project Area

80.4% of the households get water from rivers and streams for domestic use. 13.9% fetch water from a public water kiosk/tap; 2.6% reported harvesting rain water while 2.2% fetch water from unprotected wells and 2.2% fetch water from protected well and 1.3% from borehole. Other sources of water include protected and unprotected springs; stagnant pools; water vendors. There is no mains or piped water supply into homesteads.

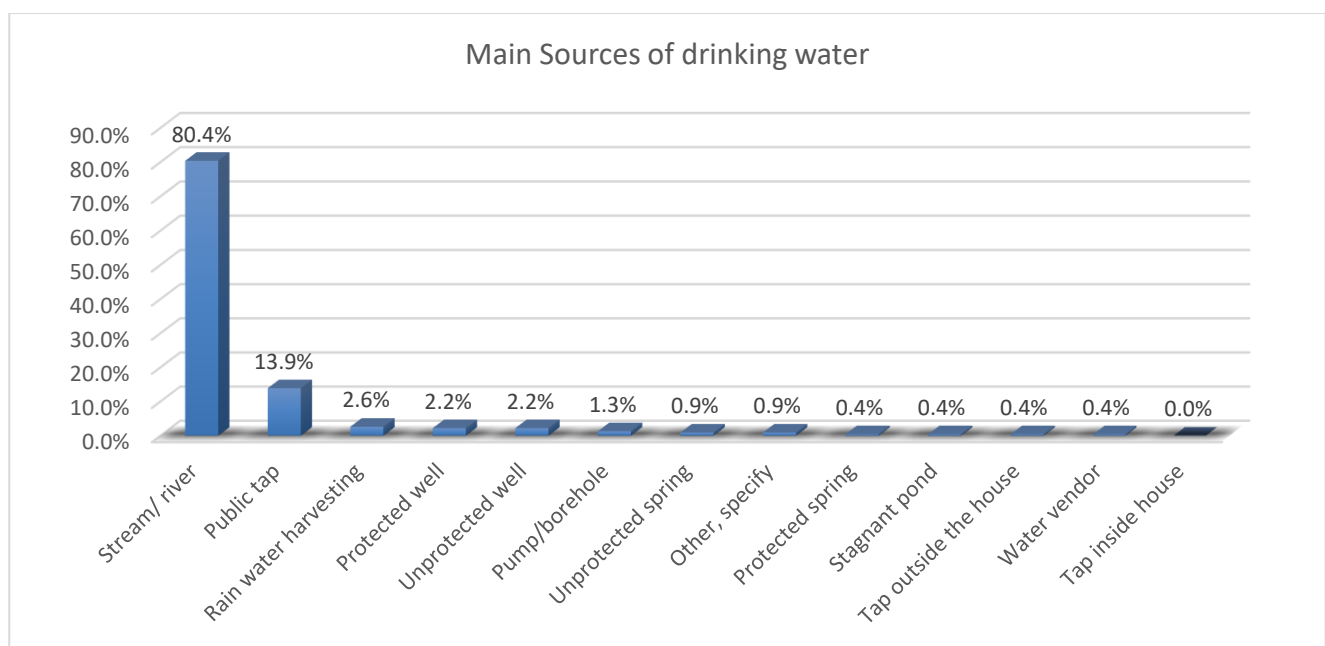


Plate 26 Sources of drinking water

Distance to Water Source

83.9% of the households reported that the nearest water source is 0-5KM away while 11.7% reported that their water source is between 5 – 10Km away. 3.9% are 10 – 15 Km away from the nearest water source and 0.4% 15 – 20Km away. Reliance on River Kuja and other streams has implication

on need for maintenance of water quality and strict control of pollution during construction, operation and decommissioning of Gogo Hydro Power Plant.

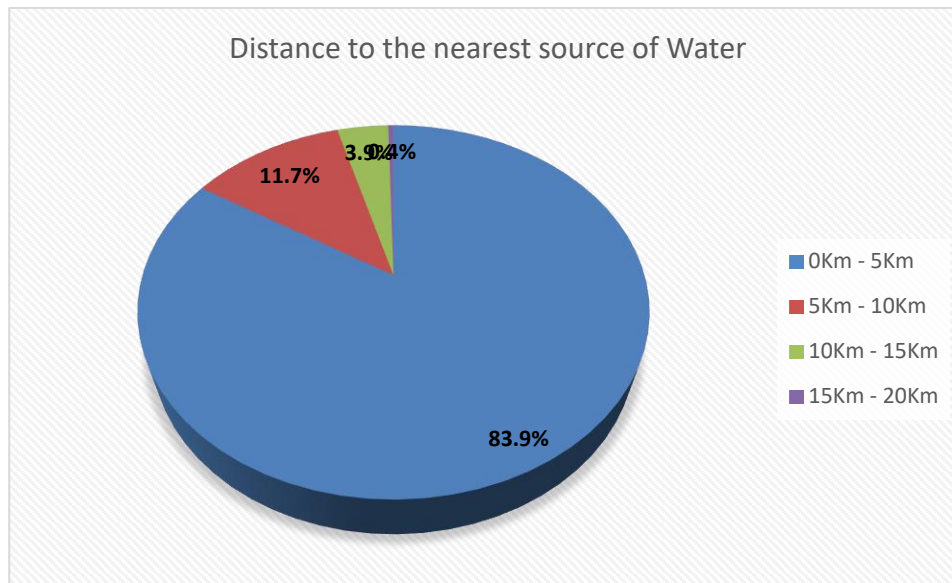


Plate 27 Distance from sources of water

• Water Shortages

37.4% of household reported they experience acute water shortages and scarcities particularly in the dry months of January, February and March; and July and August.

5.1.21.1.1 WATER ANALYSIS

Samples of water drawn from three distinct points along and within River Kuja were analysed for nutrients present and microbiological parameters. The three sites included:

- ✓ River Kuja at Gogo Hydropower Loggers house
- ✓ River Kuja at Macalder
- ✓ River Kuja Upstream of Gogo Hydropower Plant

The Analysis methods used were the American Public Health Association standard methods of examination of water and waste water (APHA) using the World Health Organisation guideline values. For actual values, KS EAS 12:2018 method was used. The KS EAS 12:2018 is an East African Standard which specifies requirements, sampling and test methods for portable water intended for direct human consumption, domestic and industrial use. It applies to treated potable water (municipal) and the untreated from boreholes, wells etc.

The results indicated that all the water samples were contaminated with *Escherichia coli* and faecal coliforms (Results Attached as Appendix 2). *Escherichia coli* are bacteria found in the environment, foods, and intestines of people and animals. Most strains of *E. coli* are harmless but some can cause

diarrhoea, urinary tract infections, respiratory illness and pneumonia. Faecal coliforms are anaerobic bacteria originating from human and animal faecal wastes and a clear indication of water contamination. Therefore, the water has been classified as bacteriologically unfit for human consumption as it is. However, water treatment can render it fit for human consumption.

All the water samples had elevated levels of iron and manganese but all the other nutrients were within the acceptable limits.

High Iron levels leads to plumbing problems since excessive iron can leave behind a residue, which can then build up and it can clog pipes, leave brownish stains on laundry, reddish-brown particles on fixtures, and can cause an unpleasant taste and odour in water. The Environmental Protection Agency (EPA) classifies iron as a secondary contaminant because iron can carry bacteria and other organic contaminants into drinking water.

Excess manganese leads to problems with memory, lower IQ, speech difficulties, and lack of coordination and movement control attention. Exposure to high concentrations of manganese over the course of years has been associated with a nervous system disease with symptoms like Parkinson's disease. The water also develops a metallic-taste and leaves black stains on bathtubs, showers, toilets, plumbing fixtures and laundry.

The water samples from Macalder area in addition to high Iron and Manganese levels also had elevated nitrites levels. If there is an excess level of nitrates in a water body, eutrophication can occur leading to excessive growth of plants and algae destabilising the amount of dissolved oxygen present in the river. During the day, there will be unusually high levels of dissolved oxygen, and at night the levels of oxygen can decrease dramatically.

The primary health hazard of drinking water with high nitrate levels is that nitrates oxidize the iron in the haemoglobin leading to *Methemoglobinemia* a rare condition in which the haemoglobin iron is in the oxidized or ferric state and cannot reversibly bind oxygen. If severe, this condition leads to hypoxaemia and death.

5.1.23 Sanitation

The county lacks access to a mains sewerage system and is therefore highly prone to diseases brought as a result of poor hygiene standards.

Human Solid Waste Disposal

Since there is no connection to a mains sewer system, human waste disposal is majorly through use of pit latrines as reported by 50% of households.

Fourty percent (40%) reported use of open defecation/open land which has grave impact on health of residents. This was evident during transect walks where human waste could be spotted in open places. 9% of households reported using burning method, 1% use compost pits and landfills. With

high reliance on rivers, streams, springs, wells and borehole water, as source of water for domestic use, these human waste disposal methods pose a high risk of pollution of the water sources particularly during rainy seasons coupled with spread of water borne diseases. This calls for strong public health and awareness campaigns on safe waste disposal.



Plate 28 Solid waste disposal

Effluent and Grey Water Disposal

81.3% reported disposing effluent and grey water in open land and 17.8% in open ditches. This method poses great risk of pollution of water sources and there is need for public awareness and sensitisation on safe disposal of this form of waste.

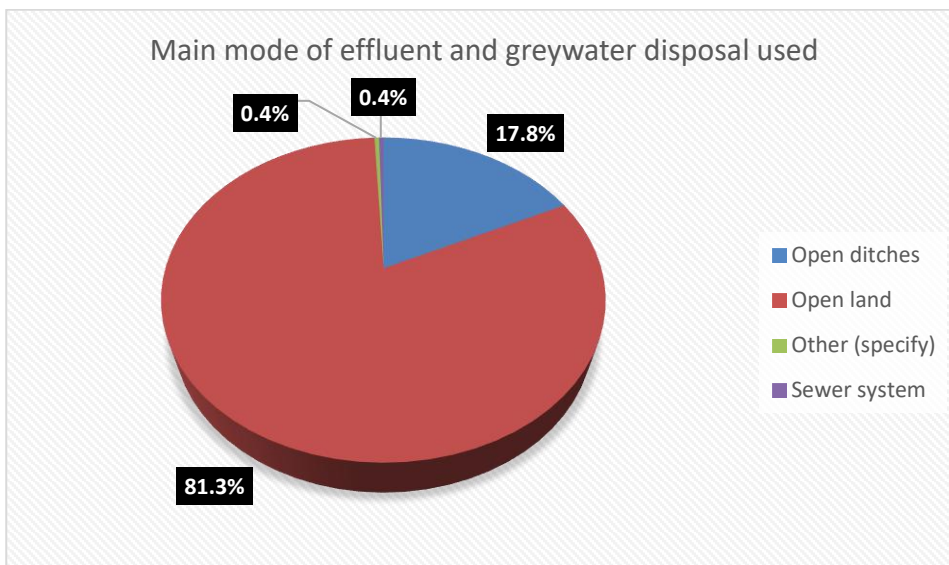


Plate 29 Effluent and Grey water Disposal

Toilet Facilities

54.8% of the households confirmed availability and use of pit latrines/toilets while 45.2% reported a lack of the same. The high percentage of those without pit latrines/toilets explains the high rate of open land defecation.

Majority of households reported presence of pit latrines with a wall and roof; 9% have pits with raised slabs; 7% have pits with wooden floors; 7% with urinals with stones and only 2% have ventilated improved (VIP) pit latrines.

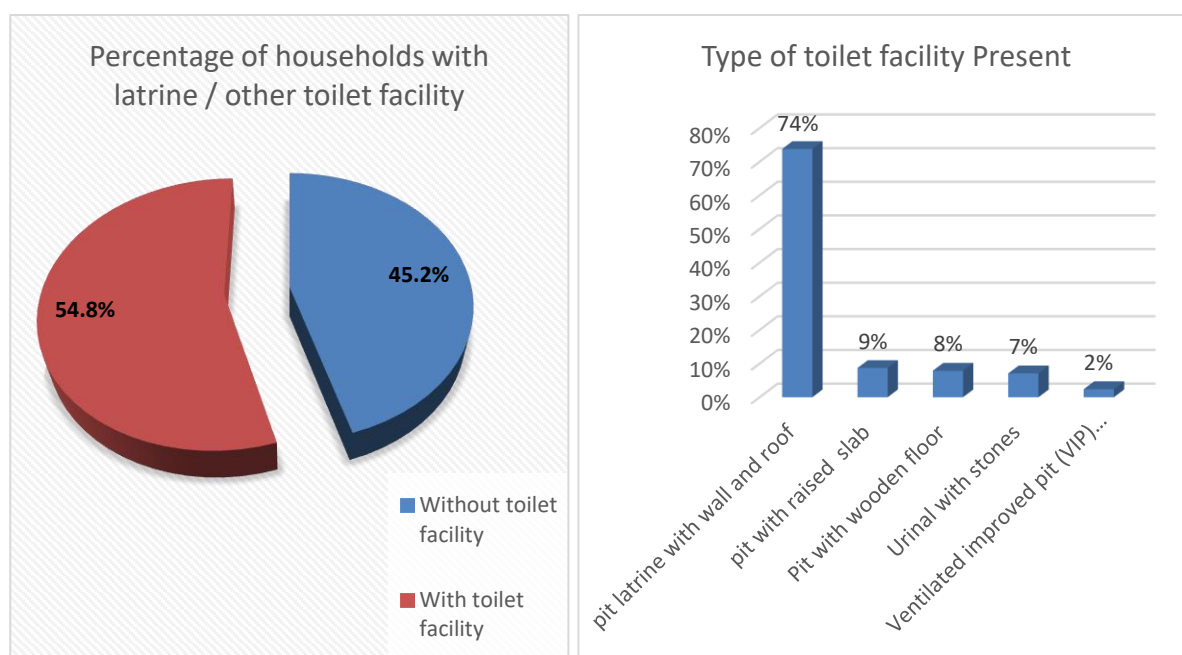


Plate 30 Toilet facilities

• Hygiene Practices

✓ Hand Washing

All the household reported practicing hand washing before and after eating. However, 72% wash hands after working or exposure outdoors, and 58% reported washing hands after using the toilet. Only 12% wash their hands before handling infants while only 5% wash hands after handling infants. There will be need for sensitisation and awareness creation to promote good hygiene through hand washing.

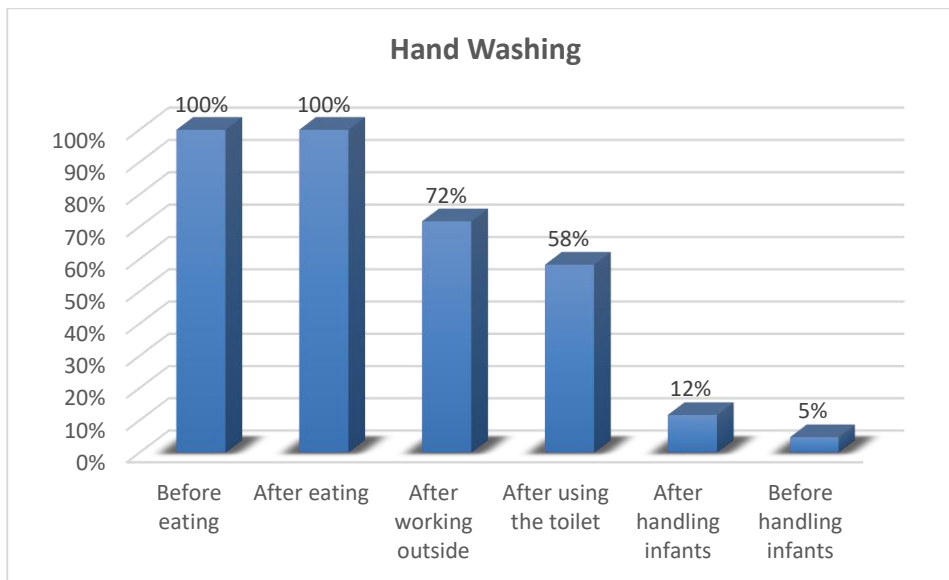


Plate 31 Hand washing

5.1.25 Energy Access

More than 60 per cent of the county's population still lacks access to electricity, and a larger share suffers from persistent power failures. Available statistics indicate that there is over dependence on non-renewable hydro-electric power within the county as the main source of energy leading to exploitation of forest resources. Firewood, charcoal, kerosene, and LPG continue to be the main sources of cooking fuel at 82.1%, 10.3 %, 4.3%, and 4.0 % respectively based on the Basic Report on Well Being in Kenya 2015/2016. For lighting 10.2% use electricity from the main grid, 29.7% use solar, 12.8%, 46.2% and 0.2 % use lantern, tin and pressure lamps respectively. 0.75% use torch while 0.2 % use candles.

There is potential for harnessing solar, biogas and wind energy within the county. There is also potential for generation of electricity from locally available resources such as biomass from agricultural wastes and biogas from sugar cane to supplement the existing sources.

- **Electricity Connection**

There is limited connection to national electricity grid with 98.3% reporting a lack of connection. Only 1.7% reported connection to the national grid. While they understand and appreciate that KenGen as project proponent will only generate electricity and supply and distribution is the mandate of Kenya Power, all community members, stakeholders and leaders consulted indicated that they expect connection to the national grid and improved supply of electricity in the area with the redevelopment of Gogo Hydro Power Plant. In fact, they were just short of demanding that the

area should be supplied with electricity first before surplus is supplied to other regions of the county and country.

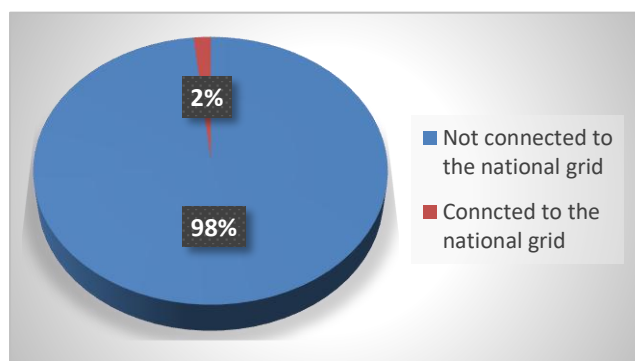


Plate 32 Electricity connectivity

Energy Sources for Cooking/Heating

In the project area, the major source of energy for cooking and heating is firewood at 98.3% while charcoal accounts for 32.2%. Only 2.2% reported use of gas/LPG while 1.7% use kerosene. Biogas, solar and plastic bags are all at 0.4%. No household reported use of electricity. The heavy reliance on firewood and charcoal was evident through cutting down of trees which has a negative impact on forest cover within the area. There is need for awareness for protection of forest and vegetation cover and development and promotion of alternative sources of energy.

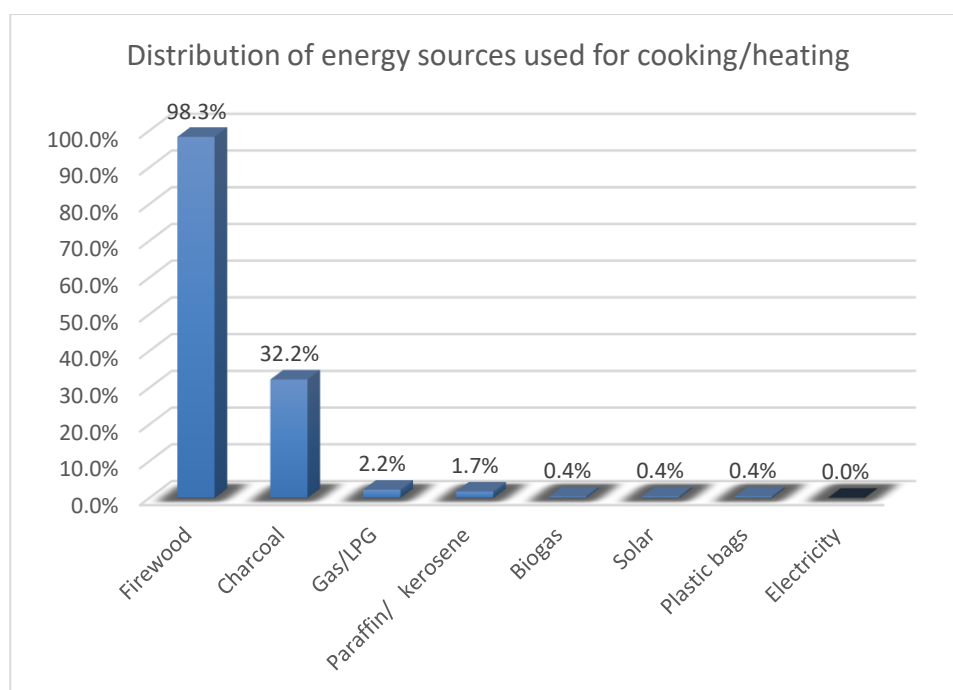


Plate 33 Source of energy for cooking

- **Energy Sources for Lighting**

Households in the project area rely on solar energy for lighting at 69.1% as indicated in the chart below; 36.5% rely on paraffin/kerosene batteries/dry cells, firewood account for 1.7% and 1.3% respectively. 0.9% reported using candles and 0.4% reported use of charcoal briquettes.

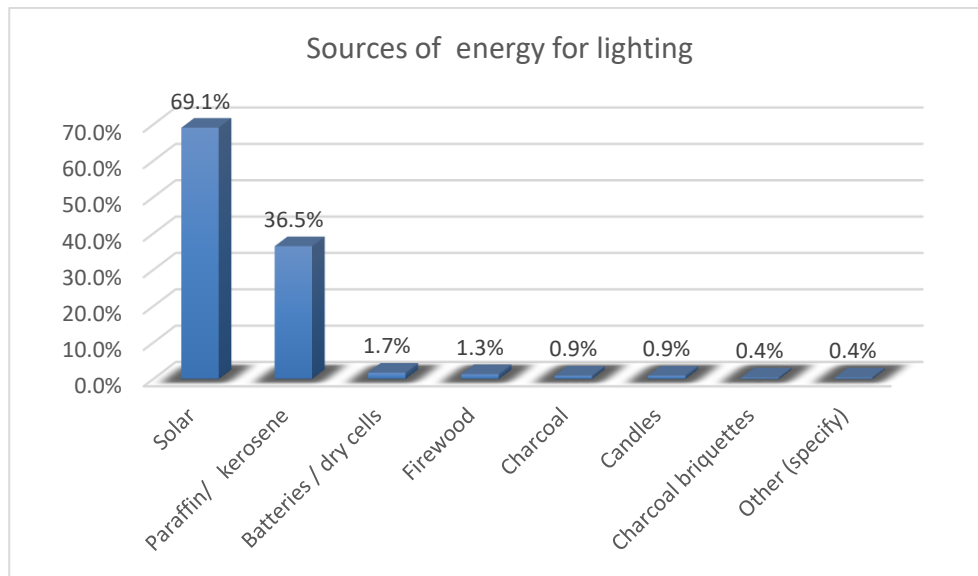


Plate 34 Sources of Energy for lighting

5.1.26 Tourism

The county is strategically placed to benefit from western Kenya and northern Tanzania tourism circuits covering tourist attraction in Kisumu, Homabay, and Maasai Mara in Narok County. The county is famous for the existence of the following attraction sites amongst others:

- The Crying stone of Kuria East
- Thim Lich Ohinga,
- Mugabo Caves
- God Kweru Religious Shrine,
- The scenic beauty of the islands in Lake Victoria
- Gogo Falls among others.

The County has no existing game reserve, game park, bird sanctuaries nor an animal orphanage. There is however a great potential in harnessing wildlife through the protection of the few existing wildlife such as birds, monkeys and hippos.

There is no tourism site in the project area but residents feel that a redeveloped Gogo Power Plant can act as a tourist attraction. Further improved road networks will enhance access to tourism sites in the neighbouring areas.

5.1.27 Cultural heritage Sites

There are existing cultural and historical sites which include:

- Thimlich Ohinga museum,
- God Kweru religious site
- Mugabo caves.

The closest site to the project area is Thimlich Ohinga, located approximately 5 km away across River Kuja.

5.2 General description of Physical Environment

5.2.1 Topography

Migori county has an altitude that varies across different areas. The altitude is 1,140 masl at the shores of Lake Victoria in Nyatike Subcounty and 4,625 masl in Uriri Sub-county at the location of the Gogo Hydropower Plant. Some of the areas have hills namely: Nyakune (4,625 masl), Ogengo (4,300 masl) and God Sibwoche (4,600 masl) in Uriri sub-county.

5.2.2 Agro-ecological Zones

Migori County has six agro-ecological zones ranging from Upper Midland (UM) 1-4 covering Rongo Sub County, Kehancha and Ntimaru in Kuria East and Kuria West Sub- Counties respectively to Lower Midland (LM) 1-5 covering parts of Rongo, Migori and Nyatike Sub Counties. The county has an inland equatorial climate modified by the effects of altitude, relief and the influence of Lake Victoria. The existence of a favourable agricultural climate makes the cultivation of cotton, rice, maize and a variety of other food crops possible.

5.2.3 Hydrology

The main rivers in the county are Kuja, Migori and Riana, all of which originate from the highland regions of the neighbouring Kisii and Narok Counties while the smaller and mainly seasonal rivers include Ongoche, Oyani and Sare. Rivers Migori, Ongoche, Oyani and Sare eventually drain into River Kuja at various locations within the county which in turn finally drains into Lake Victoria. Another spectacular feature found in the county is the Gogo Falls found along River Kuja. River Kuja is a perennial river originating from the Kisii Highlands and flows in a south-westerly direction before turning towards a westerly direction and discharges into Lake Victoria as the River Gucha-Migori. Along the river path, the River Kuja is joined by major tributaries including the River Sare, River Riana, Rand Oyani which discharge into River Kuja upstream of the SHPP Gogo location. Downstream of the SHPP Gogo, River Kuja is joined by River Migori to form the River Gucha-Migori which discharges into Lake Victoria at Kadem Point on the Lake Victoria shore. There are three river gauging stations (RGS) all located on the River Kuja; Kanga (RGS 1KB03), Macalder (RGS 1KB01A) and the Station operated by KenGen, which is the RGS located at the SHPP Gogo area.

5.2.4 Climate

Migori County has an inland equatorial climate modified by the effects of altitude, relief and the influence of the large water body of Lake Victoria. The climate of the study area is heavily influenced by its geographical location and altitude relative to Lake Victoria. The climate is influenced by two main wind systems, the North Easterlies, and the South Easterlies trade winds. The passage of the inter-tropical Convergence Zone (ITCZ) over the Kuja catchment area results into two seasons. Rainfall is also influenced by altitude of the area and proximity to the lake. The Climate of the catchment changes with altitude from upstream to downstream.

Rainfall

The rainfall pattern in Migori County is generally continuous with little distinction between short and long rains. Annual rainfall ranges between 700 - and 1,800-mm. Long rains are between March and May while the short rains are between September and November. Dry seasons are between December and February and June and September.

5.2.5 Soils

The soils in Migori County are derived from ancient Precambrian rocks, with small areas of Tertiary volcanics and sediments in the North West, and of recent Quaternary sediments near Lake Victoria. Over 80 percent of the total area in Migori is composed of soils derived from two main series of ancient rocks, the Kavirondian and Nyanzian volcanics north of the Migori river; and intrusives, mainly granites, with some dolerite dykes, south of the Migori river. The lighter sandy soils, are derived mainly from the Precambrian granites, leaching has resulted in loss of some elements, necessitating appropriate fertilizer dressings if these soils are to produce their full potential in crops.

Most parts of the county are underlain by relatively 'acid' parent rock. Granite covers most parts of Kuria East, Kuria West, Nyatike, some parts of Rongo and Migori Sub-counties. The rest of the county is covered by the Nyanzian and Bukoban rocks. There is also presence of gold deposits in the county particularly in Macalder in Nyatike sub-county, Masara in Migori sub-county and some parts of Rongo, Kuria and Uriri sub-counties.

Different types of soils were identified within the project influence area but loam/sandy/lateritic soils were predominant. Other soils types included Black clay soils within the riparian and marshy lands with patches of red soils mixed with sand soil, imperfectly drained to poorly drained, dark grayish brown to black, friable to firm, red soil, sandy clay to clay. There are several gullies from up slopy hills to the escarpment. Soil erosion is also high especially at the sloppy ground and hills.



Plate 35 Gulley erosion at the Gogo hydropower expansion project site

Soil analysis

Sub-soils from the project area were collected at a depth of 30cm along the river at different points namely: At the intake point, near the dam, at the outflow, on fallow land, the gauging station and at World vision water project site. and taken to Kenya Plant Health Inspectorate (KEPHIS) for analysis. The soils were analysed for fertility and presence of heavy metals. KEPHIS laboratories are SANAS(The South African National Accreditation System) accredited for most of the soil tests (Appendix 1).

Soil fertility results

Generally, the soils in the area are fertile and of good texture and with proper management can be very productive. Specifically from the analysis, at the intake region the soils were slightly acidic but the Calcium, Magnesium, potassium, phosphorus and Nitrogen levels are adequate. However, the organic carbon was low. The soils are suitable for growing Sweet potatoes, Maize and Tobacco. The kind of soil fertility management needed is adding well rotted compost or farmyard manure at a rate of 4 tonnes/ acre when planting. During transplanting of the seedlings, 100kg Diammonium Phosphate (DAP) fertilizer per acre should be applied and later top dressing using Calcium Ammonium Nitrate (CAN) or foliar feeds.

At the outflow region, the soils were similar to those of the intake region. However, they had low copper levels that were undetectable using the standard machines. Management of these soils

include: Avoiding using of Phosphatic fertilizers, adding 100kg of CAN fertilizers during seedling transplanting and use of foliar feeds during flowering. In one sample of the outflow, the soils were found to be slightly acidic and this can be managed by application of gypsum for soil remediation.

Soil Heavy Metal Analysis results

Heavy metals constitute groups of inorganic chemical hazards, and those most commonly found at contaminated sites are lead (Pb), chromium (Cr), arsenic (As), zinc (Zn), cadmium (Cd), copper (Cu), mercury (Hg), and nickel (Ni). Soils are the major sink for heavy metals released into the environment by aforementioned anthropogenic activities and unlike organic contaminants which are oxidized to carbon (IV) oxide by microbial action, most metals do not undergo microbial or chemical degradation and their total concentration in soils persists for a long time after their introduction. Heavy metals are toxic to soil, plants, aquatic life and human health if their concentration is high in the soil. They exhibit toxic effects towards soil biota by affecting key microbial processes and decrease the number and activity of soil microorganisms.

In this study, the soils were analysed for presence of Mercury, Chromium, Lead and Cadmium. The World Health Organisation guidelines for permitted levels of heavy metals were used as the standard measure. Near the World vision intake point and sections of the fallow land, the soils were found to have Cadmium level higher than the levels allowed WHO. High Cadmium levels could be as a result of undelyong parent rocks with high Cadmium, underlying bedrock. Anthropogenic inputs sewage sludge, manure and phosphate fertiliser application and pollution from aerosol sprays. All the other heavy metals were within the permitted range.

5.3 Environmental Setting

5.3.1 The Biological Environment

5.3.1.1 Flora

The area is composed of swamps, wood lots, mixed open woodlands, bushes and scrubland, farmlands, grasslands, and glades form most of the riparian vegetation. The natural biological environment of the project area has been considerably changed due to encroachment and land fragmentation. The project area near the river is covered with riverine vegetation characterized by rooted herbaceous, papyrus (*Cyperus papyrus*) Reeds (*Phragmites* sp.) and hippo grass (*Vossia cuspidate*). The tree species found in the area include: *Acacia polycantha*, *Acacia seyal*, *Albizia coriara*, *Euphorbia tiraculli*, *Euphorbia candelabra*, *Erythrina abyssinica* and *Eucalyptus saligna*.

5.3.1.2 Invasive Plant Species

The area has also been heavily encroached by invasive plant species such as *Lantana camara*. These plant species have threatened the integrity of the vegetation and compromised on the fodder quality through suppressing grass and other undergrowth.

5.3.1.3 Fauna

The main wildlife found in the project area are monkeys, snakes, dikdiks, squirrels, hippos, birds, crocodiles, frogs and diverse fish species such as catfish, mudfish and African common carp.

5.3.1.4 Sensitive habitats

The only sensitive habitat found in the project area is a swamp adjacent to the Gogo dam intake.

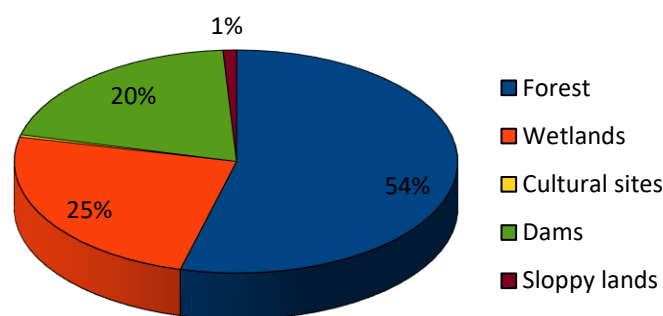


Plate 36 Sensitive habitats in the area

5.3.1.5 Environmental Degradation in the area

The destruction of water catchment areas in the project area and prolonged drought has resulted to reduced water flow consequently leading to a decline in hydro-power production at Gogo hydropower plant². Major environmental issues in Migori County include; deforestation, soil erosion, over reliance on forest as sources of fuel for energy, desertification, flooding, littering and solid waste collection.

Major causes of degradation in the area include: charcoal burning, quarrying, soil erosion, overgrazing, encroachment, poor agricultural practices, deforestation, sand harvesting, brick making and inappropriate solid waste disposal mechanisms.

The main environmental challenges in the area as perceived by the community include: Climate change (55.7%), reduction in agriculture production (38.7%), famine/drought (24.4%) and soil erosion (23.1%).

²Migori County Integrated Development Plan, 2018-2022

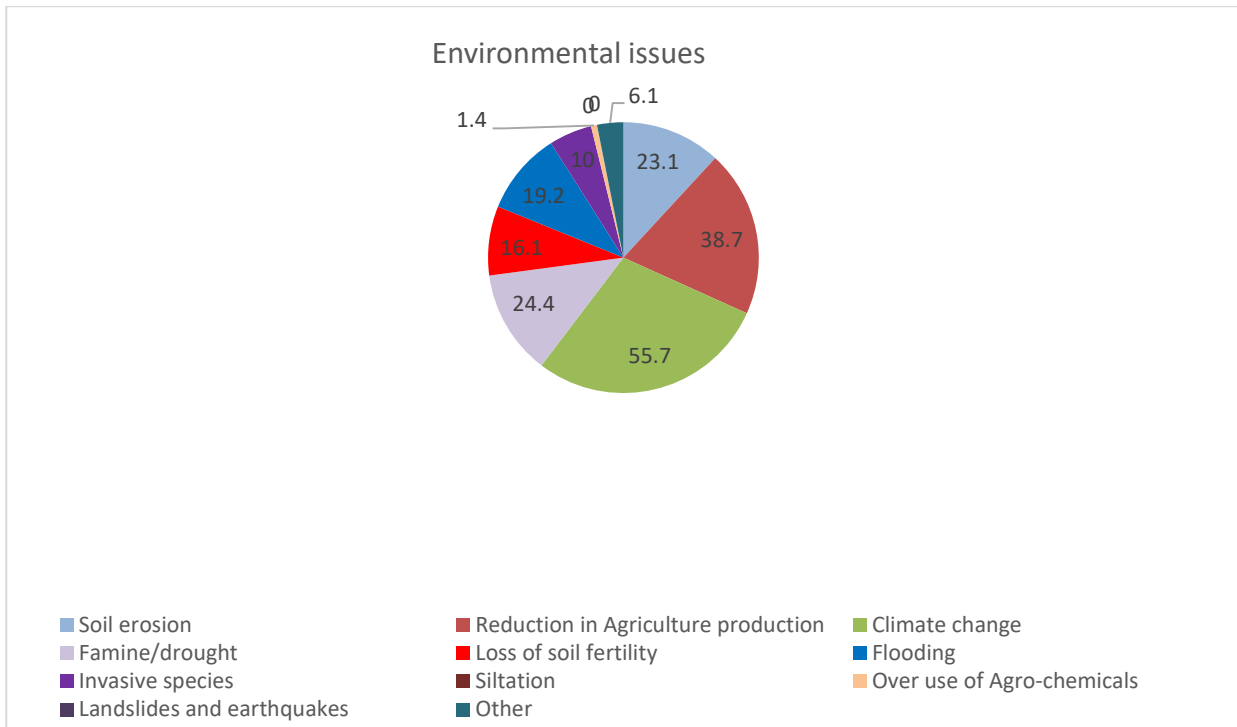


Plate 37 Environmental issues in the area

5.3.1.6 Energy Sources

During the field survey, it was evident that the source of fuel for the homesteads was mainly firewood and charcoal. Charcoal kilns were spotted in the area.



Plate 38 Energy sources

5.3.1.7 Quarrying

Quarrying was noted in many habitats in the area. This is mainly done to provide materials for construction especially of the roads.



Plate 39 Quarrying on a hill in Kanyamkago environs

5.3.1.8 Sand Harvesting

The community carry out commercial sand harvesting without making any efforts to conserve the riverbanks. Sand harvesting for construction works was evident and trucks ferrying harvested sand were noted in the project area.

This leaves the riverbanks fragile and exposed to erosion.



Plate 40 Sand harvesting

5.3.1.9 Brick Making

Bricks in the area are a common material for construction of semi-permanent and also permanent houses. Brick making is carried out as a business venture where members of the community make bricks and sell. The bricks are also made for subsistence use where they are used to construct houses in the area. The brick making process involves the digging up of soils leaving holes that are filled with stagnant water where mosquitoes breed. The brick making process also needs fire for curing the bricks and a lot of firewood is used in the process. To fire the bricks a lot of fuel wood is used and this leads to devegetation.



Plate 41 Brick Making

5.3.1.10 Poor upstream Catchment Management

River Kuja originates in the highlands of Kiabonyoru in Nyamira County passing through the heart of Gucha running west through Migori county. In Gucha, intensive farming is done at a small scale but in large scale where farming of sugarcane in plantations is carried out. There is evidence that very little is done to conserve the catchment. As a result the river is heavily silted. Communities

farm on the riparian causing degradation and even carry out deep ploughing and farming on slopy areas without putting in soil and water conservation.



Plate 42 Unprotected river banks

5.3.1.11 Solid debris collection in the river

Due to exposure of the Kuja river banks, there is erosion of river banks and collection of debris on the river banks . The debris collects on the river causing siltation.



Plate 43 Debris collection on River Kuja

5.3.1.12 River water Pollution

The local communities were found to wash clothes and motor vehicles along the river bank leading to pollution by detergents. Solid wastes such as plant materials from the farms are carried by the water into the reservoir.

5.3.1.13 Ploughing

Deep ploughing was evident in the area. This loosens the soil and makes it prone to soil erosion.



Plate 44 Ploughing on Kuja River Banks

5.3.1.14 Slash and burn

Farmers use slash and burn methods to clear vegetates and to clear shrub vegetation in readiness for planting. This exposes the soil to erosion and leads to the loss of nutrients.



Plate 45 Slash and burn

5.3.1.15 Farming on the riparian

This was noted along Kuja riverbanks. High value crops are heavy users of agro-inputs which when they are poorly applied, find a way into the water bodies.



Plate 46 Farming on high value agro-input dependent crops along Kuja river

The issues would appear to relate to poor agricultural practices. Wherever there is intensive smallholder agriculture there will be issues of excessive soil erosion, river bank degradation, pesticide misuse etc.

5.3.1.16 Collecting plant residuals

After crop harvesting the community collect the plant residuals for animal feeds, use for fuel or just burn the residuals. This compromises on the soil fertility and exposes the soils.



Plate 47 Collecting crop residuals after crop harvesting



Plate 48 Grazing along River Kuja

5.3.1.17 Invasive Plant Species

Encroachment of the area by *Lantana camara* an allelopathic invasive weed was noted. The weed releases chemical substances that inhibit growth of other plant species and thus it leads to endangering of local plants diversity.



Plate 49 *Lantana camara* an invasive plant species

Solutions to the causes of degradation.

According to the survey, some of the possible solutions to the causes of degradation in the area include; reforestation(46.6%), control of soil erosion (23.5%), public education(12.2%) and terracing at 6.1%. A considerable number of respondents (26.6%) were not aware of possible solutions to the causes of degradation, 7.9% indicated that nothing should be done while 6.6 % indicated that its only God's intervention that can help the situation.

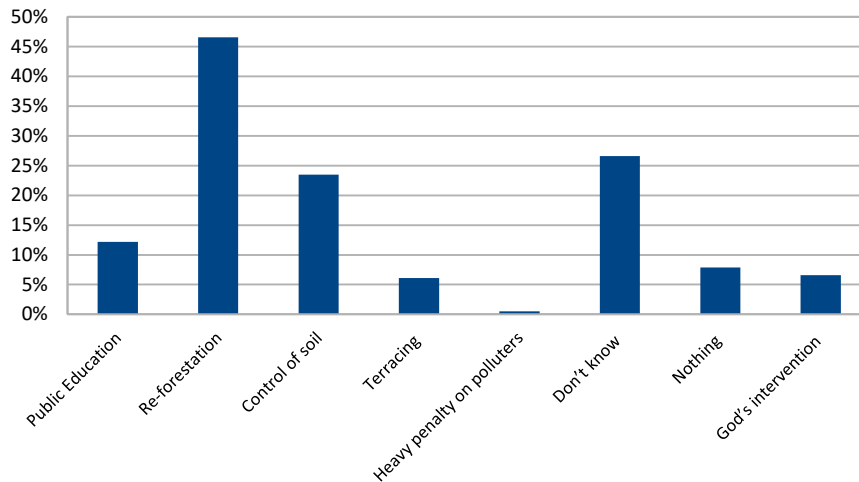


Plate 50 Solutions to causes of degradation

Consultations and interviews conducted suggested various sources of relaying environmental information as follows: radio(74.4%), local government(14.4%), television(12.7%) and meetings/trainings(8.3%), NGOs and cultural institutions at 1.5% and 1.4% respectively.

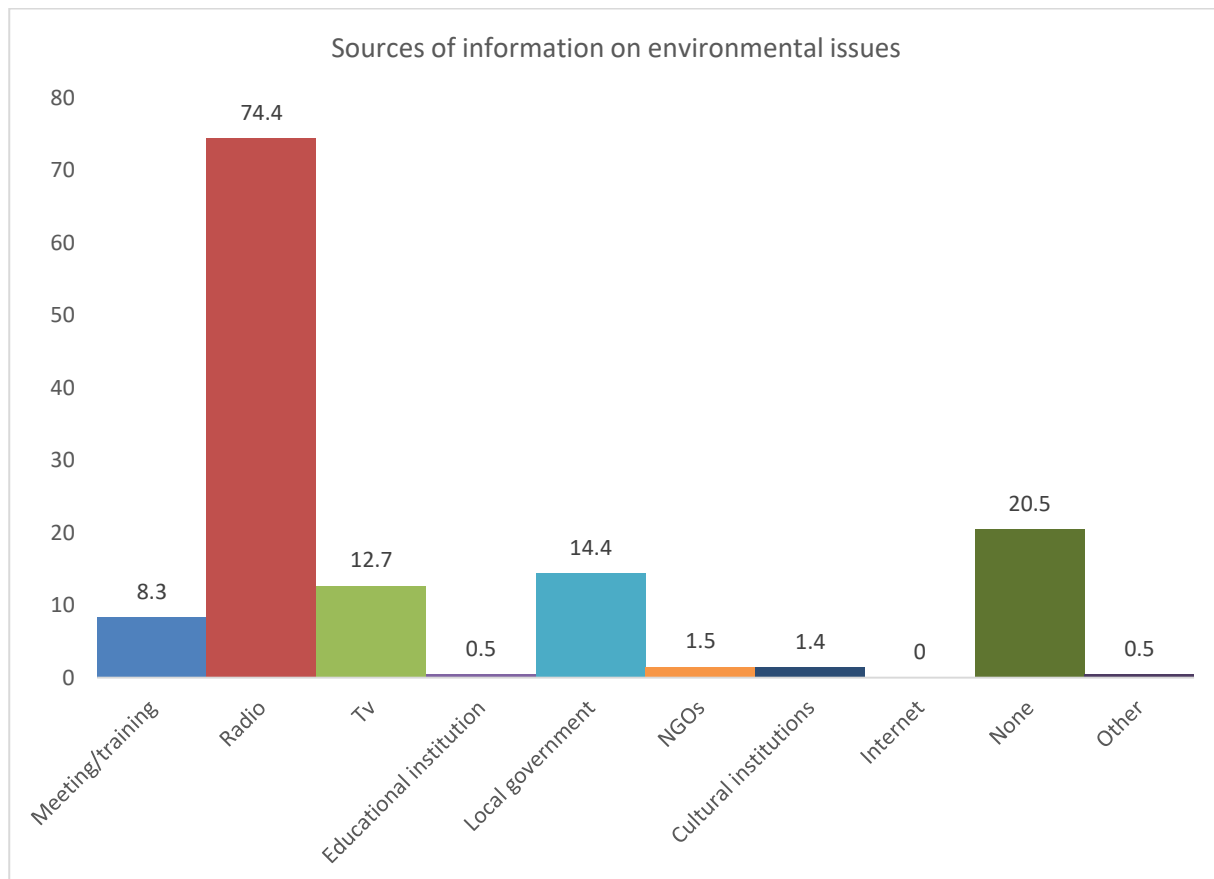


Plate 51 Sources of information on Environmental issues

5.4.2 Project Benefits

Clean source of energy was the major benefit of the project identified by 37% of the respondents. Other benefits include: controlling floods, reducing water loss, controlling soil erosion, mitigating climate change, improving water use efficiency and increase tree diversity as follows.

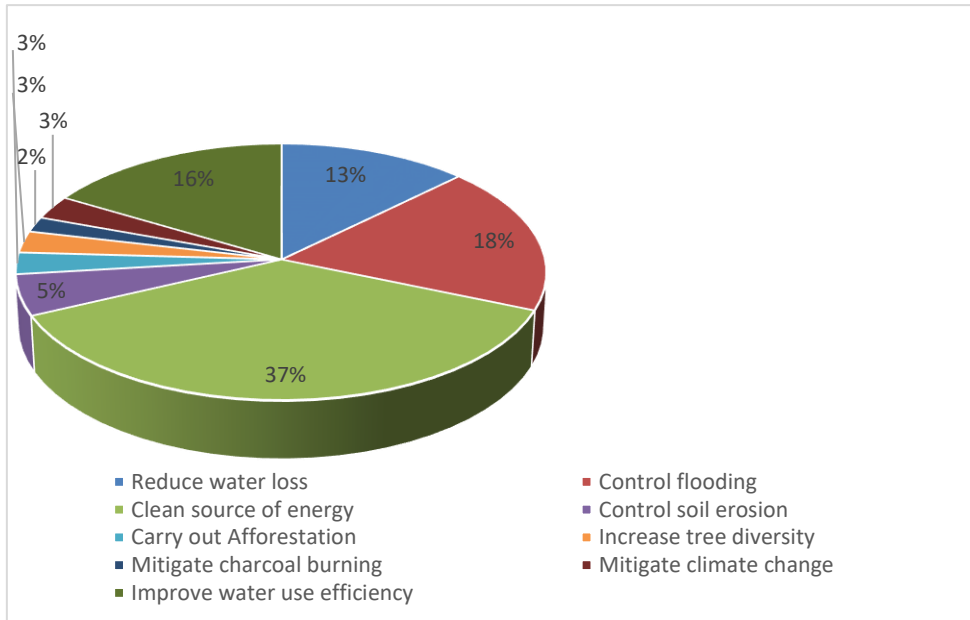


Plate 52 Project Benefits

5.4.3 Negative Impacts of the Project

According to the community the main negative impacts that may emanate from the project include: Noise and Vibration (51.4%), Occupational Health and Safety (33.5%) and oil spillage (20.5%).

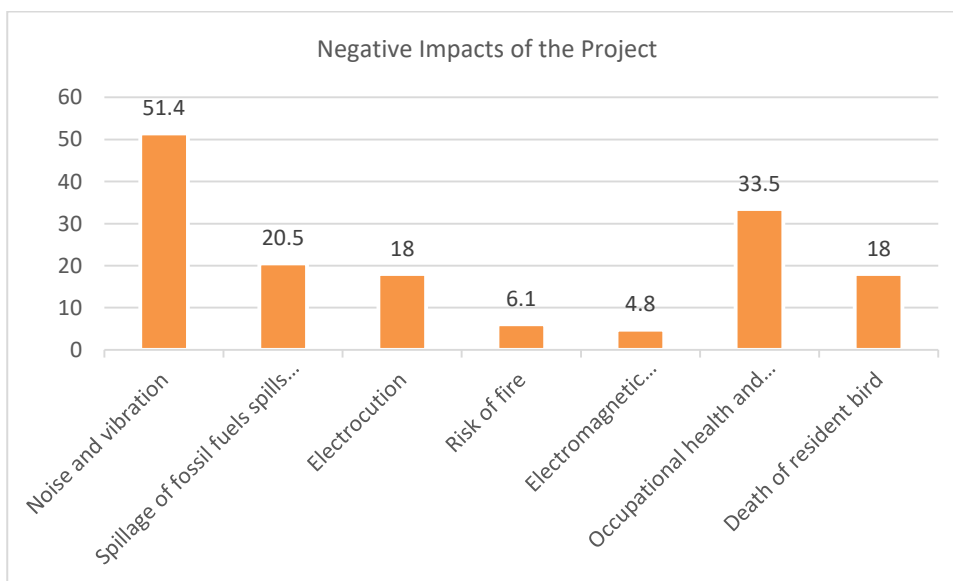


Plate 53 Negative Impacts of the project

5.4.3.1 Baseline Noise levels in the project area

According to The Environmental Management And Coordination (Noise And Excessive Vibration Pollution) (Control) Regulations, 2009, permissible noise levels have been laid out for different zones. According to this classification, Gogo area falls under zone C with a limit of 45 dB during the day and 35 dB at night.

Table 8 Permitted noise levels in various zones

Zone		Sound Level Limits dB	
		Day	Night
A.	Silent Zone	40	35
B	Places of worship	40	35
C.	Residential : Indoor/Outdoor	45	35
		50	35
D.	Mixed residential (with some commercial and places of entertainment)	55	35
E.	Commercial	60	35

The Environment Management and Co-ordination (Noise and Excessive Vibration Pollution) (Control) Regulations, cap 8 of 2009, Kenya and The Factories and Other Places of Work (Noise Prevention and Control) Rules L.N. No. 25 of 2005, Kenya states that the permitted noise levels in factories and other production units is 85dB for an 8hrs continuous exposure.

A survey was conducted around Gogo Hydro Power Station on 26th and 27th of July, 2021 to assess the noise levels in the area. From the survey results its evident that the area near Gogo power plant is basically a quiet area. Inside the power plant, the noise is higher but within the acceptable limit of 85dB. The highest average noise levels recorded in the power plant was 79.3 dB. The following table shows the noise levels in decibels in different homesteads as at the time of the survey.

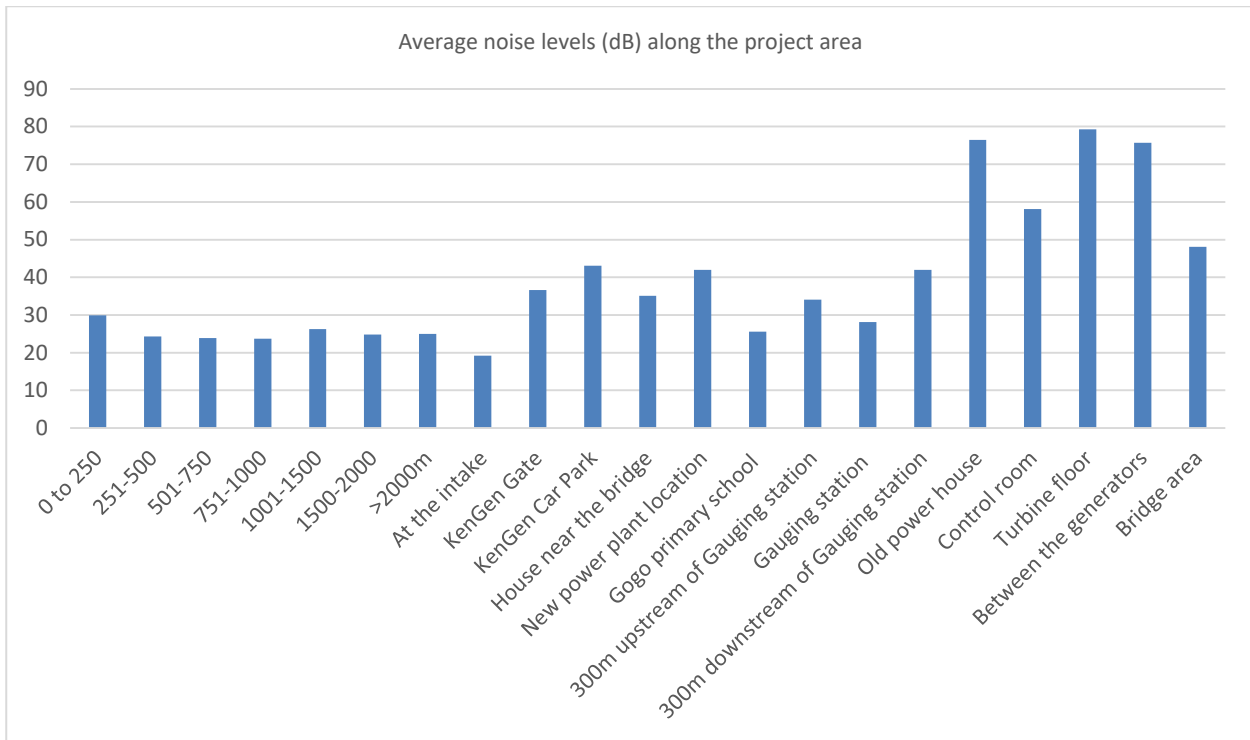


Plate 54 Day time Noise levels in dB in Gogo environs

6. CHAPTER SIX: PROJECT ALTERNATIVE ANALYSIS

6.1 Alternatives for developments

Besides hydroelectricity, there are several other energy resource options which include biomass, geothermal, wind energy, solar energy, biogas and, oil and gas. However, hydropower generation has advantages over the rest as it is based on a reliable proven technology that has been around for more than a century and hydropower plants can be easily rehabilitated or upgraded utilizing recent advances in hydro technologies.

Hydropower generation is renewable and uses water resources to generate hydropower through turbines. Therefore, it does not deplete water resources. It is also an economical and competitive renewable source of energy and can be integrated in Clean Development Mechanism projects.

Additionally, redeveloping the existing Gogo hydropower plant will provide opportunities for cost-effective capacity increases and will exploit domestic water resources, thereby achieving power stability.

6.2 ‘No project redevelopment alternative’

The no-project redevelopment alternative will mean that the proposed project will not be redeveloped. This implies that the positive impacts that would emanate from the project implementation will not be realised. By redeveloping the proposed project, this will contribute to the country’s renewable energy policy targets. In the absence of the Gogo hydro-power plant, Migori County residents would need to obtain an equivalent amount of energy from other means, most likely the thermal power options which would result in emissions of CO₂ and other green house gases.

6.2.1 The no-project redevelopment will have the following implications:

- Electricity deficiency in Migori county and the country at large will still be experienced
- Enhanced employment opportunities during the project re-development and through expansion of business activities that would have spurred by availability of electric power will not occur
- The rural electrification programme will not have been supported
- The targeted Migori residents will forgo improved electricity supply
- Increased pressure on the ecosystems especially tree cover due to use of biomass based sources of energy

The decision to develop the proposed Gogo Hydropower plant is a good investment in terms of economic development. It is important and a timely intervention as it contributes to increasing the country’s alternative environmental-friendly power demand and also supports the call for renewable energy alternatives worldwide to curb climate change.

The proposals to generate electricity from alternative sources to feed the national grid are not economically justifiable as long as exploitable potential hydropower sources are available. This gives hydropower a competitive edge over the other alternative technologies on the basis of economics and efficiency, therefore the selection of —No action alternative is not a wise option.

6.3 Different/alternative site option

The existing plant is located along River Kuja and has been in existence for over 60 years with no major set backs safe for the old machines and siltation. The current power abstracted from River Kuja is sub optimal and the water levels are adequate to support the development of the hydropower plant. Having no other hydropower generation activity utilizing water from River Kuja, the alternative of undertaking the proposed Gogo Hydropower at a different location other than the current location is not a feasible alternative.

The location of the sedimentation tank and spill way structure had been selected based on the stability of the sites and the suitability of the nearby gently sloping terrain.

From the social context, the current project layout and orientation of the project features is based on the fact that the project feature location will have an impact on a low population thus reducing on the direct or negative impacts of the physical resettlement to the affected families or communities.

6.4 Increasing the dam wall option

Increasing the dam wall would lead to flooding to as far as Riat and this is not a feasible option since the project design foresees a scenario where human displacement and relocation is envisioned and should be an option for consideration. The cost benefit analysis of this option indicated very low returns on investment since it would have no significant impact on the output of power generation.

7. CHAPTER SEVEN: POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND PROPOSED MITIGATION MEASURES

The primary purpose of the ESIA is to enable the proponent to anticipate potential environmental and social impacts and plan for their mitigation. In this activity, potential impacts will be identified, their nature (whether beneficial or adverse), and their level of impact. The likelihood of their occurrence (risk) will also be explored. The impacts will be identified for each of the project phases, namely siting and construction, operation and decommissioning.

7.1 Impact assessment scoring

To systematically identify, predict, evaluate and determine the significance of impacts resulting from the project construction and operation, generic criteria developed by Haug et al (1984) were adopted. Precautionary principle was used to establish the significance of impacts and their management and mitigation i.e. where there is uncertainty or insufficient information, the Environmentalist leaned on the side of caution.

Table 9: Impact significance rating criteria

SEVERITY OF IMPACT	RATING	CONSEQUENCE
Insignificant / non-harmful / less beneficial	-1/ +1	
Small/ Potentially harmful / Potentially beneficial	-2/ +2	
Significant / slightly harmful / Significantly beneficial	-3/ +3	
Great/ harmful / beneficial	-4/ +4	
Disastrous/ extremely harmful / extremely beneficial	-5/+5	
DURATION OF IMPACT	RATING	
One day to one month	-1/ +1	
One month to one year	-2/ +2	
One year to ten years	-3/ +3	
Life of operation	-4/ +4	
Post closure	-5/+5	
SCOPE OF IMPACT	RATING	LIKELIHOOD
Activity specific	-1/ +1	
Right of way specific (within right way)	-2/ +2	
Local area (within 5km of the project)	-3/ +3	
Regional	-4/ +4	
National	-5/+5	
FREQUENCY OF ACTIVITY / DURATION OF ACTIVITY	RATING	
Annually or less / low	-1/ +1	
6monthly / temporary	-2/ +2	
Monthly / infrequent	-3/ +3	
Weekly/ life operation/ regularly / likely	-4/ +4	
Daily / permanent / high	-5/+5	
FREQUENCY OF IMPACT	RATING	
Almost never/ almost impossible	-1/ +1	
Very seldom / highly unlikely	-2/ +2	
Infrequent / unlikely/seldom	-3/ +3	
Often / regularly/ likely/ possible	-4/ +4	
Daily / highly likely/ definitely	-5/+5	

Table 10 Significance rating matrix

LIKELIHOOD (Frequency of activity + frequency of impact)	CONSEQUENCE (<i>Severity+ Spatial Scope + Duration</i>)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Table 11: Mitigation ratings

<i>Significance Ratings</i>	<i>Value</i>	<i>Negative Impact Management Recommendation</i>	<i>Positive Impact Management Recommendation</i>
Very High	126-150	Improve proposed management	Maintain proposed management
High	101-125	Improve proposed management	Maintain proposed management
Medium - High	76-100	Improve proposed management	Maintain proposed management
Low - Medium	51-75	Maintain proposed management	Improve proposed management
Low	26-50	Maintain proposed management	Improve proposed management
Very low	1-25	Maintain proposed management	Improve proposed management

7.2 CONSTRUCTION PHASE

Following the initial site visits, scoping consultations and observations, the following have been identified as preliminary potential impacts of the proposed redevelopment of the Gogo Power Plant particularly during construction.

7.2.1 Positive Socio-economic impacts

7.2.1.1 Employment

Gogo hydropower re-development project will create employment opportunities both directly and indirectly especially for casual workers from the local community. Creation of employment opportunities has both economic and social benefit. Economically, existing excess unskilled labour will be used in economic production; socially, the young and energetic but otherwise unemployed people will be engaged in productive employment other than remaining idle. Employees with diverse skills are also expected to work on the site during the construction period. Furthermore, unskilled employees will gain some skills. The proposed project will also enhance business opportunities for local community members – goods and services supply during construction, life support systems like food to workers, accommodation, and other services.

Impact analysis

Impact without Mitigation	
Severity of impact	+4
Duration of impact	+4
Scope of impact	+5
Frequency of activity / duration of activity	+5
Frequency of impact	+4
Result	+117 High

7.2.1.2 Improved transport/Improved Accessibility

The proposed project will lead to improvement of transport in the area. A refurbished foot bridge across river Kuja will ease the movement of people, goods and services across the villages, safety for school children and other bridge users. Further, possible maintenance of the feeder and the all-weather roads in the area will enhance movement and accessibility to the area.

Impact analysis

Impact without Mitigation	
Severity of impact	+5
Duration of impact	+5
Scope of impact	+4
Frequency of activity / duration of activity	+5
Frequency of impact	+5
Result	+140 Very High

7.2.1.3 Stable electricity supply

It is expected that the project will inject more power into the national grid and with better and more efficient systems, the supply will stabilize with minimal outages.

Impact analysis

Impact without Mitigation	
Severity of impact	+4
Duration of impact	+5
Scope of impact	+5
Frequency of activity / duration of activity	+5
Frequency of impact	+5
Result	+140 Very High

7.2.1.4 Local and regional business Opportunities

The Gogo Hydro power project will significantly contribute to the development of local businesses especially as a result of influx of construction workers, suppliers and other service providers. These will include mall seasonal businesses to meet the need of construction workers; opportunity for suppliers of construction materials, goods, services and utilities; rental houses for accommodation for construction workers; and markets for locals to sell farm produce amongst others.

Impact Analysis	
Severity of impact	+5
Duration of impact	+3
Scope of impact	+5
Frequency of activity / duration of activity	+4
Frequency of impact	+5
Result	+117 High

7.2.1.5 Gains in the Local and National Economy

There will be gains in the local and national economy during the construction of the proposed Gogo hydropower redevelopment project, through consumption of locally available materials such as timber, sand, and cement. The consumption of these materials in addition to fuel oil and others will attract taxes including value added tax (VAT) and income tax which will be payable to the national government. The cost of the materials will be payable directly to the suppliers.

Impact analysis

Impact without Mitigation	
Severity of impact	+4
Duration of impact	+4
Scope of impact	+3
Frequency of activity / duration of activity	+3
Frequency of impact	+4
Result	+77 medium-high

7.2.1.6 Gains to KenGen

Sale of scrap materials from the old power house will generate some income for KenGen. Additionally, the project is more than 60 years old thus if not re-developed, it will still come to the end of its functional cycle and become obsolete. The new efficient power plant will save money spent

on the repairs and maintenance; save management time and other resources spent on maintenance and repairs.

Impact analysis

Impact without Mitigation	
Severity of impact	+3
Duration of impact	+3
Scope of impact	+1
Frequency of activity / duration of activity	+1
Frequency of impact	+2
Result	+21 Very low

7.2.1.7 Provision of Market for Supply of Building Materials

The project will require supply of large quantities of building materials most of which will be sourced locally from the surrounding areas. This provides ready market for building material suppliers such as quarrying companies and hardware stores. The demand for the building materials will in turn spur other economic activities.

Impact analysis

Impact without Mitigation	
Severity of impact	+4
Duration of impact	+2
Scope of impact	+3
Frequency of activity / duration of activity	+5
Frequency of impact	+5
Result	+90 medium-high

7.2.2 Negative socio-economic impacts

7.2.2.1 Displacement

KenGen intends to use its parcel of land estimated at around 200 acres. Consequently, no land acquisition is expected and as such, hence no displacement related to land acquisition is anticipated. Nevertheless, there are two homesteads close to the project area, one on the lower section near the location of the proposed new power house; and the other on the upper side closer to the dam. There is a low risk of flooding upstream impacting one of the farms and also a possibility of acquisition of way leave for construction of the power house.

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-4
Scope of impact	-1
Frequency of activity / duration of activity	-1
Frequency of impact	-1
Result	-12 Very low

Mitigation Measures

- Sensitisation, consultations and engagement of the impacted community members
- KenGen to conduct a survey to determine the boundaries of their land
- Corporate social responsibility mechanisms to be discussed between KenGen and the community.

7.2.2.2 Economic Displacement

There are farming activities close to the dam area and downstream close to the proposed power house location on KenGen land. The potential for loss of crops, commercial trees and fruit trees due to displacement from KenGen land. There is also potential loss of some land uses such as grazing lands around the dam area.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-4
Scope of impact	-2
Frequency of activity / duration of activity	-4
Frequency of impact	-3
Result	-56 Low to Medium

- Sensitisation and consultations of the impacted community members
- KenGen to conduct a survey to determine the boundaries of their land
- Assets inventory, valuation and documentation exercise should be conducted for the likely impacted persons
- In the event there is any monetary compensation for the affected persons, this should be done before commencement of the project.

7.2.2.3 Damage or Loss of Archaeological Features

The survey revealed that no features of major archaeological significance were found on site. However, during the site preparation and construction phase archaeological artifacts could be damaged or destroyed on the project site. The community feared that there may be exhumation of bones of dead people buried in the project area or people who have drowned in River Kuja.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-2
Scope of impact	-1
Frequency of activity / duration of activity	-2
Frequency of impact	-2
Result	-20 very low

Mitigation measures:

- Apply chance-find procedures in case of contact with an archaeological feature.
- KenGen should meet and engage with the local leaders and agree on where to bury any human remains that may be buried in the silt.

7.2.3 Negative Environmental Impacts

7.2.3.1 Increased Human – Wildlife Conflict

There is a historical conflict between human beings and wildlife within River Kuja system. There is a high number of crocodiles and hippopotamus in the project area which reportedly cause damage to crops and pose threat to human and animal life. It is feared that during construction and dam dredging, there will be interference with the wild animals' habitat leading to the animals roaming the river banks, accessing farms and homes hence more attacks on humans and livestock; and foraging on crops.

Impact Analysis

Impact without Mitigation	
Severity of impact	-5
Duration of impact	-5
Scope of impact	-4
Frequency of activity / duration of activity	-4
Frequency of impact	-5
Result	-126 High

Mitigation measures

- Awareness creation and sensitisation
- KenGen be consulting Kenya Wildlife Service on managing human wildlife conflicts in they occur.
- KenGen to consider possibility of providing a water tap for the community outside the dam area.
- The dam should not exceed its current size

- Consideration for fencing off and securing the dam to limit access by community members and livestock for water.
- Riparian land conservation to protect the wild animals' habitat

7.2.3.2 Spread of invasive species

Introduction of invasive species is equally possible through construction equipment that is not properly cleaned through the transport of seeds of invasive species from other sites. Invasive plant species have the potential of spreading quickly and inhibiting the growth of native vegetation reducing plant species diversity, and inhibition of crop growths in the surrounding areas.

Impact Analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-5
Scope of impact	-4
Frequency of activity / duration of activity	-5
Frequency of impact	-4
Result	-99 Medium to High

Mitigation measures/Recommendations:

- Quarry locations for murram should be inspected for the presence of invasive species and if any are found, care should be taken to clear the area and burn the debris before excavation;
- Murram and subsoil should be sourced from locations licensed by NEMA according to a set of contractual environmental and social procedures;
- Where invasive species are identified within the project site disposal of cleared vegetation should be done in a manner as not to allow for invasive species to be transferred in other areas;
- Proper and adequate cleaning of machinery and vehicles used for transporting materials.

7.2.3.3 Hydrological impacts

Hydrological impacts of the Gogo hydropower project will lead to hydrological changes upstream and downstream of River Kuja. During construction, the upstream impacts would be negligible since a diversion channel would be constructed to carry all flows past the dam structure, resulting in no upstream accumulation of water (Inundation). Downstream impacts would be primarily the changes in flow rates and flood intensities.

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-2
Scope of impact	-3
Frequency of activity / duration of activity	-2
Frequency of impact	-3
Result	-30 Low

Mitigation measures:

- Construction works should be done during the dry season to limit flood impacts;
- Utilize sound construction measures-Diversion channel should serve to prevent upstream accumulation of water during construction;
- Use silt screens/silt curtains at the diversion channel to trap sediments.

7.2.3.4 Water Resource Conflicts and disputes

Changes in water flow dynamics may affect other projects downstream specifically the Lower Kuja Irrigation Scheme at Nyatike; abstraction for domestic water supply by UNICEF and World Vision project; and community members who use the water for domestic purposes and animals. This can lead to conflicts particularly during the dry seasons when water levels are low and with the possible regulation of water use for energy generation.

Impact analysis

Impact without Mitigation	
Severity of impact	-3
Duration of impact	-4
Scope of impact	-4
Frequency of activity / duration of activity	-4
Frequency of impact	-4
Result	-88 Medium to High

Mitigation

- Sensitisation and consultations of the stakeholders.
- KenGen and other water users can have meetings to discuss modalities of water supply and use dynamics.

7.2.3.5 Changes in Water Quality

Water quality could also be affected due to release of heavy metals and pollutants locked in the silt into the water. The impaired sediment outflows and other releases such as petroleum and other chemical wastes generated by construction activities will also affect the water quality.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-2
Scope of impact	-4
Frequency of activity / duration of activity	-2
Frequency of impact	-2
Result	-32 low

Mitigation measures:

- Water quality assessments should be done before and after dredging.
- Use silt screens/silt curtains at the diversion channel to trap sediments

7.2.3.6 Water Temperature changes

- Surface temperatures may rise when the flow of water is slowed or stopped.
- Low seasonal flows during the dry season is also likely to result to slightly higher temperature waters downstream.

Mitigation

- This can be mitigated by regulating water flows and the retention time.
- Sediment flushing should be carefully regulated and monitored to avoid changes in water temperatures.

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-4
Scope of impact	-3
Frequency of activity / duration of activity	-3
Frequency of impact	-3
Result	-48 Low

7.2.3.7 Loss of vegetation(Shrubs, short grass)

Loss of vegetation is anticipated during the construction phase of the Gogo hydropower project to facilitate construction activities. This will involve clearing of the existing vegetation cover consisting

of mainly shrubs. The main vegetation in the dam area is papyrus (*Cyperus papyrus*) and Bulrush (*Typha latifolia*)

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-2
Scope of impact	-1
Frequency of activity / duration of activity	-1
Frequency of impact	-2
Result	-12 very low

Mitigation measure:

- Maintain the construction activities within the footprint of the development.
- Site rehabilitation, including replanting of trees and re-grassing of areas.
- Ensure proper demarcation of the project area to be affected by the construction works.

7.2.3.8 Oil Spills

The machines on site may be containing moving parts which will require continuous lubrication to minimize the usual corrosion or wear and tear. This will contaminate the soil. Likewise, moving vehicles on site may require oil change.

Impact analysis

Impact without Mitigation	
Severity of impact	-3
Duration of impact	-2
Scope of impact	-3
Frequency of activity / duration of activity	-3
Frequency of impact	-2
Result	-40 Low

Mitigation measure:

- The contractor and KenGen will control the dangers of oil spills during construction by maintaining the machinery in specific areas designed for this purpose;
- Used oil should be disposed in designated places far from water bodies;
- Project vehicles should be washed in designated places far from the river.

7.2.3.9 Loss/disruption of habitats

Habitat disruption is expected in the short term for those species adjacent to the footprint of the development areas. Habitat disruption would result from devegetation, dredging, noise from operating machinery, noise and vibration from blasting activities, as well as noise and activity from

the presence of humans. Species are likely to move away from the highest levels of disturbance, adjacent to the footprint, but are likely to return after completion of construction.

Forest habitats for reptiles and amphibians are likely to be lost during the construction phase of the project. Terrestrial habitats may become fragmented into smaller components when small parcels of vegetation are left standing.

Impact analysis

Impact without Mitigation	
Severity of impact	-3
Duration of impact	-2
Scope of impact	-1
Frequency of activity / duration of activity	-2
Frequency of impact	-3
Result	30 very low

Mitigation measures:

- During construction, if endangered species are identified nesting or breeding in isolated vegetative patches, efforts should be made to rescue and relocate them;
- As much as possible indigenous vegetation and huge trees should not be cut;
- Vegetation clearance should only be done on site and when absolutely necessary;
- Landscaping and rehabilitation of the project site with its natural flora should be done on project completion.

7.2.3.10 Increased sedimentation

Increased levels of sedimentation may occur in the Kuja river during construction as a result of clearing of vegetation and exposure of topsoil, the use of earth moving equipment, excavation activities and riverbed works.

Impact analysis

Impact without Mitigation	
Severity of impact	-4
Duration of impact	-2
Scope of impact	-3
Frequency of activity / duration of activity	-2
Frequency of impact	-4
Result	54 low-medium

Mitigation measures:

- Use of sediment curtains/silt screens/geogrid mesh
- Riverbank/bed excavation should be limited to the dry season as far as possible.

7.2.3.11 Soil erosion and run-off

During dredging of the dam and construction of the power house, removal of trees and other vegetation will occur and there may be a problem of increased soil erosion and silt run-off into the water especially during rains.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-2
Scope of impact	-2
Frequency of activity / duration of activity	-2
Frequency of impact	-2
Result	-24 Very low

Mitigation measures:

- Minimal interference with vegetation;
- The dredged materials should be stored away from the river banks;
- Construction should be done during the dry season.
- Apply proper construction practices to reduce run-off of sediments including the use of sediment curtains to reduce sediment load in the water.
- Terracing and leveling the project site to reduce run-off velocity and increase infiltration of rain water into the soil.
- Harvesting and storage of surface run off and roof water for re-use
- Re-vegetating exposed areas around the site so as to mitigate erosion of soil by storm water runoff.

7.2.3.12 Interruption of Breeding patterns of Fish

The construction phase may disrupt breeding patterns of fish. It can also affect downstream species composition.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-2
Scope of impact	-2
Frequency of activity / duration of activity	-2
Frequency of impact	-4
Result	-36 low

Mitigation Measures

- During construction, water flow will not be totally restricted

7.2.3.13 Waste generation

The main solid waste which will be generated is the desilted material from the dam. Other solid wastes include: packaging materials, plastics, scrap metal, timber, construction rubble, obsolete/damaged machines and cleared vegetation. Dumping around the site will interfere with the aesthetic status of the area. The silt may have toxic wastes and heavy metals. This has a direct effect to the surrounding community. Disposal of the same solid wastes off-site could also be a social inconvenience if done in the wrong places. The off-site effects could be loss of aesthetic value of the area, pest breeding, pollution of physical environment, invasion by scavengers and informal recycling communities. Liquid waste, including gray water and sewage effluent would also be generated.

Impact analysis

Impact without Mitigation	
Severity of impact	-4
Duration of impact	-2
Scope of impact	-1
Frequency of activity / duration of activity	-2
Frequency of impact	-5
Result	-49 Low

Mitigation measures:

- Safe disposal of dredged material;
- Soil analysis has been done during this study and should be done after completion of the project;
- All solid waste generated during the course of site preparation and construction should be properly collected and stored in a designated area to facilitate sorting, if required at that stage, before being disposed of at designated and approved NEMA disposal sites.
- Re-use and recycle waste as much as possible-sell the obsolete/damaged machines as scrap metal to licensed dealers;
- Ensure proper budgeting of construction materials to reduce on waste produced;
- Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste;
- Use of construction materials containing recycled content when possible and in accordance with accepted standards;
- Liquid waste should not be allowed to flow into natural drainage channels or be disposed of in any waterway;

- Provide ‘low flush toilets’ at the residential campsite as well as the construction areas;
- With guidance from NEMA and County Agriculture and Environment Departments, the dredged material and silt can be used as manure for farming activities.

7. 2.3.14 Extraction and Use of Building Materials/open pits/quarries

Building materials such as hard core, ballast, cement, rough stone and sand required for the construction of the proposed Gogo hydropower project will be obtained from nearby quarries and hardware stores. Sand harvesters extract sand from rivers and land. Small quantities of these materials will be required for construction of the buildings, the availability and sustainability of such resources at the extraction sites will be negatively affected as they are not renewable in the short term. In addition, the sites from which the materials will be extracted may be significantly affected in several ways including landscape changes, displacement of animals and vegetation, poor visual quality and opening of depressions on the surface leading to human and animal health impacts.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-2
Scope of impact	-3
Frequency of activity / duration of activity	-2
Frequency of impact	-5
Result	-49 Low

Mitigation measures:

- The contractor will source building materials such as sand, ballast and hardcore from registered quarry and sand mining firms whose projects have undergone satisfactory environmental impact assessment/audit and received NEMA approval;
- Ensure accurate budgeting of construction materials to avoid wastage;
- Re-use and recycle building materials. This will reduce the amount of raw materials extracted from natural resources as well as reduce impacts at the extraction site.

7. 2.3.15 Noise pollution

The construction works of the proposed Gogo hydropower plant is most likely to be a noisy operation due to the moving construction machines and vehicles. Also, the construction workers who will be working in the site will generate some noise as they are communicating to one another. This will be a potential source of disturbance at the site and surrounding neighbourhood of the proposed Gogo hydropower project.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-2
Scope of impact	-3
Frequency of activity / duration of activity	-2
Frequency of impact	-4
Result	-42 Low

Mitigation measures:

- Compliance with the Noise and Vibration Regulations of 2009 is expected at all the phases of the project.
- Limit vehicles to a minimum idling time and observe a common-sense approach to vehicle use, and encourage drivers to switch off vehicle engines whenever possible.
- Use quiet equipment (i.e. equipment designed with noise control elements).
- No construction work at night.
- Equip workers with standard noise attenuation equipments such as ear muffs;
- Inform neighbouring community of any abnormal sound and response measures.

7. 2.3.16 Generation of Exhaust Emissions

Exhaust emissions are likely to be generated by the construction equipment during the construction phase of proposed Gogo Hydropower plant. Motor vehicles that will be used to ferry construction materials would cause air quality impact by emitting pollutants through exhaust emissions. The impacts will not be significant.

Impact analysis

Impact without Mitigation	
Severity of impact	-3
Duration of impact	-2
Scope of impact	-3
Frequency of activity / duration of activity	-2
Frequency of impact	-4
Result	48 Low

Mitigation measures:

- Proper planning of transportation of materials to be used during construction of the project to ensure that vehicle load fills are increased in order to reduce the number of trips done or the number of vehicles on the road.
- Ensure proper servicing and maintenance of equipment
- Minimize vehicle idling time

- Reduce speed of vehicle on site and on road linked to the site.
- Provision of PPE's such as masks which must be worn.

7.2.3.17 Dust Emissions

Particulate matter pollution is likely to occur during the site clearance, excavation and spreading of the topsoil during construction of proposed project and during transportation of materials due to increased traffic.

Impact analysis

Impact without Mitigation	
Severity of impact	-3
Duration of impact	-2
Scope of impact	-3
Frequency of activity / duration of activity	-2
Frequency of impact	-5
Result	-56 low- medium

Mitigation measures:

- Access paths should be sprinkled with water to reduce traffic generated dust.
- Sprinkle the construction area with water to keep dust levels down.
- Train workers prior to construction on methods of minimizing air quality impacts during construction.
- Provide dust masks to all personnel in areas prone to dust emissions throughout the period of construction.
- Maintain all machinery and equipment in good working order to ensure minimum emissions suspended particulate matter.

7.2.3.18 Disposal of Excavated Soil

Excavation is likely to take place during construction of the power house at the proposed Gogo hydropower project, the excavation works to level the site will result in the generation of small amounts of excavated material.

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-2
Scope of impact	-2

Frequency of activity / duration of activity	-2
Frequency of impact	-4
Result	-30 low

Mitigation measures

- The excavated soil will be re-used in landscaping the site;
- Storage of excavated material away from the river banks.

7.2.3.19 Increased water demand

During the construction phase of the proposed Gogo hydropower plant, both the construction workers and the construction works will create additional demand for water. Water will be mostly used in the mixing of concrete for civil construction works and for wetting surfaces or cleaning completed structures. It will also be used in the washrooms at the construction site and also during the running period of the project.

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-2
Scope of impact	-2
Frequency of activity / duration of activity	-2
Frequency of impact	-5
Result	-35 low

Mitigation measures:

- Sensitizing workers of the importance of using water efficiently
- Re-use water where necessary
- Harvest rain water

7.2.3.20 Hazardous material storage

Hazardous materials such as chemicals and petroleum products would be required during the construction phase (Nitrogen rich chemicals such as Ammonium nitrate fuel oil are used in blasting quarries). Spills and leaks from hazardous materials could result in contamination of soil and the terrestrial and aquatic environments, resulting in loss of vegetation or wildlife.

Impact analysis

Impact without Mitigation	
Severity of impact	-4
Duration of impact	-2
Scope of impact	-1

Frequency of activity / duration of activity	-2
Frequency of impact	-4
Result	-42 Low

Mitigation measures:

- All hazardous material should be appropriately separated and stored in designated areas with proper signages, with appropriate demarcation and entry restrictions;
- Transportation of any hazardous waste material should be done by NEMA approved service providers;
- Disposal of the materials should be done by NEMA approved personnel in NEMA designated areas.

7.2.3.21 Equipment maintenance

Maintenance of equipment including heavy machinery and vehicles, will be required during the site preparation and construction phase. Equipment maintenance would require the use of lubricants, oils, hydraulic fluids and other petroleum products.

Impact analysis

Impact without Mitigation	
Severity of impact	-3
Duration of impact	-2
Scope of impact	-1
Frequency of activity / duration of activity	-2
Frequency of impact	-5
Result	-42 Low

Mitigation measures:

- Best practices should be employed in the siting of maintenance yards far away from the riverbank.
- Proper collection of lubricants, oils, hydraulic fluids and other petroleum products should be carried out and these materials stored in properly labeled containers.
- Oil containers should be stored in a designated area before removal for disposal at a designated NEMA approved site.
- Any contaminated soils should be remediated

7.2.3.22 Pests, vermins and disease Vectors

The potential exists for breeding of mosquitoes, rats and snails within the reservoir resulting in increased incidence of Malaria and Bilharzia

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-4
Scope of impact	-3
Frequency of activity / duration of activity	-4
Frequency of impact	-4
Result	-72 Low to medium

Mitigation measures:

- Clearing of overgrown vegetation;
- Draining of stagnant water;
- Filling in pits and holes to avoid collection of stagnant water;
- Implementation of proper solid waste storage.

7. 2.3.23 Occupational health and safety

During construction of the proposed Gogo hydropower plant, it is expected that construction workers especially unskilled temporary employees are likely to have accidental injuries as a result of exposure to workplace hazards. Because of these intensive engineering and construction activities including erection of steel structures, welding, metal grinding and cutting and concrete work among others, construction workers will be exposed to risks of accidents and injuries. Injuries can result from trips & falls and other physical and mechanical hazards.

Impact analysis

Impact without Mitigation	
Severity of impact	-4
Duration of impact	-2
Scope of impact	-1
Frequency of activity	-2
Frequency of impact	-4
Result	-42 Low

Mitigation measures:

- Adhere to the provisions of the Occupational Safety and Health Act, 2007 and its subsidiary legislation.
- Develop and implement an emergency document plan
- Train workers on occupational health and safety
- Provision of personal protective equipment

7.2.3.24 Community Health and Safety

Community health and safety will be important in the project site. Potential negative impacts are related to the generation of solid waste, generation of liquid waste, accident and/or injury, exposure to hazardous materials and activities, increase in occurrence of pests and vectors, and increased levels of fugitive dust and noise.

During construction it is anticipated that there will be heavy vehicular movement in the area and along the feeder roads. There is risk of motor vehicle traffic accidents along the routes; and air pollution from burning fuel and noise pollution.

Influx of people during the peak of construction, through increased population migration into the area in search of employment and business opportunities is likely. This influx poses the potential risk of spread of diseases like HIV /AIDs, Covid 19 amongst others. Additionally, those visiting the area for the first time and coming from geographical areas without malaria, will be exposed to the risk of malaria infection.

Impact analysis

Impact without Mitigation	
Severity of impact	-4
Duration of impact	-2
Scope of impact	-3
Frequency of activity / duration of activity	-4
Frequency of impact	-5
Result	81 medium high

Mitigation measures:

- Sensitisation of the community on communicable diseases that will increase as a result of the influx of people in the project area
- Equip workers with appropriate PPEs including dust masks, ear muffs, construction boots and safety vests.
- Have a well-stocked /equipped first aid box on site
- Site shall be fenced and security services provided on site
- Construction of pit latrine for workers
- Erection of warning signs shall be in place to warn public to avoid construction site
- Adherence to standard operational procedures and emergency procedures
- Project vehicles to observe speed limits
- Safety slogans should be strategically posted as a reminder to employees

7.2.3.25 Energy Consumption

The proposed project will consume fossil fuels (mainly diesel) to run transport vehicles and construction machinery. Fossil energy is non-renewable and its excessive use may have serious environmental implications on its availability, price and sustainability.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-2
Scope of impact	-1
Frequency of activity / duration of activity	-2
Frequency of impact	-4
Result	-30 Low

Mitigation measures:

- Proper planning of transportation materials. This will ensure that fossil fuels(diesel, petrol) are not consumed in excessive amounts
- Switch off electrical appliances when not in use
- Sensitize workers on efficient use of energy
- Monitor energy use

7.2.3.26 Vehicular Movements

During construction, movement of trucks carrying heavy construction equipment, excavated materials for disposal, construction materials and heavy plant equipment, will cause several impacts including, road blockage, slow traffic, noise and dust.

Impact analysis

Impact without Mitigation	
Severity of impact	-3
Duration of impact	-2
Scope of impact	-3
Frequency of activity / duration of activity	-4
Frequency of impact	-4
Result	- 64 Low - medium

Mitigation measures:

- Limit movement of heavy plant to off-peak hours between 10:00 am and 4:00 pm.
- Night delivery will not be allowed to prevent noise pollution to the neighboring residents.
- Drivers to reduce speed of vehicle on the road
- Use construction and warning signs to warn the public on the traffic
- Only needed vehicles will be mobilized to the site

- Erection of speed bumps in built up areas

7.2.3.27 Fire Outbreaks

Due to various construction activities at the proposed Gogo hydropower plant project, fire outbreaks can occur. Handling of inflammable products increases fire risks.

Impact analysis

Impact without Mitigation	
Severity of impact	-4
Duration of impact	-4
Scope of impact	-1
Frequency of activity / duration of activity	-4
Frequency of impact	-2
Result	-54 low- medium

Mitigation measures:

- Train workers on fire safety
- Install fire-fighting equipment on site
- Develop and implement an emergency response plan.

7.3 OPERATION PHASE

7.3.1 Negative Socio-economic Impacts during Operation Phase.

7.4.1.1 Water resource conflicts

Other water uses exist downstream of the project area and when water flow is controlled for power generation particularly during the dry seasons, there may emanate conflicts.

Impact without Mitigation	
Severity of impact	-3
Duration of impact	-4
Scope of impact	-4
Frequency of activity / duration of activity	-4
Frequency of impact	-3
Result	- 77 medium to high

Mitigation

- Sensitisation and consultations of the stakeholders
- KenGen and interested stakeholders with guidance from WRA should hold discussion on water supply and use dynamics. The project design has incorporated the minimum environmental flow requirement.

7.3.1.2 Loss of employment and income

Some of the community members employed at the Gogo hydro power plant will lose their jobs at the end of the construction phase. The loss of jobs will lead to loss of income and result to social stress.

Impact without Mitigation	
Severity of impact	-3
Duration of impact	-1
Scope of impact	-3
Frequency of activity / duration of activity	-2
Frequency of impact	-4
Result	-56 Low to Medium

Mitigation measures/Recommendations:

- Notify the employees in advance on the project closure date and compensate them as per the terms of the contract;
- Termination procedures to be compliant with Employment Act, 2007;
- Provide counselling to those who may be affected by the termination before releasing them;

7.3.1.3 Conflicts arising from employment opportunities

Casual and semi-skilled opportunities will reduce during the operation period and the locals unless well sensitised may have a sense of entitlement and build resentment towards non local skilled workers.

Impact without Mitigation	
Severity of impact	-4
Duration of impact	-2
Scope of impact	-3
Frequency of activity / duration of activity	-4
Frequency of impact	-4
Result	- 72 Low to medium

Mitigation measures

- Community sensitisation and engagement
- Use of local leadership in recruitment drives when opportunities arise to ensure transparency

7.3.1.4 Community health and safety

The dam may act as a breeding ground for vectors such as mosquitoes that cause Malaria and snails that cause Bilharzia.

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-4
Scope of impact	-4

Frequency of activity / duration of activity	-4
Frequency of impact	-4
Result	- 64 Low - medium

Mitigation measures

To control Bilharzia, the following should be observed:

- Community sensitisation and awareness creation on bilharzia
- Avoid swimming or wading in dam
- Boil or treat drinking water
- Boil bathing water for 1 minute to kill any cercariae

To control Malaria, the following should be observed:

- Sleeping under a mosquito net
- Use of insect repellents

7.3.1.5 Risk of Drowning and death

Once the dam is rehabilitated, the depth will increase and the risk of drowning will increase because the dam will become attractive to those who want to swim or fish in it. The community members may want to draw water from the dam.

Impact without Mitigation	
Severity of impact	-5
Duration of impact	-4
Scope of impact	-3
Frequency of activity / duration of activity	-4
Frequency of impact	-4
Result	- 96 – medium to high

Mitigation

- Community sensitisation on the dangers of swimming and fishing in the dam
- Fencing off the dam
- Provision of a community water point outside the dam area

7.4.1 Negative Environmental Impacts during Operation Phase

The following are the negative environmental impacts that are associated with the proposed Gogo hydropower plant project during the operation phase.

7.4.1.1 Waste Generation

The proposed Project is expected to generate some amounts of wastes during its operation phase. The bulk of the solid waste generated during the operation of the project will consist of drums, used oil,

paper, plastic, glass, metal, electricity cable wastes. Some of these waste materials especially the plastic/polythene are not biodegradable hence may cause long-term injurious effects to the environment.

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-4
Scope of impact	-1
Frequency of activity / duration of activity	-4
Frequency of impact	-2
Result	-36 Low

Mitigation measures:

- Provide waste handling facilities such as labeled waste bins and skips for temporarily holding solid waste generated at the site and ensure that the waste is disposed off regularly and appropriately.
- Segregation of waste before disposal
- Reuse of waste material where possible
- Train workers on effective waste management
- Put in place an integrated solid waste management system and give priority to reduction at source of the materials

7.4.1.2 Fuel Oil Consumption

Vehicles and emergency generators used in the proposed project shall consume diesel . Since fuel oil is produced mainly through non-renewable resources, this will have negative impacts on these non-renewable resources base and their sustainability.

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-4
Scope of impact	-1
Frequency of activity / duration of activity	-4
Frequency of impact	-2
Result	-36 Low

Mitigation measures

- Servicing of vehicles and machines to improve their efficiency thus reducing fuel consumption;
- Switching off the generator when not in use.

7.4.1.3 Water Pollution

This reduces significantly with the installation of new machines since oil spills will be minimised. However, if the sites for dumping solid wastes are not well taken care of, they may cause contamination of ground water sources and during rains, the pollutants flow into the river.

Impact analysis

Impact without Mitigation	
Severity of impact	-4
Duration of impact	-4
Scope of impact	-4
Frequency of activity / duration of activity	-4
Frequency of impact	-2
Result	-72 Low to Medium

Mitigation measure:

- Compliance with water quality regulation
- No solid matter or other pollutant shall be discharged in to open drainage to the river
- Oil containing waste shall be collected and disposed appropriately
- Transportation of hazardous waste will be done in accordance with the requirement provided by the EMCA1999
- There is need therefore for KenGen to put in place an efficient waste management scheme that will prevent the accumulation of uncontrolled waste, as well as an efficient collection system and off-site disposal.

7.4.1.5 Noise and vibration

Noise pollution from the operation of the generators from the proposed power project is inevitable. To mitigate the noise, the generator sets will be housed in buildings with solid walls. In addition, noise insulation material will be used in walls and roofs of all buildings with noise sources. Therefore, the noise levels will be limited. However, periodic noise audits will be made during the project operation phase. Workers in noisy areas will be provided with appropriate PPEs eg ear muffs.

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-4
Scope of impact	-1
Frequency of activity / duration of activity	-4

Frequency of impact	-2
Result	-36 Low

Mitigation measure:

- Comply with noise regulations
- Installation of generator engines in suitable structures with inbuilt sound and vibration absorption mechanisms.
- Establish inspection program for equipment to ensure they generate no noise during their use
- Regularly conduct noise assessment and keep records
- Inform neighbouring community on abnormal noise for them to be prepared
- Ear protection to those working in noisy areas

7.4.1.6 Oil Spills Hazards

Potential oil spills and accidents during oil transportation, storage and operations of the generators of the proposed power plant project may occur. In the case of oil spill the relatively lighter, more volatile, mobile, and water soluble compounds in diesel will tend to evaporate fairly quickly into the atmosphere or migrate to groundwater. When exposed to oxygen and sunlight, most of these compounds will tend to break down relatively quickly. Accidental oil spills can occur due to leakage from the storage tanks or site oil pipelines. Poor maintenance of machines can also lead to oil spills. A small amount of used oil may drip from spent oil filters.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-4
Scope of impact	-1
Frequency of activity / duration of activity	-4
Frequency of impact	-2
Result	-42 Low

Mitigation measures:

- Fuel storage tanks should have secondary containment bunds
- Develop and implement a spill management plan to be used as a guide in case of a spillage
- Ensure frequent inspection and maintenance of the facilities to minimize chances of spillages
- Engage a reputable company to handle used/waste oil and oil filters

7.4.1.7 Pollution from Vehicular Movements

There will be minimum regular traffic during operation phase. Delivery trucks could however cause noise pollution from the neighboring communities.

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-4
Scope of impact	-3
Frequency of activity / duration of activity	-4
Frequency of impact	-3
Result	-56 Low to Medium

Mitigation measures:

- Adhere to EMCA 1999 guidelines on noise regulation
- Delivery of fuel by heavy trucks will be limited to day time hours to prevent noise pollution and nuisance to the neighboring residencies.

7.4.1.8 Downstream Hydrological impacts

Potential downstream impacts are likely to arise as a result of changes in normal water flow, changes in water intensities with extreme rainfall conditions, extreme flooding in case there is dam failure and changes in sedimentation immediately below the dam.

Impact analysis

Impact without Mitigation	
Severity of impact	-3
Duration of impact	-4
Scope of impact	-3
Frequency of activity / duration of activity	-4
Frequency of impact	-2
Result	-60 Low to Medium

Mitigation measures:

- An emergency preparedness plan should be developed and shared with the community members. The plan should be regularly reviewed and upgraded with full stakeholder participation.
- Alerts and warning signals from departments such as the meteorological departments should be communicated to the community
- Improved watershed management to reduce incidences of uncontrolled agricultural practices to ensure that there is no increase in sediment and agricultural chemical run-off to the Kuja river.
- Regular flushing and inspection of the reservoir bed.

7.4.1.9 Increased sedimentation

Erosion upstream and periodic flushing of the reservoir may result in the release of sediments.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-4
Scope of impact	-3
Frequency of activity / duration of activity	-4
Frequency of impact	-2
Result	-54 Low

Mitigation

- Conservation of upstream catchment of River Kuja to reduce soil erosion;
- Conservation and rehabilitation of river banks;
- Practising conservation agricultural practices such as terracing.
- Observation of wetland regulations especially conservation of riparian and buffer areas.

7.4.1.10 Dam failure

Dam failure is a relatively rare occurrence but has been known to occur as a result of extreme seismic activity and other catastrophic events. On occasion dam failure may also be caused by inadequate maintenance over several years.

Total dam failure would result in the sudden and immediate release of the entire reservoir of water along with the broken dam structure and any rocks and debris held within the reservoir. The main impact of dam failure is downstream flooding, destruction to crops and property and possible loss of life.

Impact analysis

Impact without Mitigation	
Severity of impact	-5
Duration of impact	-1
Scope of impact	-3
Frequency of activity / duration of activity	-2
Frequency of impact	-2
Result	-36 Low

Mitigation measures:

- Adequate design taking into consideration all the probable catastrophic events;
- Appropriate inspection and maintenance;

- Early warning of potentially damaging events can considerably reduce the likelihood of dam failure;
- Carry out a routine preventative maintenance to ensure that deterioration is immediately observed and where possible repaired.
- Prepare an Emergency response plan and educate the surrounding community

7.4.1.11 Air pollution

Transportational activities have the potential to generate dust. This mainly happens if the transportation vehicle is not covered hence the tailing particles are carried away by wind hence air pollution. Vehicles moving on dusty roads also generate dust. Emergency diesel generators also produce emissions.

Impact analysis

Impact without Mitigation	
Severity of impact	-2
Duration of impact	-4
Scope of impact	-3
Frequency of activity / duration of activity	-4
Frequency of impact	-2
Result	-54 Low- medium

Mitigation measures:

- Ensure timely and frequent service and maintenance of the generators. This will improve combustion of fuel which will make the generators more efficient and reduce emissions.
- Ensure fuel oil used in the generators has low sulphur content to help minimize Sulphur dioxide emissions
- No burning of waste in the site
- Introduce vegetation on bare grounds along the fence to act as windbreakers and air cleaners

7.4.1.12 Risk of Fire

Improper fitting of electricity line and cables, storage of flammable/explosive products; processing chemicals and mechanical failure of the standby generator are potential sources of fire outbreak. Fire outbreak may destroy properties, can cause injuries like burns to human or can lead to death of persons within the plant.

Impact analysis

Impact without Mitigation	
Severity of impact	-5

Duration of impact	-1
Scope of impact	-2
Frequency of activity / duration of activity	-2
Frequency of impact	-2
Result	-24 Very low

Mitigation measures:

- Ensure firefighting equipment of high standards are placed in key strategic points all over the project site.
- Install fire pumps, hydrants, sprinklers/water spray systems, hose houses, dry chemical systems etc at the site
- A dedicated water storage tank for hose reel to be in place
- Emergency /fire exit doors shall be put in place
- Develop and implement a fire evacuation plan. This should be displayed in various parts of the project site
- Exit signs to be installed above all external doors and passages. All doors must be opening outward
- Availability of emergency contact
- Designate fire assembly point
- Train workers on fire safety
- Regularly conduct fire drills

7.4.1.13 Workers Health and safety

Attention must be focused on health of employees, and the general sanitation of the neighbourhood in order to attain a level of health condition that permits them to lead a healthy, socially and economically productive life. Operations of the plant may pose health and safety risks to the employees and the surrounding community. These may arise from lack of use of protective gears/gadgets, fall into tanks, dust, noise, accidents from machinery and equipment.

Impact analysis

Impact without Mitigation	
Severity of impact	-4
Duration of impact	-4
Scope of impact	-1
Frequency of activity / duration of activity	-4
Frequency of impact	-2
Result	-54 Low to medium

Mitigation measures:

- Provide adequate and appropriate PPEs including ear muffs, safety footwear, overalls, gloves, dust masks, among others for the workers

- Conduct training on the use of PPEs, handling of chemical products and acid storage cells, electric safety equipment, procedures for entering enclosed areas, fire protection and prevention, disaster response and evacuation procedures.
- Post safety signs where necessary
- Machines and equipment to be operated by qualified personnel only
- Firefighting equipment should be provided and strategically placed
- Provision of a fully stocked first aid box and employment of a person trained on its application
- Strict adherence to factory and other places of work Act and all occupational health and safety rules and regulation
- Sensitize staff on social/health issues such as drugs and HIV/AIDS
- Occupational Health and Safety regulations should be adhered to

7.4.1.14 Increased energy demand

During operation, the facility will require energy mainly for lighting and running electrical appliances.

Impact analysis

Impact without Mitigation	
Severity of impact	-1
Duration of impact	-4
Scope of impact	-1
Frequency of activity / duration of activity	-4
Frequency of impact	-4
Result	-48 Low

Mitigation measures:

- Use of energy saving bulbs
- Switching off the unnecessary lights
- Servicing the generator and other energy consuming/utilizing equipment's regularly

7.5 DECOMMISSIONING

Decommissioning refers to the formal process of removing something from the operational status once the project cycle is complete or if it is in a dilapidated state or has operated at a gross loss over a long period of time. The Gogo hydropower plant redevelopment project can be decommissioned when the design period ends or due to one of the following reasons:

- The water source may become inadequate due to unexpected change in climate rendering the project inefficient
- Dilapidation of infrastructure overtime

Under these circumstances, KenGen as the proponent will demolish all the structures remove the salvage materials and restore the sections affected to the original state.

These activities would present similar impacts to those during construction, but of less magnitude. On decommissioning of the project, the powerhouse facilities, equipment stores, equipment and machinery, and worker camps will need to be safely and securely removed and the areas stabilized to minimize risks of release to the environment of toxic or polluting materials.

7.5.1 Positive Impacts during Decommissioning Phase

The following positive impacts are associated with the proposed Gogo hydropower redevelopment project during the decommissioning phase:

7.5.1.1 Site Rehabilitation

Upon decommissioning of the proposed Gogo hydropower plant, rehabilitation of the project site should be carried out to restore the site to its original status or to a better state than it was originally. This will include replacement of topsoil and re-vegetation which will lead to restoration of the visual quality of the area.

Impact Analysis

Impact without Mitigation	
Severity of impact	+3
Spatial scope of impact	+2
Duration of impact	+2
Frequency of activity / duration of activity	+1
Frequency of impact	+2
Result	+21 Low to medium

7.5.1.2 Recyclable materials

The resultant waste should be sorted into re-recyclables and non-recyclables before disposal at the designated site in accordance to NEMA regulations on solid waste. The recyclables, e.g. generators, and plastic materials could be reused in new projects or sold to recyclers.

Impact Analysis

Impact without Mitigation	
Severity of impact	+2
Spatial scope of impact	+1
Duration of impact	+1
Frequency of activity / duration of activity	+1
Frequency of impact	+2
Result	+12 Very low

7.5.1.3 Employment Opportunities

For demolition to take place properly and in good time, several people will be involved. As a result several employment opportunities will be created for the demolition staff during the demolition phase of the proposed project.

Impact Analysis

Impact without Mitigation	
Severity of impact	+1
Spatial scope of impact	+1
Duration of impact	+1
Frequency of activity / duration of activity	+1
Frequency of impact	+2
Result	+9 Very low

7.5.2 Negative Impacts during Decommissioning Phase

The following are the negative impacts that are likely to be associated with the proposed redevelopment of Gogo hydropower plant during its decommissioning phase.

7.5.2.1 Noise and Vibration

The demolition works will lead to significant deterioration of the acoustic environment within the project site and the surrounding areas. This will be as a result of the noise and vibration that will be experienced as a result of demolishing the proposed project.

Impact Analysis

Impact without Mitigation	
Severity of impact	-3
Spatial scope of impact	-2
Duration of impact	-2
Frequency of activity / duration of activity	-2
Frequency of impact	-4
Result	-42 Low

Mitigation measure:

- Limit vehicles and other small equipment with engines to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible.
- Demolish mainly during the day, a time with minimal noise disturbance

7.5.2.2 Solid Waste Generation

Demolition of the proposed Gogo hydropower plant other related infrastructure will result in generation of solid waste. The waste will contain the materials used in construction including concrete, metal, drywall, wood, glass, paints, adhesives, sealants and fasteners. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment.

Impact without Mitigation	
Severity of impact	-2
Spatial scope of impact	-1
Duration of impact	-2
Frequency of activity / duration of activity	-2
Frequency of impact	-3
Result	-25 Very Low

Mitigation measure:

- Use of durable, long-lasting materials that are recyclable thereby reducing the amount of demolition waste generated during decommissioning phase
- Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements
- Adequate collection and storage of waste on site and safe transportation to the disposal sites and disposal methods at designated area shall be provided.

7.5.2.3 Dust

Some dust will be generated during demolition works of the proposed Gogo hydropower plant. This will affect demolition staff as well as the neighbouring community.

Impact without Mitigation	
Severity of impact	-2
Spatial scope of impact	-1
Duration of impact	-2
Frequency of activity / duration of activity	-2
Frequency of impact	-3
Result	-25 Very Low

Mitigation measure:

- Watering all active demolition areas as and when necessary to lay dust.
- Cover all trucks hauling soil, sand and other loose materials
- Provide the staff working on site with personal protective equipments

7.5.2.4 Loss of employment and income

Individuals employed at the Gogo hydro power plant will lose their jobs when the hydro power plant is decommissioned. The loss of jobs will lead to loss of income and result to social stress.

Impact without Mitigation	
Severity of impact	-4
Duration of impact	-1
Scope of impact	-5
Frequency of activity / duration of activity	-5
Frequency of impact	-5
Result	-100 Medium to High

Mitigation measures/Recommendations:

- Notify the employees in advance on the decommissioning process compensation done as per the employees terms of contract, Human resource policy and within provisions of the law;
- Termination procedures to be compliant with Employment Act, 2007;
- Provide counselling & alternative skills training.

7.5.2.5 Traffic Impacts

During decommissioning movement of trucks carrying heavy demolition equipment, demolished materials for disposal, and heavy plant, will cause several adverse impacts including, road blockage, slow traffic, noise and dust.

Impact without Mitigation	
Severity of impact	-2
Spatial scope of impact	-3
Duration of impact	-2
Frequency of activity / duration of activity	-2
Frequency of impact	-2
Result	-28 Low

Mitigation

- Signages to guide and control traffic;
- Speed bumps to control speed
- Driver training
- Community sensitisation of the increase in traffic.

8. CHAPTER EIGHT ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social Management Plan (ESMP) for development projects provides a logical framework within which identified negative environmental impacts can be mitigated and monitored. In addition the ESMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring can be done. ESMP is a vital output of an Environmental Impact Assessment as it provides a checklist for project monitoring and evaluation. The ESMP covers all aspects of planning, construction, operation and decommissioning of the project, which are relevant to environment. It is essential to implement the ESMP right from the planning stage and then continuing it throughout the construction, operation stage and decommissioning stage. Therefore the main objective of the ESMP is to identify the project specific activities that would have to be considered for investigation of the significant adverse impacts and the mitigation measures required.

8.1 Environmental and Social Management Plan

8.1.1 Environmental and Social Management Plan during Construction Phase

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
Clearance of vegetation	<ul style="list-style-type: none"> Employ best practices during construction and rehabilitate the site at the end of the construction site. 	KenGen EPC Contractor	Observation of the ground vegetation cover	Periodic checks	100,000 one time off

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
	<ul style="list-style-type: none"> Ensure proper demarcation of the project area to be affected by the construction works. Maintain the construction activities within the footprint of the development. 				
Human Wildlife Conflicts	<ul style="list-style-type: none"> Awareness creation and sensitisation KenGen should consult Kenya Wildlife Service in managing the wild animals KenGen to consider possibility of providing a water tap for the community outside the dam area. The dam should not exceed its current size Consideration for fencing off and securing the dam to limit access by 	KenGen EPC Contractor	Register of participants in awareness and sensitisation meetings Dam design before and after rehabilitation Size of the fence erected in the dam area	Quartely	60,000 for quartely monitoring (KWS 20,000; KenGen 20,000; Contractor; 10,000; Community 10,000). The rest of the costs

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
	<p>community members and livestock for water.</p> <ul style="list-style-type: none"> Riparian land conservation to protect the wild animals' habitat. 				should be factored in the BQ
Hydrological impacts	<ul style="list-style-type: none"> Utilize sound construction measures Diversion channel should serve to prevent upstream accumulation of water during construction. Use silt screens/silt curtains at the diversion channel to trap sediments. 	Engineering, Procurement and Construction (EPC) Contractor KenGen	Routine Activities	Periodic checks	In the Bill of Quantities
Oil spills	<ul style="list-style-type: none"> Maintain the machinery in specific areas designed for this purpose Having an oil spill management plan 	EPC Contractor KenGen	Routine Activities	Periodic checks	100,000 Quarterly

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
Spoil from dredging	<ul style="list-style-type: none"> • Safe disposal of dredged material; • Use of dredged material as manure • Soil analysis after dredging and after construction; • All solid waste generated during the course of site preparation and construction should be properly collected and stored in a designated area to facilitate sorting, if required at that stage, before being disposed of at designated and approved NEMA disposal sites 	EPC Contractor KenGen	Soil analysis reports	Random soil analysis	500,000 for soil analysis and monitoring. The cost disposal of the spoil should be as per the BQ
Increased sedimentation	<ul style="list-style-type: none"> • Use of sediment curtains • Riverbank/bed excavation should be limited to the dry season as far as possible. 	EPC Contractor KenGen	Observation	Periodic checks	50,000 Monitoring costs. The other charges are as in the BQ

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
Soil erosion and run-off	<ul style="list-style-type: none"> • Terracing and leveling the project site • Harvesting surface and roof water • Re-vegetate exposed areas around the site 	EPC Contractor KenGen	Observations Size of Land revegetated or Number of trees planted	Monthly	As per the BQ
Waste generation	<ul style="list-style-type: none"> • Prepare a Waste Management and pollution control plan • Proper waste collection and segregation • Re-use and recycle waste as much as possible. • Use of construction materials containing recycled content when possible and in accordance with accepted standards. 	KenGen EPC Contractor	Routine Activities	Periodic and surprise checks	100,000 per per quarter (KenGen 20,000; Public health officer 10,000; NEMA inspector 15,000; Licenced waste

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
					collector 55,000)
Inadequate human waste disposal by workers during construction process	<ul style="list-style-type: none"> As provided for by the Building Code, a temporary latrine will be provided on site to be used by construction workers 	EPC Contractor KenGen	Periodic Activities	Periodic checks	50,000 one time 30,000 for monitoring purposes
Extraction and Use of Building Materials	<ul style="list-style-type: none"> Sourcing raw materials from registered quarries and sand mining firms Ensure accurate budgeting of construction materials to avoid wastage Re-use and recycle building materials as much as possible 	EPC Contractor KenGen	Budget	Monthly	As per the BQ
Noise pollution	<ul style="list-style-type: none"> Compliance with Noise and Vibration Regulations of 2009 	EPC Contractor KenGen	Routine Activities	Periodic and surprise	40 000 per month for

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
	<ul style="list-style-type: none"> • Use of PPEs • Limit vehicles to a minimum idling time • Use equipment designed with noise control elements • Equip workers with standard noise attenuation features • Inform neighbouring communities of any abnormal sound and response measures • No construction work at night 			checks /Inspection	monitoring over the construction period. Other charges as in the BQ
Generation of Exhaust Emissions	<ul style="list-style-type: none"> • Proper planning of transportation of materials • Proper servicing and maintenance of equipment • -Minimize vehicle idling time 	EPC Contractor KenGen's	Routine inspection Observation		20,000 per month

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
Dust Emissions	<ul style="list-style-type: none"> Sprinkle the construction area with water to keep dust levels down. Train workers on how to minimize air quality impacts Provide dust masks to all personnel in areas prone to dust emissions 	EPC Contractor KenGen	Routine inspection	Periodic and surprise checks	200,000 per month
Pollution from hazardous waste	<ul style="list-style-type: none"> Appropriate separation and storage of hazardous materials Developing and implementing a spill management plan 	EPC Contractor KenGen	Periodic inspection	Periodic and surprise checks	100 000 per quarter
Community Health and Safety	<ul style="list-style-type: none"> Provision of PPEs to workers Training workers on waste handling(including hazardous waste) Proper disposal of wastes Site shall be fenced and security services provided on site 	EPC Contractor KenGen	Routine inspection	Inspection	200,000 per quarter Fencing and latrine costs as in the BQ

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
	<ul style="list-style-type: none"> • Reduce employees` exposure to dust and noise at the workplace • Have a well stocked /equipped first aid box on site • Close supervision of work • Construction of pit latrine for workers • -Instruct the workers on safety and health issues before the work begins every morning • Construction of warning signs shall be in place to warn public to avoid construction site • Adherence to standard operational procedures and emergency procedures • Project vehicles to observe speed limits 				

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
	<ul style="list-style-type: none"> • Safety slogans should be strategically posted as a reminder to employees • Incidence and accident record shall be kept • Strict adherence to factory and other places of work Act and all occupational health and safety rules and regulation • Instruct all workers on safety health issues every day before work begins • Sensitize staff on social/health issues such as drugs and HIV/AIDS 				
Workers accidents and	<ul style="list-style-type: none"> • Adherence to the provisions of the Occupational Safety and Health 	EPC Contractor KenGen	Routine Activities	Periodic and surprise checks	100 000 per month

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
hazards during construction	<p>Act, 2007 and its subsidiary legislation.</p> <ul style="list-style-type: none"> Developing and implement an emergency response plan Training workers on occupational health and safety 				
Traffic Impacts	<ul style="list-style-type: none"> Limit movement of heavy plant to off-peak hours Adequate maintenance of the equipment to reduce emissions Drivers to reduce speed of vehicle on the road Use construction and warning signs to warn the public on the traffic Only needed vehicles will be mobilized to the site 	<p>EPC Contractor</p> <p>KenGen</p>	Routine inspection and maintenance	Periodic and surprise checks	100,000 per quarter of a year

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
Increase in Sexually Transmitted Diseases	<ul style="list-style-type: none"> Sensitization of local communities and staff working on the project on dangers of free lifestyle HIV/AIDS awareness 	EPC Contractor of KenGen	Voluntary periodic random screening Secondary data from health institutions	Quarterly	300,000 per quarter
Increased water demand	<ul style="list-style-type: none"> Ensure efficient use of water and reuse where necessary Construction workers shall be sensitized to avoid irresponsible water use Harvest rain water 	EPC Contractor KenGen	Routine inspection	Periodic checks	50,000 every four months for monitoring. Cost of tanks as in the BQ
Increased energy demand	<ul style="list-style-type: none"> Ensure responsible energy use by switching off energy consuming Equipment or appliances when they are not in use Planning of transportation schedule 	EPC Contractor KenGen	Routine inspection and maintenance	Periodic checks	As per the BQ

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
	<ul style="list-style-type: none"> Monitor energy use 				
Air pollution from dust and fumes	<ul style="list-style-type: none"> Every person working on the site must wear nose masks Introduce vegetation on bare grounds along the fence to act as windbreakers and air cleaner Regular maintenance of all equipment's on site to reduce emissions of noxious gases 	EPC Contractor KenGen	Inspection Routine maintenance	Quarterly	200,000

Environmental Management Plan during Operation Phase

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
Human Wildlife Conflicts	<ul style="list-style-type: none"> Awareness creation and sensitisation Liaise with Kenya Wildlife Service in managing the wild animals 	KenGen	Register of participants in awareness and	Quartely	100,000 for Quartely monitoring of wildlife and

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
	<ul style="list-style-type: none"> KenGen to consider possibility of providing a water tap for the community outside the dam area. Riparian land conservation to protect the wild animals' habitat. 		sensitisation meetings Dam design before and after rehabilitation Size of the fence erected in the dam area		any other time when need arises
Waste Generation	<ul style="list-style-type: none"> Provide waste handling facilities Train workers on effective waste management Put in place an integrated solid waste management system Segregation of waste before disposal Reuse of waste material where possible 	KenGen	Periodic Activities Routine inspection	Periodic and surprise checks	100,000 quartely as part of the operation and maintenance budget

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
Pollution from Hazardous waste	<ul style="list-style-type: none"> Handling of the materials using the material safety data provided by the manufacturers Appoint a safety officer to ensure that proper disposal guideline are observed Ensuring that maintenance and/or piece of work carried out on any piece of equipment or construction work is undertaken by qualified personnelIn case of spillage emergency spillage control measures to be instituted Containerization of any wastes and disposal through a licensed waste handler Adhere to Waste Management Regulations 	KenGen	Periodic inspection	Periodic and surprise checks	100,000 per quarter
Water Pollution	<ul style="list-style-type: none"> Formulation of an efficient waste management scheme ReReuse water where possible 	KenGen	Periodic Activities and audits	Quarterly	250,000

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
	<ul style="list-style-type: none"> • Compliance with water quality regulation • No solid matter or other pollutant shall be discharged in to open drainage to the river • Oil containing waste shall be collected and disposed appropriately • Transportation of chemical reagents will be done in accordance with the requirement provided by the EMCA1999 • Storage tanks to have containment bunds to avoid leakages 		Quality of water		
Noise Pollution	<ul style="list-style-type: none"> • Generators to be housed in buildings with solid walls • Installation of noise insulation materials to buildings with noise sources 	KenGen	Inspection Routine maintenance	Periodic checks	100.000 twice a year
Vibration	<ul style="list-style-type: none"> • Installation of generator engines in suitable structures with inbuilt sound and vibration absorption mechanisms. 	KenGen	Maintenance of the generators Routine	Periodic checks	300,000 twice a yearmonthly

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
			Inspection of noise levels		
Oil Spills Hazards	<ul style="list-style-type: none"> • Use of prevention and protection measures to reduce spillages • Provide appropriate protection on devices against accidental discharges • Diesel storage tanks should have secondary containment bunds • Develop and implement a spill management plan • Ensure frequent inspection and maintenance of the equipment • Engage a reputable company to handle used/waste oil and oil filters 	KenGen	Inspection and observation	Periodic checks	60,000 monthly
Hydrological impacts	<ul style="list-style-type: none"> • Develop and implement an emergency preparedness plan • Alerts and warning signals should be communicated to the community • Regular flushing and inspection of the reservoir bed 	KenGen	<ul style="list-style-type: none"> • Audits • Observations • Complaints from the community • /water departments 	Quarterly	50,000 per quarter

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
Collapsing of dam Wall/Dam failure	<ul style="list-style-type: none"> Carry out a routine preventative maintenance to ensure that deterioration is immediately observed and where possible repaired. Prepare an Emergency response plan and educate the surrounding community. 	KenGen	Periodic Activities	Monthly	50,000 annually for inspection
Air pollution	<ul style="list-style-type: none"> Timely and frequent service and maintenance of the generators Use of fuel oil with low sulphur contents No burning of waste in the site Annual source testing to ensure compliance Suppress dust within the project site Every person working on the site must wear nose masks Introduce vegetation on bare grounds along the fence to act as windbreakers and air cleaner 	KenGen	Periodic Activities	Periodic and surprise checks	20,000 per month for monitoring.

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
	<ul style="list-style-type: none"> Regular maintenance of all equipment on site to reduce emissions of noxious gases 				
Fire outbreak	<ul style="list-style-type: none"> Installation of fire fighting equipment Training workers on fire safety Conducting regular fire drills Emergency /fire exit doors shall be put in place A dedicated water storage tank for hose reel to be in place Exit signs to be installed above all external doors and passages Designate fire assembly point Installation of alarms, with switches at accessible locations for activation in case of fire emergencies Posting fire response manual where they are easily readable by everyone in the building 	KenGen	Inspection observation	Quartely	120,000 quarterly

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
	<ul style="list-style-type: none"> Availability of emergency contact 				
Community health and safety	<ul style="list-style-type: none"> Provision of adequate PPEs to workers Develop and implement an emergency response plan Safety signs posted on site-spec Operation of machines and equipment by qualified persons only Provide scaffolding to facilitate safe operations at high level Sensitize and train workers on nature of environment they are working in, occupational health and safety Firefighting equipment be provided and strategically placed Provision of a fully stock first aid box and a person trained on its application be employed/designated 	KenGen	Inspection and routine maintenance	Twice a year	300,000

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
	<ul style="list-style-type: none"> Incidence and accident record shall be kept Strict adherence to factory and other places of work Act and all occupational health and safety rules and regulation Instruct all workers on safety health issues every day before work begins Provide right tools, operations, instructions & manuals during work/operation phase Sensitize staff on social/health issues such as drugs and HIV/AIDS Medical examination of employees before, during and after their employment will be ensured Hygienic conditions at work will be maintained and enforced Working procedures be implemented to minimize near miss and incidence 				

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
	<ul style="list-style-type: none"> Water for consumption be provided for employees and it be located far from processing area to prevent its contamination 				
Traffic	<ul style="list-style-type: none"> Limit delivery to off-peak hours to reduce disruption of transport links, delays and congestion Provide warning lights and other signs to reduce risk of accidents along delivery roads and at the site Keep the earth access paths and roads damp to reduce dust Adequate maintenance of trucks to reduce emissions 	KenGen	Transport register/log-in	Periodic and surprise checks	-
Workers accidents	<ul style="list-style-type: none"> All workers will be sensitized and trained on occupational safety and health issues and on how to control accidents related to construction. 	KenGen	Routine Activities	Periodic checks and Accident audits	40 000 per quarter

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
	<ul style="list-style-type: none"> A comprehensive contingency plan on accident response will be prepared before the project commences. Accordingly, adherence to safety procedures will be enforced. 				
Increased demand in energy	<ul style="list-style-type: none"> Use of energy saving bulbs Switching off unnecessary light Servicing the generator and other energy consuming /utilizing equipment regularly Using alternative sources of energy especially renewable ones such as solar in lighting should be considered 	KenGen	Energy bills Observation	Periodic checks	100,000
HIV/AIDS	<ul style="list-style-type: none"> Sensitizing the community and workers on HIV/AIDS and /or other sexually transmitted diseases(STDs) Develop appropriate training and awareness materials for Information, 	KenGen			100,000 quarterly

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency of Monitoring	Estimated Cost (KShs)
	<p>Education and Communication (IEC) on HIV/AIDS</p> <ul style="list-style-type: none"> Identify other players (local CBOs, NGOs and government organizations) on HIV/AIDS for enhanced collaboration Have programmes that will distribute condoms to the workers and the community 				

Decommissioning

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Estimated Cost (KShs)
Noise and Vibration	<ul style="list-style-type: none"> Limit vehicles and other small equipment with engines to a minimum idling time Demolish mainly during the day, a time with minimal noise disturbance 	KenGen NEMA inspector Contractor	Kshs 10,000,000
Solid Waste Generation	<ul style="list-style-type: none"> Use of durable, long-lasting materials that will not need to be replaced as often Provision of facilities for proper handling and storage of demolition materials Adequate collection and storage of waste on site and safe transportation to the disposal sites 	KenGen NEMA inspectors Contractor	
Dust	<ul style="list-style-type: none"> Watering all active demolition areas as and when necessary to lay dust. Cover all trucks hauling soil, sand and other loose materials 	KenGen NEMA inspectors Contractor	

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Estimated Cost (KShs)
Traffic and Transport	<ul style="list-style-type: none"> Carry out deliveries of materials being removed from the decommissioned site during the day to avoid noise and disruption of sleep to the residents 	KenGen	
Workers accidents during demolition process	<ul style="list-style-type: none"> All workers will be sensitized before the exercise begins, on how to control accidents related to the demolition exercise A comprehensive contingency plan will be prepared before demolition begins, on accident response. Adherence to safety procedures will be enforced at all stages of the exercise All workers, pursuant to labour laws, shall be accordingly insured against accidents. All workers will be provided and instructed to wear protective attire during demolition, including helmets. 	KenGen Public Health Officer Ministry of Labour NEMA inspectors Contractor	

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Estimated Cost (KShs)
	<ul style="list-style-type: none"> Demolition work will be limited to daytime only avoid workers accidents due to poor visibility 		

9. CHAPTER NINE: CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSIONS

Kenya is currently experiencing electrical power shortage due to various factors including climate change, inadequate investment in the power sector and rapid economic growth. The proposed redevelopment of Gogo hydropower plant project may serve as one of the committed power generation projects that are expected to meet Kenya's short to medium term power needs.

The redevelopment of the hydropower plant aims to achieve a power output of above 7MW by utilizing the available river discharge along river Kuja and optimize the hydropower plant components.

This ESIA has analyzed potential environmental and social impacts of implementing the power plant during construction and operational phase based on both the requirement of the EMCA (1999) and those of the World Bank Operational Policy and Environmental and Social Frameworks. The study has demonstrated that with relatively easy and cost effective mitigation measures, the negative environmental and social impacts can be kept at acceptable levels. Therefore, it is concluded that with implementation of the mitigation measures developed in the ESMP, the project development will not pose any serious adverse and negative environmental impacts. Ultimately, it will be possible to successfully mitigate the impacts related to the development since the power plant will be designed, constructed and operated according to the latest international recognized standards.

In a nutshell the following was noted about the project:

- Project harmony and Support of Government Policies (Green Energy and Environment): The proposed project is in line with the government's big Four Agenda, Kenyan constitution 2010 and policies touching on green energy sources, employment creation, income generation and rural development. KenGen should ensure adherence to the environmental laws and regulations from the onset of the project.
- Compliance with the existing Legislation, Conventions, Treaties, Covenants and Standards: This project is not in contravention of any of the existing laws and standards. Further to this, KenGen will ensure that the relevant laws and standards are upheld throughout the project cycle.
- Project impacts Reversibility/Irreversibility: The project is likely to do more good than harm when well executed. The foreseen social and environmental impacts can be prevented or reversed by use of environmental conservation measures and the mitigation measures proposed in the project study report.

- Geographical Extent of the Impacts: The foreseen negative social and environmental impacts are subtle and on a local scale when compared with the positive impacts of the project which are national.
- Project sensitization and acceptability: After project sensitization, the local communities and their leadership have promised to support the project. The Gogo neighbouring communities accept the project and the local leaders and political leaders are looking forward to a speedy completion of the study so that the project can be licensed. The local people and the political and religious leaders are receptive to the project.
- Occupational health hazards during construction and project operational phase: This includes accidents and any injuries to human health. Such impacts in the unlikely event if they occur are significant and irreversible, and it is therefore critical that KenGen puts in place all the proposed mitigation measures on occupational health and safety during construction while during operation, the community members should be capacity built on occupational health and safety. The dam area should also be fenced to protect the people from accidents such as accidental falls and drowning.

9.2 RECOMMENDATIONS

Following the ESIA study, the recommendations made include;

- NEMA should license the project since it is ecologically, economically and socially sound;
- Project Designs should be approved by the relevant authorities before construction works commences and construction works should be in line with relevant regulations, policies and laws;
- Environmental audits should be undertaken and submitted to NEMA regularly once the project is operational to ensure compliance with
- Downstream ecology should be protected by ensuring the Kuja River flows are regulated throughout the operation period and continuous monitoring should be emphasised.
- Adherence to ESMP: In addressing the environmental issues, the contractor and KenGen must follow the mitigation guidelines provided under ESMP. This will ensure the safety of operators and the neighbouring communities.
- Watershed Management for the Kuja upstream areas should be prioritized focusing on agroforestry and riparian areas rehabilitation with indigenous species and sensitization of the local communities on the same.

Specifically, key negative impacts that require careful management during the plant construction and operation phases include:

- The risk to public safety and environmental quality (soil, air and water) due to dredging, oil spill or large scale incident caused by human error, equipment failure or damage.
- Impacts associated with noise and vibration generated by the power plant during operation. This may require a potential buffer zone around the power plant site if the noise levels generated exceed recognized Kenya occupational exposure limits or WHO guideline levels.
- Increased risk of disease with influx of immigrant workers

10. REFERENCES

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- Agriculture Act (Chapter 318 of the Laws of Kenya)
- Energy for development. The potential role of renewable energy in meeting the Millennium Development Goals. Christopher Flavin and Molly Hull Aeck, World Watch Institute
- Electric Power Act (Act No. 11 of 1997)
- Emissions Guidelines (in mg/Nm³) Environmental, Health, and Safety Guidelines for Thermal Power Plants (World Bank, 2008)
- Environmental Management and Coordination Act No. 8 of 1999.
- Kenya Vision 2030. A Globally Competitive and Prosperous Kenya. 2007
- Legal Notice No. 101: The Environmental (Impact Assessment and Audit) Regulations, 2003.)
- Occupational Health and Safety Act
- Physical Planning Act (Cap. 286)
- The Energy Act, 2006
- The Forests Act (Chapter 375 of the Laws of Kenya.)
- Land (Group Representatives) Act (Chapter 287 of the Laws of Kenya)
- The Public Health Act (Cap. 242)
- The Local Government Act (Cap. 265)
- The National Environmental Action Plan (NEAP)
- The National Shelter Strategy to the Year 2000
- The National Poverty Eradication Plan (NPEP)
- The Poverty Reduction Strategy Paper (PRSP)
- Kenya National Population and Housing Census, 2019.

11.APPENDICES

Appendix 1 Soil Analysis



T0209

KEPHIS ANALYTICAL CHEMISTRY LABORATORY

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E-mail: director@kephis.org • Website: www.kephis.org

Client name: Stantec Consultants

Date: 29th March, 2021

Address: -

Telephone: 0722 601 849

Email: -

REPORT OF ANALYSIS

The following is the report of the soil sample submitted to KEPHIS ACL laboratory on 23rd March, 2021 for fertility evaluation analysis.

Note:

- Test marked * Not SANAS Accredited.
- "Tests marked "Not SANAS Accredited" in this report are not included in the SANAS Schedule of Accreditation for this laboratory.
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- Correspondences regarding these results shall be channelled through KEPHIS Managing Director's office using the address provided above.
- This result refers *only* to the submitted sample.
- UV-Vis = UV-Vis Spectroscopy
- AAS = Atomic absorption spectrometry
- FES = Flame emission spectrometry
- M.e % = milliequivalents percent
- ND = Not detected
- To convert results of m.e % into mg/kg (SI Unit), we multiply by 10 x equivalent weight
- To convert results of ppm into mg/kg (SI Unit), we multiply by 1
- To convert results of % into g/kg (SI Unit), we multiply by 10

Ref: FQC/SOIL/REP/ Vol.11/158

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Laboratory number	QS2100044			
Client sample identification code	Sample 1 (intake point zone) 36-650177.9899601			
Sample type	SOIL			
Sample size	1Kg			
Sample description/ condition	DRY SOIL			
Parameter analysed	Results (units as per the first column)	Result in SI units	Method/ Technique Used	Date analysed
pH	6.16	6.16	MO315	23/03/2021
*Sodium (Na) m. e. %	1.38	317.40 mg/kg	FES	23/03/2021
*Potassium (K) m. e. %	3.34	1302.60 mg/kg	FES	23/03/2021
*Calcium (Ca) m. e. %	10.27	2054.00 mg/kg	AAS	23/03/2021
*Magnesium (Mg) m. e. %	2.98	357.60 mg/kg	UV-VIS	23/03/2021
*Manganese (Mn) m. e. %	2.65	715.50 mg/kg	UV-VIS	23/03/2021
*Phosphorus (P) ppm	33.03	33.03 mg/kg	UV-VIS	23/03/2021
*Nitrogen (N) %	0.19	1.90 g/kg	UV-VIS	23/03/2021
Carbon (C) %	0.99	9.90 g/kg	MO314	23/03/2021
*Copper (Cu) ppm	1.50	1.50 mg/kg	AAS	23/03/2021
*Iron (Fe) ppm	804.95	804.95 mg/kg	AAS	23/03/2021
*Zinc (Zn) ppm	9.86	9.86 mg/kg	AAS	23/03/2021

OPINIONS AND INTERPRETATIONS QS210044:

The soil reaction of this soil coded QS210044 is Slightly acidic. Exchangeable Sodium (Na), Magnesium (Mg) and Calcium (Ca) are all at adequate levels. Potassium (K) is at reactionary levels. Available Phosphorus (P) and Total Nitrogen (N) are adequate in this soil. Organic Carbon (C) content is low in this field. Micronutrients Copper (Cu) and Zinc (Zn) are adequately supplied; Iron (Fe) and Manganese (Mn) are at reactionary levels.

Recommendations for Maize, Sweet Potatoes and Tobacco production.

The pH of this soil is suitable for optimum production of the above-mentioned crops. At two weeks before transplanting, apply well decomposed farm yard manure or compost manure in this soil at the rate of 4 tonnes/acre/year and incorporate it well with topsoil in order to maintain organic matter content of the soil, enhance soil structure, water holding capacity, microbial diversity and ultimately boost its productive capacity.



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Date: 29th March, 2021

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REPORT OF ANALYSIS

The following is the report of the soil sample submitted to KEPHIS ACL laboratory on 23rd March, 2021 for fertility evaluation analysis.

Note:

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- To convert results of ppm into mg/kg (SI Unit), we multiply by 1
- To convert results of % into g/kg (SI Unit), we multiply by 10

Ref: FQC/SOIL/REP/ Vol.11/159

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Laboratory number	QS2100045			
Client sample identification code	Sample 2 (outflow zone) 36-650135.9899581			
Sample type	SOIL			
Sample size	1Kg			
Sample description/ condition	DRY SOIL			
Parameter analysed	Results (units as per the first column)	Result in SI units	Method/ Technique Used	Date analysed
pH	6.17	6.17	MO315	23/03/2021
*Sodium (Na) m. e. %	2.21	508.30 mg/kg	FES	23/03/2021
*Potassium (K) m. e. %	7.07	2757.30 mg/kg	FES	23/03/2021
*Calcium (Ca) m. e. %	67.12	13424.0 mg/kg	AAS	23/03/2021
*Magnesium (Mg) m. e. %	0.01	1.20 mg/kg	UV-VIS	23/03/2021
*Manganese (Mn) m. e. %	0.36	97.20 mg/kg	UV-VIS	23/03/2021
*Phosphorus (P) ppm	156.14	156.14 mg/kg	UV-VIS	23/03/2021
*Nitrogen (N) %	0.65	6.50 g/kg	UV-VIS	23/03/2021
Carbon (C) %	3.80	38.00 g/kg	MO314	23/03/2021
*Copper (Cu) ppm	ND	ND	AAS	23/03/2021
*Iron (Fe) ppm	36.62	36.62 mg/kg	AAS	23/03/2021
*Zinc (Zn) ppm	22.07	22.07 mg/kg	AAS	23/03/2021

OPINIONS AND INTERPRETATIONS QS2100045:

The soil reaction of this soil coded QS2100045 is Slightly acidic. Exchangeable Sodium (Na) is at adequate levels . Potassium (K) and Calcium (Ca) are at reactionary levels while Magnesium (Mg) is deficient in this soil. Available Phosphorus (P) is at reactionary levels and Total Nitrogen (N) is adequate in this soil. Organic Carbon (C) content is adequate in this field. Micronutrients Iron(Fe) and Zinc (Zn) are at reactionary levels while Manganese(Mn) is adequately supplied and Copper (Cu) is below machine detectable levels

Recommendations for Maize,SweetPotatoes and Tobacco production.

The pH of this soil is suitable for optimum production of the above-mentioned crops. At two weeks before transplanting, apply well decomposed farm yard manure or compost manure in this soil at the rate of 1 tonnes/acre/year and incorporate it well with topsoil in order to maintain organic matter content of the soil, enhance soil structure, water holding capacity, microbial diversity and ultimately boost its productive capacity.

During transplanting avoid use of any phosphatic fertiliser till available phosphorus drops to around 80 mg/kg. At an appropriate vegetative stage, preferably three to four weeks after transplanting, top dress the crops using CAN at the rate of 2 bags of 50kgs fertilizer per acre, applied in split. At the same time, apply foliar fertilizer with copper as recommended by the manufacturer. Subsequent application of foliar or granular N.P.K fertilizer will depend with the condition of the crop or done at the onset of flowering. Ensure that the soil is well drained, adequately moist and keep the crops free from pests and diseases.

Analyst:



Stephen Ahenda
Analytical Chemist

Technical Signatory



Wachira Githenya
Senior Analytical Chemist

Authorised Signatory:



Peter Kamuti
For: Laboratory Manager



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REPORT OF ANALYSIS

The following is the analytical report for the soil samples submitted to KEPHIS Analytical Chemistry Laboratory on, 23rd March 2021 for analysis.

Note:

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- This result refers only to the submitted sample.
- The results below were analysed using ICP-MS (Inductively Coupled Plasma-Mass Spectrometer)
- Hg- Mercury
- Cr- Chromium
- Cd- Cadmium
- Pb- Lead
- mg/Kg =parts per million (ppm)

Ref: ACL/CONT/VOL.5/021

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Lab Code	Client Code	Sample Type	Cr (mg/kg)	Cd (mg/kg)	Hg (mg/kg)	Pb (mg/kg)
CA210135	Sample 1 (intake point zone) 36.650177 9899601	Soil	29.52	0.16	0.40	10.53
CA210136	Sample 2 (outrow zone) 36.650135 9899581	Soil	29.88	0.32	0.27	13.06
CA210137	Sample 3 (outrow zone) 36.650066 9899120	Soil	22.05	0.49	0.24	12.01
CA210138	Sample 4 (intake zone side) 36.650106 9899634	Soil	28.32	0.32	0.27	15.87
CA210139	Sample 5 (intake side) 36.649990 9899586	Soil	18.86	0.52	0.12	7.48
CA210140	Sample 6 (intake side) 36.649936 9899586	Soil	18.63	0.77	0.10	6.39
CA210141	Sample 7 (near world vision point) 36.649949 9899347	Soil	41.18	0.85	0.06	18.18
CA210142	Sample 8 (fallow land) 36.649944 9899125	Soil	52.33	1.67	0.07	15.89
CA210143	Sample 9 (gauging station) 36.649793 9898887	Soil	32.03	0.22	0.04	9.78
CA210144	Sample 10 (fallow land) 36.649517 9898700	Soil	57.66	2.63	0.02	12.85

Analyst:



Alex Njugi
Analytical Chemist

Technical Signatory








Paul Njuguna
Lab Technologist






Authorised Signatory:








Peter Kamuti
FOR: Laboratory Manager


Appendix 2 Water Analysis

 Lab Works East Africa LTD P.O.Box 6459-00100 Shelter Afrique Centre, 3rd Floor Wing 3A Uppercill Nairobi Kenya Phone: +2540202724481 Fax: technical@labworksea.com		Client : Earthview Geo Consultants Phone : 0721 868653 Email: earthview@geologist.com Town: Nairobi Country: Kenya	
LABORATORY TEST REPORT			
Date Received : 10/06/2021 Date Started : 11/06/2021 Date Completed : 16/06/2021 External Sample ID : Bellatrix-1 Wellsite (Upper part)		Batch No : 21/0087 Sample Ref: LW1104 Sampled By: Client Report Date: 18/06/2021	
PARAMETER	METHOD	RESULTS %	Standard Limits
CHEMICAL ANALYSIS			
Silica as SiO ₂	XRF	78.50	X ₂
Aluminium as Al ₂ O ₃	XRF	6.51	X ₂
Calcium as CaO	XRF	6.29	X ₂
Potassium as K ₂ O	XRF	3.35	X ₂
Iron as Fe ₂ O ₃	XRF	2.40	X ₂
Sulfur as SO ₃	XRF	1.22	X ₂
Phosphorus as P ₂ O ₅	XRF	0.65	X ₂
Titanium as TiO	XRF	0.58	X ₂
Magnesium as MgO	XRF	2.30	X ₂
Manganese as MnO	XRF	0.06	X ₂
Sodium as Na ₂ O	XRF	1.21	X ₂
Loss on ignition (LOI)	XRF	5.00	X ₂
Sum of conc.		107.87	
METHOD No Standard values quoted for this sample type. XRF- X-ray fluorescence spectrometer X ₂ - No standard limits provided ISO - International Organization for Standardization APHA- American Public Health Association ASTM- American standard test methods AOAC- Association of Official Analytical Chemists LWTP and LWTM - Lab Works Procedure adopted from ISO and APHA Methods Results provided in this test report apply to the sample as received by the laboratory.			
INTERPRETATION OF ANALYSIS RESULTS			
The soil sample has contamination of bentonite elements of 107.87%			
Authorized signatory:  Jacob Kipkoeh	Technical signatory:  Beatrice Wanjiru	Technical signatory:  David Muriuri	
Page 1 of 1			

 Lab Works East Africa LTD P.O.Box 6439-00100 Shauri Moyo Centre, 3rd Floor Wing 3A Upperhill Nairobi Kenya Phone: +2540202724481 Fax: technical@labworksa.com		Client : Eastview Geo Consultants Phone : 0725 868653 Email: eastview@geologist.com Town: Nairobi Country: Kenya	
LABORATORY TEST REPORT			
Date Received : 10/06/2021 Date Started : 11/06/2021 Date Completed : 16/06/2021 External Sample ID : Bellatrix-1 Wellsite (Down slope)		Batch No : 21/0087 Sample Ref: LW1105 Sampled By: Client Report Date: 18/06/2021	
PARAMETER	METHOD	RESULTS %	Standard (Max Limits)
CHEMICAL ANALYSIS			
Silica as SiO ₂	XRF	79.90	X ₂
Aluminium as Al ₂ O ₃	XRF	10.83	X ₃
Calcium as CaO	XRF	2.93	X ₃
Potassium as K ₂ O	XRF	2.34	X ₃
Iron as Fe ₂ O ₃	XRF	1.11	X ₃
Sulfur as S	XRF	0.06	X ₃
Phosphorus as P	XRF	0.22	X ₃
Titanium as TiO	XRF	0.25	X ₃
Magnesium as MgO	XRF	2.37	X ₃
Manganese as MnO	XRF	0.04	X ₃
Sodium as Na ₂ O	XRF	1.12	X ₃
Loss on ignition (LOI)	XRF	5.21	X ₃
Sum of conc.		106.38	
<p>METHOD No Standard values quoted for this sample type. XRF- X-ray fluorescence spectrometer X₃- No standard limits provided ISO - International Organization for Standardization APHA- American Public Health Association ASTM- American standard test methods AOAC- Association of Official Analytical Chemists LWTP and LWTM - Lab Works Procedure adopted from ISO and APHA Methods Results provided in this test report apply to the sample as received by the laboratory.</p>			
INTERPRETATION OF ANALYSIS RESULTS			
The soil sample has contamination of bentonite elements of 106.38%.			
Authorized signatory:  Jacob Kipkoech	Technical signatory:  Beatrice Wanjiru	Technical signatory:  David Muriuri	
Page 1 of 1			

 Lab Works East Africa LTD P.O.Box 6459-00100 Shelter Afrique Centre, 3rd Floor Wing 3A Upperhill Nairobi Kenya Phone: +2540202724481 Fax: technical@labworksea.com		Client : Earthview Geo Consultants Phone : 0725 868613 Email : earthview@geologist.com Town: Nairobi Country: Kenya	
LABORATORY TEST REPORT			
Date Received : 10/06/2021 Date Started : 11/06/2021 Date Completed : 16/06/2021 External Sample ID : Bellatrix-1 Wellsite (Bentonite Heap)		Batch No : 21/0087 Sample Ref: LW1106 Sampled By: Client Report Date: 18/06/2021	
PARAMETER	METHOD	RESULTS %	Standard (Max Limits)
CHEMICAL ANALYSIS			
Silica as SiO ₂	XRF	50.98	X ²
Aluminium as Al ₂ O ₃	XRF	5.52	X ²
Calcium as CaO	XRF	10.18	X ²
Potassium as K ₂ O	XRF	1.69	X ²
Iron as Fe ₂ O ₃	XRF	1.81	X ²
Sulfur as S	XRF	9.90	X ²
Phosphorus as P	XRF	0.22	X ₂
Titanium as TiO	XRF	8.31	X ₂
Barium as Ba	XRF	13.00	X ₂
Magnesium as MgO	XRF	2.15	X ²
Manganese as MnO	XRF	0.04	X ²
Sodium as Na ₂ O	XRF	0.98	X ₂
Loss on ignition (LOI)	XRF	4.98	X ₂
Sum of conc.		109.76	
METHOD No Standard values quoted for this sample type. XRF- X-ray fluorescence spectrometer X ² - No standard limits provided ISO - International Organization for Standardization APHA- American Public Health Association ASTM- American standard test methods AOAC- Association of Official Analytical Chemists LWTP and LWTM - Lab Works Procedure adopted from ISO and APHA Methods Results provided in this test report apply to the sample as received by the laboratory.			
INTERPRETATION OF ANALYSIS RESULTS			
The soil sample has contamination of bentonite elements of 109.76%			
Authorized signatory:  Jacob Kipkoech	Technical signatory:  Beatrice Wanjiru	Technical signatory:  David Muiruri	
Page 1 of 1			



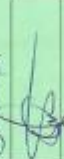

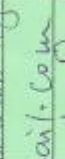



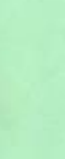

Appendix 3 Sensitisation Meetings Attendance Sheets


KenGen
 Kenya Electricity Generating Company Limited

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register.

Date	17-03-2021				
Time	12 NOON				
Location	MIGORI				
Target Group/Individual	GOVERNOR'S OFFICE / RESIDENCE				

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	DR. ADI Z. DROTH	MIGORI COUNTY GOVERNMENT	GOVERNOR	0722469587	dradi@droth.com	
2	BASSIL OPELO		PROVOCAL	918674976	bassilonggo@gmail.com	
3	JARED ANTHONY	NICG	CLERK OF STAFF	0721458751		
4	SAMUEL OMBE	MIGORI COUNTY GOVERNMENT	COO - FINANCE	078263466		
5	DR. JUDITH M.	MIGORI	Economic Adv.	0710884000	judithm@igori.org	
6	Dr Rebecca Kamanyi	Stantec Consultant	Environmental Impact Consultant	0723601849	rebecca@stantec.com	
7	Daniel Ogoi	Stantec	Social Expert	0724476756	ogoi.daniel@gmail.com	
8	Duncan Saida	KenGen	Env. Officer	0720471992	ksaida@ken-gen.co.ke	
9	Thomson Kamanya	KenGen	Engineer	0722610288	thomson@ken-gen.co.ke	
10	Floralis Mwangi	KenGen	Chief Env. Officer	0705116019	floralis@ken-gen.co.ke	
11						
12						

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	17.03.2021 (7/3/21)
Time	2 PM
Location	AGENGA CHIEFS CAMP
Target Group/Individual	Kouka Kaja Irrigation Water Users Association



MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	DANISON D. DREMO	WUA LK.	CHAIRMAN	0724445443	Dremonso@guviy.com	
2	CHARLES O. EKOTH	WUA LK.	ASST CHIEF	07289834161	charles@guviy.com	
3	KENTA A. ITTO	WUA LK.	CHIEF	07289834161	kenita@guviy.com	
4	JOSHUA GUMA	WUA LK.	COMMITTEE MEMBER	0727093930	joshua@guviy.com	
5	JOHN O. ELAKU WUA	WUA LK.	COMMITTEE MEMBER	0713779262	john@guviy.com	
6	JOEL OPIO WUA	WUA LK.	COMMITTEE MEMBER	0744344434	joel@guviy.com	
7	JOSEPH O. AIGU WUA	WUA LK.	MEMBER	0710726671	joseph@guviy.com	
8	JOHNS AIGU WUA	WUA LK.	MEMBER	0710726671	johns@guviy.com	
9	MATTHEW AIGU WUA	WUA LK.	MEMBER	0716730629	matthew@guviy.com	
10	ELIZABETH ADHAMB L WUA	WUA LK.	Village elder	0716081175	elizabeth@guviy.com	
11	SYMON AUBIN WUA	WUA LK.	Secretary	0724445442	symon@guviy.com	

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register



Date	17/3/21
Time	2PM
Location	Agunga Chiefs Camp
Target Group/Individual	Lower Kujia Irrigation Water Users Association

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Benda Mwangi	Sante	Research Assistant	0721-49314	benadkingi@gmail.com	[Signature]
2	David Ogoi	Stentec	Soil expert	0722476786	ogoidavid@gmail.com	[Signature]
3	Rebecca Kanyaga	Stentec	Environmental expert	073266844	rebeccakanyaga@gmail.com	[Signature]
4	Jurcan Kilele	KenGen	Env. Officer	0732476922	jurcan.kilele@kenya.go.ke	[Signature]
5	Florent Mwangi	KenGen	Env. Officer	0705116019	fmwangi@kenya.go.ke	[Signature]
6	Muach Kanyaga	KenGen	Senior Engineer	0732668785	muachkanyaga@gmail.com	[Signature]
7						
8						
9						
10						
11						

PLWD

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	19.03.2021
Time	1006hrs
Location	NGFA Church Gogo
Target Group/Individual	ACQUG Living with HIV/AIDS.

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	BENTER ATIENO	GOGO	ELDER	-		
2	MARY KUMA	GOGO	YOUTH			
3	JANET AMINTI	GOGO	YOUTH			
4	JOHN OTULO	GOGO	ELDER			
5	KIRI MARGIC	MUDIRA	YOUTH	070570987		
6	Daniel Odhiambo	MUDIRA	YOUTH	0703693040		
7	Daniel Omondi	GOGO	YOUTH	0795956931		
8	RUSAN OMONOI	GOGO	YOUTH	079073702		
9	JOHN OCHENGA	MUDIRA	ELDER			
10	PETER ONYANGO	MUDIRA	YOUTH	0714243912		
11	PEINILA OBIRA	KIWRID	ELDER	0706071512		

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PLND

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	19.03.2021
Time	1000hrs
Location	PfA CHURCH GOGO
Target Group/Individual	PEOPLE LIVING WITH DIABETES.

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	PHEBE KUMA	GOGO	ELDER	0789716622		
2	CHARLES KASERA	NYAKUNE	ELDER	0704622463		
3	JOHN SON DDI	KANJODERA	ELDER	0710854406		
4	JAOK OMONDI	GOGO	ELDER	---		
5	MAURICE OROTH	GOGO	ELDER	0717059624		
6	DANIEL OGOL	STAN/KE	Social Gender	0722476756	ogol@stan/ke	
7						
8						
9						
10						
11						

Community Meeting



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Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	19.03.2021
Time	0900 HRS.
Location	PEFA OFFICE - GOGO
Target Group/Individual	COMMUNITY MEETING.

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	WILKISTIA ATIENO	THIDHIA	0712005195	YOUTH		
2	SLEPININA ADRIANUS KANTODERA		07145140368	ELDER		
3	LEONIDA ADKO	NYAKUNE	0706498779	ELDER		
4	FRANCO DKOTH	NYAKUNE	0729091077	ELDER		
5	GRACE ATIENO	GOGO	0701502979	YOUTH		
6	JANE ATIENO	THIDHIA	0727662935	YOUTH		
7	NAOMI AKINTI	GOGO	0714373952	YOUTH		
8	ENDERLINE AUHOR	GOGO	075712384	YOUTH		
9	JANE AUMH	THIDHIA	—	ELDER		
10	JANE ATIENO	GOT OGENGGO	0701531077	YOUTH		
11	JANE ADKO	GOT OGENGGO	0715388898	YOUTH		

12. DANIEL OGO STANTEC SOCIETY KENGEN 0722476126 ogodan@gmail.com

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Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	19.03.2021		
Time	0900Hrs		
Location	Ngata Gogo Church		
Target Group/Individual	Community Meeting		

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	MILICENT AUMA	GOGO	ELDER	0711794547		
2	CAROLINE AUMIN	GOGO	YOUTH	0791362630		
3	LINET ATENO	GOT OGENDO	YOUTH	0728558234		
4	MAUREEN AUMUA	GOT OGENDO	YOUTH	0745854288		
5	EVERLINE OTENO	GOGO	YOUTH	07401126387		
6	CAREN ADUAMBO	MIDIDA	ELDER	07944974608		
7	MOLINE ANTANGO	MIDIDA	ELDER	0724208498		
8	ELSA ABOTO	GOGO	ELDER	0744073652		
9	BEATRICE ANTANGO	GOGO	YOUTH	0720220822		
10	FLORENCE ANTANGO	ORANGA	YOUTH	079104191		
11	MELLEN ASKO	GOGO	ELDER	07943940046		

12 Joseph Kamaya
Kenken
Engineer
0722618265

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	19.03.2021
Time	0900 HRS
Location	NGTA GOGO CHUCCU
Target Group/Individual	COMMUNITY MEETING

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	GEORGE NYUMBURH	GOT AGENDO	YOUTH	0724389729		ea
2	JOHN OCHEN'G	MIDIDA	ELDER	BT		
3	JOHN OTULO	GOT AGENDO	ELDER	0714171161		
4	BARACK OKOTH	KANYUDERX	ELDER	071674536		
5	PHOEBE KAMISA	COTO	ELDER	0729716622		
6	MACE LUMAN	LILLO	ELDER	0722364725		
7	MICHAEL OGODA	OYUNUA	ELDER	0725212668		
8	WILSON OLLIAMB	GOOGO	YOUTH	0718629757		
9	MARTIN OUMA	GOOGO	YOUTH	0716227810		
10	CATHERINE NYACHANA		ELDER	0706967094		
11	MASIANA OLVOCH	GOOGO	ELDER	—		
	Floral Mwangi	KenGen	Eng. in off	075116019		



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Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register	
Date	19.03.2021
Time	0700 hrs
Location	REGA GOGO CHURCH
Target Group/Individual	COMMUNITY MEETING

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	GWITE ANTANGO	NTAKUNE	YOUTH	0745765166		
2	QUINTERA AUMA	GOGO	YOUTH	0714872408		
3	SUSAN ATIENO	KANTODERA	YOUTH	0715036555		
4	LYNDEE ACHIENYI	KANTODERA	YOUTH	0701212800		
5	MOLINE ATENO	NTAKWAMBA	ELDER	07032412050		
6	BEATRICE AKINTI	NTAKWAMBA	ELDER	—		
7	PETER ODHIMBO	GOT OGONGO	ELDER	0723371611		
8	SILAS OMTANGO	GOT OGONGO	YOUTH	—		
9	KEN NMAEI	NTAKWAMBA	ELDER	0700570989		
10	VIOLET ACHIENYI	KIWIRI	YOUTH	0706627512		
11	TOHA OTENO	KANTODERA	ELDER	0729216489		

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Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register	
Date	14.03.2021
Time	0900 hrs
Location	RETA CHUOCHI GOGO
Target Group/Individual	COMMUNITY MEETING

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Fredrick Othman	Midiola	Youth	0768049152		
2	Gabriel Omondi	Ligo	Youth	0720625637		
3	Francis Ocheng'	Get Ogeng'o	Youth	0797925355		
4	Markine Oching	Mihida A	Youth	0708751427	odwumino@gmail	
5	Richard Opiyo	Kungedora	Elder	0702485428		
6	Charles Odingi	Nyakune	Elder	0704682403		
7	Charles Ndege	Gogo	Elder	0706828599		
8	Seketa Sam Oduka	Gogo	Elder	0704227112	jungundakunda	
9	Fredrick Onyango	Get Ogeng'o	Youth	0751971059		
10	Ismael Owigo	Kiwiro	Elder	0700583149		
11	OPHAMBIS GEMPAET	AMIDIBA	Youth	0703412050		

12. ELISHA OIKI KANYOBERA ELDER 0125698993
Duncan David Ken Gen EMB 0722076922

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	19.03.2021
Time	0900HRS
Location	Neta Gogo CHURCH
Target Group/Individual	COMMUNITY MEETING

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	DAVID DUMPA	GOT DENGGO	ELDER	0712917290		
2	EVELINE JOHN	THIDHA	YOUTH	0742287360		
3	BEATRICE AUMPA	THIDHA	YOUTH			
4	GORDON NTAAPALA	GOGO	ELDER	0701061422		
5	BENTER ATLEND	GOGO	ELDER	—		
6	ANDERLUIS OPIYO	DHENGGA	ELDER	072245813		
7	JOHNSON ODIN	KANTODERA	ELDER	0710854406		
8	NICHOLAS OGINY	KANTODERA	YOUTH	0745875372		
9	DON CARO DLOO	KANTODERA	ELDER	0722595118		
10	MURICE DLOTH	GOGO	ELDER	0796946103		
11	ALV. JEDGGE DMLD	NTAKUNE	ELDER	0701020540		
12	KADHA GOT	KANTODERA	ELDER	070673708		



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Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register	
Date	19.03.2021
Time	0900hrs
Location	Ngata Gogo Character
Target Group/Individual	Community Meeting

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	HELENA ADHIAMBO	GOGO	ELDER	071 - - -		HEC
2	BEATRICE AKINYI	KIMIRO	YOUTH	0700149033		B.C
3	SUSAN AKINYI	GOGO	ELDER	0728362492		SUS
4	NELSON MANDELA	GOGO	YOUTH	0759762946		N
5	STEVEN OWIND	GOGO	ELDER	- - -		STEVEN
6	PETER OKINYI	MIBIDA	YOUTH	0735051576		Peter
7	JANET AKINYI	GOGO	YOUTH	0799103249		JANET
8	PAMELA AKINYI	GOGO	ELDER	0702136434		PAMELA
9	EVERLINE ACHIENG	GOGO	YOUTH	0740835259		EVERLINE
10	ALEX ODHIAMBO	MIBIDA	YOUTH	0791907077		ALEX
11	KENNEDY NYUGA	GOGO	YOUTH	0700806332		KENNEDY

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Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	19.03.2021
Time	0900Hrs
Location	Ata Gogo CHDCC
Target Group/Individual	COMMUNITY MEETING

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Omondi Peter	Gogo	Elder	0711329485		
2	Jack Omondi	Gogo	Elder	0768168936		
3	Ogweni O'Keta	Midida	Elder	0768815999		
4	John Odhiambo	Nyakume	Elder	0713249837		
5	John Otiemo	Gogo	Elder	0728363492		
6	Jacob Omondi	Gogo	Elder	0715882279		
7	George Ouma	Gogo	Youth	0112406824		
8	George Odhiambo	Nyakume	Youth	0790018622		
9	David Ouma	Gogo C	Youth	0758026407		
10	Paul Odhiambo	Gogo C	Youth	0759712679		
11	Piotr Oryongo	Midida	Youth	0714283712		

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	19.03.2021
Time	0900hrs
Location	Refa Gogo
Target Group/Individual	Community Meeting

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	DANIS OTULO	GOGO	ELDER	0715266898		
2	ALICE ANYANGO	GOGO	YOUTH	0758587660		
3	ERIC OMUNDI	MIDIDA	YOUTH	0703693040		
4	JAMES OBOYO	MUSA	YOUTH	0701305620		
5	PETERSON OBILO	GOGO	YOUTH	0719625596		
6	JANEI ANYANGO	GOGO	YOUTH			
7	MARION ALDOCH	GOGO	YOUTH			
8	Champion Kendo	Gogo	YOUTH	0727439098		
9	SUSAN ACHIENG	GOGO	ELDER	0725420832		
10	MARY AUMA	GOGO	YOUTH	0705677668		
11	CHARLES OJUNGU	GOGO	ELDER			
12	LINET AUMA	GOGO	ELDER			



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Generating Company Ltd.

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register



Date	15.03.2021
Time	1400 HRS
Location	KS117077 CHIEF'S OFFICE, MIDIDA.
Target Group/Individual	ECDEAS

MEETING ATTENDEES

VILLAGE

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Omondi Peter	ECDEAS		0711329435		
2	Nick Omondi	Gogo		0759711385		
3	Johnson Odum	Kanyodera		0710854406		
4	Charles Okinyi	Myakune		0704622403		
5	John Odhiambo	Myakune		0713249837		
6	John Otieno Ndege	Gogo		0728363492		
7	Elisha Orik	Kanyodera		0725693993		
8	Gordon Nyapala	Gogo		0701061422		
9	Rv. George O. Omondi	Myakune	Church and state	0701217540		
10	ISMAEL Ochieng Antonio			0700583149		
11	Floral Mwangangi Kaulen	ECDEAS				

12. Frank Kanyaga Perben
Tegoror 0722616285

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	15.03.2021
Time	1430 hrs
Location	ASSISTANT CHIEF OFFICE KIDADA.
Target Group/Individual	12074 RDBs VILLAGE

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Theresa Linda	KenGen		0722476372		
2	JOSHUA OTIENO	GO-OGENDO		0726028934		
3	JARED OJIECH	KIVURI				J O
4	KOI OPARA	GOGO				K O
5	DUNCAN ORO	KANJOBEKA	Electricity	0722595118		
6	DAVID OUMA	GO OGENGO	V. CLERK	0712917290		
7	JOHN WENDI	GO OGENGO		0709199058		
8	Nathaly Odongo	Kanyoke		0716523266		
9	Bonface Ombao	Myakune		0758936589		
10	Isaac Oluo	Kivuri		0706298785		
11	Burack Orol	Kanyoke		0716174555		
12	DANIEL OGOL	STANTEC	MANAGER	0722476376		
13	CHARLES O OMBIA	ASSISTANT		0711541546		

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register



Date	15.03.2021
Time	8.30 AM -
Location	TWIN BATTLE HOTEL MIGORI
Target Group/Individual	Members of COUNTY ASSEMBLY

MEETING ATTENDEES



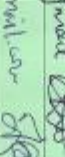




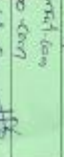

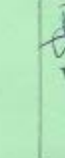


No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Peter O. Mungu	McA	McA	0721428748	pmungu@gmail.com	
2	Duncan Xacda	KenGen	Env Officer	0722476332	dxcinda@ken-gen.com	
3	Frank Kariya	KenGen	Math Eng.	072618235	Frankcar@ken-gen.com	
4	Flora Mwangi	KenGen	Chief Engineer	0705116019	fmwangi@ken-gen.com	
5	Daniel Ogoi	Stantec	Soil Expert	0722476756	ogoi@stantec.com	
6	Rebecca Karanga	Stantec	Environment expert	0722601849	rebecca.karanga@stantec.com	
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Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

KenGen
Energy Efficiency
Generating Corporation

Date	17.03.2021
Time	9am -
Location	Migori
Target Group/Individual	Various business Stakeholders

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	LAZARUS ABILA	MIGORI COUNTY GOVERNMENT	WARD ADMINISTRATOR	0720280126	etuaabila@gmail.com	
2	Valentia Oguya	Migori County	LCM	07211460526	ndoguya@gmail.com	
3	EMILY BADA	M.O.E	P.E.O	0723061634	emylbad43@gmail.com	
4	DIASI JAMES	NEMA	County Director - Migori	0720328873	diel.james@gmail.com	
5	KENNEDY D. ABONICO	MIGORI COUNTY GOVERNMENT	SUB-COUNTY ADMIN	0710839507	kenadongobeg@gmail.com	
6	RODOLPH MUSA	NATIONAL RURAL SCHEME AUTHORITY - MIGORI	EXECUTIVE DIRECTOR	0728500439	bmisa@nrsa.go.ke	
7	MILAN OJUNGI	Migori County	SECT	0726357519	allanmure@gmail.com	
8	RUTH MURONGA	Reserve Migori County	CFO	0714930874	muhonja@gmail.com	
9	Stanley Muboma	Migori County	Forest Officer	0721408196	stanleymuboma@gmail.com	
10	GABRIEL OJIYI	Migori County	SFA	07233702999	gabrielojiyi@gmail.com	
11	JAMES OJUNGI	KFS	Forest Officer	0718196940	oerogijun@gmail.com	
12	DIK TEREK KFS	FORESTER	SENIOR FORESTER	0722951958	diereksi@gmail.com	

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	18.03.2024
Time	1000hrs →
Location	DOC OFFICE VAKA & WEST COAST'S OFFICE NDIIDA
Target Group/Individual	MINISTRY OF INTERIOR & COORDINATION OF NATIONAL GOVT.

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	MONICA ENDIGNE	INLCOOL	DOC	0722464718	undecygnur	
2	TOHIN E. OJUAADIS	INLCOOL	SUB CHIEF	0723696251	toernuuegmatu	
3	CATHARINE O. OJUNDO	NICATO	CHIEF	011541316	clutawia	
4	JUNKEN DUKA	KenGen	Asst. Asst.	0722476992	dsudbe27long.6he	
5	Flora Kenyangi	KenGen	Senior Engineer	0722618285	flamuyagat	
6	Flora Mwangi	KenGen	Chief Engg	0705116019	fmwangi@kenya.co.ke	
7	Daniel O Ogoi	Stewie c	Service Engineer	0722476756	ogadano@gmail.com	
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KenGen
KENYA ELECTRICITY
Generating Company Ltd.



Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	17 th March 2021	
Time	9AM - 10AM	10:30 - 12PM
Location	Migori	
Target Group/Individual	MWASCO, MoH [Ministry of Health]	


MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Juaret Athmanwa	MWASCO	AS MD	0722254734	juaretm@kenya-electricity.co.ke	
2	Duncan Amuda	Dep't of Health	CPHO	0728692893	duncanamuda@gmail.com	
3	Brenda Akinyi	State	Research Asst.	07214931149	brendakinyi@gmail.com	
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Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	17.03.2021
Time	9 am
Location	Migori
Target Group/Individual	County Department of Lands / Kenya Power

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Dennis O. Oiro	Migori Land Office	Director	0726281233	Doroioiro@gmail.com	
2	George Wambane KPLIC	County Lands Manager	County Lands Manager	0726313809	gwambane@kplc.co.ke	
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Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date 16.03.2024

Time 2 PM

Location Akaslauf

Target Group/Individual Waaen PGD Chiefs Office, Kidiya

KenGen

MEETING ATTENDEES						
No.	Names	Organization	Position/Role	Telephone/Mobile	Email	Signature
1	Susan Akinyi Otiene	Egyo	Farmer	0722363492		SUS
2	Phoebe Akinyi Otiene	Egyo	Farmer	075197113		X
3	Esther Akinyi Otiene	Egyo	Farmer	0794104191		E
4	Sharon Mwangi	Egyo	Farmer	0795768213		Sharon
5	Teresa Otiene	Egyo	Farmer	0700230922		T
6	Caren Akinyi	Kangadara	Farmer	0794134901		C
7	Lucy Akinyi	Thakha	Farmer	0722228591		L
8	Evelyn Akinyi	Egyo	Farmer	0707925123		E
9	Jane Akinyi	Nyagwela	Farmer	0706640341		J
10	Pamela Akinyi Otiene	Egyo	Farmer	0702136434		P
11	Grace Akinyi Otiene	Egyo	Farmer	0721502979		G
12	Evelyn Akinyi	Egyo	Farmer	0759712324		E

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

KenGen
KARURA TRUST
PO BOX 1000
Nairobi, Kenya

Date: 16.03.2021
Time: 2PM -
Location: KSCIC/Plant
Target Group/Individual: Women
Chief: Otho, Nidada
FGD

MEETING ATTENDEES

No.	Names	Organization	Position/Role	Telephone/Mobile	Email	Signature
1	Eveline Ngunza Gat Gugu	Wilege	Farmer	0719685576		
2	Darius Atieno Ginyo Ginyo		Farmer	0796404363		
3	Francis Ado GAT	Wilege	Farmer	0739091071		
4	Leurika Peto Gomo Nyakurice		Farmer	0726479779		
5	Hellen Acheng Kaseg Nyakure		Farmer	070895345		
6	Hellen Koko Nyakure		Farmer	0793940686		
7	MERESA A Otho KUKIRO		Farmer	0718837278		
8	JAEI Akech Nyakure Peto		Farmer	070161422		
9	MAR-L ANJAN GOMBO KATHODISA		Farmer	0757452360		
10	MOL-THE ANJAN GOMBO MUDIRA		Farmer	0711708658		
11	Violet Acheng Acheng Kaseg		Farmer	0706071512		
12	Silemina Akhamb Kanyobasi		Farmer	0725840368		

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	16.03.2021
Time	2 PM
Location	Assistant Chief's office, Ndeda.
Target Group/Individual	WOMEN FGD

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	CHARLES O. ONINDA	NHATO	Manager	0911547346		Chris
2	Caroline Atieno	Govt Dagengio	Farmer	0723660117		one
3	Eliza Adoyo Koi	Govt	Farmer	0799073652		Eliza
4	Phibi Kaurda	Govt	Farmer	0724716622		Phibi
5	PHILIP OTUGA	GodJhoko	Village Elder	0713826329		Phil
6	maurice OKOTH	Govt	V. ELDER	0796906903		maurice
7	Daniel Ogoi	Stentec	Consultant	0722476726	egoldane@gmail.com	Daniel
8	Rebecca tho Karanja	Stentec	Consultant	0722608449	rebeccakaranja3@gmail.com	Rebecca
9	Randa Akong'i	Stentec	Research Assistant	0721-493141	brackley@gmail.com	Randa
10	Duncan Sade	Kenden	For. Officer	0722476992	dsade@kenya.co.ke	Duncan
11	Frank Karamuta	Kenden	Senior Engineer	0722618285	frankkaramuta@gmail.com	Frank
12	Floral Mwangi	Kenden	Chief Engineer	0705116019	franghwa@gmail.com	Floral



KenGen
KENYA ELECTRICITY
GENERATING COMPANY LTD.

Feasibility Study for Redevelopment of Gogo Power Plant ESIA study stakeholder attendance register

Date	15.03.2021
Time	11.45 AM
Location	MIDA KEST. CHIEF'S OFFICE
Target Group/Individual	FOCUS GROUP DISCUSSION - YOUTH.

MEETING ATTENDEES

No.	Names	Organization	Position/Role	Telephone/Mobile	Email	Signature
1	EUNICE ANYANCO	ANYAKUNE	YOUTH	0915765166		de
2	WILLIAM AMBOGE	OTUMBA	Disruptive leader	072989505		Mungu
3	DAVID ERIC OMORI	MIDION	YOUTH	0703693040.		ed
4	OCHIELI MICHAEL	KAMUODERA	YOUTH	0745875572		ed
5	DAVID ELASOGUA	GOSAO	YOUTH	07064427817		ed
6	WILSON ODHAMBO GOGONO B	YOUTH	YOUTH	0718629157		Ge
7	FELIX OKOTH	NYAKUNE	YOUTH	0727564188		JH.
8	EUNICE OCHIENG	Got engeng	YOUTH	0797925355		Ge
9	NICHOLAS STANIS	Gogo central	YOUTH	0701354857		Nandi
10	FELIX OCHIAI	MURUK	YOUTH/MR REP	0726453554		Ge
11	CHARLES O. ONINDO	KAGUUSILILE A/CHIEF	CHIEF	0711541346		Chir
12	DAVID OUMA	STANTEC	Social expert	0724476750		ed



KenGen
KENYA ELECTRICITY
Generating Company Ltd



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Scoping Mission stakeholder attendance register

Date: 03.12.2020

Time:

Location: Gogo Power Plant

Target Group/Individual: Community members

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	OMONDI, PETER			0711329485		
2	Joseph D. Omondi			0746298788		
3	ALPHONCE DINGA			0716001192		
4	HELLEN AKO NIANGA			07993940046		
5	GEORGE NIAGUMBI			0704889720		
6	Elisha got			0725693993		
7	JOHN D. OJWANGI	NIAAO	SNR CHIEF	0723696251	joomunga@gmail.com	
8	CHARLES O. ONDINGO	NIAAO	CHIEF	0711541346	charlesondingo@gmail.com	
9	ISMAEL OWINGO	ANYUOR	76#1	0700583119		
	Patrick Nyetich		76#2	0722375776		



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Scoping Mission stakeholder attendance register

Date	03.12.2020
Time	10 am - 1 pm
Location	Gogo Power Plant
Target Group/Individual	Community Members

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	GORDON NYAPAZA	FERM Community		0701061422		JALUO
2	SILVERMAN ADTHAMBO	community		0725840368		- Sur
3	JOHN OTIENO			0728363492		John
4	JOHNSON ODIN			0710854416		John
5	Geoffrey Aoto	Community	Tooth Rep.	0743349730	geoffaoto@gmail.com	Geoff
6	PETER ODHAMBO KODERO	"	Teacher	0723391611	Kidamatsagimicam	John
7	REV GEORGE O. OMOLO			0701217540		John
8	DUNCAN OLOO ORENDO		Evangelist	0722595118		John
9	NAPHTALI ODOYO O. MARGRETHA VILLO	community	community	0716523266		John
10.	DANIEL OGOL STANLEY	Social Expert		0222476756	ogolstan@gmail.com	DR

Feasibility Study for Redevelopment of Gogo Power Plant ESIA Scoping Mission stakeholder attendance register



Date	03.12.2020
Time	
Location	Gogo Power Plant
Target Group/Individual	Community Members

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Nicholas Orend		Teacher	0701304887		
2	Charles Odhiambo	Church		0708247449		
3	Pauline Auctine	Community		0759711449		
4	Patrick Omtok	Teacher	Teacher	0710938670		
5	Flora Mwangi	Teacher	Environmentalist	0705116019	frankmwangi@gmail.com	
6	John Kariuki	Teacher	Engineer	07261883	johnkariuki@gmail.com	
7	Dina Said	Teacher	Environmentalist	0722096992	dinasaid@gmail.com	
8	Dorothy Jariang	Community	Community	0703541006		
9	Selesline Ruwa	Community	Community	0793964804		
10	Dr Rebecca Karani	Statistical	ESIA Expert	0722060849		

Feasibility Study for Redevelopment of Gogo Power Plant

ESIA Scoping Mission stakeholder attendance register

KenGen
Kenya Electricity
Generating Company Ltd.



Date: 02/12/2020
Time: 10:00 AM
Location: Migori & Uasin
Target Group/Individual: Migori Gov. / Uasin Gov. / Regulatory bodies.

MEETING ATTENDEES

No.	Name	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Juddy Aniko	NEMA Migori County Government	County Executive Officer	0722631380	juddyaniko@gmail.com	
2	George Nyawake	LPDC	County Manager	0722631380	gnyawake@lpdc.co.ke	
3	Lazarus Abila	County Government	WARD 10 N	0722631380	lazarusabila@gmail.com	
4	JOHN OJWANGI	N/A	SPR. CHIEF	0722631380	johnojwangi@gmail.com	
5	LEAH ATIENO	N/A	Asst. Chief K1	0722631380	leahatieno@gmail.com	
6	Flora Mwangi	KenGen	Environment	0722631380	floramwangi@gmail.com	
7	Flora Kariuki	KenGen	Engineer	0722631380	florakariuki@gmail.com	
8	Duncan Odiit	KenGen	Environment	0722631380	duncanodiit@gmail.com	
9	Patricia Ngetich	KenGen	Tech 2	0722631380	patriciangetich@gmail.com	
10	Daniel Ogoi	StanTech	Social Expert	0722631380	danielogoi@gmail.com	
11	Dr Rebecca Kariuki	StanTech	Env. Expert	0722631380	rebeccakariuki@gmail.com	

Feasibility Study for Redevelopment of Gogo Power Plant ESIA Scoping Mission stakeholder attendance register



KenGen
KAPS 30 ELECTRICITY
Generating Company Ltd.

Date	01.12.2020
Time	
Location	Night Town & Uini
Target Group/Individual	County Govt / Ministry of Interior/NATO





MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Enjira GAMBAGE	AGRICULTURE DEPT. MIGORI COUNTY	County Chief Office Migori	072245458	enja.gambage@gmail.com	
2	Editha KASERA	WATER & ENVIRONMENT COUNTY	County Chief Office Migori	0729864061	kakakadwan@yahoo.co	
3	Rebecca Ghati	GOVT COUNTY	ASST. Engr	0720068567	rebecceghati@gmail.co	
4	Joshua Nyuola	MIGORI COUNTY GOVT	CEO - ENVIRONMENT, DM, NATURAL RESOURCE	0725854080	nyuolaj@gmail.com	
5	MONICA KAKI EITHI	STATE POLICE SUB-COUNTY	DEPUTY COUNTY COMMISSIONER	0722454718	decidine@gmail.com	
6	Ken Piter O. Mijungu	MCA W/Kangungu	MCA	0721428748	prajungu@gmail.com	
7	Florence Mwangi	KenGen	Environment	0705116019	florence.mwangi@ken-gen.co.ke	
8	Flora Karamu	KenGen	Engineer	0722615251	flora.karamu@ken-gen.co.ke	
9	Daniel Ogoi	KenGen	Environment	0722476992	daniel.ogoi@ken-gen.co.ke	
10	Patrick Ngeten	KenGen	Gen I	0722335774	patrick.ngeten@ken-gen.co.ke	
11	Daniel Ogoi	Stantec	Social Expert	0722476756	daniel.ogoi@stantec.co.ke	
12	Dr Rebecca Karamu	Stantec	Env. expert	0722476756	rebecca.karamu@stantec.co.ke	

Feasibility Study for Redevelopment of Gogo Power Plant ESIA Scoping Mission stakeholder attendance register

Date 5/12/2020
Time 9:06 am
Location 11.5 km
Target Group/Individual Water Resources Authority - Kisumu Region

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Immac M. Gwang	WMA	Secy	0710492760	immacm@gmail.com	
2	Simon David	Kenya	Environmentalist	0722476772	simondavid@gmail.com	
3	Dr Rebecca Karari	Stantec	ESIA Expert	0920608149	rebecca.karari@gmail.com	
4	David Ogoi	Stantec	Social Expert	0722476772	ogoi.david@gmail.com	
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DISCLOSURE WORKSHOP ATTENDANCE SHEETS



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date: 23/7/2021
 Time: 9am
 Location: Twin Breeze Hotel Migori town
 Target Group/Individual: Institutional Stakeholders

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	PATRIKA NIBUNYA	KEDEA	Preside.	0725074362	Patricia_nibunya@yahoo.com	[Signature]
2	KIBATIJI JERARD	M.G.G.	Env't Officer	0720346451	kibatiji.jerard@gmail.com	[Signature]
3	DROWN DANDI	Mech-Trade	Inv-Trade	0727083116	okolisa.dandi@gmail.com	[Signature]
4	HOP DILE	NO MKA-MIGA	MKA	0721660150	okolisa.dandi@gmail.com	[Signature]
5	Stanley molomo	Fisheries Dept.	P.F.O	0721408196	stanley.molomo@gmail.com	[Signature]
6	SAMSON OCHUPEI	NEMA	E.O	0726082500	ochupei.s@gmail.com	[Signature]
7	SUSAN KIRENO	Gogo community	With representation	0715030555	susan.kireno@gmail.com	[Signature]
8	Flora Kanyaga	Kenya	Engineer	0721618236	flora.kanyaga@gmail.com	[Signature]
9	Simon Kiriini	Karuri	Engineer	0722821423	simon.kiriini@gmail.com	[Signature]
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Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date: 28.07.2021
 Time: 9am
 Location: Twin breeze Hotel, Migori town
 Target Group/Individual: Institutional Stakeholders

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	KENNEDY DUNN	N/A	MANAGER	0720346021	kenna@kenya-gen.co.ke	
2	BRADY MIGIRO	N/A	ENGINEER	0725560439	brady@kenya-gen.co.ke	
3	BOTHAMBO AKOTH DUNN	N/A	TEACHER	0702227230	akothdunn@gmail.com	
4	SOLOMON KYTHINJI	HLC	COUNTY COORDINATOR	0722340058	solomon.kythinji@kenya-gen.co.ke	
5	CHARLES O. ONINDO	NGAO	ASST. MGR	0711541346	charlesonind@gmail.com	
6	KENNEDY O. ADONGO	M.C.G	SCA-NAIRI	0710839507	kenndengob@gmail.com	
7	SUSAN D. BREND	IRRIGATION	MANAGER	0724445443	susan@kenya-gen.co.ke	
8	HECTOR AGIO	APRO	MANAGER	0743549730	gostrepat@gmail.com	
9	LAZARUS ABILA	COUNTY GOVT	WARD ADMINISTRATOR	0720280126	enabib@gmail.com	
10	MOREY ACHIAPA	COUNTY-NARIO P	ENVIRONMENT & FORESTRY	0717263324	agoygachap@gmail.com	
11	JAMES DWENGA	KFS	FORESTER	0718196940	dwengajames@gmail.com	



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date 28/07/2021

Time 9am

Location

Target Group/Individual

Inin Breeze Hotel Migori town
Institutions Stakeholders

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	JOHN OGWANG OMUKO	NGAO	SENIOR CHIEF	0723696251	johnomw@gg.moi.com	
2	Donald Raphael MOKEL	MOKEL	SCAD	0725145897	scawg@kic@nail	
3	Charles Omba	County Government	DCWMO	0721225784	charlesomb@2016	
4	John Mwangi	County	Mr. Eamus	0721371256	Emisey@nail	
5	Hon G. O. Omondi		M. CA	0727308965		
6	Hon Peter O. Mijangji	County	M. CA	0721422748	petermijangji@nail	
7	ALLAN OGWANG	County Development	CEO	0726357519	allanowang@nail	
8	CHARLOTTE NUESA	County	RESIDENT	0723521220	ngesa@nail	
9	MICHAEL OTHMAN	County	CEM-officer	0722335157	michael@nail	
10	MICHAEL O. KHAM	Health	PHD	0728367612	Kham@nail	
11	Daniel Amuda	Health	CPHO	0728692843	amuda@nail	



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date: 27.07.2021
 Time: 2 PM
 Location: AGENGO CHIEF'S CAMP
 Target Group/Individual: LOWER KUJA IRRIGATION SCHEME

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Bernard Okaya	Lower Kuya	Farmer	0712536954		
2	Daniel Dwino	Lower Kuya	Farmer	0746101105		
3	Jona Ochieng	Lower Kuya	Farmer	0746833159		
4	Kenedy Ochieng	L. Kuya	V. sec Apex	071718112		
5	Johnes Ochieng	L. Kuya	Farmer	0797585391		
6	Orino Nicholas	L. Kuya	CHAIRMAN BLISS	0725021974		
7	BETTY ASEMO DEALO	L. Kuya	FARMER	0791009814	bellyasemo@gmail.com	
8	ELIZABETH O. ALIMO	L. Kuya	Farmer	0706962816		
9	EMILY AKOLU	L. Kuya	Farmer	0715902893		
10	PAUL DALMAS	"	"	0711537679		
11	JARED ODEKA	L. Kuya	Farmer	0725870611		



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date: 27.01.2021
 Time: 2PM
 Location: AGENGO CHIEF'S CAMP
 Target Group/Individual: LOWER KUJA IRRIGATION SYSTEM

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	CHRISTOPHE BAWARI	LOWER KUJA	FARMER	0792855194		
2	JOHN ARIKWA	LOWER KUJA	FARMER	07102002329	ari@ariken.com	
3	REUBEN OBISI	LOWER KUJA	FARMER	0723382285	nick@ariken.com	
4	MESTACK O. ASIAGO	LOWER KUJA	FARMER	077222729	nick@ariken.com	
5	HENRY O. LAGO	LOWER KUJA	FARMER	0717185724	nick@ariken.com	
6	HARRISON O. DIWONDA	LOWER KUJA	FARMER	0720203269	nick@ariken.com	
7	JOEL OPIYO	LOWER KUJA	FARMER	0718342434		
8	GORDON MAFINA	LOWER KUJA	FARMER	0722629018	gordonmafina@gmail.com	
9	JOHN OLANO	LOWER KUJA	FARMER	0718779262	johnolano@gmail.com	
10	JOASH ADA LAGO	LOWER KUJA	FARMER	0113369657	lagojosh@gmail.com	
11	MR OKEYO BONAVENTURE		FARMER	08085558		

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Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date 27.07.2021
Time 2PM
Location AGAGAO CAMP
Target Group/Individual LOWER KELIA IRRIGATION SCHEME

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Daniel Ogot	Starter	Consultant	072476256	ogotdaniel@gmail.com	[Signature]
2	Prof. David Kamuyu	KenGen	Engineer	0727615765	dkamuyu@ken-gen.co.ke	[Signature]
3	Eng. Simon Kine	KenGen	Asst. Manager	0722828040	skine@ken-gen.co.ke	[Signature]
4	Anthony Mwangi	KenGen	Asst. Manager	0717062353	amwangi@ken-gen.co.ke	[Signature]
5	Flora Mwangi	KenGen	Chief Eng. Off.	0705 11 6019	fmwangi@ken-gen.co.ke	[Signature]
6	Duncan Kanda	KenGen	Env. Officer	0722476332	duncan.kanda@ken-gen.co.ke	[Signature]
7	Michael O Okello	KenGen	Project Officer	0720227355	mo@ken-gen.co.ke	[Signature]
8	Dr. Rebecca Kwariga	Starter Consultant	ESIA Expert	0722601849	rebecca.kwariga@gmail.com	[Signature]
9	Peter Ngachuro	KenGen	CLO	0728433766	pyachuro@ken-gen.co.ke	[Signature]
10						
11						



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date

27.07.2021

Time

2PM

Location

LOWER-KUJA - AGENDO CHEST CAMP

Target Group/Individual

LOWER KUJA 10 AGATION SCHEME

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	TIGAS CEO	LOWER KUJA	FARMER	0720451553	kenia da @gma -book	
2	ALICHAU OLOO NGETA	LOWER KUJA	Farming	0707266378		
3	SAMSON MANGONO	LOWER KUJA	Farming	0726765663	—	
4	George Okeya Ojembu	Lower Kujia	farming	0725407432		
5	JEWETER ALUMU - O	LOWER KUJA	Farmer	0743333930		
6	Jackline Mwangi	Lower Kujia	Farmer	0729165724		
7	SAMSON DHEIO	Chair Ikuu	Chairman	0724445443	munisansa@gmail.com	
8	Edwin Ochieng	MA-LOUKE KUB	As. Agriculture	0714656773		
9	CHARLES OKOTH	NGAO	CHIEF	0728934161	okothchales1984@gmail.com	
10	BENARD OCHIENGOMAT	L. KUJA	Farming	0720068721		
11						



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date

22/7/2021

Time

9:30 AM

Location

NABIDA (CHIEF CAMP)

Target Group/Individual

GOGO COMMUNITY

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	ISAK AGOO	ORENBE	MALE	0714720196		
2	NAFALI ODUTO	KANTODERA	MALE	0716523266		
3	ELIARI ANJANJE	AEDO	MALE	0701477850		
4	EVANCE OCHIENG	AEDO	MALE	0799590699		
5	DAVID OMWANGI	AEDO	MALE	07933329203		
6	ELISHA OREDO	KANTODERA	MALE	0715811734		
7	JOASH OIENG	KINIAB	MALE	0706292722		
8	ROSE AKINJI	MAMIDIDA	FEMALE	0712681336		
9	MAURICE OKOTH	GOGO	MALE	0796946903		
10	Gregory Arito	NABIDA	MALE	0743349750	gogoparticipations@gmail.com	
11						



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date: 27/7/2021
 Time: 9:30 AM
 Location: NINDA (CHIEF CAMP)
 Target Group/Individual: GOGO (COMMUNITY)

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	DUNCAN OAMU	KANTODERA	MALE	0722595118		[Signature]
2	BENSON AWARA	GOGO	MALE	0114724284		[Signature]
3	EMILIO MOKI DIAMAH	GOGO	FEMALE	0902227230		[Signature]
4	DENIS OGILO	GOGO	MALE	0715268898		[Signature]
5	DANIEL OLENGO	KIMIRO	MALE	0113988152		[Signature]
6	GORDON NYABALA	GOGO	MALE	0201061422		[Signature]
7	PETER ODITAMBO	GOT OAHENGO	MALE	0723391611	Kodiro 75@gmail.com	[Signature]
8	BENEDICT ACHENG	GOGO	FEMALE	0103436542		[Signature]
9	JOHN OUNANGU	GOGO	MALE	0713249837		[Signature]
10	JOHANSON OPIN	KANTODERA	MALE	0716850006		[Signature]
11	CHARLES OPIRI	NYAMUNGU	MALE	0113603533		[Signature]



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date

29/7/2021

Time

9:30 AM

Location

NIDIDA (CHIEF CAMP)

Target Group/Individual

GOGO COMMUNITY

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	CAROLINE ATENO	GET OLINGO	FEMALE	0723660117		
2	LUCAS ODUMBO	MANODERA	MALE	0720133434		
3	JORAM FRANCIS	GET OROGO	MALE	070308561		
4	JOSHUA OIENO	NIDIDA	MALE	0724440059		
5	REV. GEORGE OMOLU	MAHUNE	MALE	070217540		
6	CLIFTON OIENO	LIWIR	MALE	0702026024		
7	PHILIP OJATH	THIDIA	MALE	070626329		
8	JAMES ODER OAIW	NIDIDA	MALE	0704332239		
9	OMUNDI PETER	GOGO	MALE	0711329435		
10	TOM AGOTU	GOGO	MALE	0705902011		
11	JEROME OGIK	GOGO	MALE	0722481521		



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date: 27/7/2021
 Time: 9:30 AM
 Location: MIDIDA (CHIEF CAMP)
 Target Group/Individual: MIDIDA COMMUNITY

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	JACOB DDOGO	MIDIDA	HTS	0701305620		[Signature]
2	John Wandia Odoro	Govt Orogeno	Male	0704199058		[Signature]
3	ELISHA OUK	KAMODERA	MALE	0725693993		[Signature]
4	IOBIAS ONTANGA	MIRAKUNE	MALE	09939990681		[Signature]
5	GEORGE OIENO	MIDIDA	MALE	0703923192		[Signature]
6	JACK OLECH	KINIRO	MALE	0924770343		[Signature]
7	SAMUEL OIENO	KAMODERA	MALE	0705409519		[Signature]
8	CHARLES OCHENG	MIDIDA	MALE	0702312389		[Signature]
9	JOEL OGUJU	Govt Orogeno	MALE	0700330922		[Signature]
10	JOSEPH OIENO	Govt Orogeno	MALE	0726032934		[Signature]
11	DAVID DUMA	Govt Orogeno	MALE	0718253377		[Signature]



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date: 27/7/2021
 Time: 9.30 AM
 Location: NINDIDA (CHIEF (AMP))
 Target Group/Individual: GOGO COMMUNITY

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	LEONIDA AOKO	MAKUNE	FEMALE	0726473779		
2	PHILLIS ODHIA	GOI ODHIA	FEMALE	070069461		
3	BARACK ROBE	KANTODERA	MALE	0716174532		
4	ISMAEL ODHIA	KINIRO	MALE	0720323149		
5	JOHN OTHENO	NDEGE	MALE	0723363492		
6	FARANCE OKOTH	MAKUNE	FEMALE	0724091077		
7	SILVERINA OKOTH	KANTODERA	FEMALE	0725240363		
8	CAREN AKINYI	KANTODERA	FEMALE	0791134901		
9	EUNICE ANYANGO	MAKUNE	FEMALE	0715765166		
10	JOSHUA ODERO	GOI ODHIA	MALE	0713243449		
11	PHANUEL OTHENO	GOGO	MALE	0792039529		



Feasibility Study for Redevelopment of Gogo Power Plant ESIA Disclosure stakeholder attendance register

Date: 27/7/2021
 Time: 9:30 AM
 Location: MIBIDA CHIEF'S CAMP
 Target Group/Individual: GOGO COMMUNITY

MEETING ATTENDEES

No.	Names	Organisation	Position/Role	Telephone/Mobile	Email	Signature
1	Hon. Peter O. Mijangwa	MCA	MCA	0721428748	petermijangwa@gmail.com	
2	Hon. George Omondi	MCA	MCA	0727818965	georgeomondi@gmail.com	
3	Hon. Dale Furukawa	MCA	M	0721660156	dalefurukawa@gmail.com	
4	Hon. Mark Mwangi	MP (W)	MP	0702247669	markmwangi@gmail.com	
5	Daniel Dagel	Stantec	Consultant	0722476756	egidano@gmail.com	
6	Flora Karanga	KenGen	Engineer	0722618285	florakaranga@gmail.com	
7	Joseph Karanga	KenGen	MP Manager	0722285222	joelkaranga@gmail.com	
8	Anthony Mwangi	KenGen	Assistant Chief Gen. Off.	0717062353	anthony.mwangi@kenya-electricity.co.ke	
9	Flora Mwangi	KenGen	Chief Gen. Off.	0705116019	floracmwangi@gmail.com	
10	Duncan Saida	KenGen	Env. Officer	0722476992	duncan.saida@kenya-electricity.co.ke	
11	Michael O. Odello	KenGen	Property Officer	0720227355	michael.odello@gmail.com	
12	Dr. Rebecca Karanga	Stantec Consultant	ESIA	072266849	rebecca.karanga@gmail.com	
13	Peter Ngachuro	KenGen	CLO	0728933766	peter.ngachuro@gmail.com	