INVESTING IN FORESTS AND PROTECTED AREAS FOR CLIMATE-SMART DEVELOPMENT (IFPA-CD) – P170466

PROJECT BRIEF

FOR THE PROPOSED CONSTRUCTION OF QUEEN ELIZABETH PROTECTED AREA (QEPA) ELECTRIC FENCE IN KASESE, KITAGWENDA AND RUKUNGIRI DISTRICTS

Uganda Wildlife Authority (UWA)
Plot 7 Kira Road, Kamwokya
P. O. Box 3530, Kampala

June 2023

ABBREVIATIONS

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on migratory species of wild animals
DLG	District Local Government
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plan
GMP	General Management Plan
HEC	Human elephant conflict
HWC	Human Wildlife Conflict
N/A	Not applicable
NEMA	National Environment Management Authority
QENP	Queen Elizabeth National Park
QEPA	Queen Elizabeth Protected Area
SFG	Space for Giants
UNMA	Uganda National Meteorology Authority
UWA	Uganda Wildlife Authority
WCC	Warden Community Conservation
WIC	Warden in Charge

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EXECUTIVE SUMMARY

Uganda Wildlife Authority (UWA) has been grappling with the challenge of Human Wildlife Conflict (HWC) since creation. The Authority, together with surrounding communities and partners, has deployed a number of initiatives to address this challenge including digging trenches, planting unpalatable crops such as red chili, cotton, coffee along the boundary, bee hives, use of community scouts among others. Despite the numerous efforts, the challenge of HWCs still persists and this has increased friction between community and park management.

UWA in 2018 in collaboration with Space for Giants (SFG) started implementing electric fencing to contribute to the already existing initiatives to curb human wildlife conflict. This was piloted in Queen Elizabeth National Park under the Public Private Partnership (PPP) arrangement and was later extended to Murchison Falls National Park. The objective of the fence was to reduce the human wildlife conflict especially elephants which are affecting the agricultural community around the park.

So far over 52 km of the fence has been constructed in QENP and 40 km in MFNP and is operational. Communities have expressed appreciation of the electric fence as it has tremendously reduced the incidences of animals going out of the park to their gardens. This has improved farm yields, increased household income, helped families to diversify their sources of income as men now have timeto look for other jobs, helped children to concentrate at school among others. Communities where the fence has not reached are strongly demanding for extension of the fence to their areas.

Given its effectiveness, UWA has now received funding from World Bank under the Investing in Forests and Protected Areas for Climate Smart Development (IFPA-CD) project to construct additional 61 kms of the electric fence to further minimize HWC in these areas. The areas where this will be constructed include Nyamugasani-Isingo (18km), KCCL-Karusandara (21km), Ishasha-Bwentale (9km) and Kagarama-Mahyoro(13km).

It is a requirement under the National Environment Act 2019, that all projects thatare likely to have negative impacts on the environment undergo Environmental and Social Impact Assessment. UWA prepared a project brief for the pilot project which was approved by NEMA in 2018. UWA is now updating the project brief given that it is in the same protected area to include the new sections where the fence will be constructed. The lessons learnt in the previous phase shall be used to implement this phase effectively. Impacts associated with this activity have been identified and mitigation measures proposed in this project brief. UWA will work with all partners and stakeholders to ensure that this project is implemented in a more sustainable manner in order to achieve the intended objectives with minimal impacts on the environment.

CHAPTER 1

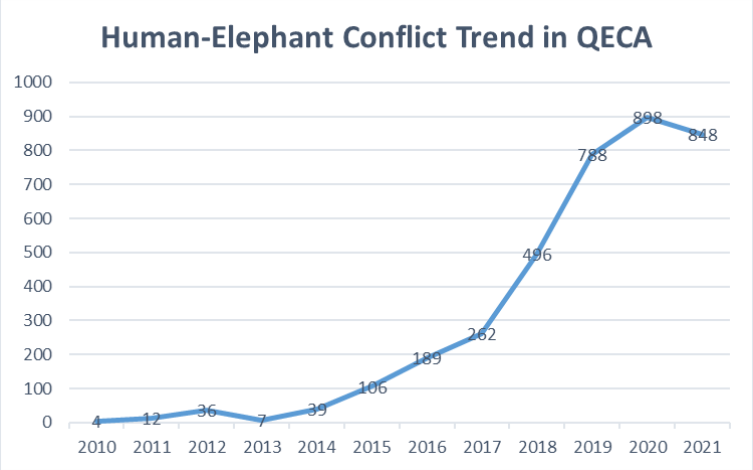
1.0 INTRODUCTION

1.1 Overview and background

Human Wildlife Conflict (HWC) is described as any negative interaction between humans and wildlife. The interactions can be real or perceived, economic or aesthetic, social or political. HWC is a global problem for communities which live near wildlife protected areas. HWC may result from any wildlife species whether large, medium or small, but the most common ones come from elephants, buffaloes, lions, hippos, crocodiles and the primates. HWC in Uganda is exacerbated by the hard edge where communities live very close to the Protected Areas. In some instances, communities share the same habitat with wildlife.

In Queen Elizabeth National Park (QENP), Human Elephant Conflict (HEC) is increasingly becoming a serious problem on the park boundaries with local farmers experiencing severe crop losses especially the sectors that are not fenced with electric fence. Subsistence and commercial farming are the main activities taking place on the boundaries of the park. The area is incredibly fertile, and it is not uncommon for farmers to conduct two cropping seasons during the year. The most common animal species affecting communities is elephants. As is evident from figure 1, there has been a significant increase in Human Elephant Conflict (HEC) in recent years which have been recorded by UWA.

Figure 1: Trends in reported Human-Elephant conflicts around QENP 2010-2021



Source: UWA, 2021

These escalating levels of HEC are undermining livelihoods, damaging relationshipsbetween Park Management and the surrounding communities and gradually turning into a political concern. The absence of wildlife corridors and farmers growing crops up to the boundary have exacerbated the problem. High population growth with increased human activities with no increase in the land area has made matters worse and created more human wildlife conflicts.

HWC is a complex problem requiring a combination of approaches to manage the conflict. Over the years, park management has put in place problem-animal management interventions including barriers such as trenches; use of irritants like red chili; use of beehives along the park boundary; planting unpalatable crops like coffee, tea, and tobacco; scare shooting, among others to manage problem animals. Maintenance of trenches has been found to be very expensive for communities to manage in terms of costs. Not a single method can be used to control problem animals, but rather a multiple implementation of these methods.

UWA in 2018 in collaboration with Space for Giants (SFG) started implementing electric fencing to contribute to the already existing initiatives to curb human wildlife conflict. This was piloted in Queen Elizabeth National Park under the Public Private Partnership (PPP) arrangement and was later extended to Murchison Falls National Park. The objective of the fence was to reduce the human wildlife conflict especially elephants which are affecting the agricultural community around the park.

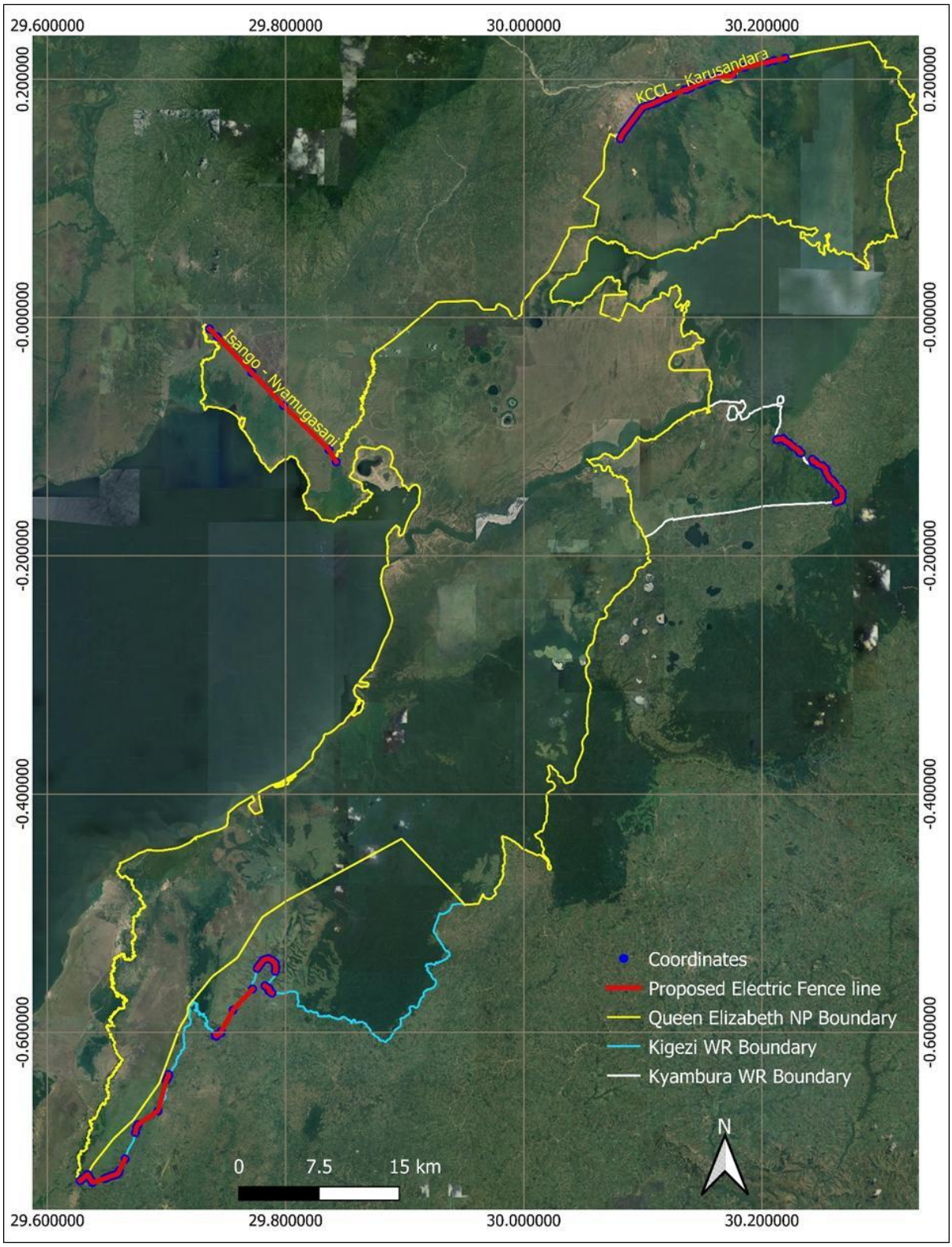
So far over 52km of the fence was constructed in QENP and 40km in MFNP and is operational. Communities have expressed appreciation of the electric fence as it has tremendously reduced the incidences of animals going out of the park to their gardens. This has improved farm yields, increased household income, helped families to diversify their sources of income as men now have timeto look for other jobs, helped children to concentrate at school among others. Communities where the fence has not reached are strongly demanding for extension of the fence to their areas.

Given its effectiveness and government desire to solve the issue of HWC for communities living close to the protected areas, UWA has now received funds from World Bank under the IFPA-CD project to construct additional 61 kms of the fence to further minimize HWC in these areas. The areas where this will be constructed include Nyamugasani-Isingo (18km), KCCL-Karusandara (21km), Ishasha-Bwentale (9km) and Kagarama-Mahyoro (13km), all located on the boundary of QENP. The proposed new areas for fencing under this project are additional hotspot areas for human wildlife conflict in QENP.

A linear fence with 3 lines of live wire will be erected with energizers (powering point) every 5km.

Uganda Wildlife Authority together with Space for Giants (SFG) carried out an assessment of the most affected areas around the park boundary in August 2020 . The assessments were done through physically walking along the park boundary and review of HWC reported cases over the past 5 years. The assessment considered:- the alignment of the fence along the boundary; vegetation cover; relief; soils; corridors; accessibility and beneficiary community among others The most affected areas are in places within Kasese, Rubirizi, Kamwenge, Rukungiri, Kanungu, Ibanda and Mitooma districts. UWA and SFG have agreed to start with areas where the HEC is more rampant. These have been shown on the maps below in Fig 2.

Figure 2: Map of QENP showing Fence sites



Source: UWA, 2021

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1.2 Project Objectives

The overall objective of the fencing project is to combat the escalating levels of human-elephant conflict (HEC) in communities along the boundaries of QENP through the construction of an electric fence.

Specific Project Objectives

To construct an electric fence along parts of the park boundary to reducecrop damage, loss of life and livelihoods as a result of incursions into villages and farmlands from elephants.
To promote the conservation of elephants in Queen Elizabeth National Park

1.3 Purpose of the Project Brief

Section 112 of the National Environment Act, 2019 requires developers of projects that may, or are likely to have impacts on the environment to submit a project brief to NEMA (the Authority) in the prescribed form and giving the prescribed information.

The purpose of this Project Brief is to objectively assess and evaluate the likely environmental and social impacts that could result from the implementation of the project. It proposes mitigation measures for the potential impacts that have been identified which are likely to accrue from the construction of the Electric Fence along the boundaries of QENP. This project brief is to ensure that the project is implemented in an environmentally sound manner consistent with national regulations as well as the World Bank's environmental and social standards. It will also assist the National Environment Management Authority (NEMA) and lead agencies to make a decision on the implementation of the project.

1.4 Specific Objectives of the Project Brief

The objectives are:

1. To define the baseline environmental and social conditions in the project area;
2. To describe design specifications for the fence so as to be able to identify and assess possible environmental and social impacts;
3. To identify the potential environmental and social impacts, and propose recommendations for their mitigation and/or enhancement, and monitoring;
4. To summarize the views, concerns and suggestions of the relevant key stakeholders (including potentially affected persons) regarding the environmental and social impacts of the project; and
5. To present the environmental and social monitoring and management plan for the fencing project, summarizing potential impacts, sources, management arrangements of local communities, monitoring indicators, frequency of monitoring, roles and responsibilities for and the regulatory agencies.

1.5 Methodology for the preparation of the Project Brief

The study was carried out in accordance with the National Environment Act 2019, the Environmental and Social Assessment Regulations, 2020 and other legal frameworks relevant to the proposed project. Additionally, the study was done in accordance with the World Bank's environmental and social standards and project documents such as the ESMF, ESCP, OHS Protocols, SEP etc were consulted during the study. Consequently, the project will be in compliance with the Project ESMF and LMP, and also comply with the WB EHS General Guidelines.

The technical team used a number of techniques and methods at each stage of data gathering and information synthesis that include literature review, stakeholder consultations, onsite observation and analyses. The methods are further described below.

Review of relevant literature – The team reviewed literature to obtain background and secondary baseline information on electric fencing and the site considering the previous project in, the regulatory and institutional context relevant to the project, the environment, and the economic situation in Uganda.

Consultations with stakeholders – The team also made consultations with UWA staff to obtain their views and create awareness about the project. Consultations were also made with the stakeholders including communities neighboring the Park, technical and political leaders of the neighboring communities.

Other quantitative and qualitative methods applied - Qualitative methods such as direct observation and photography were used to obtain information on the site and the neighborhood.

1.6 Project cost

The pilot project is estimated to cost about three billion (3,000,000,000/=) Uganda shillings. This cost will increase as more areas are covered.

1.7 Developer and contact details

Uganda Wildlife Authority (UWA)Plot 7 Kira Road, Kamwokya
P. O. Box 3530Kampala.
Tel 256-414-355000
Email: info@wildlife.go.ug

CHAPTER 2

2.0 POLICY, LEGAL AND REGULATORY FRAMEWORK

2.1 National Policy and legal framework

Electric fencing is a new concept in Uganda which is being adopted by Uganda Wildlife Authority to address the escalating Human Wildlife Conflict, specifically Human Elephant conflict. This is aimed at improving conservation of elephants andother species in general in Protected Areas. The national legal and policy framework that relate to conservation were analyzed during the preparation of thisproject brief to ensure that this project is in line with national interests.

2.2 The Constitution of Uganda (1995)

The overall government policy on natural resource conservation in Uganda isenshrined in the Constitution of the Republic of Uganda 1995. The principles are spelt out in the National Objectives and Directive Principles of State Policy. The purpose of the objectives is to provide a legal foundation upon which future policies and juridical interpretation of the substantive constitutional provisions must be based. The relevant constitutional provisions in the National Objectives and Directive Principles of State Policy include the following:

a) Principle of State Policy XXVII mandates the State (both central and local government) to create and develop parks, reserves and recreational areas, and to ensure the conservation of and promoting the rational use of natural resources so as to safeguard and protect the biological diversity of Uganda.

2.3 The Uganda Wildlife Policy, 2014

The Wildlife Policy vision for the wildlife sector is “Sustainably managed and developed wildlife resources and healthy ecosystems in a transformed Ugandan Society. The Policy goal is to conserve wildlife resources of Uganda in a manner that contributes to the sustainable development of the nation and the well-beingof its people.

Through management of HWC, UWA will be implementing the following Policy objectives;

a) Promotion of sustainable management of Uganda’s wildlife Protected areas.
b) To sustainably manage wildlife populations in and outside wildlife protectedareas
c) Effectively mitigate HWCs
d) To effectively combat wildlife Crimes

2.4 The Uganda Wildlife Act 2019

The management of wildlife and protected areas including QENP is guided by the Uganda Wildlife Act of 2000 (Chapter 200 in the Laws of Uganda, 2000) which has now been amended to Wildlife Act 2019. The Act authorizes UWA to assume responsibility for wildlife management in Uganda, both inside and outside protected areas. Under the Act, a Board of Trustees is appointed by the Minister of Tourism, Trade and Industry as the governing body of UWA. The Act spells out offenses within protected areas and gives mandate to UWA to ensure that the protected areas are well secured.

2.5 The National Environment Act No5 of 2019

The National Environment Act establishes the National Environment Management Authority (NEMA) as the principal agency in Uganda for the management of the environment. Section 11 lists the functions of the lead agency where the lead agency should plan, regulate and manage the segment within its mandate.

The Fourth Schedule of the Act requires that Project Briefs are prepared and submitted to NEMA when wildlife protected area buffer zones and corridors are being created. Guidelines for this process are given in the National Environment (Environmental and Social Assessment) Regulations, 2020.

2.6 The Tourism Policy of Uganda 2003

The Tourism Policy recognizes that in the 1960"s Uganda was a main tourism destination in Eastern Africa and therefore tourism was one of the major economicsectors for the country. Unfortunately, the turmoil of the 1970"s and 1980"s drastically reduced wildlife numbers and destroyed infrastructure resulting into reduced numbers of tourists. This policy is aimed at ensuring that tourism becomes a vehicle for poverty eradication in the future to the extent possible within the resource base and market limitations. It further recognizes UWA"s role andcontribution towards the achievement of this objective. This is mainly in the area of managing and developing the extensive resource base as well as developing and marketing various products. The policy further emphasizes the need to facilitate the flow of tourists within the region and promotion of East Africa as a single tourist destination. Addressing the challenge of HWC will lead to increased numbers and hence a boost in tourism.

2.7 The National Forestry and Tree Planting Act, 2003

The Act provides for among other things, the conservation, sustainable management and development forests, and the promotion of tree planting for the benefit of people of Uganda and the international community. It classifies forests in Uganda as central forest reserves, local forest reserves, community forests and forests forming part of a wildlife conservation area declared under the Uganda Wildlife Statute, 1996. The Act recognizes various stakeholders in the management of forest reserves, which should be guided by the Management Plan prepared bythe responsible body. In addition, the Act aims at ensuring that forests and trees are conserved and managed in a manner that meets the needs of the present generation without comprising the rights of future generations by safeguarding forest biological diversity and the environmental benefits that accrue from forest and trees.

2.8 The Occupational Safety and Health Act, 2006

The Occupational Safety and Health Act of 2006 consolidates, harmonizes and updates the law relating to

occupational safety and health and repeals the Factories Act of 1964. It makes provisions for the health, safety, welfare and appropriate training of persons employed in work places. The Act provides for safe access to the workplaces and safe work practices which applies to this project as well.

The key areas addressed by the Act include:

- General health provisions including cleanliness, ventilation, lighting and sanitary conveniences.
- Machinery safety including safe handling of transmission machinery, hand held and portable power tools, self-acting machines, hoists and lifts, chains, ropes & lifting tackle, cranes and other lifting machines, steam boilers, air receivers, refrigeration plants and compressed air receiver.
- General safety provisions including safe storage of dangerous liquids, fire safety, evacuation procedures, precautions with respect to explosives or inflammable dust or gas.
- General welfare provisions including supply of drinking water, washing facilities, and first aid.

The Act also states that all electrical apparatus and fittings shall be sufficient in size and power for the work they are meant for and shall be constructed, installed, protected, worked and maintained to prevent danger as far as practicably practicable.

The Act is applicable in relation to protection of the workers and staff against secondary injuries and hazards during execution of their duties or work. UWA shall provide for the protection of workers from adverse weather, provision of a clean and healthy work environment, sanitary conveniences, washing facilities, First Aid and facilities for safe drinking water and meals. In summary, this act shall be used as a guideline to ensure health and safety of workers is guaranteed.

All workers involved in the project will be provided with PPE including Safety Helmets, hand gloves, water proof reflector suits, safety shoes

2.9 The Wetlands Policy 1995

Wetlands cover about 11% (26,600 km^2) of Uganda's total land surface (241,500 km^2) and provide a range of biophysical and socio-economic functions. The National Wetlands Policy for the conservation and management of wetland resources seeks to promote the conservation of wetlands in order to sustain their values for the present and futurewell-being of the people.

The Policy sets five goals:

- To establish the principles by which wetland resources can be optimallyused now and in the future;
- To end practices which reduce wetland productivity;
- To maintain the biological diversity of natural or semi-natural wetlands;
- To maintain wetland functions and values; and,
- To integrate wetland concerns into the planning and decision making ofother actors.

The electric fence will traverse a number of wetlands as indicated in Chapter 3, Section 4 and UWA will ensure that during construction of the fence, the ecological and hydrological processes of these wetlands will not be interfered with or compromised as provided in the ESMP.

2.10 The National Environment (Wetlands, River Banks and Lake Shores Management) Regulations, 2000

The Regulations provide for management and protection of Wetlands, River Banks and Lake Shores. Lake Edward and Lake George are among the Lakes specified in the seventh schedule, which have a protection zone of 200m. The management of invasive alien where the lake shore is to be developed for purposes of promoting tourism or any other development, the developer should ensure that:

a) Pre-treatment or full treatment of effluent or waste from the facility is carried out to prevent contamination of the water
b) Litter is cleared and disposed in a manner in conformity with bestenvironmental practices; and
c) The river banks, lake shores or beaches are not degraded.

In addition, the regulations provides that for any developer to conduct a project which may have a significant impact on a wetland, river bank or lake shore, shall be required to carry out an Environmental Impact Assessment (EIA) and to apply for the relevant permits from NEMA under these Regulations.

2.11 The National Environment (Environmental and Social Assessment) Regulation,2020

These regulations underscore the ESIA requirement and prescribe the procedures for conducting the EIA in Uganda. They require the developer to ensure that the mitigation measures are implemented and conditions of the certificate of approvalare complied with during the lifecycle of the project. Additionally, they pose a responsibility to the developer to undertake self-auditing with the first audit not less than 12 months but not later than 36 months from the project commencement and submit the findings thereafter to NEMA. This project brief has been preparedin line with these regulations.

The main sections of a Project Brief as required by the regulations, include:

a) a description of the proposed project, including the name, purpose and nature of the project in accordance with the categories in Schedule 4 of the Act;
b) the proposed location and physical boundaries, including a map and coordinates of the project clearly showing the projected area of land or air that may be affected by the project activities, or, if it is—
    i. a linear activity, a description of the route of the activity and an alternative route, if any; or
    ii. an activity on a water body, the coordinates within which the activity is to be undertaken;
c) an evaluation of project alternatives, including a zero or no-project alternative in terms of project location, project design or technologies to be used, and a justification for selecting the chosen option;
d) the design of the project and any other project related components and associated facilities, including the activities that shall be undertaken and a description of the major material inputs to be used during construction or development and operation of the project;
e) the estimated cost of the project evidenced by a certificate of valuation of the capital investment of the project, issued by a qualified and registered valuer;
f) the size of the workforce;

g) a description of the manner in which the proposed project and its location conform to existing laws, standards and international agreements governing the projects, including reference to relevant plans required under the Physical Planning Act, 2010 and Building Control Act, 2013;
h) an indication of permits, licences or other approvals that may be required for the project; baseline conditions of the physical, biological and socio-economic environment of the project area, including results of relevant studies and other geophysical and geotechnical studies;
i) a description of potential direct, indirect, induced, cumulative, transboundary, temporary and permanent environmental, health, social, economic and cultural impacts of the project and their severity, and the proposed mitigation measures to be taken during the planning, design, pre-construction, construction, operational and decommissioning phases of the project;
j) proposed mitigation and preparedness measures for potential undesirable impacts that may arise at project implementation, but were not contemplated at the time of undertaking the project brief;
k) a description of climate-related impacts associated with the project, including potential climate benefits and carbon footprints of the proposed project, as well as the potential vulnerability of the proposed project or activity to climate change, and the proposed adaptation and mitigation measures;
l) a description of alternative resettlement areas for project affected persons, if any, their associated environmental and social impacts, and or any plans for compensation to project affected persons;
m) an environmental management and monitoring plan developed in accordance with regulation 46, incorporating climate adaptation and mitigation plan;
n) plan for stakeholder engagement throughout the proposed project or activity development, including details on how to address potential related grievances or requests for information, and evidence of stakeholder consultation.

2.12 The National Environment (Waste Management) Regulations, 2020

These regulations apply to construction waste which should be managed in a way such as to avoid environmental pollution and public health impact. UWA shall ensure there is proper contractual agreement with licensed solid waste handlers and that solid wastes are disposed in the manner prescribed by the regulations.

2.13 The National Environment (Noise Standard and Control) Regulations, 2002

The regulation provides standards for:

a) The maximum permissible noise levels to which a person may be exposed from a facility, activity or construction site
- Control of noise and mitigating measures for the reduction of noise levels

Regulation 6 establishes permissible noise levels in the following sub regulations;

Regulation 6 (1) provides that the maximum noise levels to which a person may be exposed from any area shall not exceed the level specified in Column 2 of Part 1 of the First Schedule.

Regulation 6(4) provides that the maximum noise level from a construction site to which a person in a

facility specified in column 1 of Part IV of the First Schedule may be exposed shall not exceed the level specified in Column 2 during the time specified in that part.

Regulation 7(1) states that no person shall, for any activity specified in regulation 6, emit noise in excess of the permissible noise level, unless permitted by a license issued under these regulations.

Table 1: Maximum Permissible Noise Levels for Construction Site

Column 1	Column 2	
Facility (Leq) in dB (A)	Maximum Noise Level permitted	
	Day	Night
Hospitals, Schools, Institutions of Higher learning, homes for the disabled etc.	60	50
Buildings other than those prescribed in paragraph (i) above	75	65
Residential	60	40

Time Frame:
Day 6:00 am - 10:00 pm
Night 10:00pm - 6:00 am
**The time frame takes into consideration human activity*

These noise standards apply to the construction of the project. During construction of the project, noise generated should not exceed limits prescribed by these regulations.

2.14 International Conventions and agreements

The following conventions are some of the most relevant to the conservation ofbiodiversity in Uganda:

1. **Convention on Biological Diversity, 1992**

In 1993, Uganda became a signatory to the Convention on Biological Diversity, which in Article 8, obliges member states to:

- Establish a system of protected areas
- Develop guidelines for the selection, establishment and management ofprotected areas
- Promote the protection of ecosystems, natural habitats and themaintenance of viable populations of species in natural surroundings

2. **Convention on International Trade in Endangered Species of Wild Fauna andFlora (CITES)**

Uganda is a party to CITES, which obliges member states to adhere to the recommendations of the Conference of Parties with respect to trade in endangeredspecies.

3. Ramsar Convention on Wetlands, 1971

The Ramsar Convention on Wetlands emphasizes the need to conserve wetlands and requires member states to include at least one wetland on the list of Wetlands of International Importance. L. George within the vicinity of QENP is one of the Ramsar sites found in Uganda which contains some of the endangered bird species.

4. Convention on migratory species of wild animals (CMS)

Realizing that animal migration is a global phenomenon in response to biological requirements, several countries have come together under the CMS, also known as the Bonn Convention, to cooperate in the conservation of animals that migrate across national boundaries and between areas of national jurisdiction and the sea. The Convention aims to improve the status of all threatened migratory species through national action and international Agreements between range states of particular groups of species. Agreements can range from legally binding multilateral treaties to less formal memoranda of understanding. The object of such agreements is to restore the migratory species to a favorable conservation status or to maintain it at that status. The Convention has two appendices: Appendix I lists endangered migratory species, Appendix II lists migratory species to be subject to agreements. It also establishes a scientific council to provide advice on scientific matters.

2.15 The World Bank Environmental and Social Framework

This project is financed by the World Bank and as such, projects financed by the World Bank need to comply with the requirements of the World Bank Environmental and Social Standards (ESS) contained in the Environmental and Social Framework (ESF).

This project triggers ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS7, ESS8 and ESS10 and the table below shows the key provisions of the ESSs.

Table 2: Key Provisions of ESSs

Environmental and Social Standard	Provision
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	ESS1 provides for carrying out an environmental and social assessment of the project to assess the environmental and social risks and impacts of the project throughout the project life cycle. The preparation of this Project Brief is in conformity with ESS1 and also conforms with the Project ESMF, LMP and the WBG EHS General Guidelines.
ESS2: Labor and Working Conditions	ESS2 promotes the fair treatment, non-discrimination provision of equal opportunities and safe working conditions for workers engaged on projects. It strongly encourages protection of all project workers, including vulnerable groups such as women, persons with disabilities, children (of working age) and migrant workers, contracted workers and primary supply workers, as appropriate. It provides certain requirements that the project must meet in terms of working conditions, protection of the work force (especially the prevention of all forms of forced and child labour), and provision of a grievance mechanism that addresses concerns on the project promptly and uses a transparent process that provides timely feedback to those concerned. The

	project prepared the Labour Management Procedures as well as OHS Protocols which shall be used to guide the construction of the live fence in accordance with ESS2. The construction of the live fence shall also be guided by the WBG EHS General Guidelines which contain OHS measures for construction.
ESS3: Resource Efficiency and Pollution Prevention And Management	The ESS3 provides requirements for projects to achieve the sustainable use of resources, including energy, water and raw materials, as well as implement measures that avoids or reduces pollution resulting from project activities. The standard places specific consideration on hazardous wastes or materials and air emissions (climate pollutants) given that the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of present and future lives. The activity shall adopt the use of plastic poles as one of the measures to address ESS3.
ESS4: Community Health and Safety	This standard recognizes that project activities, project equipment and infrastructure increase the exposure of project stakeholder communities to various health, safety and security risks and impacts and thus recommends that projects implement measures that avoids or limits the occurrence of such risks. It provides further requirements or guidelines on managing safety, including the need for projects to undertake safety assessment for each phase of the project, monitor incidents and accidents and preparing regular reports on such monitoring. ESS4 also provides guidance on emergency preparedness and response. The Occupation Health and Safety Protocols prepared under the IFPA-CD project will guide in addressing the issues related to community health and safety in accordance with ESS4.
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	This standard seeks to avoid involuntary resettlement. ESS5 promotes consideration of feasible alternative project designs to avoid or minimize land acquisition or restrictions on land use, especially where this would result in physical or economic displacement, while balancing environmental, social, and financial costs and benefits, and paying particular attention to gender impacts and impacts on the poor and vulnerable. ESS5 promotes engagement with affected communities, including host communities, through the process of stakeholder engagement described in ESS10. This is applicable as some communities have beehives in the park and will need continued access even after the construction of the electric fence.
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	ESS6 promotes the conservation of biodiversity or natural habitats and supports the protection and maintenance of the core ecological functions of natural habitats and the biodiversity they support. It also encourages projects to incorporate into their development, environmental and social strategies that address any major natural habitat issues, including identification of important natural habitat sites, the ecological functions they perform, the degree of threat to the sites, and priorities for conservation. Some of the mitigation measures mentioned in this Project Brief are aimed at addressing issues under ESS6.
ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	This standard seeks to ensure that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of indigenous peoples. ESS7 promotes sustainable development benefits and opportunities for Indigenous Peoples in a manner that is accessible, culturally appropriate and inclusive. ESS7 is not applicable under this activity.
ESS8: Cultural Heritage	This standard sets out general provisions on cultural heritage preservation and recommends protecting cultural heritage from the adverse impacts of project activities. Although there are no known cultural heritage sites in the direct and indirect influence of the electric fence line, a Chance Find Procedure has been included.
ESS10: Stakeholder Engagement and Information	ESS10 seeks to encourage open and transparent engagement with project-affected parties throughout the project life cycle. The standard establishes a systematic approach to stakeholder engagement and helps to identify stakeholders and build and maintain a constructive relationship

Disclosure	with them, as well as disclose information on the environmental and social risks and impacts to stakeholders in a timely, understandable, accessible and appropriate manner and format. It recommends that stakeholder engagements are commenced as early as possible in the project development process and continued throughout the lifecycle of the Project. This allows for stakeholders' views to be considered in the project design and environmental and social performance. ESS10 also provides for establishment and implementation of a grievance mechanism to receive and facilitate resolution of concerns and grievances. Various stakeholders were consulted as reflected in the Project Brief (Chapter 6) and more consultations have been planned in accordance with ESS10.

TABLE 3: COMPARISON BETWEEN THE WORLD BANK ESF AND UGANDA'S COUNTRY SYSTEM

Good International Practice	Uganda aligned?	Comments
VISION AND OVERALL GOALS		
Environmental sustainability, including action to support climate change mitigation and adaptation	YES	- Constitution (1995) requires GOU to ensure environmental protection & provides Ugandans a right to clean & healthy environment.

		- Vision 2040 outlines goals: political, economic, social, environmental, and cultural. Aspires to sustainable socio-economic development that ensures environmental quality and ecosystem resilience. - National Environment Management Policy (1994) calls for sustainable development that maintains and enhances environmental quality & resources to meet needs of present & future generations. - National Land Use Policy, 2007: promote land use that ensure sustainable utilization and management of environmental, natural and cultural resources for national socio-economic development. - Climate Change Policy 2013 promotes harmonised and coordinated approach towards a climate resilient and low-carbon development for sustainable development. Promotes conservation of water, wildlife, forests and fisheries in climate change adaptation and mitigation measures. - NEA 2019 has a variety of clauses (e.g. section 69) requiring promoting of activities that improve climate change resilience, as well as preventing activities that contribute to climate change.
Social development and inclusion, equality and non-discrimination	YES (in theory) PARTIAL (in practice)	*IN THEORY:* - NEA 2019 defines "environment" broadly to include land, water, air, atmosphere, climate, sound, odour and taste, animals and plants; social factors of aesthetics, health, safety and wellbeing of people and human interaction with both the natural and the built environment; - NEA 2019 5(b) provides for "equitable, gender responsive and sustainable use of the environment and natural resources, including cultural and natural heritage, for the benefit of both present and future generations" - National Gender Policy 1997: mainstreams gender concerns in the national development process to improve social, legal/civic, political, economic and cultural conditions of Ugandans, particularly women. *IN PRACTICE* - There is still discrimination in labour, especially regarding gender and disability, in large projects, recruitment, and social stigma against persons with HIV/AIDS. - There are still a number of interventions required at every level in the country to better ensure that gender, HIV and AIDS are properly mainstreamed.
Avoid or mitigate adverse environmental and social impacts, but also maximise benefits	YES (in theory PARTIAL (in practice)	*IN THEORY* - Mitigation hierarchy is explicitly required by the NEA (2019) (section 5.2(j) and further elaborated (section 115) - (avoid, minimize, restore, offsets), but maximizing benefits is not emphasized. Implementation is variable (see later). *IN PRACTICE* - In practice, ESIAs are stronger regarding environmental issues, weaker on social issues, and even weaker on health and gender. - Avoidance and/or mitigation of impacts appears to be relatively well planned and implemented in World Bank and other donor funded projects, but less so for government, parastatals or some private sector projects.
Standard 1: Assessment and Management of Environmental and Social Risks and Impacts		
i. ESIA required for high risk projects	YES	- NEA 2019 (section 110-4) requires ESIAs for projects likely to have environmental impacts. Projects needing a full EIA are stipulated in Schedule 5. Also requires monitoring and audits - Mining Act, 2003 requires EIAs for exploration and mining (in accordance with the NEA) - Investment Code Act Cap 92 requires every investment licence to take necessary steps to ensure that its business does not cause any injury to the ecology or the environment.

ii. ESIA must include all standard contents (as specified)	YES	- 1999 EIA Regs outline the requirements, which are standard - 1997 EIA guidelines establish three major phases for the EIA; Screening impact study phase and decision making. Process is standard and straightforward.
iii.Country must properly implement ESIA/ESCP/ESMP throughout the project life cycle – following the mitigation hierarchy	YES (in theory) PARTIAL (in practice)	*IN THEORY* - The NEA (2019) (section 5.2(j) explicitly requires the application of the mitigation hierarchy in ESIAs (avoid, minimize, restore, offsets), - Section 49(3) of the NEA requires a proponent to have and implement an "environmental Management System", which seems similar to the more commonly used term ESMP. *IN PRACTICE* - implementation is variable – good in the case of donor or Bank funded projects, but modest to poor otherwise.
iv.ESIAs must include consideration of alternatives and good stakeholder engagement	YES (in theory PARTIAL (in practice)	*IN THEORY:* - The NEA (2019) requires the considerations of alternatives in ESIAs. Also, the 1998 regulations section 7(1) (k) (project brief), section 13(2) (g) (scoping), 14 (1)(h)(k) (ESIA contents) all require consideration of alternatives. *IN PRACTICE* - See ESS10 for discussion on stakeholder consideration - Consideration of alternatives appears to be relatively good for World Bank and other donor funded projects, but less so for government, parastatals or some private sector projects.
v. ESIAs must especially consider risks to human security, escalation of conflict, violence and crime; esp. for vulnerable people	NO	- Human security is not explicitly covered by the NEA 2019, and the 1998 regulations also do not refer to issues such as risks to human security, escalation of conflict, violence and crime or violence.
vi.ESIA must also consider risks and impacts associated with the project´s primary suppliers	NO	- Not covered by the NEA nor regulations
vii.ESCP and ESMP must allow for adaptive management if a project changes or there are unforeseen circumstances.	PARTIAL	- Current legislation allows for a licence to be withdrawn if implementation is not acceptable to the authorities, but the process enabling adaptive management is unclear. - Adaptive management has been evident in World Bank and other donor funded projects, but less so for government, parastatals or some private sector projects.
viii.ESCP and ESMP must be monitored for compliance and effectiveness	YES (in theory) PARTIAL (in practice)	*IN THEORY* Section 28 of NEA Regs allow for cancellation of approved ESIA at any time where - - there is non-compliance with conditions in the certificate; - where there is a substantial modification of the project - where there is a substantive undesirable effect not contemplated in the approval. - A revocation under sub-regulation (1) shall lead to the automatic cancellation of the certificate issued under paragraph *(c)* of regulation 26. - (3) Where a certificate of approval is cancelled under sub-regulation (2) the developer shall stop further development pending rectification of adverse impact. *IN PRACTICE* - In practice the mandated institutions have limited resources to undertake monitoring, and, with some exceptions, monitoring and compliance assessment is inadequate or absent. In most cases, there is disproportionate reliance on the proponent to self-monitor and report. - Monitoring takes place for World Bank and other donor funded projects, but less so for government, parastatals or some private sector projects.
ix.External/3rd party experts should be used to verify above	NO	Independent review is not specifically required under the existing EIA Regulations and as a result EIAs are commonly reviewed by Government agencies and other key stakeholders relevant in the sector under which the proposed project falls;

x. Country must have adequate technical institutional capacity and legal mandate to implement ES1	PARTIAL	The mandated institutions have limited resources to undertake monitoring, and, with some exceptions, monitoring and compliance assessment is inadequate or absent. In most cases, there is disproportionate reliance on the proponent to self-monitor and report. Monitoring takes place for World Bank and other donor funded projects, but less so for government, parastatals or some private sector projects.
Standard 2: Labour and Working Conditions		
i. Must be adequate safety and health at work.	YES (in theory)	*IN THEORY* - National Industrial Policy 2008 provides strategies for OHS. - Workers Compensation Act, 2000 provides for the provision of financial compensation for work related injury or illness. - Occupational Safety and Health Act of 2006 consolidates, harmonizes and updates the law relating to occupational safety and health. It requires that every factory is clean, including floors, walls, workrooms, ceiling or top of rooms.
	PARTIAL (in practice)	*IN PRACTICE* - There is still no policy to guide its implementation of the Occupational Safety and Health Act (2006). This, along with the poor staffing and funding of MoGLSD, has left many workers in unsafe working conditions. - There are conflicts between the mandates in the OSH and the Physical Planning Acts. There is also limited coordination between DOSH, Police, and Ministry of Health on data collection and oversight of OSH compliance in the workplace. - The Auditor General (2016), reports a low rate of inspection and many workers continue to work in precarious conditions at risk of occupational diseases and accidents. - HS practices are in place for World Bank and other donor funded projects, but less so for government, parastatals or some private sector projects.
ii. Must be fair treatment, non-discrimination and equal opportunity of project workers.	YES (in theory)	*IN THEORY* -Article 31(b) of Constitution guarantees (inter alia) gender equality and labour rights, and equal opportunity in political, economic, and social activities, including through affirmative action. -Vision 2040 prioritises gender equality -National Development Plan II (2015-2020) prioritises the mainstreaming of women's empowerment and gender equality in key sectors. -Domestic Violence Act (2010) ensures protection of women from acts or omissions that may harm them. The 2012 Regulations of the 2006 Employment Act prohibit sexual harassment in the workplace.
	PARTIAL (in practice)	*IN PRACTICE* -Employment laws have weak or non-existent penalties for violations. Sections 43 to 46 of the Employment Act No 6 (2006) address the payment of wages and outlaws the making of certain deductions from an employee's pay, but offers no remedy for non-compliance in the timely payment of wages or for unlawful deductions. Section 53 of the Act sets the maximum acceptable working hours per day and per week but, with exception of overtime, the law provides no remedy for workers who are obliged to work beyond even 10 hours a day. Section 59 of the Act requires employers to provide written particulars (i.e., contracts) to their employees, but provides no penalty/fine for failures to do so.
iii. No forced or child labour.	YES (in theory)	*IN THEORY* -The Employment Act (2006) (*inter alia*) prohibits the use of child labour -Labour policies that specifically address Gender and Vulnerability include the 2012 Employment (of Children) Regulations, 2012 Employment (Sexual Harassment) Regulations, National Gender Policy, National Action Plan on Elimination of the Worst Forms of Child Labour in Uganda (2012/13-2016/17), and National Policy on HIV/AIDS and the World of Work (2007).

	NO (in practice)	*IN PRACTICE* - No applicable legislation on a minimum wage. - Section 32 of the Employment Act contradicts other Ugandan laws, by allowing for the employment of children aged 14 for "light work" under adult supervision (in contradiction to Section 7 of the Children (Amendment) Act (2016) which sets the employment age at 16). - The Employment Act fails to clearly define hazardous employment. - The legal framework also fails to provide express punitive penalties for those found in violation of laws prohibiting the employment of minors, contributing to high school dropout rates, teenage pregnancies and health issues as children find work on project sites.
iv. Must be freedom of association and collective bargaining of project workers consistent with national law.	YES (in theory)	*IN THEORY* - National Constitution (1995) guarantees, in its Objective XIV(a), the right of all Ugandans to (inter alia) freedom of association, the right to collective bargaining, and paid vacation (Chapter Four). These and other rights are detailed in a set of laws that includes the Employment Act (2006), Workers' Compensation Act (2000), NSSF Act (1985), Labour Unions Act No 7 (2006), and Labour Disputes (Arbitration and Settlement) Act (2006), Occupational Safety and Health Act (2006).
	PARTIAL (In practice)	*IN PRACTICE* - Inadequate political space/bargaining power for ethnic minorities and historically disadvantaged groups - The casual nature of employment affects unionization, as employees paid per day are unable to make the monthly check off in support of union activities. On an individual level, employers have also deployed legal machinery to delay and subsequently deny access to justice, especially for vulnerable workers.
v. Project workers must have accessible means to raise workplace concerns.	PARTIAL (In practice)	See below
vi. Protect project workers, including women, disabled, children (of working age) migrant workers, contracted workers, community workers and primary supply workers, as appropriate.	YES (In theory)	*IN THEORY* - The Employment Act (2006) seeks to harmonise relationships between employees and employers, protect worker's interests and welfare, and safeguard their occupational health and safety. It provides guidance on the types of labour and conditions under which a person may be hired for project works, defines workers' rights in the construction and post-construction phases, and prohibits sexual harassment, the use of child labour, and discrimination in recruitment and payment of wages based on gender, race, colour, religion, political affiliation, HIV/AIDS status and disability. - The Labour Disputes (Arbitration and Settlement) Act (2006) provides for the establishment of a strong Industrial Court with more effective and expeditious disputes resolution procedures to reduce the length of dispute settlements. The Act seeks to promote social dialogue, facilitate collective bargaining, and modernise procedures to address unresolved or mismanaged labour disputes that may have adverse effects. - The 2011 Employment Regulations deter employers from the casualization of labour by granting contractual/permanent rights to any worker exceeding four (4) months of service. Having a more permanent workforce across the project cycle also reduces the risk of labour influx.[1]
	PARTIAL (In practice)	*IN PRACTICE* - Most workers are either undocumented or on casual employment, allowing employers to deny them access to rights (annual leave, weekly rest, overtime pay…) and exploit them. This is common in construction projects, partly because of the temporary nature of works. - Whereas, Regulation 39 of the 2011 Employment Regulations sets a ceiling on casual employment of 4 months and requires that employees thereafter be given written contracts and entitled to all benefits provided by law, this is rarely followed, due to low capacity in MoGLSD to inspect workplaces and enforce these provisions. - In practice, adherence is inconsistent – depending on the project, proponent and funder.

vii.Written, clear and understandable contracts in place for project workers	YES (in theory) PARTIAL (in practice)	*IN THEORY* - Employment Act 2006 is the governing legal statutory instrument for the recruitment, contracting, deployment, remuneration, management and compensation of workers. Mandates Labour Officers to regularly inspect the working conditions of workers to ascertain that the rights of workers and basic provisions are provided, and workers' welfare is attended to. *IN PRACTICE* - Adherence is inconsistent – depending on the project, proponent and funder.
viii.Grievance mechanisms in place	YES (in theory) PARTIAL (in practice)	See vi
ix.Borrower ensure third parties who engage contracted workers are legitimate/reliable and have applicable labour management procedures	YES (in theory) PARTIAL (in practice)	See vi
Standard 3: Resource Efficiency and Pollution Prevention and Management		
i.Promote the sustainable use of resources, e.g. energy, water and raw materials.	YES	- NEA 2019, Section 5 (d) includes the principle that there shall be "optimum sustainable yield in the use of renewable natural resources" - 2011 EIA Guidelines for water resources related projects assist planners, developers, practitioners safeguarding water resources through EIAs. - Land Act Cap 227 obliges any person who owns or occupies land to manage and utilize it in accordance with the Water statute, the National Environment Act, the Forest Act and any other law.
ii.Avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities	YES (in theory) PARTIAL (in practice)	*IN THEORY* - National Water Policy, 1999: promotes integrated water resources management. Stipulates that drainage water shall not pollute surface or ground water, prevent increase in salinity levels, prevent soil pollution. - Water Act cap 152: Provides for use, protection, supply, management of water; establishes water and sewerage authorities, facilitates devolution of water and sewerage undertakings. Regulations are: Water Resources Regs (1998), Water Supply Regs (1998), Waste Water Discharge Regs (1998), Sewerage Regs (1999). - Public Health Act Cap 281 requires every local authority to take measures for preventing any pollution dangerous to public health. *IN PRACTICE* - Pollution remains a significant problem throughout Uganda (air, soil, water and noise). As with most other safeguards, adherence to best practice is relatively good for bank or donor funded projects, and those of stock-exchange listed companies, but poor when it comes to smaller proponents, many government projects and where contractors from some countries are involved.
iii.Avoid or minimize project-related emissions of short and long-lived climate pollutants	YES	- NEA 2019, section 69 deals extensively with climate change, while Section 5(s) includes (inter alia) the principle that in the implementation of public private and projects, approaches that increase both the environment and people´s resilience to impacts of climate change, are prioritized; - NEA 2019, Section 6 creates a Parliamentary Committee on Environment to (*inter alia*) provide guidance in the formulation and implementation of environmental and climate change PPPs. Section 9(2)(a) empowers NEMA to advise on the formulation of such PPPs

iv. Avoid or minimize generation of hazardous and non-hazardous waste.	YES (in theory)	*IN THEORY* - Agricultural Chemicals (Control) Act, No. 1 of 2006 controls and regulates the manufacture, storage, distribution and trade in, use, importation and exportation of agricultural chemicals - Uganda is a Party to the Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.
	PARTIAL (in practice)	*IN PRACTICE* - There are still a number of challenges (e.g. in the mining sector) regarding hazardous waste management, especially in artisanal mining where the chemicals are not well regulated and workers are not adequately protected from chemical risks. Not enough is being done by government, the private sector, CSOs and other stakeholders to raise awareness. There is widening gap between CSOs and government and the private sector, making it difficult for the establishment of a cordial working relationship. - The oil and gas industry in Uganda has been using various chemicals during exploration and production. There are ongoing pollution concerns. - There is a general lack of awareness among consumers and collectors of the potential hazards of e-waste to human health and the environment. - It is estimated that only 20-30% of the solid waste generated in Kampala is collected and disposed of properly.
v. To minimize and manage the risks and impacts associated with pesticide use	YES (in theory)	*IN THEORY* - Crop Protection Department in the Ministry of Agriculture, Animal Industries and Fisheries for plant pest prevention or eradication programmes. The department is also responsible for enforcing regulations on registration and the use of pesticides and other agrochemicals. - Agricultural Chemicals Control Board (ACB) regulates herbicides and pesticides - District Agricultural Officers and District Fisheries Officers are responsible for the surveillance and monitoring with regards to pest management and pesticide use chain. - There are several NGOs that monitor pest management.
	PARTIAL (in practice)	*IN PRACTICE* - Whilst there are no gaps between international good practice on pest management and the Ugandan legal system, there are no comprehensive regulations to guide the implementation of the various Acts. This hampers the control of the use of damaging pesticides.
Standard 4: Community Health and Safety		
i. Anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from routine and non-routine circumstances.	YES (in theory)	*IN THEORY* - Health and wellbeing are strongly articulated in the Constitution of Uganda and these principles have been carried through to the environmental policy and the NEA; - The EIA Regs require NEMA to send a Project Brief and/or EIA to lead agencies for comments. Lead agencies vary by activity and sector so a health-related project (or one with major health implications) is sent to the Ministry of Health (MoH). - Relevant sector legislation includes the Employment Act, No 6 of 2006, the Occupational Safety and Health Act, No 9 of 2006 and the Workers Compensation Act, No 8 of 2000. - EIA regs specifically require EIAs to consider health issues - 2008 Guidelines for OHS, Including HIV provide a framework for workplace health & safety for all workers within the health sector. - HIV/AIDS Policy 1992: recognizes HIV/AIDS is a risk in infrastructure projects, encourages employers to develop in house HIV/AIDS policies, provide awareness and prevention measures to workers and avoid discriminating against workers with HIV/AIDS.
	PARTIAL (in practice)	

		- National Health Policy, 2010 requires GOU to address increasing burden of water borne diseases associated with safe and clean water, hygiene and environmental sanitation. - MoGLSD has a Directorate of Labour, Employment, Occupational Safety and Health, and is responsible for implementation of Labour policies and laws. *IN PRACTICE* - Health and safety issues are generally taken care of in World Bank and donor funded projects, but less so otherwise - Most EIAs conducted focus mostly on environmental issues, with social and health issues receiving considerably less attention. - As in other countries, while the impacts of the project on the receiving environment are assessed in the EIA, issues around occupational health and safety at the workplace are often neglected because worker and workplace health are considered under separate bodies of law
ii.Promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dams.	PARTIAL	- 2019 NEA provides for emerging environmental issues including climate change - Principle 5(s) of the NEA requires that in the implementation of public and private projects, priority must be given to approaches that increase both the environment and people´s resilience to the impacts of climate change. - Article 69 of NEA deals specifically with managing climate change impacts on ecosystems. The NEA requires ESIAs for Hydro-power generation facilities; including dams with an installed capacity of more than 1 megawatt, the construction of valley dams and valley tanks where the threshold is 1,000,000 m^3 or more. - The NEA establishes the Policy Committee on Environment, whose responsibilities include providing guidance in the formulation and implementation of environmental and climate change policies, plans and programmes (PPPs) - The NEA establishes NEMA, whose functions include advising on the formulation and implementation environmental and climate change PPPs; - Uganda has a National Policy for Disaster Preparedness and Management, and makes disaster preparedness and management an integral part of the development planning process. The policy calls for community participation, public awareness and education, institutional capacity building, adequate expertise and technology, vulnerability analysis, human rights observance, social, environment and economic costs, climate change, partnership and coordination and regional and international partnerships. - The Uganda National Climate Change Policy 2013 aims at ensuring a harmonised and coordinated approach towards a climate resilient and low-carbon development path for sustainable development in Uganda. It seeks to promote and strengthen the conservation of water, wildlife, forests and fisheries in climate change adaptation and mitigation measures. but there is no legal framework for implementing the Policy. - However, there are substantive gaps between the international good practice requirements on the Safety of Dams and the Ugandan regulatory framework. There are inadequate competent professionals to design and supervise the construction of dams and implementation of dam safety measures through the project cycle. There is also no strong institution to regulate the safety of dams in Uganda.
iii.To avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials.		See 4i and 4ii
iv.To have in place effective measures to address emergency events.		See 4i and 4ii
v.Ensure safeguarding of personnel and property carried out in a manner that avoids or minimizes risks to project-affected communities.		See 4i and 4ii

vi. Ecosystem services (provisioning and regulating) not compromised	YES (in theory)	*IN THEORY* - The Constitution (1995) requires GOU to ensure environmental protection & provides Ugandans a right to clean & healthy environment. - Section 4(1) of the NEA (2019), proclaims the "nature has the right to exist, persist, maintain and regenerate its vital cycles, structure, functions and its processes in evolution". Section 4(2) provides that "a person has a right to bring an action before a competent court for any infringement of rights of nature - The NEA (Art 44) empowers the Minister of the Ministry of Water and Environment (MoW&E) to prepare a National Environment Action Plan (NEAP) which will include in clause (3)(h) the maintenance of ecosystem services and measures for preventing, reversing or mitigating any deleterious effect.
	PARTIAL (in practice)	- In 2011, the MoW&E set up the Environment Protection Police Unit (EPPU) to enforce environmental laws and prevent the degradation of protected areas. The functions of the EPPU are wide-ranging and include (inter alia) monitor and enforce compliance with laws regarding the protection and maintenance of ecosystem services. - The National Environment (Wetlands, River Banks and Lake Shores Management) Regulations, 2000 highlight the importance of wetlands and other water bodies in the maintenance of a healthy ecosystem and state that they should be protected from the negative effects of development projects. Under Regulation 5, EIA is mandatory for all activities in wetlands that could have an adverse impact. Regulation 8 provides for declaration of certain wetlands as fully protected wetlands because of national or international importance for biodiversity, ecology, natural heritage or tourism, and it prohibits all activities in such wetlands except for research, tourism, or restoration or enhancement. Various of the regulations require protection zones of between 30 and 200 meters along riverbanks and lake shores and state that no activity shall be permitted in the protection zones without the approval of the NEMA Executive Director. Local government environmental officers have a duty to assist in implementation of the regulations. - Art 54 of NEA 2019 (wetland management) requires the lead agency to identify wetlands of local, national and international importance as ecosystems and habitats of species of fauna and flora - Art 67 of NEA 2019 (payment of ecosystem services) empowers NEMA to issue guidelines and prescribe measures and mechanisms for (*inter alia*): - identifying and valuing ecosystem services that are critical for the environment and human well-being; - the instruments and incentives to generate, channel, transfer and invest economic resources for the conservation, restoration and sustainable use of the sources of ecosystem services; and - the criteria for the design of payment for ecosystem schemes that ensure ecosystem sustainability. *IN PRACTICE* - Wetland cover decreased from 13 per cent in 1990 to 8.6 per cent in 2015. It is estimated that Uganda loses 846 km^2 of its wetlands annually. - Fish production is depleted due to over fishing, illegal fishing gear and invasive species. - Most rural water samples do not comply with national drinking water quality standards. - Soil fertility is compromised because of nutrient mining, loss of soil cover and organic matter, low rainfall infiltration and soil compaction. - Within protected areas, most wildlife populations are stable but human-wildlife conflicts have increased because of habitat degradation, growth in urban settlements, agriculture expansion, and infrastructure developments. Other threats are illegal wildlife trade and alien invasive species. - Cultural sites are threatened by quarrying, agriculture and erosion. - Natural forest cover has been declining because of agriculture, charcoal and wood fuel demand, infrastructure development, and excessive harvesting. - Rangelands are under pressure from crop production, overgrazing, privatization of the communal rangelands and invasive species.
vii. Safety of dams must be ensured		See 4ii

Standard 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement		
i. Avoid involuntary resettlement & forced eviction: When unavoidable, minimize by exploring project design alternatives	YES (in theory) PARTIAL (in practice)	*IN THEORY* - 1995 Constitution guarantees protection of private property rights and the Government's power to compulsorily acquire private land for public use or in public interest. The terms "public use" and "public interest" however, are not clearly defined, leaving room for varied interpretations. - Article 237(3) establishes four distinct land tenure systems, but these multiple regimes require multiple approaches to compensation for land. *IN PRACTICE* - The law does not, however, define any corresponding tenure-specific approaches to land acquisition or compensation, which has resulted in contested compensation processes in practice.

ii. Mitigate impacts from land acquisition or restrictions on land use by providing timely compensation for asset loss at replacement cost and assisting displaced persons to improve or restore, their livelihoods and living standards, to pre-displacement levels or to levels prevailing prior to beginning of project implementation, whichever is higher.	YES (in theory)
	
	PARTIAL (in practice)
		IN THEORY
		- The Land Acquisition Act Cap 226 governs compulsory acquisition of land for public purposes in addition to the Art 26 (2) of Constitution of Uganda and S. 42 and S.77 of the Land Act.
		- Compensation and resettlement rights of spouses and children are protected under the Constitution and Land Act (Cap 227). The consent of spouse and children must be acquired prior to any transaction by head of households on land on which the family lives.
		
		IN PRACTICE
		- Above Land Acquisition Act contradicts the Constitution on several points. Law does not recognise other rights to land (e.g., the right to farm, build, hold a mortgage, occupy and grant use to another) nor the eligibility of renters, licensees, informal settlers or users of public lands for compensation when the land on which they reside or operate is compulsorily acquired, occupation or use is less than 12 years, or occupants/users have ignored calls to leave.
		- No legal requirement in cases of land acquisition to set a cut-off-date after which people moving into a project area are no longer entitled to compensation, regulate the management of the displacement and resettlement of project-affected persons, prioritise avoidance and minimisation of land acquisition, require the special protection of vulnerable persons, require the conducting of socio-economic and cultural studies or the undertaking of stakeholder consultation, participation, and information sharing, or define the social development aspects of the resettlement process.
		- In some case studies, resettled people were not assisted to resettle in their new communities; the resettlement policy does not have regard to the impact of the new community in which the resettled person has been resettled to
		- The 2016 Safeguard Diagnostic Report listed (*inter alia*) the following as gaps between WB requirements and Ugandan laws:
		  - Ugandan laws do not appear to make provisions for avoidance or minimizing of involuntary resettlement
		  - The legal right to resettlement is applicable to only those with propriety interest in the affected land. Entitlement for payment of compensation is essentially based on the right of ownership or legal user/occupancy rights.
		  - In Uganda law those without formal legal rights or claims to such lands (e.g. tenants) are not entitled to be resettled or compensated.
		  - Those without formal legal rights or claims to such lands and/or semi-permanent structures are not entitled to resettlement assistance or compensation.
		- The 2019 SRM Technical report identified the following weaknesses:
		  - Outdated, incomplete and/or overlapping laws and regulations, and lack of a clear and comprehensive national policy and guidelines;

		- Weak institutional arrangements and unclear mandates, roles, and responsibilities; - Multiple tenure regimes with no corresponding specific acquisition procedures; - Lack of provisions for avoiding or minimising involuntary resettlement or ensuring that it occurs prior to displacement or restriction of access; - Lack of clear eligibility criteria for compensation and social support; - Prevalence of cash compensation, with no clear provisions for other forms of compensation (relocation assistance, transitional support or civic infrastructure…); - Failure to pay compensation at full replacement cost; - Budget shortfalls, leading to delays, negative social impacts, and non-payment of Compensation - Inadequate and ineffective stakeholder engagement, community participation, and social accountability, GRM, and monitoring and evaluation; - Lack of systematic engagement with civil society or private sector actors (thereby foregoing the benefits of third-party monitoring and guidance); and - Inadequate inclusion of women and vulnerable groups.
iii.Improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure.	PARTIAL	See 5 ii
iv.To conceive and execute resettlement activities as sustainable development programs, providing sufficient investment resources to enable displaced persons to benefit directly from the project, as the nature of the project may warrant.	PARTIAL	See 5 ii
v. Ensure resettlement planned and implemented with appropriate disclosure of information, meaningful consultation, and informed participation of I&APs	PARTIAL	See 5 ii
Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources		
i. To protect and conserve biodiversity and habitats.	YES	- The Constitution (1995) requires GOU to ensure environmental protection & provides Ugandans a right to clean & healthy environment. - Section 4(1) of the NEA (2019), proclaims the "nature has the right to exist, persist, maintain and regenerate its vital cycles, structure, functions and its processes in evolution". Section 4(2) provides that "a person has a right to bring an action before a competent court for any infringement of rights of nature - Wildlife Act Cap 200 provides for sustainable management of wildlife, to consolidate laws relating to wildlife management, establishes the Uganda Wildlife Authority, requires developers doing projects which may affect wildlife to undertake EIAs - Wildlife Policy, 2014 aims at conserving wildlife in a manner that contributes to SD and wellbeing of people. Includes management of wildlife protected areas. - Forestry and Tree Planting Act (2003) provides for the conservation, sustainable management and development, and use of forests for the benefit of the people. It provides that the forests shall be developed and managed so as to conserve natural resources, especially soil, air and water quality - Forestry Policy 2001 seeks to establish an integrated forestry sector that achieves sustainable increases in the economic, social and environmental benefits from forests and trees by the people of Uganda, especially the poor and vulnerable. One of the strategies is

		to promote the rehabilitation and conservation of forests that will protect the soil and water in the country's key watersheds and river systems.
ii. Where biodiversity impacts likely, apply mitigation hierarchy and precautionary approach in project design & implementation	YES (in theory)	*IN THEORY* - Mitigation hierarchy is explicitly required by the NEA (2019) (section 5.2(j) and further elaborated (section 115) - (avoid, minimize, restore, offsets), but maximizing benefits is not emphasized. Implementation is variable (see later). *IN PRACTICE*
	PARTIAL (in practice)	- implementation is variable – good in the case of donor or Bank funded projects, but modest to poor otherwise. - Even though screening of projects is undertaken by NEMA at an early stage to identify potential biodiverse areas, political interference puts certain natural habitats at risk especially wetlands and forests.[32] - According to NEMA, members of the district land boards are a significant contributor to environmental degradation especially of wetlands where local governments have been issuing land titles in designated wetlands in contravention of conservation laws[33].
iii.Promote sustainable management of living natural resources.	YES (in theory)	*IN THEORY* - See 6 i - Policy for the Conservation & Management of Wetlands, 1995: seeks to maintain diversity of uses and users when using wetland resources. Include maintaining biodiversity of natural or semi-natural wetlands. - Fisheries Policy, 2004 aims at developing cooperation with neighbours on management of shared water bodies, and stocking to improve fisheries diversity and productivity.
	PARTIAL (in practice)	*IN PRACTICE* See 4 vi
iv.Support livelihoods of local communities, including Indigenous Peoples	YES (in theory)	*IN THEORY* - See 7 regarding Ips - National Land Policy 2013 is aimed at ensuring efficient, equitable and optimal and sustainable utilization and management of land resources for poverty reduction, wealth creation and socioeconomic development.
	PARTIAL (in practice)	*IN PRACTICE* See 4 vi
v. Seek inclusive economic development that integrates conservation needs and development priorities.	PARTIAL	- Local Government Act Cap 243 defines roles for different levels of governance for water related services and activities. Especially the provision of water services and maintenance of facilities is the responsibility of local councils in districts and urban centres with the support and guidance of relevant central government agencies.

CHAPTER 3

3.0 PROJECT AREA ENVIRONMENTAL AND SOCIAL BASELINE

Although the project will be implemented in some specific areas along the park boundary including Nyamugasani-Isingo (18km), KCCL-Karusandara (21km), Ishasha-Bwentale (9km) and Kagarama-Mahyoro (13km), that will be directly impacted on the environment and social baseline of the whole Queen Elizabeth Protected Area (QEPA) has been considered in order to give a general picture of the project site. The directly affected project areas include the parishes touching the park boundries where the electric fence is going to be constructed. They are also refered to as frontline parishes because they are directly impacted when animals cross into the farmlands. The indirectly affected areas are parishes beyond the frontline parishes who suffer from the pressures emanating in the front line parishes when animals raid.

Queen Elizabeth National Park and the adjoining Kyambura and Kigezi Wildlife Reserves are located on the equator in the Albertine Rift Valley, Uganda. The protected area comprising Queen Elizabeth National Park (1978km^2), Kyambura Wildlife Reserve (157km^2) and Kigezi Wildlife Reserve (330km^2) is referred to as Queen Elizabeth Protected Area (QEPA). QEPA is part of an extensive transboundary system that includes Kibale National Park to the northeast and Rwenzori Mountains National Park to the northwest. It is also contiguous with the Parc National des Virunga (Virunga National Park) in the Democratic Republic of Congo. Together these two protected areas completely encircle Lake Edward.

QEPA lies on the convergence zone of two distinct vegetation types. The overlap of the Central African rainforest and East African grassland biomes creates a range of diverse habitats, including open grassland, grassland with thickets, thick bush, forests, wetlands, and 250km of lakeshore. These habitats are placed within the context of the dramatic volcanic/ montane scenery of the Albertine Rift Valley. This unique convergence of landforms and vegetation supports one of the richest avian resources in the world, including 610 recorded bird species within the QEPA boundary. Large carnivores are represented by lion, leopard, and spotted hyena. Notable primates include chimpanzee, red-tailed monkey and the red colobus monkey.

Historically, there were also large numbers of elephants, buffalo, hippopotamus, topi, and Uganda kob. During the late 1950s and early 1960s, hippo numbers increased to the point where culling was required to protect QEPA from excessive vegetation loss. Now, with the exception of kobs, large mammal populations (e.g. elephants, buffalo and hippos) remain at reduced numbers following drastic poaching during the 1970s and 1980s.Though QEPA has registered some increase in mammal population including Uganda kobs, elephants, buffalos and hippos, subsistence and commercial poaching continue to cause significant problems up to today.

The Park was designated as a Biosphere Reserve in 1979 with the implicit goal of integrating sustainable human activities within the objectives of the QEPA system. This designation

implicitly endorses the principle that human activities can have a potentially constructive and supportive role in environmental protection while at the same time ensuring that the protected area contributes to human developmentin the immediate region.

3.1 Physical and Biological Resources

This section provides a broad overview of QENP and Section 3.4 presents more specific information to the project direct area of influence.

3.1.1 Geology and soils

In Pleistocene time, the protected area was influenced by great volcanic and tectonic activity associated with the formation of the rift valley. The main volcanic activity was occurred between 8000-10000 years ago (Bishop 1969). As a result, the area lies within the rift valley with a number of volcanic craters. Some are salty in nature, and these include L. Katwe famous for its artisanal saltindustry. Other volcanic lakes are fresh water lakes. The soils are volcanic and are very fertile supporting agricultural activities just outside the protected area boundaries.
QEPA has two major soil erodibility ranges. On the shores of Lakes Edward and George and along the banks of Kazinga Channel, there is a high susceptibility to erosion with high runoff rate. There is a low susceptibility to erosion with low runoff rates in Kyambura, Rwenshama and Katwe areas (UWA 2017).

3.1.2 Rainfall

The park has two rainy seasons, from March to May and from September to November, although rainfall varies greatly within the park. The highest rainfall average is 1,250 mm per year, occurring in the Maramagambo forest, while only 750 mm per year falls in the area along the Kazinga channel. The rest of the months are dry with the driest months being January and February. The savannas are, therefore, partially maintained by the limited rainfall in these sites and where rainfall increases to the north and south of the landscape, forest becomes the predominant vegetation type.

3.1.3 Drainage and Topography

The whole of Uganda drains to the River Nile. In the Albertine Graben, there are three main lakes namely Lake Albert, Lake Edward, and Lake George and the latter two are found in QEPA. The two lakes are connected by the Kazinga Channel. There are other numerous small streams entering the Lake Edward from both Uganda and DR Congo, some of which are seasonal and of minor importance to the hydrology of the lake. Its outlet, at the northernmost tip is into Lake Albert through the River Semliki. The Lake George catchment covers an area of about 9000 km^2 and is fed by numerous rivers that include Nyamwamba, Rukoki, Mubuku,Rwimi, Dura and Mpanga, most of which are drained from the catchment area of Rwenzori mountains.

3.1.4 Vegetation

Lock (1977) described 57 vegetation societies within the protected area with estimated 1400-1500 different plant species. The rich flora is due to a variety of habitats like grassland, woodland, bush land, swamps, savannah thicket and different types of wet and dry forest. Over the years, QENP has experienced an increase in woody vegetation. This increase in woody cover could be due to various factors which include: - a) the decrease in large mammals in the PA from the 1970s onwards (see above), b) continued release of the vegetation from the 1880s when people were living in the PA (Spinage 1970), c) changes in climate variables that have not been measured such as temperature and sunshine hours and d) changes infire frequency. Introduced plants including invasive plants are also recorded. Over years, the fire regimes and invasive flora are considered to have had some impact on native vegetation although the extent of these impacts are yet to be fully understood. The change of the native vegetation also entails an impact on the distribution pattern of the mammals in the park. This has therefore had an impact on the gradual changes in land cover of QENP. Around the lake shore there appears to be more swamp vegetation (Papyrus or other types) which has probably come back as a result in the decline in hippopotamus numbers. Where there is likely to have been overgrazing and trampling by hippopotamuses in the past such as along the Kazinga channel, that links Lake George to Lake Edward, the vegetation has developed into a scrubby forest of short trees or shrubs and the herb/grass layer is still very bare. Elsewhere with the decline in elephant numbersthere has been a re-growth of trees in woodland habitat. Prior research shows that both elephants and hippopotamuses have a major impact on the vegetation inQENP (Thornton, 1971; Lock, 1972, 1993; Eltringham, 1974, 1980; Lenzi-Grinilli, Viscanic and Mapesa, 1996) and it is likely some of this re-growth is due to the major declines in numbers and total biomass since the 1970s.

The recent land cover mapping produced by National Forestry Authority in 2011 concluded that land cover in the park has changed. Some vegetation types have increased in size while others have decreased. There has been proliferation of bush land in the park while the extent of woodland has reduced. There has not been much net change in grasslands. While some formerly grassland areas have become bush, some other land cover types have become grasslands and have therefore offset the loss.

The vegetation along the proposed sites as assessed from the physical assessments is basically grassland interspersed with a few Acacia trees along the Nyamugasani to Isango and Bwentale to Ishasha. In the valleys of each of these fence lines, swamp vegetation is dominant especially on the Bwentale to Ishasha section.

While the KCCL – Karusandara and Kagarama to Mahyoro fence have a mix of swamp and riverine forests type of vegetation as the two fence lines will be constructed along River Buhindagi for the case of Kagarama – mahyoro fence and across the rivers of Nyamwamba, Sebwe and Mobuku for the case of KCCL – Karusandara fence line.

3.1.5 Fauna

There are 96 species of mammals recorded in QEPA. The large mammals include, *inter alia*"

hippopotamus (*Hippopotamus amphibious*), elephant (*Loxodonta africana*), buffalo (*Syncerus caffer*), waterbuck (*Kobus ellipsiprymnus*), Uganda Kob (*Kobus kob*), warthog (*Phacochoerus aethiopicus*), Topi (*Damaliscus lunatusjimela*) and the giant forest hog (*Hylochoerus meinertzhageni*). The numerous numbers of hippopotamuses influence both terrestrial and aquatic ecosystems in the PA by grazing and trampling. The park also contains lions(*Pantheraleo)*, leopards (*Panthera pardus*) and other small cats. There are also several species of primates such as Chimpanzees and monkeys namely the red colobus (*Procolobus tephrosceles*), black and white colobus (*Colobus guereza*), and red-tailed monkeys (*Cercopithecus ascanius*). Various species of reptiles including crocodile (*Crocodylus niloticus*), bats, amphibians and small mammals are inhabitants of the park as well. The savannas of QENP and the Virunga landscape had the highest biomass of large mammals ever recorded on earth in the 1960s (Cornet D'Elzius, 1996; Plumptre et al. 2007b).

Large mammal populations have changed significantly over the years in the park (Table 1). Populations were decimated drastically during the time of lawlessness between 1970s and early 1980s during the civil wars. The numbers of large mammals have recovered since then and this is reflected in 2018 census as shown in table 3 below
, but the 2010 wildlife census has revealed a significant decrease in numbers of almost all

QEPA is contiguous with Virunga National Park in the DRC with wildlife crossing the international boarder. There was always a thinking that since QEPA and Virunga National Park in the DRC are transboundary, whenever the former would have reduced wildlife numbers the assumption was that they have crossed to the latter. The census carried out in the Great Virunga landscape at the same time over the same period showed a similar trend.

Table 3: Animal Population Trend in QEPA

Species	1989	1992	1995*	1999*	2000*	2002	2004*	2006	2010	2014	2018
Elephant	400	500	1100	1300	1100	998	2497	2959	2502	2913	3953
Buffalo	5000		17000	7000	10000	6807	6777	14858	8128	15771	17141
Hippo	2200		2800	2900	3400		2632	5024		4155	5875
UgandaKob	18000		31000	21000	32000		17440	20971	8483	12987	21217
Topi	400		500	325	94	157	440	1521	262	3049	1974
Waterbuck			1800	2200	4500		3382	3548	2483	2981	5456
Warthog	1600		1200	1900	2400		1880	1388	1466	1456	1963

Source: Ecological Research & Monitoring Unit, UWA

QEPA is one of the most popular National Parks in Uganda for bird watchers. Its diversity of birds is reflected in its over 600 species list, the highest number of species recorded in any IBA in Uganda and probably the highest of any PA in Africa (Byaruhanga *et al*.; 2001). The L. George Ramsar site extends to the wetlands north of the lake and this contains a number of bird species. The park also containsa number of water birds including the pelicans. Large colonies of cormorants are found roosting and breeding on ancient trees in Maramagambo forest, and during the day, these birds fly considerable distances to go and fish on the major water bodies (L. George, L. Edward, Kazinga channel) in the park. Between September and April, large numbers of Palearctic waders, like gulls, and terns migrate to QENP to augment the local bird populations (Kasoma, 1989). Large numbers of the charismatic African fish eagles and various species of king fishers are also found inhabiting the

shorelines of the water ecosystems, spicing up the variety of wadingbirds.

3.2 Socio-economic Environment

3.2.1 Tourism

Tourism is a major source of revenue for QEPA and generates foreign exchange for the country. It provides employment to local communities as well as professional staff. Tourism provides opportunities for investment in hotels, lodges, campsites and other infrastructure. The major tourist activities in the park include game drives and viewing, typically around the Kasenyi and Ishasha, chimpanzee tracking in the Kyambura Gorge and the nearby Kalinzu Central Forest Reserve and launch cruises along the Kazinga channel where several bird species can be sighted. Thereare also forest walks in Maramagambo Central Forest Reserve, which has a bat cave. QEPA is surrounded by communities with diverse cultures that also attract tourists.

3.2.2 Tourist Visitors

QEPA gets approximately 34,000 visitors each year, excluding students, and this number has been increasing over the years. The majority of tourists experience only a fraction of the QEPA. The usual itinerary includes a visit to the Mweya Peninsula, making a short launch trip to view wildlife (mostly hippos and birds) along the Kazinga Channel, and a game drive to the north. Fewer tourists take the time to visit the northern crater area with fascinating scenic views due to poor roads in this section of the park. There has been a considerable increase in number of visitors who visit Kyambura Gorge for chimpanzee viewing and Ishasha sector for tree-climbing lions. Information, orientation, and interpretation facilities, programs and materials are limited and a lot more is required to improve visitor experience.

Kyambura Wildlife Reserve provides an option to the current Mweya experience with an array of exceptional resource values and beautiful scenery. Though tourism is not well developed in this sector, there is high potential that once developed would decongest the Mweya Peninsular. Kigezi Wildlife Reserve like Kyambura is not well developed for tourism. This reserve also contains South Maramagambo Central Forest Reserve where UWA and NFA manage this section together. This unique forest is an important biodiversity habitat. However, few tourists venture there due to its remote location and difficult access. Figure 4 below shows the number of visitors to QEPA between 1996 and 2015 with students and Figure 5 without students. The highest number of visitors was received in 2011 and the least number in 2000. Notably there has been a decrease in tourists from 2011-2015. The 2019 up to 2021 was affected by the Covid-19 although numbers have started increasing again.

Figure3: Number of visitors excluding Students (Source: UWA)

3.2.3 Tourism Revenues

QEPA lies within the Albertine Graben with uninterrupted views of the savannah, Lakes Edward and George, several crater lakes, the Rwenzori Mountain Ranges and the Virunga Ranges. The park's varied habitats which are home to almost 100 species of mammals and over 600 bird species making it one of the best tourism destinations in the country" On average, QEPA receives an estimated 34,000 visitors per year estimated with total revenue of UGX 5 billion. This has attracted investments in the tourism facilities (hotels, lodges, campsites) in and around the park. In addition, park management has established tourism tracks and trails to facilitate game drives and nature walks.

3.3 Current initiatives on Human WC

QENP has had a number of initiatives to control human wildlife conflict. About 100km of trench has been excavated in various areas in the districts of Rubirizi, Kasese, Rukungiri and Kanungu. Subcounties where trenches have been excavated include Katerera, Kichwamba, Kyabakara Kirugu in Rubirizi, Nyakiyumbu, Isango and Muhokya in Kasese, Kikarara in Rukungiri and Rushoroza and Bukorwe in Kanungu district. 8 chain links have been constructed in boggy and rocky areas in Kakari, Kicwamba, Kirugu, Kataara and Katerera. Mauritius thorns have been planted in a number of areas of the park where HWC has been a challenge.

Apart from the Kagarama – Mahyoro fencelies, the rest of the proposed fence lines have none functional trenches. The factors the affected the trenches in these areas included poor soils which collapsed in in some areas, rocky areas where excavation of the trench would be difficult, weltands/ swamps and rivers where water would fill the trench making or make streams to fill the trenches. In most cases it was difficult to get long enough dry ground sections the would deter elephants. Elephants are known to walk over 20 km a night and most areas were not more than 5 km before getting to ineffective areas.

Current mitigation measures including revenue sharing

Uganda Wildlife Authority has over the years implemented numerous mitigation measures including; excavation of trenches, placement of beehives, red chili, Buffalo stone walls, Chain link fencing, planting of Mauritius thorn trees, promotion of unpalatable cash crops such as tea, scare shooting, direct capture and translocation, sport hunting of problem animals and construction of crocodile cages. Over 200 community scouts have been trained and equipped to complement UWA staff, report cases and or attend to problem animal cases aroundaffected villages.

Figure 4: Elephant trench along the boundary of Kibale National Park

Figure 5: Hippo Deterrent Fence in Lyantonde District

Figure 6: Use of Tea as a buffer in Kibale and Bwindi areas

Figure 7: Use of Mauritius thorns in Kibale National Park

Figure 8: Stone Buffalo wall in Mgahinga Gorilla National Park

Figure 9: Direct capture and translocation of crocodiles captured from Buvuma Islands

Figure 10: Beehive fence along the park boundary in Toro Semliki Wildlife Reserve

Figure 11: Community scouts under training in Kiryandongo District

Revenue Sharing

The enactment of the Uganda Wildlife Statute of 1996 (now Wildlife Act 2019), under Section 65 (4), legally obliged Uganda Wildlife Authority (UWA), to provide a conditional grant worth 20% of its park entry fees with local governments surrounding the protected area that generate the funds through tourism entry fees. This obligation is based on the acknowledgment that communities at the frontline of protected areas endure a disproportionate burden of the costs associated with the conservation of protected areas, and yet the benefits they gain are considered minimal (Manyindo & Makumbi, 2005)[2]. In other words, revenue sharing was intended to act as an incentive for local communities and local government to actively participate in wildlife conservation.

In the last fifteen years (2005 to 2020), UWA disbursed over 36 billion shillings to the district local government authorities that host protected areas (as indicated in Table

Table 4: Showing amount of revenue sharing funds disbursed to protected area bordering districts in the last 15 years

Protected Area	**Amount of money disbursed (Ug. Shillings)**
Bwindi Impenetrable National Park	7,199,975,676
Kibale National Park	1,824,237,741
Kidepo Valley National Park	641,766,240
Lake Mburo National Park	3,906,288,741
Mgahinga Gorilla National Park	463,311,614
Mt Elgon National Park	291,873,565
Murchison Falls National Park	14,479,935,569
Queen Elizabeth National Park	6,672,851,080
Rwenzori Mountains National Park	518,399,229
Semliki National Park	1,500,000
Toro-Semliki Wildlife Reserve	13,989,000
Total	**36,014,128,455**

Source: UWA

Some of successful projects supported by Revenue sharing projects

Figure 12: Akayanja water valley dam constructed using revenue sharing funds in Lake Mburo NP

Figure 13: Some of the classrooms and staff house constructed in MFNP

Figure 14: Goats that were distributed to beneficiaries around Bwindi Impenetrable NationalPark

Although UWA has implemented all the above initiatives to address the HWC, the challenge still exist. From the experience of where the electric fence has been constructed it is evident that it is more effective than the others. The benefits justify the cost of construction of the fence

3.4 Baseline information for specific sections to be fenced (direct area of influence)

The following section highlights the baseline conditions of the 4 sections to be fenced. This includes the physical challenges that may be faced while the project is being constructed. Mitigations to minimize these challenges are covered in thesubsequent chapters.

It is proposed that the fence will be in four sections of the park as explained inTable 5 below:

Section	**Number of kms**
Nyamugasani - Isango	18
KCCL – Karusandara	21
Ishasha – Bwentare	9
Kagarama – Mahyoro	13
Total	**61**

SECTION 1: NYAMUGASANI – ISANGO (18KM)

Physical characteristics of along the fence line

The vegetation along the proposed fence line is dominated by medium tall savanna interspersed with a few shrubs and Acacia trees. Hence there will be no significant felling of trees as the clearing of the fence takes place.

There is a community access road that crosses part of this park boundary to Kayanja Fishing village. After construction of the fence line communities and traders will still need to continue using the road. Electric power must be carried across this road. However, communities need to keep also using the road to go to Kayanja Fishing village. In order to ensure continuous use of the road by the road users, danglers shall be across the road. In addition rollers shall be put on the road to scare away elephants.

In some sections the area is poorly drained thus leading to some pools of rainwaterstagnating in some places.

The soils are mixture of laterite, clay and in some points, sandy roams. These absorb water during the water season and dry up quickly soon after the rains. The expansion and contraction of the soils affects the firmness of compacted poles. In other sections, the soils when compacted turn into dust. measures to ensure that the poles remain firm in the ground need to be sought.

Almost 80% of the proposed fence line is lined with a trench which was dug to specifically deter elephants from crop raiding. Due to the poor texture of the soils,some points along the fence line collapsed in. This led elephants to take this as an opportunity to continue crop raiding. In some areas where the trench has collapsed, it will be properly filled and left to regenerate. Where it is still in good condition, it will be maintained to stop other animal species such as hippos and bush pigs.

Social Context of electric fence in this area

The fence line goes through the Sub-Counties of Nyakiyumbu, Nyakatonzi and Isango in Kasese District. The population density of Isango Subcounty is 647, Nyakiyumbu 336 and Nyakatonzi 60 persons per square kilometre as per the 2014 Population census.

Nyakiyumbu Subcounty has a projected population of 34,800. The community in Nyakatonzi are predominantly cattle keepers with a density of 335.6 per km^2, while Nyakatonzi Subcounty has population density of 60 persons per square kilometer.

Nyakiyumbu SC has the most severely deprived households with the fewest numberof meals per day. The households in Isango and Nyakiyumbu Sub-counties are more likely to be vulnerable to poverty. The same Sub Counties have a high density of households that are severely deprived. Despite efforts for development, poverty remains an issue in Kasese district with 55.2% of the households being moderately poor or extremely poor.[1] This situation would be worsened by human wildlife conflict.

The predominant economic activity along the stretch of the fenceline is crop farming and progressively transforms to pure livestock farming in the sub county of Nyakatonzi. The

major crops grown include maize, banana, cotton and beans. Horticulture crops such as tomatoes, onions, and cabbages are also grown. Most of the rural community in these areas depend on these crops for livelihood.

The communities living in the area are smallholder farmers whose livelihooddepends on crop farming. The main crops which include maize, beans and cotton are heavily raided by elephants leaving them poorer and vulnerable. This may lead them into poaching and illegal resource access to make a living.

HUMAN ELEPHANT CONFLICT SEVERITY

Despite the establishment of the trench and ranger deployments along this section of the park, communities still experience human elephant conflict. The trench widened at some sections due to soils collapsing in. The elephants use such weak points to crop raid.

Communities in the parishes of Kayanja, Rwehingo, Nyakiyumbu, Isango and Nyakatonzi that lie along the proposed fence line experience human elephant conflict. This is partly due to elephants moving along this corridor between QENP and Virunga National Park in Democratic Republic of Congo. While moving in this narrow corridor, the elephants crop raid. Reported HEC cases range from 12 - 41 cases annually. These cases are probably much higher than this as some of the HEC cases are not reported. Communities have reported the crop raiding elephant herds being large in number and usually with young ones. Herds with young ones are difficult to dislodge from the gardens and therefore cause significant damageto the small land holdings leaving the affected households in poorer conditions.

Table 6: Human Elephant Conflict

Sub County	ParishName	2014	2015	2016	2017	2018	2019	Total
Isango	Harukungu	0	0	0	0	0	5	5
	Kyabikere	0	4	0	0	0	0	4
Kisinga	Rwenguhya	0	0	0	0	0	2	2
	Kabafu	0	9	0	0	0	0	0
Kyarumba	Kaghema	0	0	0	1	0	0	1
	Nyakatonzi	1	4	0	10	37	3	55
	Nyamugasani	1	1	1	1	3	5	12
Nyakiyumbu	Katholhu	0	0	0	0	0	9	9
	Kayanja	0	4	0	0	0	1	5
	Nyakiyumbu	0	1	0	0	0	1	2
	Rwehingo	0	0	0	0	0	56	56
Total		**2**	**23**	**1**	**12**	**40**	**82**	**151**

Table 7: Results of physical assessment of the site conducted by UWA and Space for Giants 2020

FEATURE TYPE	DESCRIPTION (e.g. Frequency, status,etc.)	POSSIBLE RISKS	RECOMMENDED MITIGATION (If required)	SUITABIL ITY SCORE (1 = poor, 5 = excellent)
Overall Alignment Shape	The proposed fenceline is straight with 2 gorges towards River Lhubiriha	low cost of construction	Adapt standard electric fence design at the gorges	5
Vegetation Cover	Open grassland with a few shrubs. Some trees lie on the proposed fence and need to be cut.	when not cut the treesmay fall on the fences line or elephants push them onto the fence.	Limit clearing to only a few meters from the fence line; cut only trees the will affectthe fence line.	4
Relief (e.g., erosion risks, storm runoff, etc.)	the terrain is gentlysloping and, in most areas, flat. erosion is not expected to be significant.	on gentle slopes erosion may occur	only slash vegetation to maintain groundcover	5
Soil Type & Composition (stability, minerals, salt content etc.)	Some are rocky, others black cottonand laterite.	using excavated soil from the holes may lead to poles not wellcompacted.	compact using murram transportedto site	4
Natural Barriers (e.g., valleys, gorges, rocky areas etc.)	there are two deep gorges along the proposed fence line.	elephants may use the gorges to cross to the community the fence maintainer finding it hard to cross through the gorges.	adapt fence design to cross the gorges construct ladders or inform the community to allow fencer to always use their land to cross to next part of fence line	4
River Crossings	part of the fence line will be constructed across River Nyamugasani bridge	Elephants may use the bridge to cross to the community	UWA will construct a ground metallic grid at the bridge	4
Road/Railway Crossings	There is Kayanja and Katwe - Mpondwe roads that cross the fence line	Elephants may use the bridge to cross to the community	There will be need of a ground electric grid at the bridge to connect to another proposed fence line of River Nyamugasani to Isango	5
Flood Prone Areas (e.g., swamps, marshes, boggy areas, dams etc.)	sometimes R. Nyamugasani flash floods at the bridge. R. Nyamugasani is a major watering point for wildlife in the area	floods washing away the fence ● wildlife failing to get water	UWA will Construct water dams alongside the fence line for wildlife. The dams shall be of 20m by 20m in size ($400m^2$) Limit construction of the fence line to high ground,	4

			where the flood potential is unlikely	

Evidence of Fire	wildfires are frequent in thisarea grass grows tall and may fall on the fence line causing damage during wildfire incidents	Wooden poles and some porcelain insulators used in the construction of the may be affected by fire	The Ecological Monitoring Unit will undertake early burning in areasprone to wildfires Use plastic fire resistant poles Use insulators resistant to fire	3
Proximity to High Voltage Transmission Lines	No high voltage power line. There will therefore be no interference with the electric fence line.	N/A	N/A	5
Accessibility by Vehicle	Poor motorable access close tothe proposed fence line.	Delay fence construction due to constraints of delivery of materials to site	UWA will construct an access road that can also function as a security patrol road of 5m width hire casual labourers to carry materials to construction site which will be extracted from existing murram pits	2
Ability to construct boundaryroad	This is possible as the area is generally flat	Construction will take longer due to difficulty in delivery of materials Fence supervisor will find it difficultto supervise.	UWA will construct an access road that can also function as a security patrol road	3
OVERALL SCORE The site is 77% suitable for fence construction				46/60
ADDITIONAL OBSERVATIONS OF MERIT				
FEATURE TYPE	DESCRIPTION & COMMENTS			

Evidence ofConflict	Evidence of poaching was seen through recovery of at least 6 wire snares Evidence of illegal resource access. community tracks to the park wereseen Evidence of cattle tracks entering into the park and crossing to thecommunity Community digs up to the river bank. Any land left out the proposed fence line but within the PA boundary may be encroached upon
Intensity of farming activities	Both in Isango and Nyakiyumbu SC the intensity of farming is high
Other Mitigation Measures	Where the energizer will be established there is a need to provide security by deploying rangers. The remoteness of the area combined with increased threat of illegal activities (grazing, illegal resource access and poaching) put the fence infrastructure at high risk of vandalism or damage.

Wildlife Corridors or Crossing Points	There is a wildlife corridor at the end of the fence line (after Nyamugasani bridge). Wildlife especially use this section of the park to move back and forth Virunga National Park, in DRC. The proposed fence line doesn't affect movement of wildlife
Presence of Settlements	No settlements along the fence line. Settlements are on community land
Existing Human Access Points	A number of access points into the park were seen. However, all these were illegal. The access points were for poaching, illegal resource access and grazing. There is no existing signed MOU with the neighboring communities.

SECTION 2: KASESE COBALT COMPANY LIMITED (KCCL)- KARUSANDARA (21KM)

Physical characteristics along the fence line

The first 6 km from KCCL are easily fenceable though there is need to prevent the community getting in contact as the settlements are very close to the park boundary. Section of the PA border makes an interface with Kasese Municipality. Elephants have been reported to walk into the town. This poses serious threat to human life of persons that may meet the elephants. Usually, the response is for the community to make a lot of noise. This may agitate some elephants that can endup attacking people causing serious injuries or death;

The trench that was excavated previously is no longer effective and cannot be rehabilitated due to the water being high.

There are a lot of agricultural activities especially in the Mubuku irrigation scheme. Providing protection to the crops in the area will greatly improve the livelihood of the farmers and improve food security. They grow crops all year round due to the irrigation scheme

Three rivers that is River Nyamwamba, R. Sebwe and R. Mubuku burst the banks upstream leading to widespread flooding and silting along the park boundary which may affect the fence as this may cause short circuit. However power shall be switched off during times of flooding.

In addition with good civil works water will be stopped from reaching the fence line,

The soils are of various types clay, sand, sandy loam and salty. In most of the areas there is impeded drainage making the water table too high with some areas having surface water all the time. This makes pitting for normal wooden poles difficult as the holes are filled with water all the time.

Construction of KCCL to Kikorongo electric fence appears to have shifted the HEC to concentrate in Railway, Scheme, Kyalanga and Karusandara areas. This shift leaves the total HEC to remain the same but only spreading to other areas. Hence the need to continue with electric fence to such areas.

The railway has remained intact except around River Sebwe and River Nyamwamba where some sections are under thick wetland vegetation with some silting. The railway was well shaped and with a number of bridges which runoff water to go through.

The vegetation along the fence line is of varied types which include grassland, wetland, forest, and shrubs (see figures below). Most of the sections have vegetation that will require intensive clearing, and regenerates fast. The first 6 kmhave grassland type of vegetation. The clearing and maintenance of the fence line will be easier. The last half of the fenceline (towards Karusandara) is dominated byswamp vegetation.

Figure 15: Vegetation types along the fence line in Karusandara

From Kasese Cobalt Company Limited (KCCL up to the Railway) a distance of 5 km, the proposed fence line is lined with urban settlements. Private houses were built very close to the park boundary with some having toilets and compounds illegally established in the boundary line (see figures below). Other people access their homes through the park due to lack of a proper road network to their places. These scenarios present challenges during construction and operation of the fence. Children may be shocked by the powered fence. Some community members will have to demolish their buildings and others will fail to get access to their facilities.The major issue will be that of children playing or touching the powered fenceline. This stretch will require mitigation to prevent the community especially the children getting in contact with the electric fence.

Figure 16: Boundary mark stones in compounds of homesteads in Kidodo

In Kidodo, there is a stream which is a diversion from River Nyamwamba. Information from community members indicated that the stream was created afterRiver Nyamwamba burst its banks. The stream has potential of being an impediment in the establishment of the electric fence as previously the area was said to be extensively flooded.

Three prominent rivers intersect the proposed fence line. These include River Nyamwamba, River Sebwe and River Mubuku. These rivers periodically flood and have deposited a lot of silt along the proposed fence line which runs along the defunct railway line. In some of the areas, the deposition is extensive and has led to splitting into a number of streams. The three rivers pose the most challenges of electric fence line construction and future maintenance although proper designs shall be recommended e.g. poles that withstand water logged conditions. Understanding the flooding regime is crucial. Despite this, much of the railway line has remained intact. This implies that with good civil works to stop water from reaching the fence line on the three rivers it is possible to create a sustainable fence line.

Figure 17: Rivers to be crossed by the fence in Kasese district

About three quarters of the proposed fence line runs along the railway line whichis also the boundary of the park. Crop raiding elephants have to cross the railway to peoples" farms. Establishing the electric fence is thus beneficial to operations of the railway as it will prevent

elephants running causing accidents when the train ispassing.

Socio Economic Aspects

The area is flanked by Mt Rwenzori and has moderate productive soils withmoderate rainfall. Agriculture in these areas is dominated by peasant small holders, based on crops like bananas, cassava, maize, legumes and coffee. These areas are of marginal agricultural productivity and high sensitivity to degradation. Consequently, soil erosion and rapid decline in land productivity is a major environmental problem in this area, while soil erosion from these high land areas isthe major cause of sedimentation of the rivers.

The proposed fence line lies entirely in Kasese district. It goes through three lowerlevel local governments of Central and Nyamwamba Divisions in Kasese Municipality and Karusandara sub county. All the three had an estimated population of 45,468 as per population and housing census of 2014.The parishesand wards directly affected by human elephant conflict are 8 as shown in the tablebelow. Most of the residents are peasant farmers with their livelihood depending on crop farming. The common crops grown include banana, maize, sugarcane, sweet potatoes, rice and cocoa in a few areas.

Next to the railway line is the 556 ha Mubuku Irrigation Scheme. With over 160 farmers the area supports a number of crops and vegetables including rice, beans, sweet potatoes, maize, tomatoes, and onions. Some of these crops are severely susceptible to damage by elephants. The scheme contributes significantly to food security in the region and a direct source of livelihood to many farmers.

Table 8: Population of Parishes affected by human elephant conflict along the proposed fence line

County	Sub County	Parish	HHhold population	Number of males	Number of females	Total
Kasese Municipality	Central division	Kamaiba	2,457	2,496	3,172	5,668
Kasese Municipality	Central division	Railway ward	1,024	5,533	6,380	11,913
Kasese Municipality	Central division	Kirembe	616	1,214	1,256	2,470
Kasese Municipality	Nyamwamba division	Kanyangeya ward	3,808	6,311	6,707	13,018
Kasese Municipality	Nyamwamba division	Scheme ward	905	1,855	1,803	3,658
Busongora	Karusandara	Karusandara	1,405	2,335	2,295	4,630
Busongora	Karusandara	Kanamba	284	1,347	1,280	2,627
Busongora	Karusandara	Kyalanga	240	777	707	1,484
		Total	10,739	21,868	23,600	45,468

Source: Compiled from Uganda National Population and Housing Census 2014

Other private smallholder farms exist along the proposed fence line outside the scheme which engage in growing similar crops and are equally affected by elephant damage.

Elephant Aspects

Human Elephant Conflict cases along the KCCL to Karusandara have increased by over 190% in the recent past and constitute over 15% of all cases in QEPA

The number of reported HEC cases on this section of the park boundary represent 15.2% of all HEC incidents (1968 cases) of 2014 t0 2019. From the statistics shown in Table 6 the number of HEC cases increased significantly in 2019. This may be due to failure of the trench that had been constructed along the fence. The elephants use the space between the community and Lake George as a corridor to Kibale National Park. It is probably during this movement that makes the elephantsdivert onto community land.

Table 9: Recorded human elephant cases 2014 - 2020

Local Government	**Parish/Ward**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Hima TC	Rwehingo	0	0	0	0	0	56	3
Hima TC	Hima	0	0	0	1	0	1	0
Karusandara	Kanamba	0	0	0	2	1	5	4
	Karusandara	0	24	3	0	17	48	49
	Kyalanga	1	1	0	2	1	4	23
Muhokya	Muhokya	1	5	2	6	10	63	87
Rukoki	Kihara	0	0	0	2	0	0	0
Rukoki	Rukoki	0	0	0	0	0	1	0
Central Division	Kamaiba	0	0	0	0	0	1	0
Central Division	Kirembe	0	0	0	0	0	44	5
Central Division	RailwayWard	0	0	0	0	0	8	65
Nyamwamba Division	Kanyageya	2	3	0	2	30	10	6

Source: UWA, QECA HWC records

There is a trench excavated along the park boundary from KCCL towards Karusandara. The floods of the three rivers silted most of it and in some areas, it formed part of the river (see figure below).

Figure 18: Poorly maintained trench in Karusandara that will need to be crossed by the fence

Table 10: Results of physical assessment of the site conducted by UWA and Space for Giants 2020

FEATURE TYPE	**DESCRIPTION (e.g. Frequency, status, etc.)**	**POSSIBLE RISKS**	**RECOMMENDED MITIGATION (If required)**	**SUITABI LITY SCORE (1 = poor, 5=excellent t)**
Overall Alignment Shape	The proposed fence line is straight ¾ being along the railway line.	low cost of construction	Adapt standard electric fence design at the gorges	5
Vegetation Cover	Many types exist dominated by swamps, swamp forest and woodland.	Intense vegetation clearing with high regeneration rates	raise the ground with gravel along the railway reserved land. This will be extracted from the existing muram burrow pits	3
Relief (e.g., erosion risks, storm runoff, etc.)	Generally low lying and some sections subject to flooding.	submerging of the fence line after construction	direct river flow by constructing river banks with gabion boxes along River Nyamwamba, Sebweand Mubuku	3
Soil Type & Composition (stability, minerals, salt content etc.)	Marsh, clay and peat in most places. on river banks mainly sand and silt.	anchoring of poles in the ground will be hard	use concrete in most the places	3
Natural Barriers (e.g., valleys, gorges, rockyareas etc.)	Rivers Nyamwamba, Sebwe and Mubuku	increase the cost of construction	Divert fence to narrower crossings along the rivers. Obtain understanding with relevant communities and MWE	1
River Crossings	three majorcrossing	as above	as above use poles that can with stand water logged conditions	2
Road/Railway Crossings	No railway or road crossing. Except the fenceline will be running along the railway line	upgrading of the railway may affect thefence	There will be need of aground electric grid at the bridge to connect another proposed fence line of River Nyamugasani to Isango	5

Flood Prone Areas (e.g., swamps, marshes, boggy areas, dams etc.)	the three rivers flood periodically ●	floods washing away the fence	the 3rd option is to negotiate with Uganda Railways so thatthe fence line isrun along the current existingrailway as better ways ofconstructing along thestretch Limit construction of the fence line to high ground, where the flood potential is unlikely	2
Evidence of Fire	wildfires are not frequent due to area being swampy	low risk of impactof wildfire	NA	4
Proximity to High Voltage Transmission Lines	high voltage power line crosses fence line at one point	Power line fallingonto fence magnetic interference but very minimal	N/A	4
Accessibility by Vehicle	Poorly accessed to the proposed fenceline.	Delay completion fence construction due to constraints of delivery of materials to site	hire casual labourers to carry materials to construction site	2
Ability to construct boundaryroad	not possible due to rivers and swamps	Fence supervisor will find it difficult to supervise.	UWA will construct an access road that can also function as a security patrol road of 5m width hire casual labourers to carry materials to construction site which will be extracted from existing murram pits	1
OVERALL SCORE The site is 57% suitable for fence construction				34/60
ADDITIONAL OBSERVATIONS OF MERIT				
FEATURE TYPE	DESCRIPTION & COMMENTS			

Evidence of Conflict	from reported human elephant cases Evidence of illegal resource access especially firewood was seen.
Intensity of farming activities	These is intensified farming in the Mubuku irrigation scheme. However othercommunity members not in the scheme also have crop fields.
Other Mitigation Measures	undertake extensive civil works to establish a fenceline The are many ponds on the side of community. Some of these have beeninhabited by hippos. effort to drain some of these should be made to discourage the hippos settling in.

Wildlife Corridors or Crossing Points	The fence line will be along the corridor to Kibale national Park. The corridor will remain open after construction of the fence.
Presence of Settlements	Some communities in Kidodo area have their houses close to the boundary. This creates a risk to the community especially children who may touch the live wires of the fence and be shocked. There is need to put a screen fence that will prevent communities easy getting in contact with the electric fence. some persons have put their toilets in the park and should be asked tovoluntarily remove them awareness to residents and local leaders on what electric fence entails and what communities are expected to do double fencing along this section. The outer fence on the community side should not be electrified. This will limit community interface withthe electric fence.
Existing Human Access Points	Some communities have been hives inside the national park. There is need toleave access routes to the bee hives.

SECTION 3: KAGARAMA – MAHYORO (13 KM)

Physical characteristics along the proposed fence line

In 2020, UWA completed a 19.5 km fence section from Kyenzaza to Kagarama. From Kagarama to River Buhindagi, a distance of about 1 km and on the opposite side of the road lies Kasyoha-Kitomi Central Forest Reserve. Elephants are known to use this narrow corridor to move between the two reserves and this corridor will be maintained. From Buhindagi bridge, Kyambura Wildlife Reserve, boundary runs for about 8 km along River Buhindagi and then forms a swampy flood plain as it enters Lake George. The edge of the swamp is about 5 km up to Lake George. Before entering this wetland, the river forms a tributary which goes to Lake Kalilo.

The vegetation along R. Buhindagi comprises mature high tropical forest, disturbed regenerating forest, emergent colonising vegetation and areas with no vegetation. The areas with no vegetation are due to mining activities which disturbed the forest and were left unrestored (see figures below). Workers will be provided with PPE's to minimize the risk of being affected with any contamination detected

Figure 19: Gold mining activities in Kyambura Wildlife Reserve

The forested area presents tall trees that may have no impact on the fence, whilea few others may have to be cleared.

A section of about 2 km along the proposed fence line comprises regenerating vegetation with many pools of water. The area has to be reshaped and fill a number of water pools to create a fence line. Proper landscaping through cut and fill will be done to fill the water pools. It is hoped that hippos which are currently habiting mining pools outside the reserve will relocate and stop being a problem to the community.

The area is generally low lying in the river bed of Buhindagi. The river side winds as it snakes down to Lake George. In ward flooding in the reserve occurs at some points. However, this can be mitigated for the floods not to affect the established fence line.

Accessibility by vehicles to the fencible area is limited by the river running the length of the boundary. The possible access route to the site would be at Kalilo outpost where there is already a bridge constructed by Uganda National Roads Authority (UNRA). The bridge will also require a grid to prevent elephants crossing to the community using the bridge.

Social Economic Context

The proposed electric fence will serve a population of about 21,221 as per the Uganda population and housing census of 2014 of which 10,781 are female and 10,440 male as

detailed in the table below.

Table 11: Population of beneficiary community when the electric fence is constructed

District	Subcounty	Parish	Male	Female	Total
Kitagwenda	Mahyoro	Mahyoro	2914	2875	5789
Kitagwenda	Mahyoro	Kanyabikyere	2331	2351	4682
Kitagwenda	Mahyoro	Kyendangara	2150	2210	4360
Ibanda	Kicuzi	Irimya	3045	3346	6390
Total			**10,440**	**10,781**	**21,221**

Most of the people in the Districts of Ibanda and Kitagwenda practice subsistence agriculture in which cultivation of maize, finger millet, cassava, groundnuts, rice, beans, bananas and sweet potatoes are dominant. Some farmers grow coffee and rear livestock. Fishing is also a major economic activity in Mahyoro Subcounty.

Figure 20: Some of the agriculture activities in Ibanda district

Human Elephant conflict

Multi vulnerability profiles of Kamwengye, Ibanda and Rubirizi districts highlight problem animals including elephants, buffaloes, hippos and baboons being ranked as a high risk among the community of the parishes of Irimya in Ibanda district, Kyendangara, Mahyoro, Nyakeera, Bukurungu and Kanyabicere in Kitagwenda district.

There is a notable increase of human elephant conflict in areas of Kicuzi Subcountyin Ibanda District, Mahyoro, Ntara and Kanara SC in Kitagwenda district in the recent past. Elephants are known to use this area as part of the corridor to Kibale National Park. As they move, they crop raid.

Key Recommendations

- Shape the fence line over a distance of about 2 km to prevent flash floods destroying the fence and create the fence line
- Create a fenceline by filling some of the water pools that are within and to provide water especially for hippos that have settled in pools created by mining activities.
- The stretch from Kalilo to Mahyoro lies outside the Kyambura Wildlife reserve boundary. Elephants intensely use the area to crop-raid. There is need to have an MOU with the community/land owners on how the fence established along the edge of the wetland will be managed.
- During implementation stage, UWA should engage NFA on management of the corridor that connects Kyambura Wildlife Reserve and Kasyoha-Kitomi in terms of elephants that may continue to cause human-elephant conflict.
- UWA needs to get permission from UNRA before installation of a grid across the Kitagwenda - Rubirizi road at Kalilo bridge.

SECTION 4: ISHASHA – BWENTALE (9KM)

This fence section begins from Ishasha bridge and connects to Bwentale through River Ntungwe. The stretch from Ishasha to River Ntungwe covers approximately 22km, while the stretch from where the boundary crosses to Kameme road toBwentale covers about 26 km. This makes a total of 48km although only 9km shall be constructed under the World Bank. This fence section crosses three roads at Ishasha, Kameme and Bwentale.

The vegetation is varied ranging from savanna open grassland to swamps with a lotof water and riverine forest along River Ntungwe (see figures below).

Figure 21: Vegetation types along Ntungwe River

The soil types also vary from marsh in wetlands, sandy soils and red ferralitic soils (see figure below). The varied types of soils have implications on fence construction and maintenance. The sandy soils are drier and require use of many earth pegs to increase the earthing system of the fence system. While the waterlogged marshy soils present a challenge of anchoring poles in the ground and future maintenance. These will require mitigation measures for the fence to be constructed and perform well.

Figure 22: Sandy soils in Ishasha that will need to be considered during fence construction

Social Economic Aspects

The area is heavily settled with most of the community deriving livelihood from agriculture. Most of the crops grown include bananas, cassava, rice, sweet potatoes and other vegetable crops. Gardens were seen established up to the boundary pillars.

Elephant Conflict Aspects

Human elephant conflict is the major type of conflict in the area. Lions, hippopotamus, baboons, monkeys and leopards have been reported as problem animals in the area. But their severity does not compare that of elephants.Trenches were constructed in the area to mitigate human elephant conflict. However, the impact of these declined with time. This was due to some places having wetlands where trenches could not be established, some sections of the

trench silted up while for others the walls collapsed due to the poor nature of soils. In some areas beehives were also established. However, these cover a small area and elephants were able to move beyond the bee lines and crop raid. TheHEC affected areas are shown in the table below.

Table 12: Human Elephant Conflict cases 2014 – 2021

District	Subcounty	Parish	2014	2015	2016	2017	2018	2019	2020	2021
Kanungu	Kanyantorogo	Kihembe	0	0	0	0	0	0	0	0
Kanungu	Kanyantorogo	Nyamigoye	0	0	8	0	2	0	0	0
Kanungu	Kihihi	Bukorwe	3	13	7	0	4	8	1	3
Kanungu	Kihihi	Kabuga	0	0	0	0	0	0	0	0
Kanungu	Kihihi	Kibimbiri	0	1	10	12	16	13	29	67
Kanungu	Kihihi	Kihihi	0	2	2	0	0	0	0	0
Kanungu	Kihihi	Nyanga	4	15	2	4	0	6	0	27
Kanungu	Kihihi	Rushoroza	3	6	10	20	7	3	21	37
Kanungu	Kirima	Bushura	5	0	0	6	1	0	0	0
Kanungu	Kirima	Kihanda	0	0	0	0	1	0	0	0
Kanungu	Rugyeyo	Kitojo	0	0	0	0	0	0	0	0
Rukungiri	Bwambara	Bikurungu	0	1	0	2	0	2	0	0
Rukungiri	Bwambara	Bwambara	0	0	0	1	3	1	0	0
Rukungiri	Bwambara	Kahimbi	0	0	0	0	2	0	0	0
Rukungiri	Bwambara	Kikarara	1	15	9	6	13	27	11	14
Rukungiri	Bwambara	Kikongi	0	0	0	0	0	0	3	5
Rukungiri	Bwambara	Nyabubare	0	2	0	0	0	4	0	0
Rukungiri	Bwambara	Rwenshama	0	0	0	2	0	3	1	0

Source: UWA QECA problem animal records

FEATURE TYPE	**DESCRIPTION (e.g., Frequency, status, etc.)**	**POSSIBLE RISKS**	**RECOMMENDED MITIGATION (If required)**	**SUITABILITYSCORE (1 = poor, 5 =excellent)**
Overall Alignment Shape	The proposed fence presents an S- shape beginning from Ishasha bridge to River Rushaya after Bwentale.	Increased cost of construction	Adapt standard electric fence design	4
Vegetation Cover	Open grassland and swampy vegetation in some areas. Some of the sections where trenches were excavated arebare and	Faster regeneration in the wetland areas. Flooding in the wetlands and making it difficult for fence	Divert fence line away from the wetland where possible. Shape some sections of wetland to raise fenceline abovethe water level	3

	covered with spoil	maintenance		
Relief (e.g., erosion risks, storm runoff, etc.)	The area is generally gentle sloping with a fewemergent hills. Low laying areas usually have wetlands	Encroachment of isles of PA land that may be left out when aligning the fenceline	Plant pillars on park areas left beyond the fence to reduce encroachment	3
Soil Type & Composition (stability, minerals, salt content etc.)	Sandy loams, marsh, and blackcotton soils.	Difficult to compact poles in sandy and marsh. Poor earthing in the sandy sections	Concrete poles in marshy and sandy areas Increase number of earth pegs per km	4
Natural Barriers (e.g., valleys, gorges, rockyareas etc.)	River Ntungwe is the major natural barrier along this fence section	Difficulty in crossing the electric fence across the river	Adapt fence design to suit crossing of river Ntungwe ie using poles that withstand water logged conditions	4
River Crossings	River Ntungwe is the major natural barrier along this fence section	As above	As above	4
Road/Railway Crossings	The fence crosses three roads - at Ishasha, Kameme and Bwentale.	The roads are busy and use of dangles is not suitable	There will be need of construction ground grids for these road crossings	4
Flood Prone Areas (e.g., swamps, marshes, boggy areas, dams etc.)	The wetland after Kameme road and River Ntungwe have potential of flooding during heavy rains	Power outages during flooding and washing away of the fence line	Align the fence to avoid floodingpoints Use cut outswitches	4
Evidence of Fire	Evidence of wildfires was seen during the assessment	Threat of burning porcelain and poles if they are wooden	Undertake early burning in areasprone to wildfires Use plastic fireresistant poles Use insulators resistant to fire Establish fire line after the fence line	2
Proximity to High Voltage Transmission Lines	No high voltage power line. There will therefore be no interference with the electric fence line.	N/A	N/A	5
Accessibility by Vehicle	Due to some areas being remote, and the terrain not being good accessibility by	Delay fence construction due to constraints of delivery of	Construct an access road where possible of 5m width Use casual labourers to carry materialsto site	3

	vehicle is poor for some points	materials to site Fence Supervision after construction will be difficult	Procure electric bicycle for Fence Supervisor	
Ability to construct boundary road	Very difficult to connect through the hills and valleys.	Survey some distance away from the boundary and make a track for access	UWA will construct an access road that can also function as a security patrol road of 5m width hire casual labourers to carry materials to construction site which will be extracted from existing murram pits	1

OVERALL SCORE 68% overall score. Fence is possible with implementation of proposedmitigation measures	41/60

ADDITIONAL OBSERVATIONS OF MERIT	
FEATURETYPE	DESCRIPTION & COMMENTS
Evidence ofConflict	Evidence of conflict was seen where pillars were planted at intervalsof 50 meters. Leaving any land beyond park boundary may lead to encroachment Evidence of illegal resource access with illegal access tracks into thepark Evidence of cattle tracks entering into the park and crossing to thecommunity
Intensity offarming activities	Most of the land from the park boundary and beyond was undercultivation
Other MitigationMeasures	The nature of the terrain may make it difficult for the Fencer to manage moving the 5 km daily to the end of the fence line. The configuration of the fence line should make it possible to the fencerto be efficient in the fence maintenance. Where the energizer will be established there is a need to provide security by deploying rangers. The remoteness of the area combined with increased threat of illegal activities (grazing, illegal resource access and poaching) put the fence infrastructure at high risk of vandalism or damage.
Wildlife Corridors or Crossing Points	The fence line does not interfere with the movement of wildlife across River Ishasha to Virunga National Park
Presence ofSettlements	Community Settlements exist across the community land and none inthe park
Existing Human AccessPoints	A number of access points into the park were seen. However, all thesewere illegal. The access points were for poaching, illegal resource access and grazing. There is no existing signed MOU with the neighbouring communities.

CHAPTER 4

4.0 COMPARISON OF PROJECT ALTERNATIVES

In executing this mandate, UWA has implemented numerous interventions including excavation of trenches, placement of beehives along the protected area boundaries, red chilli growing and application, stone wall construction, hippo deterrent fences, planting of Mauritius thorn trees, promotion of unpalatable cash crops such as tea, scare shooting, direct capture and translocation, sport hunting and construction of crocodile cages and education and awareness among others.

4.1 HWC alternatives in QENP

QENP has had a number of initiatives to control human wildlife conflict. About 100km of trench has been excavated in various areas in the districts of Rubirizi, Kasese, Rukungiri and Kanungu. Sub Counties where trenches have been excavated include Katerera, Kichwanba, Kyabakara Kirugu in Rubirizi, Nyakiyumba, Isango and Muhokya in Kasese, Kikarara in Rukungiri and Rushoroza and Bukorwe in Kanungu district. 8 chain links have been constructed in boggy and rocky areas in Kakari, Kicwamba, Kirugu, Kataara and Katerera. Mauritius thorns have been planted in a number of areas of the park where HWC has been a challenge. However, all these have not been very effective in addressing Human elephant conflict. The electric fence will complement these different initiatives.

4.2 Reason for electric fence Option

The impact survey, conducted by UWA in July 2021 on the Kyenzaza-Kagarama section bordering Kyambura Wildlife Reserve, included 249 respondents. The survey was conducted through questionnaires and focus group discussions. Overall, the pilot electric fence has had a significant impact on the severity of elephant crop raiding activities. Prior to the fence over 75% of respondents experienced crop-raiding by elephants on a daily basis with an increasing trend in the last 12 months. Since the fence was completed, 87% of respondents claimed to have had no conflict with elephants. This result is backed up by the fact that in the baseline survey 97% of respondents claimed to implement some type of mitigation measure such as trenches, bee hives, and Mauritius thorns but now that the fence is in place 88% report not using any mitigation measures to protect their crops. Human Elephant Conflict incidents collated by UWA rangers indicate a decreasing trend as well. Over 90% of respondents claimed;through rapid assessments and one on one ranger-community interaction; that their crop yields had increased to some degree attributing this to the presence of the fence although detailed studies need to be done to confirm this.

Figure 23: Electric fence in Kyenzaza -Kagarama (QENP)

4.3 No Project Alternative

This aims at maintaining the status quo of the situation. This will mean there will be no electric fence constructed as proposed and therefore, all the efforts by UWA and other stakeholders will be rendered fruitless. This implies communities adjacent to QEPA will continue suffering from wildlife destroying their crops, property and endangering their lives. This makes the 'no project alternative' *expensive* and *unacceptable.*

Some of the major demerits of this alternative include:

a) Continued destruction of crops by elephants;
b) Continued food insecurity in areas adjacent to QENP;
c) Disruption of social order as community members stay up all night to guard their crops against elephants;
d) Disruption of social order which in turn leads to low productivity;
e) Insecurity as community members in areas adjacent to QENP cannot freely move around at night for fear of being attacked by wild animals;
f) Continued degeneration of community relations with UWA and wildlife; and
g) The negative impacts associated with human-wildlife conflicts affect the living standards of the communities as they make the communities poor and perpetuate them in poverty.

It is therefore evident from the above, that the 'no project' alternative, if pursued would have huge social costs. Human wildlife conflicts would persist with resultant crop destruction; food insecurity; disruption of social order; lack of productivity; insecurity etc.

4.4 Other project alternatives

Uganda Wildlife Authority has over the years implemented numerous mitigation measures including; excavation of trenches, placement of beehives, red chili, Buffalo stone walls, Chain link fencing, planting of Mauritius thorn trees, promotion of unpalatable cash crops such as tea, scare shooting, direct capture and translocation, sport hunting of problem animals and construction of crocodile cages. Over 200 community scouts have been trained and equipped to complement UWA staff, report cases and or attend to problem animal cases around affected villages. Taking an example of elephant trenches, the factors that affect the trenches includ poor soils which collap in some areas, rocky areas where excavation of the trench would be difficult, weltands/ swamps and rivers where water would fill the trench making or make streams to fill the trenches.

Despite all the above various HWC intervention measures implemented by UWA over the years and in various PAs, communities continue to suffer from problem animals. UWA continues to get blames from all corners. Compared with now the tested electric fence intervention where almost no conflict has been reported since construction of the fence, it remains the only viable alternative for solving HWC.

CHAPTER 5

5.0 PROJECT DESCRIPTION

5.1 Scoping/Planning Phase

This phase has been completed to find out the suitability of constructing an electric fence in different section of the park. The results are presented in chapter 3 above. During this phase, it was realized that gum poles have so far posed challenges in terms of durability.

5.2 Fence Design and specifications

UWA is proposing to change from using wooden poles to composite plastic poles to ensure fence longevity. Since project inception, UWA has been monitoring the quality of tree poles sourced and suitability; the provided quality is undermining the integrity of the fence. Some of the poles are rotting within 2 years, others are being attacked by termites. In both instances these require replacement which weakens the fence over times (due to wires needing to be cut and rejoined repeatedly).

There are numerous possible reasons for this but the most likely are:

- Inadequate Treatment: Poles are not subjected to the correct pressure and duration required to ensure penetration of the CCA chemical into the pole. Rogue suppliers have a habit of dipping the poles in chemicals to give thema tint but once cut open it becomes apparent that the poles were never treated. This saves the supplier significant funds.
- Moisture Content of Poles: Gum fence poles need to be allowed adequate time to dry out entirely before attempting to treat them with chemicals. If they are treated while "wet" the chemical will not be able to penetrate sufficiently. This means once they do dry out over time, they will be more susceptible to rotting etc. It is advised that poles are air dried for at least 2 months to allow moisture content to reduce below 30%. Suppliers usually skip this process when they are asked to fill large orders in limited time.

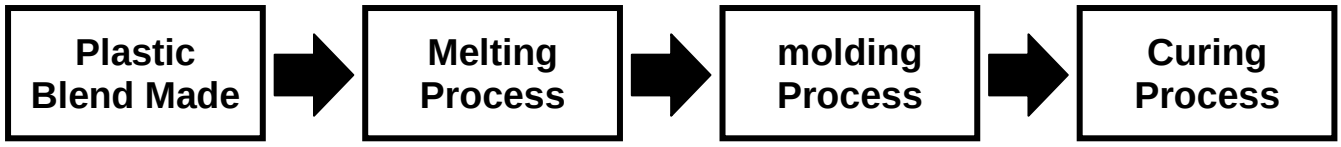
A total of 23 poles out of 2000 poles in the 10 km have so far been replaced in the first 10 km of the Kyenzaza - Karagama fence line at Queen Elizabeth Conservation Area. The oldest poles were placed in November 2018 with most less than 2 years in the ground.

Figure 24: Examples of gum fence poles being replaced at QECA at the moment

Figure 25: demonstration of electric fence constructed using composite poles

Description of Reinforced Heavy Duty Plastic Poles

4.2. Specifications - Manufacturing Process



3.3. Technical Specifications

- Product Density: 1,860 kg/m^3
- Water Absorption: 1.6%
- Failing Load (3m 150mm x 150mm post):3,025 KN
- Flexural Strength: 10.57 N/m^3

3.4. Key Advantages of Plastic Poles

a) Rust, rot and insect/termite proof
b) Does not absorb water
c) No value for scrap metal industry
d) Fire Resistant
e) Can be drilled, painted, colored, nailed as necessary
f) Ability to make flexible shapes and sizes
g) Cleans up the environment
h) Durability for decades
i) Low electrical conductivity

3.5. Sourcing of Heavy Duty Plastic Poles

Space for Giants has identified a suitable company in Kenya that have both the expertise and necessary equipment to manufacture high quality plastic poles. This company no longer manufactures the poles in Kenya due to the absence of necessary raw materials (specifically plastic polythene bags) as a result of the ban introduced by the Government of Kenya.

Space for Giants organized for a number of these samples to be transported to Kampala to allow for the construction of a small demonstration fence that was presented to UWA Management (Conservation Unit) to provide proof of concept.

3.5. Plastic Pole Applications

Plastic poles are increasingly being used in Kenya as a more environmentally friendly alternative. The images below are from the Mt. Kenya Perimeter Fence being constructed by Rhino Ark utilizing recycled plastic poles. The quality, shape and dimensions of the poles differ but the basic goal is the same.

Figure 9 - 10: Plastic poles being used at Mt. Kenya National Park, Kenya

1. Potential cost implication

The current cost of a wooden pole is UGX 48,000. On average, the pole's durability or longevity is 5 years. UWA would therefore pay UGX 96,000 every 10 years translating into a considerable amount of funds lost through constant procurement of gum/wooden poles. Therefore, unless UWA explores alternative options management will continue to lose an average of UGX 19,200,000 per km per every 10 year(s). That implies that the fence will be highly expensive to manage and maintain and hence affect its sustainability in medium and long term. Below is a detailed illustration and comparison of the cost implication;

4.1 Pricing Comparison

Plastic Pole	Wooden Gum Poles
	Corner Straining Post: 125mm diameter x 6ft:

Corner Straining Post: 150mm x 150mm x 5ft: USD 15.75 + VAT UGX 56,775 + VAT	USD 19.40 (incl. VAT) UGX 70,000 +VAT
Standard Line Post: 100mm x 125mm x 5ft: USD 13.25 + VAT UGX 47,750 + VAT	Standard Line Post: 125mm diameter x 5ft: USD 13.30 (incl. VAT) UGX 48,000 +VAT

5.0. Conditions

a) Minimum Quantity for above pricing regime - 14,000 units (+- 70km)
b) Production at or near one of UWA's CAs - Provided by contractor
c) Basic Production Facility (e.g. warehouse) - Provided by contractor
d) Availability of fine construction sand close to site - Sourced by contractor
e) Availability of recycled plastic in Kampala - Sourced and delivered to site by contractor
f) 3 month set up period from agreement signing
g) Machines, equipment and ops moved to site - Transport & import met by contractor
h) Upfront Deposit of USD 50,000 - Provided by client
i) Monthly draw for production at USD 23,000 - Payments to ensure ongoing production
- Transport to fence sites - Provided by contractor

3.3. Technical Specifications

- Product Density: 1,860 kg/m^3
- Water Absorption: 1.6%
- Failing Load (3m 150mm x 150mm post):3,025 KN
- Flexural Strength: 10.57 N/m^3

KEY ADVANTAGES OF PLASTIC POLES:

- Rust, rot and insect/termite proof
- Does not absorb water
- No value for scrap metal industry
- Fire Resistant
- Can be drilled, painted, colored, nailed as necessary
- Ability to make flexible shapes and sizes
- Cleans up the environment
- Durability for decades
- Low electrical conductivity

5.3 Fence construction

Labor requirements for fence construction and maintenance

The Ugandan approach has adopted employment of both the „fencer" and „fence supervisor supported by several casual laborers sourced from the community. UWA will organize community members that are willing to work on the fence into groupsand sign an MOU with them for every five km in every section of the fence. The MOU will cover the agreed mode of payment, the frequency, the working hours, grievance handling mechanism and fence security and avoidance of fence vandalism and ownership.

The following Roles will be undertaken by casual laborers

i. Vegetation clearance

Clearing of vegetation along the proposed alignment will be done using hand tools for example slashers, pangas and chainsaws where necessary. Vegetation will be completely cleared on 3-5m on either side of the proposed fence alignment. This work shall be done by 15-20 contracted casual laborers from nearby communities although this may change in different sections. Each individual will be assigned a specific portion in exchange for a fair remuneration. The individuals will be assigned work by the Fence Supervisor in collaboration with UWA Management. All the vegetation removed shall be left on site except for sizable trees that could be accessed by communities for firewood.

ii. Hole excavation

Once the site is cleared of vegetation, ranging rods shall be used to sight as straight a line as possible. Pegs will be placed along the proposed alignment indicating where the holes will be dug. Holes shall be dug to a depth of 60-90cm (depending on the size of the poles in use). The holes are dug at intervals of exactly 5m. The holes will be dug with a diameter of no more than 30cm. Holeswill be dug using iron bars and spades.

iii. Pole placement

Once the holes have been dug the poles will be placed into the ground with carefulattention being placed to the height of the pole above the ground. Each pole will be exactly 90cm above the ground to ensure a consistent fence height. Strainer Assemblies are constructed (these are the structures that take up the strain of the fence) by concreting them into the ground and leaving them to cure for 3-5 days depending on the weather and soil conditions. This work may require cutting poles to size using a chainsaw and nailing poles together. Heavy duty plastic insulators are secured to the strainer poles with high tensile wire. These are responsible for catching the strain of the wire.

Wire will then be strung between the strainer assemblies by feeding the wire through the holes in the poles. Heavy duty wire strainers are used for this activity. It is critical that the wires are strung to a high enough tension using a heavy duty strainer to prevent the wires from drooping. Outriggers are fitted onto the top wire and supported on the second wire. It is critical that each of these outriggers is between 4-5ft in length and that they are spaced at a consistent distance of 2ft from the next one. The outriggers should be angled at 45 degrees away from the fence. A 5 ft earth rod (using either copper or galvanized iron) shall be installed at each strainer assemblyto ensure proper earthing of the fence. These earth rods will be hammered into the ground using a large hammer. A double insulated underground cable will be used to attach the earth rod to the fence and secured to the earth wire of the fence for proper earthing.

Energizer Station

Once the wiring is complete, the energizer station shall be configured. The first step is to choose an appropriate location for the station close to the fence, ideally in the middle of the fence. Next the earth rods are installed into the ground nextto the station in a radial pattern. Another earth rod shall be installed 10m away to be attached to the earth monitor of the energizer. Then the solar panels are installed of 100cm by 50cm (on a movable frame to be able to follow sunlight or where they are able to capture maximum sunlight), wired up to the battery via the charge controller. The energizer is wired to the battery and a fence alarm/light combination may be installed if deemed useful. Underground insulated cable is used to wire the liveand earth wires respectively onto the fence. The panels are put at every 5km. along the fence and voltage of 6-7kv

Maintenance/Operation Phase

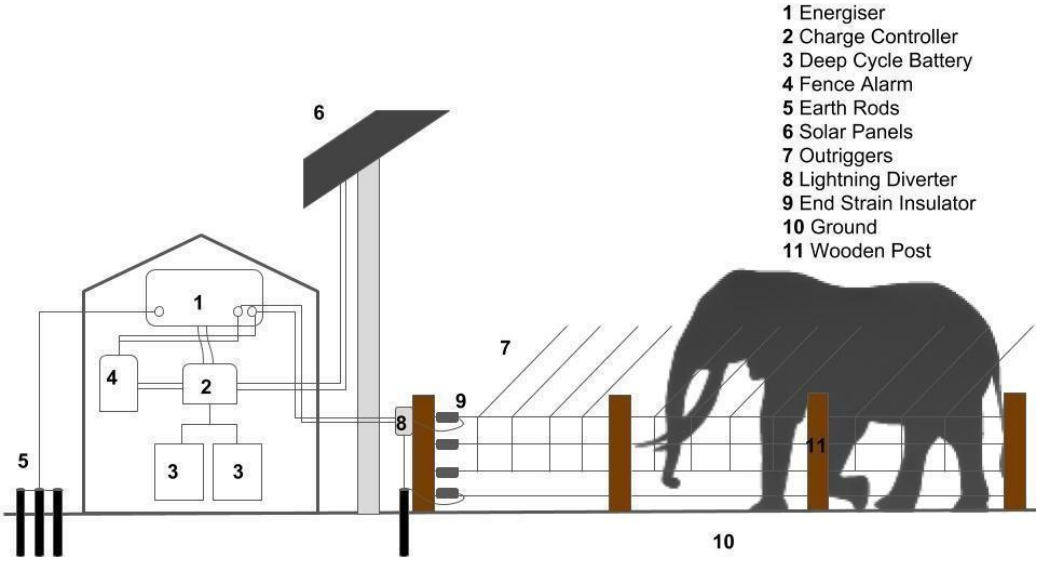
During this phase of the project all construction activities will have been successfully completed and the remaining tasks are related to ongoing maintenance to ensure that the fence stays operational.

Specific Activities:

- Vegetation clearance to prevent grass growing onto the wire;
- Daily patrolling to measure fence voltage to ensure optimal performance;
- Documenting any fence breakage incidents;
- Stakeholder meetings to discuss fence performance; and
- Monitoring and evaluation activities (e.g., redo the baseline survey etc.).

The diagram below shows the installation of the energizer station and associated fence design:

Figure 26: Exact Measurements of Fence Design


1 Energiser
2 Charge Controller
3 Deep Cycle Battery
4 Fence Alarm
5 Earth Rods
6 Solar Panels
7 Outriggers
8 Lightning Diverter
9 End Strain Insulator
10 Ground
11 Wooden Post
6
1
4
2
3
3
5
7
9
8
11
10

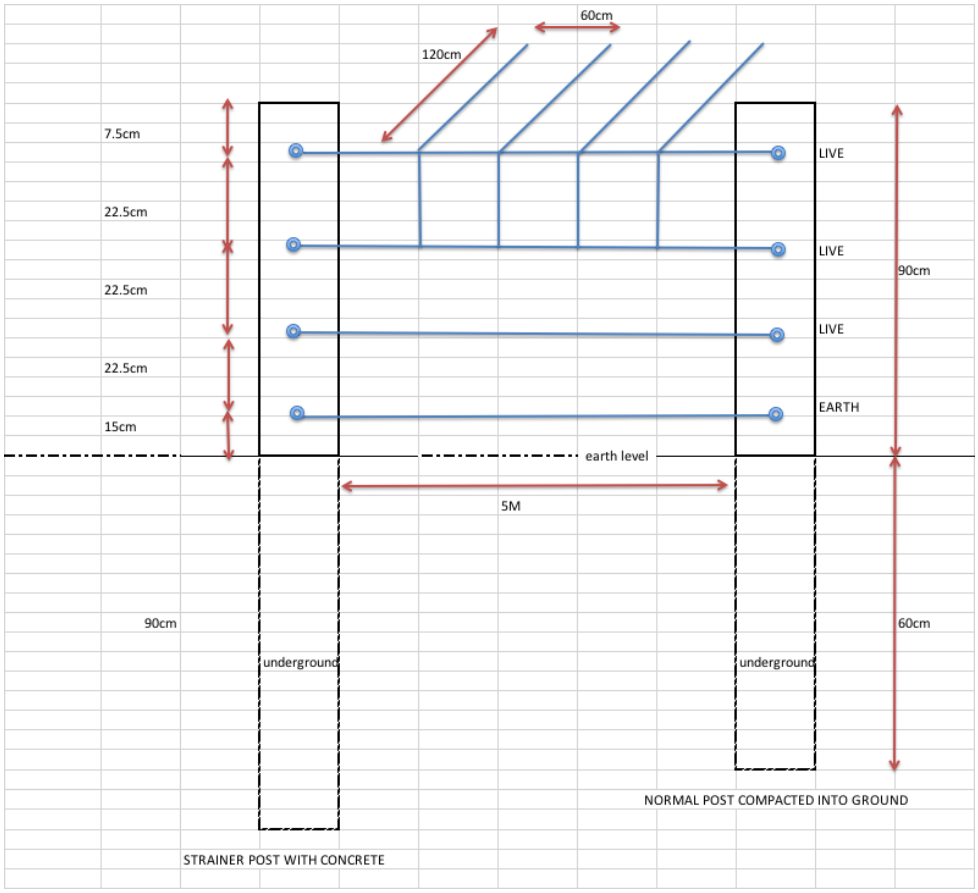


Figure 27: Photo of Fence Design

Roles of fencers and fence supervisors

Fencer

A fencer will be required for 5km of completed fence line. This individual will be adequately trained in fence maintenance activities.

The *Tasks of the Fencer shall Include*:

- Patrol designated sections of the fence on a daily basis ensuring that the fence is in good working order and standards are adhered to by carrying out tasks including but not limited to:
  - Vegetation clearing (cutting grass, removing stumps, etc.) to avoid fence shorting;
  - Repairing any fence breakages or electrical shorts (e.g., caused by people or wildlife);
  - Aligning outriggers to ensure they face away from the fence at consistent angles;
  - Checking the batteries, solar panels, energizer etc. in good working order.
- Informing the *Fence Supervisor* of any breakage on the fence, filling out the appropriate breakage forms (with GPS locations) and ensuring this data is securely stored and made available to the *Fence Supervisor*;

- Conducting monthly fence assessments of your respective section of the fence with your *Fence Supervisor*;
- Responsible for maintaining assigned tools in good working order (e.g., GPS Unit, Voltmeter, wire strainers, Pliers etc.);
- Immediately reporting any security incidents (e.g., fence vandalism, wildlife carcasses, people crossing etc.) to the *Fence Supervisor*;
- Checking fence voltages every morning and evening, ensuring all fences areactive at all times and capturing fence voltage data in the provided forms;
- Communicate clearly to the *Fence Supervisor* in a timely fashion any material or equipment needs;
- Support any fence construction work as assigned by the *Fence Supervisor*; and
- Carry out any other duties as may be reasonably required to carry out by the management.

Fence supervisor

Primary Responsibility:
Responsible for the day-to-day management of fences, including supervising the activities of all fencers, at (Insert Location) to the required standards while upholding the values of UWA.

Tasks Include:
- Patrol assigned fence sections on a daily basis conducting rigorous inspections along the way (making notes to assign work to fencers where necessary);
- Conducting daily meetings with fencers to agree on work to be completed and assigning tasks, recommendations and warnings as necessary;
- Supervise the fencers in their daily activities making sure that the fences are in good working conditions and the working standards are followed and adhered to;
- Stimulates staff discipline and initiate and recommend corrective action;
- Determines the voltage of all the fences every morning and evening and ensures all fences are active at all times;
- Ensure prompt repairs of the fences in case of any breakage and clearance of any vegetation along the fences that may cause short circuits;
- Completes and submits monthly reports to the Warden Problem Animal Unit capturing information but not limited to fence performance, security incidents, material/equipment needs, fencer performance etc. (fence voltages and breakages filled in on the *Google Drive*); and
- Conduct regular assessments of electrical materials (solar panels, energisers, etc.).

Role of UWA

Fence construction and maintenance oversight
- Monitoring and evaluation oversight;
- Coordinating monthly feedback meetings on fence activities andperformance
- Conducting regular site visits;
- Ensure timely construction and maintenance standards are maintained;
- Design and support the implementation of all baseline and impact assessments to

evaluate fence performance;

- Ensure fence performance data is being collected, stored and analyzed in the appropriate format; and
- Provide timely GIS Mapping support to ensure all monthly reports are furnished with a corresponding map of activities taken place, challenges encountered and proposals developed.

CHAPTER 6

6.0 STAKEHOLDER CONSULTATIONS

The National Environmental Act, 2019 provides that stakeholders who possess vested interest in the proposed project be consulted at all stages of the Environmental and Social assessment. Consultations were carried out at different levels i.e., village, Sub County, district and national.

The aim of these consultations was to identify and take note of environmental and social concerns and views of all the stakeholders at a fairly early stage so that appropriate mitigations are incorporated in the implementation. All the issues that were raised during consultations have been addressed in the impact and mitigation section.

6.1 OUTCOMES OF THE MEETINGS

This section summarizes what transpired in each of the consultative meetings held. Focus was put on risks associated with construction and maintaining the electric fence; potential positive and negative impacts, mitigation measures and any lessons learnt from similar previous works on the completed sections. Were briefed on why UWA has decided on the electric fence compared to other mitigation measures, what is the role of community, advantages and disadvantages.

1. Staff meeting held at Queen Elizabeth Conservation Area Headquarters inKatunguru (12 May 2022)

The following key aspects were noted by UWA staff:

- Communities have consistently demanded for the electric fence hoping that this will be an effective solution to human wildlife conflicts such as crop raiding, injury to humans and sometimes deaths.
- It was suggested that this process is fast tracked to ensure that the construction process starts as soon as possible since UWA has been promising people for quite some time now.
- The recently conducted perception survey about the existing electric fence further revealed the unwavering need and urgency of constructing an electric fence.
- Some cattle grazing communities do not support the fence since they want to continue illegally grazing in the park. The fence will work as a physical barrierto cattle.
- Fencing extends/transfers the HWC/problem animals to areas not yet fenced. The solution would be to fence off the entire Protected Area.
- There are some sites with boggy areas and permanent wetlands. These normally require special designs which can be a little more expensive.
- Elephants can easily break the fence when they are trying to enter back into the protected area (Since protruding wires are inside the park).
- In future boundary issues may arise since by design the fence leaves a small portion of land for easy maintenance of the fence line. It was suggested that the fence should be extended at the actual boundary and pillars should also complement the fence to

avoid future arguments with communities.

- Sometimes people access the protected area legally through authorized mechanisms and using designated access routes but when they are getting out of the PA, they instead jump off the electric fence. As a result, they damage the fence and reduce its effectiveness. It was suggested that the height of the fence should be increased to discourage people from jumping over it.
- Some wildlife is permanently residing outside the protected area (e.g., Nyakatonzi area has 3 herds of elephants. The fence will certainly lock them out without any hopes of ever returning home. So, it was suggested that these and other similar animals be relocated into the park by UWA
- Reducing the gaps between the wires

Figure 28: Staff meetings held at QENP

2. Summary of key issues raised during the Stakeholder consultative meeting held at **Mahyoro Sub County (proposed electric fence stretches from Kagarama to Mahyoro i.e., 13 KM)**

Venue	**Buhindagye cell, Kyendangala Parish, Mahyoro Sub county, Kitagwenda District**
Date	13 May 2022
Recorded number of community participants consulted(UWA Excluded)	Total 108 participants (32 women and 76 men) Age: Majority were between 36 and 60 years old Below 35 years of age: 34 36-60 years: 57 Above 60 years: 17
	Seven villages including; Buhindagye cell, Omukarere cell, Kalo karungi, rwetuuma, Zambiya, Kihogo and Kanyabikyere
Representation	Two parishes represented i.e. Kyendangala and Kanyabikere
	One Sub County i.e., Mahyoro

Potential risks and impacts raised by participants

No	Positive impacts/opportunities
1.	Reduction in cases of animal related diseases among communities especially children. Participants noted that they have had cases of strange diseases suspected to be transmitted by wild animals which feed on people's crops
2.	The fence will increase food production and consequently food security in the areas. Currently most households trek long distances in search for food since they can no longer grow food crops in fear of being raided by wild animals especially elephants
3.	Fence will contribute to increase in household income since farmers will start carrying of large scale/commercial farming without fearing crop raids
4.	The fence will reduce on the disease burden within communities. Currently most men sleep outside their homes while guarding their garden a practice which has blamed to have resulted in diseases such as malaria as a result of mosquito bites
5.	Reduction in cases of domestic violence.
6.	Land is likely to appreciate compared to the current situation since it will more productive and attractive.
7.	Reduction on the number of injuries and deaths cases associated with attacks by wild animals
8.	The fence will greatly improve UWA-community relations. Currently most communities resent UWA for „Not doing enough" to save them from animal attack and crop raids by wildlife.
9.	The fence will improve confidence among youths. It was reported that youths from HWC hot spots are referred to as „animals" by other communities sincethey interact a lot with wildlife while they are guiding their crops
10.	More people will return to God since they will have time to go to churches.

11.	The fence will reduce on the poaching incidences. It was reported that some people are tempted to poach because they want to settle agricultural loans. They get these loans anticipating to get high yields and pay back only to getraided by wild animals

No	Negative impacts/risks	Suggested mitigation measures by participants
1	Reduced access to park especially by a few people who have been accessing the protected area illegally. For example, fishing, firewood	There is need for massive sensitization of communities on the legal means of accessing resources from the PA. Support communities to get Memorandum of understanding resource access. The fence design should include access gates for permitted resource access into park
2	Potential for people to get electrocuted while trying to illegally accessing the protected area	Communities should be provided with tree seedlings to enable them create their own woodlots as this would reduce on over reliance on the PA for resources like firewood

Figure 29: Community meetings held at Mahyoro subcounty

Potential impacts raised by participants during the meeting held at Karusandala Subcounty at Kabaka Village LC1 14th May 2022

No	Positive
1.	Improved agricultural productivity since cases of crop raid will reduce drastically
2.	Increased household income since people will be farming and harvesting their food and cash crops without worrying about crop raids
3.	The fence will improve access to quality education as a result of increased household income
4.	Fence will minimize on the cases of domestic violence. It was reported that some men lie to their wives about their whereabouts in the name of guardinggardens. This is the major cause of domestic violence in the communities
5.	People's lives and crops will be protected from wild animal attacks and damages
6.	The current level of resentment against wildlife will reduce
7.	Provision of employment opportunities to community members especially the youths during the construction

No	Negative	Suggested mitigation measures
8.	Lead to loss of biodiversity through clearance of the fence corridor and future maintenance during the operation of the fence	Limit clearance to only areas to be fenced
9.	Reduced access to park especially by a few people who have been accessing theprotected area illegally. For example, fishing, firewood	Provide designated access points

Quotes from the community meeting

"People resent wildlife due to crop raiding but as communities, we have devised means of establishing a temporary barbed wire fence which is about 2 km and not powered. It has demonstrated some level of effectiveness so far. We did this out of desperation. We are crying out to UWA to please start construction of the electric fence by July 2022. If by that time UWA has not started the fence, we are going to power the line to protect our people and crops. We had even resolved to use our revenue sharing money from UWA and construct our own fence. This demonstrates how desperate we are. The fence should have come like yesterday" Warned by one of the participants in the meeting.

Figure 30: Stakeholders meeting held at Karusandara

COMMUNITY APPRECIATION OF POTENTIAL IMPACTS FROM ESTABLISHMENT OF THE ELECTRIC FENCE ALONG THE ISANGO – NYAMUGASANI - 18 KM STRETCH

S/N	POSITIVE IMPACTS
1.	Minimized issues of human wildlife conflict
2.	Issues of domestic violence that are related to night guarding are Reduced
3.	Spread of zoonotic diseases will be reduced/ stopped
4.	Electric bills will reduce because there will not be need to charge torches for night guarding anymore
5.	children will stop guarding gardens and be able to go to school
6.	Theft of household properties while people are guarding will stop
7.	There will be increased income for households
8.	The fence shall improve the park community relations
9.	Employment opportunities for the community

S/N	NEGATIVE IMPACTS	Mitigation measures
1.	The wildlife animal corridors will be blocked	some know animal crossings that lead to corridors will remain open
2.	The community members will no longer access the park easily for resources	Support communities to getMemorandum of understanding resource access. The fence design should include access gates for permitted resource access into park
3.	Cattle will be electrocuted and killed which may lead to possible miscarriages	Community sensitization will beconducted not to graze cows close to the fence
4.	Some wildlife may be closed out on community land given that there are buffaloes and elephants that have lived in the community for a very longtime	Possible relocation

Strong demand

Community response: "*the anticipated reduction in human injury and deaths will be the most* ***important benefit achieved by the electric fence."***

Figure 31: Consultative meeting at Nyakiyumbu and Isango sub counties

COMMUNITY APPRECIATION OF IMPACTS FROM ESTABLISHMENT OF THE ELECTRIC FENCE ALONG THE ISHASHA – BWENTALE - 9 KM STRETCH

S/N	POSITIVE IMPACTS
1.	Night guarding by the community will stop
2.	Reduced human wildlife conflict
3.	communities will be able to harvest their crops
4.	Value for land will increase
5.	The community will have food security
6.	Children will go to school
7.	Women and men will be staying in their houses
8.	The available land will be fully utilized for activities
9.	Communities will get jobs from the fence establishment
10.	Poaching will reduce

S/N	NEGATIVE IMPACTS	Mitigation Measures
1.	Resource access including fire wood will be limited	Resource access will be provided for in designated resource areas

2.	The community does not know much about the electric fence	awareness and sensitisation will be carried out
3.	Wildlife will be electrocuted	Ensure the fence has the right voltage
4.	The likely wild fire may destroy the fence	Ensure that the fence has a fire line

Figure 32: Community members of Bwentale held on 16th May 2022

Comments from National Stakeholders

Stakeholders	Comments
Rural Electrification Agency	The electric fences should have gates to allow formaintenance of power lines it is important that the alignment of fences should alsoprovide for corridor between the road reserve and the fence for construction of distribution powerlines
Uganda National Roads Authority	This is a very good project & we hope it solves the human-wildlife conflicts in the mentioned areas. A few points that you might consider: 1. Crossing the National Road Network requires that an adequate vertical clearance of at least 6m & horizontal clearance of 50m is considered. For other roads, the vertical clearance remains 6m & horizontal clearance varies between 15&30m. This will help to avoid & or minimize any potential impacts on the roads during project implementation or on the fence project during maintenance & upgrading of the roads. 2. This is probably a good opportunity to provide for solar powered cameras along the hotspots. Cameras could enable UWA collect the much-needed data to guide on suitable interventions against different wildlife conservation challenges. May be, the effectiveness of the proposal to have cameras installed in Murchison Falls National Park can be piloted here.

	3. Low current deters the animals but might not deter community members from accessing the Park without authorization. However, high current is fetal to most animals, including humans. You may consider an appropriate management regime to regulate the current such that it does not result into more conflicts and loss of life. 4. Additionally, in case there are any savings made or more funding provided, you may consider a combination of the electric fence together with trenches along the hotspots. 5. In case the plan is to use solar as the only energy source, you may consider an alternative backup power to ensure constant supply. 6. It might be important that communities within the identified sections (hotspots) are connected with electricity from this project. Such an initiative would enhance relations and project acceptability. This way, the project could make more contribution to both conservation & socioeconomic growth of the area towards ending extreme poverty that is usually a characteristic of the immediate Park neighbors. 7. Importantly, consider meaningful stakeholder engagement and consultation. Very useful input will be provided by stakeholders once we have good appreciation of what impacts you think the proposed project will have on different stakeholders or their respective mandates.
District Local Governments (Kasese, Rukungiri, Kitagwenda)	District Leaders are happy with the current arrangement as long as UWA is able to construct andmaintain the fence It is important that UWA engages with its neighboringcommunities and draws up clear resource access protocols to ensure the fence is not vandalized by beneficiaries in future as they seek access to natural resources. The electric fence has transformed the livelihoods of farmers living alongside the areas where the fence is constructed and this in turn has improved attitudes ofpeople towards elephants and QECA in general The fence has solved the conflict in one place and pushed the conflict to areas that remain un fenced. What plans does UWA have for the remaining sections
Wildlife Conservation Society (WCS)	1. Most of the areas to be fenced are sights with direct contact with the communities. This will hopefully reduce the human-wildlife conflict in these areas. Some of these may, however, be historical corridors or areas of access for food for some of the animals during food scarcity for specific species in the park. A study should be constituted to monitor the different species attempts to cross from some of the animals even in the presence of the fence vis-à-vis the food availability in the park 2. WCS has a full-time presence in the Ishasha sector. We would like to know how the fence will impact the movement and safety of lions in this region. First, since the fence is designed to deter movement of elephant, which are much bigger animals than the lions. Long-term studies to inform lion management in this region should be carried out.

	3. The lions depend on the kobs and other smaller animals that occur in the park. Studies should be carried out to access how the abundance and diversity of these species is affected by the fence. This should include studies on frequency of animal-fence accidents during their escape when being pursued by other species and other threats in the park e.g. fire, which may block other potential areas of exit from the threat 4. Also studies should be carried out on the effectiveness of the fence on illegal activities in the park

CHAPTER 7

7.0 EVALUATION OF POTENTIAL IMPACTS AND MITIGATION RECOMMENDATIONS

7.1 Positive Impacts

For some sections where the electric fence has been piloted for example in Kasese and Rubirizi districts, the following positive benefits have been observed:

i. Crop yields have improved;
ii. Makeshift huts are no longer observable meaning men are now sleeping in their houses instead of guarding crops;
iii. Incidences of human wildlife conflict have reduced; and
iv. The fence has made the boundary clear and guarded the park against encroachment.

That noted, the following positive benefits are expected to result from the construction of the electric fence:

a) Improved Livelihoods

Severe HEC has resulted in a decline in agricultural productivity due to crop damage, demoralized farmers and social discord. With the fence in place there will be increased agricultural productivity resulting in improved food security and income. As such the fence will contribute to social unity and poverty alleviation.

b) Improved Social Order

Currently the majority of farmers spend their evenings in make-shift guarding shacks along the boundary of the park to discourage crop raiding by elephants.This has disrupted social order because farmers are getting little sleep and risking their lives trying to protect their crops. The fence will prevent the need forfarmers to spend their nights actively guarding their crops. This will have apositive impact on family cohesion.

c) Reduced Human Wildlife Conflict

Communities living on the boundary of QENP experience severe crop losses as a result of HEC. The proposed fence aims to reduce HEC by 90% by preventing elephants" access to community farms. The fence will also reduce the incidents of conflict with other problematic species e.g., buffaloes.

d) Improved Health

Many farmers spending their nights actively guarding their crops are exposed to theelements at night. This has resulted in increased risk of pulmonary diseases such aspneumonia. The fence will ensure that farmers are able to stay in their homes at night.

e) Community Attitudes

With the reduction of conflict with animals the fence is likely to promote positive attitudes

towards QENP and an overall acceptance of wildlife. It will also help promote positive dialogue between the park and local communities living on its boundaries.

f) Park Security

The fence will help to secure the boundary of QENP and will help to formalize access rights for communities. There are existing MoUs in place but the fence will help to streamline this process and protect the park from illegal activities such as resource extraction, illegal grazing etc. In addition, the fence will help to demarcate the park boundary in areas where beacons are missing or in the absenceof a boundary road.

g) Improved Conservation

Fencing QENP will enhance the conservation activities that are taking place within the park by reducing activities such as poaching, illegal resource extraction, illegal grazing, etc. It is envisaged that the fence will have a positive impact on local communities who in turn will report illegal activities to the authorities. This will help the park regenerate in areas where it has been degraded especially:

- Reduced illegal resource harvesting;
- Reduced expenditure since a lot of money is spent in restraining animals from going out; and
- Clear Park boundary and therefore reduced incidences of encroachment.

7.2 Negative Impacts

7.2.1 Construction Phase

Although the electric fence has a lot of benefits both to communities and UWA, stakeholders raised a number of negative impacts that will be associated with it. This section outlines these impacts that have been identified as the assessmentwas being carried out. Some of these are perceptions and concerns from the community. Mitigation measures have been proposed which will eliminate or reduce the impacts to minimum and address concerns from the community. UWA will undertake comprehensive sensitization programs in the communities to ensure that people understand how the fence works and how they can avoid danger. Signage will be installed at appropriate locations.

a) Occupational Safety and Health of Workers

Project workers including contractors and casual laborers may be affected during construction of the project. Issues of concern will potentially be injuries, poor working conditions and welfare, among others.

These impacts may arise as result of air pollution, harsh weather conditions(hot weather and rainfall), and accidents with handheld or mechanized tools, physical hazards including slips, trips and falls and in some instances poor housekeeping practices. Physical hazards also represent potential for accident or injury or illness due to repetitive exposure to mechanical action or work activity. Poor sanitation and hygiene condition may expose workers to disease outbreaks like cholera and others.

Over-exertion, and ergonomic injuries and illnesses, such as repetitive motion, over-exertion, and manual handling, can also cause injuries to workers. There is also likelihood of biological hazards from snake bites or venomous animals and poisonous plants. Biological agents that can cause severe human disease, are a serious hazard to workers for example mosquitoes.
Fence construction work will take place on the boundary of QENP. As such, workers may also be at risk from wild animals especially in the early morning and late afternoons when wildlife is most active.

The Occupational Safety and Health of workers shall be addressed by the OHS Protocols prepared under the IFPA-CD project.

Mitigation measures
UWA will make sure that the project Occupational Health and Safety Protocols as well as the Labour Management Procedures are followed to address workers' issues. This shall also be in accordance with the occupational Health and Safety Policy and action plan, the Occupational Health and Safety Act and attendant regulations as well as UWA's guidelines. The WBG EHS General Guidelines will also be followed to address the OHS issues identified. Workers will be provided with PPEs including safety boots, gloves, goggles, coveralls etc. and PPE usage shall be enforced. A first Aid box will be availed to address emergency health related issues. Regular safety toolbox meetings and emergency drills will be conducted to enable workers understand and avoid incidences as much as possible.

During the fence construction process there will be a minimum of 2-armed guards present (especially where labourers are spread out) to watch over workers and to disperse any wildlife where necessary. In addition, a vehicle will be present for emergencies when it is deemed that labourers should quickly be removed from the site for their safety and taken to the nearest medical facility or health centre in case the injured worker requires emergency medical treatment.

Workers will be sensitized before start of work about dangers expected while working in the park including the park rules, dos and don'ts (for example no illegal hunting, poaching etc.) that must be complied with. Reports on animal encounters will be given to the supervisors every morning to devise more measures of how to manage these wild animals.

Workers will be trained in lifting and materials handling techniques in construction including the placement of weight limits above which mechanical assists or two-person lifts are necessary. There will also be planning of work site layout to minimize the need for manual transfer of heavy loads and administrative controls into work processes, such as job rotations and rest or stretch breaks will be implemented.

b) Vegetation Clearing & Soil Erosion
In order to construct the fence a considerable part of the boundary vegetation must be cleared. This will require the removal of tall grass and including some large bushes and trees along the fence line. The fence requires a 3-5m wide vegetation clear zone on either side of the fence.

The clearance of vegetation along the fence line may make the area prone to soil and wind erosion, especially in areas of heavy rainfall on steep terrain.

Mitigation measures
Vegetation clearance will be carefully overseen by the fence construction manager to ensure that only the required amount of vegetation is cleared as per the approved electric fence route plan and that is strictly necessary for optimal performance of the fence. Given that the vegetation is not completely removed, the roots will keep the soil intact. In areas where there is a likely risk of soil erosion the area will be reinforced with stones, proper drainage or the fence alignment may be diverted. This will be treated on a case-by-case basis.

The vegetation cleared during construction will be given to the neighboring community as firewood and where the vegetation like grass cannot be reused, it will be left to decompose on site.

c) Pollution

During the construction process of the fence there will be varying degree of noise pollution (e.g., the use of chainsaws & drills), air pollution (vehicles and/or tractors moving up and down the fence line transporting materials) human waste (casual labourers defecating along the fence line in the absence of hygiene facilities).

Mitigation measures
Noise pollution will be mitigated by using the chainsaws and other heavy machinery only during the day. All construction activities will take place during the day (between 7:00 AM and 6:00 PM) to avoid disrupting the nights. Noise reduction and control strategies that will be considered in areas close to community areas include planning activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance and avoiding or minimizing project transportation through community areas.

No employee shall be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).

The use of hearing protection shall be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A). Hearing protective devices provided should be capable of reducing sound levels at the ear to at least 85 dB(A).

Air pollution will be kept to a minimum by only using vehicles which are in good mechanical condition where strictly necessary.

Dust suppression techniques will be implemented such as applying water to minimize dust from vehicle movements and PPE such as dust masks will be used where dust levels are excessive.

Human waste will be mitigated by use of mobile toilets during the entire construction phase. No waste shall be disposed of in the park, UWA shall contract a NEMA certified hazardous waste company to collect and dispose of the sanitary waste generated during the construction phase of the project.

d) Waste management

There will be waste generated in the course of fence construction. The waste will include food remains, plastic bottles and polyethene bags, the remains of construction of the fence e.g., wires and poles, excavation spoils, concrete and concrete washing, non-ferrous scrap associated with fencing etc.

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Mitigation measures

Adequate waste collection bins will be provided during the entire construction phase and all waste generated during the day will be collected and transported outside the park. Only wires and poles to be used that specific day will be brought on site.

Ensuring proper waste management by adhering to the hierarchy of waste management practices which includes prevention, reduction at source, re-use, recycling, recovery and disposal and designating areas provided for temporary waste storage on site.

Waste shall also be segregated from source in waste bins that shall have covers to avoid littering and a licensed waste handler shall be contracted for offsite disposal and no waste shall be disposed in a manner that the waste would find its way into the community.

All workers will be inducted on proper waste management prior to construction that includes waste prevention, reduction, re-use, recycling and recovery.

e) Animals that will be fenced outside the park

Although there are a number of interventions currently being implemented, animals continue going out of the park It is therefore anticipated that during the implementation of the project, some of the animals that will be already outside the demarcated fence line will be fenced out. This could put such animals at risk of being killed by communities or vice versa.

Mitigation measures

The park guards with the help of community members will ensure that they patrol all accessible areas close to the park boundary so that any animals outside the demarcated fence line are brought back within the boundaries of QENP.

The communities will be sensitized on reporting of cases where they encounter animals that will be fenced out during and after the fence construction phase.

f) Stealing of equipment e.g., energizers

With construction activities on going at the site, various construction materials including energizers will be required and if not properly handled could attract wrong elements who steal some of these items. Project component may be subject to the same situation if not properly guarded. If this is not adequately addressed,it could sabotage the smooth running of

construction activities.

Mitigation measures
A containerized storage facility for some of the construction materials (energizers, wires and timber) will be set up at the site with secure locking and manned with a store keeper. Screening will be done on some casual workers recruited locally with the help of the local council leaders.
Guards will be provided during the construction times along the fence lines to closely watch over the workers for both safety and security reasons. This will help scare those with wrong intentions.

g) Impacts on cultural heritage

There are no known cultural resources near the project site. However, it is possible that, given the long period of habitation of communities near the project site, there are undetected cultural or archaeological resources that could fall within the footprints of the project site.

Mitigation Measures

In order to minimize the potential for impact to sub-surface cultural archaeological material, UWA will establish and implement a Chance Find Procedure (Attached as Annex 1).

h) Interference from fence construction on animal numbers and animal behavior

There may be interference from fence construction on animal numbers, animal behavior (breeding and feeding patterns) through obstruction of migration routes, alteration of migration patterns etc.

Mitigation Measures

There will be provision of wildlife migration corridors during construction.

7.2.2 Operation and Maintenance Phase

a) Risk of electrocution for wildlife
Electric fences by design are not made to be lethal to wildlife but it does occur (infrequently) that wild animals may get entangled in the fence wires e.g., a buffalo getting its horns stuck in the wire and be electrocuted. In this event it may result in the death of the animal. Additionally, if the live wires are placed too close to the ground, crawling animals like snakes may be killed.

Mitigation measures
Electrocution for wildlife is extremely rare since it would need constant contact with the wires for this to happen. For this particular electric fence, the maximum allowed voltage is 10 kvolts. Nevertheless, because this fence is electric with a monitor to measure fence voltage an alarm will go off when the voltage drops in case any incident happens. If the voltage drop is permanent, it means that either the fence has been broken and needs to be

fixed or something is caught in the fence. In both scenarios the fence must be switched off and inspected. If care is taken with this process no animals should be electrocuted. In addition, the design from the outriggers should prevent most animals from approaching the fence. The fence will be constantly patrolled to minimise such incidences. Cameras will be installed at specified locations to capture such incidences and solutions will be devised accordingly. Additionally, electric wires will be placed at least 20 cm above the ground to allow for easy movement of crawling animals.

b) Restriction of Wildlife Movement

Wildlife always moves in and out of the park. There is a corridor that connects the park with Kasyoha Kitomi. The fence may block these routes and this may affect their search for any other resources like water and salt licks which may be fenced off. This restriction will result in loss of food and possible access to water for elephants and other large mammals. The fence will not affect the carrying capacity because the existing corridors will not be blocked

Mitigation measures

Given the degree of settlement on the boundary of QENP around the whole park with the exception of the northern boundary with Kibale National Park and western boundary with Congo, the park is already significantly isolated. As such there is already a very limited degree of dispersal beyond the park. Nevertheless, in some places the fence may limit wildlife movements impacting behavioral and feeding patterns.

Where historical wildlife corridors have been previously identified that are critical for the maintenance of connectivity, these will remain unfenced or where deemed necessary, the wildlife corridor will be fenced to prevent wildlife exploiting the corridors to crop raid farmsThese corridors include Queen - Kibale Corridor , Ishaasha - Virunga Corridor and , Mpondwe – Virunga Corridor. Nevertheless, the fence is intended to curb the movement of large mammals onto farmers" lands and no corridors are expected to be blocked.

c) Increased human activity close to park boundary

By constructing a fence, which is essentially a hard boundary, it may result in community members intensifying their activities up to the park boundary. In some cases, the fence may not be able to be constructed on the exact boundary line e.g., swamps, existing trenches, difficult terrain and may need to be diverted into the park. It is likely that cultivation may spread up to the exact boundary alignment over time resulting in to possible encroachment and loss of park land.

Mitigation measures

It may not be possible to construct the fence on the exact park boundary throughout. In this event the park will work with the relevant authorities to place additional beacons to clearly demarcate the boundary. Through regular patrols UWAwill ensure that park boundary is not encroached upon. In addition, community sensitization activities will ensure that park boundaries are clearly understood and respected. The fence is therefore meant to prevent elephants from raiding crops but not to prevent poaching. Poaching will be addressed through other interventions such as regular patrols, sensitization, prosecution of offenders

d) Access limitations for park resources

The construction of the fence will reduce un-managed access to QENP. While user rights exist for communities it may now result in all access to QENP taking place through a limited number of strategically placed access gates, mutually agreed with the communities. However, this may result in community members having to commute longer distances to access key resources that they would normally access by directly entering the park next to their homes.

Mitigation measures

This will be mitigated through involving the community in the placement of gates for access. In addition, communities will be briefed on access rights and how fence access will be managed and enforced. Through community engagements, communities shall be informed of the dangers associated with trespassing instead of using the allocated access points into the park.

e) Electrocution & Accidents

Fences are non-lethal to humans but it is not uncommon for people living next to fences to receive strong shocks. For the case of the electric fence for QEPA, the voltage will be between 8-10 kv. This kind of voltage is strong enough to give a jolt or light shock but is not designed to be strong enough to be lethal to humans and animals. The most likely events are children playing close to fences with a poor understanding of the dangers or when people illegally try to gain access to QENP and are shocked in the process. It is also possible for community livestock to get tangled in the fences by accident which could result in their deaths with the associated economic impacts.

Mitigation measures

All electric fences will be fitted with warning signs (hazard signs) spaced every 250m along the fence line to warn community members not to touch or tamper with the fence. In addition, community members will be carefully sensitized about how the fence works and the risks posed by fences to community members including children and their livestock to minimize accidents. However, as already noted, such kind of electric fences send pulses of low amperage and pulsating current. As thus, they cannot kill or cause permanent damage to people.

f) Loss of livelihood

There are communities who have put bee hives along the boundary as a form of measures to prevent elephants passing such areas but also as a source of livelihood. In addition, there are signed MOUs to access some resources by the communities.

Mitigation measures

Gates or regular access points will be put in place in consultation with communities and depending on whereresource access is currently happening. Schedules will be agreed upon to allow communities enter the park for access to these resources. For the bee hives, communities have already been requested to shift their bee hives outside the demarcated areas for the fence line. These new locations for the bee hives shall not be within fenced QENP.

g) Laxity in developing other intervention

There are a number of interventions that UWA has been developing and implementing over a long time to curb human wildlife conflicts. Some have worked while others are not very effective and the organization continues to try many others. Construction of the fence may kill this innovation and more initiatives totry other interventions.

Mitigation measures

The fence will work alongside other interventions that UWA has been implementing. In some areas where the fence may not be constructed due to terrain or other challenges, other interventions will be applied. under other funding sources WA will be open to any other new interventions after assessing their viability.

h) Occupational Health and Safety risks and impacts

There may be loss of life due to animal attacks, injuries due to cuts, snake bites and other biological hazards during routine maintenance of the electric fence. There may also be physical hazards, slips and falls and injuries from tools and equipment.

Mitigation Measures

Adherence to safety requirements and standards, awareness creation on possible accidents, training of technicians on maintenance of the fence, installing warning signs. Provision of PPE and first aid boxes etc

i) Disposal of batteries and solar panels

During maintenance phase, there will be waste generated in form of used solar panels and batteries that can contaminate the receiving environment.

Mitigation Measures

The waste batteries and solar panels shall be segregated and stored in a designated waste management area. Additionally, recovery and re-use shall be explored and where it is not feasible, the waste will delivered to licensed waste handlers for final disposal.

j) Aesthetic Impacts

Electric fences are likely to damage the natural beauty of QENP. Fences are artificial structures that can be seen from far in the distance and may not be pleasant on the eyes. While likely to be limited in impact, fences may damage some of the tourism potential in specific areas. Given that the fence is along the boundary where a considerable number of hotels are located this impact is high.

Mitigation measures

In order to mitigate any visual impacts, the fence poles used will be natural in colour so that they do not stand out from their environment. In addition, since the alignment of fences is strictly on the boundary of the park, they will not be very conspicuous to tourists. In some

areas the fence will be where electricity transmission poles already exist so the area is already impacted upon.

k) Fire hazards

There may be fire hazards that can lead to destruction of fence infrastructure, destruction of vegetation and habitats

Mitigation Measures

Firefighting equipment will be purchased and installed at strategic points; fire drills will be undertaken at periodic intervals, emergency routes will be created to enable easy access in case of fire; Install warning and preventive signs along access routes, engage stakeholders in fire management exercises.

l) Maintenance activities

Monitoring the performance of the electric fence (operation and maintenance requirements of the fence to ensure it remains functional, voltage requirements, clearing the fence alignment, replacing damaged poles and wires, ensuring the fence is not vandalized).

Mitigation Measures

Involve and equip the local community with the equipment and skills necessary for the maintenance of the fence.

m) Interference from fence operation on animal numbers and behavior

The operation of the fence may interfere and have impact on animal numbers, animal behavior (breeding and feeding patterns) through obstruction of migration routes, alteration of migration patterns etc.

Mitigation Measures

During fence construction, wildlife migration corridors will be provided for.

CHAPTER 8

8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN(ESMP)

8.1 Introduction

The Environmental and Social Management Plan is a key tool used to ensure that environmental and social aspects are appropriately managed and that the recommendations of the assessment are complied with during the construction and operation of the project in a manner compliant with the environmental regulatory requirements. This ESMP comprises of mitigation measures, management actions, monitoring indicators, timeframes for implementation and resources needed for the smooth implementation of the plan.

8.2 Purpose of the ESMP

The ESMP specifies the actions required to mitigate and manage environmental and social impacts and guides the implementation of these actions. The ESMP also details the monitoring and record keeping required to ensure that mitigation measures are effective and, that where they are not effective, the necessary corrective actions are promptly put in place. Finally, the ESMP provides a tool for auditing the implementation of the mitigation and monitoring commitments of the project and communicating the results to stakeholders.

8.3 Implementation of the ESMP

8.3.1 Responsible Parties

Responsibility to implement the Environmental and Social Management Plan shall be shared among key players that include; UWA, Space for Giants, NEMA, community workers during construction and operations/maintenance, surrounding communities including civil society and the District Local Governments.

Table 13: Roles and Responsibilities of Stakeholders

Stakeholder	Roles and Responsibilities
UWA	UWA will have the ultimate responsibility for ensuring that the mitigation measures are implemented. Consequently, UWA will review and approve strategies for delivery of the actions contained in the ESMP and subsequently to ensure that all proposed mitigation measures are implemented.
NEMA	NEMA is the regulatory authority responsible for coordinating, monitoring and supervision of environmental and social protection activities in Uganda.
Community workers during construction and operation/maintenance	The community workers, under the supervision of UWA, will be responsible for implementing the identified mitigation measures.
Communities	The communities are the ultimate beneficiaries of the ESMP. They will play a role

	in validating the reports, monitoring, reporting environmental and social safeguards issues, offer materials and labour resources in implementation of ESMP. The civil society part of the community will play a role in monitoring, reporting and advocacy for the timely implementation of ESMP. Civil society organizations especially those involved in environmental conservation and human rights will be involved in monitoring the implementation of the ESMP and the project as a whole. Ultimately, NGOs are envisaged to make UWA accountable during the implementation phase.
Local Governments	The District Local Governments have the major role of direct supervision and enforcement of ESMP.

8.3.2 Capacity Building for the implementation of ESMP

All workers (Contractors) and UWA staff involved in the project will be trained on construction, effective operation and maintenance of the fence and the implementation of the Environment Management Plan.

8.4 Monitoring

Key monitoring requirements have been identified through the ESIA process to monitor the environmental and social performance of the project. The overall objectives of monitoring are to:

- Ensure regulatory and World Bank requirements are met;
- Verify that mitigation measures are implemented and effective; and
- Provide early warning of potential unplanned for or unmitigated impacts.

8.4.1 Monitoring Approach

Monitoring will be done by UWA to ascertain whether the project is being implemented in line with the approved procedures and legal requirements. NEMA may also take part in the monitoring of the project as it may require. Thefollowing two monitoring approaches will be employed;

Inspection: These will be planned and conducted on a monthly basis to ensure that mitigation measures and commitments are properly maintained and implemented, and that specific management procedures are being followed

Auditing: Will be done to assess compliance of the project activities to both regulatory and site management system requirements.

Table 14: Summary of Environmental and Social Management Plan

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
A: POSITIVE IMPACTS							
1.	Improved livelihood as a result of increased agricultural productivity; improved food security and income.	Surrounding Communities	Creating awareness about the benefits of an electric fence Sharing of Park revenues with neighboring communities	Seasonal yields; number of people employed on the project	UWA Community Conservation & District Local Government (DLG)	Annually; During operation stage.	
2.	Improved social order due to increased family bonding time for farmers	Surrounding Communities	Creating awareness about the benefits of anelectric fence	No. of reported community grievances No. of farmers spending nights protecting their farms fromElephants	UWA Community Conservation & DLG	Quarterly during operationstage	
3.	Reduced human wildlife conflict	Surrounding Communities	Employing other complementary initiatives forcontrolling HWC	Number of farms attacked by wildlife; No. of reported community grievances.	UWA Community Conservation & DLG	Quarterly during operationstage	
4.	Improved community attitude towardsQENP	Surrounding Communities	Sharing of park revenues withcommunities	Number of community grievances recorded	UWA Community Conservation & DLG	During operationstage	
5.	Improved Parksecurity	QENP boundaries	Formalized Park access rights for the communities; Clear demarcation of the park boundaries	Reduced or registered illegal activities in the Park	UWA Community Conservation & DLG	During operationstage.	
6.	Improved conservation	QENP	Formalized Park demarcations; and increased park access security	Reduced illegal activities such as poaching, grazing and resource extraction in the park		During operationstage	

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
7.	Employment creation	Surrounding Communities	Employing workers from theproject vicinity	Number oflocal people employed; wages	UWA CC	Monthly during project construction and operation phase	
B. NEGATIVE IMPACTS DURING THE CONSTRUCTION PHASE							
8.	Destruction of the vegetation, animal disturbance, and lack of consensus towards the project between the stakeholders	Park project areas.	Use of the available tracks, maintain higher degree of silence, and intensified consultations.	Vegetation destroyed/Affected animals; project acceptability	WIC QENP and UWA EIA Unit.	Throughout the Planning Cycle/project implementation	12,000,000
9	Vegetation clearing and soil erosion making the area prone to soil and wind erosion especially in areas of heavy rainfall on steep terrain	3-5m wide vegetation clear zones either side of the fence and under the fence	Only the required amount ofvegetation, that isstrictly necessary for construction and optimal performance of the fence, shall be cleared. In areas where there is a likely risk of soil erosion, the area will be reinforced with stones and proper drainage.	Incidences of haphazard vegetation clearing; non backfilled excavations. Reports on the amount and type of vegetation cleared. Amount of area reinforced with stones.	UWA	All through the construction and maintenance period	20,000,000
10	Occupational health and safety impacts as result of air pollution, harsh weather conditions, physical hazards, poor sanitation and hygiene, over-exertion and ergonomic injuries and illness, biological	Project working areas	Implementation of the OHS Protocols to address workers issues, Implementation of the WBG EHS General Guidelines to address OHS issues,	Number of induction trainings undertaken, Presence of first aid boxes, Presence of PPE, Number of toolbox meetings undertaken, Presence of armed guards,	UWA	All through the construction	35,000,000

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
	hazards, risks from wild animals etc.		Provision of PPE to workers, Provision of first aid boxes, Regular safety toolbox meetings and emergency drills, Provision of armed guards to protect workers, Induction of workers will be undertaken, Training of workers in lifting and materials handling techniques	Records of trainings undertaken			
11	Pollution in terms of noise pollution, airpollution and poor human wastemanagement.	Working areas.	To reduce on noise pollution, chainsaws and other heavymachinery shallbe used only during the day; All construction activities will take place during the day to avoid disrupting the nights. Air pollution will be kept to a minimum by only using vehicles which are in good mechanical condition; Human waste will bemitigated by useof mobile toilets during the entireconstruction phase. For noise pollution,	Visible smoke emitted by equipment in use; Mobile toilets installed at working areas; Waste segregation/collection bins. Ensuring all wastes are properly disposed. Presence of PPE,	Contractor	All through construction phase	20,000,000

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
			hearing protection will be used, Employees will not be exposed to noise levels greater than 85 Db (A) for a duration of more than 8 hours per day, Dust suppression techniques will be implemented such as applying water, Use of PPE such as masks				
12	Waste management including food remains, plastic bottles and polyethene bags and the remains of construction of the fence e.g., wires and poles	Working areas.	Adequate waste collection bags will be provided; All waste generated during the day will be collected and transported outside the park; Only wires and poles to be used that specific day will be brought on site; Ensuring proper waste management by adhering to the hierarchy of waste management, Waste segregation will be undertaken, Workers will be inducted on proper waste management	Number of waste collection bags provided; incidents of environmental degradation due to littering; Number of proper waste management trainings conducted Amount and type of waste generated and method of disposal, Number and records of induction trainings.	UWA	During the entire construction and decommissioning phases.	40,000,000
13	Animals that will be fenced	Along the	The park guards with	Number of reported cases of	UWA, QENP	Throughout the	12,000,000

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
	outside the park putting them at risk of being killed by communities or vice versa	fenced off boundaries	the help of community members will ensure that they patrol all accessible areas close to the park boundary so that any animals outside the demarcated fence line are brought back within the boundaries of QENP; The communities will be sensitized on reporting of cases where they encounter animals that will be fenced out during and after the fence construction phase	animals found outside QENP fence	Management	project cycle	
14	Stealing of equipment e.g., energizers	Storage areas, transportation and working sites	A containerized storage facility for some of the construction materials (energizers, wires and timber) will be set up at the site with secure locking and manned with a store keeper; Screening will be done on some casual workers recruited locally with the help of the local council leaders; Guards will be provided during the construction times along the fence lines	Number of thefts reported incidents; Storage facility provided	UWA	Throughout the construction phase	15,000,000

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
			to closely watchover the workers for both safety and security reasons				
15	Interference from fence construction on animal numbers, animal behavior (breeding and feeding patterns) through obstruction of migration routes, alteration of migration patterns etc.	Park area	Provision of wildlife migration corridors	Evidence of migration corridors	UWA, QENP	Throughout the project cycle	8,000,000
C: NEGATIVE IMPACTS DURING THE OPERATIONAL AND MAINTENANCE PHASE							
16	Risk of electrocution for wildlife	Park boundary/ Fenceline	Provision of an alarm to go off and the voltage to drop in case of any incident; Constant patrols along the fenceline; Installedcameras to capture such incidents andelectric wires to be installed 20cm above the ground level to allow	Number of wildlife electrocution incidents reported; Number of fence line patrols conducted	UWA, QNEP management	During the operation stage ofthe project.	8,000,000

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
			easy movement of crawling animals				
17	Increased human activity close to park boundary	Community–park boundaries	The park will work with the relevant authorities to place additional beacons to clearly demarcate the boundary; Through regular patrols UWA will ensure that park boundary is not encroached upon; In addition, community sensitization activities will ensure that park boundaries are clearly understood and respected.	Scope of land that has been encroached on.	UWA	Quarterly	8,000,000
18	Aesthetic Impacts	Along the park boundary/fence line.	The fence poles used will be natural in color so that they do not stand out from their environment; in some areas the fence will be where electricity transmission poles already exist	Number of complaints registered from communities, tourists and tour operators	UWA	Quarterly	8,000,000
19	Electrocution & Accidents	Along the fence lines/ community boundaries.	All electric fences will be fitted with warning signs spaced every 250m along the fence line to warn community members not to touch or tamper with the fence; Community members will	Number of related incidents recorded; Number of warning signs installed and community sensitization campaigns conducted	UWA	During operation stage	8,000,000

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
			be carefully sensitized about how the fence works and the risks posed by fences to themselves and their livestock to minimize accidents; Routine maintenance of the fence to ensure it remains in good working condition.				
20	Access limitations for park resources by the communities thus commuting longer distances to access the resources	Surrounding communities.	Involve the communities in the placement of gates for access; Communities will be briefed on access rights and how fence access will be managed and enforcement; Through community engagements, communities shall be informed of the dangers associated with trespassing instead of using the allocated access points into the park	Number of access gates provided; Number of related community grievances registered	DLGs	During operation stage	8,000,000
21	Loss of livelihood to communities who have put bee hives along the boundary as a form of measures to prevent elephants passing such areas.	Surrounding communities	Gates will be put in consultation with communities and depending on where resource access is currently happening; Schedules will be agreed	Number of access gates provided; Visible new locations of the bee hives outside the demarcated fence boundaries .	DLG, UWA	During construction and operation stages.	8,000,000

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
			upon to allow communities enter for access to these resources; For the bee hives, communities have already been requested to shift their bee hives outside the demarcated areas for the fence line and these new locations for the bee hives shall not be within fenced QENP.				
22	Potential contamination of the environment through disposal of solar panels and batteries after use	Along the fenced off boundaries and receiving environment	Segregate and store in a designated waste management area, Recovery and re-use to be explored and where it is not feasible, they should be disposed off by a NEMA Certified waste handler	Recruitment of NEMA licensed waste handler	UWA, QENP	Entire operation and decommissioning periods	10,000,000
23	Fire hazards, major storms of flooding that can lead to destruction of fence infrastructure, destruction of vegetation and habitats	Along the fence line and adjacent areas	Firefighting equipment will be purchased and installed at strategic points; fire drills will be undertaken at periodic intervals, emergency routes will be created to enable easy access in case of fire; Install warning and preventive signs along access routes,	Number of fire-fighting equipment Records of fire drills	UWA, QENP	Throughout the project cycle	8,000,000

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
			engage stakeholders in fire management exercises				
24	Maintenance activities/ Monitoring the performance of the electric fence (operation and maintenance requirements of the fence to ensure it remains functional, voltage requirements, clearing the fence alignment, replacing damaged poles and wires, ensuring the fence is not vandalized)	Along the fence line	Involve and equip the local community with the equipment and skills necessary for the maintenance of the fence	Continued functioning of the fence	UWA/QENP Management Local Community	Daily/Weekly	12,000,000
25	Interference from fence operation on animal numbers, animal behavior (breeding and feeding patterns) through obstruction of migration routes, alteration of migration patterns etc.	Park area	Provision of wildlife migration corridors during construction	Evidence of migration corridors	UWA, QENP	Throughout the project cycle	6,000,000
26	Occupational health and safety impacts for example from attacks from wild animals, snake bites and other biological hazards, physical hazards, injuries from tools and equipment during routine maintenance activities.	Project area	Adherence to safety requirements and standards, Training of the workers on maintenance of the fence, Installation of warning signs, Provision of PPE, Awareness creation on possible accidents, Provision of First Aid Kits	Records of trainings, Number of first aid kits, Presence of PPE, Presence of warning signs,	UWA, QENP	Throughout the project cycle	8,000,000

S/N	Potential Impacts	Location	Mitigation/ EnhancementMeasures	Monitoring Indicators	Responsible Person	Timing/ Frequency	
27	Laxity in developing other interventions	Project area	The fence will work alongside other interventions that UWA has been implementing. In some areas where the fence may not be constructed due to terrain or other challenges, other interventions will be applied. UWA will be open to any other new interventions after assessing their viability.	Number of new interventions implemented by UWA	UWA, QENP	Throughout the project cycle	6,000,000

CHAPTER 9

9.0 CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion

This proposed project is set to transform the lives of Ugandan farmers living on the boundaries of QENP. Through the construction of this electric fence, human elephant conflict will be reduced to manageable levels resulting in increased crop harvests, reduced retaliatory killings and improved relationships between thecommunity and QENP/UWA.

9.2 Recommendations

In order for this project to come to fruition and yield a positive impact, UWA shall conduct regular stakeholder meetings during the construction phase and during themaintenance phase to identify problems that may undermine the operational capacity of the fence. In addition, UWA shall create a dedicated fence committee along the proposed fence that meets on a quarterly basis to discuss fence performance and access needs. A boundary road shall be created along the fence line as it is being constructed to improve the capacity for patrolling the line. An armed presence along the line, especially in the initial phase, is advised to deter fence vandalism. UWA shall also create a dedicated "Fencing Unit" that either fallsunder the Warden Community, Logistics or Security. This team will be responsible for fence performance, monitoring and reporting.

The electric fencing in QENP has numerous positive impacts both socially and economically. From the consultations communities are eagerly waiting for the startof this project and many said it has been long overdue. Despite the positive impacts, there are a number of negative impacts and as outlined above these will be minimized and some eliminated completely. It is therefore UWA‟s recommendation that this project brief be approved to allow the project commence.

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Annex 1: Chance Finds Procedures

Overview

Cultural resources are important as sources of valuable historical and scientific information, as Assets for economic and social development, and as integral parts of people's cultural identity and practices. The loss of such resources is irreversible, but fortunately, it is often avoidable.

The World Bank **ESS8; Cultural heritage** requires the Identification of stakeholders and carrying out of meaningful consultations with local or national authorities for cultural heritage. It further stipulates the need to attend to the chance finds and identify mitigation measures thereafter. Its objective is to 1) Protect cultural heritage from the adverse impacts of project activities and support its preservation, 2) Address cultural heritage as an integral aspect of sustainable development, 3) Promote meaningful consultation with stakeholders regarding cultural heritage. 4) Promote the equitable sharing of benefits from the use of cultural heritage.

Protection of Cultural Heritage

Cultural heritage in the project context includes cultural sites within and outside the forests, sites of significance points of view, and other defined assets and structures having archaeological, historical, architectural, or religious significance, and natural sites with cultural values. This also includes cemeteries, graveyards and graves.

A systematic procedure for protection and treatment of discovered artefacts during project implementation will be taken according to the Ugandan cultural and national requirements, and an adequate provision for handling of chance finds will be included in all contracts for civil works Workers will be instructed to remain vigilant during excavation works, identify chance finds immediately and alert the site foreman.

If the chance finds occur, they will be handled according to the Historical Monuments Act, Cap 46. Under the Act, any chance finds should be reported to the Department of Museums and Monuments (DoMM) of the Ministry of Tourism, Wildlife and Antiquities and the Chief Administrative Officer. If the finds are not of interest to the DoMM, they should be reburied on a site set aside for such purpose. If they are unknown human remains, police need to be alerted and remains will be handled according to their instructions. All relocation and reburial costs shall be borne by the contractor.

Chance Find Procedures

Chance find procedures will be used as follows:

a. Stop the project activities in the area of the chance find;
b. Delineate the discovered site or area;

c. Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be deployed until the

responsible local authorities and the DoMM take over;

d. Notify the project supervisor who in turn will notify the responsible local authorities and the National Museum immediately (within 24 hours or less);

e. The local authorities and the National Museum will take charge of protecting and preserving the site in case the finds are of interest to the Department

i. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the National Museum (within 72 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;

ii. Decisions on how to handle the finding shall be taken by the responsible authorities and the National Museum. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;

iii. The local authority/ National Museum decision concerning the management of the finding shall be communicated in writing by the National Museum; and

iv. Findings will be recorded in World Bank Implementation Supervision Reports (ISRs), and Implementation Completion Reports (ICRs) will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.

v. Project works could resume after permission is given from the responsible local authorities and the National Museum concerning safeguard of the heritage;

f. The above procedure when applicable must be referred to as standard provisions during the project activities and therefore site supervisors shall monitor the procedure for any chance find encountered during project activities

g. If the finds are not of interest to the Department of Museums and Monuments, they should be reburied on a site set aside for such purpose and project works continue

In case of Chance finds, the Implementing partners for the project will ensure that the chance finds procedure is adequately utilized and monitored.