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UPDATED ENVIRONMENTAL AND SOCIAL IMPACT STATEMENT (**ESIS**)

Proposed Upgrade of Karugutu-Ntoroko (56.5km), Link to Rwebisengo (8.2km) and Ntoroko Town Roads; to Bituminous Standard

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For:

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Plot 57-59, Jinja Road
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Developed by:

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January, 2026

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GDP	-	Gross Domestic Product
GoU	-	Government of Uganda
MOWT	-	Ministry of Works and Transport
NEA	-	National Environment Act
ESIA	-	Environmental and Social Impact Assessment
IFC	-	International Finance Corporation
NEMA	-	National Environment Management Authority
UWA	-	Uganda Wildlife Authority
NT	-	Near Threatened
R-VU	-	Regionally Vulnerable
LC	-	Least Concern
IUCN	-	International Union for Conservation of Nature
IBAs	-	Important Bird Areas
ESMMP	-	Environmental and Social Management Plan
UNRA	-	Uganda National Roads Authority
ESHS	-	Environmental Social and Health and Safety
DPP	-	District Development Plan
NDP	-	National Development Plan
VOC	-	Volatile Organic Carbon
OHS	-	Occupational Health and Safety
WRMD	-	Water Resources Management Directorate
MoWE	-	Ministry of Water and Environment
IWRM	-	integrated water resources management
MGLSD	-	Ministry of Gender Labour & Social Development
MoLG	-	Ministry of Local Government
TSWR	-	Toro-Semiliki Wildlife Reserve
QENP	-	Queen Elizabeth National Park
NFA	-	National Forestry Authority
CAC	-	Criteria Air Contaminants
TC	-	Town Council
LC	-	Local Council
HIV	-	Human Immune Virus
GPS	-	Geographical Positioning System
CHA	-	Controlled Hunting Area
UNESCO	-	United Nations, Educational, Scientific and Cultural Organization
WCS	-	Wildlife Conservation Society
NWSC	-	National Water and Sewerage Corporation
STIs	-	Sexually Transmitted Infections
VAWG	-	violence against women and girls
ESMMP	-	Environmental and Social Management and Monitoring Plan
ESIP	-	Environmental and Social Implementation Plan
ESIS	-	Environmental and Social Impact Statement

EXECUTIVE SUMMARY

A. Introduction

Uganda's government aims at enhancing transportation services to support agricultural, industrial, trade, tourism and social sectors. The transport policy focuses on developing an integrated and self-sustaining economy to eradicate poverty and boost economic integration. Roads are hugely important to local communities, and in Uganda, they carry 95% of freight traffic and 99% of passenger traffic and contribute 3% of the country's Gross Domestic Product (GDP).

The Government of Uganda (GoU) through the Ministry of Works and Transport (MoWT) is planning to upgrade Karugutu-Ntoroko (56.5km), Link to Rwebisengo (8.2km) and Ntoroko Town Roads (3.2km) from Gravel to bituminous standard. In accordance with the National Environment Act (NEA), 2019, National Environment (Impact Assessment) Regulations, 2020 and the Guidelines for Environmental Impact Assessment in Uganda. The road development project is among the projects that are subjectable to an Environmental and Social Impact Assessment (ESIA) process.

The project will be implemented in accordance to IFC standards; this ESIA has been revised in accordance to IFC's Sustainability Framework. According to IFC Standards, the Karugutu-Ntoroko Project is **Category A**. This is because most of the project closely interacts with a Wildlife Protected Area, Toro Semliki Wildlife Reserve (TSWR). Performance Standard 1 establishes the importance of (i) integrated assessment to identify the environmental and social impacts, risks, and opportunities of projects; (ii) effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them.

The upgrade of Karugutu-Ntoroko is highly desirable because an all-weather Road will improve inter-connectivity between towns, and reduce pressure on existing road infrastructure while providing more sustainable solutions for economic development; Improvement of the proposed roads is expected to directly boost tourism within and around the protected area, as well as biodiversity protection.

The National Environment Management Authority (NEMA) approved the ESIA of the proposed project in 2017, on December 07; and the Certificate of approval Number NEMA/EIA/10874 was issued October 2015. Additionally, an extension of the validity of the ESIA Certificate was issued by NEMA on September 23, 2024. The project is due to commence civil works, an update of the Environmental and Social Impact Statement and in accordance to IFC Performance Standards.

B. ESIA update Methods used

Various methods were utilized during this exercise. These included Literature review; where District Development Plans, Design Documents, Previous project ESIA reports as well as the legal and institutional frameworks inclusive of the Performance Standards of the IFC. Key aspects of the Environment were assessed, these included Physical Environment; where Air quality, Noise and vibrations were assessed. Additionally, Hydrology, flood risks and water quality parameters were examined using the appropriate equipment.

Regarding the Biological Environment, vegetation, mammals, herptiles and birds was assessed for species diversity and distribution. These were selected because of their indicator ability; communicating the status of the Environment. All assessments that were done in previous ESIAs were considered comparatively. Vegetation were studied using transect methods, Herptiles and mammals used visual encounter surveys and non-lethal trapping while Birds were studied using Transect species counts. Most of the fauna and flora was identified on site.

Socio-economic assessment was conducted through Literature review. This was done to avoid stakeholder fatigue; since previous studies conducted similar assessments. However, to a limited extent, semi-structured questionnaires were issued to validate the previous findings and also capture prevailing concerns. Additionally, focused group discussions, meetings with selected stakeholder facilitated the profiling of the Socio-economic aspects on the project.

Impact assessment included a combination of a complex of methods, including: Expert judgment; Quantitative physical and mathematical models; and Rapid Impact Assessment Matrix (RIAM).

C. Institutional, Policy & Legal Framework

The National Environment Act, Cap 181; includes a list in Schedule 5 that outlines the projects requiring ESIA. Furthermore, various policies, institutions, and legal frameworks provide support for the specific guidelines under which the projects listed in Schedule 5 must adhere. This section clearly explains the importance of the legal and policy frameworks in the project context.

The IFC Performance standards have been explored; and their relevance to the project. The IFC performance standards are designed to help the project manage the environmental and social risks, and to ensure that these risks are mitigated.

D. Description of the project area

The proposed project is situated in Ntoroko District, in western Uganda. The road starts at Karugutu Trading Centre on the Fort Portal – Bundibugyo Road at UTM Arc 1960 191336E 87285N and ends at the lake shore on Lake Albert in Kanara Town Council at UTM Arc 1960 226397m E 116912m N. The road has been undergoing periodic maintenance and is motorable. It has a width of approximately 6m. The Karugutu – Ntoroko road is Gravel class A, maintained by MoWT. The current road is in a fair to poor condition and exhibits defects including, loss of gravel, potholes and scoring of drainage channels mainly after river Wasa towards Kanara Town Council where the road is generally flat with cotton soils that often become problematic during the rainy season.

The project consists of; Karugutu-Ntoroko (56.5km), Link to Rwebisengo (8.2km) and Ntoroko Town Roads. There are also some support facilities including Construction Camps, Rock quarries, Swamp fill material & borrow areas. While final choice of material source is a responsibility of the road contractor, possible locations of borrow sites and quarries were identified along the road corridor. These sources will be subjected to an appropriate level of environmental and social impact assessment for respective developments in compliance with the National Environment Act, 2019 and the IFC Performance Standards.

The proposed road will be a class II paved road with a right of way 50m and carriage way of 7m. Humps and rumble strips with specified geometry will be installed along the proposed road upgrade as a measure of controlling driving speed.

E. Analysis of alternatives

The alternatives evaluation considered the government's desire to develop a sustainable connection between Karugutu and Ntoroko without compromising the TSWR integrity. In order to enable rational decision making, alternatives were also subjected to; engineering designs considerations, physicochemical studies, biodiversity assessments, social impact assessments and natural resource economics studies. Four (04) options were considered. These include;

a) Alternative 1: Karugutu-Ntoroko through Toro Semuliki Wildlife Reserve. (50.4km)

Nearly 70% of this existing alignment route predominantly traverses through the Toro Semuliki Wildlife Reserve. With the widening, cutting and opening of more land to improve the current design of the road, as well as an improvement of the bridge on Wasa River, the reserve will cease to be biological diversity conservation area. This option was rejected by key stakeholders, the Uganda Wildlife Authority (UWA).

b) Alternative 2: Karugutu – Kakara – Rwebisengo – Rwangara – Kachwankumu – Kanaara (86.6km)

The second route starts off the Fort Portal Bundibugyo Junction at Karugutu, and follows along the existing alignment from Karugutu towards Kanara for approximately 10.7km, then diverts at the Kakara Junction on to the existing Kakara Rwebisengo Road for 27 km.

The route continues easterly along the existing Rwebisengo Rwangara for 32.5 km road through the towns and communities of Makondo, Kasungu Katoma and thereafter traverses southerly from Rwangara through Kachwankumu, to Kanara 21 km and connect to the Karugutu Ntoroko Road at Kanara. The route progresses to Ntoroko Lake shores for another 8km. The total length of this route is 86.6km. The Rwangara Kachwankumu Kanara Road (21km) is currently in a terrible state. It traverses a flood plain and majority of the road has been washed away.

c) Alternative 3 A: Karugutu Kakara-Kahondo-Kachwankumu-Kanara-Ntoroko (58.5km)

The third route option starts off the Fort Portal-Bundibugyo road Junction at Karugutu, and follows along the existing alignment from Karugutu towards Kanara for approximately 10.3km, then diverts at the Kakara Junction on to the existing Kakara-Rwebisengo Road for 19km only.

The route vias off towards the right along the boundary of the Toro Semuliki wildlife reserve through an existing UWA footpath for 18kms (Greenfield). The game reserve boundary is demarcated by concrete marker posts at every 200m up until the Rwangara Kachwankumu District Road Junction. The route connects to the Rwangara Kachwankumu.

d) Alternative 3 B: Karugutu – Kakara – Kahondo – Kachwankumu – Kanara - Ntoroko (55km) (Red Route)

The fourth route option is similar to the above alterative 3A but is shorter by approximately 3.5km. This route is proposed to traverse south of the Wildlife Reserve boundary running for 21km, (Pending Approval from UWA), then reconnect on to the Karugutu Ntoroko Road at Kanara. The total length of this Option is 55km Long. Note: Options 3A & 3B cross the River Wassa flowing towards Lake Albert and will require a bridge crossing.

Alternative alignment and segmentation of bituminous and gravel sections along the proposed options were also assessed. Wildlife boundary structures were also assessed including Wildlife trenches,

F. Environment and Socio-Economic Baseline

i. Biological baseline

A total of 153 plant species in 118 genera from 59 families were recorded (Appendix 5). For the species recorded shrubs registered the highest in terms of life forms, with a total of 62 species, followed by trees with 43 species, while the herbs, climbers and grasses followed with 20, 16 and 12 species respectively. The habitats along the Rwebisengo (8.2km) and Ntoroko Town Roads are heavily modified, with developments and human settlements. Emphasize was amounted on the vegetation along the main Road alignment. Diverse habitats occur within the landscape of Toro-Semuliki Reserve supporting a variety of vegetation types such as grasslands, riverine forests, scrub woodland, swamp forests, papyrus swamps, and savannah woodland mosaic.

A total of 18 mammal species were recorded along the project corridor belonging to 11 families and 17 genera. The sparsely wooded grassland recorded the highest species richness with 11 species followed by the open grassland with 10 species, thickets with six species and degraded community areas with four specie. The commonest mammals recorded were the Uganda Kob (Kobus Kob), Olive Baboon (Papio anubis) and the Warthog (Phacochoerus africanus).

TSWR has Seven (07) species of Primates have been observed and recorded during previous biodiversity assessments in the TSWR; These include; Chimpanzee (*Pan troglodytes schweinfurthii*), Olive baboon (Papio Anubis), Black & White Colobus (*Colobus guereza*), Red-tailed Monkey (*Cercopithecus Ascanius*), Blue monkey (*Cercopithecus mitis*), Vervet Monkey (*Chlorocebus aethiops* and the Northern Lesser Bush Baby (*Galago senegalensis*).

During the 2025 surveys, only Six (6) amphibian species, belonging to 6 families and 6 genera were recorded along the proposed Road Corridor from Karugutu to Ntoroko. All these were recorded in water logged wallows and dry flood plains. The low amphibian diversity was attributed to unstable soils that are easily eroded leading to low ground vegetation cover and the long dry spell. While during the 2017 studies, fourteen (14) amphibian species were recorded in the project area as shown. The species belonged to seven genera and five families. The genera include Phrynobatrachus, Ptychadena, Hoplobatrachus, Hyperolius, Kasina and Afrixalus. The difference in amphibian species diversity is attributed to the variation in seasonality.

A total of 106 butterfly Individuals in five families (Appendix 6) were recorded in the different road sections sampled. Riverine woodland along River Wasa registered the highest number of species (64%) of the total butterfly fauna recorded from the entire project area. Woodlands both registered 54%, while Gallery forests and wooded grasslands registered the least number of butterflies with only 45% each of the total species recorded by these surveys. No IUCN threatened or endangered species would be impacted by the proposed action because none of them is present in the areas covered by this project. However, some sensitive butterfly species could be disturbed especially those that are habitat specific.

The Reserve is also known to host about 400 bird species. However, during the surveys, a total of 138 species were recorded along the road section which was also limited to open grassland, sparsely wooded grassland, and grassland with thickets, riverine forest and degraded community land. The sparsely wooded areas recorded the highest species richness with a total of 72 species followed by the grassland with thickets, 68 species, Riverine forest, 52 species, degraded areas, 38 species and the open grassland with 38 species.

Among bird species of conservation concern recorded were; **Martial Eagle** *Polemaetus bellicosus;* that is globally Near – Threatened and Regionally Vulnerable (NT, R-VU). **White-backed Vulture** *Gyps africanus; a* single congregation of the White-backed Vulture Gyps africanus which is globally Near – Threatened, regionally Near – Threatened and nationally Near – Threatened (NT, R-NTG) was recorded with eight individuals on a kob carcass in the open grassland. **Shoebill** *Balaeniceps rex* which is globally Vulnerable, regionally Vulnerable and nationally Near – Threatened (VU, R-VUW), and; **Grey Crowned Crane** *Balearica regulorum* which is globally endangered, regionally Near – Threatened and nationally Endangered (EN, R-NTWG) are also known to occur in the Reserve but were not recorded during all surveys.

ii. Physical Environment baseline

Ntoroko District in Uganda experiences a tropical climate with a distinct wet and dry season, characterized by relatively high rainfall due to its location near the Rwenzori Mountains, which often bring rain clouds to the area; expect a humid climate with consistent temperatures throughout the year. Climate is strongly influenced by Lake Albert, but is also influenced by three other separate air masses—those of the Rwenzori Mountains, the uplands to the east of the reserve, and the air mass associated with the Congolese rainforest to the west.

Plate tectonism dictates that the tectonic plates and subsequent movement along the rift valley floors created igneous and metamorphic bedrocks in the region's mountains and escarpments. The rocks are mainly granites, gneisses, and schist; of the steep slopes are the nutrient source of the soil deposits along the river floors.

The 2025 survey established that Nitrogen dioxide, Carbon monoxide, Hydrogen Sulphide and Methane were all within safe ranges and/or not present at all (Table 12). It was further observed that 13% (n=8) have VOCcs above the action level of these 37.5% (n=3) had values above the PEL. Particulate matter measurement results indicate the mean of PM10 and PM2.5 concentrations are 14.2µg/m3 and 8.6µg/m3 respectively, was not exceeded. Soils and deposited dust on surfaces are likely to be drier and more readily available for suspension or re-suspension in air, leading to higher concentrations of suspended particulate matter during construction phase.

iii. Climate change Analysis

Flooding in the project area is mainly caused by River Semiliki and its tributary rivers which include R. Wasa, R. Itojo, R. Semuliki, R. Dorwa and several smaller streams such as Kithoma, Kamayatya, Nyangilika, Kanyamabale, Ngisia which overflow when they are full to capacity. Floods may be independent of rains in the district; with heavy rains in the Rwenzori Mountains, River Semiliki bursts its banks and the water enters the Ntoroko flood plains. This phenomenon is disastrous to the local communities when they suffer loss of their property, houses, crops, and animals; as well as the project area. The landslides occur mainly in the sub counties of Nombe and Karugutu, which are prone to high and low risks of 13 Ntoroko District Hazard, Risk and Vulnerability Profile the hazard respectively. The rest of the sub counties and town councils of Ntoroko District are not prone to landslides.

iv. Socio-economic baseline

Ntoroko District is one of the two Ugandan districts west of the Rwenzori Mountains, the other being Bundibugyo District. Ntoroko District is found in the Rwenzururu sub-region of the western region of Uganda, and became operational on 1 July 2010. Administrative Areas traversed by Karugutu-Ntoroko road include; Karugutu Town Council, Karugutu Sub County, Rwebisengo, Kanara Sub County and

Kanara Town Council. As of 2023, Ntoroko District population was estimated at 80,700 People comprising of 39,400 males and 36, 600 females1,236 km² Area and population density of 65.29/km².

There has been a significant Annual Population Change of 2.0% from 2020 to 2023. The household survey found that 60% of the respondents were married while 21% were separated, 12% were widowed while 7% were single. A gender disaggregation of the respondent's further reveal that there are more women than men who reported to be separated and widowed. The migratory nature of the two communities of Karugutu and Kanara, resulted in a multiplicity of ethnic groups. The survey found a multi-ethnic population made up of 30.3% people of Toro origin, 19.3% of Bakonjo from Kasese, 13% Batuku, 12.1% from Congo, 3.8% were Banyoro, and 3.8% were Alur.

The study revealed that there were more Protestants (30%) than other religions; Catholics were found at 20%, Moslems at 23.2%, Pentecost at 13.3%, Adventists at 9%, while other religions were at 4.4%. At the focus group discussion in Kanara, the participants mentioned seven people who have managed to keep cattle on a small scale in this area. They put those who own boats at the landing site at 5%, those who trade in fish at 10% and the workers at 85%; and that these correspond to their wealth ranks where the 5% are the better-off, 10% are average and 85% taken as the poor. Agricultural activities were unique to Karugutu community, where the survey found 18.7% of the households engaged in growing food and cash crops, as well as keeping livestock.

G. Critical habitat Analysis

The International Finance Corporation (IFC) requires an assessment of environmental and social risks using eight Performance Standards. Performance Standard 6 (PS6; IFC 2012a) and the associated Guidance Note 6 (GN6; IFC 2012b) focus on the protection and conservation of biodiversity. In most cases, the required conservation outcome under PS6 is **no-net-loss of biodiversity value** achieved using the "**like-for-like**" or better principle of biodiversity offsets. However, when a project occurs in critical habitat (CH) supporting exceptional biodiversity value, a net gain in biodiversity value is required.

TSWR is located in an area of geographical, geological, and ecological value, which is a main reason for having high conservation values (HCV). TSWR contains the unique dry habitat Chimpanzees, and has the forest elephant subspecies that live in savannah ecosystems.

Additionally, the TSWR is a home to the shoebill stork, a globally threatened species categorized as Vulnerable by the International Union for Conservation of Nature [IUCN] National Redlist, 2025; lies within the global flyway for migratory (Palearctic) birds; and is one of the 34 Important Bird Areas (IBAs) of Uganda.

An estimated area coverage of **115 Hectares** will be cleared of vegetation to create space for construction and workspace. This will lead to clearance of bushlands, savannah grasslands and woodlands. Additionally, there will be alternation of the seasonally flooded areas. The loss of vegetation cover of this magnitude is significant and triggers a **biodiversity offset**. Fortunately, all the vegetation within the sampled plots a lot the corridor is of Least Concern (LC).

A restoration offset is the most feasible, in this way a degraded habitat or ecosystem within TSWR will be restored to compensate for environmental damage of vegetation clearance of 115 hectares of vegetation. Human encroachment has taken place mostly within the southwest section of TSWR and in Ntoroko area near Lake Albert.

H. Stakeholder engagement

Stakeholder consultation and engagement for the proposed upgrade of the Karugutu-Ntoroko (56.5km) Link to Rwebisengo (8.2km) and Ntoroko Town Roads; were undertaken in accordance with IFC performance standards; and the NEMA guidelines for seeking opinions and views on the environmental aspects of project. The local legal framework of consultation activities and project disclosure requirements, particularly in respect of public consultation activities that are directly required, were also consulted.

According to IFC, the first step in the process of stakeholder engagement is stakeholder identification–determining who is project stakeholders, and their key groupings and sub-groupings. From this flows stakeholder analysis, a more in-depth look at stakeholder group interests, how they will be affected and to what degree, and what influence they could have on your project. The answers to these questions will provide the basis from which to build your stakeholder engagement strategy. It is important to keep in mind that not all stakeholders in a particular group or sub-group will necessarily share the same concerns or have unified opinions or priorities.

Key themes from engagements included; Visual and Landscape, Traffic and road safety, Biodiversity and Conservation, Hydrology and other utilities such as electricity and communication facilities, Health and vulnerable populations, Employment and the Economy, Land acquisition and resettlement, Social disruption, Poverty, food insecurity and prolonged drought.

I. Analysis of Environment and Social Impacts & Mitigation Measures

Impact analysis involves identification of an impact and all its parameters on environment and social aspects, and determination of its significance. For the proposed development, potential positive and negative impacts were identified for the pre-construction, construction and operational phases. The IFC Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project.

The pre-construction, construction and operation phases of have the potential to result into significant impacts on the biophysical and Socio-economic environment. The project has benefits on which the need and purpose for the project are premised.

The main positive impacts associated with all phases of the project include; increased access to social services, Employment opportunities and fostering Socio-economic transformation of the area. The ESIA identified potential major negative impacts including; loss of property due to land take, habitat modification and fragmentation, wildlife road kills, waste accumulation, impacts from influx of workers, impacts from roads works and unplanned developments. Implementation of the project is associated with cumulative impacts from previous, present and more importantly future developments.

The ESIA update proposed enhancement measures for the benefits from the project and mitigation measures to avoid reduce and compensate for the residual negative impacts. A Resettlement Action Plan was prepared to address Land acquisition and involuntary resettlement. All highly significant negative imparts arising from the projects have been considered in the ESMMP for adequate management during project implementation.

J. Conclusion and Recommendation

The upgrade of Karugutu-Ntoroko (56.5km), Link to Rwebisengo (8.2km) and Ntoroko Town Roads is associated with perfect benefits to biological resources held within TSWR; INCLUDING; protection of the TSWR boundary and alleviate encroachment; Contribution to ecosystem recovery through diversion of

Public traffic to out-side the TSWR, as well as Increasing biodiversity safety through implementation of regulated design speeds and ample drainage structures.

The loss of vegetation cover, green-field, of this magnitude is significant and triggers a biodiversity offset. Fortunately, all the vegetation within the sampled plots a lot the corridor is of Least Concern (LC). A restoration offset is the most feasible, in this way, ANY degraded habitat or ecosystem within TSWR will be restored to compensate for environmental damage of vegetation clearance of 115 hectares of vegetation. The project is associated with a number of positive Socio-economic impacts which include; Employment opportunities, Promotion of Local and Regional Development, Creation of business opportunities, Reduced transport costs and time of travel Improved access and delivery of health services; fostering Socio-economic transformation of the area

In order to ensure environmental and social compliance, the Contractors and other associated developers, should be required in the tender documents to prepare a standalone Environment and Social Implementation Plan (ESIP) addressing a Biodiversity Management Plan (BMP), Health and Safety Plan, Contingency and Emergency Plan, among other Plans.

1.0 Introduction

1.0 INTRODUCTION

1.1 Project Background

The Government of Uganda (GoU) through the Ministry of Works and Transport (MoWT) is planning to upgrade Karugutu-Ntoroko (56.5km), Link to Rwebisengo (8.2km) and Ntoroko Town Roads (3.2km) from Gravel to bituminous standard. Uganda's government aims at enhancing transportation services to support agricultural, industrial, trade, tourism and social sectors. The transport policy focuses on developing an integrated and self-sustaining economy to eradicate poverty and boost economic integration. Roads are hugely important to local communities, and in Uganda, they carry 95% of freight traffic and 99% of passenger traffic and contribute 3% of the country's Gross Domestic Product (GDP). There is much more about roads beyond good engineering and construction—sustainable roads connect people to jobs, education and health, boost regional integration, link communities to income-generating markets, expand economic growth, and decrease poverty.

The main project road (Karugutu to Ntoroko) starts from Karugutu Trading Centre on the Fort Portal – Bundibugyo Road at UTM Arc 1960 191336E 87285N and ends at the lake shore on Lake Albert in Kanara Town Council at UTM Arc 1960 226397m E 116912m N. The starting point of the road at Karugutu is approximately 340 kilometers, by road, West of Kampala, the Capital City of Uganda. Over 95% of the road traverses through a gazetted Wildlife Reserve which falls under the jurisdiction of Uganda Wildlife Authority. The proposed desired alternative will maintain an existing road section from Karugutu to Kakara where there is a junction to Rwebisengo-and will continue all the way to Makondo an operational road covering about 16 Km that will require an opening for the upgrade and later on divert near the park boundary for 18 Km through green-field and to join the District feeder road of 3 Km to give a total length of approximately 21 km to Kanara.

In accordance with the National Environment Act (NEA), Cap 181, National Environment (Impact Assessment) Regulations, 2020 and the Guidelines for Environmental Impact Assessment in Uganda. The road development is among the projects that are subjectable to an Environmental and Social Impact Assessment (ESIA) process. This requirement is outlined in Sections 49(1) & (2), 113 (2) & (3), 176(1), 177(1), 126(2) & (3), and 181(2) of the NEA, 2019, along with Schedule 5 section 1 (a); and specifies that projects such as the construction or upgrade of public roads necessitates an Environment and Social Impact assessment (ESIA). This ESIA update expands on the previous assessments carried out on project and recommends actions that best-promote sustainable development in line with current design requirements, biodiversity and Socio-economic demands.

The project will be implemented in accordance to IFC standards; this ESIA has been revised in accordance to IFC's Sustainability Framework. IFC's Sustainability Framework articulates the Corporation's strategic commitment to sustainable development, and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability. The Policy on Environmental and Social Sustainability described IFC's commitments, roles, and responsibilities related to environmental and social sustainability in this report.

According to IFC Standards, the Karugutu-Ntoroko Project is **Category A**. This is because most of the project closely interacts with a Wildlife Protected Area, Toro-Semliki Wildlife Reserve (TSWR); and project activities have potential adverse environmental impacts on some of the Biological resources held within TSWR, though most of them can be readily addressed through mitigation measures.

1.2 Justification for the project

As people in Ntoroko District were smarting from the devastating flooding of 2019, the same disaster happened again in 2024, this time more severe than had ever been experienced in more than 50 years. The floods left 11 schools submerged and more than 24,000 people displaced from their homes. The floods destroyed sources of livelihoods, damaged safe water sources, and latrines and made roads impassable (UNICEF, 2024). The upgrade of Karugutu-Ntoroko is highly desired as described below;

1.2.1 Improved Transport & connectivity

Ntoroko District is described by dispersed towns and human settlements that are connected by Water (along Lake Albert) and Poor Roads especially the route from Karugutu to Ntoroko, that is absorbing most of the increasing traffic. As a result, increased traffic on limited road infrastructure is envisaged increasing road damage and maintenance costs, the road becomes impassable during flood regimes. An all-weather Road will improve inter-connectivity between towns, and reduce pressure on existing road infrastructure while providing more sustainable solutions for economic development.

1.2.2 Improve Tourism sector

TSWR is among the leading source of tourism revenue contributing significantly to the management of Uganda's protected area network (MTWA, 2014). Improvement of the proposed roads is expected to directly boost tourism within and around the protected area. Additionally, the proposed project falls within the Albertine Graben where an improved network is needed to enhance tourism connectivity.

1.2.3 Biodiversity Protection

The project will create an alternative route, that will divert the heavy traffic away from the TSWR at Kakara. The heavy traffic from Karugutu to Kanara, through TSWR, is associated with numerous animal Road kills that directly impacts the gene-pool of TSWR.

The PROPOSED road will be designed will recommended traffic of 30km/hr. through a protected area; and this will significantly reduce the current high driving speed. Additionally, the project will install a wildlife-barrier along the boundary with communities; this will help to deter poaching as well as reduce the community-wildlife conflicts.

Upgrade of Karugutu-Ntoroko will enhance ecosystem recovery along the existing road corridors, since the existing road network has intense maintenance associated with continuous massive extraction of gravel, some of it from ecologically sensitive areas within the TSWR.

1.3 History of project's ESIA and NEMA approvals

The Year 2016 was project formative year; then UNRA commissioned a team of experts to undertake the detailed engineering design including Environmental and Social Impact Assessment (ESIA); this team was purely in-house comprised of members from both the Design and Environment Departments. Environment and Socio-economic studies were conducted following both dry and wet seasons. This facilitated documentation of flood regimes for the multiple rivers that form a woven of aquatic ecosystems; as well human utilization of the project area.

The preliminary engineering design were completed in June 2018. The National Environment Management Authority (NEMA) approved the ESIA of 2017, on December 07; and the Certificate of

approval Number NEMA/EIA/10874 was issued October 2015 (*Certificate No. NEMA/EIA/7844: attached as appendix 1*).

The year 2023; Due to inability to secure the necessary funds for implementation of civil works, the project did not commence within the stipulated 2 years' period upon issuance of the NEMA Certificate. Therefore, the Developer (then Uganda National Roads Authority-UNRA); requested for an extension of the validity period of the ESIA certificate in 2023. The extension of the validity of the ESIA Certificate was issued by *NEMA on September 23, 2024*. (*appendix 2*)

The project is due to commence civil works, however, the prevailing environmental and Socio-economic conditions have significantly changed, hence requiring an update of the Environmental and Social Impact Statement and in accordance to IFC Performance Standards.

1.4 Need for ESIA update, 2025

1.4.1 Changes in the regulatory framework

Changes in the legal framework have a substantial impact on the implementation of the Environmental and Social Impact Assessment (ESIA). Since the project began, several new legal frameworks have been introduced, replacing previous ones. Key changes in the legal landscape that are overseen by the National Environment Authority (NEMA), including the National Environment Act of 2019 and the Environmental and Social Impact Regulations of 2020.

Numerous policy and legal changes have occurred within different government ministries and departments, limiting their capacity to provide the envisioned supervisory role for the project, within the existing project context. The IFC Requirements also require inclusion for better implementation on the project, and need adequate representation in the Legal framework.

1.4.2 Mandatory Changes in Design

Numerous changes have been suggested on the previous design, most of them are induced by Socio-economic and environmental demands, in addition to cost optimization. These design changes have potential to impact the receiving environment and Socio-economic aspects within the project area. Various route and structural options that were adopted earlier have been dropped and some of them are reconsidered.

This has rescored the project foot print hence a requirement for supplementary impact analysis to inform decision making especially in this era of climate change impacts, poverty and urge for sustainable development.

1.5 Objectives of the ESIA update

The ESIA update aimed at ensuring that project design and activities are implemented in line with the present Environment and Social requirements, IFC Performance Standards, and demands to ensure sustainable development.

Among the specific objectives of this exercise included;

i) Updating the status of the receiving environment and social aspects with design alternations;
ii) Aligning the project to the present "new" National legal and policy framework regarding Environmental Social and Health and Safety (ESHS);
iii) Aligning the project to IFC Performance Standards;
iv) Conducting detailed analysis for supplementary potential impacts and propose mitigation measures while following the impact-mitigation hierarchy;

v) Conducting stakeholder analysis and engagements; to solicitor their views and respective incorporation into the project fabric.

Documenting the ESHS Requirements will ensure that the Project is implemented in compliance with the National legal provisions including the National Environment Act, 2019, NEMA environmental guidelines, requirements of MoWT's Environmental and Social Safeguards Policy, and provisions of IFC Performance Standards.

1.6 Scope of the ESIA update

The update covered a review of NEMA approval conditions of the Existing certificate(s), the previous ESIA reports; assessing the existing baseline, review of the design and associated options, stakeholder engagements, and impact analysis and mitigations. The scope also focused on ensuring that the designs and civil works are carried out in accordance within the requirements IFC Performance Standards on Environmental and Social Sustainability.

1.7 Report structure

This ESIS is composed of the following chapters:

a) **Chapter 1** presents the introduction and it consists of the background of the project, justification for the project and the need for an ESIA update, project Justification

b) **Chapter 2** presents methodologies applied during ESIA update; to generate adequate information of relevance to the proposed project.

c) **Chapter 3** consists of the Project Description. It describes the project location, the area of influence, the project components, and project technical designs;

d) **Chapter 4** outlines the policy, legal and institutional framework relevant to the proposed project.

e) **Chapter 5** Alternative Analysis

f) **Chapter 6** presents environmental and Socio-economic baseline of the project area

g) **Chapter 7** provides a Critical Habitat Analysis (CHA)

h) **Chapter 8** provides an overview of public disclosure and stakeholder consultations undertaken during ESIA.

i) **Chapter 9** outlines anticipated impacts of the proposed project on environment and social settings of the area and their proposed mitigation measures to eliminate or reduce the negative impact to acceptable levels.

j) **Chapter 10** presents the Environmental and Social Management and Monitoring Plan, which should be implemented throughout the lifetime of the project.

k) **Chapter 11** consists of the conclusion and recommendations from the assessment

Generally, the structure of this ESIS is in conformity with that specified in the ESIA Guidelines

2.0 ESIA Update Methods

2.0 ESIA UPDATE METHODS

2.1 Literature review

2.1.1 Review of the Management Plans for TSWR, ESIA studies, and Biodiversity reports

Reports from previous studies that were conducted in 2017 were thoroughly reviewed to supplement on the most recent studies on the project. The baseline conditions that were captured during previous studies were subjected to the prevailing conditions to determine how much of the project is accountable to changes occurring in the project area. Additionally, the Toro-Semuliki Management Plan was reviewed and the Sensitivity Atlas.

2.1.2 Review of the design documents

Road construction requires the use of design documents/ construction drawings. These offer a thorough set of guidelines to the contractors, and sub-contractors that should be adhered to throughout the project implementation process. This systematic literature review of design documents aimed at examining the adequacy of designs in addressing the potential project impacts on the environment and Socio-economic settings of the project area. Review of the design documents captured the extents of mandatory design changes that occurred so far during project implementation as well as all supplementary designs that were not included in the previous designs.

2.1.3 Review of District Development Plan

District Development Plan (DDP)for Ntoroko was reviewed. This provided useful information on the baseline conditions as well as leadership within the project area. The Local Governments Act, CAP 243 devolves planning powers to Local Councils in their areas of jurisdiction. These five-year DDP were developed using participatory planning process; wide consultation with key stakeholders in line with government policy on decentralization and in conformity with the Local Government Development Planning Guidelines 2020/21- 2024/25 and NDP III Strategic direction.

2.1.4 Review of the legal, policy and institutional frameworks

Policy and institutional legal framework that is relevant to the project was thoroughly reviewed. This included the most recent developments such as the National Environment Act, 2019; Environment and Social Impact Assessment Regulations, 2020; as well the International Finance Cooperation (IFC). All policies and legal frameworks that are relevant to the project area have been provided in chapter 3 of this report.

2.2 Biological environment assessment

The Biological surveys covered aspects of both wet and dry seasons; during the months of August/September and December/January respectively. Comparative data from the previous assessments was as well utilized covering natural, semi-natural, and some altered habitats along the project road with accessible locations. The focus was on identifying the presence, variety, and distribution of flora and fauna, with particular attention to critical habitat trigger species like the Chimpanzees, Elephants, Grey crowned Cranes and other endangered and endemic species in the region. The project examined flora and fauna, including herptiles, birds, and mammals. The team

identified four fauna groups as key indicators, allowing for quick data collection to assess the overall terrestrial biodiversity of the area.

2.2.1 Vegetation survey methods

The project area's vegetation was divided into survey units based on land cover/use and plant community types. Field surveys were conducted at different locations where these layers were found.

A quadrant sampling unit of (25 x 25) meters for woodlands & forest; (10 x 10) m for swampy & marshy vegetation; thickets and Bushy vegetation was adopted. Plant species were assessed using the DAFOR scale (Kent, 2012), where; D=Dominant, A=Abundant, F=Frequent, O=Occasional & R=Rare. Each survey location focused on the physiognomy and floristics by: (i) describing the vegetation type, with a focus on the dominant species, (ii) evaluating the vegetation structure and noting any human activities that could affect the observed structure, (iii) documenting all plant species present through on-site surveys.

Photographic records of the vegetation types and ecologically sensitive features were taken. Ecologically sensitive features were noted, and their geographical coordinates were taken. Photographic records of the vegetation types/ habitats were taken. All recorded species were assessed to determine their conservation status (IUCN, 2023; MTWA, 2018). The plant lists generated were also examined to identify the presence of invasive species (Ogwang et al., 2020) in the survey locations.

2.2.2 Fauna survey Methods

a) Mammals

Mammal occurrence was surveyed for in all the locations visited and mostly restricted to small and medium sized mammals and larger mammals that occurred in the area. Transect surveys were used to sample Medium sized mammal species diversity in project area. This involved setting out well laid transects parallel to the roads corridor. Two transects on each side of the road corridor were mapped out using GPS. These were ranging between 500m to 1km apart. Along each transects, purposeful searches and record of any live encounter for any mammal species and/or their spoor (Tracks, signs, faecal, roosts, etc.) were done.

For Rodents and shrews, non-destructive sampling was executed using baited Sherman traps, set out in a random pattern along project corridor. These were alternated every after two days (after spending two trap nights) to maximize capture. In addition, opportunistic searches for Rodent spoor especially burrows and feeding signs were done to maximize records. Captured individuals were identified and later released.

b) Avifauna

The proposed road alignment and proposed alignment (in the greenfield) was used as a transect. Birds were surveyed through areas of different habitats. A line transect count is a highly adaptable method in terrestrial systems and can be universally applied to species from different ecological categories (Gibbons and Gregory 2006). Bird identification was based on Stevenson and Fanshawe (2002). Species were assessed against the IUCN Redlist (IUCN, 2025) in order to understand their conservation status.

Species abundance assessments were based on estimated numbers of observed individuals in along the transect. Because it is not easy to obtain the exact numbers of individuals, species were

categorized into the following arbitrary abundance categories: 1=<10 individual; 2=11-100 individuals; 3=101-1,000 individuals and 4=>1,000 individuals

Birds recorded were classified into categories, where possible, basing on the standard habitat classification by Bennun and Njoroge (1996) and Carswellet al. (2005). This classification is widely used in evaluation of avifauna in Uganda, Table 2-1.

Table 2-1: Classification of birds according to their habitat requirements

Category	Description	Abbreviation
Forest birds	Forest specialists, cannot survive outside the primary forest	FF
	Forest generalists or forest edge species. They can live in the forest and at the forest edge or a degraded forest	F
	Don't live in the forest, they come to the forest as 'visitors'	f
Water birds	Species restricted to wetlands/open waters. They cannot survive outside an aquatic environment	W
	Water bird non-specialist-often found near water. They can as well survive where there is no water.	w
Grassland birds	Live in grassland habitats and sometimes in cultivations	G
Wide spread	These are generally found in all habitats but tend to avoid forests	Ws
Agricultural farmland	These are species that can be found in cultivated areas like gardens and settlements.	NF

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

All recorded species were assessed to determine their conservation status (IUCN, 2025). The species lists generated were also examined to identify their regional and National conservation status as accorded by Wildlife Conservation Society (WCS).

c) Herptiles (Reptiles and amphibians)

The use of Visual Encounter Surveys, (VES) is a well-known method for surveying herpetofauna. They can be used to document presence of reptiles and amphibians. This constitutes moving through a habitat watching out for and recording surface-active species. The data gathered using this procedure provides information on species richness of the habitat.

Within wetlands and swamps or marshlands, a dip-net was used to scoop through aquatic habitats to sample amphibians. Opportunistic records that occurred outside the sampling points but within the project surrounding were documented. These opportunistic encounters complimented the herpetofauna checklist within the project area, because of their high mobility levels.

Identification of herptiles followed Channing & Howell (2006), The AmphibiaWeb (2014) and The Reptile Database (Uetz, P. & JiríHošek (eds.) 2014), while the conservation status will be measured against the IUCN Red Listing (IUCN 2023).

2.3 Physical Environment Assessments

2.3.1 Air quality assessments

The MX6 Multi-Gas Monitor industrial equipment was utilized for assessing air quality parameters. Air quality readings were conducted at specified sections along the Expressway corridor.

The assessment concentrated on Criteria Air Contaminants (CAC) and Greenhouse Gases that indicate the emissions of interest with regards to environmental health. Primary sources of outdoor air emissions in the project location stem from vehicular traffic. Various air pollutants evaluated include; Particulate Matter (PM), including total suspended particulate (TSP). Inhalable particulate matter (PM10) and Sulphur dioxide (SO2); Sulphur Dioxide (SO2); Nitrogen Dioxide (NO2); Carbon Monoxide (CO); Greenhouse Gases: Carbon dioxide (CO2), methane (CH4), and Volatile Organic Carbon (VOC).

The Suspended Particulate Matter (SPM) sampling method works by filtering particles from a predetermined air sample volume using a suction device (Lazer Particle Counter). The particulate matter concentration outcomes are shown on the screen and logged.

2.3.2 Noise/ Sound, and Vibration Assessment

The sound/Noise level was measured by Precision Integrating Sound Level Meter Type: 4 in one Digital Sound Level Meter, Model CEM DT 8820 (range 35 – 130 dBA) for noise, (-20 – 750oC) for temperature, (25% - 95%) relative humidity. The meter is equipped with the three frequency-weighing networks (A, B and C) that are used to estimate the response characteristic of the ear at various sound levels and frequency distribution of noise over the audible spectrum.

The (A) frequency-weighing approximates the response characteristics of the ear for levels below (55dB). The (B) frequency weighing approximates the response characteristics of the ear for levels between (55 and 85) dB and the (C) frequency weighing approximates the response characteristics of the ear for levels above 85dB.

It consists of the following main features:

i) The Sensor or Microphone: The sensor is a high precision electrode condenser microphone, which must be protected from physical abuse, dirt, oil, water or ingress of any other such substance.
ii) The Control Panel: The control panel comprises of the: Recorder for the maximum level of sound, and minimum level of sound, Range selector, Auto and manual rest switches, Hold on max and min level
iii) The Range Selector: These switches can be used for selecting the relevant range of the sound level.

The charged sound level meter was adjusted for slow time response. The sound levels were measured at different sites with maximum and minimum recordings taken for the particular site and respective average sound levels calculated as the final readings. Readings were taken at several points along each of the proposed selected locations. Data obtained from baseline noise monitoring was processed and is presented according to the analysis below. The noise levels were compared with the National minimum and maximum noise levels.

2.3.3 Hydrology, flood risks and Water quality assessments

a) Hydrology and flood Risk assessments

Flooding is a common occurrence in Ntoroko and the surrounding areas due to heavy rainfall, wetland degradation, and blockage of drainage systems by various factors like structural developments, solid waste, and agricultural activities. The drainage infrastructure is often insufficient and not well-maintained. Approximately three-quarters of the current road alignment passes through low-lying areas and flood plains that are susceptible to flooding. With changing rainfall patterns, climate change, and land cover alterations, there has been an increase in rainfall run-off in the area. This raises the risk of flooding to both the road infrastructure and surrounding developments was assessed using the existing literature. Hydraulic modeling with HEC-RAS will then be used to evaluate how well the proposed structures could handle the anticipated design floods before and after the construction of the Karugutu-Ntoroko Road.

b) Water quality assessment

Direct observations were made by experts using a GPS with preloaded coordinates of culvert and water resources (Rivers, streams, swamps, boreholes, shallow wells, protected and unprotected springs) from UNRA's hydrologist. Data on the location, culverts located in the vicinity of homesteads, commercial buildings, farmlands, animal cross and track points within Semliki wildlife reserve, streams and animal watering holes to identify where the water diverted off the road would be channeled and its impact to the surrounding environs flow direction were taken and entered in MS Excel for simple analysis.

A total of 18 samples were collected from portable water sources (4), water holes (5) and Water Resources (9). Portable water was mainly got from the Landing sites and the Water holes are found in the game Reserve that are used as watering points for animals. **River Wassa** is the only Water resource found in the game reserves and serves as the main point for watering the animals. Some parameters were tested onsite while others were tested for in the laboratory. The water quality samples were collected in 1.5-liter plastic sampling bottles and delivered to Directorate of Water Resources and Management (DWRM) Laboratories in Entebbe for analysis.

Several characteristics of water were assessed, and these included physical characteristics (temperature, color, light, sediment suspended in the water), chemical characteristics (dissolved oxygen, acidity (pH), salinity, nutrients and other contaminants) and biological characteristics (bacteria and algae).

2.3.4 Soils, Materials and Geotechnical studies

Geotechnical investigations were also conducted in order to characterize, assess and evaluate the subsurface conditions at the swamp and bridge locations along the road alignments. This section has been written as part of the preliminary design and economic feasibility study report. This is because Soils and geological Materials take a very long time to deform.

2.4 Socio-economic assessments

2.4.1 Socio-economic survey

Socio-economic data collection relied mostly on the most recent secondary data, where necessary, some data collection was undertaken at household levels in selected communities/settlements and social aggregations.

The approach taken to collect and gather Socio-economic data relevant for completing this ESIA were as follows:

i) Document and literature review; involving detailed study of existing, related and relevant documents, case studies, reports, manuals and policies.
ii) Data collection (primary and secondary) at District level.
iii) Selection of a representative sample population for which a quantitative and qualitative assessment was done.
iv) Field survey using structured and semi-structured questionnaires, key informant interviews, participant observations and focus group discussions.
v) Assessment and analysis of field findings.
vi) Stakeholder consultation and additional data collection (informant interviews, focus group discussions etc.).
vii) Analysis of identified impacts and determination of their severity and significance.

2.4.2 Physical Cultural Resources surveys

Consultations with communities and other stakeholders were done so as to understand some interpretations on some sites as they regarded to be custodians of our recent past histories. Among those consulted were District leaders, cultural and religious leaders. Interviews were carried out to identify sites of cultural heritage importance. Focus Group Discussions and Individual Interviews with community members of the affected areas were conducted to obtain information about the cultural heritage resources and their significance. Stakeholders guided the survey team to some of the heritage sites and gave recommendations regarding the proposed development.

During the previous archeological assessments, test pits were excavated to determine the cultural history of the area.

2.4.3 Stakeholder Engagement and Consultations

Meaningful stakeholder engagements and consultations were carried through meetings with villages leaders including project affected persons, officials of the relevant districts, and government Ministries, Departments and Agencies. The method for engagement and consultations included Key informant interviews, consultative meetings, focus group discussions and structured interviews.

2.5 Critical Habitat Analysis

Critical Habitat Area of Analysis is only relevant to a development project if it can be impacted by that project. Consequently, a Critical Habitat Area of Analysis (CHAA) for each project area is identified as an ecologically relevant area surrounding and including the anticipated extent of project influence on biodiversity.

The CHAA was used as the geographical extent to screen biodiversity features to be assessed for CH. CH was only identified and mapped at the CHAA scale as potential project effects are limited to this spatial extent. Biodiversity features of concern were screened at the species, ecosystem and landscape levels using primary data and all relevant literature from the TSWR sensitivity Atlas.

2.6 Methods for Impact Assessment and Analysis

Impact assessment included a combination of a complex of methods, including: Expert judgment; Quantitative physical and mathematical models; and Rapid Impact Assessment Matrix (RIAM).

2.6.1 Expert Judgements

Expert judgment is based on the professional option of experts that have considerable experience in the areas of assessed impacts especially where adequate data is available to allow for predictive

modelling to explore the impacts. Expert judgments were used in conjunction with quantitative modelling and to complement modelling. This helped to interpret results and their consequences on the receiving environment and Socio-economic aspects.

Table 2-2: Rating of impact parameters to guide professional judgment

Symbol	No	minor	Low	Moderate	High	Very High	No
M=Magnitude	0	2	4	6	8	10	0
P=Probability	0	1	2	3	4	5	0
E= Extent	0	1	2	3	4	5	0
S=Significance			< 30	40-50	> 60		

2.6.2 Quantitative physical and mathematical models

During establishment of impact significance, several impact parameters were evaluated using Quantitative physical and mathematical models. The impact parameters that were assessed include Type, Timing, extent, certainty, duration, and magnitude and receptor sensitivity.

Where;

Timing	:	time frame (phase) at which an impact occurs within a project area
Duration	:	the period of persistence of an impact on receiving environment
Extent	:	Spatial occurrence by the impact on the subject environment
Magnitude	:	the strength of the impact on the environment
Certainty	:	the likelihood of occurrence of an impact
Significance	:	the overall change brought in the environment
Sensitivity	:	Level of change on the receptor environment

Table 2-3:quantitative format for ranking impacts based on parameters: magnitude and sensitivity

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

3.0 Institutional, Policy & Legal Framework

3.0 INSTITUTIONAL, POLICY & LEGAL FRAMEWORK

The National Environment Act 2019, (Cap 181) includes a list in Schedule 5 that outlines the projects requiring ESIA. Furthermore, various policies, institutions, and legal frameworks provide support for the specific guidelines under which the projects listed in Schedule 5 must adhere. This section clearly explains the importance of the legal and policy frameworks in the project context.

3.1 Institutional framework

3.1.1 International Financial Corporation (IFC)

IFC's Sustainability Framework articulates the Corporation's strategic commitment to sustainable development, and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Performance Standards are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities obligations regarding its investment and advisory services. There are eight IFC performance standards, these include;

Table 3-1: IFC performance standards and their relevance to the project

Performance Standard (PS)	Narration	Relevancy to the project
PS1	**Assessment and Management of Environmental and Social Risks and Impacts** All projects that face environmental and social risks that can affect their performance, so this standard helps companies identify, assess, and manage these risks in a way that protects both people and the environment. The standard includes requirements for conducting an Environmental and Social Risk Assessment, which must be updated periodically.	The project is associated with adverse Environmental and Social Impacts
PS2	**Labor and Working Conditions** projects must ensure decent working conditions for their workers, including the guarantee that they receive a fair wage, access to adequate facilities and resources, and protection from health and safety risks. It also requires them to provide employees with training and development opportunities, as well as to take measures to prevent discrimination and harassment.	This project heavily relies on Human labour resource
PS3	**Resource Efficiency and Pollution Prevention** This standard demands companies take measures to prevent pollution and increase resource efficiency. They must assess their operations to identify opportunities for improvement, while developing and implementing an environmental and social management system which includes specific procedures to address pollution and resource efficiency.	The project is associated with potential adverse Environmental pollution
PS4	**Community Health, Safety, and Security** Promoting health, safety and community protection during project development and operation; requiring projects to develop and implement policies, procedures and programs to prevent or mitigate health, safety and community impacts. The goal is to protect people and communities from harm while promoting sustainable development	The project traverses community sections in Karugutu, Rwebisengo, Kanara and Ntoroko.

Performance Standard (PS)	Narration	Relevancy to the project
PS5	**Land Acquisition and Involuntary Resettlement** This standard requires projects to avoid or minimize adverse impacts on communities, including displacement and loss of livelihoods. If displaced people cannot return to their previous level of well-being, the project must provide adequate compensation and treat them fairly and respectfully.	There is likely displacement of people in communities of Kanara, Karugutu, Rwebisengo and Ntoroko
PS6	**Biodiversity Conservation and Sustainable Management of Living Natural Resources** The objective of this performance standard is to promote sustainable development and protect the environment, with the conservation and sustainable management of biodiversity being a key aspect, including the protection of endangered species, maintenance of ecosystem function, and a sustainable use of natural resources.	A significant section of the project traverses Toro-Semliki Wildlife Reserve, with a vulnerable Chimpanzee population
PS7	**Indigenous Peoples** It requires companies to respect the rights of indigenous peoples when planning or carrying out business activities that may affect them, including making sure that communities are consulted at an early stage and in a culturally appropriate manner, that they have the opportunity to give their consent, freely, prior and informed, and that they are adequately compensated for any impacts.	Within the project footprint, there are no records of indigenous people,
PS8	**Cultural Heritage** This standard requires projects to avoid significant adverse impacts on cultural heritage; it has recently been updated to include new guidance on how to assess and manage risks to intangible cultural heritage, such as traditional knowledge, customs, and beliefs.	The project is a potential site for Cultural heritage

3.1.2 Ministry of Works and Transport (MoWT)

The Ministry of Works and Transport (MoWT) is responsible for policy formulation in the transport sector in Uganda and therefore sets standards in the sector. Among the policies is the Gender Policy whose objective is to strengthen contribution of roads to poverty eradication through providing an enabling environment where women and men participate in, and benefit from, developments in the sub-sector in an equitable manner. The Ministry of Works and Transport developed sectoral policies to mainstream Gender, HIV/AIDS and Occupational Health and Safety (OHS) in the sector.

The Uganda National Roads Authority (Repeal) Act, 2024, that was gazetted on 23rd December, 2024. Rendered UNRA inactive. Consequently, the functions of the Uganda National Roads Authority (UNRA) were taken over by the Ministry of Works and Transport on 30th December 2024.

The mandate of MoWT includes the development and maintenance national road system, advise Government on general roads policy and contribute to addressing transport concerns. In this project UNRA is both a developer and lead agency. As a lead agency, MoWT manages national roads infrastructure and is responsible for mitigation of impacts associated with road development. As a developer on the other hand, MoWT is required to comply with national environmental laws including undertaking ESIA for project.

3.1.3 Ministry of Water and Environment (MoWE)

Through its technical arm (Water Resources Management Directorate - WRMD), MoWE has a responsibility to regulate quality and quantity of water resources in the country. The Directorate is responsible for the full range of integrated water resources management (IWRM) activities including monitoring, assessing, planning, allocating and regulating water resources. Specifically, the Water Resources Planning Department is responsible for water regulation through issuance of permits for water abstraction and wastewater discharge. The Wetlands Management Department in this

Ministry is responsible for monitoring of wetland conservation in Uganda including projects through wetlands of conservation value. The MoWE will be instrument in monitoring to ensure that the project is in full compliance with the relevant laws and requirements.

3.1.4 National Environmental Management Authority (NEMA)

The National Environmental Act provides for the establishment of NEMA as the principal agency responsible for coordination, monitoring and supervision of environmental management activities. NEMA is under the Ministry of Water and Environment (MoWE) but has a cross- sectoral mandate to oversee the conduct of ESIAs through issuance of ESIA guidelines, regulations and registration of practitioners. It reviews and approves environmental and social impact statements (ESISs) in consultation with relevant lead agencies. NEMA works with District Environment Officers and local environment committees at local government levels who also undertake inspection, monitoring and enforce compliance with the laws. In Government ministries, NEMA works with Environmental Liaison Units to ensure that they effectively incorporate environmental issues in their activities, policies and programs. NEMA will play a monitoring and regulatory role this project.

3.1.5 Ministry of Gender Labour & Social Development

The Ministry has the overall mandate to mobilize and empower communities to harness their potential through Skills Developments, labor productivity and Cultural Growth for Sustainable and Gender Responsive Development of all Ugandan citizens. MGLSD works through its Directorate of Gender and Community Development, Department of Gender and Women Affairs, Department of Culture and Family Affairs, Department of Community Development, Directorate of Social Protection (Specifically the Department of Youth and Children Affairs, Department of Disability and Elderly, and Department of Equity and Rights.

The Ministry promotes cultural growth, non- formal skills development, labour productivity and gender responsive development, while focusing on reducing vulnerability associated to being or becoming poor. In addition, the Ministry rectifies imbalances to eliminate discrimination and inequalities against any individual or group of persons and takes affirmative action in favour of the marginalized.

The Ministry works with other stakeholders including the National Women's Council, National Youth Council, National Council for Children, and National Council for Disability, Industrial Court and the Equal Opportunities Commission. These councils are also decentralized from the district to the sub-county levels. Non-state actors include the Civil Society Organizations (NGOs and Faith Based Organizations), Cultural institutions and Development Partners. The Ministry will supervise the project to ensure Gender aspects, child protection and workers health and safety, among others are adhered to.

3.1.6 Directorate of Geological Survey and Mines

Geological survey and mines is a directorate under ministry of Energy and Mineral Development whose mandate is to control all forms of mining in Uganda through the Mining Act. Stone quarrying, sand mining and gravel excavation are key to providing materials for construction of the proposed Bridge. Quarrying and sand mining shall require an appropriate mining licenses issued by the Department.

3.1.7 Ministry of Local Government Local

The Ministry of Local Government (MoLG) is a cabinet-level government ministry responsible for the "creation, supervision and guidance of sustainable, efficient and effective service delivery in the

decentralized system of governance. The ministry is responsible for the harmonization and support of all local government functions, to cause positive Socio-economic transformation of Uganda".

District and Local Council administration of Ntoroko will be vital in implementation of the project by mobilizing political goodwill and sensitizing communities. In addition, the Department of Community Services, Department of Public Health, Department of Natural Resources of respective districts shall. In addition, the Department of Community Services, Department of Public Health, Department of Natural Resources of respective districts shall be fundamental in monitoring for compliance with the laws and regulatory.

3.2 National Policy Framework

No.	Policy	Summary of policy Narrative	Relevance on Karugutu-Ntoroko project
1	National Environmental Health Policy, **2005**	The main objective of this policy is to create an enabling environment for the achievement and maintenance of healthy living conditions in rural and urban areas. It actively promotes and supports the adoption of a national sanitation, ensure that an environmental health community at national and local government level is suitably skilled and equipped to meet current environmental health challenges.	Significant adverse sanitation challenges are likely to rise due to construction works. The proposed project involves construction and disposal of waste and pollutants hence the requirement for observation of this policy.
2	National Policy for Conservation and Management of Wetlands, **1995**	The overall aim of this policy is to promote the conservation of Uganda's wetlands in order to sustain their ecological and Socio-economic functions for the present and future wellbeing of the people. It aims at curtailing loss of wetland resources and ensuring that benefits from wetlands are equitably distributed to all people of Uganda.	The project transverses wetlands and flood plains. Therefore, project management should ensure that construction and operation activities do not lead to a decline of wetland productivity.
3	Wildlife Policy, **2014**	The main objective of this Policy is to conserve wildlife resources of Uganda in a manner that contributes to the sustainable development of the nation and the well-being of its people. Among the specific objectives includes Promotion of sustainable management of Uganda's wildlife Protected Areas, sustainably manage wildlife populations in and outside Protected Areas.	The project area falls within sensitive areas of Toro-Semuliki Wildlife Reserve that are holding significant Biodiversity and wildlife content. The project should promote sustainable management of wildlife habitats as well as avoid/minimize/mitigate impacts on protected area.

No.	Policy	Summary of policy Narrative	Relevance on Karugutu-Ntoroko project
4	National Water Policy, **1999**	The objective of this policy is to provide guidance on development and management of the water resources in Uganda in an integrated and sustainable manner, so as to secure and provide water of adequate quantity and quality for all social and economic needs, with full participation of all stakeholders and mindful of the needs of future generations.	The project area has prominent water bodies of National importance specifically the fact that it terminates in L. Albert. Sound measures shall be devised to avoid/minimise/mitigate the impact of construction on these water bodies.
5	Uganda's Vision **2040**	The Uganda Vision 2040 aims at transforming Uganda from its present Least Developed Country (LDC) status to, a competitive and upper middle-income country by 2040. Road infrastructure is identified as one of the priority economic growth drivers to enhance the quality of life as it facilitates movement of goods and services and general industrialization process among others.	The proposed Karugutu-Ntoroko will relief foster Socio-economic transformation within the region.
6	National Development Plan III 2020/2021-**2024/2025**	The National Development Plan III (NDP III) 2020/2021-2024/2025 developed under the theme "Sustainable Industrialization for inclusive growth, employment and wealth creation", placed integrated Transport Infrastructure and Services among the development drivers. Development of the Karugutu-Ntoroko was identified under NDP III among the infrastructure required to facilitate connectivity for improved household incomes and quality of life.	Proposed project meets the objectives of National Development Plan III 2020/2021-2024/2025
7	Gender Policy, **2007**	The purpose of the Uganda gender policy is to establish a clear framework for identification, implementation and coordination of interventions designed to achieve gender equality and Women's empowerment in Uganda. The policy is a guide to all stakeholders in planning, resource allocation, implementation and monitoring and evaluation of programs with a gender perspective.	Planning for gender equality shall be integrated into pre-construction, construction and post construction activities. MoWT shall ensure that gender specific needs are well articulated and implemented to avoid and minimize Socio-economic impacts.
8	National Policy on Elimination of Gender Based violence, **2016**	The policy seeks to promote, prevent and respond and end impunity of gender-based violation in the country. The highest prevalence of gender-based violence is among women aged between 15 and 45; and generally, involves sexual violence.	The proposed project shall have specific policy on eliminating of gender-based violence throughout project phases. In addition, the project will be required to work with community members, police, teachers, parents and all stakeholders to specifically address gender issues.

No.	Policy	Summary of policy Narrative	Relevance on Karugutu-Ntoroko project
9	National Policy for Older Persons, **2009**	The policy seeks to achieve equal treatment, social inclusion and empowerment of older persons. Among the values of the policy includes; Equity, Fairness, fair play, impartiality and justice in the distribution of benefits and responsibilities in society.	All project affected persons above 65 years shall be incorporated in the compensation process and shall be treated with equity and respect.
10	National Policy on Disability, **2006**	The vision of the policy is a society where people with disabilities (PWDs) fully participate in all spheres of development. The mission is to provide a framework to the empowerment of PWDs in the development process.	The project shall ensure participation of PWDs in the planning, implementation, monitoring and evaluation for all the project phases.
11	National Orphans and other Vulnerable Children's Policy, **2004**	The vision of the policy is a society where all orphans and other vulnerable children live to their full potential and their rights and aspirations are fulfilled. The mission of the policy is to provide a framework for the enjoyment of the rights and fulfilment of responsibilities of the orphans and other vulnerable children.	The project shall provide employment opportunities to only persons above the age of 18years The project shall ensure adequate protection of PAPs that are orphans
12	National Youth Policy, **2001**	The goal is to provide an appropriate framework for enabling youth to develop social, economic, cultural and political skills so as to enhance their participation in the overall development process and improve their quality of life.	The project should include youth in all phases of the project execution, including planning, construction and operations. Priority for employment should be given to youth from the project area.
13	Uganda National Culture Policy, **2006**	The Policy provides a framework for the promotion of culture for development and complies with international and regional instruments on culture. The core principles underlying the Policy are; Promoting Unity in Diversity, respecting one another's' culture, ensuring social inclusion, promoting cultural change, promoting environmental protection and strengthening partnerships.	The project shall ensure harmony with efforts to promote and enhance the contribution of culture to community empowerment.

No.	Policy	Summary of policy Narrative	Relevance on Karugutu-Ntoroko project
14	National Equal Opportunities Policy, **2006**	The National Equal Opportunities Policy provides a framework for re-dressing imbalances, which exist against marginalized groups while promoting equality and fairness for all, with a goal of. Providing avenues where individuals and groups' potentials are put to maximum use by availing equal opportunities and affirmative action.	construction comes along with a lot of opportunities including service delivery, trainings and employment. The project will avail equal opportunities and affirmative action.
15	National Child Labour Policy, **2007**	The overall objective of the policy is to guide and promote sustainable actions aimed at the progressive elimination of child labour starting with the worst forms. The vision of the policy is a society free of exploitative child labour in which all working children enjoy their right to childhood, education, dignity and the full development of their potential.	The project shall actively participate in efforts to eliminate child labour during pre-construction, construction and post construction.
16	National HIV/AIDS and the World of Work Policy, **2007**	The goal of this National policy is to provide a framework for prevention of further spread of HIV and mitigation of the Socio-economic impact of the epidemic within the world of work in Uganda. The policy recognizes HIV/AIDS as a workplace issue, which should be treated like any other serious illnesses / conditions in the workplace. It emphasizes the importance of promoting and protecting human rights, participation of people living with HIV/AIDS, gender equality as well as prevention, care, support and treatment as the major tools to be used in addressing the impact of HIV/AIDS in the world of work. It guides the overall response to HIV/AIDS in the world of work in Uganda.	The project shall endeavor to promote human rights, participation of people living with HIV/AIDS, gender equality as well as prevention, care, support and treatment as the major tools to be used in addressing the impact of HIV/AIDS on the project.
17	The National Tourism Policy, **2002**	This policy is aimed at ensuring that tourism is a medium for poverty reduction. The development of Karugutu-Ntoroko has potential to enhance or stimulate tourism in the region.	Appropriate management and monitoring plans shall be put in place to mitigate adverse impacts and also enhance positive benefits of the project to any tourism activities throughout all stages of the project.
18	National Land Policy, **2013**	The Policy is in tandem with the provisions of Uganda's Constitution which empowers the Central and local	In accordance to the provisions in this policy, resettlement action plan will

No.	Policy	Summary of policy Narrative	Relevance on Karugutu-Ntoroko project
		Governments to acquire land in public interest provided the acquisition is necessary for public use or is in the interest of defense, public safety, public order, public morality or public health and is subject to prompt payment of a fair and adequate compensation, prior to the taking of possession or acquisition of the property.	provide measures to ensure the affect landowners are compensated
19	National Climate Change Policy, **2015**	The overarching objective of this multi-sector national climate change policy is to ensure that stakeholders, including the transport sector, address climate change. This is because the predicted impacts of climate change threaten people and their livelihoods. More so, Uganda's vital transport infrastructure such as roads and bridges are also threatened by the predicted changes in climate. In order to adapt to climate change, transport plans and infrastructure management must reflect climate predictions.	Construction needs to adapt climate resilient designs that can mitigate impacts arising from increased peak flows and floods.
20	The National Policy on Elimination of Gender Based Violence (GBV), **2016**	The policy provides a framework for the implementation of comprehensive GBV prevention measures and provision of multi-sectoral support services for survivors. Under these provisions, the project will be required to prepare a gender action plan to support the project workers and the community during project implementation.	The general environment and social management system for the project shall include: anti-sexual harassment policy, workers code of conduct, anti-retaliation policy among others.
21	UNRA Environment and Social Safeguards Policy, **2016**	The UNRA Environment and Social Safeguards Policy was approved in March 2016. The policy statements include; Assessment and management of Environmental and Social impacts, Occupational and community Health and Safety, Gender, Vulnerable people, HIV/AIDs awareness and prevention, Stakeholder engagement and disclosure of information, Grievance redress mechanism, Labour and working conditions, sensitive ecosystems and sustainable management of environment, Climate change, Land acquisition and involuntary resettlement and Cultural resources.	All the provisions of the Policy will be observed and implemented throughout the project cycle

No.	Policy	Summary of policy Narrative	Relevance on Karugutu-Ntoroko project
22	The UNRA Land Acquisition and Resettlement Management System (LARMS), **2019**	The LARMS lays down the procedures and standards for land acquisition for UNRA projects. It provides for meaningful stakeholder consultations and engagement, fair, adequate and timely compensation prior to expropriation of land.	The land acquisition process for the proposed project shall be in compliance with standards of LARMS.

3.3 The Legislative Framework

No.	Legal Framework	Summary of the Narrative	Relevance to Karugutu-Ntoroko project
1	Constitution of Republic of Uganda, 1995	The Constitution is the supreme law of Uganda and it provides for protection of the environment. It provides for: Promotion of sustainable development and public awareness on the need to manage land, air, water resources in a balanced and sustainable manner for the present and future generations; Take possible measures to prevent or minimize damage and destruction to land, air and water resources resulting from pollution or other causes; and Promote the rational use of natural resources so as to safeguard and project bio-diversity of Uganda.	Under Article 39, the Constitution guarantees the right of every Ugandan to a clean and healthy environment. The constitution therefore, requires that the project to be implemented without endangering human health and the environment.
2	National Environment Act, CAP 181	This is the key legislation that provides the landscape for environmental management for Uganda. The Act provides for the management of the environment for sustainable development. Schedule 5 of the Act lists projects for which Environmental and social impact assessment is mandatory. KBE is among the project mandated to conduct full scale ESIA process.	This ESIA UPDATE has been carried out in compliance with this Act. In addition, appropriate assessments shall be undertaken for all project support structures during the implementation phase.
3	Local Government Act, Cap 243	Local Governments Act, 1997 establishes a form of government based on district as the main unit of administration. Districts are given legislative and planning powers under this Act. (Sections 36- 45) They are also enjoined to plan for conservation of the environment within their local areas. District Environmental Committees established under section 15 of the National Environment Act Cap 153 are supposed to guide district authorities in that regard.	The project management should plan closely with the Local government to ensure mutual understanding and fruitful achievements.

No.	Legal Framework	Summary of the Narrative	Relevance to Karugutu-Ntoroko project
4	Land Act, Cap 227	Part III Sections 43, 44 and 45 addresses the utilization of land in accordance with the Various Statutes and Acts of environmental concern, which include; the Forest Act, The Mining Act, The National Environment Act, and The Water Act. In addition, section 45 addresses the control of environmentally sensitive areas. Subsection (1) states that No person shall enter into any contract for or actually sell the land on which that person usually lives with a spouse or dependent children of the age of 18 or above except with prior written consent of either the spouse or the children. The developer should seek to enter into mutual agreement with the occupier or owner of the land upon payment of compensation.	This Act applies to land acquisition process for the entire project
5	Land Acquisition Act, Cap 226	This Act makes provision for the procedures and methods of compulsory acquisition of land for public purposes whether for temporary or permanent use. The Act requires that adequate, fair and prompt compensation is paid before taking possession of land and property. Dispute arising from the compensation to be paid should be referred to the court for decision if the Land Tribunal cannot handle.	All land acquisitions for the Karugutu-Ntoroko and auxiliary facilities regarding this project will be guided by this Act.
6	Roads Act, 2019	The Act empowers the Minister of Works and Transport to provide for different widths for road reserves for the different classes of public roads. In addition, the Act designates road authorities responsible for construction, alteration, rehabilitation, maintenance, protection and supervision of roads. UNRA is responsible for the development and maintenance of the national road network. It further provides that acquisition of land, excavation and taking of materials required for road construction be done in accordance with the Constitution. It also creates offences including destroying roads, obstruction and interference on roads such as the improper erection of billboards among others.	The proposed project will be part of the National Road Network. Construction should be undertaken while observing Standard road reserve requirements as stipulated by this Act.

No.	Legal Framework	Summary of the Narrative	Relevance to Karugutu-Ntoroko project
7	Water Act, Cap 152	The objective of the Act is to enable equitable and sustainable management, use, and protection of water resources of Uganda through supervision and coordination of public and private activities that may impact water quantity and quality. Section 18 requires that before constructing or operation of any water works, a person should obtain a permit from Water Resources Management Directorate (WRMD).	This Act will specifically be applicable to two aspects of the proposed road project: i) Water abstraction for road construction and camp use; ii) Activities associated with construction across the wetlands.
8	Mining Act, 9/2003	Several auxiliary activities are associated with road construction and include stone quarrying and borrow materials extraction. Such activities especially stone quarrying involves excavations or working where any operations are connected with mining including erections and appliance used in connection with such operations. These activities, therefore, are a subject of this Act. Requirements under Part XI for the Protection of the environment under the Act are therefore, relevant. Such requirements include Environmental Impact Assessment and Audits and Environmental standards for the prevention and minimization of pollution of the environment and waste management. Under section 110 (2b) gives guidance on restoration activities.	The project should ensure that relevant assessment/ studies are conducted for all auxiliary sites and will be restored basing on the guidance on restoration activities.
9	Occupational Safety and Health Act, 2006	The Act provides for the prevention and protection of persons at all workplaces from injuries, diseases, death and damage to property. The OSH Act covers not just the 'factory' but also any workplace where persons are employed and its provisions extend not just to employees but to the self-employed and any other persons that may be legitimately present in the workplace who may be exposed to injury or disease. Employers must 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 meals.	This law clearly applies to occupational health and fire safety risks associated with construction activities, management of fuel at storage sites, camp operations and bitumen.

No.	Legal Framework	Summary of the Narrative	Relevance to Karugutu-Ntoroko project
		The Act provides for safe access to the workplaces and safe work practices. In Section 95, the Act requires employers to take preventive measures including administrative and technical actions to prevent or reduce contamination of working environment.	
10	Workers' Compensation Act, Cap 225	This Act shall apply to all employment within Uganda; and shall apply to workers employed by or under the Government of Uganda in the same way and to the same extent as if the employer were a private person, but the Act shall not apply to active members of the armed forces of Uganda. If personal injury by accident arises out of and in the course of a worker's employment, the injured worker's employer shall be liable to pay compensation in accordance with this Act. The employer shall not be liable in respect of an injury which does not either result in permanent incapacity or incapacitate the worker for at least three consecutive days from earning full wages at the work at which he or she was employed.	This law should be applied in case of any injuries arising to any of the workers in the due course of construction activities.
11	Uganda Wildlife Act, Cap 200, 2019	The main objective of the Uganda Wildlife Act, Cap 200, is to protect wildlife resources and enable derivation of benefits. The Act provides for, inter alia, the sustainable management of wildlife, and establishes the Uganda Wildlife Authority (UWA) as the body mandated with the co-ordination, monitoring and supervision of wildlife management. It does so in partnership with neighboring communities and stakeholders. It was established as a result of a merger between the Uganda National Parks and the Game Department.	Section 15 (1) & (2): requires that any developer desiring to undertake any project which may have significant impact on any wildlife species or community undertakes an ESIA in accordance with the National Environment Act.
12	Petroleum (Refining, Conversion, Transmission and Midstream Storage) Act, 2013	The Act enables the development of refining, gas conversion, pipelines, transmission pipelines and midstream storage. Under Section 3 of the Act, a licensee and any person who exercises or performs functions, duties or powers under the Act in relation to midstream operations is required to take into	The project requires a fuel storage facility to run the machinery and equipment

No.	Legal Framework	Summary of the Narrative	Relevance to Karugutu-Ntoroko project
		account and comply with environmental principles as prescribed by the National Environment Act and other applicable laws.	
13	National Forestry and Tree Planting Act, 2003	This Act provides for the protection of forests through the creation of forest reserves in which human activity is strictly controlled. It seeks to control commercial harvesting of forest products through the use of licenses and promotes afforestation.	The project traverses Wildlife Reserve, an extensive swampy forest. The project will also promote tree planting as a measure to mitigate climate change.
14	Physical Planning Act, 2010	The infrastructural developments are likely to traverse areas of special characteristics. The areas have special physical, social economic and development potential and considerations. Section 3 of the Physical Planning Act 2010 declares the whole country a planning area and brings it under the planning control. Provisions under the Act will have to be invoked by the mandated institutions to control developments in urban and rural areas in the proximities of project to control unplanned developments.	The project designs will incorporate the long-term district plans.
15	Tobacco Control Act, 2015	Under Section 11, the Act guarantees every person to a tobacco smoke free environment. A person smoking a tobacco product is obliged to ensure that another person is not exposed to tobacco smoke. Section 12 prohibits smoking in public places, work places and means of public transport. Under Section 13, smokers are prohibited from smoking in outdoor space that is within 50 meters of a public place or designated not smoking area.	Smoking on project premises shall be regulated in accordance to this Ac Conspicuous sign posts and notices shall be placed in a language commonly used in the area, that smoking is prohibited.
16	Explosives Act, Cap 298	The state owns all the rights to importation and storage of quarrying explosives and exercises this right through The Explosives Act (Cap 309 of the Laws of Uganda). It is mandatory for quarry operators to comply with this law. This Act regulates use and management of explosives for civil purposes. Under this Act, explosives are kept at a site approved by the Ministry of Internal Affairs (MoIA) and can only be transported to the blast site under Police escort.	For stone quarrying where explosives will be used, provisions of this Act will be relevant to this project.

No.	Legal Framework	Summary of the Narrative	Relevance to Karugutu-Ntoroko project
		Charging of explosives and blasting are carried out under Police supervision.	
17	Public Health Act, cap 281	This Act aims at avoiding pollution of environmental resources that support health and livelihoods of communities. The Act gives local administrative units authority (Section 103) to prevent pollution of watercourses in interest of public good.	This Act will not only be relevant along the project course, but also in land where workers camps, equipment yards and quarries will be located.
18	Children's Act, Cap 59	Consolidates the laws relating to children and provides inter alia for the care, protection and maintenance of children. Establishes a family and children court, Section 8 prohibits the employment or engagement of children in any activity that may be harmful to his or her health, education or mental, physical or moral development.	During execution of the project, no persons of age under 18 years will be engaged in any of the project activities.
19	NSSF Act, Cap 222	The National Social Security Fund is a mandatory pure defined contribution provident fund which pays lump sums at retirement. The contribution rate to NSSF is 15% shared at 5% and 10% between the employee and employer respectively. The scheme was created by the National Social Security Fund Act (Cap 222) Laws of Uganda and its core objective is to protect formal employees against uncertainties of social and economic life.	All permanent employees should be subject to NSSF registration
20	Historical Monuments Act, Cap 46	This Act provides for the preservation and protection of historical monuments and objects of archaeological, paleontological, ethnographical and traditional interest. The historical monuments act, Cap 46 gives mandate to the Department of Museums and Monuments in the ministry of Tourism Wildlife and Antiquates to collect document and preserve cultural relics that have values to the community, the nation and the international community. Sections 10 and 11 of the Act provide for conservators of antiquities to maintain and inspect and preserved or protected objects. Regarding chance findings, clause 17-11 of the general specification of Road and	All cultural sites within the project area should be preserved during execution of the road project. A Chance Finds Procedure shall be adopted and implemented in case of any Chance Finds during the works on the project. This will involve reporting to the Department of Museums and Monuments for advice and any other necessary action.

No.	Legal Framework	Summary of the Narrative	Relevance to Karugutu-Ntoroko project
		Bridge Works of 2005 require the contractor to immediately notify the Engineer evidence of possible scientific historical, pre-historical or archeological data, giving the location data and nature of findings.	
21	Immigrations Act, Cap 63	An Act to consolidate and amend the law regulating immigration into Uganda and for other purposes incidental to and connected therewith. All foreign (non-Ugandan) employees and workers connected with this project should seek clearance from the Directorate of Citizenship and Immigration Control of Uganda before engaging into any project activities.	Construction works will attract expatriate experience from foreign countries. All foreign (non-Ugandan) employees and workers connected with this project should seek clearance from the Directorate of Citizenship and Immigration Control of Uganda.
22	Public Holiday Act	The days specified in the Schedule to this Act are declared to be public holidays, which, subject to this Act, shall in every year be kept and observed as public holidays throughout Uganda.	All public holidays will be observed
23	Rivers Act, Cap 357	Section 4 of this Act requires that any dredging in a river be licensed. It states that it shall not be lawful to dredge in any river without a license from the Minister. Section 6(1) stipulates that the Regulations set forth in the Third Schedule of this Act shall be endorsed on every license to dredge.	The MoWT shall acquire the dredging license before the implementation of the works that are bridges across major rivers within the catchment; and all river related activities should be carried in accordance with the provisions of this Act.
24	Fish Act Cap, 197	The Act makes provisions for the conservation of fish and related matters. Section 7 provides that any person who, without the written permission of the chief fisheries officer, uses or possesses for the purpose of using any poison, noxious substance, explosive, lamp, light, flare, torch or electrical device for the capturing, killing or injuring of any fish or for rendering any fish more easily captured commits an offence against this Act.	The activities pertaining to Karugutu-Ntoroko construction works should be carried out in line with the provisions stipulated in Act.
25	Traditional ruler's Act, Cap 247	Under the Reinstitution of Traditional Rulers statute of 1993, confirmed by the constitution of Uganda in 1995, kings and chiefdom were given right to own their cultural property. In the area of the project, chiefs are recognized and they are the custodians of cultural sites and traditional belief systems hence key stakeholders in that regard.	Toro Kingdom shall be consulted regarding cultural sites within the Right of Way.

No.	Legal Framework	Summary of the Narrative	Relevance to Karugutu-Ntoroko project
26	Traffic Act, 2002	The traffic Act 2002 consolidates law relating to traffic on all public roads. The Act also prohibits encroachment on and damage to roads including road reserves.	During the construction phase of the project, temporary road signs shall be installed following an approved traffic management plan. Upon completion of the project, appropriate road furniture including traffic signage shall be installed and the right of way protected from encroachment.
27	Employment Act, 2006	The Act defines the relationship between employers and employees. It is the umbrella law that governs labour management in Uganda. The Act provides clear terms and conditions of employment including; appointments, contracts, leave management, remunerations, conflict resolution among others. The Act empowers the district labour officers to undertake labour inspections and prosecute any offences related to non-compliance to the labour laws of Uganda.	The project shall develop and implement a comprehensive Labor Management Plan in consultation with the district labour offices of Ntoroko District.

3.4 Regulatory Framework

No	Regulation	Summary	Importance to the project
1	National Environment (Air Quality Standards) Regulations, **2024**	The National Environment Management Authority (NEMA) launched a set of regulations and standards designed to protect Uganda's air quality amidst the mounting challenge of air pollution. Key objectives include; establishing clear standards for indoor air quality to safeguard the health of occupants in workplaces and other enclosed environments. Additionally, the regulations impose stringent emission limits for industrial facilities, vehicles, and other sources of pollution to mitigate their impact on communities.	Significant adverse emission challenges are likely to rise due to construction works from excavation, vehicular emissions and waste matter. The proposed project involves construction of road infrastructures, disposal of waste and pollutants that will compromise the air quality within the project area hence the requirement for observation of this policy.
2	The National Environment (Environmental and Social Assessment) Regulations, S.I **No.143 of 2020**	The regulations provide a framework within which ESIAs for projects are undertaken. It also emphasizes that an environmental and social impact study for relevant projects be undertaken in accordance with section 113 of the National Environment Act and Schedule 5 of the same Act. The regulations emphasize the adoption of the mitigation hierarchy during project planning. The regulations also introduce penalties for non-compliance to the Act.	This ESIA has been prepared in compliance with these regulations.

No	Regulation	Summary	Importance to the project
3	National Environment (Waste Management) Regulations S.I. No. 49 of **2020**,	These regulations categories the different types of waste including hazardous waste. The regulations provide that only licensed handlers can collect, store, transport and dispose of hazardous waste. An adequate waste management plan for the project shall be developed and implemented in conformance with these regulations. More so, a licensed handler shall be procured to handle any hazardous waste generated by the project activities. The practices emphasized under these regulations are aimed at preventing the contamination of water, air, soil and other components of the environment.	The regulations promote cleaner production methods that enable the recovery and reuse of wastes, reclamation and recycling. Further the regulations would influence management of solid waste at workers camps, equipment yards and road construction site.
4	National Environment (Wetlands, Riverbanks and lakeshores Management) regulation S.I No. **2/2000**	These regulations provide principles for sustainable use and conservation of wetlands, and riverbanks. The regulations provide for; Mandatory ESIA for all major activities on riverbanks and lakeshores, and Development and implementation of measures to prevent soil erosion, siltation and water pollution. This ESIA has been undertaken in compliance with these regulations and the required mitigations for prevention of soil erosion, silting shall be developed and implemented. A soil erosion control plan shall be developed and implemented during construction.	These regulations are important considering the major rivers and wetlands within the project corridor.
5	National Environment (Control of Smoking in Public Places) Regulations, **2004**	Regulations require that public smoking be avoided. Second-hand smoke (SHS) is a complex mixture of more than 4,800 chemical compounds, including 69 known carcinogens. The World Health Organization (WHO) indicates that, exposure to tobacco smoke causes disease, disability and death. According WHO, SHS is a human carcinogen for which there is no "safe" exposure level. The construction site is considered place and thus smoking shall be prohibited at all times.	These regulations should apply to areas communally used by construction workers such as site offices, eating areas in camps and workers transport vehicles. Requirements of these regulations should be fulfilled to avoid exposure of workers to tobacco SHS and attendant health risks.
6	National Environment (Noise Standards and Control) Regulations, **2003**	Part III Section 8 (1) requires machinery operators, to use the best practicable means to ensure that the emission of noise does not exceed the permissible noise levels. The regulations require that persons to be exposed to occupational noise exceeding 85 dBA for 8 hours should be provided with requisite ear protection. The regulatory noise limits at construction sites are presented Table Below	Appropriate Personal Protective Equipment (PPE) shall be given to all workers and especially those in areas where noise generation could exceed the permissible levels. In addition, regular maintenance of equipment including machinery shall be undertaken throughout the project.

No	Regulation	Summary	Importance to the project
		<table><tr><td>Facility</td><td colspan="2">Noise limits dB(A) (Leq)</td></tr><tr><td></td><td>Day*</td><td>Night*</td></tr><tr><td>Construction</td><td>75</td><td>65</td></tr><tr><td colspan="3">Time frame: Day 6.00 a.m -10.00 p.m.; Night 10.00 p.m. - 6.00 a.m.</td></tr></table> **Source:** *The National Environment (Noise Standards and Control) Regulations, 2003.*	As a requirement, generators shall be installed with silencers to minimise emission of noise.
7	Water Resources Regulations, **1998**	The regulations apply to motorized water abstraction from boreholes or surface watercourses or diverting, impounding or using more than 400 cubic meters of water within a period of 24 hours. Part II, Regulation 3 requires a water permit for operation of motorized water pump from a borehole or waterway. Under Regulation 6, application for permit may be granted on conditions of projected availability of water in the area, existing and projected quality of water in the area and any adverse effect which the facility may cause among other considerations. As such, the project shall acquire water abstraction permits in compliance with these regulations.	The contactor should abide by provisions of this law in regard to drilling and operation of a borehole proposed at the workers camp and abstraction of water to be used for construction.
8	National Environment (Audit) Regulation, **2020**	Schedule 3 to these Regulations provide projects for which an annual environmental compliance audit must be carried out by the respective developer. The regulations also provide for voluntary compliance audits for projects not listed in Schedule 3. All projects listed in Schedule 5 of National Environment Act are among those listed in Schedule 3 of the Regulations and require a mandatory annual environmental compliance audit.	Following approval of the ESIA by NEMA, the proposed project will undergo mandatory annual environmental compliance audit.

3.5 International Conventions to which Uganda is Party

3.5.1 The UN Conventions on the Rights of Persons with Disabilities, 2008

The Convention on the Rights of Persons with Disabilities is an international human rights treaty of the United Nations intended to protect the rights and dignity of persons with disabilities. Parties to the Convention are required to promote, protect, and ensure the full enjoyment of human rights by persons with disabilities and ensure that they enjoy full equality under the law. The Convention has served as the major catalyst in the global movement from viewing persons with disabilities as objects of charity, medical treatment and social protection towards viewing them as full and equal members of society, with human rights. It is also the only UN human rights instrument with an explicit

sustainable development dimension. The Convention was the first human rights treaty of the third millennium.

3.5.2 United Nations Conventions on the Rights of the Child and its Optional Protocols and Declarations on Children

The United Nations Convention on the Rights of the Child (commonly abbreviated as the CRC or UNCRC) is a human rights treaty which sets out the civil, political, economic, social, health and cultural rights of children. The Convention defines a child as any human being under the age of eighteen, unless the age of majority is attained earlier under national legislation. Two optional protocols were adopted on 25 May 2000. The First Optional Protocol restricts the involvement of children in military conflicts, and the Second Optional Protocol prohibits the sale of children, child prostitution and child pornography. Both protocols have been ratified by more than 160 states including Uganda.

3.5.3 Convention on Elimination of All Forms of Discrimination against Women

The International Convention on the Protection of the Rights of All Migrant Workers and Members of their Families is a United Nations multilateral treaty governing the protection of migrant workers and families. Signed on 18 December 1990, it entered into force on 1 July 2003 after the threshold of 20 ratifying States was reached in March 2003. The Committee on Migrant Workers (CMW) monitors implementation of the convention, and is one of the seven UN-linked human rights treaty bodies. Implementing Contractors of this project may have foreign workers whose rights need to be protected.

3.5.4 Convention on the Conservation of Migratory species of Wild animals

The Convention on the Conservation of Migratory Species of Wild Animals aims at conserving terrestrial, marine and avian migratory species throughout their range. It is an inter-governmental treaty, concluded under the aegis of the United Nations Environment Program, concerned with the conservation of wildlife and habitats on a global scale. There is a possibility of recording migratory bird species within the project area in the due course of construction activities, because the project area lies in within a large catchment wetland system and alongside a Wildlife Reserve.

3.5.5 Convention on Protection of Migrant Workers

The International Convention on the Protection of the Rights of All Migrant Workers and Members of their Families is a United Nations multilateral treaty governing the protection of migrant workers and families. Signed on 18 December 1990, it entered into force on 1 July 2003 after the threshold of 20 ratifying States was reached in March 2003. The Committee on Migrant Workers (CMW) monitors implementation of the convention, and is one of the seven UN-linked human rights treaty bodies. Implementing Contractors of this project may have foreign workers whose rights need to be protected.

3.5.6 International Convention on Economical Social and Cultural Rights

The International Covenant on Economic, Social and Cultural Rights (ICESCR) is a multilateral treaty (of which Uganda is a member) adopted by the United Nations General Assembly on 16 December 1966, and in force from 3 January 1976. It commits its parties to work toward the granting of economic, social, and cultural rights (ESCR) to the Non-Self-Governing and Trust Territories and individuals, including labour rights and the right to health, the right to education, and the right to an adequate standard of living. As of 2015, the Covenant has 164 parties.

3.5.7 Convention for the Safeguarding of the Intangible Cultural Heritage, 2003

Unlike other UNESCO conventions, this convention begins with stating its purposes, which are to safeguard the intangible cultural heritage to ensure respect for the tangible cultural heritage of the communities, groups and individuals concerned to raise awareness at the local, national and international levels of the importance of the intangible cultural heritage, and of ensuring mutual appreciation thereof; to provide for international cooperation and assistance.

All intangible cultural and values within the project area will be respected during construction works.

3.5.8 The United Nations Framework Convention on Climate change (UNFCCC), 1992

The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty negotiated at the Earth Summit in Rio de Janeiro from 3 to 14 June 1992, then entered into force on 21 March 1994. UNFCCC has 197 parties as of December 2015 of which Uganda is a member. Its sister Rio Conventions are the UN Convention on Biological Diversity and the Convention to Combat Desertification. Preventing "dangerous" human interference with the climate system is the ultimate aim of the UNFCCC. Therefore, all construction works should maintain the ecological integrity of the habitat by avoiding activities that could enhance climate change especially massive tree cutting.

3.5.9 African Convention on the Conservation of Nature and Natural Resources, 1982

The African Convention on the Conservation of Nature and Natural Resources (Organization of African Unity - OAU) notes that soil, water, flora and fauna constitute valuable capital, and that these are currently under threat. The convention notes that these resources have economic, nutritional, scientific, educational, cultural and aesthetic value. The main principle of the convention is that measures necessary to ensure conservation, utilization and development of these resources are undertaken in accordance with scientific principles and with due regard to the best interests of the people.

3.5.10 The Ramsar Convention on Wetlands, 1971

The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Uganda is a Contracting Party to the Ramsar Convention. The project area is far away from known Ramsar sites, however, each wetland system somehow feed into the other. Efforts taken to protect the wetland within the project area will directly or indirectly contribute to wetland protection.

3.5.11 The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

CITES recognizes that there exist many endangered species whose vulnerability is increased due to trade. The convention's main aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

3.5.12 The Convention on Biological Diversity (CBD)

Uganda signed the Convention on Biological Diversity (CBD) in 1992 and ratified it in 1993. The CBD requires Contracting Parties to conserve their biological diversity and promote sustainable use of biological resources. Of specific relevance to future development projects in the area is Article 14 of the CBD which requires its Contracting Parties to introduce appropriate procedures for ESIA of proposals that might have effects on biological diversity, and to provide mechanisms for taking the biodiversity impacts of programs and policies into account. Emphasis is given to in situ conservation

in Protected Areas where rehabilitation of degraded ecosystems, recovery of threatened species, and protection of natural habitats and maintenance of viable populations of species in natural surroundings is carried out (CBD, Article 8).

Therefore, as part of the decision-making process, the ESIA outcomes will need to be considered in the context of the responsibility of the Ugandan government to protect and conserve threatened species and natural habitats.

3.5.13 The Strategic Approach to International Chemicals Management (SAICM)

This was adopted by the International Conference on Chemicals Management (ICCM) in February 2006. It is a global voluntary strategy. SAICM was adopted by a consensus of Environment Ministers, Health Ministers and other delegates from more than one hundred governments participating in the ICCM in Dubai, United Arab Emirates. The conference was organized by the United Nations Environment Program (UNEP). It is a non-legally binding policy framework that aims to facilitate the elimination and reduction of risks of chemicals throughout their life-cycle. It is an international chemicals regulation that has made some significant steps forward, moving from regulating specific problems to addressing generic issues including governance.

3.5.14 Stockholm Convention on Persistent Organic Pollutants, 2001

The Stockholm Convention is a global treaty designed to protect human health and the environment from Persistent Organic Pollutants (POPs). The Convention was adopted in May 2001 and entered into force in May 2004. Uganda acceded to the convention on the 20th July 2004. Its aim is to eliminate the intentional production and use of POPs and minimize releases from unintentional production of POPs, such as dioxins and furans, which are produced by incomplete combustion. It deals specifically with chemical management and in particular with POPs, PCBs and dioxides. The objective of this convention is to protect human health and the environment. Parties are required to take action on an initial group of 12 specified chemicals in addition to the nine new specified chemicals within this convention.

3.5.15 The Basel Convention on the Control of Trans-Boundary Movements of Hazardous Wastes and Their Disposal

The Basel Convention is a global treaty aimed at protecting human health and the environment from risks posed by hazardous wastes and their transboundary movement. The treaty was adopted in 1989, came into force in 1992 and Uganda acceded to it on 11th March 1999. The overall goal of the Basel Convention is to protect, by strictly controlling, human health and the environment against the adverse effects which may result from the generation, transboundary movement and management of hazardous and other wastes. When hazardous wastes are dumped indiscriminately, spilled accidentally or managed improperly, they can cause severe health problems, or even death, and poison water and land for decades. All chemicals used in road constructions will be managed in accordance to this convention.

3.5.16 World Heritage Conventions

a) ***International Human Rights Instruments***

Uganda is signatory to the Universal Declaration of Human Rights (UDHR) and therefore has a moral obligation to advance the Rights spelt therein. Under Article 17 of the UDHR, everyone has the right to own property alone as well as in association with others and no one shall be arbitrarily deprived of his property. This includes cultural property. In addition, the International Covenant on Economic, Social and Cultural Rights (ICESCR), which it ratified in 1987, binds Uganda. Article 27 of UDHR and Article 15 of ICESCR recognize everyone's right to freely participate in cultural life.

b) The UNESCO Convention on the Protection of the World Cultural and Natural Heritage (1972)

Uganda is a signatory to the Convention on the Protection of the World Cultural and Natural Heritage in 1987 and is thus obliged among other things, to:

- Ensure the identification, protection, conservation, preservation and transmission to future generations of the cultural and natural heritage (Article 4).
- Ensure that effective and active measures are taken for the protection, conservation and preservation of the cultural and natural heritage situated on its territory, each State Party to this Convention shall endeavor, in so far as possible, and as appropriate for each country (Article 4). and
- Adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programs

c) World Bank Operational Policy on Physical Cultural Resources, OP4.11

- It defines Physical Cultural Resources as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance.
- Physical cultural resources may be located in urban or rural settings, and may be above or below ground, or under water.
- Their cultural interest may be at the local, provincial or national level, or within the international community.
- Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices.

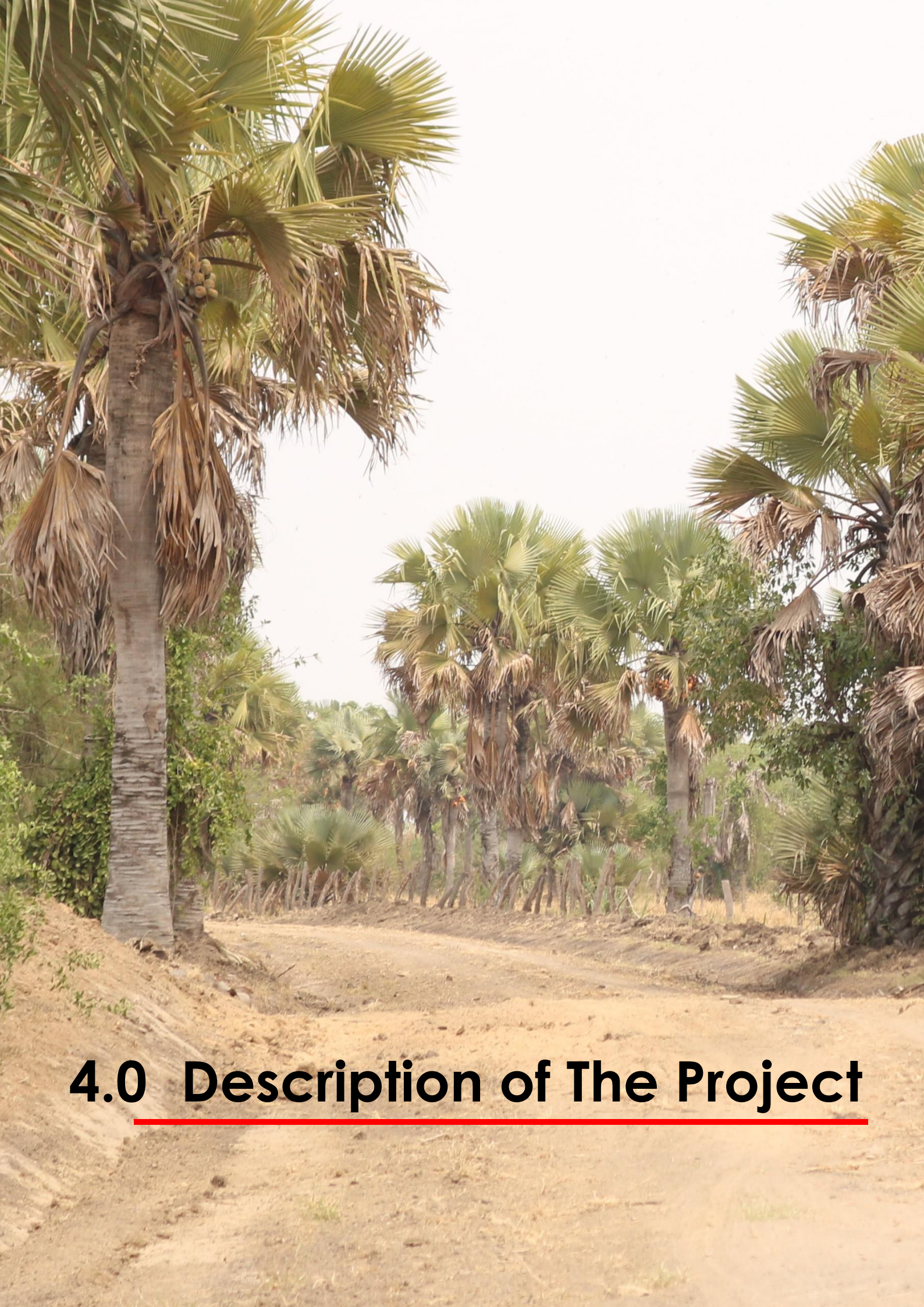
3.6 Required Licenses and Permits

Development of the proposed project will require a number of licenses, consents and permits from relevant authorities. Some of them are indicated in Table 3-2, below.

Table 3-2: Presents some of the required permits.

S/N	Permit	Issuing agency	Responsibility
1	ESIA Approval Certificate for the Project	NEMA	MoWT
2	ESIA Approval certificates for Project Associated Facilities	NEMA	Contractor
3	Water abstraction permit	Water Resources Management Directorate, (WRMD)	Contractor
4	Wastewater/Effluent discharge permit	DWRM & NEMA	Contractor
5	License for storage, transportation and disposal of hazardous waste	NEMA	Contractor
6	Permit to construct a bridge across rivers.	Water Resources Management Directorate, (WRMD)	Contractor
7	Magazine license (explosives)	Ministry of Internal Affairs	Contractor
8	Blasters License	Ministry of Internal Affairs	Contractor

S/N	Permit	Issuing agency	Responsibility
9	Workplace Registration Permit for worker's Camp and Quarry sites.	Ministry of Gender, Labor and Social Development, OSH	Contractor
10	Certification of Lifting equipment	Ministry of Gender and Social development	Contractor
11	Approval of layout and physical plans for campsites	Districts, Municipal councils	Contractor
12	Work permits for foreign workers	Ministry of Internal Affairs	Contractor
13	Fuel storage and dispensing permit	Ministry of Energy and Mineral Development	Contractor
14	Wetland User Permit	NEMA	MoWT
15	Dredging Permit	Ministry of Water and Environment	Contractor



4.0 Description of The Project

4.0 DESCRIPTION OF THE PROJECT

4.1 Location

The proposed project is situated in Ntoroko District which was granted a District status by the act of parliament in 2010 curving it from Bundibugyo District effective July 2010. Ntoroko as a District is located in the western region of Uganda bordered by the Districts of Kibale in the Northeast, Kabarole in the East and Southeast, the Bundibugyo District, Democratic Republic of Congo (DRC) to the West, and Lake Albert to the North.

The road starts at Karugutu Trading Centre on the Fort Portal – Bundibugyo Road at UTM Arc 1960 191336E 87285N and ends at the lake shore on Lake Albert in Kanara Town Council at UTM Arc 1960 226397m E 116912m N. The starting point of the road at Karugutu is approximately 340 kilometers, by road, West of Kampala, the Capital City of Uganda. Over 95% of the road traverses at the peripheral of Toro-Semuliki Wildlife Reserve which falls under the jurisdiction of Uganda Wildlife Authority. The proposed desired alternative will maintain an existing road section from Karugutu to Kakara where there is a junction to Rwebisengo-and will continue all the way to Makondo an operational road covering about 16 Km that will require an opening for the upgrade and later on divert near the park boundary with in the park for 18 Km through green field and to join the District feeder road of 3 Km to give a total length of approximately 21 km to Kanara.

The existing road has been undergoing periodic maintenance and is motorable. It has a width of approximately 6m. The Karugutu – Ntoroko road is Gravel class A, maintained by MoWT. The road is in a fair to poor condition and exhibits defects including, loss of gravel, potholes and scoring of drainage channels mainly after river Wasa towards Kanara Town Council where the road is generally flat with cotton soils that often become problematic during the rainy season.

Table 4-1: Administrations along the project

Sub County/ Town Council	Ward / Parish	Villages/Cells
Karugutu Town Council	Karugutu Ward	Karugutu South Cell
	Nyabuhuru Ward	Karugutu North Cell
		Nyabuhuru Cell II
	Kacwamba	Kacwamba I, Kacwamba II
		Kakhoga
Karugutu Sub County	Itojo Parish (within the wildlife reserve)	Kakara
Kanara Sub County	Kimara Parish (within the Wildlife reserve)	Kanywataaba
		Wassa
		Kandita
		Kacwankumu
Kanara Town Council	Kanara Ward (old)	Kanara A
		Kanara B, Rwenyange B
		Rwenyange A
	Twanzane Ward	Ntoroko South B
		Ntoroko south A
		Ntoroko Middlewest
		Ntoroko west
	Kanyansi Ward	Ntoroko Central A
		Ntoroko Central B
		Ntoroko East B, East A
		Ntoroko
	Ntoroko Ward	Kisenyi A
		Kisenyi B
		Ntoroko, North B North A

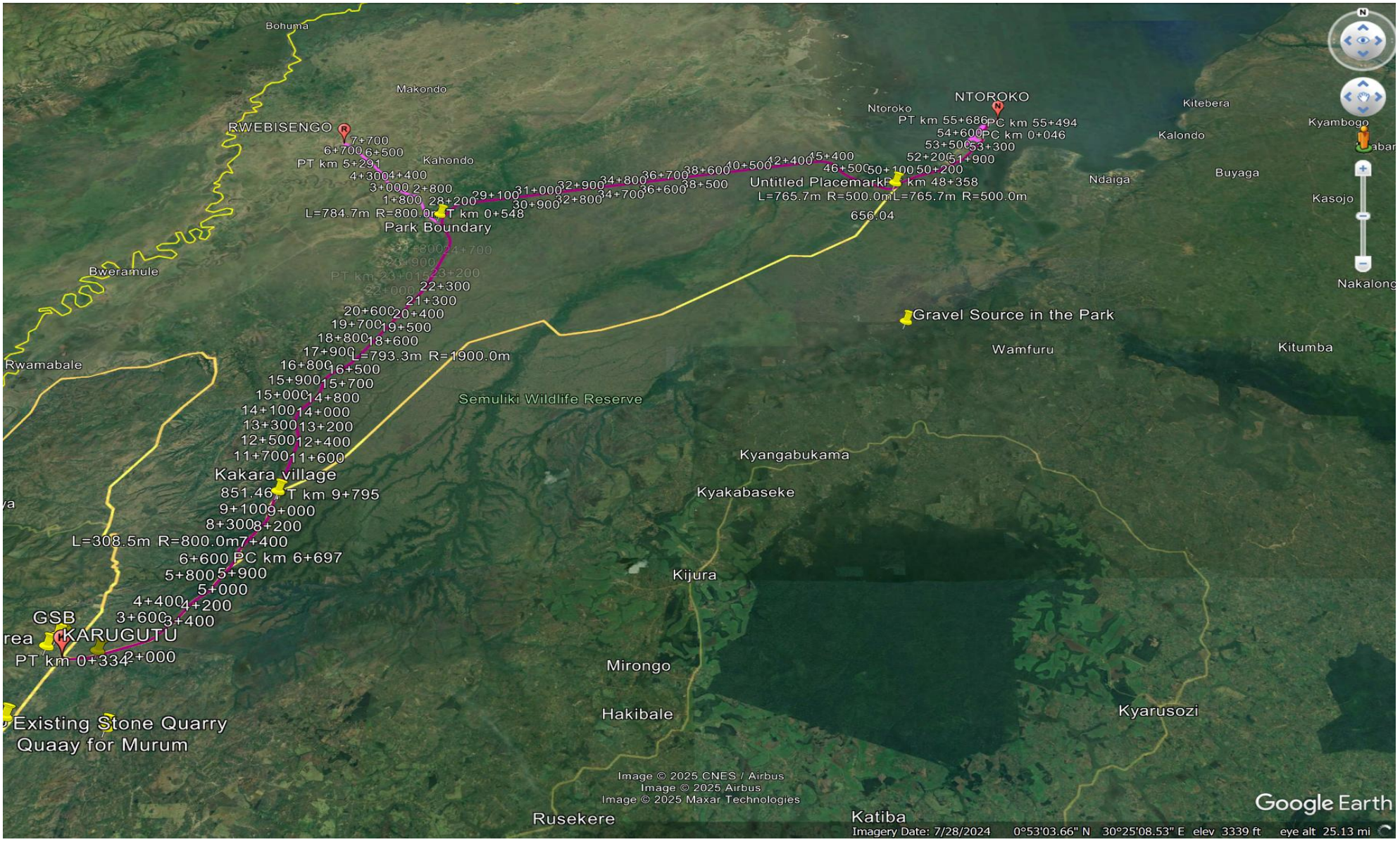


Figure 4-2: Google map showing the location of the project

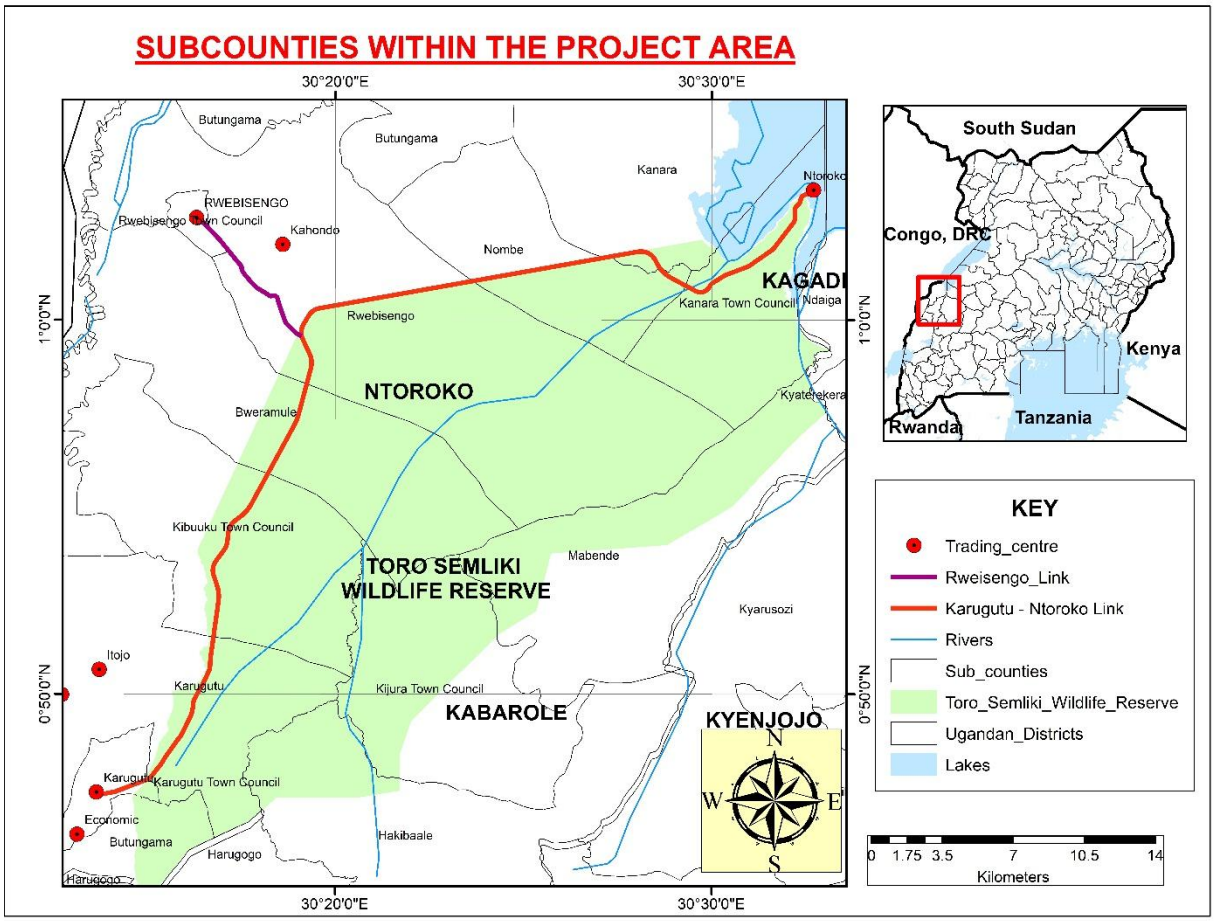


Figure 4-3: Location of the project

4.2 Nature of existing roads

Karugutu-Ntoroko (56.5km), Link to Rwebisengo (8.2km) and Ntoroko Town Roads (3.2km) are existing road links. The existing roads are Gravel class A, maintained by MoWT and the local government. The roads are in a fair to poor condition and exhibits defects including, loss of gravel, potholes and scoring of drainage channels mainly after **River Wasa** towards Kanara Town Council where the road is generally flat with cotton soils that often become problematic during the rainy season.

Plate 4-1: Status of the existing Road (Photos taken on 25th January 2025)

4.3 Project composition

The project consists of;

- Karugutu-Ntoroko (56.5km),
- Link to Rwebisengo (8.2km) and
- Ntoroko Town Roads
- Construction Camps
- Rock quarries, Swamp fill material & borrow areas

While final choice of material source is a responsibility of the road contractor, possible locations of borrow sites and quarries were identified along the road corridor. However, the contractor in consultation with the supervising engineer will select the final material sources.

4.3.1 Potential sources of construction materials

Some sources of construction materials were identified, as shown Table 4-2 below;

Table 4-2: Potential sources of construction materials

No	Potential Material type	Source
1	Water	1°01'05.11"N, 30°28'53.68"E
2	Water	1°03'13.99"N, 30°32'14.38"E
3	Borrow area	0°47'44.91"N, 30°13'26.57"E
4	Quarry material	0°47'33.79"N, 30°14'09.50"E
5	Quarry material	0°45'39.93"N, 30°12'55.46"E

These sources will be subjected to an appropriate level of environmental and social impact assessment for respective developments in compliance with the National Environment Act, 2019 and the IFC Environmental and Social Standards.

4.4 Design Considerations

The proposed Road will be a class II paved road with a right of way 50m and carriage way of 7m. The other geometric parameters are given in Table 4-3 below.

Table 4-3 : Geometric parameters of the proposed Road

No.	Design Element		Unit	URDM Design Parameter
1	**Design Speed:**	Flat	Km/h	90
		Rolling		70
		Urban/ peri-urban		50
2	**Cross Section Elements:**	Carriageway width	m	7 (2 lanes)
		Carriageway cross fall	%	2.5%
		Shoulder width	m	2No. x 1.5
		Shoulders cross fall	%	2.5%
		Support strip width	m	0.45
		Right of Way	m	50
3	**Horizontal alignment Elements**	Desirable Minimum stopping sight distance	m	135 (Flat terrain, 95 (Rolling Terrain)
		Desirable Minimum passing sight distance	m	605 (Flat), 485 (Rolling)
		Maximum Super Elevation $_{max}$	%	7.0% Rural sections (4% Urban/per-urban sections)
		Minimum Horizontal curvature (Radius)	m	320 (Flat), 200 (Rolling) Where an isolated curve exists between 2 long straights, the design radius should be at least 50% more than the minimum value
		Transition Curves		Clothoid Applied when $R<V^3/432$)
		Climbing lanes		As required under Section VI.6 of the Uganda Road Design Manual
4	**Vertical Alignment Elements**	Desirable max grade	%	3.5% (Flat), 5.5% (Rolling), 6.0%
		Max Grade (Desirable)	%	5.5% (Flat), 7.5% (Rolling), 6.0%
		Minimum Grade	%	0.5%
		Minimum Crest K Value (Stopping)	K_{min}	43 (Flat), 32 (Rolling)
		Minimum Crest K Value (Passing)	K_{min}	307 (Flat), 246 (Rolling), 126 (Urban/ peri-urban)
		Minimum Sag K Value (Stopping)	K_{min}	50 (Flat), 37 (Rolling)

4.4.1 Humps and Rumble strips

Humps and rumble strips with specified geometry (Table 4-4) will be installed along the proposed road upgrade as a measure of controlling driving speed. Humps within the section along the Wildlife Reserve will be installed at an interval of 250m throughout the wildlife section with rumble strips at the beginning. Whereas in the urban centres humps will be installed an interval of 500m and at specific locations like schools, and market places.

Table 4-4: Geometry Humps and Rumble strips

Particular	Width	Height	Interval
Humps	0.95m	0.1m	150m within the Park
Rumble strips	0.5 - 1m (in four pairs)	0.05m	Sandwiched between Humps at 300m

4.5 Proposed Project Activities

4.5.1 Pre - Construction Stage

The pre-construction stage is composed of two sub-stages; surveying and assessments, and land acquisition. Surveying and assessment during pre-construction is focused on materials, topography and ESIA concerns while land acquisition considers land ownership and current land use in the project area.

a) Surveying and assessment

Material investigations involved identification, excavation and collection of materials from test pits along the road. Data collected during materials investigations were taken for laboratory tests to assess soil parameters such as soil texture, composition and stability, among others. Detailed topographical and cadastral surveys were conducted along the project route to identify land and properties that would be affected during the construction phase. The surveys also involved the establishment of the centre line of the road and marking the width limits of the Right of Way.

b) Land acquisition and area of influence

The land to be acquired included;

- Land under which the proposed road will be constructed.
- Land for spoil areas and access roads.
- Land for equipment and plant storage sites.
- Temporary construction camps.
- Land for stone crusher and bitumen container storage.
- Batching plant.

The area of influence for the proposed road project generally follows the existing road alignment and will be expanded where required. The exceptions are auxiliary sites (temporary construction camps, spoil areas, quarry sites, bituminous plant and access roads). Both the proposed road project area and auxiliary sites affect the Environment and Socio-economic structure of the greater area and are addressed in this report.

4.5.2 Construction Phase

The construction phase comprises upgrading the existing roads to bituminous standard. Upgrading entails improvement of the carriageway and associated drainage as well as safety infrastructure along the existing alignment. Planned construction activities include;

- Stripping away existing wearing gravel surface as per design specifications.
- Earthworks, involving cut and fill operations.
- Excavation of gravel and soils from borrow areas.
- Natural gravel/crushed rock base construction.
- Bituminous construction.
- Stone pitching of drains in cut and urban areas.
- Planting grass on side slopes/ embankments.
- Reshaping of borrow pits and decommissioning them.
- Installing road furniture including traffic signs, guard rails and road markings.

Table 4-5; highlights the key activities associated with the Project development from pre-construction phase, construction phase to the rehabilitation of the affected areas.

Table 4-5: Key Project Activities

Activity	Description
Detailed Surveys	Carry out topographic measurements with levelling and GIS instruments
	Carry out geotechnical Investigations sampling by undertaking pit excavations and drilling boreholes, driving augers underground and trial blasting.
	Carry out geophysical investigations with falling hammer sound source.
	Carry out detailed ESIA and assembling necessary permits.
Road project mobilization, site set-up and temporary facilities	Road transportation of personnel, equipment and materials to project site
	Site clearance for construction of camps and materials yards
	Creating access roads and parking areas within the camps and materials yards
	Construction of foundations and installation of crusher plant and concrete mixing plants
	Install water pump to provide water for works and camp use
	Construction of domestic waste and sewer waste facilities for the camps
	Create temporary access roads to project site, camps, borrow pits and spoil areas
	Construct sheds for Bitumen yard and heating Area
	Construct foundations and install temporary accommodation facilities
	Construct sheds for fabrication and mechanical workshops
	Construct sheds and bunds for fuel storage and plant service bays
Extractive activities	Abstract surface Water from River Wasa. This will require a water abstraction permit
	Gravel from cut material from road project site and existing borrow pits
	Stone base, chippings and aggregate from rock blasted and cut from project area or any other suitable location
	Extract sand using excavator machine onto tipper trucks from sites approved by the supervising Engineer
Earth works	Clearing of vegetation
	Construct temporary access roads to work areas
	Remove top-soil and sub-soil by mechanical stripping and stock pile at designated locations
	Mechanical excavation and loading of stripped material
	Transportation by truck of the excavated material to designated stockpile areas
	Storage of top-soil, sub-soil and rock material at spoil areas approved
	Bore drilling of ground surfaces and rocks for explosive placing
	Use of explosives for blasting of rocks
	Use of pneumatic Jack hammers and excavator mounted jack hammers to extract and shape rock
	Stone base production at crusher plant for road works
	Compaction of road surface layers with compactor rollers
	Chemical stabilization of road bed surface layers with road lime or cement
	Watering of road subbase and gravel base layers
	Mechanical stabilization of road bed layers with geotextiles, georgic and stone masonry embankments
Bituminous layers and seals	Temporary access roads
	Bitumen heating in storage tanks
	Transportation of bitumen in containerized truck to construction area
	Bitumen spraying on sub-base and base road surfaces
	Stone chippings spreading over bitumen layers
	Stone dust blinding over bitumen layer
	Mechanical broom, compressed Air spray and water jet-wash of road surface
	Work site sampling and Laboratory investigation
Ancillary road facilities	Vehicular transport for personnel and materials
	Heavy machinery and Trucks Parking along road construction area
	Installation of Marker and Kilometer posts
	Installation of guard rails especially at sharp corners and in the rocky terrain
	Installation of road signs at most critical points, especially highly populated and public places and dangerous areas
	Road markings
	Installation of rumble strips and speed humps
	Landscaping
	Borrow and spread topsoil

Activity	Description
Grassing and tree planting	Improve soil with fertilizer such as nitrogen fertilizers or any recommended method
	Hydro-seeding with recommended plant species
	Watering of grass
	Plant trees with the Right of Way
Restoration of material borrow sites, stone crushing areas and temporary access roads	Spreading of spoil material, soils and topsoil in spoil areas
	Demobilization and restoration of disturbed Camp and Yards location areas
	Rehabilitation of material borrow sites, stone crushing areas and temporary access roads
	Post construction monitoring

a) Road construction Materials

Materials to be required by the project include;

- Bitumen: used for bituminous surface;
- Cement: used mainly for concrete works;
- Crushed rock / aggregate: required for base and surface bituminous courses and concrete works;
- Gravel: for filling, obtained from borrow-pit areas along the project area;
- Sand: for concrete works;
- Steel: would be required mainly for structural work;
- Water: for construction and use in workers' camps;
- Explosives: for cracking hard rocks.

possible locations for borrow sites and other construction materials were identified along proposed roads. The final choice of material source is a responsibility of the construction contractor.

b) Construction Equipment

Among the equipment that will be used during construction phase include: i) D4 Dozer or equivalent with blade and ripper; ii) D8 Dozer or equivalent with blade and ripper; iii) Wheeled excavator with bucket capacity under 1 m3; iv) Track Loader (3-4 m3 bucket capacity); v) Wheeled excavator (bucket capacity 1-2 m3); vi) Backhoe loader; vii) 5t tipper lorry-9t tipper lorry Dump Truck; viii) Motor grader- complete with scarifier (Cat. 14 or equivalent). ix) 5-6t drawn vibrating roller and tractor; x) 10-12t smooth wheeled roller; xi) 16-18t smooth wheeled roller; xii) Pneumatic roller, 5,000 kg per tyre when fully ballasted; xiii) Vibrating plate compactor; xiv) Self-propelled water tanker min. 14,000 liter. with pick-up pump; xv) Compressor 120 l/m complete with all tools (Figure 3); xvi) Generator 15 kW; xviii) Generator 150 kW; xix) Rock drill; xx) Concrete mixer up to 400 liters; xx) Concrete mixing plant, complete 1.0m3 or above; xxii) Bitumen distributor; xxiii) Chip spreader; xxiv) Concrete vibrator; xxv) Pick-up truck and Piling rig.

Plate 4-2: Compressor

c) Human resource

The quality and quantity of human resource will be determined by the contractor. The road upgrade project is expected to employ between 500 and 600 people during pre-construction, construction and operation phases.

4.5.3 Post Construction phase

The post-construction phase involves the operation and maintenance activities carried out by the developer to ensure optimization of the road. Post construction includes both routine and periodic maintenance works such as; tree planting and maintenance, pothole patching, cleaning of drainages, repair of broken road items (including maintenance of street lights). The periodic maintenance activities include; clearing the RoW, re-sealing, re-painting road markings, among other activities. Other post-construction activities include enforcement of road rules and control requirements. On completion of the construction phase of the project, all environmental and social components impacted upon by the project shall be restored to their original state, where possible.

Hence:

- All temporary structures erected during road construction will be demolished.
- All sites used for storing road construction materials and temporary camp(s) used for accommodating road construction workers shall be properly cleared and cleaned.
- Waste resulting from the project works shall be collected and properly disposed.
- Unpaved areas cleared of vegetation such as temporary access roads shall be re-vegetated with grass and trees indigenous to the sites.
- Boulders and stones exposed during road construction should be covered.
- The road reserve in communities shall be populated with recommended trees species.

a) Wildlife corridors

The project is located along the Toro-Semuliki Wildlife Reserve, a Protected Area (PA). Environmental and social impact of road development alongside wildlife corridors include; habitat disruption, road kills and influence on tourism activities. Direct roadkill affects most species, with severe documented impacts on wide-ranging predators (Forman et al., 2003). Rosen and Lowe (1994) found an average of at least 22.5 snakes per km per year killed due to vehicle collisions. Roads cause habitat fragmentation because they break large habitat areas into small, isolated habit patches which support few individuals. In addition to these obvious effects, roads create noise and vibration that interfere with ability of reptiles, birds, and mammals to communicate, detect prey, or avoid predators (Forman et al. 2003).

- ***Wildlife road-crossing structures***

Where there are over-riding reasons to build or expand roads in animal corridors, wildlife crossing structures can facilitate wildlife movement across roads (Clevenger et al., 2001; Forman et al., 2003. Alternations in road alignment usually results into high slopes and embankments that interfere with animal crossing. Where they are inevitable, safe wild passage will be provided. The proposed design for the road will employ multiple crossing structures to accommodate the diversity of wildlife within Toro-Semuliki Wildlife. This is because no single crossing structure allows all species to cross a road. Among proposed animal crossing structures include; wildlife culverts, green bridges, bridges, culverts, and pipes.

- ***Wildlife Barriers***

A number of Wildlife crossing barriers for specifically large mammals like Elephants, buffalos have been proposed, with specific objective of deterring animals from crossing to the communities. These include; Trenches. These have been explored in details in the alternative analysis chapter

5.0 Analysis of Alternatives

5.0 ANALYSIS OF ALTERNATIVES

During engagement with key stakeholders, like UWA, it was intimated that construction of a paved road will significantly impact on the Wildlife Reserve as it will permanently dissect it into two and increase heavy goods traffic, Increased vehicle speeds, wildlife animal kills, Noise, waste dumping and also poaching cases. Various approaches were considered to ensure achievement of the Socio-economic transformation as well as wildlife protection.

5.1 No project alternative

In the event that this option is considered then there will be no development within the area in relationship to the Road infrastructure thus hindering development. The area will remain with its current accessibility limitations, the fair to poor state of the road will prevail with the many gaping potholes, and erosion galleys, rocky outcrops and poor drainage especially across the flat area 25km from Karugutu near Kandita stream. This state will limit the delivery of services by the various providers and probably stopping the Kanara community from selling their products mainly from the lake and business to Congo when heavy trucks get stuck on the narrow road within this oil region among other negative Socio-economic limitations. It is therefore not a desirable alternative as it will hinder development.

5.2 Alternative alignment

Three route FOUR options as shown on the Map below were analyzed. These include;

i) **Alternative 1: Karugutu-Ntoroko through Toro Semuliki Wildlife Reserve. (50.4km)**

ii) **Alternative 2: Karugutu – Kakara – Rwebisengo – Rwangara – Kachwankumu – Kanaara (86.6km)**

iii) **Alternative 3 A: Karugutu Kakara-Kahondo-Kachwankumu-Kanara-Ntoroko (58.5km)**

iv) **Alternative 3 B: Karugutu – Kakara – Kahondo – Kachwankumu – Kanara - Ntoroko (55km) (Red Route)**

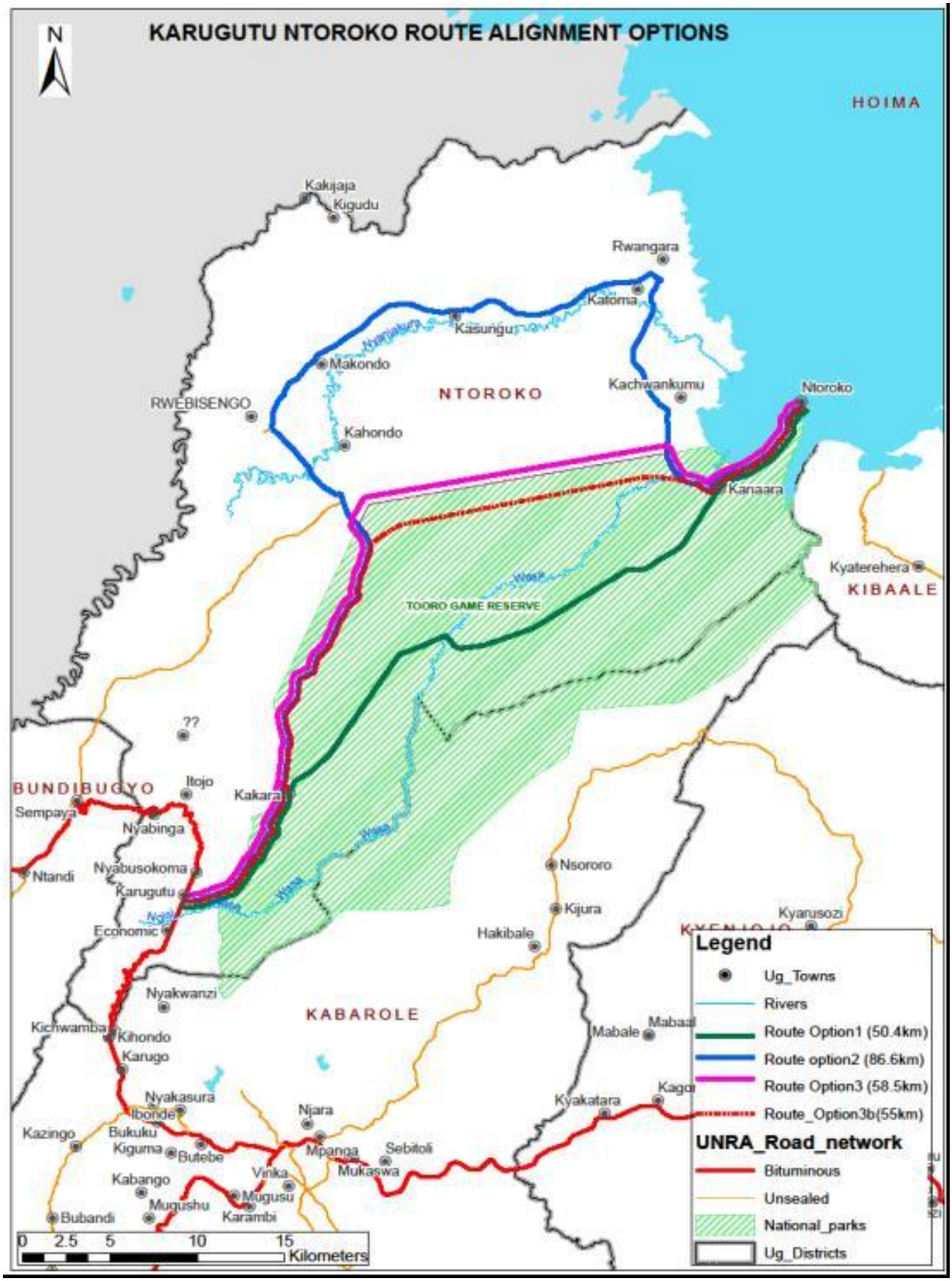


Figure 5-1: Orientation of the FOUR route options

5.2.1 *Alternative 1*: Karugutu-Ntoroko through Toro Semuliki Wildlife Reserve. (50.4km)

The Identified first route option starts off the Fort Portal Bundibugyo Junction at Karugutu, and follows the existing alignment from Karugutu to Kanara for 50.4km where it terminates at the shores of Lake Albert in Kanara Town Council. Nearly 70% of this existing alignment route predominantly traverses through the Toro Semuliki Wildlife Reserve as shown in the map above below as Green Route with a total length of 50.4km.

Having entire road upgrades keeping the existing alignment is called for to improve safety of roads for different users. Because of many accidents that have occurred along road through animal kills and also slippery cotton soils during the rainy season within the wildlife reserve. Current road alignment could be maintained but will increase on road kills, enhance encroachment and deter animals from their current ranges since it cuts the reserve into two yet it is a small reserve.

The improvement of the Wasa Bridge may interfere with the chimpanzee community in this part of the Country where by unpublished information indicates they are endemic to the area and also believed to be closer to man that any other group. According to information from Semuliki Safaris they have invested in the reserve and are worried that the improvement of the road will deter the ever increasing number of visitors to this unique ecosystem.

With the widening, cutting and opening of more land to improve the current design of the road, as well as an improvement of the bridge on Wasa River, the reserve will cease to be biological diversity conservation area.

5.2.2 *Alternative* 2: Karugutu – Kakara – Rwebisengo – Rwangara – Kachwankumu – Kanaara (86.6km)

The second route starts off the Fort Portal Bundibugyo Junction at Karugutu, and follows along the existing alignment from Karugutu towards Kanara for approximately 10.7km, then diverts at the Kakara Junction on to the existing Kakara Rwebisengo Road for 27 km blue route in Figure 5, above. The route continues easterly along the existing Rwebisengo Rwangara for 32.5 km road through the towns and communities of Makondo, Kasungu Katoma and thereafter traverses southerly from Rwangara through Kachwankumu, to Kanara 21 km and connect to the Karugutu Ntoroko Road at Kanara. The route progresses to Ntoroko Lake shores for another 8km. The total length of this route is 86.6km. The Rwangara Kachwankumu Kanara Road (21km) is currently in a terrible state. It was worked on under DLSP funding arrangement but was never completed.

It traverses a flood plain and majority of the road has been washed away.

5.2.3 Alternative 3 A: Karugutu Kakara-Kahondo-Kachwankumu-Kanara-Ntoroko (58.5km)

The third route option starts off the Fort Portal-Bundibugyo road Junction at Karugutu, and follows along the existing alignment from Karugutu towards Kanara for approximately 10.3km, then diverts at the Kakara Junction on to the existing Kakara-Rwebisengo Road for 19km only Figure 5, Pink Route. The route vias off towards the right along the boundary of the Toro Semuliki wildlife reserve through an existing UWA footpath for 18kms (Greenfield. The game reserve boundary is demarcated by concrete marker posts at every 200m up until the Rwangara Kachwankumu District Road Junction. The route connects to the Rwangara Kachwankumu.

5.2.4 Alternative 3 B: Karugutu – Kakara – Kahondo – Kachwankumu – Kanara - Ntoroko (55km) (Red Route)

The fourth route option is similar to the above alterative 3A but is shorter by approximately 3.5km. This route is proposed to traverse south of the Wildlife Reserve boundary running for 21km, (Pending Approval from UWA), then reconnect on to the Karugutu Ntoroko Road at Kanara. The total length of this Option is 55km Long. **Note**: Options 3A & 3B cross the River Wassa flowing towards Lake Albert and will require a bridge crossing.

5.3 Alternative segmentation of Bituminous Sections Vs Gravel

The assessment of the robustness of the project was based on a comparative analysis of the six project alternatives described below. The alternatives were subjected to stakeholder consultation in government agencies, local government, research and academia and civil society throughout the EISA process. The alternatives were also subjected to engineering design considerations, physicochemical studies, biodiversity assessments, Socio-economic impact assessments and natural resource economics studies.

5.3.1 Option 1: 'No project' scenario - Maintaining the Road as Gravel

The existing roads within the project area were not planned for heavy traffic that are predicted in future. Maintaining the status quo would enhance protection and preservation of Semuliki ecosystem. This option is preferred by some NGOs and concessionaires fearing that road upgrade will greatly impact on biodiversity which is the driver of their businesses hence reducing returns from tourism. The "No project" scenario would be inadequate to handle both the burden of heavy traffic, and tourism traffic. In this case, the roads would require rigorous intermittent maintenance due to regular break downs hence high and continuous economic and environmental costs resulting into additional environmental foot print specially borrow pits.

5.3.2 Option 2: Upgrading all proposed road links to bituminous standard

This option involves upgrading all the roads sections from gravel to bituminous standard. The roads proposed for upgrade are currently gravel and are regularly maintained; hence periodic ecosystem disturbance. Engagements with Park authorities indicated preference to bituminous standard outside and within the Park in order to enhance tourism. UWA advised on minimal environmental foot print thus the roads inside and outside the Wildlife Reserve should be designed and upgraded to bituminous standard with fewer disturbances on the ecosystem. Since the existing road network has intense maintenance associated with continuous massive extraction of gravel from ecologically sensitive areas within the Wildlife Reserve, this option attracted a wide range of preferences from stakeholders.

5.3.3 Option 3: Upgrading proposed road sections outside the Wildlife and only selected sections within the Wildlife Reserve

Roads outsides the Wildlife Reserve are preferred by all stakeholders. The limiting factor would be roads within the Wildlife Reserve. The Wildlife environment is mostly sensitive and the extensive wetlands. Upgrading the low sensitive areas to bituminous standard while excluding the identified sensitive zones would render Toro-Semuliki continuously vulnerable to regular road maintenance of the exclusion zones under gravel. Moreover, roads through sensitive zones like Rive Wasa; extensively floods during wet seasons impairing tourism activities. This requires more reliable solutions through sustainable engineering designs and more dependable materials to mitigate the current road flood problems in this area. Upgrading selected road sections to bituminous standard would not solve the current road problems and would not achieve the purpose of supporting tourism development.

5.4 Alternative Wildlife Protection Structures

5.4.1 Wildlife boundary structures (Trenches)

Wildlife fencing in combination with crossing structures is commonly regarded as the most effective and robust strategy to reduce large mammal–vehicle collisions while also maintaining wildlife connectivity across roads. However, fencing and associated measures may affect landscape esthetics and are sometimes considered costly and unpopular. Therefore, fence length is often minimized. The best alternative is to create Wildlife Trenches.

Wildlife trenches are physical barriers that are dug to keep wildlife out of cultivated areas or to guide them through underpasses and over bridges. They are often used to keep elephants away from farms and communities. Wildlife trenches have some benefits; They can reduce crop raiding by elephants; They can improve community livelihoods, and They can inspire communities to value wildlife.
Examples of wildlife trenches in Uganda: Trenches around Kibale National Park, The Bukorwe Ridge Elephant Trench, and Trenches in Bwambara Community Bordering Queen Elizabeth National Park(QENP). The trenches will be constructed along the section between Rwebisengo Junction and Karana, on the TSWR side.

Plate 5-1: Wildlife Trench along QENP

5.4.2 Alternative under passes

The project does not require specialized animal underpass since most of the project area is flat and located along side TSWR. However, all Bridges and Culverts should have wide and extended wing structures to guide ground fauna to use them as crossing points (were necessary).

5.4.3 Alternative speed control measures

Alternative speed control measure includes humps.

6.0 Environment and Socio-Economic Baseline

6.0 ENVIRONMENT AND SOCIO-ECONOMIC BASELINE

6.1 Biological baseline

6.1.1 Vegetation and land cover

Assessments were conducted along Karugutu-Ntoroko (56.5km) and the road links Rwebisengo (8.2km) and Ntoroko Town Roads. The habitats along the Rwebisengo (8.2km) and Ntoroko Town Roads are heavily modified, with developments and human settlements. Emphasize was amounted on the vegetation along the main Road alignment. Diverse habitats occur within the landscape of Toro-Semuliki Reserve supporting a variety of vegetation types such as grasslands, riverine forests, scrub woodland, swamp forests, papyrus swamps, and savannah woodland mosaic. There were Four (04) major habitat classifications along the road as shown on the map 6-1 below.

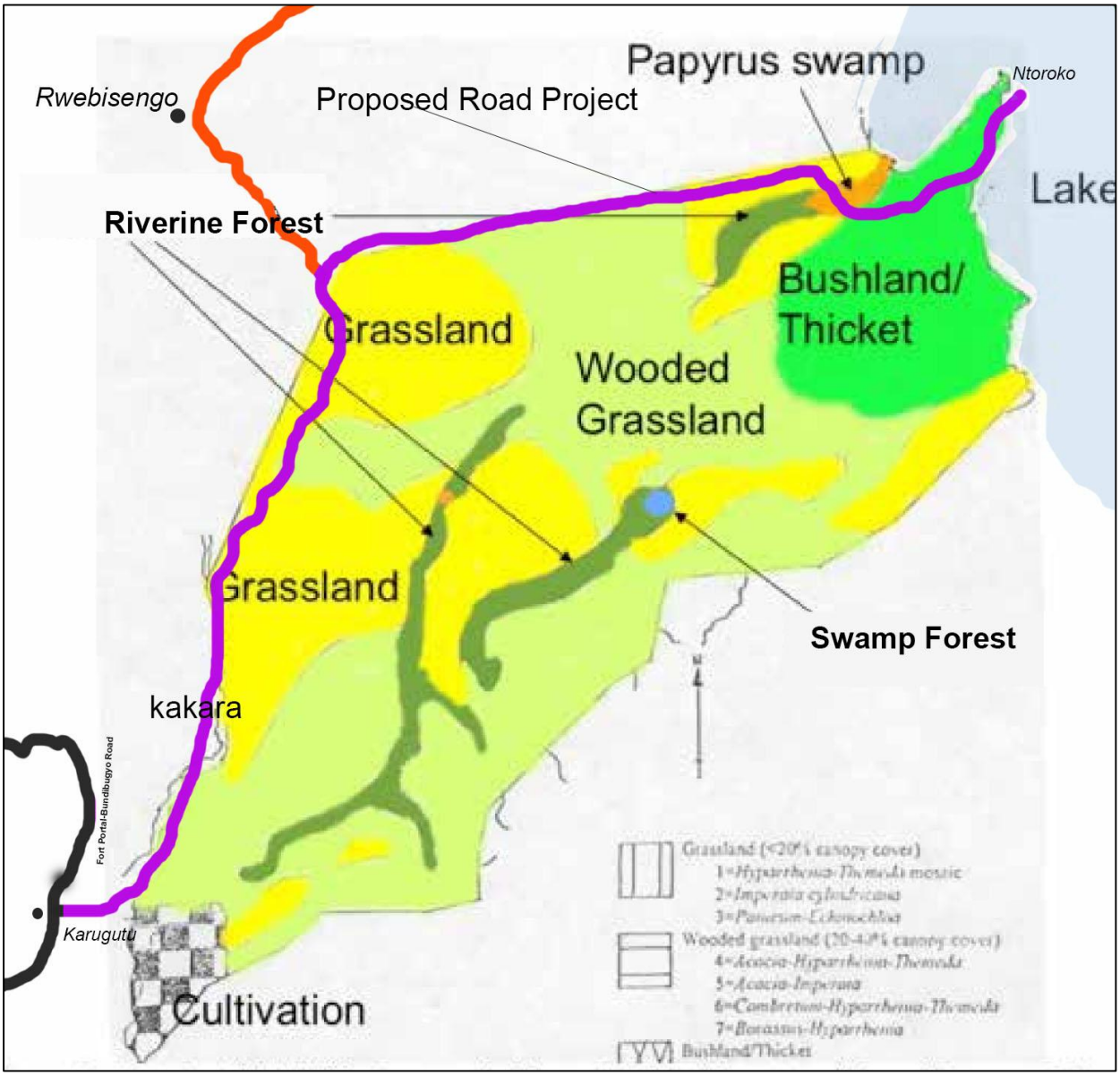


Figure 6-1: Habitat classifications along the project corridor (Source: Langdale and Brown, 1964)

a) Grassland habitats

These are dominated by Hyparrhenia-Themeda mosaic, Hyparrhenia filipendula, H. dissoluta, and Themeda triandra dominate the north-west of the reserve where there have been frequent fires and intensive grazing. Other species include Chloris spp; Sporobolus spp, a short- to-medium-height grass that occur in patches; Imperata cylindrica; and Panicum echinochloa, a tall grass mainly covering large, moist depressions such as watering holes and forming a thick band on non-forested river banks and lower grounds in the vicinity of Lake Albert.

Plate 6-1: Grassland habitats along the project corridor

b) Scrub Woodland /wooded grassland

This is dominated by wooded grassland characteristic of the Acacia-Hyparrhenia-Themeda woodland with Acacia sieberiana as the dominant tree species associated with Albizia grandibracteata. Others include the Acacia-Imperata, a moist wooded savanna dominated also by Acacia sieberiana, Combretum-Hyparrhenia -Themeda mixed wooded savanna dominated by Combretum spp., Tamarindus indica; and Borassus–Hyparrhenia a palm savanna dominant with other tree species scattered at lower densities. The Borussus aethiopium palm is the frequent species although Acacia and other leguminous species are also common.

This habitat type was variable from open to dense vegetation, with shrubby species of Ziziphus pubscens, Rhus natalensis, Capparis spp, Flueggea virosa, Grewia mollis, Cadaba farinosa, mixed with varying abundances and distribution of Dichrostachyus cinerea. Dichrostachyus cinerea was among the identified yet abundantly distributed invasive plant species along the road corridor. All the above species mentioned form thickets that variably blend with other species such as Cissus spp, Opilia celtidifolia, Stephania abyssinica, Dragea rebicunda and Sarcostemma viminale as the commonest climbers whose growths and inter-twining nature give dense vegetation coverage over the thickets. Trees were also sparsely distributed amidst the thickets and dominated by Crateva adansonia, Acacia gerrardii, Grewia similis, Balanites aegyptiaca, Tamarindus indica and Euphorbia candelabrum.

Plate 6-2: Road sections showing dense scrublands (Photo taken in Dry season)

Plate 6-3: Borassus–Hyparrhenia community within the project area

c) Permanently flooded Wetland Vegetation

Areas of wetland vegetation are mainly located on permanently waterlogged areas adjacent to the riverine forests and along shores of Lake Albert. The areas are dominated by Phoenix reclinata swamp forest, Cyperus papyrus, and Typha papyrus swamp.

d) Modified habitats

This constituted of very limited subsistence farmlands with some herbaceous-weedy species and very sparse individual tree and shrub species growing along the road. This section covers from geographical locations (in UTM) 191271/87329 along the Karugutu junction to 193773/ 87932 which is the interface of the Community areas and TSGR, with linear settlements or homesteads.

Plate 6-4: Linear Settlements or Home steads from Karugutu towards the TSWR gate

There are various habitats along the alignment that have been modified by anthropogenic activities most especially cattle grazing. This is associated with mushrooming human settlements and also encroachment on the boundaries of the wildlife reserve.

Plate 6-5: Cattle grazing with the project corridor

Plate 6-6: Settlements along Rwebisengo Link

e) Riverine habitats

A riverine habitat exists along River Wasa at geographical location 1°01'07.38" N, 30°28'51.06" E; this was described by sparse distribution of tree species characterized by Acacia gerrardii, Ficus sycomorus, Ficus natalensis, Albizia coriaria, Pterygota mildbraedii, Rothamnia urcelliformis, Phoenix reclinata, Magifera indica and the invasive Senna spectabilis dominating the upper layer of the vegetation structure. Lower vegetation layers comprised of Acanthus pubscens, Acalypha spp, Hibiscus ovalifolius, Panicum maximum and Harrisonia abyssinica.

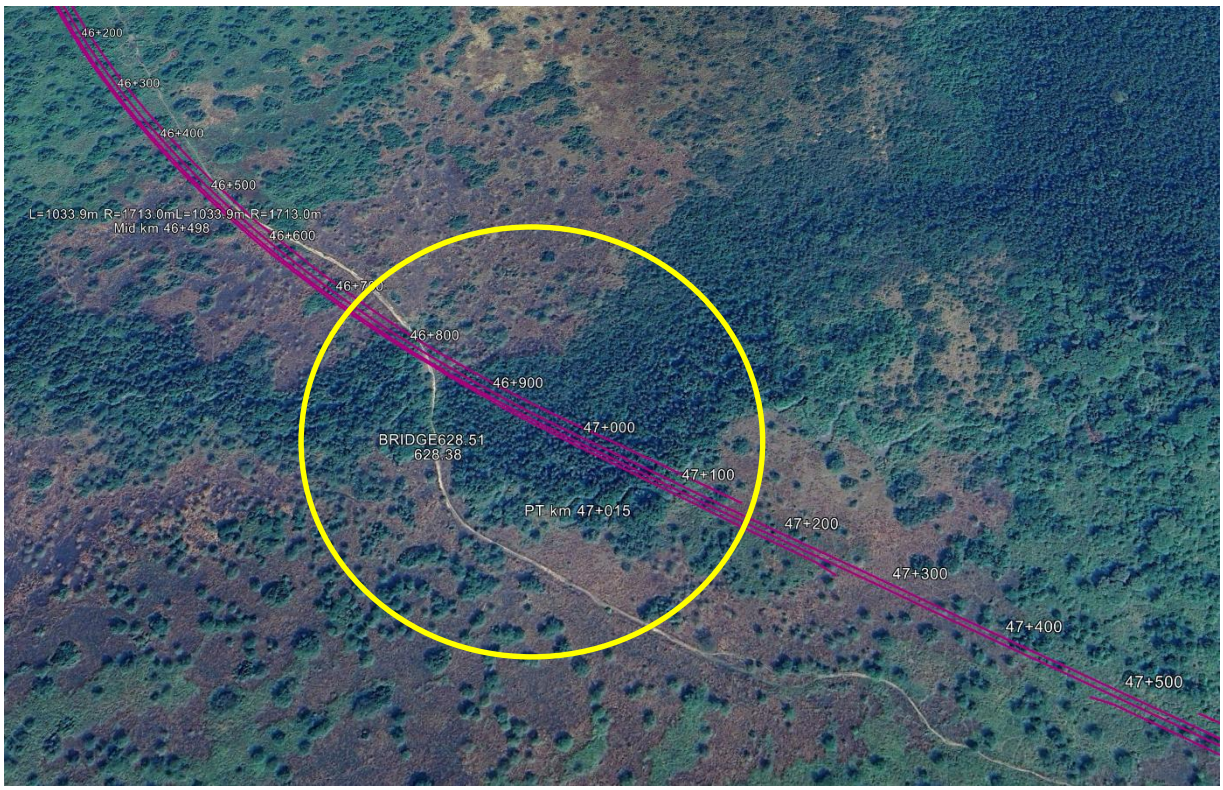


Figure 6-2: Project interaction with Riverine Forest of R. Wasa at Chainage 46+900

Plate 6-7: Riverine forest 1o01'07.38" N, 30o28'51.06" E

6.1.1.1.1 Species diversity

A total of 312 plant species from 42 families were recorded (**Appendix 5**). For the species recorded shrubs registered the highest in terms of life forms, with a total of 114 species, followed by trees with 92 species, while the herbs, climbers and grasses followed with 52, 31 and 23 species respectively (Figure 6-3). The woody species altogether contributed 66% by species richness as compared to 34% of the non-woody species. The woody species constituted of trees and shrubs while the non-woody species were of herbs and grasses.

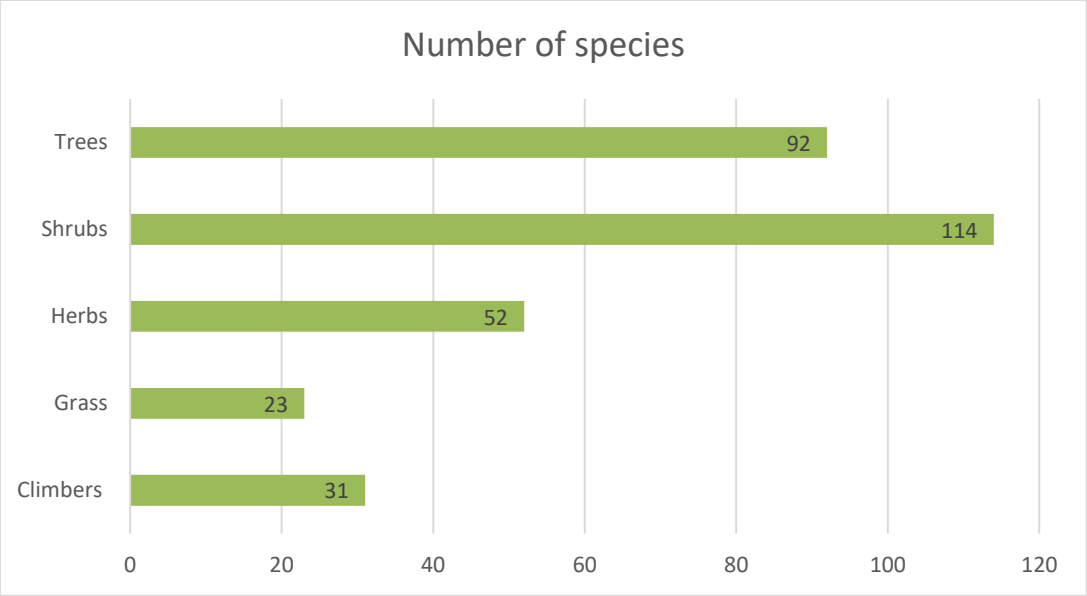


Figure 6-3: Distribution of plant life forms along the road

6.1.1.1.2 Relative species abundance and frequency

Transformation of the DAFOR scale as explained in the methods was done to estimate the relative abundance of species. The 10 commonest species (most frequent) and most dominant species along the road are listed in Table 6-1. This gives a quick overview of species presence and in case of future ecological restoration works, guidance can be sought from this.

Table 6-1: The top ten most abundant and frequent plant species

Rank	Most abundant species	Most frequent species
1	Piliostigma thoningii	Panicum maximum
2	Grewia similis	Hoslundia opposita
3	Acacia gerrardii	Combretum collinum
4	Combretum molle	Sprobolus pyramidalis
5	Stereospermum kunthianum	Senna hirsuta
6	Setaria sphacelata	Cissus aralioides
7	Hyparrhenia filipendula	Acacia hockii
8	Crateva adansonia	Grewia mollis
9	Borassus aethiopum	Ficus sycomorus
10	Balanites aegyptiaca	Albizia coriaria

6.1.1.1.3 Distribution of tree size classes within habitats

The graph below was generated following random samplings of trees as explained under methods. The presentation of tree size classes ranges from < 10 cm to > 55 cm as per their distribution along the road (Figure 6-4). These illustrations give indications of the likely damage on the tree cover once the upgrading of the roads is implemented. The woodland, open wooded grassland and riverine habitats have all size classes of trees, implying that saplings to mature trees will be impacted upon, causing impairment to the succession levels within the respective ecological systems of the habitats, especially when seed producers are lost. Above all great loss of biomass will follow suit.

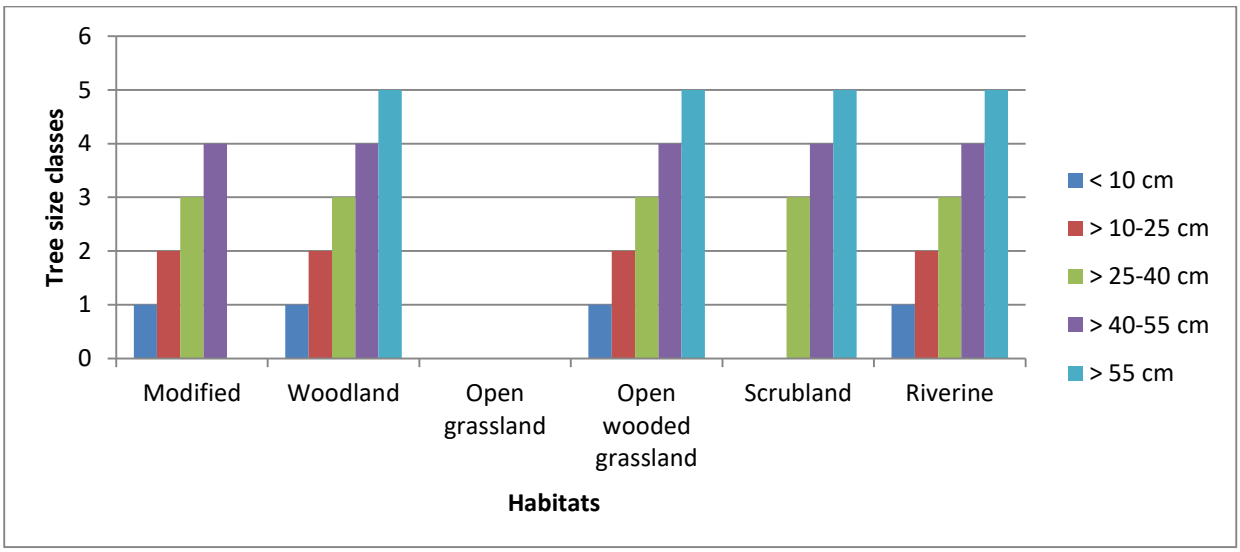


Figure 6-4: Distribution of tree size classes within habitats along the road

For the open grassland section there was absence of trees, hence biomass loss shall be minimal and restricted to grasses and a few herbaceous-weedy species. But this is short-term given that grasses and other associated plants that were recorded have short recovery periods, are easily dispersed by animals and wind and with high levels of regeneration. The tree cover within scrublands was limited to relatively mature trees of variable species of Crateva adansonia, Acacia gerrardii, Grewia similis, Balanites aegyptiaca, Tamarindus indica and Euphorbia candelabrum that were sparsely distributed. This occurrence and distribution of trees within scrublands could be influenced by restricted ranging and foraging of wildlife that also double as dispersers, a factor that impairs seedling recruitment. Also the dense shady coverages from thickets serve to suppress germination and growths of dispersed seeds if it happens. Under these shades, there is limited sunlight penetrating the floor of the ground to offer ambient temperatures for germination.

6.1.1.1.4 Plant Species of conservation concern

a) Protected Plant species

i. National Forestry Authority (NFA) lists

These included; Albizia coriaria, Tamarindus indica, Cynometra Alexandria, Kigelia africana as per the National forestry authority list of reserved species. These are variedly distributed along the project corridor, except Cynometra alexandria that is located as earlier indicated above in the report. Therefore, it is critical that their habitats are protected. In this case efforts should be focused on avoiding or minimizing the cutting of such species.

ii. IUCN Redlist

During the 2017 assessments, Tamarindus indica was assessed as Nearly endangered on a global scale based on the IUCN Redlist (IUCN, 2017), well as during the 2025 studies, Tamarindus indica is rated as Least Concern (LC) on the IUCN Redlist (IUCN, 2025). While nationally *Tamarindus indica* is categorized as vulnerable (WCS 2016). Otherwise the species is relatively spread along the road corridor and enjoys a wide geographical range nationally. Hence minimal impacts are expected to the species.

b) Invasive species

The invasive aliens along the road corridor were;

- *Dichrostachyus cinerea,*
- *Lantana camara* and
- *Senna spectabilis.*

These occur in low abundances within the project at dotted spots, except Dichrostachyus cinerea whose invasion and spread is worrying to the UWA management. Occurrence and distribution of *Dichrostachyus cinerea* is limited within 15 km range for the last section of the road within the reserve. Invasive plants can be a potential threat to biodiversity conservation. The spread of invasive plants is often triggered by disturbances in the ecological systems. Invasive plants are potential threats to conservation, and may cause economic or environmental damage (NARO, 2007). They displace native species through aggressive and altered recruitments in natural ecosystems. Therefore, their management is critical. The IFC Performance Standard 6 (IFC 2012); on Biodiversity Conservation and sustainable management of living resources, provides that any project that wishes to be in compliance with the provisions therein in the standard, endeavors to address concerns related to invasive aliens.

6.1.2 Mammals

The sections outside TSWR (Rwebisengo Link, Ntoroko Town Roads, & 4km section between Karugutu and the TSWR gate) were as well assessed for mammal diversity and distribution. Most of these sections had no records of mammal activities. However, the last 3 to 4Km of the road outside the Reserve from Kanara to Ntoroko landing site were characterized by several families of Olive Baboons *Papio Anubis* and Vervet monkeys *Chlorocebus tantalus*. This section further recorded two main Hippopotamus crossings used by Hippopotamus *Hippopotamus amphibious* crossing from L. Albert to feed/graze terrestrially within the Reserve. The thickets also allowed for small mammal trapping since Sherman traps could be hidden from human sight.

6.1.2.1 The Primates of TSWR

Seven (07) species of Primates have been observed and recorded during previous biodiversity assessments in the TSWR; These include; Chimpanzee (*Pan troglodytes schweinfurthii*), Olive baboon (Papio Anubis), Black & White Colobus (*Colobus guereza*), Red-tailed Monkey (*Cercopithecus Ascanius*), Blue monkey (*Cercopithecus mitis*), Vervet Monkey (*Chlorocebus aethiops* and the Northern Lesser Bush Baby (*Galago senegalensis*).

a) The chimpanzees

The chimpanzees of TSWR live in usually dry habitat similar to that of the early human ancestors, according to Plumptre et al. (2003); the census established about **66** chimpanzees within the wildlife reserve. Currently, chimpanzees are found in Nyaburogo and the Mugiri area. Records as far back as 1998 show that three separate chimpanzee communities in the reserve existed. In the middle of

the reserve, the chimpanzee group under research is found along the flanks of the Mugiri River and its tributaries. Currently about **40** to **50** individuals inhabit Mugiri area while less than **8** individual explore Nyaburogo (Reported by the TSWR field Rangers). The insecurity within the project area makes it hard to evaluate the actual population. However, there are on-going Chimpanzee Research Projects that will hopefully generate data with time.

A separate community can be found in the far northeast along the banks of Muzizi River—although it is certainly much reduced or eliminated by habitat destruction. In the west, a population is found in forests flanking the Nyaburogo Valley. No chimpanzees were encountered during the field assessments.

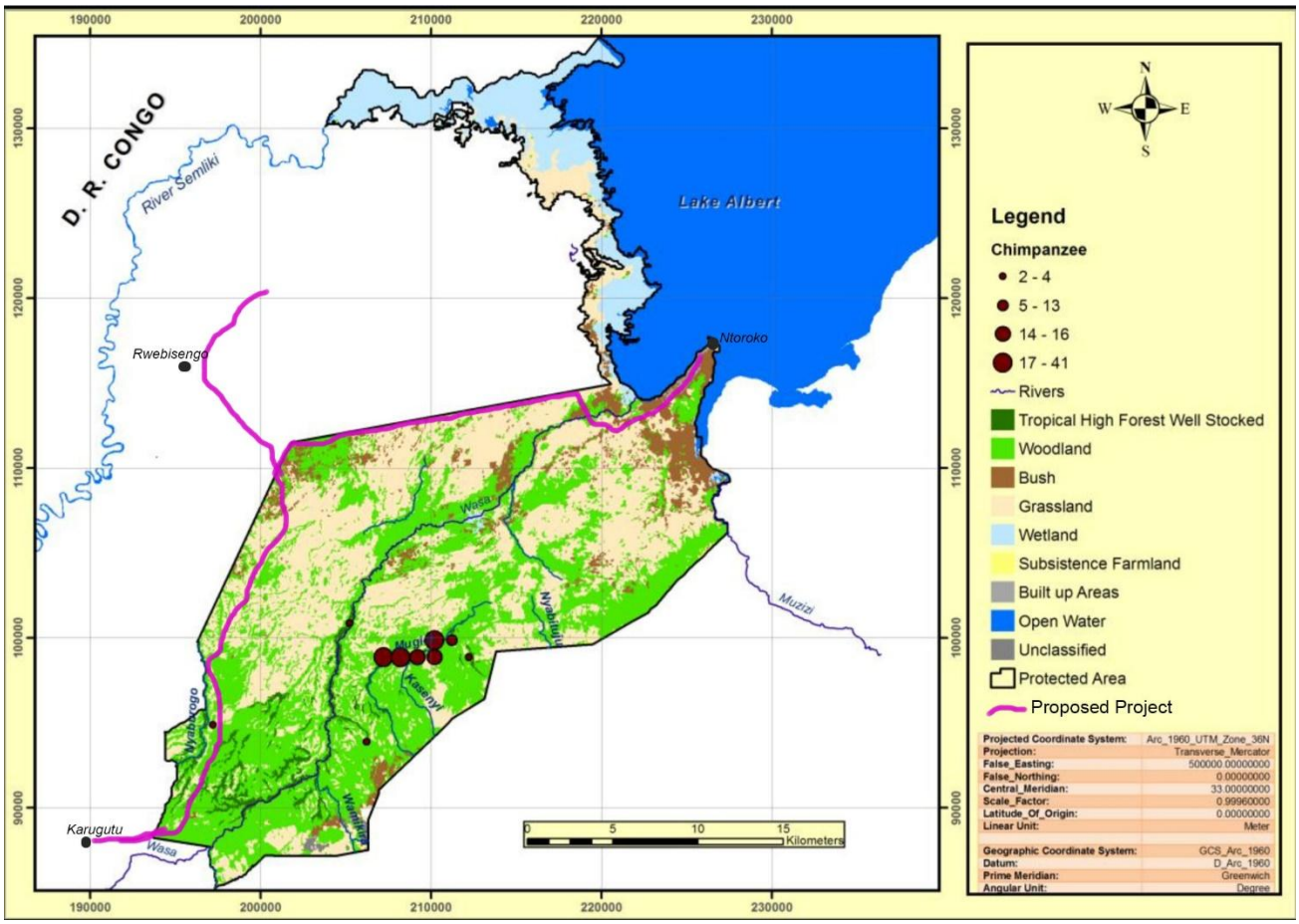


Figure 6-5: Distribution of chimpanzees within the project area (Source: TSWR GMP, 2023)

IUCN status:	Chimpanzee Pan troglodytes has most recently been assessed for The IUCN Red List of Threatened Species in 2016. Pan troglodytes is listed as Endangered under criteria A4bcde.	

b) Black-and-White Colobus Monkeys (Colobus Guereza) & Red-Tailed Monkeys (Cercopithecus Ascanius

The population of black-and-white colobus monkeys has not been previously estimated in TSWR. The species mainly live in the riverine forest and wooded grassland areas, especially in the areas of Muzizi, Mugiri, the SSL, Nyaburogo, Karugutu, Kakara, and Munyage. Black-and-white colobus monkeys live in territorial groups of about 10 individuals consisting of one male with a number of females and their young offspring. They are mainly herbivorous, eating fruits, leaves, flowers, and twigs. The species are mainly threatened by habitat destruction especially logging and deforestation and are vulnerable to road kills. Various Black & White Colobus monkeys were recorded along the project corridor.

Red-Tailed Monkeys (Cercopithecus Ascanius): The red-tailed monkey is primarily frugivorous and a territorial species. They range mainly in the areas of Rivers Mugiri, Munyage, where River Wasa enters TSWR, Nyaburongo Gorge, and along River Muzizi. Some red tailed moneys were recorded within the project foot print.

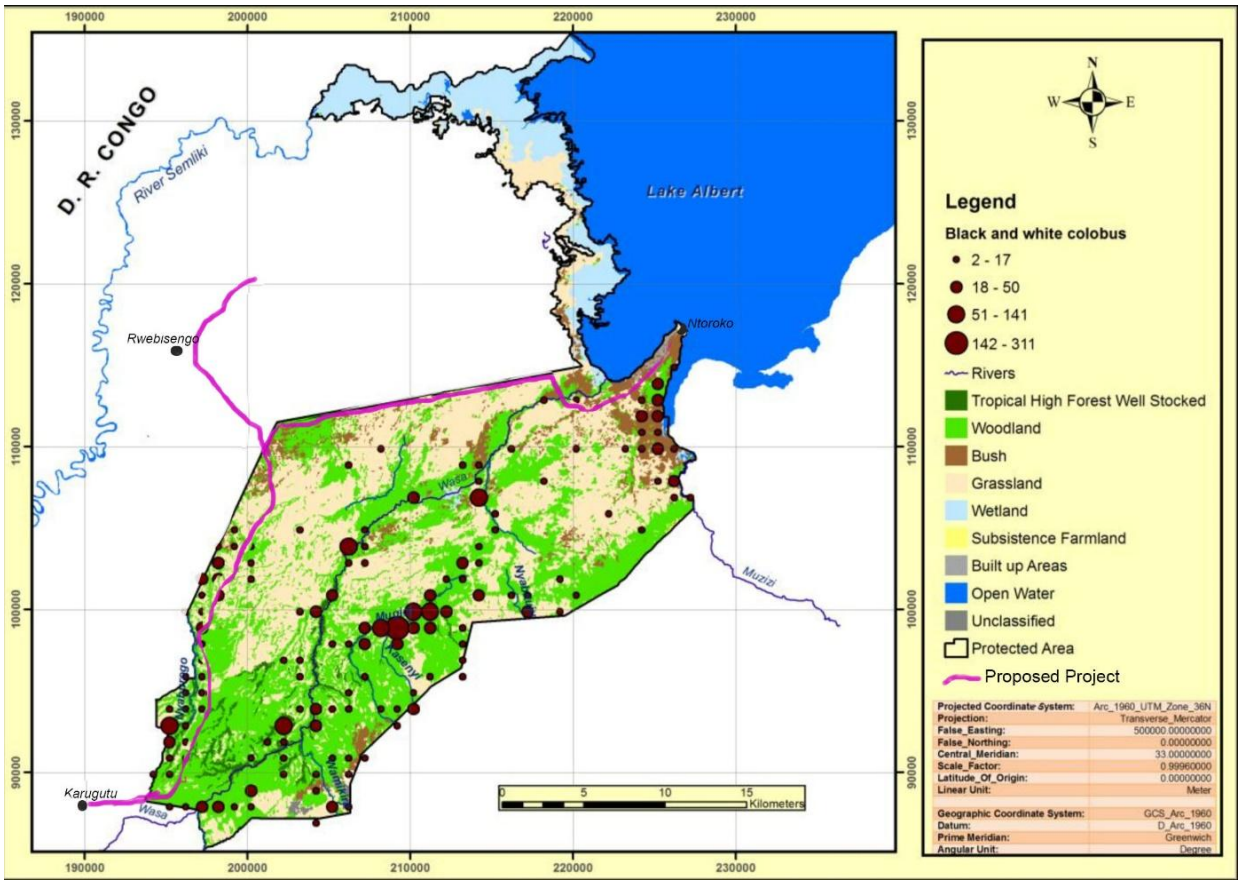


Figure 6-6: Distribution of Black & White Colobus Monkeys (Source: TSWR GMP, 2023)

6.1.2.2 Diversity of other mammals along the project corridor

A total of 18 mammal species were recorded along the project corridor belonging to 11 families and 17 genera (Table 6-2). The sparsely wooded grassland recorded the highest species richness with 11 species followed by the open grassland with 10 species, thickets with six species and degraded community areas with four specie. The commonest mammals recorded were the Uganda Kob (*Kobus Kob),* Olive Baboon (*Papio anubis*) and the Warthog (*Phacochoerus africanus*).

Table 6-2: Mammal species recorded along different habitats of the road and their global threat status

No.	FAMILY	SPECIES	ENGLISH NAME	ORDER	IUCN Status
1	Cercopithecidae	*Chlorocebus tantalus*	Vervet monkey	Primate	LC
2	Cercopithecidae	*Colobus guereza*	Guereza colobus	Primate	LC
3	Cercopithecidae	*Papio anubis*	Olive Baboon	Primate	LC
4	Herpestidae	*Mungos mungo*	Banded Mongoose	Carnivora	LC
5	Proboscidea	*Loxodonta africana*	African Elephant	Proboscidea	VU
6	Tubulidentidae	*Orycteropus afer*	Aardvark	Tubulidentata	
7	Bovidae	*Kobus ellipsiprymnus*	Defassa waterbuck	Artiodactyla	NT
8	Bovidae	*Kobus kob*	Uganda Kob	Artiodactyla	LC
9	Bovidae	*Syncerus caffer*	African Buffalo	Artiodactyla	NT
10	Bovidae	*Tragelaphus scriptus*	Bushbuck	Artiodactyla	LC
11	Hippopotamidae	*Hippopotamus amphibius*	Hippopotamus	Artiodactyla	VU
12	Suidae	*Phacochoerus africanus*	Warthog	Artiodactyla	LC
13	Suidae	*Potamochoerus larvatus*	Bush pig	Artiodactyla	LC
14	Megadermatidae	*Lavia frons*	Yellow-winged Bat	Micro-chiroptera	LC
15	Verspertilionidae	*Scotophilus dinganii*	African Yellow House Bat	Micro-chiroptera	LC
16	Pteropodidae	*Epomops franqueti*	Common Singing Fruit Bat	Mega-Chiroptera	LC
17	Muridae	*Mastomys natalensis*		Rodentia	LC
18	Muridae	*Aethomys hindei*		Rodentia	LC

Note: Same species were recorded during the 2017 surveys.

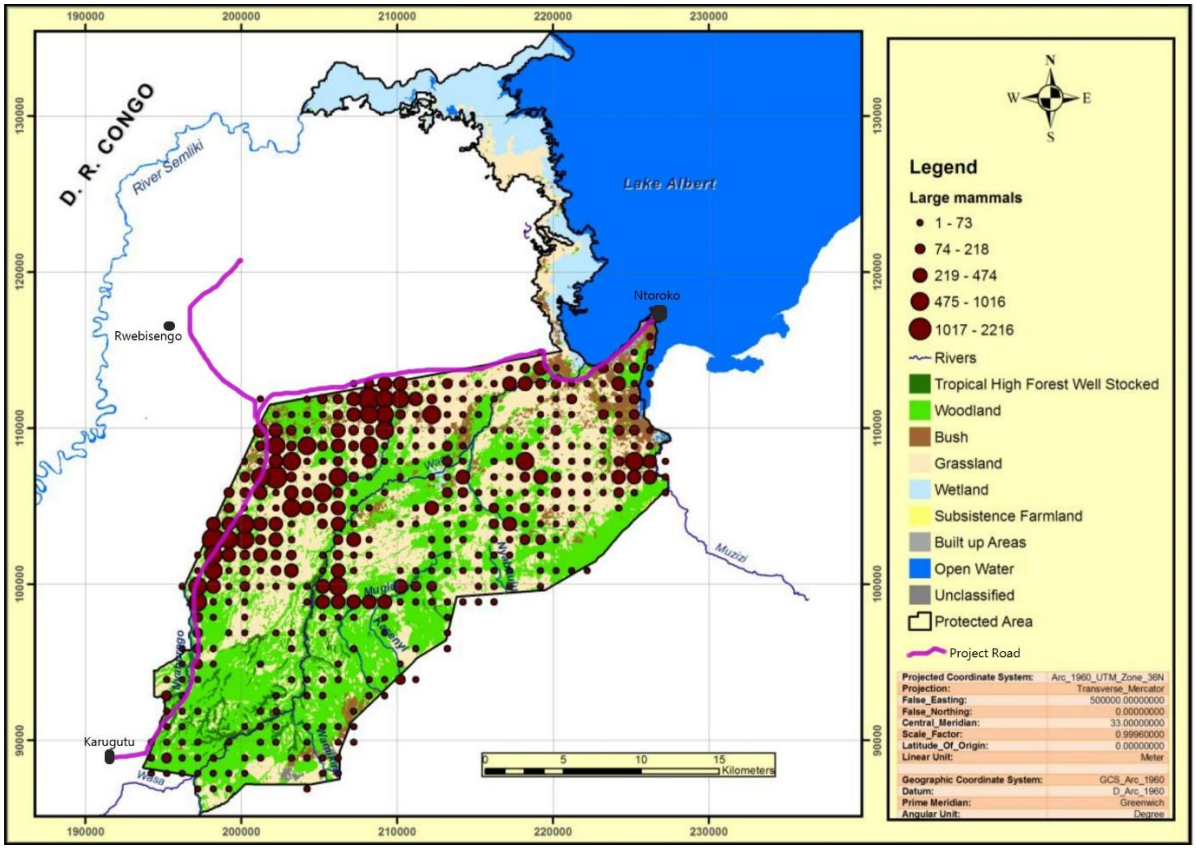


Figure 6-7: Distribution of all large Mammals in reference to the Road Project (Source: UWA, 2023)

6.1.2.3 Mammal Species of conservation concern

a) Medium to large sized mammals

Although primates such as Chimpanzees were not recorded during the field survey, they are known to exist and migrate from the Luga-Luga swamp and other areas sometimes towards the Semliki flats using the Wasa riverine forest that crosses the proposed road. These are also dependent on the riverine forest and its canopy for feeding and as a transit corridor.

Other primates not recorded include several species of Galagos, Bush-babies Guereza colobus and Red-tailed monkeys. The Chimpanzee is globally Endangered (IUCN, 2025), and according to the national redlist (WCS 2016), it is also Endangered requiring special protection status especially of its diminishing habitat. According to an on-going study by the Indiana University, the Semliki Chimpanze may be closer to humans than any other chimpanzees (Jonathan Wright, pers.com).

Mammal species of conservation concern include;

i. **Chimpanzee *Pan troglodytes***: Globally threatened species such as the Chimpanzee Pan troglodytes (EN–IUCN) also make part of the primate population. The Chimpanzee, according to the IUCN and National Redlist is endangered requiring special protection status especially of its diminishing habitat.

ii. **African elephant *Loxodonta Africa***: The African elephant Loxodonta Africanis is Vulnerable (VU) according to the IUCN and Critically Endangered according to the national Redlist owing to its being poached for ivory.

iii. **Hippopotamus *hippopotamus amphibious***: The hippopotamus amphibious is also listed as Vulnerable both by the IUCN (2025) and in the National Redlist (WCS, 2016). Hippo pools are a common sighting in this section especially during the rainy season and therefore any construction phases need to take care of seasons, preferably construction done during the dry season.

b) Small mammals

Among the rodents and shrews recorded, none is of global or national concern. Most of the small sized mammals are nationally data deficient. Several Mammal sensitive areas are distributed within the project area and therefore require special attention during the project life.

c) Mammal sensitive habitats

The whole of TSWR is an ecologically sensitive zone. However, the most sensitive habitats that were identified within the project area for mammals include Wetlands, and fringes of Riverine forests along River Wasa.

6.1.3 Herptiles

6.1.3.1 Amphibians

During the 2025 surveys, **only Six (6)** amphibian species, belonging to 6 families and 6 genera were recorded along the proposed Road Corridor from Karugutu to Ntoroko. All these were recorded in water logged wallows and dry flood plains. The low amphibian diversity was attributed to unstable soils that are easily eroded leading to low ground vegetation cover and the long dry spell. While during the 2017 studies, **fourteen (14)** amphibian species were recorded in the project area as shown. The species belonged to seven genera and five families. The genera include

Phrynobatrachus, Ptychadena, Hoplobatrachus, Hyperolius, Kasina and Afrixalus. The difference in amphibian species diversity is attributed to the variation in seasonality.

Table 6-3: Amphibain species recorded along Karugutu-Ntoroko in During Jan/Feb 20225 Vs 2027

Family Name	Scientific Name	Common Name	IUCN	2017	**2025**
Phrynobatrachidae	*Phrynobatrachus natalensis*	Natal Dwarf Puddle Frog	LC	v	v
Phrynobatrachidae	*Phrynobatrachus mababiensis*	Mababe Dwarf Puddle Frog	LC	v	
Ptychadenidae	*Ptychadena mascareniensis*	Mascarene Rocket Frog	LC	v	
Ptychadenidae	*Ptychadena anchietae*	Anchieta's Rocket Frog	LC	v	
Ptychadenidae	*Ptychadena nilotica*	Grass frog	LC	v	
Dicroglossidae	*Hoplobatrachus occipitalis*	Eastern Groove-crowned Bullfrog	LC	v	v
Hyperolidae	*Hyperolius kivuensis*	Kivu Reed Frog	LC	v	v
Hyperolidae	*Hyperolius viridiflavus*	Common Reed Frog	LC	v	
Hyperolidae	*Hyperolius nasutus*	Sharp-nosed Reed Frog	LC	v	
Hyperolidae	*Kassina senegalensis*	Senegal Kassina	LC	v	v
Hyperolidae	*Afrixalus quadrivittatus*	Striped Leaf-folding Frog / Four-lined Spiny Reed Frog	LC	v	
Bufonidae	*Sclerophrys maculatus*	Flat-backed Toad	LC	v	v
Bufonidae	*Sclerophrys regularis*	Common Toad	LC	v	v
Bufonidae	*Sclerophrys kisoloensis*	Kisolo Toad	LC	v	

Anthieta's Rocket Frog, *Ptychadena anchietae* (36 N 0218164, 0107852)

Kivu Reed Frog, *Hyperolius kivuensis* (36 N 0225868, 0116072)

Flat-backed Toad, *Sclerophrys maculatus (36 N 0219637, 0112709)*

Ptychadena nilotica (36 N 0218164, 0107852)

The Amphibian species were generally randomly distributed. However, their distribution was dictated by the availability of water / moisture. Members of genus Ptychadena were encountered throughout the project area, near water or away from water. Members of the genus Ptychadena have the ability to adapt and can utilize any water source for breeding be it temporary. During the baseline survey, members of this genus were found settlements, pools and ponds. The genus Sclerophrys also has the ability to utilize temporary water pools for breeding and can therefore occur some distance away from permanent water source. Members of genera Hoplobatrachus, Afrixalus, Hyperolius, Phrynobatrachus, are associated with permanent water sources. Members of genus Afrixalus and genus Hyperolius are found hanging over vegetation in and around permanent water sources. At several water pools and ponds members of Afrixalus and Hyperolius were recorded.

The Natal Dwarf Puddle Frog Phrynobatrachus natalensis and Dwarf Puddle Frog Phrynobatrachus mababiensis also prefer wet substrate around permanent water sources to avoid desiccation. These species were encountered and are distributed in and around permanent water sources including pools and ponds.

6.1.3.2 Reptiles

Nine reptilian species were recorded in the project area during the 2017 studies. The species belong to nine genera and seven families. The genera include Pelusios, Dipsadoboa, Acanthocerus, Trachylepis, Cnemaspis, Lygodactylus, Hemidactylus, and Varanus. At genus level, genus Trachylepis was the most abundant, followed by genus Varanus. Specifically, Trachylepis maculilabris was the most abundant species with eighteen individuals registered during the baseline survey. Varanus niloticus was the second abundant with 13 individuals encountered during the baseline survey. The least abundant was Dipsadoboa viridis.

Table 6-4: Reptiles recorded during the 2017 and 2025 surveys

Family Name	Scientific Name	Common Name	IUCN status	2017	2025
Pelomedusidae	*Pelusios gabonensis*	African Forest Hinged Terrapin	LC	v	
Colubridae	*Dipsadoboa viridis*	Laurent's Green Tree Snake	LC	v	v
Agamidae	*Acanthocercus atricolis*	Blue Headed Tree Agama	LC	v	v
Scincidae	*Trachylepis maculilabris*	Speckled-lipped Skink	LC	v	
Gekkonidae	*Cnemaspis quattuorseriatus*	Four-lined Forest Gecko	LC	v	v
Gekkonidae	*Lygodactylus gutturalis*	Forest Dwarf Gecko	LC	v	v
Gekkonidae	*Hemidactylus mabouia*	Tropical House Gecko	LC	v	v
Crocodylidae	*Crocodylus niloticus*	Nile Crocodile	VU	v	
Varanidae	*Varanus niloticus*	Nile Monitor	LC	v	v

Reptiles utilize the sun's energy to raise their body temperatures in order to be more active. The reptiles' basic requirements are a hiding place and a substrate on which to bask. These places and substrates are abundant in the project area, in form of trees, stone works around culverts, and broken culverts that have been replaced. They also occur in form of settlements, be it home building or institutional.

Fifty percent of the reptile species encountered during the baseline survey are adaptive and can live in any habitat as long as there are substrates they can hide and bask. These include the Blue Headed Tree Agama Acanthocercus atricolis, Tropical House Gecko Hemidactylus mabouia, Speckled-lipped Skink Trachylepis maculilabris and Forest Dwarf Gecko Lygodactylus gutturalis. Laurent's Green Tree Snake, Dipsadoboa viridis was found as a road kill, along the road. The Nile Monitor Varanus nilotica were mainly found around pools, ponds, collapsed culverts and culverts that had collected water in them. The culverts were being used for breeding as well as refugee for

the Nile monitors. The Wildlife Reserve Officials indicated that Monitor lizards are the most affected by road kills.

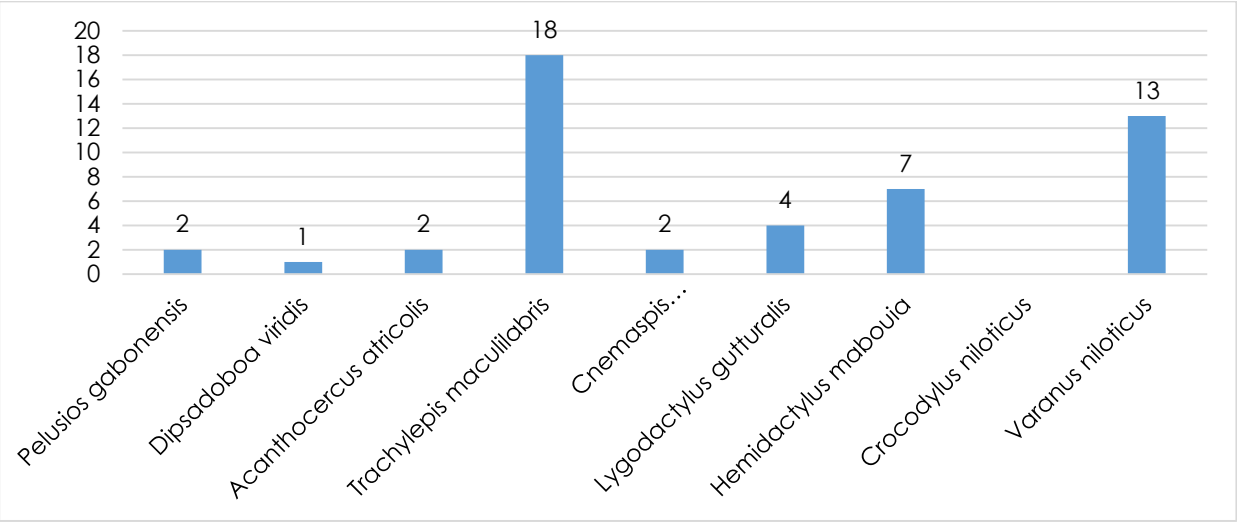


Figure 6-8: reptile Species Abundance as per 2017 and 2025 surveys combined

6.1.3.3 Sensitive Habitats

Most of the Amphibian species were recorded in and around pond, pool, or swamp/wetlands. These water sources are therefore important habitats for the survival of the amphibian species and their populations. Construction in and around these habitats should therefore be done with care to avoid negative impacts on the amphibians that may come as a result of the changes in their habitat.

6.1.4 Butterflies

Butterflies are preferred indicators of habitat disturbance because of their sensitivity to environmental changes, diversity, advanced taxonomy, and lower economic and temporal costs of collection [Bonebrake et al 2010; Daily & Erlich 1995]. They also have been used as models to monitor temporal changes in plant-insect interactions, because climate change induces phenological mismatches between butterflies and their exploited plant species that can produce changes in trophic webs [Parmesan, 2006].

6.1.4.1 Species diversity

A total of 106 butterfly Individuals in five families (**Appendix 6**) were recorded in the different road sections sampled. Riverine woodland along River Wasa registered the highest number of species (64%) of the total butterfly fauna recorded from the entire project area. Woodlands both registered 54%, while Gallery forests and wooded grasslands registered the least number of butterflies with only 45% each of the total species recorded by these surveys.

A number of habitat specific species were present for example 25 forest dependent butterfly species, 12 forests edge/woodland species, one lowland Forest species, 15 migrant species, 14 open habitat species, 37 widespread species and two wetland species.

Nepheronia argia

Appias sabina

Papilio phorcas

Cymothoe jodutta

Plate 6-8: Some butterflies seen along the route

6.1.4.2 Species of conservation concern

No IUCN threatened or endangered species would be impacted by the proposed action because none of them is present in the areas covered by this project. However, some sensitive butterfly species could be disturbed especially those that are habitat specific.

6.1.5 Birds

6.1.5.1 Species diversity

The Reserve is also known to host about 400 bird species (UWA, 2020). It is estimated that this may be more diverse than most of Uganda's National Park. This is due to its location at the confluence of Mt. Rwenzori, the high tropical forests of the Congo, Savannah grassland typical of low land areas within the Rift valley, riverine forest along several rivers and the Semliki flats within the flood plains, all contributing to the bird species diversity.

During the surveys, a total of 138 species (**Appendix 7**) were recorded along the road section which was also limited to open grassland, sparsely wooded grassland, and grassland with thickets, riverine forest and degraded community land. The sparsely wooded areas recorded the highest species richness with a total of 72 species followed by the grassland with thickets, 68 species, Riverine forest, 52 species, degraded areas, 38 species and the open grassland with 38 species.

Of the species recorded, 68% were f-species, 27% were F-species, 3% were w-species and 2% were G-species. The average number of species recorded per hour was 19 species.

Table 6-5: Species recorded in the different conservation categories

Category		Description	No. species recorded
Threat category	CR	Globally Critically Endangered	0
	EN	Globally Endangered	02
	VU	Globally Vulnerable	0
	R-VU	Regionally Vulnerable	01
	R-NT	Regionally Near Threatened	03
	R-RR	Species of Regional Responsibility	01
Habitat	FF	Forest specialist	02
	F	Forest generalist	17
	f	Forest visitor	58
	W	Waterbird	02
	w	Bird often near water	06
	G	Grassland	04
	Ae	Mostly aerial species	2
Migrants	P	Palearctic	02
	A	Afro-tropical	03

6.1.5.2 Species of conservation concern

Among bird species of conservation concern recorded were;

i. **Martial Eagle** *Polemaetus bellicosus;* that is globally Near – Threatened and Regionally Vulnerable (NT, R-VU).
ii. **White-backed Vulture** *Gyps africanus; a* single congregation of the White-backed Vulture Gyps africanus which is globally Near – Threatened, regionally Near – Threatened and nationally Near – Threatened (NT, R-NTG) was recorded with eight individuals on a kob carcass in the open grassland.
iii. **Shoebill** *Balaeniceps rex* which is globally Vulnerable, regionally Vulnerable and nationally Near – Threatened (VU, R-VUW), and;
iv. **Grey Crowned Crane** *Balearica regulorum* which is globally endangered, regionally Near – Threatened and nationally Endangered (EN, R-NTWG) are also known to occur in the Reserve but were not recorded during all surveys.

6.2 Physical environment

6.2.1 Climate and seasonality

Ntoroko District in Uganda experiences a tropical climate with a distinct wet and dry season, characterized by relatively high rainfall due to its location near the Rwenzori Mountains, which often bring rain clouds to the area; expect a humid climate with consistent temperatures throughout the year. Climate is strongly influenced by Lake Albert, but is also influenced by three other separate air masses—those of the Rwenzori Mountains, the uplands to the east of the reserve, and the air mass associated with the Congolese rainforest to the west (UWA, 2020).

The temperature of the lake is less variable than the air and soil, so that as the temperature drops at night, the warmer air over the lake rises, creating prevailing winds toward the lake, or northeast. In the day, the lake is typically cooler than surrounding areas, creating a prevailing wind away from the lake, or southwest. The Toro-Semliki climate is dry, particularly in comparison to other protected areas in the Albertine Graben. It is also hot and humid. The relative humidity daily maxima average 95% in the wet season and 92% in the dry season (Hunt, et al., 1999). Rainfall in TSWR is one of the major sources of water for wildlife survival. Toro-Semliki has two distinct rainy and dry seasons.

The rainy seasons are from March–May, reaching its peak in April; and August–November, with the peak in October. The escarpment in the eastern part receives more rainfall than other parts of the reserve (Figure 6-9).

Figure 6-9: Average monthly Rainfall Distribution pattern in TSWR (Source: World Bank Data Portal)

6.2.2 Soils and Geology

Plate tectonism dictates that the tectonic plates and subsequent movement along the rift valley floors created igneous and metamorphic bedrocks in the region's mountains and escarpments. The rocks are mainly granites, gneisses, and schist; of the steep slopes are the nutrient source of the soil deposits along the river floors. Rivers distribute gravel and sands over the wider areas of the valley before depositing sands and clay sediments into Lake Albert (Verner and Jenik, 1984). According to Verner and Jenik (1984), the soils in TSWR are associated with the rift valley faulting, a phenomenon with varied geological processes that are a factor in the existence of various soil types indicated in Figure 6-10 (a) and (b).

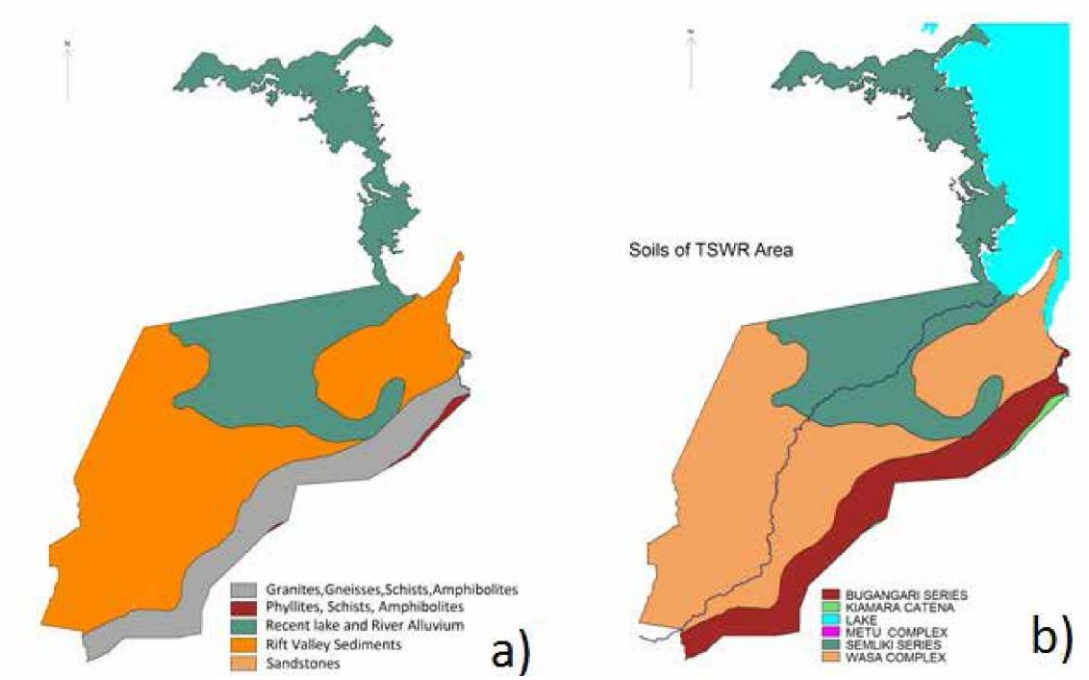


Figure 6-10: Geological Units in the Toro-Semliki Wildlife Reserve (A) and the related Soil Units (B) (UWA, 2020)

6.2.3 Water quality analysis

During the 2025 surveys, some of the water sources had no viable water for sampling along the project corridor. All water retention areas were contaminated by the stagnation, used by animals with multiple faecal droppings. Most of the river and stream beds were dry. Both Surveys of 2025 and 2017 classified water sources based physical-chemical properties as;

i) Physical chemical quality of surface water bodies: All surface water bodies showed poor physical water quality in respect to the following parameters; turbidity, color and suspended solids.

ii) Physical water quality of animal watering points samples: All animal watering points showed poor physical water quality in respect to the following parameters; turbidity, color and suspended solids.

iii) Physical quality of domestic water supply systems.: All ground water based for domestic use showed satisfactory physical water quality characteristics in compliance to the Uganda Standards for drinking (potable) water – specification class 11.

6.2.3.1 Microbiological quality

The microbiological attributes used to classify the water sources were faecal and total coliforms

i) **Microbiological quality of surface water bodies**: All water samples from the surface water bodies (streams and rivers) that were assessed indicated high levels of faecal and total coliforms contamination.

ii) **Microbiological quality of animal water bodies**: All water samples from the animal watering points that were assessed indicated high levels of faecal and total coliforms contamination (Appendix 8).

iii) **Microbiological quality of drinking water supplies**: All water samples collected from the groundwater based for domestic water supply indicated satisfactory microbiological water quality characteristics in compliance to the Uganda Standards for drinking (potable) water specification class 11 due to no presence of faecal contamination (Appendix 8).

6.2.4 Noise and vibration

The average readings per location ranged from 29.96 to 61.4 dB (A) with 37% (n=8) being above 60 dB (A). Readings above 60 dB(A) such as at Karugutu Trading Centre and Kanara Town Council Market were attributed to economic activities such as Music, and vehicles to the landing site and motor cycle movements at the point in time for taking measurements.

Table 6-6: Measurements of Noise level, dB(A)

Name of site (Sample Location)	Coordinates	Min	Max	Average
Ntoroko: Fuel pump	225947.76E 1146022.75N	45.2	53	48.9
Ntoroko: waste pits	225159.34E 1146022.75N	34.9	48	41.2
Ranger outpost	203616.61E 102497.32N	29.6	30	29.9
Kakara Junction	197099.50E 94161.77N	29.2	37	33.2
Karugutu UWA gate	193755.52E 87922.44N	46.4	56	51.1
Karugutu electrical transformer	19131259E 87311.2N	57.9	65	61.4

6.2.5 Air quality assessment

a) Gaseous composition

This assessment focused on the Criteria Air Contaminants (CAC) and Greenhouse Gases, which reflect the project emissions of concern with respect to human and environmental health. Major sources of outdoor air pollution in the project area are or will be from vehicular traffic and road construction activities. Different air pollutants are described under the following headings:

- Particulate Matter, including total suspended particulate (TSP); inhalable particulate matter (PM_{10}) and Sulphur dioxide (SO_2);
- Sulphur Dioxide (SO_2)
- Nitrogen Dioxide (NO_2);
- Carbon Monoxide (CO);
- Greenhouse Gases: (carbon dioxide (CO_2), methane (CH_4).

The 2025 survey established that Nitrogen dioxide, Carbon monoxide, Hydrogen Sulphide and Methane were all within safe ranges and/or not present at all (Table 12). It was further observed that 13% (n=8) have VOCcs above the action level of these 37.5% (n=3) had values above the PEL.

Familiar substances containing VOCs include; solvents, paint thinner, and nail polish remover, as well as the vapours associated with fuels such as gasoline, diesel, heating oil, kerosene, and jet fuel. The category also includes many specific toxic substances, such as benzene, butadiene, hexane, toluene, xylene, and many others. OSHA adopted a Permissible Exposure Level (PEL) of 0.75 ppm and an action level of 0.5 ppm for VOCs.

Table 6-7: Results from Air Monitoring

		Coordinates	ppm				%vol
No.	**Name of site**		NO_2	H_2S	CO	VOCs	CH_4
1	Ntoroko: Fuel pump	225947.76E 1146022.75N	0	0	0	0.6	0
2	Ntoroko: waste pits	225159.34E 1146022.75N	0	0	0	0.9	0
3	Ranger outpost	203616.61E 102497.32N	0	0	0	0.9	0
4	Kakara Junction	197099.50E 94161.77N	0	0	0	0	0
5	Karugutu UWA gate	193755.52E 87922.44N	0	0	0	0.1	0
6	Karugutu site 2	19131259E 87311.2N	0	0	0	0.4	0

b) Particulate matter

Inhalable (PM10) and respirable (PM2.5) particulate matter are comprised of very small particles that are less than 10µm and 2.5µm respectively. Particles of diameter smaller than 10µm can make their way deep into the respiratory tract and will become lodged there-in.

Project-related sources of particulate matter (PM) include internal combustion and fired equipment such as the diesel generators, engines when they are fired. Fugitive and process dust during road construction is considered PM. Combustion-related PM is generally in the respirable range (<2.5µm), while fugitive and process dust are generally above the inhalable range (>10µm).

Particulate matter measurement results indicate the mean of PM10 and PM2.5 concentrations are 14.2µg/m3 and 8.6µg/m3 respectively, was not exceeded. Soils and deposited dust on surfaces are likely to be drier and more readily available for suspension or re-suspension in air, leading to higher concentrations of suspended particulate matter during construction phase.

Table 6-8: Readings for Particulate matter (particles/m3) measured

Name of site (Sample Location)	Coordinates	0.3 µm filter	0.5 µm filter	5 µm filter
Ntoroko: Rubbish pit	-	5.63E+07	1.69E+07	2.33E+05
Ntoroko: Fuel pump	225947.76E 1146022.75N	5.68E+07	1.40E+07	6.18E+05
Ntoroko: Water point	-	5.62E+07	1.02E+07	1.33E+05
Ntoroko: waste pits	225159.34E 1146022.75N	5.77E+07	1.53E+07	1.52E+06
Elephant track	203616.61E 102497.32N	6.06E+07	1.96E+07	1.15E+06
Kakara	197099.50E 94161.77N	6.25E+07	1.50E+07	1.53E+05
Karugutu gate	193755.52E 87922.44N	6.70E+07	3.25E+07	4.70E+06
Karugutu center	19131259E 87311.2N	6.73E+07	2.46E+07	2.04E+05

6.2.6 Green House Gas (GHG) emissions

A Greenhouse Gas (GHG) Assessment as per IFC Performance Standards mainly follows the requirements in IFC Performance Standard 3: Resource Efficiency and Pollution Prevention and its guidance notes, plus the IFC Environmental, Health, and Safety (EHS) Guidelines.

IFC requires a GHG assessment when a project is expected to emit more than **25,000 tonnes** of CO_2e annually (direct + indirect). The goal is to quantify emissions, identify sources, and propose mitigation measures to reduce emissions over time. Applies to Scope 1 (direct), Scope 2 (indirect from purchased electricity/heat/steam), and in some cases Scope 3 (other indirect, e.g., supply chain, transport).

6.2.6.1 Scope of GHG emission assessment

This report provides an estimate of scope 1, scope 2, and scope 3 GHG emissions resulting from the construction and operation (including maintenance) of the proposed Road development.

The estimated GHG emissions can be used to assess the requirement for the development, as per the Environmental Factor Guideline Greenhouse Gas Emissions (GHG Factor Guideline). For the operation elements, scope 2 and 3 emissions have been modelled showing annual predicted emissions.

Table 6-9: GHG emissions scope definitions

Principle	Description
Scope 1	Direct emissions from owned or controlled sources resulting from the combustion/consumption of fuels (e.g., combustion of diesel in engines, transmission losses, use of synthetic gasses)
Scope 2	Indirect emissions from the generation of purchased energy (e.g., purchased electricity, heating, cooling)
Scope 3	All indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions (e.g., purchase of goods and services, Supply chain, waste, employee travel, product transport

6.2.6.2 Carbon Accounting and Reporting

Carbon accounting is the process of identifying and measuring the amount of GHG, measured in t CO2-e, emitted by a project. Carbon reporting is the process of reporting on that accounting.

a) GHG emissions

The carbon account is inclusive of the following GHG emissions covered by the United Nations Framework Convention on Climate Change (UNFCCC) Reporting Guidelines and in line with the GHG Factor Guideline:

- Carbon dioxide (CO2)
- Methane (CH4)
- Nitrous dioxide (N2O)
- Sulphur hexafluoride (SF6)
- Perfluorocarbons (PFCs)
- Hydrofluorocarbons (HFCs)

While all the above-mentioned GHG's have been considered, GHG's relating to infrastructure developments are primarily limited to CO2, CH4 and N2O.

b) Scopes of GHG emissions

The GHG Protocol defines three (3) scopes of emissions to ensure that single emission sources are not counted twice within the supply chain. Scope 1 and 2 emissions are required to be included in recognized GHG inventory reporting schemes and these emissions therefore should be included within any GHG assessment. Scope 3 emissions are typically considered optional in most compliance reporting schemes. However, it is recognized that the inclusion of scope 3 emissions provides a more holistic view of a project's environmental impact. They also provide an opportunity to be innovative in GHG emissions management.

c) GHG Assessment Boundaries

In estimating GHG emissions for the proposal, the assessment boundary has been considered to include all the emission sources that were deemed to potentially be impacted by decisions made by designers, constructors, managers, operators of the road project and associated infrastructure.

d) Materiality

Materiality is a measure of the perceived effect that the inclusion or exclusion of an emission source or activity may have on the accuracy or validity of a GHG emission assessment. Different standards stipulate different definitions and thresholds for materiality. An organization can determine materiality themselves, but if reporting under a specific scheme, then materiality is determined by the scheme's requirements and standards.

6.2.6.3 Calculation methodologies used to estimate the GHG emissions

The calculation methodologies used to estimate the GHG emissions attributable to the construction, operation, and maintenance of the proposal are in alignment with GHG Protocol Corporate Accounting and Reporting Standard (GHG Protocol) and have been based on the principles outlined in Table 6-10.

Table 6-10: GHG accounting and reporting principles

Principle	Description
Relevance	Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision making needs of internal and external stakeholders
Completeness	Account for and report on all GHG emission sources and activities within the chosen inventory boundary, disclosing and justifying any specific exclusions from the emissions assessment
Consistency	Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors
Transparency	Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used
Accuracy	Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information

Emissions estimated are represented in CO2-e using current global warming potential (GWP). The GWPs from the IPCC Fifth Assessment Report (AR5) have been used in this assessment and are listed in Table 6-11

Table 6-11: Greenhouse gases and 100-year global warming potentials

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO2)	1
Methane (CH4)	28
Nitrous Oxide (N2O)	265

The scope 1, scope 2, and scope 3 emission factors used in the estimation of GHG emissions have been taken from the National Greenhouse Accounts (NGA) Factors 2022.

a) Assumptions

The assumptions used in the GHG emissions assessment are presented in Table 6-12. These assumptions have been developed from information available, default Carbon Gauge Tool assumptions and previous project experience.

Table 6-12: Assumptions used in the estimation of GHG emissions

Activity	Assumption
Vegetation clearing (construction)	Vegetation removal will be conducted using conventional plant (i.e., graders and dozers) • Class 1 equivalent to 0-50 t dry matter/ha • The vegetation types selected were based on the ecological survey undertaken for the PDE. • The vegetation types identified were apportioned to the clearing area based on their occurrence within the PDE in its entirety (e.g., 10% of PDE vegetation identified as vegetation class D would result in 10% of cleared area assumed to be of vegetation class D)
Construction materials	• Construction material data was collected for steel, concrete and plastic and was estimated by Horizon Power based on similar project experience and dimensions • Estimated emissions are based on cradle-to-gate embodied emissions
Liquid fuel – transport & stationary (construction)	• Fuel consumption was estimated on similar project experience and dimensions • All construction related liquid fuel emissions were assumed to be from the consumption of diesel
Employee transport to site	• Emissions have been estimated on the most emissions intensive scenario of Fly in Fly out (FIFO). Assuming 2 flights from India to Uganda (1,247km one-way) occurring per month for the duration of the construction period • Employee workforce has been estimated at 200 for the entire duration of the construction period • Short-haul average passenger emissions factor (person.km) has been applied to estimate emissions
Liquid fuel – transport & stationary (operation and maintenance)	• Liquid fuel emissions have been based on vehicle/equipment type, fuel efficiency of each vehicle (0.124 L/km for mobile and 16.8 L/hr for stationary), hours of operation (8 hr per day) and estimated average vehicle speed (100km/hr) • Inspection frequency has been used to estimate the duration of vehicle/equipment use – Data based estimates for vehicles used in inspections (4x4 for mobile and elevated work platform for stationary). • All operation (incl. maintenance) related liquid fuel emissions were assumed to be from the consumption of diesel

6.2.6.4 Greenhouse Gas Emissions Inventory

The GHG emission inventory included construction and operation activities, including maintenance works, to provide an overview of the impact of the proposal during its full life cycle. While majority of emissions are concentrated to the construction phase, the footprint of asset use, namely connectivity, is insurmountable in comparison.

a) Construction

Emissions associated with construction have been broken down by various construction activities. The estimates have been based on 36 months of construction activities.

Table 6-13: Estimate of Construction emissions breakdown by activity

Activity	Scope 1	Scope 2	Scope 3	Total [t CO2-e]	Annual estimate
Construction material	-	-	14,176	14,176	9,890.6 t CO2-e per year
Liquid fuel (diesel) consumption	2,120	-	56	2,176	
Vegetation clearing - lost sink	10,456	-	-	10,456	
Employee travel to site	-	-	2,864	2,864	
Total	**12,576**	**-**	**17,096**	**29,672**	

The annual GHG emission from construction for the proposal have been estimated to be **9,890.6t** CO2-e, with approximately 48% of total emissions being attributed to embodied emission in construction materials. Lost carbon sink from vegetation clearing and fuel consumption contributed to approximately 43% combined, with vegetation clearing accounting for an estimated 35% of the total construction related GHG emissions.

b) Operation

Emissions associated with operation of Karugutu-Ntoroko and associated road links have been broken down by various activities. The estimates have been based on design life of 5 years' prior a mandatory rehabilitation phase.

Table 6-14: Annual operation emissions breakdown by source

Activity	Scope 1	Scope 2	Scope 3	Total [t CO2-e]	Annual estimate
Veichular movements	10600	-	-	10600	3541.67 t CO2-e per year
Stationary diesels	25	-	-	25	
Total	**10625**	**-**	**-**	**10,625**	

Total GHG emission from operation and maintenance for the proposal have been estimated to be **3541.67** t CO2-e per year, with approximately 98% of total emissions being attributed to Vehicular movements along the project road.

6.2.7 Potential catastrophic Risks: flooding regimes. landslides

6.2.7.1 Flooding

Flooding in the project area is mainly caused by River Semiliki and its tributary rivers which include R. Wasa, R. Itojo, R. Semuliki, R. Dorwa and several smaller streams such as Kithoma, Kamayatya, Nyangilika, Kanyamabale, Ngisia which overflow when they are full to capacity. Floods may be independent of rains in the district; with heavy rains in the Rwenzori Mountains, River Semiliki bursts its banks and the water enters the Ntoroko flood plains. This phenomenon is disastrous to the local communities when they suffer loss of their property, houses, crops, and animals; as well as the project area.

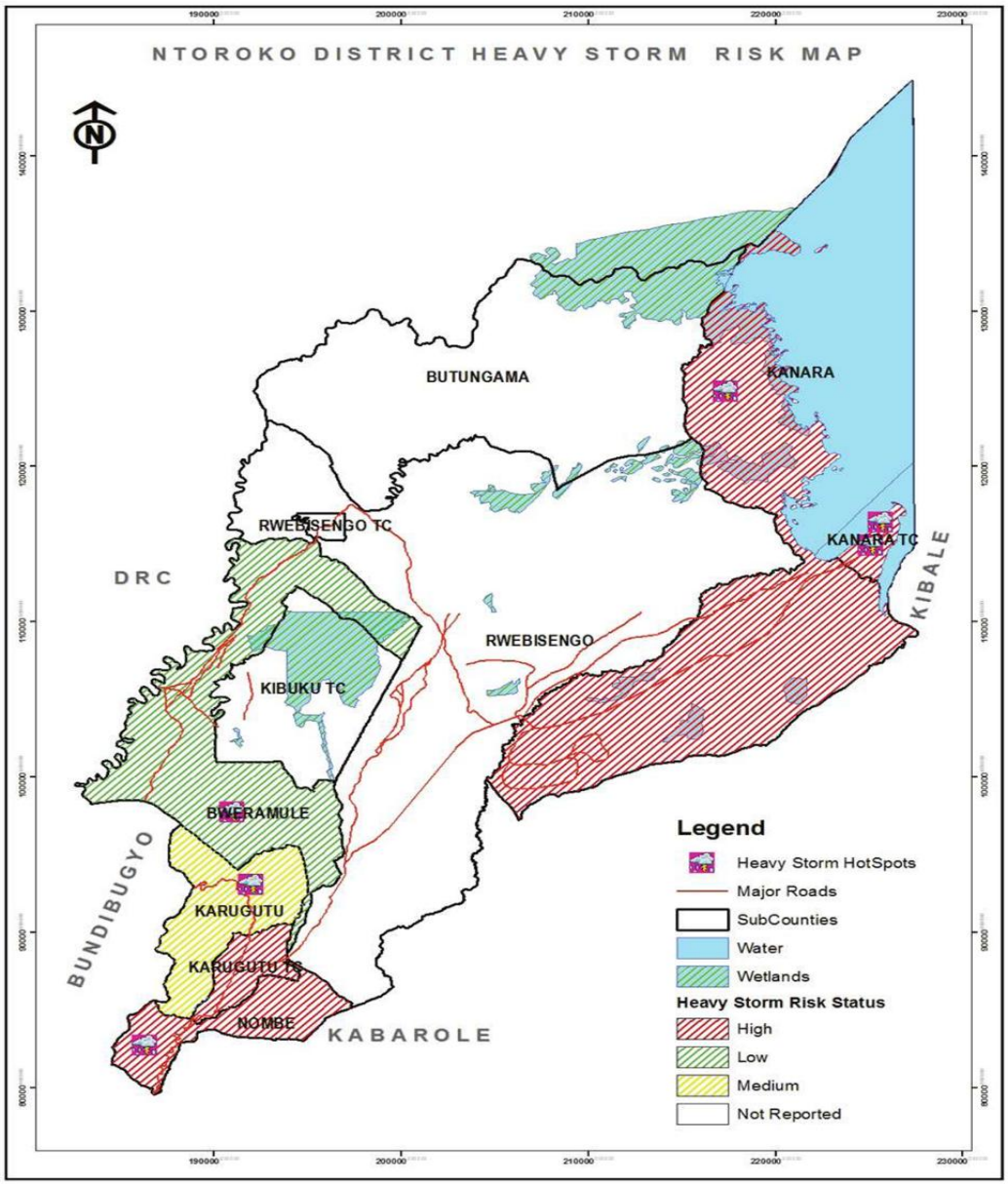


Figure 6-11: Heavy Storm Risk Map (OPM, 2016)

The floods are sometimes so severe that they even use canoes to move in the areas, which used to be their grazing land. The farmers are forced to take their animals to the Democratic Republic of Congo. The communities prone to high risk of floods are those in Rwebisengo SC, Butungama SC, Bweramule SC and Rwebisengo TC; those Nombe SC, Kibuuku TC, are prone to moderate risk of flood while the communities in Kanara SC, Kanara TC, and Karugutu SC are prone to low risk of floods. Only communities of Karugutu TC are not prone to any risk of floods. Floods in Kanyasi Ward, Kanara Ward and Twanigene Ward in Kanara Town Council and in Nyakasuyi village, and Masaka and Bwizibwera in Butungama Sub-county respectively led to cholera outbreaks

6.2.7.2 Landslides

The landslides occur mainly in the sub counties of Nombe and Karugutu, which are prone to high and low risks of 13 Ntoroko District Hazard, Risk and Vulnerability Profile the hazard respectively. The rest of the sub counties and town councils of Ntoroko District are not prone to landslides. The most notable landslide events have been in the parishes of Musandama, Nyakatoke and Nombe, which led to destruction of bridges in Kyabandara parish and Musandama, along Wasa River. The steeper

slopes in Karugutu and Nombe sub-counties combined with seismic activity give the area a higher risk of landslides. A recent forest fire has caused deforestation which exacerbates the condition.

6.2.7.3 Earthquakes

Ntoroko District has not recorded any losses suffered from earthquakes due to its relatively low population density. It is anticipated that the risk is increasing with increase in buildings especially in the town councils and population density. The district is in the seismically active Western Rift Valley. The communities of Nombe sub-county are prone to moderate risk of earthquake induced landslides due to weak soil structure and consequently unstable slopes and so is Karugutu though at a low risk. The others in the low risk category include Rwebisengo TC, Kanara Tc, Karugutu SC, Rwebisengo TC, Kibuuku TC and Kanara TC. The communities of the other sub counties are perceived to be free from the risk of earthquakes.

6.3 Socio-economic baseline

Ntoroko District is one of the two Ugandan districts west of the Rwenzori Mountains, the other being Bundibugyo District. Ntoroko District is found in the Rwenzururu sub-region of the western region of Uganda, and became operational on 1 July 2010. The District is bordered by the Democratic Republic of the Congo to the West, Lake Albert to the North, by the districts of Kibaale in the Northeast, Kabarole in the East and Southeast, Kibaale District to the East, Kabarole to the south, and Bundibugyo to the south-west. Ntoroko District has only one county, Ntoroko, divided into six Sub-Counties and four Town Councils. At the lower levels, there are 49 Parishes and 206 villages as indicated in the table for population by Sub County.

The proposed Karugutu - Ntoroko project is a 50.4km road with a 3km section traversing Karugutu Town Council, 42Km through Toro-Semliki wildlife reserve (comprising Itojo parish of Karugutu Sub County for a stretch of 5.6Km at Kakara village, ending at River Wassa where another portion of the road is in Kanara Sub County in the game reserve); and about 3kms of Kanara Town Council (formerly Kanara Sub County with two parishes named Ntoroko and Kanara) which ends at Lake Albert. The road begins at Karugutu Town Council T- junction off Kabarole-Bundibugyo-Lamia road and ends at Lake Albert in Kanara town council.

6.3.1 Administration

In Uganda, government structures are decentralized and hence local governments are placed at district, municipalities, town councils and sub counties. The community reside in villages which are headed by local council chairpersons at Local Council Level I (LCI). The villages, led by LC I chairpersons are overseen by parish chiefs. Parishes support the Lower Local Governments (LLGs) at Sub County level in the bottom-up planning processes and implementation of government programmes. The Sub county and District levels have both political and technical leadership, where the sub county level LC III chairpersons lead the political arm, while the Sub County chief is the technical administrator. At the district level, the LC V chairpersons lead the political arm, while the Chief Administrative Officer heads the administrative and technical staff. A Technical Planning Committee (TPC) comprised of the heads of departments and sections, coordinates the activities and functions of the district. The service departments in the district include: health, works and technical services, production and marketing, education, statutory bodies, gender and community services, finance, planning, internal audit, management support services and natural resources. The community and institutional structures in the district are key to the proposed road project. The ESIA team made consultations with Ntoroko District where all the political Councilors were represented by the district executive, and the Chief Administrative Officer and staff from all the departments. Project disclosure and consultations on the likely positive and negative impacts of the project were extended to the Sub Counties of Karugutu and Rwebisengo, to the town councils of Karugutu,

Kanara and Rwebisengo, up to the community levels where community meetings and focus group discussions were conducted. The findings from these stakeholders are presented in the chapter 8.

Table 6-15: Administrative Areas traversed by Karugutu-Ntoroko road

Sub County/ Town Council	Ward / Parish	Villages/Cells
Karugutu Town Council	Karugutu Ward	Karugutu South Cell
	Nyabuhuru Ward	Karugutu North Cell
		Nyabuhuru Cell II
	Kacwamba	Kacwamba I
		Kacwamba II
Karugutu Sub County	Itojo Parish (within the game reserve)	Kakara
Rwebisengo		
Kanara Sub County	Kimara Parish (within the game reserve)	Kanywataaba
		Wassa
		Kandita
		Kacwankumu
Kanara Town Council	Kanara Ward (old)	Kanara A
		Kanara B Rwenyange B
		Rwenyange A
	Twanzane Ward	Ntoroko South B
		Ntoroko south A
		Ntoroko Middlewest
		Ntoroko west
	Kanyansi Ward	Ntoroko Central A
		Ntoroko Central B
		Ntoroko East B
		Ntoroko East A
	Ntoroko Ward	Kisenyi A
		Kisenyi B
		Ntoroko North B
		Ntoroko North A

6.3.2 Demography

In 1991, the national population census estimated the district population at 24,300. The national census in 2002 estimated the population at 51,100. In 2014, the national census and household survey enumerated the district population at 67,005. While in 2016, the population was estimated at 69,600. As of 2023, Ntoroko District population was estimated at 80,700 People comprising of 39,400 males and 36, 600 females1,236 km² Area and population density of 65.29/km². There has been a significant Annual Population Change of 2.0% from 2020 to 2023.

Table 6-16: Administrative Areas traversed by Karugutu-Ntoroko road

District	Total Population	Male population	Female population	**population density**
Ntoroko	80,700	39,400	36, 600	65.29/km².

6.3.2.1 Household size

The survey questionnaire was administered to 181 (116 males, 64 females) respondents, representing 64% male headed and 36% female headed households, in 2017. From this sample Kanara town council had 49.72% respondents, while Karugutu Town Council had 50.28% respondents or households. The average age of the respondents was 42.7%; and over half of the respondents (51.8%) were 40 years and above, followed by 15% of 35 – 39 years, while the rest (32%) were between 34 years to 20 years representing the youth population.

Since there are no human population in the Toro-Semliki wildlife reserve, as well as the immediate park boundary; the study revealed that half of the households (50.3%) along the road, in Karugutu

and Kanara had between ten to five people followed by those (28.2%) with five people, and 12.7% households with 15 to 11 people, while in Karugutu 9.9% households had 20 to 16 people. This finding reflects the numbers of people in the household who would be affected by the proposed upgrade of the Karugutu – Ntoroko road.

Table 6-17: Size of Households along Karugutu - Ntoroko road

Respondents' household size								
Town Council			<5 people	5-10 people	11-15 people	16-20 people	21+ people	Total
	Kanara T/C	No.	23	51	12	1	3	90
		%	25.6	56.7	13.3	1.1	3.3	100.0
	Karugutu T/C	No.	28	40	11	9	3	91
		%	30.8	44.0	12.1	9.9	3.3	100.0
Total		No.	51	91	23	10	6	181
		%	28.2	50.3	12.7	5.5	3.3	100.0

Source: UNRA, 2017

6.3.2.2 Marital status of the Respondents

The household survey found that 60% of the respondents were married while 21% were separated, 12% were widowed while 7% were single. A gender disaggregation of the respondent's further reveal that there are more women than men who reported to be separated and widowed. This situation has health implications as far as HIV/AIDS is concerned in the communities of Karugutu and Kanara where the prevalence rate is estimated at 10.4% as per the Kanara Town Council Development Plan, 2015/16 -2019/2020. Further, HIV/AIDS was reported to be much more common among women and men who are widowed, divorced or separated than among those who are married or never married according to reports that informed the National HIV and AIDS Strategic Plan 2015/2016 – 2019/2020 (UAC, 2015). Therefore, the external road construction workers must be safely secured in a camp.

Table 6-18: Marital Status of the Household Heads by Gender

Marital Status	Karugutu T/C				Kanara T/C				Grand Total	
	Males		Females		Males		Females			
	No.	%	No.	%	No.	%	No.	%	No.	%
Married	50	28	7	4	47	25.9	4	2.2	108	60
Separate	6	3	12	6.6	3	1.6	19	10.4	40	21
Widow	4	2	8	4.4	2	1.1	10	5.5	24	12
Single	1	1	3	1.6	3	1.6	2	1.1	9	7
Total	61		30		55		35		181	100

6.3.2.3 Migration patterns

The social survey revealed the migration patterns by investigating the duration of stay the respondent had spent in the current area and where she or he had come from. Most respondents; 47% had spent less than 10 years in Kanara reflecting more men (52.7%) than women (38.2%) having stayed less than 10 years at the landing site; 32.6% had spent 10 to 20 years, and 20.2% had spent more than 21 years. This implies that 79.8% had been in Kanara for less than 20 years, which is an indication of migratory tendencies. The survey further revealed that only 13.2% of the respondents in Kanara Town Council had been born in Kanara, the rest had moved to Kanara from Karugutu (9.9%), Bundibugyo (9.9%), Congo (7.1%), Kabarole (4.4%), Kasese (3.8%), Rwebisengo (3.3%), Hoima (3.3%), Kigungu (2.7%) among others. Similarly, in Karugutu T/C, 40% of the respondents had been in the area for less than 10 years, 25.5% had stayed for 10 to 20 years, while 34.4 had stayed for over 21 years. This implies that the majority (65.6%) had stayed for at least 20 years. When asked where they had come from, only 5.5% responded that they had been born in their current residence. The rest had come from Rwebisengo (3.3%), various respondents at 1.6% had come from Congo,

Bundibugyo, Nombe Sub County in Ntoroko, and Nyabuhuru I, while 1.1% had come from Itale, Kampala, Kanara, among others.

Despite the migratory tendencies, our interactions and observations could reveal that the respondents had come determined to settle and to work at the landing site as fisher folks or in the agricultural areas of Karugutu. In this respect, they use and constrain the social services which had been planned for the residents. The participants in the focus group discussions decried the limitations in the social services and appealed to the planning authorities to consider the continuous inflow during the planning. This situation has serious implications for the road project workers, justifying the need for a camp with ample social services, since the available services are already constrained. The landing site comprises of small communities in which the respondents appeared to know each other, interacted and socialized amongst each other. In this respect, the project should watch out and be responsive to the breakdown of the social networks in case such communities get disrupted.

Table 6-19: Duration of stay in the area

Duration of stay of HH disaggregated by Sex						
Town council				Sex		Total
				Male	Female	
Kanara T/C	Period	<10yrs	No.	29	13	42
			%	52.7	38.2	47.2
		10-20yrs	No.	16	13	29
			%	29.1	38.2	32.6
		21+yrs	No.	10	9	19
			%	18.2	23.5	20.2
	Total		No.	55	34	90
			%	100.0	100.0	100.0
Karugutu T/C	Period	<10yrs	No.	18	18	36
			%	30.0	60.0	40.0
		10-20yrs	No.	16	7	23
			%	26.7	23.3	25.6
		21+yrs	No.	26	5	31
			%	43.3	16.7	34.4
	Total		No.	60	30	90
			%	100.0	100.0	100.0

6.3.2.4 Ethnicity

The migratory nature of the two communities of Karugutu and Kanara, resulted in a multiplicity of ethnic groups. The survey found a multi-ethnic population made up of 30.3% people of Toro origin, 19.3% of Bakonjo from Kasese, 13% Batuku, 12.1% from Congo, 3.8% were Banyoro, and 3.8% were Alur. The ethnic diversity therefore raises the issue of differing cultural values, and combined with being a border area, the diversity can be attributed to exchange and fishing. The main languages used in the area include Rutooro, Lunyoro, Swahili and Luganda. Therefore, the minority of the ethnic groups should be given equal opportunities in participation and decision making on issues affecting them.

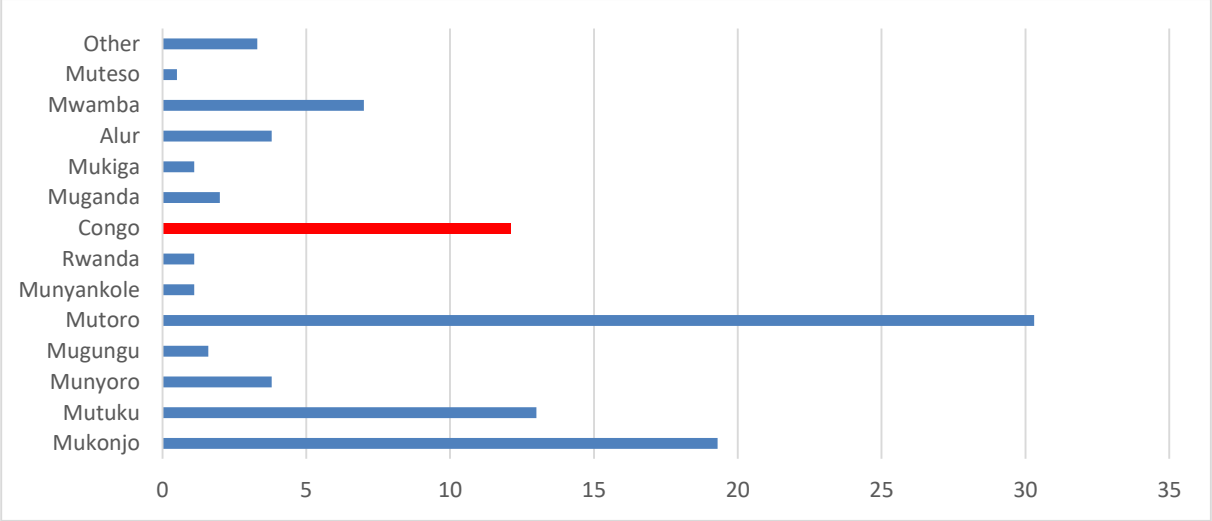


Figure 6-12: Ethnic groups along the project area,

Further analysis on the distribution of ethnic groups in the town councils reveal that there are those tribes which are perceived to be physically more energetic than the others. These include the Lugbara in Karugutu and the Alur in Kanara, who can be targeted for some manual work that would require a lot of energy. The people from neighboring Congo who include the Lendu are more concentrated in Kanara town council because of the ease of access through Lake Albert.

6.3.2.5 Religion

The study revealed that there were more Protestants (30%) than other religions; Catholics were found at 20%, Moslems at 23.2%, Pentecost at 13.3%, Adventists at 9%, while other religions were at 4.4%. Similar to the diversity in ethnicity, the religious diversity depicts a cultural practice of worshipping God in their various ideologies or denominations. Apart from the various values that they hold, the followers of the religions worship on different days, for instance the Moslems worship on Friday, the Adventists on Saturdays, the Protestants, Pentecostals and Catholics worship on Sundays. The project contractors should therefore release their staff to worship on their respective days. In the same way, they should be mindful of the noise from the heavy road machines, where possible to avoid noise around the places of worship. Field observations revealed that these places of worship were located along the proposed road, and would require relocation in case they happen to be within the road reserve; hence relocation should be in a convenient place for the user community.

6.3.3 Liviehoods

6.3.3.1 Livelihood Sources

The study revealed that in Kanara Town Council, at the landing site, the primary sources of livelihood were fishing and trading in goods and services, while in Karugutu Town Council the main livelihood sources were business and farming as highlighted in the following sections. The assets that the households owned to sustain their livelihoods. At the focus group discussion in Kanara, the participants mentioned seven people who have managed to keep cattle on a small scale in this area. They put those who own boats at the landing site at 5%, those who trade in fish at 10% and the workers at 85%; and that these correspond to their wealth ranks where the 5% are the better-off, 10% are average and 85% taken as the poor. The survey found that the majority (61.1%) of households in Kanara depended on fishing activities for their livelihoods, while 33.3% engaged in business, 1.1% worked as casual laborers, 1.1% indicated some minor farming and 2.2% earned a salary. The main livelihood sources for the Karugutu community were business (56%) and farming (18.7%), while 9.9% of the households engaged in fishing, and 5.5% in providing casual labour (Figure 6-13).

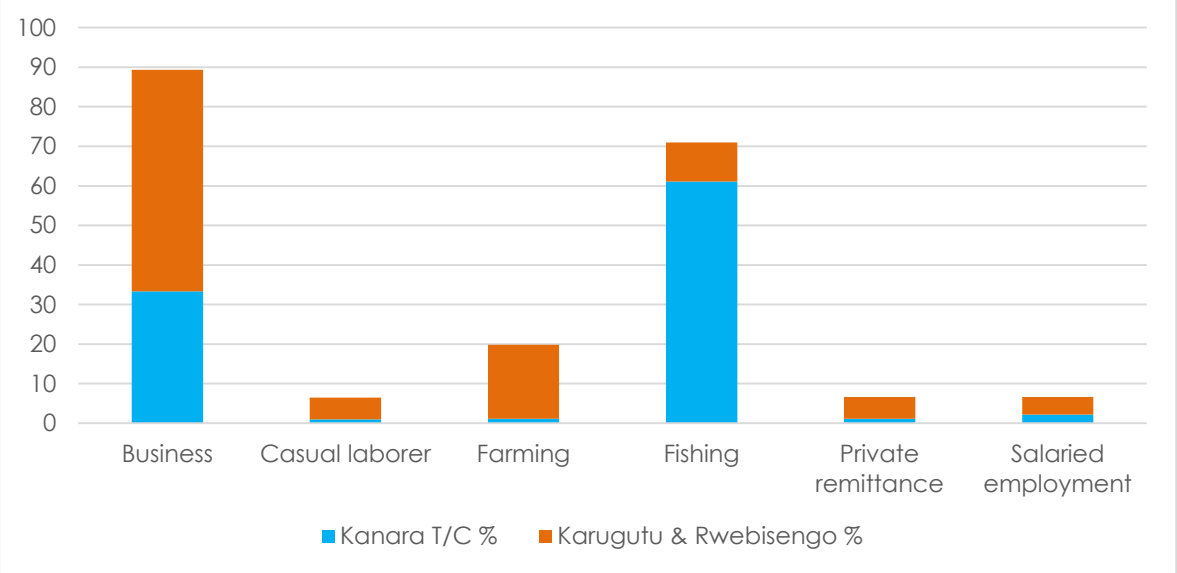


Figure 6-13: Primary source of income

Through observations, the ESIA team recorded the kind of businesses engaged in at Karugutu, Rwebisengo and Ntoroko trading centres. In Karugutu some crop gardens could be seen along the road, and in the town centres of Rwebisengo and Karugutu, the businesses that were observed comprised of;

- motorcycle or boda-boda
- and vehicle transport operators,
- shops dealing in second hand clothes, carpentry workshop,
- Mobile money agents for mostly for Airtel, and MTN,
- motorcycle repairs and vehicle workshops,
- a petrol station,
- drug shops and a pharmacy,
- lodges, pub and restaurant,
- welding, mansions,
- market stalls alongside the road, phone accessories
- retail shops, hair salons, and general merchandise retail and wholesale shops.

On the contrary, there were no observable crops in Kanara and the focus group discussion participants in Kanara attested to this "The main economic activity is fishing and trading in fish.

The women mainly trade in fish which they supply to Fort Portal, Bundibugyo, Karugutu, Kabarole, and Kasese. Vehicles with cold-chain systems supply fish to Rwanda, South Sudan, and DRC through Mpondwe post in Bwera." Other specific economic activities for Kanara included wheel burrows carriers, boat riders for passenger, luggage and cargo transport; timber trade from Congo and they mentioned at least 15 lodges which were operational day and night to cater for the visitors in Kanara.

The household baseline survey found that a third of (34%) households had access to credit to support their economic activities, while the majority (64%) did not. Apart from 13.3% who accessed credit from Centenary Bank, the rest of the households accessed credit from the locally organized and managed savings and credit cooperatives (SACCOs) such as Karugutu (20%) and Mugabante (20%), and Businge SACCOs in Karugutu and Ntoroko respectively. These sources of credit will be useful to the households and communities in enhancing their economic activities to take advantage of the likely increase in demand for goods and services when the road works begin.

6.3.3.2 Agricultural productivity

Agricultural activities were unique to Karugutu community, where the survey found 18.7% of the households engaged in growing food and cash crops, as well as keeping livestock. In terms of compensation for food and cash crop, the road project will have to be concerned with at most two kilometers of the road where food crops are found in Karugutu. The gardens in most cases appeared at a distance well away from the road reserve.

Plate 6-9: Cattle watering point in Rwebisengo

6.3.4 Land tenure and land use

There are three land tenure systems under which the households along the Karugutu – Ntoroko road owned the land. The most common land tenure system for the households (41.3%) was the customary followed by freehold (16.4%), leasehold (6%) and those who did not respond (36%) did not own land. Both men (74%) and women (36%) owned land in all communities of Rwebisengo, Karugutu and Kanara. This is an important revelation for the processes of land acquisition and

compensation, to be aware that beyond involving spouses of male headed households, there are female headed households with land ownership in their own rights.

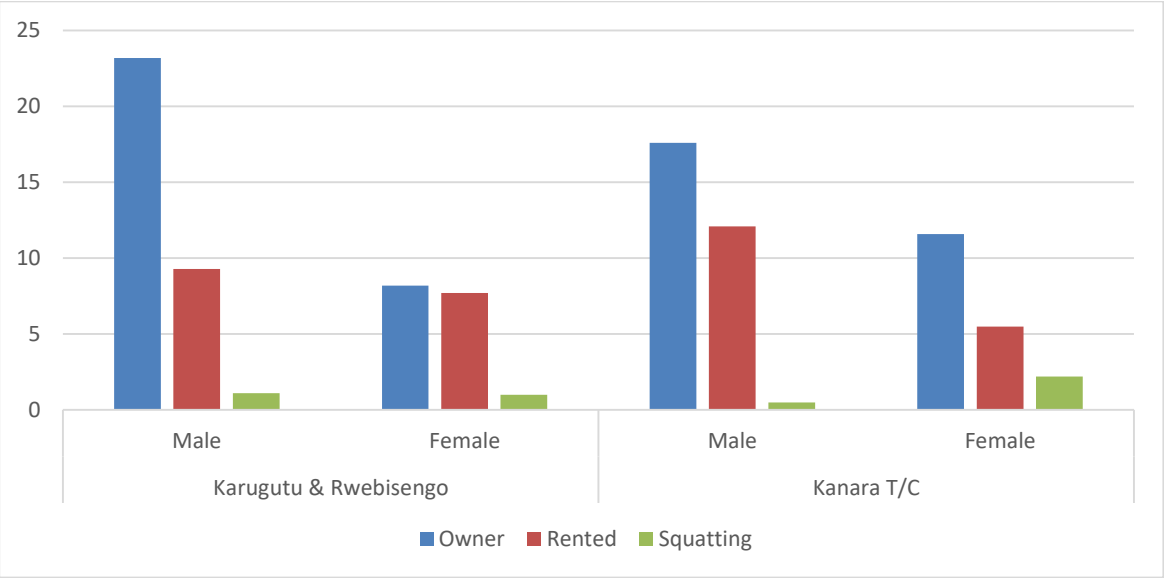


Figure 6-14: Status of Land Ownership along Karugutu – Ntoroko Road

6.3.4.1 Land Use

Ntoroko District is approximately 1,360. Square kilometers in size, comprising of mountains, forests, national parks, forest reserves, wildlife reserves, swamps and rivers, and agricultural or farm land as in the table 6-15 below.

Table 6-20: Land area coverage

Cover	Area	Percentage
Waters, Swamps and Rivers	353	26
Mountains, Forests (including parks)	326	24
Wildlife reserves	136	10
Agriculture/Farm land	544	40
Total	1,360	

According to a baseline survey, about 55% of the District land area is gazetted. This creates pressure on land available for agriculture. The terrain is hilly especially in Karugutu and Nombe S/counties where cultivation activities take place and soil erosion is immense. The Northern low lying flat areas are prone to flooding and over grazing. Therefore, sector activities must focus on optimum use of natural resources.

6.3.5 Social services

6.3.5.1 Health

The ESIA team visited Rwebisengo, Ntoroko HCIII and Stela Maris HCII in Kanara T/C, as well as Karugutu HCIII in Karugutu T/C because these health centres serve the population in the project area. The common diseases were identified as HIV/AIDs, malaria, dysentery, sexually transmitted infections (STIs). What was striking was high rate of teen mothers from 13 years. Regarding referrals, Karugutu HC III was better equipped than the rest of the health centres to handle referrals using an ambulance which was observed to be in good condition as shown in Figure 6-16 below.

Table 6-21: Health Centres in Ntoroko District

Sub County	Health Unit Name	Owner	Level	No of in- Patients and outpatients
RWEBISENGO S/C	RWEBISENGO HCIII	Govt	HC III	4,641
KARUGUTU T/C	KARUGUTU HCIV	Govt	HC IV	7,881
KANARA T/C	NTOROKO HCIII	Govt	HCIII	11,464
KANARA S/C	RWANGARA HC II	Govt	HCII	28,775
BWERAMULE S/C	BWERAMULE HCII	Govt	HCII	3,192
NOMBE S/C	MUSANDAMA HC II	Govt	HC II	4,314
KANARA T/C	STELA MARIS	PRIVATE	HC II	4,015

Source: Ntoroko DDP

According to Ntoroko DDP, HIV/AIDS and the Most at Risk Populations (MARP) in Ntoroko have been identified as shown below:

- *Commercial Sex Workers,*
- *Boda-boda cyclists,*
- *Youth, in school*
- *Youth out of School*
- *Married couples*
- *House-maids*
- *Saloon and Barber shop workers*
- *Holiday makers/Vacationists*
- *Bar-maids,*
- *Fishing communities,*
- *Alcohol and substance abusers*
- *Commercial vehicle operators.*
- *Casual laborers e.g. road constructors*
- *Orphans and vulnerable Children*
- *Persons with disabilities (PWDs)*
- *Uniformed services (Police and Prisons)*
- *Health workers*
- *Mining communities*
- *Soldiers*
- *Cross Boarder Mobile Population (CBMP)*
- *Women and the girl child*

6.3.5.1.1 Access to health care

Most of the households 79.5% (47.5% and 32%) were within 2 Km reach to the health centers. The communities mainly use Karugutu HC IV which is accessed by 46% of the households, followed by Ntoroko HCIII at an access level of 40% and Stella Maris HCII in Kanara at 11.6%.

6.3.5.1.2 Common illnesses

The household survey revealed that the common illnesses are malaria (68%) and cough (46. 4%) in all communities but with more malaria cases in Kanara Town Council. Given the location of the communities at the shores of Lake Albert, this is expected. Therefore, the construction team should be prepared with mosquito repellants and treated mosquito nets. Other common illnesses in the communities include; TB, RTI/Cougs and STI. There are multiple chronic illnesses; the percentage incidence of chronic illnesses in Kanara was found at 46.7%, while that of Karugutu and Rwebisengo was 41.8%. This reveals some vulnerabilities to the population in the two communities, implying that the project should be mindful of the health safety measures such as controlling dust since there are chronically asthmatic cases in the population.

6.3.5.1.3 Reproductive health

Records at health facilities confirmed a high rate of teenage pregnancy in the project area. This trend raises serious concerns to the expected influx of workers when works begin. Number of births attended at health centres in the project area serves as an indicator for future monitoring and has hence been used for this report. The data in indicates that 442 (20.7%) of the 2130 mothers attended to at three health centres of Ntoroko District in 2016 were teenage mothers (aged 18 or less at time of conception).

6.3.5.1.4 HIV/AIDS

All the respondents (99 %) were aware of HIV/AIDS, how it was contracted and how it could be avoided. These perceptions need to be translated into realities in these communities, and should be monitored at different levels of the project.

Through focus group discussions and secondary data review from health centres and development plans of the town councils, the study found that the prevalent rate for HIV/AIDS was above 10%, which is above the average rate of the Mid-Western region (8.2%) according to Uganda AIDS Commission reports (UAC, 2024). Further, since the main livelihood activities of the communities involve fishing and long distance truck transportation to the landing site, where the lifestyle involves transactional sex activities among others, there is need to be cautious when the road works begin. This is because HIV/AIDS situation analysis in Uganda recorded higher HIV/AIDS prevalence in key populations such as sex workers (35-37%), fisher folk (22 – 29%), and long distance truck drivers (25%) (UAC et al. 2024). All the health centres in the project area reported similar high levels of patients who were under active ARVS/ART care. The focus group discussion in Kanara mentioned that "one would think that HIV/AIDS was manufactured here'. This situation further underscores the need for enforced use of camps for the external road construction team.

6.3.5.2 Education

Within Ntoroko District, persons aged 18 years and above who are illiterate account for 39.3% of which 30.7% are males. This high rate of illiteracy is attributed to immigrations, insecurity and lack of good learning environment in schools. The persons aged Persons aged between 6-15 and not attending school are 19.9%. This is a very worrying status for non-school going children. About 24.1% of the students fail to join Secondary school. They drop-out after Primary.

Schools were observed along the project road in Kanara Town Council, Rwebisengo TC and the team visited Ntoroko Primary School, Kanara Seed Secondary School –Ntoroko seed community based school, under Universal Secondary Education which was government aided and Brain Model Primary school, a private school in Kanara Town Council. The common challenge to all the schools visited was the high drop-out rate for both boys and girls, though that of the girls was more than the one for boys at the fishing Town Council. Another challenge was the state of the private schools' structures such as The Brain Model Primary School as compared to the neighboring government aided primary school.

Plate 6-10: One of the existing primary school towards Rwebisengo

6.3.6 Housing and settlements

A number of settlement patterns were observed in the project area and this varied on the road. Settlement patterns along the project corridor can generally be defined as dispersed; though towards Kanara town, it can be defined as nucleated.

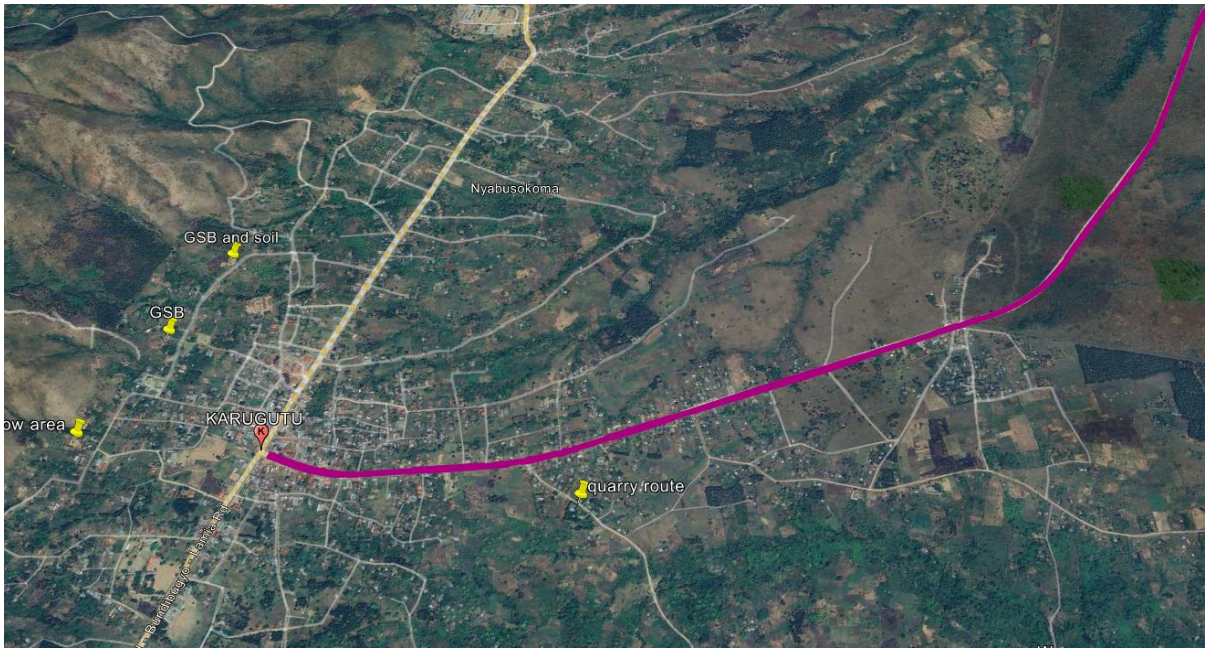


Figure 6-15: Linear settlements along the section between Karugutu to TSWR gate

Figure 6-16: Nucleated settlements in NTOROKO

The housing structures were dominated by permanent ones made of brick and mortar walls and roofed with iron sheets roof estimated at 61% within the project area. These grass thatched houses with walls made of mud and wattle were the second popular type of houses and those made of mud and wattle walls with iron roofs were the least popular. The mud and wattle houses were more common in Rwebisengo estimated at 59% compared to Kanara and Karugutu at a 16% occurrence.

Plate 6-11: A typical house structure in Rwebisengo

Plate 6-12: a Typical mud and wattle house structure in Kanara

Plate 6-13: Permanent structures within the project area

Plate 6-14: Shops made of mud and wattle in Kanara

6.3.7 Electricity and water

Households mainly rely on rudimentary sources of energy for lighting. The main sources of energy for lighting were hand held kerosene lamps locally known as tadooba and lanterns. It was noted that 43% of the household uses solar although this was relatively high in Karugutu at 58% as compared to Kanara and Rwebisengo were only 30% of all households surveyed. Solar doubled as energy source for small businesses like shops and bars (Figure 6-17).

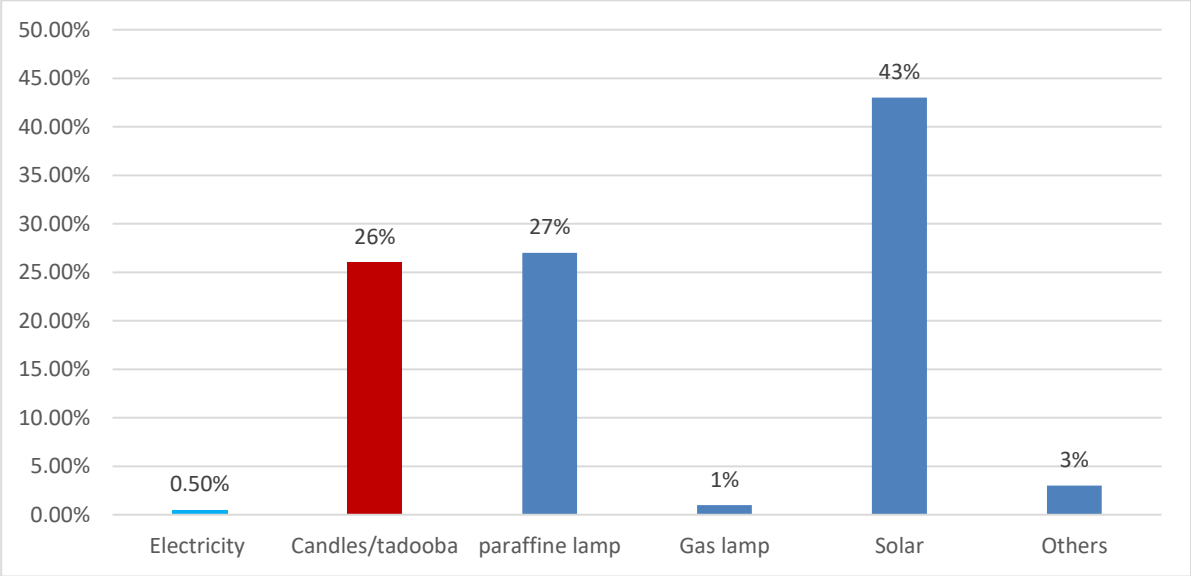


Figure 6-17: Main sources of energy among the households

Various water sources were recorded within the project area, through far away from the direct project foot print. Boreholes is the most reliable water source in Trading centres of Rwebisengo and Karugutu. In Kanara, most communities fetch water directly from the Lake. There is an established water reservoir at Rwebisengo, that supports the supply of piped water.

Plate 6-15: The only water reservoir in Rwebisengo T/C

6.3.8 Gender analysis

A gender analysis of Ntoroko District, would likely reveal significant gender inequalities, particularly in areas like access to education, healthcare, economic opportunities, land ownership, and decision-making power, with women generally facing more constraints than men due to entrenched cultural norms and power dynamics; studies have highlighted projects focusing on improving women's participation in agriculture and economic activities within the district as a key area of focus.

No.	Gender aspect	Narrative
1	Agriculture	Women in Ntoroko District play a crucial role in subsistence farming, but may face limitations in accessing land ownership, credit, and training, impacting their overall economic empowerment
2	Education	While access to primary education may be relatively equal, girls might drop out at higher levels due to early marriage, household chores, and societal expectation
3	Health	Maternal mortality rates could be high due to limited access to quality healthcare services, particularly in remote areas, and cultural practices surrounding childbirth
4	Decision-making	Women may have limited participation in household and community decision-making processes, impacting their ability to influence issues affecting their lives
5	Gender-based violence	Prevalence of domestic violence and sexual assault against women could be a significant concern, often underreported due to stigma
6	Cultural norms	There are deep-rooted patriarchal beliefs that limit women's roles and opportunities including; • Women's limited access to income-generating activities and control over finances; • Unequal distribution of resources like land, water, and healthcare between genders.; • Low representation of women in local leadership positions;

Potential interventions based on a gender analysis of Ntoroko District include;

i) Community awareness campaigns that Promote gender equality and challenging harmful cultural norms;
ii) Empowering women through skills training in areas like agriculture, business development, and leadership;
iii) Enhancing reproductive health services and addressing gender-specific health needs.

6.4 Physical cultural resources: Paleontology, Archeology & Living Cultural

6.4.1 Paleontology

Potential paleontological deposits were identified in the project area at Kakara but no fossils identified. It's however anticipated that the road project may expose some fossils which would otherwise be exposed by erosion. As indicated in the management plan, a paleontologist should be available at the groundbreaking stage to ensure good record of any cultural heritage material Additionally, in Karugutu sub-county, Ntoroko district on GPS coordinates 36N 0206429 UTM 0103580 within the RoW. There is a site that provided some sediment common to other fossil sites in the country. It is in the RoW but no significant fossils were identified. This site was documented after opening up the existing road and so researchers were able to see the site. It's recommended that paleontologists conduct a pre-impact mitigation assessment for the area at the commencement of the project.

Plate 6-16: Exposure of potential fossil bearing deposits at Kakara in the RoW

6.4.2 Archaeological features

Archeological sites and materials do exist in the project area. Decorated and undecorated potsherds were scattered within TSWR. Stone tools were also recorded and collected for further analysis. All the materials were taken to the Uganda Museums and Monuments laboratory for further analysis. A test pit was conducted in one of the surveyed areas for further investigations but detailed study and excavations have been recommended in areas with enormous concentration of artifacts. Details of the test pit and other discoveries are discussed below.

6.4.2.1 Posherds at Kisenyi B Village

The potsherds are located in Kisenyi B Village, Kanara town Council, Ntoroko district on GPS coordinates 36N 0226343 UTM 0116853 out of the RoW. It was undecorated, in fragile form of a body and rim. Basing on the rim and the body size, the vessel was an open mouthed bowl tempered with sand possibly used for serving which indicates earlier human settlement in the area.


Plate 6-17: Un decorated potsherd in situ at Kisenyi B Village

6.4.2.2 Kakara archaeological site

This site is located in Kakara village in the RoW and it covers a big area on both sides of the road. On this site are scatters of lithic artefacts and potsherds. The first point had both decorated and undecorated pottery, stone tools of LSA period made out of clear quartz at GPS coordinates 36N 0196367 UTM 0091439. Pottery analysis revealed that vessels were tempered by both sand and grog; the decorated one had twisted roulette with a slightly inverted rim. Others were simply smoothed during manufacturing and have slightly oxidized outer surface due to firing processes. Stone tools recovered are microlithic a characteristic of LSA tools. The second point located on the opposite side of the road at GPS coordinates 36N 0196355 UTM 0091378 had undecorated potsherds, lithic raw materials of quartzite, smoky quart. All were flakes and no scrapers or tools seen. A full systematic excavation is recommended at this site. Other artefacts collected on the site included a pre-fossilized bone (rib).

hammer

Roulette decorated pottery

Chert flake

Roulette decorated pottery

core scrapper

flakes with pre –fossilized bone

6.4.2.3 Significance of archaeological sites

Chert, and smoky quartz flakes indicate interactions between communities since these two raw materials are not found within the area and were possibly brought to the area. Therefore, the association of stone tools, pottery and a pre-fossilised bone indicated past human settlement and hunting as part of their subsistence.

6.4.2.4 Test pit at Kakara

The test pit was set at Kakara village, Karugutu Sub County; Ntoroko district on GPS coordinates 36N 0196998 UTM 0093295 in the RoW. It was a 1X1m test pit with three levels each 10cm deep. Undecorated potsherds were collected from the surface, first and second levels. No artefacts were recovered from the third level. This implies that communities who lived in this place might be of the 20th century AD.

Plate 6-18: Test pit conducted in the road reserve

6.4.2.4.1 Analysis of finds

Test pits were to be conducted in areas that had scatters of archeological material on the surface for detailed investigations. Fortunately, all the identified places had a concentration of archeological material therefore a full systematic excavation is recommended. In that regard only one test pit was conducted at Kakara area yielding undecorated pottery. See table 6-16. Surface collection from other parts included pottery and lithic artifacts that indicate LSA habitation as described by Posnansky, 1975.

Significance: The pottery collected from this area indicated the late Iron Age habitation. Meaning the human settlement and interaction of this place is what could be considered recent but archiving the history of the area is worthy for preservation.

Table 6-22 : Analysis of surface and excavated materials

Site Name	Provenance		Pottery		Bones	Lithics		
			Decorated	Non-Decorated		Core scrappers	Flakes	Hammer
Nyabiligali	Surface		0	0	0	0	4	0
Kakara 1	Surface		1	4	2	0	1	1
Kakara 2	Surface		0	2	1	1	8	0
Kisenyi B	Surface		0	1	0	0	0	0
Wasa	Surface		21	4	0	0	1	0
Kakara/Test pit	Excavation	Surface	0	2	0	0	0	0
		Level 1	0	2	0	0	0	0
		Level 2	0	3	0	0	0	0
		Level 3	0	0	0	0	0	0

a) Nyabigali lithic site

This site is located in Nyabigali village; Karugutu sub County, Ntoroko district on GPS coordinates 36N 0202392 UTM 0100842. Flakes of quartz and quartzite were collected from this site for further analysis.

Plate 6-19: Lithic artefacts (flakes), Nyabigali village, Karugutu sub county.

b) Pottery at Wasa River

This site is close to Wasa River in Karugutu Sub County, Ntoroko district on GPS coordinates 36N 0206495 UTM 0103578 within the RoW. The site produced scatters of bones and potsherds both decorated and undecorated. Oral traditions have it that this was a hunting area for the King of Toro and used to roast meat on this site which is close the river (Wasa). According to Omusaga Charles Kamurasi, the head of the royal clan leaders in Toro kingdom, this area and the wildlife reserve in general was a hunting area for the kings of Toro. Historically it was used by Omukama Kasagama Daudi Ikingura IV (1891-1928) together with his son Sir George Lukidi III who later reigned from (1929-1965). Numerous scatters of pottery are also found at the banks of this river at GPS coordinates 36N 0206551 UTM 0103616. Most of them have decorations while others are undecorated. Samples were collected for further investigation. Analysis of the findings indicated that this site is rich in animal bones and pottery making involved use of coils, and grog as temper Decorated pottery included; roulette, horizontal grooves on rims and red burnished.

Plate 6-20: Roulette decorated Pottery at Wasa River

6.4.3 Living culture

Living cultural sites were identified in the project area and only one out of the Row. Interview with the local community revealed that both sites are in RoW of the project area. It's therefore advised to put attention to the management plan as per this report.

6.4.3.1.1 Burial site in Kigungu

This was a burial ground for the Kanara community members but was later demarcated off by UWA. Various graves exist at this point and some are marked by Jatropha Carcustrees and other tree species. Part of the site is in the RoW in Kigungu North village on GPS coordinates 36 N 0226176 UTM 0116408. According to Mr. Lubega Ntumwa Isaac, parish internal security officer (PISO) of Kanara parish council who has been in the area since 1989, the area was a community cemetery and marked off by UWA since it was a game reserve land, the people were advised to bury the dead in Kanara area. The burial ground is approximately 200m X 150m in the RoW.

Plate 6-21: Burial site at Kigungu

6.4.3.1.2 Graves at Kisenyi B

This is located in Kisenyi B, Kanara town council, Ntoroko fishing community. It can be traced on GPS coordinates 36N 0226210 UTM 0116726, these graves are in the RoW at 11m from the middle of the existing road and 4m from the access road to the town council headquarters. According to Mr. Kyalimpa Wilson who has been in this area since 1983, these two graves are of his grandmother Kabatooro Lavin who died in 2000 and his granddaughter Kobusinge Alice. The graves can be relocated on condition that a new burial site is identified and all the cultural procedures for the relocation are followed which includes buying a cow to sacrifice among others. Mr. Kyalimpa should be contacted on +256 784 994 476 before the relocation is done.

Plate 6-22: Graves at Kisenyi B

Significance:

The dead in the African culture are to be respected and human remains are supposed to be kept scared. Therefore, these places are significantly important and are to be treated with great respect. In the event of construction, relocation procedures as per the house head or local leaders should be followed.

6.4.3.1.3 Black Smithing, Karugutu town council

This is site located in Karugutu town council, Ntoroko district out of the RoW (35m from the existing road) at GPS coordinates 36N 0193696 UTM 0087859. At this site, instead of using the iron ore, scrap metals are used but with closely similar technology as the early iron smelter.

Plate 6-23: Tuyeres used for black Smithing out of the RoW

Significance:

The history of iron smelting which is now replaced by blacksmithing is a direct evidence of civilization and technological development. This technology put the neighboring great Bunyoro Kingdom powerful as an economic policy. Unfortunately, this skill is disappearing and so recording it along the project calls for preservation of the site on which the practice takes place.

6.4.4 Historical Monuments/buildings

This route was used by sir Apollo Kivebulaya (c. 1864 - 30 May 1933) as he crossed from Democratic republic of Congo to Fort portal across Rwenzori ranges. It is located on GPS coordinates 36N 0193730 UTM 0087896 within the RoW crossing the proposed project road. According to oral history Apollo Kivebulaya a Muganda and also the apostle to the "pygmies" was on many occasions seen crossing this point passing through the hills to and from Uganda and Congo.

Significance:

Sir Apollo Kivebulaya was a Ugandan priest and evangelist referred to as the apostle to the "pygmies". He is historically remembered for his work in Toro and the Bambuti people of Ituri forest in Eastern Congo. He also played a great role through preaching, teaching, praying, church planting and training of evangelists between 1895 when he was baptized and 1933 when he died

6.5 Systematic review of Ecosystem Services

Assessing ecosystem services involves identifying, valuing, and managing the benefits that people derive from nature that may be affected by the project; and ensuring the project complies with IFC Performance Standard 6 (PS6): Biodiversity Conservation and Sustainable Management of Living Natural Resources, Especially paragraphs 24–28 on Ecosystem Services.

6.5.1 Screening for Ecosystem Services

The ecosystem services that are relevant to the project area include;

i) Provisioning services;
ii) Regulating services; and
iii) Cultural services;

Toro Semliki Wildlife Reserve provides numerous ecosystem services, including supporting biodiversity, regulating water flow, and contributing to carbon sequestration. These services are crucial for both the ecological health of the region and the well-being of the local communities.

a) Biodiversity Conservation
The reserve is a haven for various species, including elephants, buffalo, Uganda kob, and numerous bird species. It also plays a vital role in protecting the unique Albertine Rift ecosystem, according to Arcadia Safaris.

b) Water Regulation
The reserve's wetlands and riparian woodlands help regulate water flow, mitigating floods and ensuring a consistent water supply for both wildlife and human populations

c) Carbon Sequestration
The diverse vegetation, including forests and savannas, contributes to carbon storage, helping to mitigate climate change.

d) Recreation and Tourism
The reserve's scenic beauty and abundant wildlife attract tourists, generating revenue for local communities and supporting conservation efforts.

e) Cultural and Spiritual Values
The reserve holds cultural and spiritual significance for local communities, who often have traditional uses for its resources and sacred sites within its boundaries.

f) Food and Resources
The reserve provides resources like firewood, medicinal plants, and potential hunting grounds (for licensed hunters) for local communities.

6.5.2 Stakeholder Engagements on Ecosystem services

Local communities play a crucial role in the conservation of Toro Semliki Wildlife Reserve. Through community-based tourism initiatives, such as guided walks and cultural performances, they benefit directly from the reserve's existence while also contributing to its protection. These initiatives also encourage sustainable resource management practices among the local population.

Despite the numerous benefits, Toro Semliki Wildlife Reserve faces challenges such as habitat loss, poaching, and human-wildlife conflict. Uganda Wildlife Authority (UWA) is actively working to address these challenges through increased surveillance, habitat restoration, and community engagement.

6.5.3 Priority ecosystems within the project foot print

Table 6-23: Assessment of priority ecosystems within the project foot print

No.	Source ecosystem	Quantity/quality	Beneficiaries	Current threats
1	Rivers and streams	River wasa is permanent, multiple streams are seasonal	***Communities*** use water for domestic and industrial	Siltation, water pollution
2	Wetlands	Most wetlands are seasonal, flood plains exist	***Communities*** Used for flood control, erosion regulation, climate regulation, water purification	Floods, conversion into agricultural fields
3	Forests and savannas	Toro Semiliki Wildlife Reserve	***Communities*** Provides like firewood, medicinal plants, grazing grounds contributes to carbon storage, helping to mitigate climate change.	Floods, conversion into agricultural fields
4	Sacred sites	The enire TSWR is considered a sacred site by some members of the community	**Local communities** reserve holds cultural and spiritual significance for local communities	None; beside the spread of christinity that considers the spiritual briefs demonic
5	Lake Albert	At Kanara, and Ntoroko	**Local communities** Fishing activities	Over fishing, water pollution

The project will not interrupt provision of any ecosystem services within the project area and beyond.

7.0 CRITICAL HABITAT ANALYSIS

7.0 CRITICAL HABITAT ANALYSIS

The project area rhymes along Toro Semuliki Wildlife Reserve, a protected area within the Albertine Rift. Gazetted as Toro Game Reserve in 1929 by General Notice 546 and since that time renamed and consolidated several times, thus 548km2 conservation area is now called Toro-Semliki Wildlife Reserve (TSWR). The TSWR was originally gazetted to protect the large population of Uganda Kob (Lamprey and Michel more, 1996). The TSWR is made up of principally of the relatively flat Rift floor, but its eastern boundary runs along the top rift escarpment, thus including the eastern escarpment in the reserve. TSWR is a critical habitat for Biodiversity.

The International Finance Corporation (IFC) requires an assessment of environmental and social risks using eight Performance Standards. Performance Standard 6 (PS6; IFC 2012a) and the associated Guidance Note 6 (GN6; IFC 2012b) focus on the protection and conservation of biodiversity. In most cases, the required conservation outcome under PS6 is **no-net-loss of biodiversity value** achieved using the "**like-for-like**" or better principle of biodiversity offsets.

However, when a project occurs in critical habitat (CH) supporting exceptional biodiversity value, a net gain in biodiversity value is required. CH identification is required by PS6 to manage risks and avoid, mitigate, and offset impacts to areas with high biodiversity value including: 1) habitat of significant importance to Critically Endangered (CR) and/or Endangered (EN) species; 2) habitat of significant importance to endemic and/or restricted-range species; 3) habitat supporting significant global concentrations of migratory species and/or congregatory species; 4) highly threatened and/or unique ecosystems; and/or 5) areas associated with key evolutionary processes.

CH exists independent of a project and can be identified without reference to a project; a project may be proposed in CH, but the CH is present under baseline conditions and is not defined by the size of the project footprint, or other project effects.

7.1 Critical and Natural habitat cover

7.1.1 Critical vegetation habitats along the project corridor

The proposed road upgrade between Karugutu (0+000) and Rwebisengo Junction (26+700) follows mostly the existing road foot print. There will be some vegetation clearance to achieve the design considerations within the allowable and mitigatable limits. However, the section between Rwebisengo Junction and 49+100 towards Kanara follows mostly a greenfield.

An estimated area coverage of **115 Hectares** will be cleared of vegetation to create space for construction and workspace. This will lead to clearance of bushlands, savannah grasslands and woodlands. Additionally, there will be alternation of the seasonally flooded areas. The loss of vegetation cover of this magnitude is significant and triggers a **biodiversity offset**. Fortunately, most of the vegetation within the sampled plots a lot the corridor is of Least Concern (LC).

Table 7-1: Land Cover and habitat importance along the project Corridor

No.	Habitat/ Description	Importance	Specific location
1	**Tropical High Forests** Tropical high forests are therefore the least expected to be found in this place. They however occur due to deep gorges in the reserve and are drained by more or less permanent rivers. The Karugutu-Ntoroko project corridor doesn't have significant sections of Tropical High Forest besides where it crosses River Wasa.	**Primary Chimpanzee Habitat** There are habitats qualified as CH due to the presence of Chimpanzees, and their potential home-range within TSWR. These are areas along the Riverine forest of Wasa River. Within the project foot-print, chimpanzees are found in Nyaburogo gorge, though a little away from the proposed project corridor.	Chimpanzees are known to have wide home ranges and are like to interface with the project, during the project life time. The section along Kakara-Junction to Rwebisengo-Park boundary is therefore considered a critical habitat section
2	**Wetlands** Seasonal wetlands were encountered along the project corridor. Permanent wetlands are found along Lake Albert in Ntoroko/Kanara. Here the wetlands are dominated by Cyperus spp, Typha spp, and other sedges. The edge of the wetland—between land and wetland—is dynamic depending on the level of water in Lake Albert.	Most animals within TSWR utilize wetlands for their survival and breeding.	Wetlands occur mostly along rivers in the flat terrains; as the rivers drain the reserve flow into Lake Albert, their course becomes less distinct. They form meanders and pools that become large during rainy seasons.
3	**Woodlands** They are more concentrated in the southwestern part of the reserve, where terrain is more ragged, and in plains and gorges. Woodlands are characterized by single-story canopy structure unlike the multi-layered canopy of Tropical High Forests.	Most woodlands are elephant habitat, All large mamamls range within woodlands.	The Karugutu-Ntoroko project corridor interacts with woodland, along a green field between Chainage 26+600 and 49+000.
4	**Grasslands** Grasslands generally occur in the west, north, and eastern parts of the reserve and are interspersed with strips and patches of woodlands, creating a mosaic that provides food and shelter to wildlife. Grasslands in the reserve are dominated by Hyparrhenia spp, which provides good pasture to grazers. In the Semliki flats outside the reserve, the unpalatable Sporobolus grass is abundant.	Provide grazing grounds for the herbivoures	Grasslands are scattered over the project foot print
5	**Bushlands** This is a land cover type dominated by thickets and shrubs.	Provide grazing grounds for the herbivoures, breeding sites for birds among others	It is scattered in many parts of the reserve but it is most prominent in the northeast near and along the shores of Lake Albert.

7.1.1.1 Estimation of vegetation cover

Table 7-2:Area (Hectares) Covered by respective Land Cover Class

No.	Habitat/ Description	Area within the TSWR (in Hectares)	Area within the Project foot print (in Hectares)
	Total area covered	**54,200**	**323.5**
1	Unclassifed	143.88	0.85
2	Tropical High Forests	1,514.52	1.03
3	Wetlands	5,299.66	31.63
4	Woodlands	24,483.88	146.14
5	Grasslands	23,943.21	142.91
6	Bushlands	3,793.56	22.64
7	Built-up areas	8.28	0.05

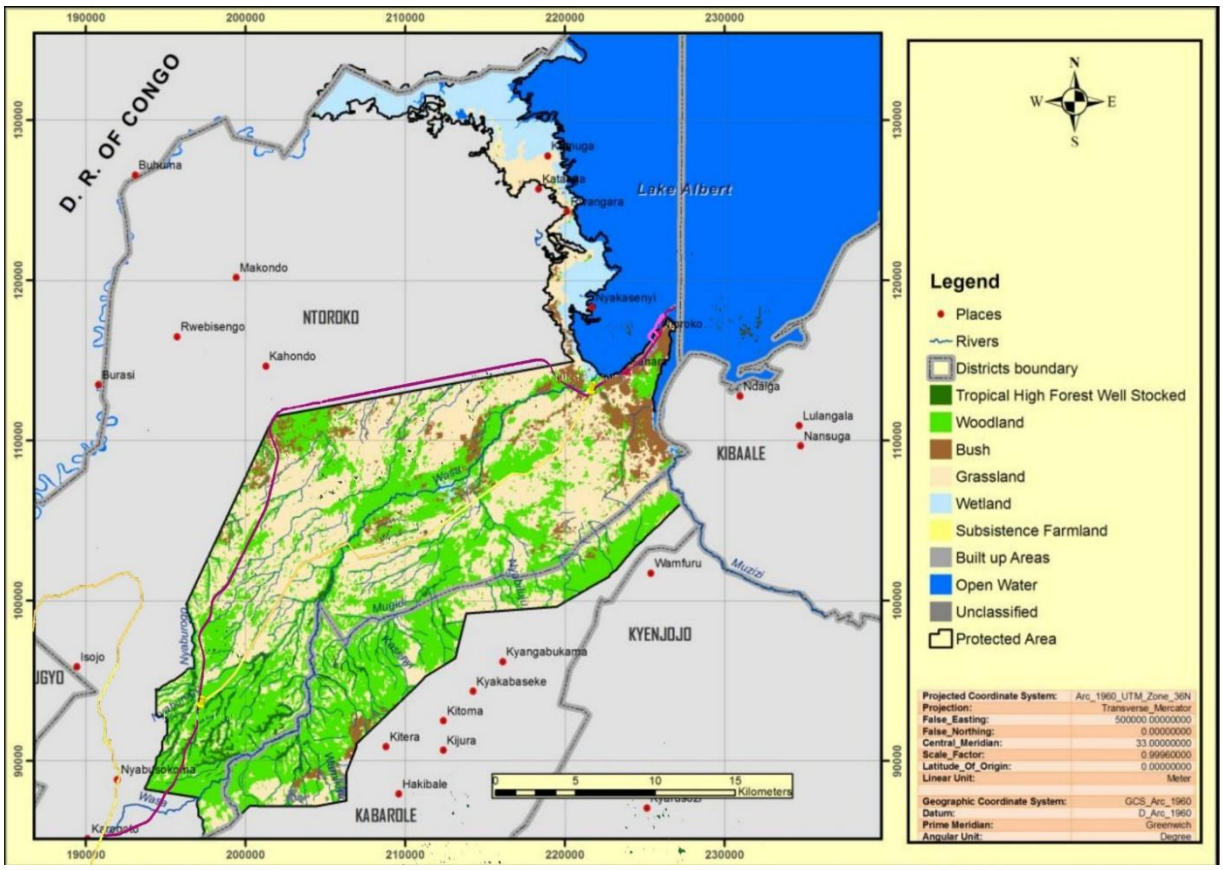


Figure 7-1: Land cover map for TSWR, relative to the project

7.2 Potential Critical Habitat-qualifying biodiversity

Critical Habitat (CH) identification is required by PS6 to manage risks and avoid, mitigate, and offset impacts to areas with high biodiversity value including:

i) habitat of significant importance to Critically Endangered (CR) and/or Endangered (EN) species;
ii) habitat of significant importance to endemic and/or restricted-range species;
iii) habitat supporting significant global concentrations of migratory species and/or congregatory species;

iv) highly threatened and/or unique ecosystems; and/or
v) areas associated with key evolutionary processes.

CH designation is based on the presence and/or quantity of significant types of biodiversity (e.g., threatened species, highly threatened ecosystems) and is independent of the condition of the habitat. The criteria to determine CH are summarized in Table 7-3. In addition, IFC PS6 gives special attention to certain internationally recognized areas of high biodiversity value.

Table 7-3: IFC PS6 Critical Habitat criteria.

Criteria	Nature of thresholds	Units
Criterion 1 (C1): Critically Endangered and Endangered species	Quantitative	Percentages of global and national population sizes combined with – whenever available - minimum numbers of reproductive units
Criterion 2 (C2): Restricted-range species		
Criterion 3 (C3): Migratory/ congregatory species		
Criterion 4 (C4): Highly threatened and/or unique ecosystems		Percentage of global extent
Criterion 5 (C5): Key Evolutionary Processes	Qualitative	Presence of landscapes with high spatial heterogeneity, environmental gradients and features of demonstrated importance to climate change adaptation

A separate CHA and the priority species identified in Table 7-4 are based on the Biodiversity assessment and numerous studies within the project area. Chimpanzees in particular were identified within the project landscape hence qualify as CH.

Table 7-4: Species assessed as qualifying for Critical Habitat

Taxa	Scientific name	Common Name	IUCN Cat	CH criteria	Presence in the Landscape
Mammals	*Pan troglodytes schweinfurthii*	Chimpanzee	EN	C1, C2, C4	Comfirmed by UWA, in Nyaburongo valley which is about an average of 0.54km from the project corridothough not recorded during the surveys
Birds	*Polemaetus bellicosus*	Martial Eagle	NT	C4	Comfirmed, recorded in flight
	Gyps africanus	White-backed Vulture	NT	C4	Comfirmed was recorded with eight individuals on a kob carcass in the open grassland.
	Balaeniceps rex	Shoebill	VU		There were no Shoebill sightings along the project foot print. Most of the wetlands are seasonally and quickly drained of the water. However, community members reported sightings in some of the wetlands in Kanara. This implies a precaution principle will be applied to ensure the integrity of the wetlands around Lake Albert.
	Balearica regulorum	Grey Crowned Crane	EN	C1	known to occur in the Reserve but were not recorded during all surveys.

7.2.1 Species of stakeholder concern

A list of potential species of stakeholder concern was compiled from those species with confirmed, or assumed likely presence within the project area. These include;

i) Classified by IUCN as CR/EN/VU (that had not triggered CH);
ii) Listed as CR/EN/VU in national red lists;
iii) With cultural/economic or other interest and that have been flagged by stakeholders.

Table 7-5: Priority species of stakeholder concern.

No.	FAMILY	SPECIES	ENGLISH NAME	ORDER	IUCN Status
Mammals					
1	Proboscidea	*Loxodonta africana*	African Elephant	Proboscidea	VU
2	Bovidae	*Kobus ellipsiprymnus*	Defassa waterbuck	Artiodactyla	NT
3	Bovidae	*Syncerus caffer*	African Buffalo	Artiodactyla	NT
4	Hippopotamidae	*Hippopotamus amphibius*	Hippopotamus	Artiodactyla	VU
Reptiles					
1	Crocodylidae	*Crocodylus niloticus*	Nile Crocodile	Sauria	VU
Plants					
1	Fabaceae	*Albizia coriaria*		Fabales	Nationally Protected Medicinal trees used by communities
2	Fabaceae	*Tamarindus indica*		Fabales	
3	Fabaceae	*Cynometra Alexandria*		Fabales	
4	Bignoniaceae	*Kigelia africana*		Lamiales	

7.2.2 Species highly vulnerable to poaching

Some animals have higher susceptibility to poaching or any human-induced fatalities and may have a greater population-level effect due to their small population sizes or slow reproductive rates. Almost all large mammals within TSWR are susceptible to poaching for their meat, skin or any other body parts. The proposed upgrade of Toro Semuliki Wildlife Reserve is likely to opportune multiple poaching avenues.

Table 7-6: Species highly vulnerable to poaching

No.	FAMILY	SPECIES	ENGLISH NAME	ORDER	IUCN Status
1	Cercopithecidae	*Colobus guereza*	Guereza colobus	Primate	LC
2	Proboscidea	*Loxodonta africana*	African Elephant	Proboscidea	VU
3	Tubulidentidae	*Orycteropus afer*	Aardvark	Tubulidentata	
4	Bovidae	*Kobus ellipsiprymnus*	Defassa waterbuck	Artiodactyla	NT
5	Bovidae	*Kobus kob*	Uganda Kob	Artiodactyla	LC
6	Bovidae	*Syncerus caffer*	African Buffalo	Artiodactyla	NT
7	Bovidae	*Tragelaphus scriptus*	Bushbuck	Artiodactyla	LC
8	Hippopotamidae	*Hippopotamus amphibius*	Hippopotamus	Artiodactyla	VU
9	Suidae	*Phacochoerus africanus*	Warthog	Artiodactyla	LC
10	Suidae	*Potamochoerus larvatus*	Bush pig	Artiodactyla	LC

7.3 Conservation Values of TSWR

TSWR is located in an area of geographical, geological, and ecological value, which is a main reason for having high conservation values (HCV). TSWR contains the unique dry habitat Chimpanzees, and has the forest elephant subspecies that live in savannah ecosystems. Additionally, the TSWR is a home to the shoebill stork, a globally threatened species categorized as Vulnerable by the International Union for Conservation of Nature [IUCN] National Redlist, 2025; lies within the global flyway for migratory (Palearctic) birds; and is one of the 34 Important Bird Areas (IBAs) of Uganda.

The TSWR has a spectacular scenic beauty, contains high and unique biodiversity with a range of habitat diversity, and lies at the Sudanian ―regional center of endemism‖ and in the proximity of the Guinea-Congolian regional center of endemism found in Semliki National Park (UWA, 2021).

Table 7-7: Conservation status of important species

No.	Species	Uniqness	IUCN status
1	Chimpanzees	Unique Dryland chimpanzees	EN
2	Elephants	forest elephant subspecies that live in savannah ecosystems	EN
3	shoebill stork	a globally threatened species	VU

7.4 TSWR location relative to nearest protected areas

7.4.1 Rwenzori National Park

The TSWR takes up most of the western Great Rift Valley floor between the Rwenzori Mountains and Lake Albert, two of the geographically, geologically, and ecologically unique features that surround the reserve (Hunt, 2016). It is bordered in the north by the Rwangara Community Wildlife Area and the Semliki Flats formally a Controlled Hunting Area (CHA).

The Ntoroko-Kanara Wildlife Sanctuary borders the northeastern tip of the reserve, adjoining Lake Albert. The top of the Rift Valley escarpment forms the eastern boundary. The Rwenzori Mountains foothills lie to the south of the reserve. By distance, TSWR is about 52.8 km from Rwenzori Mountains. Rwenzori Mountains National Park is a UNESCO World Heritage Site located in the Rwenzori Mountains. Almost 1,000 km2 (386 sq mi) in size, the park has Africa's third highest mountain peak and many waterfalls, lakes, and glaciers. The park is known for its beautiful plant life. Rwenzori Mountains National Park was established in 1991. It was designated a UNESCO World Heritage Site in 1994 because of its outstanding natural beauty. Rebel militias occupied the Rwenzori Mountains from 1997 to June 200. The park was inscribed on UNESCO's List of World Heritage in Danger between 1999 and 2004 because of insecurity and a lack of resources in the park.

The Karugutu-Ntoroko Road Project has no direct and indirect impacts on the Rwenzori National Park by virtue of its location. The project is located far below the mountain, in the Rift valley. However, the precautionary principle is necessary to protect regionally migrating species especially the Birds, flying mammals and insects, though not much of these were recorded during the biodiversity assessments.

7.4.2 Semuliki National Park

Semuliki National Park is a national park in Bwamba County, a remote part of the Bundibugyo District in the Western Region of Uganda that was established in October 1993. It encompasses 219 km2 (85

sq mi) of East Africa's only lowland tropical rainforest. It is one of the richest areas of floral and faunal biodiversity in Africa, with bird and butterfly species being especially diverse.

The park is managed by the Uganda Wildlife Authority. The area of Semuliki National Park is a distinct ecosystem within the larger Albertine Rift ecosystem. The park is located at the junction of several climatic and ecological zones, and as a result has a high diversity of plant and animal species and many microhabitats. Most of the plant and animal species in the park are also found in the Congo Basin forests, with many of these species reaching the eastern limit of their range in Semuliki National Park.

The vegetation of the park is predominantly medium altitude moist evergreen to semi deciduous forest. The Semuliki National Park is closely associated with TSWR, Separated by a direct distance of less than 40km. The two protected areas share some of the ecosystems within the River Semuliki Catchment area.

7.4.3 River Semliki

Semliki River is a major river, 140 kilometers (87 mi) long, in the Democratic Republic of the Congo (DRC) and Uganda. It flows north from Lake Edward in Beni Territory, Nord-Kivu, D.R.C avoiding the Rwenzori Mountains on its Right (East), emptying into Lake Albert in the Albertine Rift, Irumu Territory, Ituri Province, D.R.C overlooking the Blue Mountains to its left in the west. Its mouth is near the Village of Katolingo in Kanara sub-county, Ntoroko district, Uganda. Along its lower reaches, it meanders extensively forming part of the international border between the DRC and the western Ugandan districts of Bundibugyo and Ntoroko, near the Semuliki National Park. The project lies within Semuliki River catchment.

Figure 7-2: Location of TSWR relative to Mt. Rwenzori National Park; River semuliki, and Semuliki National Park(Source: UWA, 2025)

7.4.3.1 Critical vegetation habitats along the project corridor

The proposed road upgrade between Karugutu (0+000) and Rwebisengo Junction (26+700) follows mostly the existing road foot print. There will be some vegetation clearance to achieve the design considerations within the allowable and mitigatable limits. However, the section between Rwebisengo Junction and 49+100 towards Kanara follows mostly a greenfield.

An estimated area coverage of **115 Hectares** will be cleared of vegetation to create space for construction and workspace. This will lead to clearance of bushlands, savannah grasslands and woodlands. Additionally, there will be alternation of the seasonally flooded areas. The loss of vegetation cover of this magnitude is significant and triggers a **biodiversity offset**. Fortunately, all the vegetation within the sampled plots a lot the corridor is of Least Concern (LC).

7.4.3.1.1 Biodiversity mitigations

The mitigation measures adopted by the Project will follow the mitigation hierarchy: avoid, minimise, restore, and compensate/offset (Figure 7-3). Avoidance entails 'designing out' an impact or risk

(e.g., through relocating a project component, avoiding a harmful activity, employing alternative technology), preventing their expected impacts on biodiversity. Minimization reduces the severity of impacts on biodiversity by controlling or limiting the source of that impact.

Such actions reduce the likelihood or magnitude of biodiversity impacts, but do not completely prevent them. Restoration seeks to recreate the original (pre-project) habitat type or to actively enhance the rate of recovery of degraded habitats on the actual Project site, with a focus on areas affected temporarily during construction. Where significant residual impacts remain, compensation/offset actions to achieve an overall NNL for NH, where feasible, and NG for CH qualifying features will need to be developed.

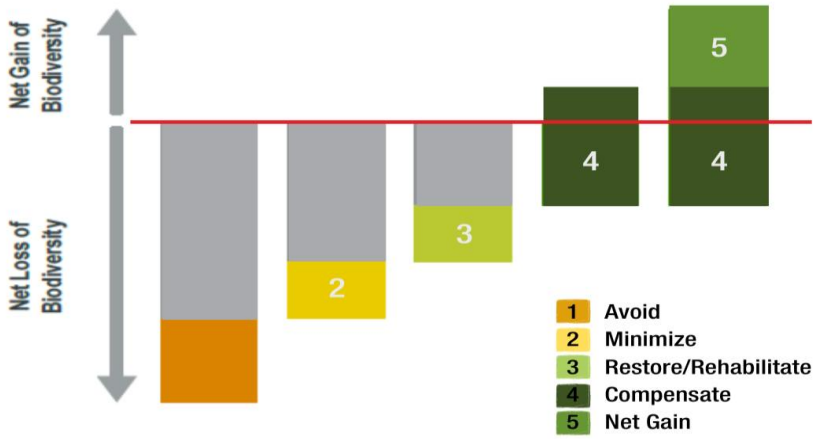


Figure 7-3: The Mitigation Hierarchy and delivery of net positive impact on biodiversity.

A range of good-practice mitigation actions were included in the Biodiversity Action Plan, attached as annex. The mitigation actions are summarized as:

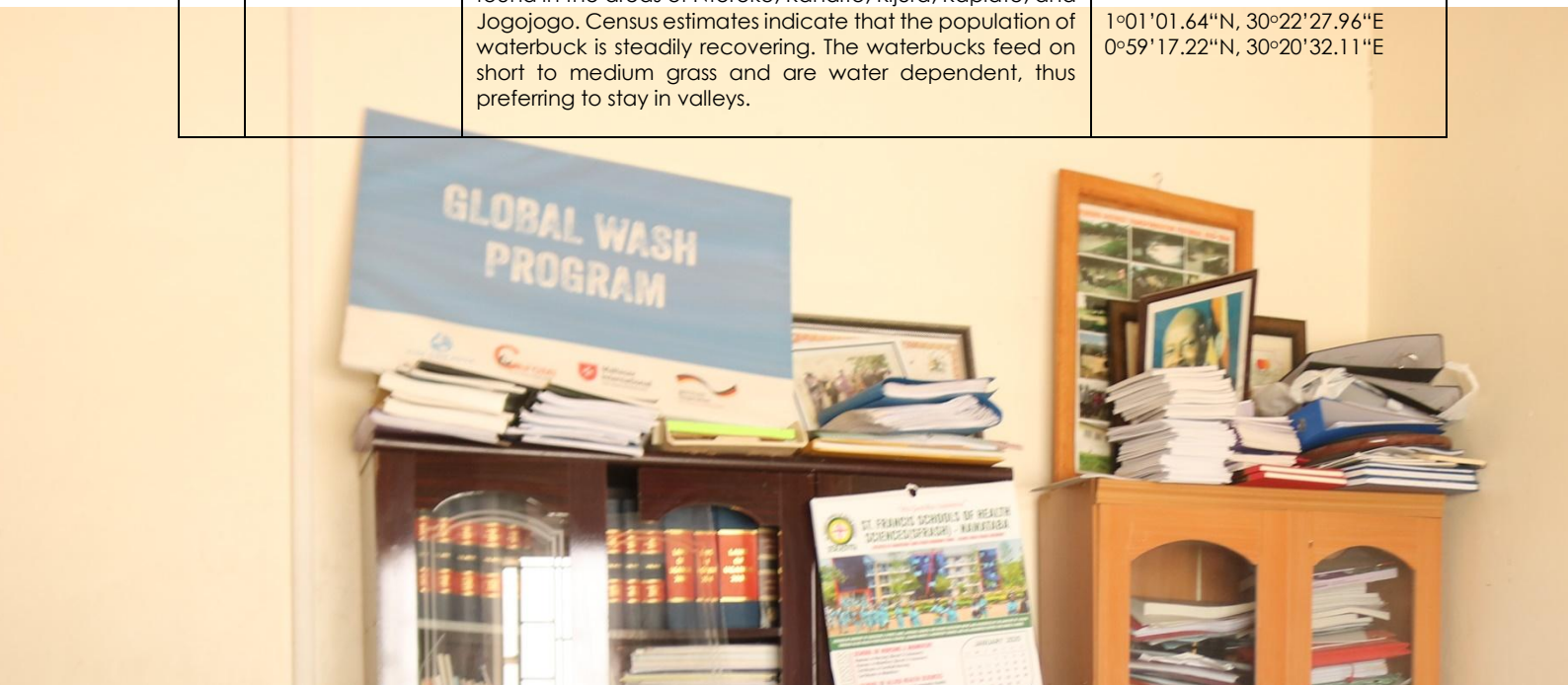
i) In the ESIA, four alternatives were originally considered with the selected option considered as having the lowest biodiversity impact.
ii) High sensitive biodiversity sites were identified (being in the middle of TSWR), **avoidance** measures were taken, and located the proposed road on the boundary with communities;
iii) Most actions are focused on impact **minimization** through reduction of the Right of Way; controls on clearance or degradation of vegetation and disturbance of fauna;
iv) **Restoration** of habitats using native species is required as soon as possible following the end of impacts;
v) A restoration **Offset** is proposed to cater for the greenfield that will be opened up along the boundary of TSWR, however compensation actions to address this issues will be concluded between UWA & MoWT.

7.4.4 Distribution of Key Large Mammal Species Relative to the project alignment

No.	Species	Distribution within TSWR (extracted from the senstivity atlas of TSWR)	Interaction with the Karugutu-Ntoroko Road
1	Elephants (*Loxodonta Africana*)	The elephants were mainly spread in the central area of the reserve along the riverine forest in the areas of Makondo, Nyamabare, Kacwankumu, Wango, Kandito, Mugiri Jogojogo, and the SSL. This number could be an undercount (Wanyama, 2010), since all herds encountered were in the riverine forest. There is a possibility that elephants were under the forest canopies	During the surevys, signs of elephants interarction with the proposed alrighnment were encountered, through feacal dropping, Broken trees. At points; 1◦0018.97"N, 30◦20'46.60"E

No.	Species	Distribution within TSWR (extracted from the senstivity atlas of TSWR)	Interaction with the Karugutu-Ntoroko Road
		and were therefore not counted. If the population is to grow, then it is these families that must be jealously guarded against poaching. The wildlife corridor between Congo and Uganda through Rwangara Wetlands and Semliki Flats is now cut off by settlements.	1°00'35.49"N, 30°22'02.57"E
2	Buffaloes (*Syncerus Caffer*)	The buffalo numbers in the reserve have been increasing since 2010; Most of the sightings were in the woodlands and along River Wasa in the areas of Wango, the SSL, Kandito, and Sunset track as well as areas of Makondo, Bugando, Nyamabare, Ntoroko, Muzizi, Mugiri, Jogojogo, and Kaplate	During the surveys, no signs of buffalos were encountered along the corridor. However, communities reported usual interafce with them
3	Uganda Kob (*Kobus Kob*)	The Uganda Kob is the most dominant species and is distributed over the entire reserve in dominant land cover classes of woodland and savanna grassland. During the recent surveys, kobs were observed in the Semliki Flats and Rwangara Wetland area outside the reserve are mostly found in Makondo, Bugando, Karungutu, Muzizi, Kanywataba, Jogojogo, Kaplate, Kandito, the SSL, Kacwakumu, Ntoroko, Wango, Nyamabare, and Mugiri	This was the most encountered mammal species along the project corridor. Congregations of Uganda Kobs were rencounted at an average interval of every 3-4km within the project corridor
4	Reedbucks (*Redunca Fulvorufola*)	These mainly inhabit thickets and scrubs within the reserve. The recent surveys show a reduction in the numbers, but the reduction may be attributed to the fact that reedbucks live in bushy areas and are not easily visible during aerial counts. Therefore, the aerial estimates are clearly underestimates of the population in the reserve. Reedbucks are found in bushy areas of Kacwakumu, Bugando, Makondo, and Muzizi. They are mostly selective grazers. The Reedbuck exhibits a polygynous7 mating system and typically give birth to one offspring at a time. Males and females reach sexual maturity at 12 months and the average gestation period is eight months. The lifespan in the wild is estimated to be 12 years. The major threats for the species include habitat loss and predation.	Recorded mainly in the thickets along Rwebisengo Junction and Kanara. The species was recorde 3 times, and all were solitary. 1°01'14.84"N, 30°28'42.18"E 1°01'47.53"N, 30°28'02.93"E 1°02'35.49"N, 30°20'24.84"E
5	Black-and-White Colobus Monkeys (*Colobus Guereza*)	Black-and-White Colobus Monkeys (Colobus Guereza): The population of black-and-white colobus monkeys has not been previously estimated in TSWR. The species mainly live in the riverine forest and wooded grassland areas, especially in the areas of Muzizi, Mugiri, the SSL, Nyaburogo, Karugutu, Kakara, and Munyage Black-and-white colobus monkeys live in territorial groups of about 10 individuals consisting of one male with a number of females and their young offspring. They are mainly herbivorous, eating fruits, leaves, flowers, and twigs. The species are mainly threatened by habitat destruction especially logging and eforestation and are vulnerable to road kills.	Three black and White Colobus Monkeys were recorded after Kakara Junction Only. 0°51'56.80"N, 30°16'53.35"E
6	Red-Tailed Monkeys (*Cercopithecus Ascanius*)	The red-tailed monkey is primarily frugivorous and a territorial species. They range mainly in the areas of Rivers Mugiri, Munyage, where River Wasa enters TSWR, Nyaburongo Gorge, and along River Muzizi	No Red-tailed monkey were recorded within the project corridor
7	Chimpanzees (*Pan Troglodytes*)	Currently, chimpanzees (Plate 27) are found in Nyaburogo and the Mugiri area (Figure 29). Records as far back as 1998 show that three separate chimpanzee communities in the reserve existed. In the middle of the reserve, the chimpanzee group under research is found along the flanks of the Mugiri River and its tributaries.	No chimpanzees were recorded within the project corridor. The senstivity atlas recorded some chimpanzees in Nyaburogo Valley.

No.	Species	Distribution within TSWR (extracted from the senstivity atlas of TSWR)	Interaction with the Karugutu-Ntoroko Road
		A separate community can be found in the far northeast along the banks of Muzizi River—although it is certainly much reduced or eliminated by habitat destruction. In the west, a population is found in forests flanking the Nyaburogo Valley.	The Nyaburongo valley is about an average of 0.54km from the project corridor
8	Baboons (*Papio Anabis*)	Baboons are found along side roads in many areas. They often raid agricultural crops of communities neighboring the TSWR and feed on garbage/waste in urbanized settlements around Karugutu, Kanara, and campsites. Their close proximity to humans influences group behavior and social structure.	Baboons were recorded along the project corridor mostly between Kakara and Rwebisengo Junction
9	Bushbuck (*Tragelaphus Scriptus*)	Bushbucks are widely distributed throughout a variety of habitats, including forest and savannah habitats. They are mostly solitary but sometime aggregate into pairs. Due to their secretive behavior, bushbuck populations are often grossly underestimated by ground and aerial censuses. Bushbucks within the reserve are commonly sighted in the areas of Bugando, Makondo, Ntoroko, Mugiri, Kijura, and Munyage.	Bushbucks were recorde at: 0°55'13.12"N, 30°18'16.59"E 0°58'07.31"N, 30°19'36.93"E 1°00'20.78"N, 30°21'11.02"E 1°01'17.26"N, 30°24'07.65"E
10	Giant Forest Hog (*Hylochoerus* Meinertzhageni)	Giant forest hogs often live in groups of up to 20 individuals, mainly consisting of females and their young, but can be solitary. These herbivorous animals reside a variety of habitats ranging from forest to savannas. They prefer to live in thickets and bushes, especially under forest cover and near permanent water sources, but eventually move to the grasslands to feed. During the 2015 survey, the giant forest hogs were seen in the areas of Makondo, Muzizi, Mugiri, Kandito, the SSL, and the R. Wasa Bridge on the Karugutu-Ntoroko Road Since both aerial and ground counts are not effective methods for population estimation, the exact population of giant forest hogs has not been clearly estimated. The use of Capture-Mark- Recapture (CMR) methods such as using camera traps could provide better estimates in future.	No Giant Forest Hog were recorded along the project corridor.
11	Warthogs (*Phacochoerus Africanus*)	Warthogs inhabit open savannah grasslands, bushland, and woodland within the vicinity of permanent water wallows. They are commonly found in Kacwankumu, Buganda, Ntoroko, Wasa, Muzizi, the SSL, Jogojogo, Kandito, and Kaplate.	Warthogs were recorded at: 1°01'17.26"N, 30°24'07.65"E 0°51'56.80"N, 30°16'53.35"E 1°01'47.53"N, 30°28'02.93"E
12	Waterbuck (*Kobus Ellipsiprymnus*)	Waterbucks prefer savanna woodlands and forest-savanna mosaics near permanent water. They are mostly found in the areas of Ntoroko, Kandito, Kijura, Kaplate, and Jogojogo. Census estimates indicate that the population of waterbuck is steadily recovering. The waterbucks feed on short to medium grass and are water dependent, thus preferring to stay in valleys.	Waterbucks were recorded at: 1°01'01.64"N, 30°22'27.96"E 0°59'17.22"N, 30°20'32.11"E



8.0 Stakeholder Engagements

8.0 STAKEHOLDER ENGAGEMENT

Stakeholder consultation and engagement for the proposed upgrade of the Karugutu-Ntoroko (56.5km) Link to Rwebisengo (8.2km) and Ntoroko Town Roads; were undertaken in accordance with IFC performance standards; and the NEMA guidelines for seeking opinions and views on the environmental aspects of project(s). The local legal framework of consultation activities and project disclosure requirements, particularly in respect of public consultation activities that are directly required, were also consulted.

The main objectives of stakeholder engagement were to:

i) **Identify**: all those affected by or interested in the Project to ensure they are included in the engagement process.
ii) **Understand**: the views of the key stakeholders and make sure that stakeholders adequately understand the positive and negative impacts of the Project.
iii) **Inform**: the ESIA including local benefits and partner opportunities.
iv) Relationships and Trust: build relationships through supporting open dialogue and engagement with stakeholders. Establish transparency in activities being undertaken and build trust with stakeholders.
v) **Engage with all Stakeholders**: including vulnerable and marginalized groups by having an inclusive approach to consultation and participation. This included the use of differential measures to maximize effective participation of vulnerable stakeholders.
vi) **Manage Expectations and Concerns**: by providing a mechanism for stakeholders to engage with the Project about their concerns and expectations and provided a mechanism for receiving, documenting and addressing comments that we received.
vii) **Compliance**: with both national regulations and international best practice

8.1 IFC standards for stakeholder engagement

According to IFC, the first step in the process of stakeholder engagement is stakeholder identification–determining who is project stakeholders, and their key groupings and sub-groupings. From this flows stakeholder analysis, a more in-depth look at stakeholder group interests, how they will be affected and to what degree, and what influence they could have on your project. The answers to these questions will provide the basis from which to build your stakeholder engagement strategy. It is important to keep in mind that not all stakeholders in a particular group or sub-group will necessarily share the same concerns or have unified opinions or priorities.

During stakeholder Identification, the ESIA team identified;

i) stakeholders directly and indirectly affected by the project
ii) those whose "interests" determine them as stakeholders

It is important to keep in mind that the situation is dynamic and that both stakeholders and their interests might change over time.

For this project;

iii) Refer to past stakeholder information and consultation;
iv) Develop Socio-economic fact sheets with a focus on vulnerable groups

8.1.1 Stakeholder Analysis

The ESIA team formulated a stakeholder matrix and identified key stakeholders who were engaged during the detailed studies. These included Community, directly affected and indirectly affected people, institutional stakeholders including government and civil society, and stakeholders that will be involved in project implementation and regulation/ monitoring. In addition to community, Institutional stakeholders that were consulted included but not limited to;

i) The District local government technocrats including Sub counties and Town councils
ii) Uganda Wildlife Authority, and the Semiliki wildlife reserve in Ntoroko
iii) National Forestry Authority
iv) National Environment Management Authority

v) Ministry of gender labour and social development (Labour, gender, OSH, community development, youth and children departments)
vi) UNRA (Engineers, stations etc)
vii) Department of Museums and Monuments
viii) Ministry of Lands Housing and Urban development; Directorate of Physical Planning
ix) Ministry of Water and Environment (meteorological department, wetlands management department)
x) Ministry of Energy and Mineral Development
xi) Uganda AIDS Commission
xii) Utility agencies (Electricity distribution, UTL, NWSC)
xiii) Biodiversity databank
xiv) Wildlife Conservation Society(WCS)

Meeting minutes of the consultations held are included in Appendix 2 of this ESIA Report. The input from stakeholders obtained during the detailed study phase has informed the identification of important issues and potential sensitivities that were investigated. The stakeholder consultation activities are shown in Table 8-1;

Table 8-1: Stakeholder Consultation Activities

Stakeholder	Role or Interest in the Project	Status of Consultation
Uganda Wildlife Authority Toro- Semliki Wildlife Reserve office	Sustainable management of wildlife	Formal Meeting with ESIA team at Toro-Semliki Wildlife Reserve office
Ntoroko District local government (CAO, District Planner, DCDO, District Environmental Officer, DHO, DEO etc)	Plan, implement, monitor government development projects	Formal Meeting with ESIA team, Administrative structures, Health centres/medical facilities in the District, list of schools in the district and project road; District Development Plan for review of secondary data
Karugutu Health Centre IV	Health service delivery and epidemiological monitoring	Formal meeting between Health Inspector, records officer, in –charge maternity ward and ESIA team, HMIS data collected
Karugutu Town Council	Extends about 3.5Km on the proposed road; an area of influence with many commercial structures, households, places of worship and densely populated; hence with vested interests	Formal meeting with technical and political leaders; Relevant documents for review of secondary data
Kanara Town Council in Ntoroko	Extends about 5Kms on the proposed road; an area of influence with many commercial structures, households, schools and densely populated; hence with vested interests.	Formal meeting with technical and political leaders

Table 8-2: Key Themes for ESIA Engagement

Theme	Issue	Stakeholders
Visual and Landscape	Aesthetics in Town Councils, tree planting along roads;	Town Councils
Traffic and road safety	Anticipation of growth and provision for dual carriage	Ntoroko District local Government and Town Councils
Conservation	Recognition of significance of some sections to the project area for wild animals in the wildlife reserve; and the species of conservation concern. The need to consult with UWA in Toro-Semliki wildlife reserve	Ntoroko District local government and UWA Toro-Semliki Wildlife Reserve

Hydrology and other utilities such as electricity and communication facilities	The need for hydrological, electricity and communication studies to inform the road designs;	Ntoroko District Local Government, Karugutu T/C and Kanara T/C, UMEME, Ministry of Water and National Water and Sewerage Corporation
Health and vulnerable populations	Sexually transmitted infections, HIV and teen pregnancies, Mixed race children left fatherless	Karugutu T/C and Karugutu health centre IV; Ministry of Health
Employment and the Economy	Local authority stakeholders hope for job opportunities for the local people	Karugutu and Kanara T/C Ntoroko District
Land acquisition and resettlement	Timing for compensation, resettlement and sensitivity of populations	Ntoroko District local government. Ministry of gender labour and social development
Social disruption	Divorces, School drop outs, related health issues	Ntoroko District local government Ministry of gender labour and social development Lower Local governments (Sub Counties and Town Councils)
Poverty, food insecurity and prolonged drought	Fishing communities depend on the crop farmers to access food; poor crop yields; less fish catch	Communities in Town Councils and Sub Counties

During the ESIA and the ESIA updates, the team engaged stakeholders at the levels.

Plate 8-1: Meeting with the CAO for Ntoroko District in Feb, 2025

Table 8-3: Stakeholders within the project corridor that were engaged

Activity /Stakeholder Communities	Location	Issues covered/discussed
Consultations with UWA Office at Semliki Wildlife Reserve	UWA office at the Toro-Semliki Wildlife Reserve, Karugutu Town Council	Described project and discussed with UWA on their expectations of the road project Obtained data on tourism volumes and accidents in the reserve And the Planned for leaders and technocrats meeting at Kanara Town Council
Consultation with Kanara TC	Kanara Town Council	
Consultation with Ntoroko District Local Government	District office	The team described the project to the leaders and technocrats during a workshop at the District. With details of ESIA and household survey

Karugutu T/C	Karugutu T/C office	The team planned and mobilized leaders and technocrats who attended a workshop at the town council Planned and mobilized community meetings for cells/villages along the road in Karugutu T/C
Uganda Police, Child and Family Protection, Ntoroko District	Child and family protection unit	Described the project and the study as well as the household survey and collected data on crime within the region
Socioeconomic survey Community engagement at Karugutu T/C	Karugutu,	The team administered household surveys and also gave the community encountered a description of proposed road upgrade and captured their concerns and discussed possible mitigation measures
Focus Group discussions with selected groups Socioeconomic survey	Households in Karugutu	Administered household surveys as well as capturing concerns and discussed possible mitigation measures
Kanara T/C Meeting with technical and political leaders and Socioeconomic survey	Kanara T/C offices	Described the proposed road upgrade and administered household surveys to capture concerns and discussed possible mitigation measures with the community
Ntoroko District Meeting **Socioeconomic survey**	District office	Described the proposed road upgrade to the administration and continued with household surveys to capture more concerns and discuss possible mitigation
Karugutu HCIV Socioeconomic survey	health center	Described the proposed road upgrade and collected HMIS data on accidents
Kanara Seed Secondary School Socioeconomic survey	Kanara Seed Sec School Households in Kanara T/C	Disclosure and description of proposed road upgrade Collection of data on schools' enrollment, performance, drop-out rates, absenteeism, early pregnancies and marriages Administration of household survey
Ntoroko Primary School Brain Model Nursery and Primary School, Socioeconomic survey Data Cleaning	Ntoroko primary School Brain Model School	Description of proposed road upgrade Administration of household survey Capture concerns and discuss possible mitigation
Karugutu T/C Socioeconomic survey Data Cleaning	Karugutu T/C office	Collection of baseline data Capture concerns and discuss possible mitigation
Kanara T/C focus group discussions from special interest groups Socioeconomic survey Data Cleaning	Kanara T/C	Administration of household survey Capture concerns and discuss possible mitigation
Focus Group Discussions for special interest groups Socioeconomic survey Data Cleaning	Village hall	Had Brief on proposed road upgrade and ESIA Capture envisaged concerns on impacts and discuss possible mitigation Administration of household survey

Table 8-4: National Level Stakeholders Engaged

Stakeholder	Role or Interest in the Project	Status of Consultation
Uganda Wildlife Authority	Sustainable management of wildlife and curving the road out of the wildlife reserve to enhance its conservation	Formal Meeting with ESIA study and RAP teams
Ministry of Energy and Mineral Development	Oil production is the main interest. The proposed roads are critical oil roads support transportation during the production phase	Kick off Meeting with ESIA study team

National Environment Management Authority (NEMA)	NEMA is the Ugandan government agency responsible for coordinating, monitoring regulating and supervising environmental management in Uganda. NEMA has oversight over the entire EIA process and was consulted in relation ESIA process	Strategic Initiation meeting by UNRA
Ministry of Gender Labour and Social Development Director Labour, Employment and Occupational Safety and Health	The ministry is responsible for overseeing social development, culture, labour, child protection and gender mainstreaming. Their main interests are changes in social environments, culture, resettlement action planning, occupational safety and health, incorporation of institutional structures like CDO's into planning and projects implementation.	Formal Meeting with ESIA study and RAP teams

The following methods were used to conduct consultations during the ESIA:

- Holding meetings
- Conducting key informant interviews
- Making observations

The meetings with the local government officials were held at Kibuku, Kanara and Karugutu Town Councils while the meetings with community members were held at the various proposed project sites of lot 9 in the respective Villages of Karugutu, Kanara and Rwebisengo sub counties.;

Plate 8-2: Disclosure workshop at Kibuku Town Council, NtorokoDistrict

Plate 8-3: Team with National Forestry Authority meeting

Plate 8-4: Ntoroko District Technical Planning Committee consultative

Plate 8-5: Kanara Town Council Techical team

8.2 Key Public Concerns about the Project

8.2.1 National Stakeholders

Table 8-5: Key extrcats from records of engagement with National Staleholders

Stakeholder	Summary of Deliberations
Uganda Wildlife Authority	The meeting focused mainly Alternative route options. And the existing road from Karugutu – Ntoroko road which traverses through the middle of Toro-Semliki Wildlife reserve, following the existing road up to Kanara/Ntoroko. Key areas of interest for the stakeholder were expressed including fears of wildlife migration, barriers to movement of animals, threats to biodiversity that arise from vegetation clearing and traffic management. A diversion through Rwebisengo pastoralists, then along the TSWR boundary was preferred
National Forestry Authority	NFA emphasized planned utilization of forest resources, for coexistence and tradeoffs must be carefully selected. The stakeholder clarified that Karugutu – Ntoroko road will not reach the North Rwenzori Reserve but resources such as murram, stones, firewood were likely to be encroached on given the past experience of the Fort Portal – Bundibugyo road project. The contractor's camp was yet to be cited and the stakeholder had an interest in ensuring a suitable location for this. Since Ntoroko has a fuel wood crisis, to mitigate forest degradation, the meeting suggested that private community members with lots should be identified to supply fuel needs of the contractor.
National Environment Management Authority	The stakeholder's concerns focused on the content of the ESIA report, planning issues, the actual implementation of the project and the period after the project. Some highlights are given below: ESIA report should ensure site specific analysis and adhere to the IFC requirements; alternatives should be clearly written indicating the changes; reference should be made to the recommended mitigation strategies; cumulative impacts of projects was the way forward; negative impacts and mitigations should be addressed in the design, for instance speed in the protected areas; sensitivity to protected areas; operating speed; local operators; joint stakeholder efforts for the critical oil roads such as joint inspections were highly recommended; MoWT was advised to follow-up the livelihoods of the affected people after resettlement every 2 years to look out the positive impacts; and to monitor the contractors to ensure they have done the expected environmental restorations such as clearing burrow-pits among others.
Semliki Safari Lodges	For fear of likely irreversible negative impacts, the stakeholder strongly advised to divert the road from the middle of the wildlife reserve to the border line of the reserve from Kakara through the Rwebisengo pastoral communities to Kanara/Ntoroko fishing communities.
Uganda Police, Ntoroko Police Station at Karugutu T/C	The Police Department for Child and Family Protection advised that with proper compensation and sensitization concerning relocation of the project affected people, there will be minimal gender based violence. The common cases included defilement, child neglect, men disappearing and neglecting families, fighting due to drunkenness and these were likely to increase with the proposed road project. Another common challenge was the street children, they run away from home due to mistreatment, peer pressure, and they start petty thieving. The fear that children offenders will increase due to the project. Programs to counsel parents to care for their children should be intensified in order to minimize this impact.

	Linkages with NGOs and CBOs operating in the area can be useful in this regard. Karugutu HCIV records confirmed the teenage pregnancies and births. These are some of the key points the project should monitor.
Kanara Police Post, under Ntoroko Police Station	The stakeholder provided the **common crimes** at the landing site as either domestic or criminal assault; bar fights due to drunkenness, wife stealing among others; theft cases from shops mostly in August when the winds are fierce and stormy, and fishing activities are risky; Accidents mostly caused by heavy trucks due to poor road condition, over speeding, and in the game park reserve where an animal crosses unexpectedly, yet the road is narrow with bad spots, difficult to overtake; drunken drivers reported common; more accidents in rainy season than dry season; in a month 4 accidents reported in a rainy season while 1 accident or none in a dry season. School children go fishing and casual work on the site and drop out of school; Defilement many cases get reported and recorded a year, but the majority cases are not reported to police because families settle out of police, investigations are difficult because the community is small and they know each other. HIV/AIDS is the biggest problem at the landing site, 4 out of 5 people are HIV positive including children as records at Ntoroko HC IV and Stella Malis HCII indicate.
Deputy Resident District Commissioner, Karugutu	The RDC shared his experiences of the Fort Portal – Bundibugyo road; He expressed unfairness on the part of the developer where access is denied in the protected areas, because then they revert to the poor people's land like they did in Bundibugyo. He noted that the diversion of the proposed road to go through Rwangara via Kacwankumu to Kanara would be problematic because there is no road, and fresh studies would be needed for this part. The stakeholder is in charge of security in the district, and he affirmed the food insecurity in the area. He also informed the team that since November 2016, the youth in support of *Obusinga bwa Rwenzururu* mobilize privately, underground movements; killings at the border between the Bangiti and Balega deep in the DRC from River Semliki were on the increase and risky due to abrupt road blocks. He shared this information so that the project team is aware and can take charge of their security by for example keeping safe in their camp, which the RDC recommended.

8.2.2 Local Government

At the local government level, the identified stakeholders to engage with included Ntoroko District higher local government, Karugutu Sub County, Karugutu Town Council, Kanara Town Council, and Rwebisengo Sub County and Rwebisengo Town Council as the lower local governments. All the consulted local governments welcomed the road project, and mentioned that they heard about this road during the reading of the previous national budget.

A summarized record of the issues discussed with the local governments, and key points for the project to monitor is given Table 8-6.

Table 8-6: Extracts from Record of Meetings with District level stakeholders

Stakeholder	Summary of Deliberations
Ntoroko District Local Government	The engagement with the stakeholder revealed useful insights from the previous construction of Fort Portal – Bundibugyo road which will guide management of the proposed road; such as enhanced monitoring of the agreed strategies/actions to ensure compliance of the mitigation measures, restoration of affected environment; preparation of the communities to reduce the likely negative social impacts, high school dropouts and teenage pregnancies; district involvement was emphasized citing challenges of centrally managed projects; mobilization of communities using local FM radios commonly used by the communities, drainage issues to be mindful of the plain nature of the reserve area which is prone to floods; PAPs and compensations to be handled with justice; district wondering whether it can be compensated through local service tax from the contractors; protection of sign posts on the road side; security issues and the immigration trends in the area stressing the already stressed resources. Multiple identification of migrant populations noted to be a security issue, hence agreed to strengthen the District Security structures and strategies at all levels.
Karugutu Town Council	Issues pointed out for the road design to address include the narrow bends, the piped water installations, drainage, humps to control speed, and a public toilet along the road in the town council. Treatment of the road workers especially the local content, should be in line with the labor laws in Uganda and desist from unfair remuneration of casual laborers; minimum wage must be fixed in the agreement and appointment letters; National and local level Valuers should work together to minimize corruption; the youth to strategically position themselves to gain from the road project; meaningful and timely compensations with measures to curb domestic violence; workers camp could reduce pressure on existing facilities such as water and housing, impregnating the young girls; replanting trees and restoration of the destructed environment; the contractor to hold an exit meeting before leaving the site. Conduct regular health camps to sensitize the ever increasing population on public health issues including HIV/AIDS.
Karugutu Sub County	The seat of the stakeholder is located in Itojo parish on the Fort Portal – Bundibugyo road, and Itojo parish crosses the proposed road upgrade at Kakara, 6km and continues to R. Wassa. The team learnt that UWA pays Shs 4Million to the Sub County and to the other lower local governments which extend into the wildlife reserve (Kanara T/C and Karugutu T/C). The sub county engages in coffee, cocoa, and cattle as the main economic activities and produces food to feed the non-farming communities.
Kanara Town Council	The stakeholder preferred the proposed road upgrade of the existing road through the wildlife reserve, because it is the shortest and historical route to the community; and did not support diverting the road to Rwebisengo. The road is expected to boost tourism, trade, ease transport for traders, reduce transport costs; they said it is cheaper to travel from Fort Portal to Kampala than Fort Portal to Ntoroko; and claim that the high cost of living is due to the bad road. Stakeholder advised developer to replicate control measures which are used in other roads that

	traverse the protected areas. In the opinion of the stakeholder, the road was more valuable than the anticipated negative impacts in the wildlife reserve.
Rwebisengo T/C and S/C in a combined meeting	The stakeholders were engaged because of the voices arising from other stakeholders in Kanara town council and the Toro-Semliki Wildlife reserve, for a possible diversion of the proposed road from Kakara through Rwebisengo and to Kanara. The stakeholder welcomed the road regardless of whether it will be diverted to their pastoral communities or whether it will be part of the existing road in the middle of the reserve to link to Kanara fishing site. Issues of compensation, location of the camp, behavior of road workers, assurance on speed on the roads for the community and animals, terrain and floods came out strongly. Stakeholders suggested that those coming to work should undertake VTC and stay safe in their camps; while the communities get more sensitized on HIV/AIDS and keeping the girls securely.

8.2.3 Community

Consultations involved community meetings in Karugutu and Kanara Town Councils. The two communities are separated by a stretch of 42Km wildlife reserve. The Karugutu community practices livestock farming as well as cash and food crop growing, unlike Kanara community which is a purely fishing community. The summarized record is presented in the Table 8-7:

Table 8-7: Extracts from Record of Meetings with Community level stakeholders

Stakeholder	Summary of Deliberations
Karugutu Town Council Community	The community expressed the need for fair compensation of the affected businesses, places of worship and houses in the town council, fears of the increasing population due to inflows from DRC, which constrain the already limited resources, the high cost of living and food insecurity, non-availability of arable land for food crop growing due to the wildlife reserved area, water shortages due to weather variability, high school dropouts and early pregnancies; they shared the negative impacts from the previous road construction of Fort Portal – Bundibugyo including at least 6 road workers' children who were left behind; fears of increased prostitution and HIV/AIDS prevalence rates with the coming project; the sex workers have more fear for pregnancy than *HIV*/AIDS; mitigation measures to include strengthening community systems to sensitize the young people and parents; youth to form groups and access support from the government Youth Livelihood Program; and increased linkages with NGOs and CBOs operating in the area for technical support. Communities advised to take advantage of the local content in the proposed project.
Kanara Town Council Community	The stakeholders provided the team with more in-depth understanding of the Socio-economic characteristics of the Kanara fishing community, which is encircled by the wildlife reserve on one side and Lake Albert on the other. Therefore, the key points for the project to monitor would include the following: wild animals such as baboons which access the homes, shops and the waste dumping site in search of bananas, in the process scaring children going to school. These animals should remain in the reserve and protected, to avoid harm to the community and zoonotic diseases; poor management of fish waste which pollutes the air with a foul smell in the community; The migrant nature of the population putting pressure on the available medical facilities; the high mortality rates due to high HIV/AIDS prevalence rates, water borne diseases and malaria. The HIMS data from Kanara and Stella Maris HCs confirmed this situation. The high school dropout rates from the schools was confirmed with data from the schools, and the teenage pregnancies were confirmed from the schools and health centers in Kanara and Stella Maris; transactional sex, gender based violence and assaults due to drunkenness.

9.0 Analysis of Environment and Social Impacts & Mitigation Measures

9.0 ANALYSIS OF ENVIRONMENT AND SOCIAL IMPACTS & MITIGATION MEASURES

Impact analysis involves identification of an impact and all its parameters on environment and social aspects, and determination of its significance. For the proposed development, potential positive and negative impacts were identified for the pre-construction, construction and operational phases. The IFC Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project.

At times, the assessment and management of certain environmental and social risks and impacts may be the responsibility of the government or other third parties over which the client does not have control or influence; therefore, and an Environmental and Social Management Plan (ESMP) provided in Chapter 10. The ESMP will translate proposed mitigation measures into specific, measurable, achievable, realist and time (SMART) bound actions.

9.1 Approach to Impact Assessment and Analysis

To assess impacts using IFC standards, we followed the International Finance Corporation's (IFC) Performance Standards, which involve a comprehensive process of identifying potential environmental and social impacts of a project, analyzing their significance, and developing appropriate mitigation measures, all while considering the specific context of the project area and engaging with stakeholders throughout the assessment process; this typically included associating the project activities to the baseline data; then impact prediction, alternative analysis, mitigation planning, and monitoring and reporting.

As described in chapter 2, Impact assessment included a combination of a complex of methods, including: Expert judgment; Quantitative physical and mathematical models; and Rapid Impact Assessment Matrix (RIAM). Expert judgment was based on the professional option of experts that have considerable experience in the areas of assessed impacts especially where adequate data is available to allow for predictive modelling to explore the impacts. Expert judgments were used in conjunction with quantitative modelling and to complement modelling. This helped to interpret results and their consequences on the receiving environment and Socio-economic aspects.

As Per IFC Performance standards, Impact significance assessment requires an evaluation of the magnitude, duration, and reversibility of each identified impact to determine which ones are considered "material" and require focused mitigation. Several impact parameters were evaluated using Quantitative physical and mathematical models to establishment of impact significance. The impact parameters that were assessed include Type, Timing, extent, certainty, duration, and magnitude and receptor sensitivity.

The RIAM method was used by a multidisciplinary team to organize the analysis process into an interactive and coherent form that encourages participation throughout the process. The system made it possible to create an impact profile which allowed the practitioners to make a rapid comparison to the development options. There were three (03) aspects of the environment that were analyzed; physical-chemical, biological, Socio-economics.

Significance of an impact depends mostly on the on magnitude of the activity and sensitivity of the receiving environment. Magnitude can be defined as the strength of an impact on the receiving environment, while severity is extent of damage that an impact could cause on the receiving environment.

9.2 Analysis of potential impacts during Pre-Construction Phase

Pre-construction activities are tasks that take place before construction begins. A crucial environmental task during this phase is the selection and construction of camps. The location, design, and construction of these camps can potentially lead to adverse environmental and social effects.

These IMPACTS may include placing camps in environmentally or socially sensitive areas, creating camps with insufficient facilities, and causing negative construction impacts. The project area is characterized with hostility from the inter-tribal conflicts and also M23 rebel associated activities from the Eastern D. R. Congo.

The Pre-construction phase has the potential to raise social expectations regarding job opportunities, compensation, speculation, and potential hostility from affected communities. Furthermore, a lack of integration of environmental and social considerations in feasibility assessments and engineering designs may result in inadequate environmental and social safeguard plans and project execution.

The negative impacts of these shortcomings can be **significant**, ranging from short to medium term consequences that may be difficult to reverse and could re-surface later in the project lifecycle.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct/ Indirect ,	4	5	6	5	75

Proposed Mitigation measures

i) The project should work closely with the security management team within the project area including the Gombolola Internal Security Officer (GISO), UWA, Resident District Commissioner (RDC), The UPDF and local leaders;
ii) Information regarding the project and its relationship with the local community, including aspects of hiring labour and compensation should be transparently disseminated to the community;
iii) Community engagements should be continuous throughout the project cycle so that all concerns are addressed;
iv) Undertaking environmental and social planning with the engineering design team;
v) Conducting comprehensive studies covering environmental and Socio-economic issues;
vi) Camps should not be permitted within the sensitive areas especially TSWR;
vii) The responsibility for environmental and social planning and their establishment lies with the contractors. A standalone environmental and assessments should be conducted for camps and equipment yards and approvals obtained as required by law before works commences;
viii) The plans of camps should conform to standard planning requirements and the plans should have approvals from relevant planning authorities and MoWT.

9.3 Analysis of potential impacts during Construction phase

9.3.1 POSTIVE Socio-economic Impacts & enhancement measures

9.3.1.1 Employment opportunities

The construction of Karugutu-Ntoroko (56.5km), Link to Rwebisengo (8.2km) and Ntoroko Town Roads was anticipated to create employment opportunities for both skilled and unskilled labour. This project is expected to provide between 300-400 jobs when intensive road works commence. It is estimated that majority of the workers will be Ugandan and this will highly contribute to a reduction in unemployment and boost people's incomes in the project area. This impact is highly significant and positive as analyzed below;

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct, positive	4	5	6	5	75

Proposed enhancement measures:

i) Establish a screening program to isolate bad characters, involve of Local leaders and security in the recruitment process to ensure fair and full participation of the local people;
ii) To promote local content, semi-skilled and unskilled labour shall be sourced from within the project area. This is in conformance with The Buy Uganda Build Uganda, 2014 policy;
iii) Development and implementation of a workers' code of conduct;
iv) Ensure a safe working environment for all workers;
v) Ensure gender equity in employment;
vi) Provision and honoring of contracts to all project workers;
vii) Provision of security by working with Police, Army and local authorities.

9.3.1.2 Promotion of Local and Regional Development

The project area is located in a strategic position that facilitates local and regional development. Karugutu-Ntoroko project fits well with the existing Fort Portal-Bundibugyo. These two roads are important for the National Development. Most of the areas traversed by the proposed project in Rwebisengo, Kanara are rural areas that were characterized by slow growth potential in the absence of the proposed development.

The project has potential to trigger multiple developments within the project area. This impact is positive, relatively permanent and highly significant.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct, positive	5	5	10	5	100

Proposed enhancement measures:

The project plans and Designs should be integrated into the projected Ntoroko District Development plans, The UWA- TSWR Management Plan, to avoid mushrooming settlements and unplanned developments especially at the TSWR boundary in the pastoral communities.

9.3.1.3 Creation of business opportunities

During road construction, there is stimulation of roadside businesses, shops and markets especially ones involved in vending foodstuff. Additionally, land is always rented from community members to

set up temporary workers' camp and equipment yard. Owners of land on which these facilities will be erected will earn a rental income upon negotiations with contractors.

Stone quarrying is one of the major income generating activities in the area. During project construction such quarry material may be required. Land is always rented from community members to set up temporary workers' camps, equipment yards, borrow areas, quarries etc. Owners of land on which these facilities will be erected will earn a rental income upon negotiations with contractors. This is a positive but short-term and reversible benefit ceasing with project completion or whenever such facilities are no longer required in a given location. Impact duration will be short-term for each site used as workers' camp or yard and likelihood of occurring is high but benefit will be to a few landowners hence minor impact significance.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct, positive	1	3	4	5	20

Proposed enhancement measures:

i) Complementary initiatives for women traders in aspects such as financial management, cooperatives development and bulk marketing among others;
ii) Regular maintenance of the feeder roads to facilitate traffic flow;
iii) Construction of market stalls in collaboration with local authorities.
iv) Ensure proper acquisition or rental of land from land owners is in line with national laws;
v) Adequate, fair, and prompt payments for the landowners;
vi) Conduct safety awareness regarding construction activities;

9.3.2 NEGATIVE Socio-economic impacts and mitigations

9.3.2.1 Loss of agricultural land & property

The proposed Right of Way along the main Road corridor is 50m, while along the link roads is 30m. Most of this is greenfield with no existing roads that would instead require widening especially the section between Rwebisengo to Kanara. Loss of graze and farmlands will have a significantly high negative impact because it was established that 73% of the population depend on agriculture as their main source of livelihood.

Additionally, a significant population in trading centers rely on built structures for Liviehoods. The anticipated loss of property, land and crops was the main concern of the Project Affected Persons.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct, Negative	5	5	10	5	100

Required Mitigation measures:

i) Adequate, fair, and prompt compensation and resettlement of PAPs should be done before project construction activities commence;
ii) Timely communicate to PAPs on schedules of project activities to enable them adjust their livelihoods plans;
iii) The RAP should define mechanisms that are responsive to the extent possible to the prevailing needs of the beneficiaries/PAPs;

9.3.2.2 Intermittent flooding of communities

Some communities lie within flood zones of the River Semliki catchment. Flooding in the project area is mainly caused by its tributary rivers which include R. Wasa, R. Itojo, R. Semuliki, R. Dorwa and several smaller streams such as Kithoma, Kamayatya, Nyangilika, Kanyamabale, Ngisia which overflow when they are full to capacity. Floods may be independent of rains in the district; with heavy rains in the Rwenzori Mountains, River Semiliki bursts its banks and the water enters the Ntoroko flood plains. This phenomenon is disastrous to the local communities. Excavations during road construction might accelerate flooding in communities due to backfills. This impact is moderately significant.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct, Negative	2	5	10	3	51

Proposed Mitigation measures:

i) Designs should avoid and at worst minimize flooding risks and impacts on the wetlands and flood plains in the sections including adequate structures like Bridges and culverts;
ii) Maximize the dry seasons to finalize construction in flood plains.

9.3.2.3 Impacts from workers' camps

Operation of the camp will generate domestic and hazardous waste (used oils and oil filters) which if improperly managed will contaminated local environmental resources (soil, water) and posing a public health risks. Vehicle maintenance areas and workshops generate used oils that have the potential of contaminating land and water bodies. Peelings commingled with plastic carrier bags could pose a risk to livestock from feeding on camp waste.

Workers camps are also associated with bulk fuel storage and dispensing, vehicle maintenance areas and workshops generator houses and vehicle wash bays with potential to result into fuels spillages and generation of waste waters that can contaminate land and water bodies. Unrestored camp and yard sites would cause aesthetic blight and remnant contamination from fuel, oil or unused bitumen.

Duration of impacts is short-term, extent is local but likelihood high and impact severity on receptor community is moderate

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct, Negative	1	3	6	5	30

Proposed Mitigation measures:

i) Camp site and yard should have adequate sanitation facilities (latrines) that are gender friendly. Living quarters should be gender friendly as well;
ii) Contractor should provide clean water at camp, ensuring that water abstraction is permitted by WRMD;
iii) Contractors should prohibit smoking in outdoor space that is: - Within 50 meters of a public place, and Designated not smoking area;
iv) Contractors should prohibit smoking in work places and means of public transport;
v) For fire safety, contractor should provide fire extinguishers and signage in camp including refueling areas;
vi) On completion of the project, contractor should remove structures and sites restored to pre-project condition or give them to local communities'/ land owners for use. Exposed areas shall be replanted with indigenous tree or vegetation species.
vii) Onsite combustion of waste shall not be done at camp;

viii) Restrict community access to workers' camps;
ix) Smoking in communal areas at camp and near fuel storage areas should be prohibited and signs to this effect posted in visible areas;
x) Workers' camps should be located outside community settlements Recruit the work force from the local communities where possible;

9.3.2.4 Impacts from the quarry sites and bituminous plant

Stone quarry sites and other auxiliary plant locations are yet to be identified. Some locations have been proposed, and mostly lie in communities. The potential Impacts that might arise from the quarry sites and bituminous plants include dust and gaseous emissions, noise and vibration, flying stones, among others. These expose workers and surrounding communities to Occupational Safety and Health risks. These impacts are negative and moderately significant.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct, Negative	1	3	6	5	50

Proposed Mitigation measures:

i) These auxiliary components undertake their own environmental and social planning requirements and to obtain approvals.
ii) Quarries affecting human settlements should undertake abbreviated RAPs and obtain necessary approvals.
iii) Stones should be exploited is such a way that does not leave sharp cliffs and loose hanging stones to cause accidents and pits.
iv) Rehabilitation/restoration of quarries will have to be undertaken at the end of stone quarrying activities.
v) Dust from the stone crushers should be suppressed by wet crushing.

9.3.2.5 Social disruptions due to Population Influx

9.3.2.5.1 Prostitution, crime and drug abuse

The proposed road project is located towards the border with DR. Congo, and is expected to generate additional disposable income particularly for the active working group of youth and young adults. A large influx of males for a construction project is expected both from DR. Congo and within Uganda; this will increase demand for sex in an area. Prostitution is normally associated with crime and drug abuse. Duration of impacts is short-term, extent is local but likelihood high and impact severity on receptor community is moderate. However, the risk of HIV makes this impact negative high significance medium to long term irreversible.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	indirect, Negative	4	3	6	5	75

Proposed Mitigation measures:

i) The contractor should have an independent security system that collaborates with the local security organs.
ii) Development and implementation of security plans should involve local (LC) leaders and police.
iii) Create awareness and build capacity within communities, workers, security agencies on the dangers of prostitution, crime and drug abuse to resist the temptation.

9.3.2.5.2 HIV/AIDS and other sexually Transmitted Diseases

The proposed project is expected to be generating an influx of migrant workers which will increase the risk of spread of HIV/AIDS and other STDs especially in Karugutu and the landing sites of Kanara. The project area is already struggling with high HIV Prevalence.

The impact of increased risk of HIV includes pressure on local health systems, impact on community livelihood and social cohesion. Increased HIV prevalence would result into reversal of economic gains within the community and may reduce the ability of the community to benefit from the project. Duration of impacts is permanent, extent is local but likelihood high and impact severity on receptor community is high.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	indirect, Negative	5	5	6	5	80

Proposed Mitigation measures:

i) An HIV/Aids organization will be nominated by MoWT to conduct work place HIV/AIDS awareness, and control programmes for the contractor's workers.

9.3.2.5.3 Dominance of migrant workers on employment opportunities

The location of the project at the border is likely to trigger dominance of causal workforce from DR. Congo. There is as well Contractor's preference of migrant workers to undertake skilled and semi-skilled employment, this will reduce employment opportunities for community members. The practice may marginalize community and reduce their support towards the project. Denial of employment opportunities to suitable community members is against the spirit of the National Development Plan and vision 2040 that seek to raise incomes of PAPs. Duration of impacts is short-term; extent is local but likelihood high and impact severity on receptor community is moderate.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct, Negative	1	3	6	5	30

Proposed Mitigation measures:

i) Priority for skilled, semi-skilled and unskilled labour should be given to persons from within immediate communities.
ii) Foreign workers should have work permits as required by law.
iii) The contractor should follow Ugandan Labour laws and related regulations on the recruitment and disciplinary measures for the workers.
iv) There should be sensitization of workers on Batuku cultural values and norms.

9.3.2.5.4 Potential of child abuse

The proposed project traverse areas with a number of schools and settlements. It is likely that workers associated with the project will engage in sexual relationships with school and under aged children. The community indicated that occurrence of such behaviors may reduce community support for the project. Child pregnancy and early marriage was being documented. The impact is negative with high sensitivity and overall impact significance is moderate.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct, Negative	1	5	7	2	26

Proposed Mitigation measures:

i) The contractor will be required to develop a child protection plan which will be implemented in collaboration with community leaders, schools and districts;
ii) The contractor will be required to collaborate with communities to provide information where child abuse cases;
iii) The community should be sensitized on the risks of child abuse;
iv) Minimize the interaction of children with the workers, and closely monitor and report worker's behavior/conduct;
v) Cases of abuse should be reported to the police for investigation and prosecution.

9.3.2.6 Gender concerns

Gender concerns for the project particularly relate to infringement on the rights of women in the work place such as sexual harassment, denial of employment opportunities, physical violence, and male partners forcefully taking away women's pay and lack of proper public facilities such as toilets and shelter for their children as they work on the road. Other potential negative impacts on women include; exposure to STIs such as HIV/AIDS, sexual exploitation of young girls and abandonment by partners in case of unwanted pregnancies. Impacts related to gender are negative, highly sensitive with potential for high magnitude however they can be effectively alleviated against hence making the overall impact moderate.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
communities	Direct, Negative	2	5	10	3	51

Proposed Mitigation measures:

i) Workers should be sensitized on their gender rights and responsibilities. MoWT will Work with the contractor on establishing zero tolerance policies and codes of conduct related to violence against women and girls (VAWG).
ii) The Contractor will conduct gender sensitization to the work force on matters such as gender sensitive communication and on the gender sensitive conduct of workers towards women amongst others.
iii) Display signs throughout the site making it clear that the work site is a violence free zone and VAWG will not be tolerated.
iv) All workers should receive adequate briefing and education on the laws against defilement and other sexual offences.
v) To the extent possible, there will be gender sensitivity in task allocation to the women.
vi) There will be a Specialist (Environmental/Social Specialist) to oversee implementation of the gender action plan.
vii) The project will install gender sensitivity facilities (toilets and bath shelters).

9.3.2.7 Physical cultural resources loss

Following IFC Performance Standards, it is important that projects are screened for impacts on cultural heritage. The findings of physical cultural resources (PCR) survey indicate resources that are of cultural importance especially archeological materials Burial grounds. Such shall be preserved and managed with guidance form the Department of Museums and Monuments under the Ministry of Tourism, Wild life and antiquities.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
Community	Indirect negative	1	5	4	2	20

Proposed Mitigation measures:

i) The preferred route avoided directly affecting the known cultural sites.
ii) In case any other physical cultural resources are established during construction, the chance finds procedure shall apply.
iii) MoWT and the contractor shall work closely with the Department of Museums and monuments to ensure proper management of any cultural resources established in the project area.

9.3.2.8 Impact on Public Utilities

Electricity and water are the utility services identified in the project area. Certain service lines and structures are located within the right of way. Consequently, construction activities will cause disruptions in the provision of water and electricity, impacting households, businesses, schools, health centers, and other institutions. Overall, this impact is considered moderately significant and highly manageable especially along the link Roads of Ntoroko and Rwebisengo.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
Communities	Direct, negative	2	2	4	5	40

Proposed Mitigation measures:

iv) Timely plan the relocation of affected utilities following an approved utilities relocation plan.
v) Timely communicate and notify all affected communities

Residual impact will be insignificant with the implementation of these mitigation measures.

9.3.2.9 Occupational health, safety and security risks of workers and community

Traffic management during road construction poses significant risks to workers and communities that rely on the roads. The presence of valuable construction equipment and materials on-site makes them attractive targets for theft and vandalism especially with the porous border to DR. Congo. The safety and health considerations of projects involve the safe operation of equipment, exposure to noise, vibrations, dust, exhaust fumes, and overall risks of injuries and accidents. To address security concerns, projects frequently employ armed personnel, who may inadvertently pose a threat to the community.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
Workers & Community	Direct and negative	4	2	8	4	56

Proposed Mitigation measures:

i) In line with IFC standards, the project shall develop and implement management plans that address aspects of occupational health and safety, security, and pollution prevention;
ii) Community and workers' sensitisations shall be regularly undertaken to reduce risks of exposure to construction sites hazards;
iii) Develop and implement emergency response plans prop0tionate to the risk, to respond to accidents or emergency events that may cause risks to human health and environment;
iv) Appropriate job allocations to skilled personnel is highly emphasized;
v) Provide appropriate PPE to all personnel on site.

9.3.3 Impacts on Bio-physical Environment

9.3.3.1 Potential loss of Biological diversity

The proposed road alignment traverse wetlands, Greenfields of variable magnitudes. An estimation of vegetation cover of 130 Hectares was established. Fauna surveys established the fact that animals within TSWR explore the entire project areas without obeying TSWR boundaries.

Clearance of the project corridor possess a very high risk of losing biodiversity held within. Some animal species utilize the project area in various ways. Some are likely to be affected due to habitat loss and hunting/poaching of wildlife in the areas due to increased access and improved roads. This will have affected large mammals. Various Amphibians and reptile species use the project area for breeding during the rainy seasons.

All habitats should be protected according to the guidance of International Finance Corporation's (IFC) Performance Standard 6 (PS6) focuses on conserving biodiversity and sustainably managing natural resource. The relevance of PS6 is in the need to conserve biological diversity and the respective habitats. The impact is rated as permanent and highly significant.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
Biodiversity	Direct, Negative	5	5	10	5	100

Among the specific mitigation actions include;

i) Implementation of the measures as detailed in the Biodiversity Action Plan (Annex 4)
ii) Update and implement protection measures for wetland habitats (swamp, river, streams, and pools) and associated species during construction and operation of the Project
iii) Prepare and implement a habitat removal and reinstatement plan – HRRP

Residual impact:
It is expected that after proper implementation of appropriate mitigation measures, the residual impact will be minimal.

9.3.3.2 Potential impacts on Chimpanzees

The TSWR sensitivity atlas and Management plan; recognizes the fact that Chimpanzees explore some sections of Nyaburongo valley, which is about 0.5km from the project foot print (within the project proximity between KM 6+00 and 10+00). Not recorded during the surveys, there are rar chances that the chimpanzees of this area cross and interact with other sections of the TSWR and neigbouruing Chimpanzee communities.

Impact severity is considered high and significance is high

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
Biodiversity	Direct, Negative	5	5	10	5	100

Among the specific mitigation actions include;

i) Ensure that the maximum design speed between KM 4+00 and 15+00 is 20km/hr.
ii) Install Road signs that indicate presence of chimpanzees within the project area

9.3.3.3 Habitat destruction for ground fauna species

The proposed road traverse a multitude of sections of different wetlands and construction may lead to distortion, Pollution, fragmentation, separation or complete loss of wetland cover along the road sections. Several rivers, streams, flood plains, marshes, animal watering points cross the different road sections to various extents. Construction activities will therefore lead to loss or drainage impairment of some wetland sections. These wetlands are utilized by Birds, Small mammals, Butterflies, Fish, amphibians and reptiles for breeding and feeding. Most of these habitats will be destroyed and polluted during construction phase.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
Biodiversity	Direct and negative	4	2	8	4	56

Mitigation measures:

i. Box culverts should be installed in routine flooding areas.
ii. All flood plains should be connected with several box culverts (number of culverts required will depend on the size of the flood plain).
iii. The Contractor shall ensure that potentially contaminated runoff from storage areas should be drained through oil traps.
iv. A "soft start" approach should be used within wetlands the other ecologically sensitive areas to enable sensitive and shy animals move farther before construction begins.
v. Avoid dumping spoil into wetlands.
vi. Contractors shall restore all sensitive habitats like wetlands before leaving site.
vii. The Contractor should suppress dust during earthworks through continuous watering.
viii. Put all yards and camps outside the TSWR
ix. MoWT shall install appropriate road signage on speed limits and animal crossing corridors.

9.3.3.4 Fire outbreaks

The presence of combustible materials especially fuels and oils from construction machinery hike the risk of fire outbreaks within the TAWR. This has a potential of putting biodiversity at verge of extensive extinctions.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
Biodiversity	Direct, negative	4	2	4	2	40

Impact severity is considered medium and significance is low

Mitigation measures:

i. The Contractor shall not dump waste oil in watercourses, drains or on land but collected and sent for recycling or reuse
ii. Onsite combustion of waste shall not be done at the construction yard.
iii. For fire safety, contractor shall provide fire extinguishers and signage at the yard and especially, at re-fueling areas.
iv. Smoking area should be gazetted away from fuel storage areas and signs to this effect posted in visible areas.

9.3.3.5 Poor waste discharge

Waste discharge into ambient water and land can lead to contamination of aquatic and terrestrial habitats within and outside the TSWR. Habitat contaminations directly affect biological life hence interfering with biological processes due to deprivation of oxygen essential for survival this may result into fatalities of biological ecosystems if not controlled. The inter-connectedness of water bodies easily facilitates transportation of liquid waste from up to down streams, into animal

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
TSWR	indirect, Negative	4	3	6	5	75

Impact severity is considered medium and significance is high

Mitigation measures:

i) The Contractor should install anti-pollution equipment to treat waste before discharge into the environment in compliance with the National Environment Waste Discharge into Water on Land) Regulations.
ii) Sensitize workers about potential for environmental contamination due to improper waste management practices.
iii) The Contractor should ensure waste types (organics, inorganic, hazardous, medical etc.) are segregated and responsibly disposed of.
iv) Containers should be provided for safe onsite waste containment and segregation before final disposal.
v) In the waste disposal strategy, recycling should be emphasized and all recyclable waste properly sorted and delivered or properly stored for pick up by recyclers.
vi) Install adequate sanitation facilities (latrines) at the construction sites e.g. mobile toilets.
vii) Waste engine oil should be collected and stored in a facility licensed by NEMA. Similarly, transport and disposal of used oil should be done by a NEMA-licensed contractor.
viii) Ensure that relevant permitted by WRMD are granted before using or constructing hydraulic structures across rivers and streams within the project area.
ix) The contractor should ensure proper management of spoil and stoke piles.

9.3.3.6 Increased Human-Wildlife interface

9.3.3.6.1 Increased road kills

There will be chances of increased injury or mortality occurring during road construction (e.g., inadvertent burial or death from excavations) as well as subsequent physical contact with constructing vehicles.

Mitigation measures:

i) MoWT should install speed humps at interval of 0.2-0.5 km during construction phase.
ii) A "soft start" approach will be used within the ecologically sensitive areas to enable sensitive and shy animals move away from the road.
iii) Trapped individuals like reptiles and mammals should be rescued and released to safer zones.
iv) Install wildlife crossing structures that can facilitate wildlife movement across roads. these structures include green bridges, bridges, culverts, and pipes

9.3.3.6.2 Cases of Zoonosis

Primates especially Baboons, Monkeys and Chimpanzees have a very high potential to Zoonosis (contract human diseases) especially those transmitted through human waste, littering and other forms of human-animal interactions. This puts the health of wildlife at risk in case of disease out-breaks. Impact severity is considered medium and moderate significance within savannah areas, well as in the wetlands and forests impact sensitivity is considered severe and significance high. However, there were no likely impacts on fauna diversity within the human communities.

Mitigation measures:

i) Workers with chronical diseases (especially air borne) should seek medical attention before entering the Park

9.3.3.7 Spread of invasive/ alien species

Invasive-alien species can be compounded by disturbances to the ecosystems through excavations earthworks and through movement of machinery & equipment contaminated with materials of invasive plant species. Invasive plants suffocate growth of native species and some have potential to degrade soils fertility.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
Biodiversity	Direct, Negative	2	5	10	3	51

Impact severity is considered medium and significance is moderate

Proposed mitigation measures:

i) Sensitize workers on control measures to manage the existing invasive plant species, spread and their distribution. .
ii) Foreign plant species especially fruits and support poles should not be introduced in the TSWR.
iii) Efforts through mechanical elimination of invasive plants within the project areas should be implemented.
iv) Continuously monitor the occurrences of invasive plant species throughout the project cycle.

9.4 Analysis of potential impacts during Operational phase

9.4.1 Positive Socio-economic impacts

9.4.1.1 Reduced transport costs and time of travel

Improved road infrastructure by the project is anticipated to reduce transport costs due to increased traffic plying the route in the medium and long term as a result of increased passengers. The current gravel road is poorly maintained with pot holes and mud hence discouraging public transport because of high mantatince costs and fuel consumptions. Currently, the journey that takes an hour takes 2-3 hours on a bad road stressing passengers in Ntoroko.

9.4.1.2 Improved access and delivery of health services

Improvement of the road network will increase access to health facilities and service delivery. Transportation of drugs, health service providers and emergency cases such as expectant mothers, infants etc. will also be facilitated.

9.4.1.3 Increased income from agricultural production and trade

The project will boost farmer and traders' incomes and accelerate development in trading centres, at village and domestic (family) levels. The proposed roads upgrading will allow free marketing of produce and farmers will be able to access bigger markets while the trading centres will become more active. The major economic activity in the project area is farming (crop production) mainly of crops including cassava, sweet potatoes, maize, sorghum cotton, and cattle farming.

9.4.2 Negative Socio-economic impacts

9.4.2.1 Potential of Road accidents

Drivers on a newly improved road commonly excitedly drive faster. This is a risky Behavior common on new road in Uganda and is referred to as "new road effect". This usually happens in the first few months of commissioning a new road and is associated with frequent road accidents, especially at pedestrian crossings, sharp corners and blind spots, often leading to loss of life or commercial goods. This impact can be reversible with safe road use sensitization campaigns for 1-2 months before road commissioning. Likelihood of impact occurrence is medium but severity high where accidents lead to loss of life Impact significance is therefore high.

Mitigation measures:

i) Potential accident hotspots should be marked with appropriate road signs.
ii) Provide necessary road signs along the constructed roads.
iii) MoWT and respective district local governments should undertake road safety campaigns for at least 1 month before and 1 month after commissioning the road.

9.4.2.2 Floods in communities

Some households might be affected by the constructed culverts directing surface runoff from the roads to their homes. A number of commercial buildings near channels in Rwebisengo might be similarly affected. Likelihood of impact occurrence is medium but severity high where peoples' properties are affected, impact significance is therefore high.

Mitigation measures:

i) Plant grass along road sides to slow down water
ii) Install side trenches to reduce volume of water reaching the culverts in farm locations.
iii) Collect the water in ponds for community use
iv) Direct culverts away from property such as houses.

9.4.3 Positive impacts on TSWR during operations

9.4.3.1 Protection of the TSWR boundary

The proposed project is a boundary at the interface of pastoral communities and TSWR. Boundaries ensure that priority species are contained and protected within a conservation area. This will reduce the wildlife animal conflicts especially from the elephants that raid people's crops. This boundary will as well protect TSWR from human encroachment.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
TSWR	Direct, Positive	5	5	10	5	100

9.4.3.2 Contribution to ecosystem recovery

Diversion of public traffic at Kanara to Rwebisengo and then along the TSWR boundary will contribute to ecosystem recovery along the usual Karugutu-Ntoroko Road; that traverses through the TSWR. Additionally, there will be no additional excavation of borrow materials within TSWR to maintain the existing Road. The existing Karugutu-Ntoroko Road will be purely for tourism purposes.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
TSWR	Direct, Positive	5	5	10	5	100

9.4.3.3 Increased biodiversity safery

The design of the road will increase ecosystem and biodiversity safety. The average design speed within TSWR is 30km hr. This will significantly reduce the driving speed. Additionally, the installment of wildlife crossing facilities like culverts will enhance ground fauna crossings.

Receptor	Impact Type	Extent	Duration	Magnitude	Probability	significance
TSWR	Direct, Positive	5	5	10	5	100

9.4.4 Negative impacts on TSWR during operations

9.4.4.1 Enhancement of Climate change impacts

Climate change impacts might be enhanced as a result of reduced vegetation cover. Greenhouse gases will be emitted as a consequence of all internal and external combustion equipment on site (operational machinery and generators), plus land clearing burning. Greenhouse gasses generally include all emissions of carbon dioxide (CO_2), nitrous oxide (N_2O) and methane (CH_4). The sum of all greenhouse gasses is generally expressed as a carbon dioxide equivalent (CO_2e). Accumulation of Greenhouse gases leads to climate change; Likelihood of impact occurrence is high and impact significance accumulates with time

Mitigation measures:

i) High carbon sequestrating tree planting should be planted along road corridors in communities.
ii) Avoid cutting trees as much as possible

9.4.4.2 Increased road kills

Improved roads through TSWR and higher travel speed could raise incidents of animal road kills. Species including reptiles (especially snakes and tortoises) could be at risk of road kill. The main concern is with monkeys, ungulates and nocturnal animals that are slow on land and yet their populations have been drastically reducing in the recent past due to skin and meat demand.

Mitigation measures:

i) Speed limit measures should be installed e.g. humps at interval of 0. 5 km along the forested stretches, with operational speed of 20-40 km/hr.
ii) In consultation with UWA, install appropriate safety signs and speed humps along the stretch through the TSWR. The signage to be installed should indicate to motorist's narrowness of the stretch, humps, wildlife crossing and speed limits.

9.5 Impacts on the integrity of Toro-Semuliki Wildlife Reserve

Most of the potential negative impacts discussed in Section 9.3.3; regarding Bio-physical Environment are likely to happened within the boundaries of TSWR. Road construction in a protected area fundamentally creates a trade-off between Socio-economic benefits and severe, often irreversible, adverse environmental impacts. Most of the significant impacts will happen during construction; and the TSWR will recover progressively upon implementation of adequate mitigation measures. Additionally, there are potential opportunities of the proposed project on TSWR as stated in section 9.4.3; these were extracted and summaried in the table 9-1 below with their significances.

Table 9-9-1: Imapcts and their significance on TSWR

No.	Potential Impacts	Impact Significance	
	Negative		
1	Loss of Biological diversity (fauna and flora)	**-100**	
2	Impacts on Chimpanzees	**-100**	
3	Habitat destruction for ground fauna species	**-56**	
4	Fire outbreaks	**-40**	
5	Poor waste discharge and pollution	**-75**	
6	Increased road kills	**-75**	
7	Spread of invasive/ alien species	**-51**	
	Postive (opportunities)		
8	Protection of the TSWR boundary		**+100**
9	Contribution to ecosystem recovery		**+100**
10	Increased biodiversity safety		**+100**
	AVERAGE	**-71**	**100**
	Overall impact significance	**29**	

The overall impact significance on TSWR **is low, <30**; implying that with adequate implementation of the proposed mitigation measures under sub-sections of 9.3.3; and enhancement measures under section 9.4.3; TSWR will have a positive benefit due to the proposed upgrade of Karugutu-Ntoroko (56.5km), Link to Rwebisengo (8.2km) and Ntoroko Town Roads.

9.6 Climate change Risk Assessment

Ntoroko District is a high-risk climate hotspot: prone to increasingly intense floods, lengthy droughts, heat extremes, and cascading impacts on water, agriculture, health, and education. Climate Change Risk Assessment (CCRA) under IFC standards focuses on identifying, evaluating, and managing climate-related risks—both physical and transition—that could affect a project's environmental and social performance. CCRA for this Road development project is primarily guided by:

i) IFC Performance Standard 1 (Assessment and Management of Environmental and Social Risks and Impacts);
ii) IFC Climate Risk and Resilience Good Practice Note (2020);
iii) IFC Guidance on Greenhouse Gas Accounting;

Note: Links to World Bank Group Climate and Disaster Risk Screening Tools were not available at the time of assessment

9.6.1 Purpose of this CCRA

The aim of CRAA is to ensure that the proposed construction of Karugutu-Ntoroko (56.5km), Link to Rwebisengo (8.2km) and Ntoroko Town Roads;

i) Remain resilient under future climate scenarios;
ii) Do not exacerbate vulnerability of people or ecosystems;
iii) Comply with IFC investment criteria on climate risk and GHG management;

9.6.2 Screening of climate and disaster risks within the Project area

The project was screened against five climate hazards as detailed in the table 9-1 below;

Table 9-9-2: CCRA screening for the proposed Road development

No.	Climate hazard	Prevelence
1	Flooding	Frequent & intensifying floods in low-lying villages along Lake Albert and Semliki River.
2	Drought	Extended dry seasons of over four months, with documented livestock losses
3	Extreme heat	Record during the dry seasons
4	Wildfires	Not record

9.6.3 Climate change Risk profile

While communities and agencies have begun responding from adaptive livestock practices to re-location discussions; the scale of projected climate hazards demands a coordinated, well-resourced strategy combining infrastructure resilience, ecosystem restoration, early warning, and sustainable livelihoods. The climate change risk was assessed as detailed in Table 9-2, below;

Table 9-9-3: Climate change Risk profile for the project area

No.	Hazard/ Risk	Hazard/ Risk Profile	Hazard Drivers
1	Flooding	• 2019 flood displaced ~10,000 people; water receded by late 2022, but left infrastructure in ruin • August 2024 floods submerged multiple villages, displacing families and	**Geography:** flat rift-valley terrain with poor drainage and clayey soils **Land-use change:**

		disrupting health, sanitation, school operations, livestock and livelihoods.	wetland destruction, riverbank encroachment, deforestation upstream exacerbating runoff
2	Drought	• Extended dry seasons of 2018 led to ~5,000 cattle deaths and severe water scarcity necessitating long treks for potable water • Local studies show declining rainfall trends and rising temperatures over 1988–2018 — although rainfall changes aren't statistically significant, temperature rise is confirmed	**Geography**: the project area lies in a rianfall shadow **Land-use change**: wetland destruction, riverbank encroachment, deforestation upstream exacerbating runoff
3	Health & Livelihood destruction	• Flooding often destroys sanitation facilities and contaminates water supplies — leading to cholera, dysentery, other water-borne diseases. • Prolonged floods/droughts disrupt agriculture, fishing, cattle keeping; threaten education and increase risks like teenage pregnancies due to school closures	• Poor planning, • Non-resiliant climate change infrastructures

9.6.4 Project Vulnerability to Climate Change Risks

This vulnerability assessment to climate change identifies how climate change impacts might affect a road's functionality and proposes adaptation measures. This will assist to prioritize develop strategies for building a more resilient road project. This assessment typically identifies hazards, evaluating vulnerability, and analyzing the impacts on communities and the economy at large.

Table 9-9-4: Project Vulnerability to Climate Change Risks

Hazard	Likehood	Exposure	Vulnerbility	Risk Rating	Adaptation Measure
Flooding	Very High	• Construction Camps • Access roads • Road sections across the flood plains • Road sections in Kanara	Medium (current drainage inadequate) Delayed project Completion	**High**	• Elevate all axilluary sites, • improve drainage capacity • Planning should be considerate of flooding regimes
Drought	Medium	• Water supply for concrete mixing • Water supply for camp activities	Medium	**Medium**	• Rainwater harvesting, • water recycling
Extreme heat	Medium	Outdoor workers	High (heat stress risk)	**Medium**	• Shade shelters, • work-rest cycles
Health & Livelihood destruction	Very High	• Communities and construction workers living in communities • Flooding often destroys sanitation facilities and contaminates water supplies hence disease out-breaks	High (disease out breaks, communities and construction workers interract)	**High**	• Have an adquate Risk and Preparedness plan with a strong screening procedure incase of disease outbreak

9.6.5 Adaptation & Mitigation measures

Schools, health centers, roads, sanitation, water systems regularly inundated or impaired diminishing service delivery and mobility. The climate change risk is still a continuous challenge within the project area. Regarding the implementation of Karugutu-Ntoroko Road and associated links, the following measures should be considered;

i) **Engineering measures:**
These include;
- Adequate drainage structures should be provided along major water ways;
- The Road designs should be raised high enough to avoid being sub-merged during flood seasons;
- Apply storm-resistant structures;

ii) **Nature-based solutions**
- MoWT should invest in ecosystem & watershed restoration: including restoration of Reforest riverbanks, wetlands, upstream catchments to buffer runoff especially for River Wasa and River semuliki;

iii) **Operational measures**
- seasonal work scheduling,
- backup water supplies.

9.7 Cumulative Impact Assessment (CIA)

A Cumulative Impact Assessment (CIA) is a process used to evaluate the combined effects of multiple activities, developments, or stressors on the environment over time. Unlike standard Environmental Impact Assessments (EIA) that focus on a single project, CIA looks at the broader picture, considering past, present, and reasonably foreseeable future actions.

Cumulative Impact Assessment (CIA) under IFC Performance Standards is a structured process to identify and manage the combined environmental and social impacts from multiple activities, projects, or natural processes that may interact over time and space. With reference to IFC Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets (2013), the CIA considered;

i) **Multiple projects**, operators, or natural pressures affect the same Valued Environmental and Social Components (VECs).
ii) **Impacts may occur over time**, across space, or in combination with natural events.

The key principles that were considered during CIA for Karugutu-Ntoroko road project and associated links are;

i) Beyond the project foot print (regional and temporal context).
ii) Focus on VECs – Identify environmental or social components that are critical to communities, ecosystems, or livelihoods.
iii) Multiple contributors – Considers other past, present, and reasonably foreseeable actions by other parties.
iv) Dynamic and adaptive –iterative review and stakeholder engagement.

9.7.1 Scope of CIA

i) Spatial

The cumulative impact assessment was conducted for the Albertine Graben region, around lake Albert. Covering major development projects that have significant impacts on Socio-economic settings as well as biological diversity.

ii) Temporal

The CIA considered projects since 2010; that have been implemented as well as those that are planned within the protected areas around Lake Albert.

iii) VEC

The VEC considered; Water resources (River flow regimes, Groundwater levels), Biodiversity, livelihood Resources (Grazing lands, Fishing areas, Agricultural lands), Social Cohesion especially land tenure security.

9.7.2 Current status of VECs

No.	VEC	Summary of Status	Importance
1	Water resources	The Albertine Rift is characterized by a chain of Rift Valley lakes formed by geological rifting. Lake Albert, the largest, is shared by Uganda and the Democratic Republic of Congo. Other significant lakes include Lake Edward and Lake George. Numerous rivers flow from the surrounding highlands into these lakes. Notable rivers include the Semliki (which flows from Lake Edward into Lake Albert), the Victoria Nile (which flows from Lake Kyoga into Lake Albert), and the Mpanga, Nyamwamba, and Mubuku rivers, among others. The Graben has two main aquifer environments: unconsolidated sediments within the trough and weathered basement rocks.	***Ecosystems:*** The water resources of the Albertine Rift are vital for maintaining diverse ecosystems, including swamp-forests, woodlands, and riverine habitats, which support a wide range of wildlife. ***Human Use*** These water resources are crucial for human consumption,agriculture, and other economic activities.
2	Biodiversity	The Albertine Rift is renowned for its exceptionally high biodiversity, holding more vertebrate species than any other region in Africa. It's a hotspot for endemic species, particularly birds and mammals, and is recognized globally as a biodiversity hotspot, Endemic Bird Area, and a Global 200 Ecoregion.	Its exceptional biodiversity makes it a critical area for conservation efforts, facing challenges from human population growth, poverty, and conflict.
3	livelihood Resources	Livelihoods in the Albertine Rift are diverse, ranging from agriculture	**Fishing** Fish landing sites along lakeshores (Albert, Edward,

No.	VEC	Summary of Status	Importance
		and fishing to timber harvesting and increasingly, oil and gas activities. The region's rich biodiversity and natural resources play a crucial role in supporting these livelihoods, but also face pressures from population growth, agricultural expansion, and resource extraction.	and George) support fishing, fish processing, and related businesses like food vending and hospitality. However, these sites often lack adequate social and economic infrastructure and water sanitation facilities. Oil exploration and drilling activities pose risks to fish landing sites, including potential water contamination from spills **Artisanal and small-scale mining** also contribute to livelihoods in the region, but can have negative impacts on conservation and community well-being. **Tourism**, particularly in protected areas like national parks, also offers some employment opportunities **Agriculture** Small-scale, multi-cropping subsistence agriculture is common, with some areas transitioning to larger-scale cooperative farming like tea. Land is often converted from forests for agricultural expansion, including cultivation of crops like maize, which is increasingly replacing traditional multi-cropping systems.
4	Social Cohesion	Involuntary displacement is primarily driven by large-scale development projects, particularly oil and gas exploration and infrastructure development. This displacement often involves the loss of land and livelihoods for local communities, raising concerns about the impact on vulnerable populations and the environment.	

9.7.3 Multiple projects in Albertine Graben

9.7.3.1 Oil and Gas

Ntoroko, Lake Albert. Additionally, within the North of Lake Albert, Total Energies and China National Offshore Oil Company (CNOOC) are expediting the Oil and Gas production processes. Oil was first discovered in Uganda in 2006 by Hardman Resources and Tullow Oil in the Lake Albert Basin. Estimated reserves: Uganda holds approximately 6.5 billion barrels of oil, of which 1.4 to 1.7 billion barrels are estimated to be recoverable.

Key oil fields include;

- Kingfisher Field (operated by CNOOC Uganda Ltd.)
- Tilenga Project (operated by TotalEnergies EP Uganda)
- Kaiso-Tonya and Mputa-Nzizi-Waraga fields

Major Oil Projects

(i) Tilenga Project Operated by TotalEnergies in partnership with Uganda National Oil Company (UNOC) and CNOOC. Covers six oil fields in Buliisa and Nwoya districts. Will produce up to 190,000 barrels of oil per day at peak.
(ii) Kingfisher Development Area Operated by CNOOC Uganda Limited. Located in Kikuube and Hoima districts. Expected peak production of 40,000 barrels per day.
(iii) East African Crude Oil Pipeline (EACOP) A 1,443 km heated pipeline from Hoima (Uganda) to Tanga Port (Tanzania). Jointly developed by TotalEnergies, CNOOC, UNOC, and TPDC; will transport crude oil to international markets.

Key concerns include:

- Biodiversity loss due to oil exploration in protected areas.
- Oil spills and water contamination risks.
- Displacement of communities and land acquisition issues.
- Cumulative environmental impacts from multiple developments.

9.7.3.2 Road Construction

Several road projects are underway or planned, including upgrades to existing roads and the construction of new ones, to improve connectivity and facilitate the transportation of equipment, personnel, and eventually, oil and gas. The government is investing in a network of over 700 kilometers of roads in the Albertine region to enhance connectivity and improve living standards. Some of the specific road projects include:

i) Kabaale-Kiziranfumbi
ii) Hohwa-Nyairongo-Kyarushesha-Butole
iii) Kaseeta-Lwera
iv) Hoima-Buliisa-Wanseko
v) Masindi-Biiso
vi) Masindi-Paraa-Pakwach
vii) Sambiya-Murchison Falls

The Fort Portal-Bundibugyo Road was upgraded to bituminous standards, a project that took over 10 years to complete.

9.7.3.3 Hydro power projects and Transmission lines

The Albertine Graben in Uganda has significant hydropower potential, with several projects already underway and more proposed. Key projects include the Muzizi Hydropower Project and mini-hydro sites on rivers like Wambabya and Waki, along with potential at Murchison Falls.

Uganda Electricity Generation Company Limited (UEGCL) is developing the 48MW Muzizi Hydro Power project (HPP) at the lower course of the Muzizi River in Western Uganda, South east of Lake Albert with the powerhouse approximately 6km upstream of Lake Albert at the eastern flank of the Albertine Graben. Further infrastructural developments in form of Hydro power plants and transmission lines are underway in the project area and the neighborhoods.All these infrastructural development projects have similar previous, current and future Socio-economic and biophysical impacts all major impacts of these projects have been highlighted (Table 9-2).

9.7.4 Assessment of cumulative impacts

Table 9-9-5: Assessment of Cumulative Impacts

No.	Impact	magnitude	Prob	Extent	Duration	Significance
(a)	**Socio-economic**					
1	Loss of land and property	10	5	5	5	100
2	HIV/AIDS and other STDs	6	5	3	5	70
3	Social disruption of communities	8	4	3	5	64
4	Potential of child abuse	2	5	1	3	30
5	Human wildlife conflict	2	2	2	1	10
6	Accumulation of waste	8	4	2	4	56
7	Air, water and nosie pollutions	10	5	5	5	100
(b)	**Bio-physical**					
1	Vegetation Clearances	10	5	5	5	100
2	Loss of Threatened species	2	2	2	1	10
3	Habitat Fragmentation	6	5	3	5	70
4	Spread Colonies of Invasive plants	2	5	1	3	30
5	Habitat alteration and destruction	10	5	5	5	100
6	Pollutions and Contaminations	10	5	5	5	100

Scale of assessment

Symbol	No	minor	Low	Moderate	High	Very High	No
M=Magnitude	0	2	4	6	8	10	0
P=Probability	0	1	2	3	4	5	0
E= Extent	0	1	2	3	4	5	0
S=Significance	<10	10-20	< 30	40-50	> 60		

Where:
D=DURATION: (0 to 1 years) –1. (2 to 5 years) –2. (5 to 15 years) –3. (> 15 years) – 4 or permanent – 5
And S= (E+D+M) P

Addressing cumulative impacts is a concerted effort, the developers should benchmark good practices of addressing these impacts including addressing in their own ESIS.

10.0ENVIRONMENT AND SOCIAL MANAGEMENT AND MONITORING PLAN

The Environmental and Social Management and Monitoring Plan (ESMMP) summaries the specific actions that the contractor and implementing team will take to reduce environmental and social effects linked to road development across various stages. The core tool the Contractor will use to monitor is a standalone Environmental and Social Implementation Plan (ESIP). This ESMMP is intended to guide the contractor in the preparation, implementation, monitoring and reporting on the ESIP. The ESIP will need to be regularly reviewed and updated as the project evolves to reflect any changes in project implementation and organization as well as regulatory requirement.

The ESMMP is intended to ensure that all project activities comply and adhere to environment and social safeguard requirements under MoWT Environment and Social Safeguards Policy; national requirements and international best practices; and IFC Performance Standards; conditions of Approval Certificate of ESIA and mitigation measures proposed in this ESIS.

10.1 Specific objectives of the ESMMP

Among specific objectives of the ESMMP includes;

i) Assist in ensuring continuous compliance to IFC performance Standards;
ii) Provide a mechanism for ensuring that measures identified in the ESIA mitigate potentially adverse impacts and unforeseen or unidentified impacts are implemented until construction is complete.
iii) Provide assurance to regulators and stakeholders that their requirements with respect to environmental and Socio-economic performance will be met. and
iv) Provide a framework for MoWT's compliance, auditing and inspection programmes.

10.2 Monitoring

Monitoring will be undertaken to check progress and the resultant effects on the environment as the implementation of the project proceeds. During the construction stage, implementation of the proposed mitigation measures shall form part of the developer's daily routine. These shall be checked against their effectiveness in reducing the negative impacts or enhancing the benefits identified in the Environmental Social Impact Statement. Monitoring should also include regular reviews of the impacts that cannot be contemplated at the time of carrying out baseline study. Appropriate actions should be undertaken to mitigate any upcoming negative effects.

Monitoring procedures will comprise formulations of enforceable contractual terms to ensure contractors implement the ESMMP. Certifying a project completion and handover process necessitates UNRA and NEMA approval for social-environmental aspects. Detail of the ESMMP is provided in Table 10-1 below;

Table 10-1: Environmental and Social Management and Monitoring Plan

	Impact/ Mitigation/ Enhancement and Commitments	Preferred Outcomes	Monitoring/ performance Indicators	Frequency	Project Phase	Responsible party	Incremental Costs (Table	Capacity Building Requirements
1	Impacts: Social expectations in anticipation for jobs, compensation, speculation and hostility from affected communities Mitigation(s): i) Information regarding the project should be transparently disseminated to the community; ii) The project should work closely with the security management team within the project area including the Gombolola Internal Security Officer (GISO), UWA, Resident District Commissioner (RDC), The UPDF and local leaders; iii) Community engagements should be continuous from commencement of studies throughout the project cycle so that all concerns are addressed;	Controlled expectations,	i. Stakeholder engagements conducted, ii. Grievance redress committees established, iii. Resettlement Action Plan iv. Disclosure of valuation report v. Comments from PAPs	During feasibility, ESIA and RAP studies, mobilization and before works commence	Pre-construction	MoWT, CGV	Conducted	Not Applicable
2	Impacts: Loss of agricultural land, property and crops Mitigation(s): i) Prepare an adequate RAP to address vulnerability and Liviehoods. ii) Preparation, approval by CGV and implementation of the RAP iii) Adequate, fair, and prompt compensation and resettlement of PAPs will be done before project construction activities commence. iv) Communicating to the PAPs early enough on the schedules of the project so that, they can adjust on a number of their livelihoods plans. v) RAP will define mechanisms for the Resettlement of some of the PAPs as their needs may demand.	i. Adequate, fair, and prompt compensation and resettlement of PAPs. ii. Effective and well-organized communication between the PAPs and the contractor. iii. Community stability.	• Stability of the communities and other stakeholders. • Number of Complaints rose to Grievances Management Committees. • Number of meetings organized between the contractor and PAPs.	Monthly for first 6 months	Construction	- MoWT - Contractor - Local Authorities	Incorporated into the RAP phases	None
3	Impacts: Intermittent flooding of communities Mitigation(s): i) Adequate hydrological designs; ii) Upgrading the existing structures in the sections mapped to be at risk of flooding iii) Quick response to livelihood restoration as part of injurious affection iv) All potential displacement due to flooding should be adequately provided for under injurious affections; v) consider construction of lateral structures such as sheet piles to act as water proofing that prevent flood extent from reaching built up areas beyond road reserve.	Zero experiences of community floods	Hydrological parameters Including; *-Water Levels* *-Water flows* Adequate designs	Quarterly, and after every down pour (during construction)	Construction Operation (for 2 rainy seasons)	- MOWT - Contractor - Local Authorities	Cost for structures catered for under works ~$10,000 for monitoring	Not Applicable
4	Impact: Impacts from workers' camps Inadequacy of integration of environmental and social considerations into design feasibility assessment resulting into poor and inappropriate environmental and social safeguards for workers' camps.	Optimal operations at the campsite without interference with community wellbeing	Location map, Approval from NEMA Approval form local authorities	Once	Pre-construction During Construction	- Contractor	Contractual sum ~$20,000 per site	Not Applicable

	Impact/ Mitigation/ Enhancement and Commitments	Preferred Outcomes	Monitoring/ performance Indicators	Frequency	Project Phase	Responsible party	Incremental Costs (Table	Capacity Building Requirements
	Mitigation(s): Conduct adequate ESIA for all campsites							
5	Impact: Impacts from quarry sites and bituminous plant Mitigation(s): i) Conduct adequate ESIA for all auxiliary components; ii) Quarries affecting human settlements undertook abbreviated RAPs and obtained approvals; iii) Stone should be exploited is such a way that does not leave sharp cliffs; iv) Dust from the stone crushers are suppressed by wet crushing; v) Rehabilitation/restoration of quarries will have to be undertaken. vi) Preparation and implement of Health and Safety Plan, vii) Health and Safety education programmes. viii) Preparation and implement of a Traffic Management Plans ix) Enforce a strict blasting schedule and install a community warning system x) Quarry sites should be located away from settlements.	Optimal operations at the quarry and bituminous sites without interference with community wellbeing - No accidents result from project activities - No public health problems result from project facilities.	- Location map, - Approval from NEMA - Approval form local authorities - Incident/accident reports involving the public Availability of a Health and Safety plan	once	Pre-construction During Construction	- contractor	$40,000	
6	Impact: Increased HIV/AIDs illnesses due to influx of workers Mitigation (s): i) maintain a strict "no socializing" policy, workers' camps could be hotspots for prostitution or illicit sexual relationships; ii) HIV/AIDS sensitization programmes shall be conducted at the workers' camps	i. Zero new infections among young teenagers. ii. Reduced rate of HIV/AIDs transmission iii. Improved HIV/AIDs services	Activities of the Nominated Service Provider (NSP)	Monthly	construction	- Contractor - Local Authorities - NSP	$60,000 for HIV awareness services	Training in HIV/AIDS counseling
7	Impact: i. Environmental contamination due to hazardous waste from Workers' camps Mitigation (s): ii. Preparation and implementation of a Waste Management Plan iii. Preparation and implementation of a Health and Safety plan iv. Locate worker's camps and equipment yards away from communities. v. Screen off site to intrusion by community vi. Develop rational waste management systems vii. Transportation and disposal of hazardous waste will be undertaken by licensed transporters to facilities licensed for storage and disposal of hazardous waste. viii. The waste should be sorted and resources recovered. Biodegrable waste shall be	i. High degree of sanitation at the campsite ii. Protection of public health and the environment. iii. Zero exposure to hazardous substances	Frequency of waste collection Prevalence of sanitation related illness Sanitation related complaints from the communities	Daily	Construction	- Contractor's Team - Contractor's CLO	Inbuilt in Contractor's price. ~$75,000	None

	Impact/ Mitigation/ Enhancement and Commitments	Preferred Outcomes	Monitoring/ performance Indicators	Frequency	Project Phase	Responsible party	Incremental Costs (Table	Capacity Building Requirements
	transported to Kampala waste composite plant at Kiteezi while recyclable waste will be transported to recycling plants. ix. Operationalize a Management plan for construction waste x. Enforce buffer distance regulations from surface water sources xi. Preparation and implementation of a hazardous waste management plan xii. Develop onsite sewage management systems, Health and Safety education Programmes. xiii. Design vehicle wash areas so as not to contaminate the environment. xiv. Hazardous waste should be stored in facilities designed and licensed for storage of hazardous waste by NEMA							
8	Impact: Prostitution, crime, insecurity and drug abuse due to influx of people Mitigation (s): i. Prepare and implement a Security Management Plan with clear measures to protect workers and communities. ii. The contractor shall involve local (LC) leaders in labour recruitment to ensure people hired have no criminal record. iii. Local authorities and the contractor shall collaborate with police to contain criminal activities and drug abuse. iv. The contractor shall sub-contract a local security firm to take charge of Camps and Machine yard security	i. Amicable working environment ii. Contained cases of prostitution, drug abuse and crime	Crime rates Prostitution rates	Daily	Construction	- Contractor's Sociologist - Local authorities - E.g. Police	$25,000 for Health Camps	Conduct regular Health camps and sensitize all employees on dangers of drugs, prostitution. Sensitize workers on crimes and promote neighborhood watch
9	Impact: Potential of child abuse e.g. child pregnancy/ marriage, sex work, school dropout and defilement Mitigations i) A child protection plan will be developed and provided to local stakeholders ii) Discourage contractors from using children as laborers iii) Ensure that community have access to and know of and report abuse using the national child abuse hotline 116 iv) Hoard off construction sites to ensure controlled interaction between children and workers v) Ensure close monitoring of worker's behavior/conduct are in place vi) Parents/guardians should be sensitized and held accountable for children leaving and arriving home before dark	i. Violence free childhood ii. Incessant school life	Number of child abuse cases Rate of school drop outs Premature pregnancies	Weekly	construction	Contractor's CLO Local authorities MOWT	$15,000	None

	Impact/ Mitigation/ Enhancement and Commitments	Preferred Outcomes	Monitoring/ performance Indicators	Frequency	Project Phase	Responsible party	Incremental Costs (Table	Capacity Building Requirements
10	Impact: Social order disruption: Increased gender based violence Mitigation (s): i) Female workers will be sensitized on their sexual rights. ii) Have polices to promote non-discrimination and equal opportunities iii) Establish zero tolerance policies and codes of conduct related to violence against women and girls (VAWG). iv) Adequate briefing and education on the laws against defilement and other sexual offences. v) There will be gender sensitivity in the project with respect to facilities (toilets and bath shelters).	Violence free community Protection of women and girls' rights	Cases of gender based violence	Weekly	Construction	Contractor's Sociologist Local authorities MOWT	$25,000	Sensitize workers, communities on their rights, gender based issues.
11	Impact Impacts on vulnerable groups Mitigation (s) i) Provide access facilities for vulnerable (women, children, elderly, blind) people along the project area. ii) Institute and enforce a sexual harassment policy. iii) Children below 18 years should not be recruited	Preserve rights of vulnerable people	Complaints from vulnerable people	weekly	Construction and operation	Contractor MOWT District Environment Officers	$35,000	-
12	Impact: Temporary loss of livelihoods Mitigation (s) i) Give timely notice to affected business units. ii) Follow relevant compensation procedures.	Affected people find alternative livelihoods. Community wellbeing does not decline.	Level of litigation involving communities and road contractors	Monthly	Construction phase	Contractor's Sociologist MOWT Local authorities CBOs And NGOs	USD 40,000	Vocational skills trainings
13	Impact: Occupational Hazards and Risks Mitigation (s) i) Prepare and implement an Occupational Safety and Health Plan in line with Occupational Safety and Health Act of 2016 including; ii) induction training to all workers on OHS; iii) A professional t Safety manager will have recruited and deployed on the project by the Contractor; iv) Work place safety committees will be set up on the projects; v) Contingency and Emergency Plan	- No injuries to workers - Reduced risks to the work force	Number of injuries reported per day during the construction phase. Availability of a safety management plan approved by the employer Deployment of a competent Safety Manager on a full time basis Existence of functional safety committees	Daily	Construction phase	Contractor' Team MOWT Local authorities	Inbuilt in Contractor's price. ~$80,000	Occupational Hazards and Risks training
14	Impact: Air pollution from dust Mitigation (s)	Improved air quality with suspended particulate matter with national and international limits	Level of suspended particulate matter in air at areas under construction	Daily	Construction	Contractor MOWT NEMA	Inbuilt in Contractor's price. ~$24,000	-

	Impact/ Mitigation/ Enhancement and Commitments	Preferred Outcomes	Monitoring/ performance Indicators	Frequency	Project Phase	Responsible party	Incremental Costs (Table	Capacity Building Requirements
	i) Prepare and implement a dust management plan ii) Construction sites, transportation routes and materials handling tools will implement dust suppression measures including water spraying on dry and windy days and speed reduction measures such as humps to reduce dust emissions iii) The speed limit should not exceed 30km/hr. during construction. iv) Cover trucks transporting construction materials.		Level of complaints from the public					
15	Impact: Storage of construction materials, accidental spills and fires Mitigation (s) i) Avoid open stock piling ii) Construct silos for long time storage iii) Provide bunded storage for fuels iv) Install fire suppression systems v) Design ware house safety manual vi) Maintain a portable spill control pack.	Pollutants resulting from warehouse activities do not contaminate the surrounding environment. Ensure worker safety at all times in the warehouse	Regular audits on performance of pollution control systems	After every 3 months	construction	Contractor MOWT NEMA	Inbuilt in Contractor's price.	Training hazardous waste handling and fire fighting for warehouse personnel
16	Impact: Increased noise and vibration levels Mitigation (s) i) Prepare and implement a dust, noise and vibration management plan; ii) Schedule construction activities near school during weekends or during school holidays iii) Working hours will be restricted from 0700Hrs to 1900Hrs around community settlements. iv) Building close to sites should be monitored for any impacts from vibrations. Damages buildings will be repaired. v) Ensure vehicle and equipment maintenance schedules are followed. vi) Vehicles and equipment generating excessive noise shall not be operated on the project. vii) workers should be provided with appropriate ear protective devices.	Noise released does not exceed maximum permitted national standards.	Monitored noise levels at construction sites Level of complaints from the public	Daily	Construction and Operation	Local authorities MOWT Contractor	None	none
17	Impact: Disruption of roadside trade Mitigation (s): i) Resettlement Action Plan (RAP) will be prepared to ensure that project affected persons are appropriately compensated ii) Project Affected Persons (PAPs) will be notified and given sufficient time to relocate if their structures are affected	Grievance free communities	Number of unsolved cases	Daily	Construction and Operation	Local authorities MOWT	Captured within the RAP	None

	Impact/ Mitigation/ Enhancement and Commitments	Preferred Outcomes	Monitoring/ performance Indicators	Frequency	Project Phase	Responsible party	Incremental Costs (Table	Capacity Building Requirements
18	Impact: Cliffs resulting from deep cuts and embankments from fills Mitigation (s) i) Protect road embankments and slopes with stone walls, Gabions, erosion control mats. ii) Plant vegetation on graded embankments and slopes to improve aesthetic beauty	Controlled erosion and sedimentation of water bodies from road embankments and slopes	Rate of siltation in nearby surface water Rate of rill formation on road sides	Weekly	Construction and operation phases	Contractor team -MOWT -District Environmental Officer	$90,000.	None
19	Impact: Inconveniences due to traffic diversions Mitigation (s): i) Preparation and implementation of Traffic Management Plan ii) Place signs warning road users about traffic detours. iii) Have guides at detours to organize traffic.	Alternative routes for all road users	Time spent on the road	Daily	Construction	Local authorities Contractor	$10,00	None
20	Impact: Increased road accidents Mitigation (s): i) Preparation and implementation of Trafic Management Plan ii) Mark off accident hotspots with appropriate road signs. iii) Provide necessary road signs along the constructed roads. iv) Conduct road safety campaigns for vulnerable groups like children. v) Installation of humps and speed control measures.	roads safety for all users	Number of road accidents	Monthly	Construction and operation	Local authorities Contractor	$50,000.	Road safety campaigns for vulnerable groups like School children.
21	Impacts: Social discrimination, unequal treatment and harassment at the work place Mitigation(s): i) Develop policies to promote non-discrimination and promote equal treatment and communicate them to Workers, managers and supervisor ii) Ensure that decisions on hiring, working conditions, pay benefits, termination are not made on the basis of discrimination grounds. iii) Ensure that women and men are paid the same wages for work of the same value. iv) Employ competent Human Resource manager.	Non-discrimination, unequal treatment and non-harassment at the work place	Policies on non-discrimination, unequal treatment and non-harassment at the work place	Continuous		-		
22	Impact: Impacts from poor disposal of spoil including; disposal in sensitive ecosystems, interruption of hydrological systems,	- Resource recovery of spoil materials - Protection of sensitive ecosystems	-Spoil Management Plan -Integrity of the ecosystem -Landscape stability	Daily	Construction	Contractor	Inbuilt in Contractor's price. ~$50,000	

	Impact/ Mitigation/ Enhancement and Commitments	Preferred Outcomes	Monitoring/ performance Indicators	Frequency	Project Phase	Responsible party	Incremental Costs (Table	Capacity Building Requirements
	Mitigations: i) Prepare and implement a spoil management plan before commencing earthworks ii) Desired quality materials from earthworks should be filled within the carriage way iii) Use spoil material in borrow pit restoration. iv) Properly store spoil for re-use during rehabilitation of embankments and slope. v) Do not stockpile near sensitive environments like wetlands.	- Maintaining the integrity of the landscape						
23	Impact: Fragmentation of habitats hence destruction of fauna breeding and feeding sites Mitigation (s): i) Install an appropriate hydrological drainage system; ii) define project boundaries around wetland areas to reduce on the zone of impact; iii) Cut soils should be filled only within the proposed road section (carriage way); iv) Restore all ecologically sensitive sites after construction phase using spoil. v) Construction should be done on viaducts where possible to maintain wetland integrity	Continuous integrity and TSWR connectivity	Species diversity of Fauna	Daily	Construction	Contractors' Ecologist MOWT's Environmentalist District Environmental Officer	$80,000.	None
24	Impact Potential loss of biodiversity Mitigation(s): i) Implement a Biodiversity Monitoring Programme during construction and for the first three years after completion of works ii) Update and implement protection measures for wetland habitats (swamp, river, streams, and pools) and associated species during construction and operation of the Project iii) Support development and the implementation of TSWR restoration Offset Plan	Achieving a Net-Gain/ and No Net Loss of Biodiversity	Implementation of the Biodiversity Action Plan	Quarterly	Construction and operation	UWA, Contractor and MOWT	$1,500,000	Biodiversity action planning
25	Impact: Spread of invasive/ alien species Mitigation (s): i) manage the existing invasive plant species spread through sensitizations; ii) Ensure no foreign plant species are introduced in the project area;	Invasive species free areas	Diversity and occurrence of invasive species A alien and Invasive Species - Control Plan	during annual Environmental audits	Construction and operation	Contractors' Floral Ecologist	Inbuilt in Contractor's price. ~$40,000	Sensitize workers on invasive species

	Impact/ Mitigation/ Enhancement and Commitments	Preferred Outcomes	Monitoring/ performance Indicators	Frequency	Project Phase	Responsible party	Incremental Costs (Table	Capacity Building Requirements
	iii) Efforts through mechanical elimination of invasive plants within the project areas should be made; iv) Develop and implement an Alien Invasive Species Control Plan during construction phase							
26	Impact: Accumulation of waste Mitigation (s): i) Locate worker's camps and equipment yards away from Sensitive ecosystems; ii) Develop waste management system. iii) Solid waste disposal sites will be located away from watercourses and have restricted access. iv) Wherever feasible, waste recovery and reuse will be undertaken.	Proper waste management	Amount and prevalence of waste generated	Daily	Construction	Contractor	Inbuilt in Contractor's price.	-
27	Impact: Pollution of Soil, air and Water Mitigation (s): i) Solid waste disposal sites will be located away from watercourses and have restricted access. ii) Establish a cut off drain on the upper slopes of the site iii) Establish sediment traps/basins on the lower slopes iv) Ensure that potentially contaminated runoff from storage areas should be drained through oil traps. v) Avoid open stock piling vi) Construct silos for long time storage vii) Provide bunded storage for fuels	Pollutants resulting from warehouse activities do not contaminate the surrounding environment.	Regular audits on performance of pollution control systems	Daily	Quarterly audits	Pre-construction, Construction and operation	Part of contractor's bid ~$10,000	Training hazardous waste handling for warehouse personnel, camp attendants
28	Impact: Destruction of Physical Cultural Resources Mitigation (s): Construction activities should comply with mitigation actions prescribed and Cultural Resources Management Plan (Appendix 4))	Zero impact on PCR during construction	-Training of workers conducted in PCR conservation. - PCR inspection report.	Daily and quarterly audits	Throughout construction	Contractors -MOWT, Department of Museum & Monuments	Inbuilt in Contractor's price. ~$50,000	none
29	Impact: Contribution to climate change Mitigation (s): i) All combustion equipment on site including operational machinery and generators should be serviced regularly. ii) High carbon sequestrating tree planting should be planted along road corridors in communities at an interval of 100m on both sides of the road. iii) Avoid using dilapidated machinery. iv) All on site burning should be done and controlled under a proper chimney. v) Avoid cutting trees as much as possible	Zero contribution to climate change	Number of Trees planted with the road corridor Monthly machinery servicing report	monthly	Construction and operation	Contractor	$100,000	Basic trading in Tree planting

10.3 ESMMP Monitoring and Reporting

Laxity in implementation and reporting on safeguards issues is common amongst contractors largely because they do not take safeguards issues seriously. This can be addressed by requiring contractors to prepare monthly environment and social monitoring reports. These should either be pay items and clearly included in the BoQs or a condition for certification and payment approvals.

Contractor's safeguards reports are usually characterized by failure to include useful monitoring indicators such as safety statistics (fatalities, minor injuries, near misses, etc.), number of trees cut, and/or replanted amongst others. The contractors will be required to train staff on safeguards monitoring and reporting. The contractors need to undertake proper recordkeeping of all safeguard activities. The contractors should liaise with District technical offices such as the District Environment Officer, District Community Development Officer, District Engineers and Physical Planner to ensure proper monitoring and timely implementation of project activities.

The Supervising Consultant shall be required to maintain a Compliance Tracker to follow-up on implementation of corrective instructions during project implementation and also guide on the use of financial remedies to evoke Compliance. For example, each instruction that does not get implemented for two consecutive reminders would attract financial penalty without further reminder or withhold of any financial certificate due for payment.

The Contractor will be required to report accidents to the supervising engineer in a timely manner and police, including maintaining an accident and incident log; Serious Accidents shall be reported to the Supervision Consultant immediately and to MOWT within 12 hours and to Development partners (IFC) within 24 hours of occurrence.

10.3.1 Project Reporting Commitments

The Contractor is required to prepare regular reports (monthly, quarterly, and annual) on environmental, social, health and safety performance. On an annual basis, the Contractor will, under the guidance of UNRA, engage services of an independent environmental and social compliance auditor to determine the level of the Project's environmental and social performance. The reports provide the information and data required to determine compliance with national legal requirements as well as the IFC.

The aspects to be reported on include; Biodiversity integrity; Flooding; grievance management, labour influx, traffic management, community health and safety and security, air quality, erosion and water pollution, waste management, emergency response, HIV/AIDS and gender management, Environmental and social restoration, among others.

10.3.2 Decommissioning and restoration of disturbed areas

At the end of the construction period, the Contractor must ensure restoration of all disturbed areas both with TSWR and outside; including material sites through proper landscaping, backfilling and restoring topsoil, re-introduction of genetic species e.g. natural re-grassing similar to those destroyed in order to re-establish the natural local ecosystem. The final payment must be tagged to successful restoration activities.

10.4 Responsibilities for implementing the ESMMP

10.4.1 MOWT (Project Developer)

The Project Developer will:

i) Have overall responsibility for environmental and social compliance;
ii) Check that penalties for non-compliances with contractual environmental commitments are actioned; and
iii) Ensure that adequate supervision for implementation of the ESMMP is provided at all times;
iv) Ensure that appropriate resources are allocated to facilitate environmental and social management of the Project, including financial and human resources;
v) Review for quality and approve the Contractor's ESIP for project implementation, ESIAs for project associated facilities and the Final Environmental Mitigations Report;
vi) Undertake regular compliance audits, including the mandatory Annual Environmental Compliance Audit in accordance with the National Environment Act.

10.4.2 Project Supervision Consultant

The Supervision Consultant will:

i) Approval acceptable sites for project associated facilities prior to their respective ESIAs;
ii) Check that the required management and monitoring measures identified in the ESMMP are incorporated into the ESIP;
iii) Enforce compliance with the contractual environmental and social requirements;
iv) Issue any penalties for non-compliances with contractual environmental commitments.
v) Monitor the implementation of the ESIP;
vi) Regularly review and cause updating of the ESIP;

10.4.3 Contractor (s)

The contractor(s) shall:

i) Develop an ESIP in line with this ESMMP prior to construction, providing detail to meet environmental and social management requirements, and to the satisfaction of the Supervision Consultant;
ii) Effectively implement and manage the ESIP to the satisfaction of Supervision Consultant and MOWT;
iii) Monitor, record, audit and conduct surveillance of the implementation and effectiveness of the ESIP and report their effectiveness to Supervision Consultant;
iv) Report regularly to the Supervision Consultant's Environmental and Social Specialists regarding environmental and social performance;
v) Prepare regular reports (monthly, quarterly, and annually) on environmental, social, health and safety performance.
vi) Undertake adequate environmental and social assessments, including annual environmental compliance audits, for project associated facilities;
vii) Recruit qualified and experience environmental and social personnel to implement the ESMMP;
viii) Report environmental and social incidents to the Supervision Consultant, MOWT and relevant government authorities. Furthermore, document actions taken to rectify and improve the situation;

ix) Check that all other requirements as described in the contract specification and other licenses, certificates and permits are complied with;
x) Review and update the ESIP, during construction annually or if any significant changes occur; and
xi) Ensure that all workers are regularly sensitised on environmental, social, occupational health and safety aspects of the project to enhance compliance.

10.4.4 Uganda Wildlife Authority (UWA)

The TSWR is under jurisdiction of Uganda Wildlife Authority(UWA). MOWT shall liaise with UWA while executing project activities in the Park for purposes of approving work plans, obtaining permits and security to all workers, among others.

10.4.5 NEMA

i) As part of pre-construction activities, NEMA undertook environmental and social due diligence including review and consideration of previous ESIA studies in consultation with other relevant stakeholders, and issued mandatory Certificates;
ii) NEMA shall also review and consider ESIAs for project support facilities.
iii) Issue permits and licenses required to guide project operations
iv) Monitor implementation of EIA conditions of approval and provide feedback for continuous improvement.
v) Review and consider Environmental and Social Audits for the project road and project support facilities.

10.4.6 Development partners

Development partners including IFC, will;

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

10.5 Grievance Redress Mechanism (GRM)

Project activities usually result into undesirable social-economic and environmental impacts, which may cause feelings of discomfort and unfairness among project stakeholders including PAPs. This often results into grievances which require to be managed easily and promptly so as not to affect project activities.

MoWT (then UNRA) developed harmonized guidelines for GRM (2018) for its roads and bridges projects. The same guidelines will be followed on this project. Every aggrieved person shall be able to trigger this mechanism to quickly resolve their complaints. A grievance in the context of this project is defined as a complaint of dissatisfaction, harm, unfairness or mistreatment raised by an individual or a group within the project area including project workers affected by project processes and activities.

10.5.1 Purpose and Objectives of GRM

The purpose of the GRM is to put in place a simple and easily accessible systematic process for recording, processing and promptly resolving grievances during project planning and implementation. In line with the MOWT ESS policy and MOWT Harmonized Grievance Redress Mechanism, 2018, the specific objectives of the GRM are:

i) To provide project stakeholders with a clear mechanism of channelling grievances;
ii) To set up and make known to all stakeholders a clear, accessible, transparent and efficient system for receiving and resolving grievances;
iii) To record, categorize and prioritize the grievances;
iv) To provide an environment that fosters free and honest exchange of information and ideas in regard to resolving received grievances;
v) To define clear roles and responsibilities of the various parties involved in managing grievances.
vi) To promptly resolve grievances in consultation with stakeholders within a specified timeframe; and;
vii) To escalate unresolved grievances in line with MOWT harmonized GRM procedure

10.5.2 Sources of Grievances

During project planning and implementation, and during project development, grievances arise from multiple sources. These include but not limited to casualties, fatalities, damages to sensitive ecosystems, loss of productive lands and assets, the spread of diseases, sexual violence, physical displacement, loss of livelihoods, as well as delayed completion of essential works among others. More detailed sources are provided in Table 10-2;

Table 10-2: Types of Grievances and examples

Type of Grievances	Examples
Engineering Related Grievances	The major issues related to engineering are to do with the alignment of the proposed road, culvert locations, cost overruns, and the location of detours and diversions.
Environmental Grievances	Disturbance of natural ecosystems, inadequate management of project impacts such as storm water, stone blasting, dust, noise, uncovered borrow areas, encroachment on natural resources, waste disposal, hipping soil spoils in private property or swamps, inadequate restoration of sites, Animal road kills.
Social Issues	Disruption of existing public services e.g. hospitals, schools, water and electricity supply, historical sites, impacts on cultural sites, access to people's homes, unwanted pregnancies, spread of diseases (HIV/AIDS, STI issues), child labour, family breakages, Rape / sexual and Gender-Based Violence, accidents
Land-related issues	Non-payment and underpayment compensation money, over-valuation and undervaluation of same or similar property, loss of livelihoods, omission of the affected property, road reserve queries, return of title, delayed payment, disputes of land ownership, injurious affections e.g. cracks in buildings, house left either hanging or below the road, culvert locations, boundary queries between PAPs, registration of ghost PAPs, forgery of documents (e.g. Land titles, death certificate), obtaining money by false pretense, impersonation

10.5.3 GRM Principles

The proposed GRM is informed by a set of principles explained in MOWT Harmonized Grievance Redress Mechanism, 2018 that include that the GRM is binding and legitimate; GRM is affordable and accessible; GRM is transparent and free from interference; and GRM promotes equal opportunity for all parties.

10.5.3.1 Grievances Management Committees(GMCs)

MOWT promotes the concept of Grievances Management Committees. This is a community based arrangement that seeks to resolve grievances at the lowest level possible using existing or established structures. GMCs are composed of a minimum of 6 persons with; 3 PAP representatives with a gender balance, LC1 chairpersons (ex-officio) and 2 other community members elected by community members from among the elderly or opinion leaders, and or community based civil society leadership:

a. ***The GMC should comprise of: An observer who is a CBO / CSO representative if available–***
b. ***Chairperson LC1 (but not to be elected as chairman of the GMC)–***
c. ***3 Project Affected Persons (at least 1 woman must be elected)–***
d. ***An opinion leader (e.g. elder, religious or clan leader) if available.***
e. ***From the PAPs members, an executive is elected composed of chairperson, secretary and mobiliser.***

GMCs will be set up with the help of sub-county CDOs and LC1 leaders through community meetings with PAPs and general community members along the alignment of project road. In addition, UNRA oriented the GMCs in the process of conflict management procedures in order to enable them to effectively collect, screen, manage and communicate about such grievances to UNRA for verification and consideration (for more details, refer to MOWT- GRM, (2018).

10.5.3.2 Grievances Management

a) A grievance can be submitted by any stakeholder either in writing or verbally through MOWT established channels (contact centres along the alignment, at the headquarters, offices in Kyambogo, UNRA station at Fort Portal).
b) Grievances may, in addition, be submitted through any of the following channels:
   - Via (telephone)Toll-free line: (0800-100-812) or Customer Care Hotline (041- 4-318111)
c) To promote access to this GRM, grievances can be submitted in the local language. At entry, such grievances submitted in the local language will be translated into English and an equivalent explanation given to the complainant or their presentative.
d) To promote quick response and resolution of grievances, minimum considerations for reception of grievances will apply (names of complainant, address, nature of complaint, time and parties involved, any evidence and witness). These minimum considerations will continuously be explained to the community members during stakeholder consultations at the planning and implementation phase of this project.
e) All grievances received will be registered using the GRM forms and logged onto an established GRM database. The complainant should receive an acknowledgment of receipt of the grievance in writing within a reasonable timeframe not exceeding 48 hours. Record forms and logo books already in use by MOWT will be adapted for this project.
f) Paper copies of the grievance form and the community reporting template will be made available to GMCs.
g) Screening and categorizing Grievances: Grievances received will be screened and categorized to establish the nature, type and eligibility of the complaint as illustrated in the table below.

In addition, the GM shall be adapted to be responsive to SEA/SH reporting in the following ways;

- The GM focal persons will be trained on SEA/SH/GBV and on survivor centered approaches including those of confidentiality and safety of complainants/survivors;
- Clear GM procedures and mechanisms for reporting allegations of GBV/SEA are in place,
- Also, a Response and Accountability mechanism should be clearly defined to hold project related perpetrators accountable.

Table 10-3: Screening and categorization criteria

Category	Description	Implication
Category 0:	Complaints that are not related to a MOWT project, project workers or any MOWT activity	Out of scope and require immediate feedback/referral and closure
Category 1:	Queries, comments, and suggestions	Require immediate feedback and closure
Category 2:	Complaints and concerns, which are not criminal in nature or do not require the involvement of police	It is within mandate of MOWT in respect to project activities and require processing
Category 3:	Complaints and concerns that involve allegations that require investigation or intervention by the police or other law enforcement authorities.	Require immediate escalation

Once the complaint is screened for eligibility, then a decision will be taken to either drop it or proceed with assessments and investigation, and the complainant will be duly informed. Complaints that are categorized as (0) or (1) are quite straight forward will be resolved on first contact and closed out. The complainant will be given feedback and sign a closure out form. After screening and ascertaining need for further investigation by MOWT, the grievance will be attended to by the GMC or assigned to relevant department at MOWT as quickly as possible.

10.5.3.3 Grievance Processing

The following process, as adapted from the existing GRM Harmonized Guidelines, 2018; has been made available for PAPs, community and other stakeholders to have their grievances processed once they have been categorized as eligible. Investigation and Feedback (Tier One): If a grievance is categorized as (2) and requires further investigation it will be handled by the GMC or by mandate assigned to relevant officers or department. The process flow is lustrated in Table 10-4.

Table 10-4: Grievances Process Flow

Step	Action	Responsibility
1.	Reception and registration by GMC or UNRA office/centre/contractor/consultant	GMC sec or appointed MOWT representative or contractor /consultant CLO/sociologists
2.	Acknowledgement of receipt to complainant	GMC sec or appointed MOWT representative or contractor /consultant CLO/sociologists
3.	Sorting/categorization	GMC sec or appointed MOWT representative or contractor /consultant CLO/sociologists
4.	Grievance review and investigation (if category 2) and solution discussion	GMC, relevant MOWT department or contractor/consultant representative
5.	Feedback to complainant	GMC sec or appointed MOWT representative or contractor /consultant CLO/sociologists
6.	Notification of responsible parties and implementation of resolution	GMC sec or appointed UNRA representative or contractor /consultant CLO/sociologists
7.	Closure	GMC sec or appointed MOWT representative or contractor /consultant CLO/sociologists

i) In case the complainant is satisfied with the proposed solution, there solution will be effected and grievance closed out. Complainant will sign a grievance closure form witnessed by the UNRA or appointed representative.
ii) The second tier is where the complainant is not satisfied with the resolution at the first tier. A mediator will be identified to mediate between the complainant and MOWT or contractor/consultant. Possible mediators include religious leaders, family/clan leaders, elders and CSO leaders or managers.
iii) At the second tier, a near process described in table above will apply.
iv) In case the complainant is satisfied with the mediator proposed solution, the resolution will be effected and grievance closed out. Complainant will sign a grievance closure form witnessed by the mediator or appointed representative.
v) In case complainant is not satisfied with the mediation resolution, this GRM provides for recourse to the formal and traditional judicial system.
vi) For SEA/SH/GBV cases, the GM shall adapt a survivor centered approach facilitating safe and confidential access to services by complainants/survivors.

10.5.3.4 Women Access and Participation in the Grievance Management Process

Gender differences are taken into consideration when handling grievances. In addition, established forms of gender segregation and defined roles and responsibilities may affect both men and women's access to and use of a grievance mechanism.

Women may also be inhibited or hindered from complaining about specific incidents (e.g., husbands abandoning affected family and eloping with different women after receiving compensation proceeds and gender-based violence emanating from contested sharing of compensation proceeds). In some communities, women may have lower literacy rates than men and be less familiar with formal processes.

Therefore, Grievance Management Committees to be established will include female staff who are aware of and are sensitive to the role of women in local communities and the issues they face. The project will train personnel in the handling of gender-sensitive issues; preferably the safeguards team for MOWT should have training in gender-based violence.

10.5.3.5 Reporting

The MOWT sociologists, CLO and or contractor/consultant appointed representative in charge of grievances make monthly grievances management reports with gender and area disaggregated data; highlighting information regarding the status, management, coordination and implementation of the GRM.

Key indicators relevant for the weekly and monthly GRM reporting are:

i) Number of grievances received / month or week
ii) Number of outstanding grievances currently within each tier of the GRM
iii) Number of outstanding grievances and reasons for non-resolution
iv) Number of resolved and closed out grievances
v) Number of closed out grievances on stipulated time period allowed
vi) Number of closed out grievances outside the stipulated time allowed
vii) Number of escalated grievances and reasons for escalation.

10.6 Monitoring against the ESMMP

The implementation of an appropriate monitoring strategy as part of the ESMMP is important to ensure that existing management measures are effective, and to identify the need for improved or additional measures. The objectives of the Project monitoring programmes are to:

i) Detect and analyse environmental and social trends or changes to develop an appropriate response, where required.
ii) Ensure relevant environmental legislation and licensing commitments of the Project are complied with.
iii) Evaluate the performance of environmental and social management measures to ensure impacts remain at an acceptable level and there is ongoing improvement of Project's operations; and
iv) Provide early warning of potential impacts, determine the extent of anticipated impacts and identify any unforeseen impacts associated with Project activities.

The environmental and social monitoring Program for the construction and operation phases includes the following main categories of monitoring:

a) **Construction and Operations monitoring**: Routine construction monitoring including visual inspections and 'toolbox' meetings with Project personnel to ensure management measures are employed adequately during construction works and during operations.

b) **Discharge (emission) monitoring**: The monitoring of potential contaminants discharged or emitted from the Project to the environment, measured at or near the point of discharge (e.g. discharges from sewage treatment plant at the accommodation camp).

c) **Ambient monitoring**: The monitoring of background conditions and the receiving environments that may be affected by Project activities. Ambient monitoring involve undertaking in upstream and downstream surface waters, along with ambient dust and noise monitoring at all growth centres. While operational and discharge monitoring will determine if environmentally significant releases have occurred, effects on sensitive receptors within the receiving environment can only be determined by ambient monitoring.

d) **Social monitoring**: The monitoring of socio-economic indicators and feedback from Project affected communities, to identify and quantify the direct and indirect impacts of the Project on the surrounding community.

A further category, **investigation monitoring**, will also be carried out when necessary, to determine the occurrence, nature and extent of impacts following an environmental incident (oil leakage, etc.) from the Project, or to verify/refute third-party claims of environmental / social impact.

During the construction decommissioning phase, closure monitoring will be undertaken to assess progress in achieving closure completion criteria for temporary work sites such as decommissioned borrow pits or accommodation camps.

All relevant employees involved in monitoring activities (particularly for field monitoring) will be given appropriate training, where required, by a competent person in the use of:

a) Monitoring techniques, including use, calibration and maintenance of field monitoring equipment, sample collection, labelling and transport.
b) Review and interpretation of field and laboratory monitoring results; and
c) Record keeping and reporting procedures, including using standard forms and databases.

Relevant environmental and social monitoring programme for each Project component are detailed in this ESMMP. These monitoring programs should be revised as appropriate when Project activities or conditions change significantly.

10.7 Auditing and Review

Regular audits of the Project ESMMP and associated management systems will be required. The audits will assess:

i) Adequacy of the ESMMP and associated plans with respect to the scale and nature of anticipated impacts and current development stage of the Project;

ii) Workforce awareness, competence and compliance with the ESMMP and associated plans and procedures;

iii) Performance of managers and operators in implementing, maintaining and enforcing the ESMMP and associated plans; and

iv) Suitability of allocated resources, equipment and budget for implementation of the ESMMP.

Corrective actions will require documentation including reporting of progress towards their completion.

a. Internal audits of ESMMP implementation will be conducted by the construction contractor on a quarterly basis during construction, and at least annually during operations. After the construction period, MOWT shall continue these internal audits annually in line MOWT's current audit schedule for their ESMS.

b. Independent external audits will be conducted during the construction phase and on an annual basis (over the construction period). The first external audit will be conducted at the end of the first year after commencement of construction to ensure all required environmental management and monitoring plans and procedures are established. The frequency of subsequent operational audits will be based on the recommendations from the initial audits ensuring that they are in line with the environmental audit regulatory regime in Uganda.

c. Regular site inspections of all Project facilities will be conducted on a routine basis using a visual inspection form to record observations onsite. The frequency of inspection will be informed by risk but will typically be on a monthly basis. Key Performance Indicators (KPIs) were developed to enable environmental performance to be assessed objectively and quantitatively across the operation.

11.0 CONCLUSION AND RECOMMENDATION

11.1 Conclusion

From this ESIA update, most of the project corridor closely interacts with TSWR. This implies most of the project foot-print regarding involuntary community physical displacement is minimal occurring only in Karugutu and Kanara. The project interacts closely with biological resources of TSWR. The most critical mammal habitat lies along the section between Kakara Junction and the Rwebisengo Junction. This section lies in cross proximity to the Nyaburongo valley which is about an average of 0.54km from the project corridor.

The Nyaburongo valley has an estimated number of 08 chimpanzees. Additionally, Toro Semliki Wildlife Reserve (TSWR) is one of 34 National IBAs and lies within the global flyway for migratory birds. The flagship bird of TSWR is the shoebill, located mainly in wetlands of Rwangara and Kanara. The upgrade of Karugutu-Ntoroko (56.5km), Link to Rwebisengo (8.2km) and Ntoroko Town Roads is associated with perfect benefits to biological resources held within TSWR; INCLUDING; protection of the TSWR boundary and alleviate encroachment; Contribution to ecosystem recovery through diversion of Public traffic to out-side the TSWR, as well as Increasing biodiversity safety through implementation of regulated design speeds and ample drainage structures.

The project is associated with a number of positive socio-economic impacts which include; Employment opportunities, Promotion of Local and Regional Development, Creation of business opportunities, Reduced transport costs and time of travel Improved access and delivery of health services; fostering socio-economic transformation of the area. Among the noted negative impacts will be the loss of agricultural land, property and perennial crops (RoW), population influx and all associated impacts within the host communities. These will mostly arise during the construction phase and are all manageable by the proposed appropriate mitigation measures.

This ESIA update concludes that the project has no significant residual impacts, and therefore should be implemented, with adherence to the proposed mitigation measures.

11.2 Key recommendations

Stressing the fact that the project traverses TSWR and wetland areas; implies a direct impact on the biological resources held within. Among the anticipated project impacts is reduction of vegetation cover and destruction of ecological habitats for a multitude of species. An estimated area coverage of 115 Hectares will be cleared of vegetation to create space for construction and workspace. This will lead to clearance of bushlands, savannah grasslands and woodlands. Additionally, there will be alternation of the seasonally flooded areas.

i) An estimated area coverage of 115 Hectares will be cleared of vegetation. The loss of vegetation cover, green-field, of this magnitude is significant and triggers a biodiversity offset. Fortunately, all the vegetation within the sampled plots along the corridor is of Least Concern (LC). A restoration offset is the most feasible, in this way, ANY degraded habitat or ecosystem within TSWR will be restored to compensate for environmental damage of vegetation clearance of 115 hectares of vegetation.

ii) The deign speed within the most critical mammal habitat should be less than 20km/hr. Additionally adequate drainage structures should be installed especially in the flood plains to act as animal crossings.

iii) Actively involve local authorities, household heads and community members in the process of land acquisition for the project and subsequent project implementation activities. Gender sensitive interventions aimed at improving household livelihoods and a deliberate and effective communication strategy to improve community attitudes about the project is also recommended.

iv) Adequate and prompt compensation and resettlement of PAPs should be done before project constructions activities commence as well as timely communication to PAPs on schedules of project activities to enable them adjust their livelihoods;

v) The project area traverses highly sensitive Physical Cultural Resources which should be preserved and the proposed Physical Cultural Management and Monitoring Plan should be developed and implemented during construction;

vi) The proposed roads should be designed to support the anticipated traffic demands within the region. Engineering designs adopted should be appropriate for promotions of tourism and maintenance of the existing road alignment.

- Replacement of bridges should be based on engineering considerations such as life span and geometry.
- The wilderness and environmental foot print in this area should be maintained as much as possible and safety measures incorporated within TSWR.
- As a general mitigation measure, inbuilt speed reduction measures and animal crossing infrastructure should be incorporated into the designs in all sensitive environments.
- Engineering designs of all roads, implementation practices and operations should be eco-friendly.

11.2.1 Compliance assurance

In order to ensure environmental and social compliance, the Contractors and other associated developers, should be required in the tender documents to prepare a standalone Environment and Social Implementation Plan (ESIP) addressing a Biodiversity Management Plan (BMP), Health and Safety Plan, Contingency and Emergency Plan, among other Plans.

ESIPs should be reviewed and approved by the developers or their representatives to guide implementation of environmental and social mitigation measures during the project implementation phase. This should be done before commencement of construction activities.

The Contractors, Supervising Consultants and MOWT should have a team of Environmental and Social Development Specialists to oversee implementation of the project. Lead / Regulatory Agencies should regularly visit the project roads and associated development projects as a team to ensure compliance with approval conditions in the certificates of environmental and social impacts assessment, conditions in the permits and licenses and mitigation measures contained in the ESIS, ESMP, the approved ESIP and method statements of Contractors.

References

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12.0 APPENDICES

Appendix 2: NEMA Certificate of extension for ESIA

N E MA

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THE NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY
The National Environment Act, No. 5 of 2019
National Environment (Environmental and Social Assessment) Regulations, 26(4)(b) S.I. No. 143/2020

RE: EXTENSION OF CERTIFICATE OF APPROVAL OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT NO. NEMA/EIA/10874 FOR UPGRADING TO PAVED BITUMINOUS STARDARD OF KARUGUTU-KAKARA-MANDOKO-KANARA-NTOROKO ROAD FROM KARUGUTU TRADING CENTRE ALONG FORT-PORTAL BUNDIBUGYO ROAD TRAVERSING NTOROKO DISTRICT.

1.0 The Certificate of Approval of Environmental and Social Impact Assessment **No. NEMA/EIA/10874** granted on **7th December, 2017** to the **Uganda National Roads Authority** is hereby extended for a further period of five (5) years, from **7th December, 2022 to 8th December 2027** the period which covers both the construction and operational phases of the project.

2.0 This extension of validity of Certificate may be revised upon request or when site conditions change.

3.0 The Certificate is extended on the following conditions;

(a) The Conditions of Approval contained in the Certificate of Approval No. NEMA/EIA/10874, **remain valid**.

(b) **The Executive Director shall be NOTIFIED** and Approval for any transfer of ownership, variation/alteration of the project design or components, or surrender of this Certificate of Approval, shall be required.

(c) In accordance with Section 122(3) of the National Environment Act, Cap 181, ensure that any other undesirable impacts that may arise at project implementation, but were not contemplated at the time of undertaking the initial environmental and social impact assessment or by the time of extension of the validity of the Certificate of Approval, are mitigated;

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(d) Seek written approval from this Authority for any other operational changes covered under the Certificate;

(e) This certificate may be recalled without civil liability for review on account of change in Government Policy, Standards, new conservation measures by this Authority and/or enforcement of a court order.

4.0 That the following actions identified by this Authority to be undertaken;

(a) The Road Upgrade Land must be legally obtained in accordance with the Land Act Cap 227 and or other relevant laws of the country.

(b) Compensate all project affected persons (PAPs) arising from the operations of the Road Upgrade, in accordance with the national laws governing compensation.

(c) All the project components and activities must be restricted to the area as indicated in and the GPS Coordinates in **Figure-1**.

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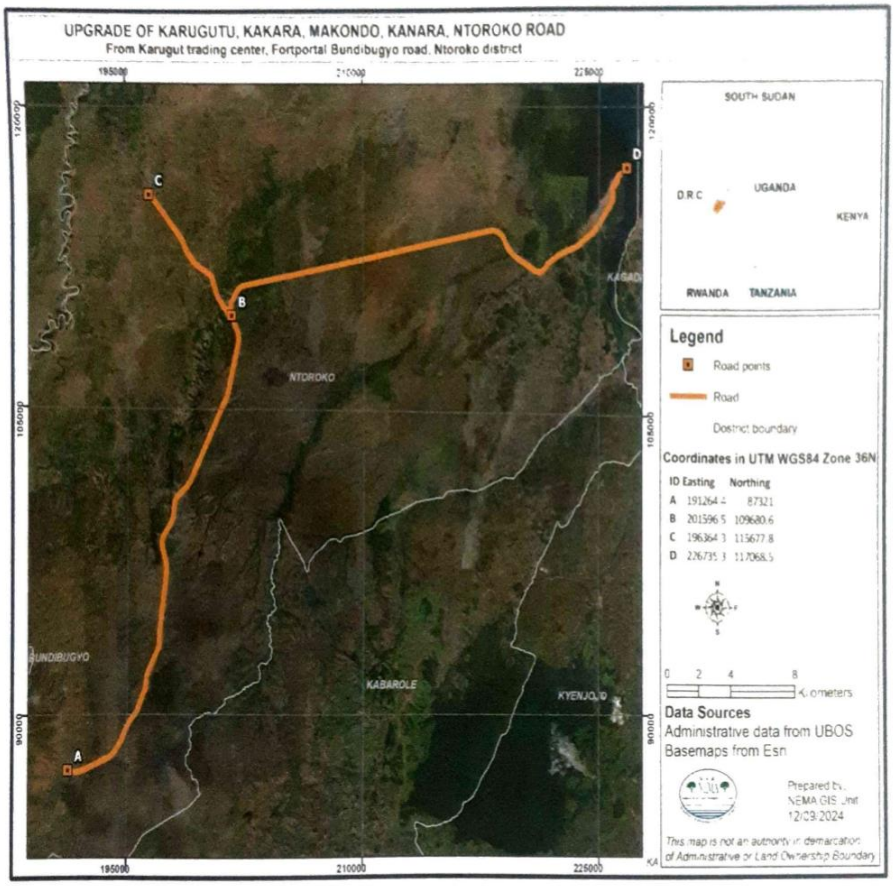

Figure 1: Geographical location of the Road Upgrade

(d) Strictly adhere to the building codes relevant to the category of buildings for the Road Upgrade in accordance with the Building Control Act, 2013.

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(e) Consult the Uganda Wildlife Authority on the road upgrade in line with the Uganda Wildlife Act 2019, to enhance conservation efforts of Tooro Semuliki Wildlife Reserve including ensuring that the road alignment is routed outside Tooro Semuliki Wildlife Reserve.

(f) Ensure to routinely carry out modelling of noise, vibrations and particulate dispersion in order to establish the extent of influence of the noise, vibrations and dust emissions from construction operations on the community.

(g) Restrict construction activities to day time hours (7.00am-6.00pm) only.

(h) Single use plastic bags below 30 microns and any plastic that is not labelled in accordance with provisions of National Environment Act, No. 5 of 2019, shall not be used during the entire project life cycle.

(i) That the environmental management and monitoring plan be updated to take into account the prevailing environmental and social issues of concern regarding the project, and must be implemented.

(j) Apply appropriate site design that will provide for a natural hydrological flow and drainage patterns along and across the project area.

(k) Put in place adequate soil stabilisation and erosion control mechanisms in accordance with the section 57(3) of the National Environment Act, Cap 181.

(l) Put in place mechanisms to minimize noise and vibration from project operations and/or from noise generating equipment in accordance with the National Environment (Noise Standards and Control) Regulations, S.I. No. 30/2003.

(m) Put in place measures to ensure that workers and the communities are not exposed to dust emissions in accordance with the National Environment (Air Quality Standards) Regulations, S.I. No. 22/2024.

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(n) Put in place a monitoring programme including the frequency and methods for the following parameters.

No.	Parameters	Acceptable limits
1.	Particulate Matter (Dust Emissions)	60µg/m^3
2.	Noise	109dB(C)
3.	Vibrations at 10 – 50Hz frequency	12.5mm/s
4.	Oil and Grease	5.0mg/l
5.	pH	6.0 – 8.0

(o) Put in place mechanisms for handling hazardous and non-hazardous waste generated, in accordance with the National Environment (Waste Management) Regulations, S.I. No. 49, 2020.

(p) Be duty bound to protect the wetland and the water resources from degradation in accordance with the National Environment (Wetland, River Bank and Lakeshores Management) Regulations, S.I. No. 3/2000.

(q) Ensure that this Certificate of Approval is displayed at appropriate location(s) within the project site premises and should be available at all times during both the construction and operational phases of the Project. The NEMA Certificate number should also be displayed on all project signposts.

(r) Carry out the first environmental audit by **September, 2025**, in accordance with section 126 with the National Environment Act, No.5 of 2019, the National Environment (Audit) Regulations, S.I. No. 47/2020, and the National Environment (Environment and Social Assessment) Regulations, S.I. No. 143/2020.

(s) Ensure that the site structures are fully decommissioned and all areas affected during the conduct of various project activities are restored to as near as possible to their original state.

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DATED AT KAMPALA ON 23RD SEPTEMBER, 2024

Signed:

EXECUTIVE DIRECTOR, NEMA

c.c. The Permanent Secretary,
Ministry of Works and Transport,
KAMPALA.
Attn: Engineer in Chief/Director Engineering.

c.c. The Permanent Secretary,
Ministry of Gender, Labour and Social Development,
KAMPALA.

c.c. The Permanent Secretary,
Ministry of Water and environment,
KAMPALA.

c.c. The Chief Administrative Officer,
Ntoroko District Local Government
NTOROKO.
Attn: The District Environment Officer

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Appendix 5: NEMA Certificate of Approval of the ESIA that was conduucted in 2017

Original

10874

THE REPUBLIC OF UGANDA

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)
The National Environment Act Cap. 153
The Environment Impact Assessment Regulations, S.1 No. 13 of 1998

Certificate of Approval of Environmental Impact Assessment

Certificate No. NEMA/EIA/ 10874

This is to certify that the Project Brief / Environment Impact Statement**

received from

M/s: **UGANDA NATIONAL ROADS AUTHORITY(UNRA)**

of **P.O. BOX 2848 KAMPALA (TEL. +256 312233100)**

submitted in accordance with the National Environment Act Cap.153 to the National Environment Management Authority (NEMA) regarding:

THE PROPOSED UPGRADE OF KARUGUTU-KAKARA-MAKONDO-KANARA-NTOROKO ROAD

(Title of Project)

briefly described as **THE UPGRADE OF THE CRITICAL OIL ROAD**

(Nature, Purpose)

located at **FROM KARUGUTU TRADING CENTRE, FORTPORTAL-BUNDIBUGYO ROAD, NTOROKO DISTRICT**

(District/Sub-county/City/Town/Ward)

has been reviewed and was found to:

** have significant environmental impacts and the followimg appropriate mitigation measu
and made a condition precedent for approval and implementation:

(The relevant conditions are attached in the subsequent pages)

Dated at **KAMPALA** on **07 DECEMBER 2017**

Signed

EXECUTIVE DIRECTOR (NEMA)

ORIGINAL: Developer: DUPLICATE: Lead Agency; TRIPLICATE:The Authority; QUADRUPLICATE:Any other relevant agency

THE REPUBLIC OF UGANDA

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

CONDITIONS OF APPROVAL FOR THE PROPOSED UPGRADE OF (58.5KM) KARUGUTU-KAKARA-MAKONDO-KACHWANKUMU-KANARA-NTOROKO ROAD STARTING FROM KARUGUTU TRADING CENTRE ON FORTPORTAL-BUNDIBUGYO ROAD AT UTM ARC 1960 191336E 87285N TO LAKE SHORE ON LAKE ALBERT IN KANARA TOWN COUNCIL AT UTM ARC 1960 226397E 116912N NTOROKO DISTRICT

In addition to implementing the mitigation measures outlined in the Environmental and Social Impact Statement, this **Certificate of Approval** is granted on condition that the developer - **UGANDA NATIONAL ROADS AUTHORITY (UNRA)** complies with approval conditions stated below:

ADMINISTRATIVE CONDITIONS OF CERTIFICATE

1. This **Certificate is issued in accordance with the requirements** of the National Environment (Environment Impact Assessment) Regulations, S.I No. 153-1 and of the Physical Planning Act, 2010.

2. Issuance of this Certificate of Approval is based on the content of/information contained in the Environmental and Social Impact Statement submitted by the Uganda National Roads Authority.

3. **Uganda National Roads Authority shall be held responsible** for any omissions, falsified information or any other anomalies that are contrary to the provisions of the relevant laws governing the proposed project.

4. This **Certificate of Approval is VALID for a period of 5 YEARS**- the period which covers both the construction and operational phases of the project.

5. The **project must commence within the first 24 months** (from the date of approval) of the validity period, failure of which this Certificate may be varied, cancelled or otherwise dealt with by this Authority.

6. **The Executive Director should be NOTIFIED** of any transfer of ownership, variation/alteration of the project design or components, or surrender of this Certificate of Approval.

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1.0 SPECIFIC CONDITIONS OF APPROVAL

(i). Ensure that the proposed project areas (sites) traversed are legally obtained.

(ii). Make provision for designated stop-over rest areas outside of the Protected Areas for commuters, long convoys and wide loads of trucks along the road at appropriate intervals in accordance with the physical developmental plans. Areas where trucks are not allowed to stop should be clearly marked.

(iii). Plant appropriate tree species along the whole Karugutu-Kachwankumu-Kanara-Ntoroko stretch with exception of the Bugoma Central Forest Reserve road section in collaboration with the District Forest Services; avoid tree species that will damage pavements, drainage systems and footpaths; and ensure that the trees planted are maintained, to provide adequate cover when they grow.

(iv). Ensure that where a cliff has been created or is in existence that may undermine the road section below it, the cliff should be terraced and/or planting with appropriate grass cover to control soil erosion or soil/stones wash-down to the road below.

(v). Obtain all the necessary permits and approvals from this Authority, the Ministry of Works and Transport, Department of Occupational Safety and Health (Ministry of Gender, Labour and Social Development), Uganda Wildlife Authority, National Forestry Authority, Ministry of Energy and Mineral Development, Ministry of Tourism, Wildlife and Antiquities, Ntoroko District Local Government Authority, Directorate of Water Resources Management (Ministry of Water and Environment) and any other relevant authorities, **before commencement of the proposed project activities.**

(vi). Ensure that the Project is implemented in conformity with the planning provisions for the site as provided for by Ntoroko District Local Government Authority and in line with the Physical Planning Act, 2010, respectively.

(vii). Carry out an inventory of all affected properties and a socio-economic survey of all affected households and businesses before compensating for the loss prior to site possession giving special consideration to vulnerable communities and individuals. This should be done before, during and after project implementation where applicable.

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(viii). Ensure full compensation is made to all project affected persons (PAPs) in the said Districts, in a transparent and timely manner, according to the agreed compensation terms and rates, as required under the national laws governing compensation.

(ix). Liaise with the Department of Museums and Monuments (Ministry of Tourism, Wildlife and Antiquities) and carry out a comprehensive physical cultural survey along the length of the Road, prior to commencement of the construction activities; and document the findings to enable protection and conservation of the cultural heritage components found.

(x). In accordance with the National Environment (Wetlands, Riverbanks and Lakeshores Management) Regulations, S.I. No. 153-5, prevent the degradation or destruction of water bodies or water courses (of rivers/streams) traversed by the Road. **For any activity that may be permitted under the said Regulations, guidance and approval should be obtained from this Authority and the Directorate of Water Resources Management (DWRM)** before undertaking any such regulated activities. Ensure that all natural water flows through transversal drainage structures are preserved.

(xi). Apply for and obtain water abstraction and water discharge permits from the Directorate of Water Resources Management (DWRM), for abstracting waste water from the ground-water or surface-water sources identified and discharge of waste water respectively, as required under Regulation 3 of the Water Resources Regulations, 1998, prior to the commencement of construction activities.

(xii). Put in place appropriate and/or adequate on-site sanitary facilities separate for the respective sex of project site workers, in order to properly contain sanitary effluent (waste-water/sewage and grey water), and sources of safe drinking water for site workers with clear bye-laws in accordance with the National Environment (Standards for Discharge of Effluent into Water and Land) Regulations, S.I. No. 153-3.

(xiii). Before commencement of construction work, identify and disclose to this Authority the identified suitable sites for setting up stone quarries, asphalt plant, temporary workers camps and storage/ parking yards and other support structures as well as site for extraction of sand and murram; and, **note that for such components, separate ESIAs need to be undertaken and approval obtained from this Authority, before commencement of the road works.**

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THE REPUBLIC OF UGANDA

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

(xiv). Carry out annual environmental audits and submit the audit reports to this Authority in line with the provisions of the National Environment (Audit) Regulations, S.I. No. 12/2006 and submit **the first Environmental Audit Report to this Authority by December, 2018.**

(xv). In accordance with Section 22(4) of the National Environment Act, Cap. 153, ensure that any other undesirable impacts that may arise due to implementing this project, but were not contemplated by the time of undertaking this Environmental and Social Impact Assessment, are mitigated.

2.0 GENERAL CONDITIONS OF APPROVAL

(xvi). Ensure that the road design meets the needs of the oil and gas sector such as anticipated loads, width and height of the expected traffic in consultation with relevant stakeholders such as operators, licensees and Uganda National Oil Company. The maximum load permissible on this road should be clearly marked with a mechanism for load control and enforcement.

(xvii). Design all culverts and bridges along the proposed road especially the bridge at Wassa to take care of possibilities of flooding, and to a strength that matches anticipated tonnage of trucks participating in oil and gas operations.

(xviii). In accordance with Traffic and Road Safety Act, 358, impose speed limits to regulate vehicle traffic; install clear and appropriate Road lights, Road signs/markings (indicating speed limits among others), and zebra crossings (wherever required), speed humps, including sensitive areas for animal crossing and social services, among others; and, put in place appropriate plans for diversions/road detours (wherever necessary) to direct traffic, in order to reduce risks of vehicular and/or other accidents, during the construction phase and throughout the project lifespan.

(xix). Liaise with Uganda Wildlife Authority to identify appropriate turning points for all trucks and earth moving equipment used during construction in Tooro Semuliki Wildlife Reserve.

(xx). Road control for traffic should be done in such a way not to inconvenience the tourists; best measures should be put in place to maintain smooth tourist flow and ensure to provide tourists with information at the gate warning visitors on the inconvenience of road construction.

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(xxi). Have in place qualified focal point personnel responsible for workers' occupational health and safety, tourism, community affairs and environmental issues.

(xxii). Minimise effects of soil degradation by with appropriate designs that will optimize the use of soil and gravel requirements; and ensure installation of erosion and sedimentation control systems during construction. Incorporate reinforcement gabions and stone walls to prevent erosion and damage from steep slopes at Makondo Village.

(xxiii). Have in place a road safety awareness programme to sensitize the local community, road users, school children, among others, on safety measures to adhere to, during the road construction and operational phases. Where appropriate avail local communities with information leaflets in their local languages.

(xxiv). All employees including casual workers should be accorded decent working conditions in accordance with the Employment Regulations, 2011, stipulating their terms and conditions of employment, contracts of employment, statutory leave, statutory allowance, statutory remittances, procedure for termination and disciplinary action, among others.

(xxv). Note that the use of child labour is prohibited during the implementation of project activities.

(xxvi). Ensure that members of the community with appropriate skills and competence especially women, Persons with Disability and the youth are accorded employment opportunities in the project.

(xxvii). Work with the Uganda Wildlife Authority and other relevant Lead Agencies to put in place and implement a monitoring plan to ensure that effects on flora and fauna are identified and where possible avoided, eliminated or reduced.

(xxviii). Liaise closely with Authorities responsible for provision of public utilities (for example water, electricity, telecommunication structures, power distribution lines, among others) to identify such public utilities and to avoid disrupting their functions and services and access by the general public to these facilities, during the implementation of project activities.

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(xxxvii). Ensure that road construction including drainage channels do not create depressions and steep slopes which may impede the movement of wildlife in Tooro Semuliki Wildlife Reserve. There should be gentle slopes with appropriate gradients for wildlife to cross the road and move freely in the reserve.

(xxxviii). Ensure that there is no Right of Way in Tooro Semuliki Wildlife Reserve and limit vegetation clearing to the carriage way, shoulders and drainage as much as possible, liaise with Uganda Wildlife Authority to Geo-reference the endangered tree species such as *Tamarindus indica* and *Baranites spp* and ensure.that they are protected.

(xxxix). Map out any available water sources for communities and wildlife that may be affected by road construction works in order to suggest appropriate mitigation measures of protecting them and/or provide alternative water sources.

(xl). Ensure that all road works have minimum interference on operation of social amenities such as Kanara Seed Secondary School, Ntoroko Primary School, Kanara Taxi Park, Kanara Community Polytechnic, Kanara Police Post, Kanara Town Council offices, Ntoroko Health Centre III, among others.

(xli). Ensure that construction materials (sand, wood, stones, amongst others) are **NOT EXTRACTED** from regulated/protected areas including river beds, amongst others.

(xlii). In accordance with the Occupational Safety and Health Act, 2006, ensure that adequate occupational health and safety measures and procedures are put in place, including provision of safe methods of work, medical surveillance programmes, equipment and machinery preventive maintenance, trainings, emergence response, occupational hygienic surveillance, control of air emissions and provision of appropriate and adequate protective gear to be used by the entire work-force.

(xliii). Provide onsite first aid services to include anti venom, anti-allergy, insect repellant or treatment in case of animal attacks; and in the event of workplace accidents and occupational diseases, workers should be treated and compensated in accordance with the Workers' Compensation Act, 2000.

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(xliv). Conduct induction and refresher trainings to the contractor and sub-contractor teams on the Environmental and Social Safeguard policy, any other applicable laws, regulations and standards; and induction on application of these conditions; and apply strict penalties for non-adherence.

(xlv). Minimize dust nuisance to the immediate neighbourhood and littering during construction works, by applying dust control measures including: dampening of the bare ground surface with water; and, covering trucks with tarpaulin during transportation of loose construction material and excavated soil.

(xlvi). Ensure that all solid waste (including cut to spoil material) and garbage generated, is disposed of at the identified suitable locations gazetted by the respective Ntoroko District Local Government Authority as waste holding/ dump sites, in accordance with the National Environment (Waste Management) Regulations, S.I. No. 153-2; and, **ensure that no waste is dumped into water bodies, wetland ecosystems and protected areas.** Also develop and implement a spoil management plan in consultation with relevant lead agencies.

(xlvii). Ensure that culverts of appropriate size and design are installed at suitable sections along the Road such as River Wassa flood plain at Ndorwa, among others so as to minimize interference with the hydrological and drainage patterns of the project affected areas.

(xlviii). In accordance with the National Environment (Noise Standards and Control) Regulations, S.I. No 30/2003, ensure that electricity generators to be used during the construction phase of the project, are fitted with silencers, and put in place adequate sound-buffering measures to cater for noise generating equipment, in order to minimize noise and not to inconvenience the local communities and wildlife adjacent to sites where the said generators are in use. All equipment should be fitted with vibration control mechanisms and preventive maintenance conducted.

(xlix). Ensure that environmental pollution due to waste-oil or oil-leaks and spillage from construction equipment and machinery is avoided, and that used-oil/waste-oil and other hazardous waste generated during the construction of Road works at the site are collected and safely disposed of, in an environmentally-sound manner, as stipulated under the National Environment (Waste Management) Regulations, S.I. No. 153-2; and, waste-oil should be disposed of by authorized/ licensed hazardous waste handlers; servicing of the vehicles should be done outside the wildlife reserve.

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(l). A comprehensive waste management plan should be in place before the commencement of the activities and must be implemented during project operation. This should include a description of possible waste streams from the project for waste tracking and segregation including storage, treatment, recycling and final disposal.

(li). Put in place a comprehensive emergency and monitoring plan and appropriate fire-fighting equipment at temporary workers' camp, parking/storage yards, amongst others, for purposes of averting any undesirable incidents of fire-risk behavior or actual fire out-break; and, put in place proper safety procedures for the workforce and provide for hands-on training for the workers/employees on use of the fire-fighting equipment.

4.0 OPERATIONAL PHASE CONDITIONS OF APPROVAL

(lii). Install and regularly maintain standard guard rails, safety reflectors, among others, on the Road for safety mitigation.

(liii). Ensure regular monitoring of the road construction activities/ maintenance and operations throughout the road project lifetime.

(liv). These conditions are in addition to any other applicable conditions in this Certificate or relevant laws.

5.0 NOTIFICATION PHASE CONDITIONS OF APPROVAL

(lv). The developer shall seek written approval from this Authority for any operational changes under this Certificate.

(lvi). Ensure that this Authority is notified of any malfunction of any component under this project, within 12 hours and that mitigation measures are put in place.

(lvii). Notify this Authority of the intent to decommission any components under this project, **three months** in advance in writing.

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6.0 DECOMMISSIONING AND RESTORATION PHASE CONDITIONS OF APPROVAL

(lviii). Ensure that comprehensive decommissioning and restoration plans are submitted to this Authority for approval, at least **3 (three)** months prior to decommissioning the project components. This should include restoration of roads that will be left after the realignment especially at Makondo and Kakara areas.

(lix). Decommission the Project components (quarry sites, borrow pits, asphalt plant, temporary camps, parking/storage yards, amongst others) when their lifespan comes to an end as per the decommissioning plan, and/or as will be prescribed by the relevant Lead Agencies.

(lx). Ensure that all pollutants and polluted material are contained and adequate mitigation measures provided during this phase.

(lxi). Restore all scarred areas affected during the conduct of various project activities to their original or near original state as possible, and re-vegetate degraded ground surface by planting native plant species, so as to minimize the occurrence of soil erosion.

(lxii). Report on the completed decommissioning and restoration activities to NEMA.

7.0 SUSPENSION/WITHDRAWAL/CANCELLATION CONDITIONS

(lxiii). This Certificate shall be suspended/withdrawn/cancelled if:

(a) there is no compliance with any of the **Specific Conditions** set out in this ESIS Certificate in **Section 1.0 above and of substantive general conditions of the certificate**;

(b) where there is a substantial modification of the project implementation or operations which may lead to un-assessed adverse environmental and social impacts that were not evaluated at the time of issuing this Certificate of Approval; and,

(c) where there arise substantive undesirable effects that were not contemplated during the issuance of this Certificate of Approval.

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UPGRADE OF KARUGUTU-NTOROKO ROAD - 2017 | CERT. NO. 10874

THE REPUBLIC OF UGANDA

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

DATED AT **KAMPALA ON 5TH DECEMBER, 2017**

Signed:

EXECUTIVE DIRECTOR (NEMA)

c.c: The Permanent secretary,
Ministry of Water and Environment,
KAMPALA.

c.c: The Permanent secretary,
Ministry of Works and Transport,
KAMPALA.

c.c: The Permanent Secretary,
Ministry of Gender, Labour and Social Development,
KAMPALA.

c.c: The Permanent Secretary,
Ministry of Lands, Housing and Urban Development,
KAMPALA.

c.c: The Permanent secretary,
Ministry of Tourism, Wildlife and Antiquities,
KAMPALA.

c.c: Permanent Secretary,
Ministry of Energy and Mineral Development,
KAMPALA.

c.c: The Executive Director,
Uganda Wildlife Authority,
KAMPALA.

c.c: The Director,
Directorate of Water Resources Management,
ENTEBBE.

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THE REPUBLIC OF UGANDA

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

c.c: The LC-V Chairperson,
Ntoroko District Local Government,
NTOROKO.

c.c: The Resident District Commissioner,
Ntoroko District,
NTOROKO.

c.c: The Resident District Commissioner,
Ntoroko District,
NTOROKO.

c.c: The Chief Administrative Officer,
Ntoroko District Local Government,
NTOROKO.

c.c: The District Environment Officer,
Ntoroko District Local Government,
NTOROKO.

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Appendix 6: Records of Stakeholder engagements

NOVA CONSULT UGANDA LIMITED

Nova Consult Uganda Limited
Kimbejja Crescent, Nalubale Road
P.O. Box 146081, Kampala- Uganda

Project: Karugutu-Ntoroko RAP/ESIA update Community engagement Date: 28/02/2025

No.	Name	Position	Org	Tel	Signature
01	ANTOLIITO S. GEOFFREY	Sec for finance	K/T/C	0782500977	[signature]
02	KOR DAVID	MAYOR KANARA T/C	KTC	0775286247	[signature]
03	ATEGEKA PAUL	NT CENTRAL C/PERSON LCI	NT CENTRAL	0772608968	[signature]
04	Kabagambe L.	Guide of visitors	Karugutu T/C	0762665876	LBK.
05	MUKUNDI PAUL. M	for Town clerk	KANARA T/C	0772858513	[signature]
06	Rwemulikya Ibrahim	Area MP Ntoroko	Parliament of ug	0773-641996	[signature]
07	RUSOKE JULIUS	D/Councillor workers	Ntoroko DLG	0772870899	[signature]
08	AMBOKO Julius	Community Member	NTOROKO	0773760492	[signature]
09	Kisembo Patric	comm Member	TOTOKO	0778813552	K.P

NOVA CONSULT UGANDA LIMITED

Nova Consult Uganda Limited
Kimbejja Crescent, Nalubale Road
P.O. Box 146081, Kampala- Uganda

Project: Karuguttu- Ntoroko ESIA UPDATE. Date: 27/02/2025

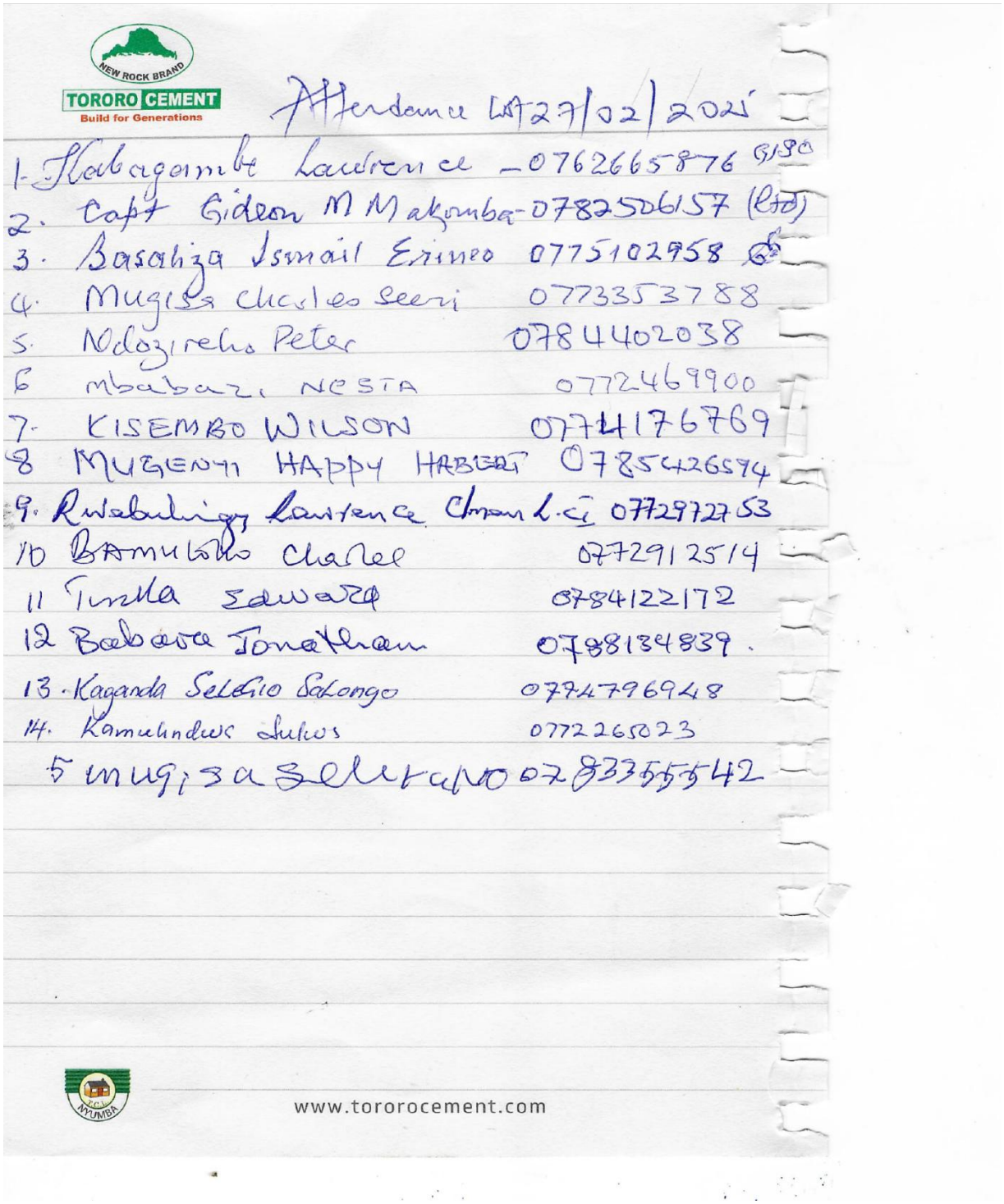
No.	Name	Position	Org	Tel	Signature
01	Kabaganzobe Lawrence	GISO.	G.O.U	0762665876	-
02	Capt. Cudeon. Mawanda	ATO.	G.O.U	0782506157.	-
03	Baseke29 Ismail Eniree			0775702958	-
04	Mugisa. Charles Serri			0773555788	-
05	Ndafireho Peter			0784402038	-
06	Mbabazi Nesta			0772469900	-
07	Kusemba. Wilson			0774176769	-
08	Mugenyi. Happy Herbert			0785426594	-
09	Rwabuhyi Lawrence	Chairman LC I		0772972753	-
10	Bamuloho. Charles			0772912514	-
11.	Tumwa. Edward.			0784122172	-
12.	Baboole Jonathan			0788134539	-
13.	Kagonde Selegwa Salongo			0774796948	

NOVA CONSULT
UGANDA LIMITED

Nova Consult Uganda Limited
Kimbejja Crescent, Nalubale Road
P.O. Box 146081, Kampala- Uganda

Project:.....Date: 27/02/2025

No.	Name	Position	Org	Tel	Signature
14.	Kamukindwe Julius.			0772265023	
15.	Mugisa Salvano.			0783557742	



TORORO CEMENT
Build for Generations

Attendance LIST 27/02/2021

1. Kabagambe Lawrence – 0762665876
2. Capt Gideon M Makomba-0782506157 (Ltd)
3. Basaliza Ismail Erineo 0775102958
4. Mugisa Charles Seeri 0773353788
5. Ndagireho Peter 0784402038
6. Mbabazi NESTA 0772469900
7. KISEMBO WILSON 0774176769
8. MUGENYI HAPPY HABERT 0785426594
9. Rwabuhinga Lawrence Chairman L.C 0772972753
10. Bamuloho Charles 0772912514
11. Tumwa Edward 0784122172
12. Babaasa Jonathan 0788134839.
13. Kaganda Selegio Salongo 0774796948
14. Kamuhunduo Julius 0772265023
15. Mugisa Selestino 0783355542

www.tororocement.com

KARUGUTU T/C

UNRA

REGISTRATION FORM

Activity: Stakeholder Planning Meeting / Engagement Date: 07/07/2017

SN	NAME	TITLE	ORGANIZATION	SEX (M/F)	PHONE CONTACT	E-MAIL ADDRESS	SIGNATURE
1.	Maate Raphael Gersham	[illegible] C/P	Karugutu Town Council	M	0782431733	maaterapheal[illegible]2016@gmail.com	
2.	Tibagon[illegible] [illegible] [illegible]	Senior Assi. [illegible]	Karugutu [illegible]	M	0772369331	[illegible]@yahoo.com	[illegible]
3.	Beatrice Mukasa	Sociologist	UNRA	F	0753184517	bitulabi@yahoo.co[illegible]	[illegible]
4.	SHEM Bihanikire	GISO	ISO	M	0782544013 0772-267775	bihanikire.shem @gmail.com	Shem
5.	JUNE LOGOSE	District Child & Family Protection Officer D CFPO	Uganda Police Ntoroko	F	0776299108		[illegible]
6.							
7.							
8.							
9.							
10.							

Uganda National Roads Authority
Plot 3-5 New Port Bell Road,
UAP Nakawa Business Park Block C & D
P.O. Box 28497
Kampala, Uganda
In any correspondence on this subject
Please quote No. UNRA/DNPE/OIL ROADS/Hoima/18

29 June 2017

Chairman LC5 Ntoroko District

RDC Ntoroko District

CAO Ntoroko District

NTOR[illegible]RICT
LOCA[illegible]MENT
07 JUL 2017
R[illegible]D

THE CRITICAL OIL ROADS PROJECT

Introduction of the Environmental Social Impact Assessment and Resettlement Action Plan Teams

The Government of Uganda and Partners through the Lake Albert Basin Development Committee (LABDC) have set a target achieve the First Oil by 2020.

Accordingly, the Government together with the Oil Partners identified a total of approximately 600km of critical oil roads that must be upgraded by the prescribed time in order to achieve First Oil by 2020. These roads include Karugutu-Ntoroko.

Uganda National Roads Authority (UNRA) has been asked to expedite the feasibility study, Environmental Social Impact Assessments (ESIA), and Resettlement Action Plan (RAP) in order fast truck implementation of Identified oil roads by 2020.

The ESIA and RAP teams will be carrying out studies and consultations from June to August 2017 for the planned upgrading of the Karugutu-Ntoroko road.

The purpose of this letter therefore is to introduce to you the ESIA and RAP teams, and request for your cooperation and support to ensure the Critical Government programme is delivered in accordance with the set timelines.

Eng. Isaac Wani
For: EXECUTIVE DIRECTOR
DM/NPE

Copy to;
- DISO Ntoroko District
- DPC Ntoroko District

KARUGUTU T/C COMMUNITY MEETING FOR DISCLOSURE OF KARUGUTU – NTOROKO ROAD

TOWN CLERK KARUGUTU TOWN COUNCIL 07 JUL 2017 NTOROKO DISTRICT LOCAL GOVERNMENT

T/C

UNRA

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	KABOLA SUZIA		NYABUHURU	M	0785527275	[illegible]
2.	SADRU Tumusiime	N/O	Kacwamba	M	0752013895	[illegible]
3.	MAKune James		Kabusindagizi	M	0786783628	[illegible]
4.	SAFINA Kaiwa		Yabwahuro II	F	——	[illegible]
5.	KAPARANGIRA BEREG		Nyabuhuru	F	0785538158	Jeni
6.	Rwakaiki D.R.		Karugutu SC	M	0715162686	DRR
7.	Nyanjura Beatrice		Kakuramba II	F	0778469180	Nyanjura
8.	IBRAHim yusufu		Kacwamba ~~Nyabuhuru~~	M	0772988116	[illegible]
9.	Kariman gulamusen	Driver	Kacwamba ~~Ayabutuhula~~	M	–	[illegible]
10.	AISHA Sumaiya	House wife	Kacwamba	F	–	Aisha
11.	TWEHEYO ANNET		Karugutu	F	0788646909	A Tweheyo
12.	KANSIME SIFA		Karugutu	F		S. Kansime
13.	mukono Faith		Nyabuhuru	F		m. F
14.	mulyete aginesi		Nyabuhuru	F		A, m
15.	mutesa moses		Nyabuhuru	m	–	[illegible]
16.	muyinga Nalwanah		Kyabandara	M	0777303195	[illegible]
17.	Olowo HERBERT		Kacwamba	M		[illegible]
18.	ABANABAR, AHUMDI		KARUNGUTU T.C.	M	0779004337	[illegible]
19.	NEBASURA, AHHMDI		KACWAMBA.	F.	0779004337	[illegible]
20.	Kabugho LUSI		K.T.C	F	0774853860	[illegible]

KARUGUTU T/C COMMUNITY MEETING FOR DISCLOSURE OF KARUGUTU–NTOROKO ROAD

07th July 2017

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	Tibanagwo Olive	–	Nyabuhuru II	F	0785 74 0685	T.O
2.	Kamsiime Alice	–	Kacwamba II	F	0784694423	[illegible]
3.	Bagaya Zam	–	Nyabuhuru	F	0788211176	Bagaya
4.	Magilani Atanasi	–	Nyabuhuru II	M	–	[illegible]
5.	Twebaze Joshua	–	Kacwamba	M	0757953658	[illegible]
6.	Gaburyesi Kas	–	Nyabuhuru	–	–	Gaburyesi
7.	Biira Naume	–	Kacwamba I	F	[illegible]	
8.	Manzi Robert	Secretary	"	M	[illegible]	[illegible]
9.	Bukombi Joyce	–	Kacwamba I	F	0752115[illegible]	[illegible]
10.	Biira Jostina	–	Nyabuhuru II	F	0782514876	BJ
11.	Babyenda Aminah	–	Karugutu North	F	–	unable to sign
12.	Ruhweza Steven	–	Karugutu KTC II [illegible]	M	075722033	unable to sign
13.	Asaba Swaibu	–	Kanyoke	M	0781333062	[illegible]
14.	Baguma Muhammad	–	Nyabuhuru II	M	0782650982	[illegible]
15.	Nyakagoma Sharifah		Karugutu North	F	0779808601	[illegible]
16.	Katebwa Nuuru	–	Karugutu North	M	2773761633	KATEBANOR
17.	Nsungwa Ben	–	Kakoga		0778507834	N.B.
18.	Kyakyo Nulyati	–	Kacwembe ~~Karugutu~~		0788493614	KN
19.	Mugisa Iburahimu		Kacwembe			
20.	Kathembo	Yona	Karugutu		0786991926	[illegible]

KARUGUTU T/C COMMUNITY MEETING FOR DISCLOSURE of Karugutu – Ntoroko Rd.

TOWN CLERK KARUGUTU TOWN COUNCIL 07 JUL 2017 NTOROKO DISTRICT LOCAL GOVERNMENT

UNRA

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	NJUERA ROSET	C/Person L.C III	Karugutu T/C	F	0782460082	[signature]
2.	Mugume Nasiri	C/Person District Land Board	Karugutu T.C	M	0785-105131	[signature]
3.	Rwabulinga Lawrence	Chair L.C I	Karugutu south	M	0782773353	[signature]
4.	Kisembo Wilson	Chairman LC I	Kacwamba II	M	0774176769	[signature]
5.	Bamuhigganira Farma	Farmer	Nyabirongo ward	M	0773119967	[signature]
6.	Kalumanu Robert	C/Person LC II	Kacwamba	M	0779775375	[signature]
7.	Ritah Kongo	Farmer	Kacwamba	M		P.K.
8.	Tumusiime Edward	Businessman	South	M	0780122172	[signature]
9.	Kagoro Mosiah	Businessman	Karugutu I	M	0785881234	[signature]
10.	Baluku David	Land owner	Kacwamba	M	0776110701	[signature]
11.	Kisembo Sele	Farmer	Nyabuswa II	M	—	Kisembo
12.	Kuza Joseph	Farmer	Kachwamba	M	—	Kuza
13.	Kasaija Richard	Farmer	Kacwamba II	M	0782591126	K.R.
14.	Mugisa Charles	Land owner	Kacwamba	M	0778353788	[signature]
15.	Kusemererwa Good	Land owner	Kacwamba	F	0775260732	Gurisi
16.	Atebale Amos	Land owner	Karugutu South	M	0778426021	[signature]
17.	TINKASIMIRE JOHN	SECRETARY	KANYAMWIRU	M	0785533165	[signature]
18.	Sebbamukiragelezo	mulimi	Kacwamba I	M		SBB.
19.	Kasirinzi Yoronia	Farmer	Nyabandara	M	0786585372	[signature]
20.	Friday Richard	Farmer	Kacwamba I	M	0781989653	Friday
21.	Mulenyezi Amos	Speaker Karugutu Town Council	Karugutu Town	M	0782052464	[signature]

KARUGUTU TOWN COUNCIL
COMMUNITY MEETING
FOR DISCLOSURE
of Karugutu - Ntoroko
Rd.

Uganda National Roads Authority

TOWN CLERK
KARUGUTU TOWN COUNCIL
07 JUL 2017
NTOROKO DISTRICT
LOCAL GOVERNMENT

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	Rubongoya S.M.	mutaka	South	M	0782533722	
2.	Sanyonga H.	mutaka Karugutu TC	Karugutu TC	M		
3.	SPANYO	Youth Rep				
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TOWN CLERK
KARUGUTU TOWN COUNCIL
07 JUL 2017
NTOROKO DISTRICT
LOCAL GOVERNMENT

UNRA
Uganda National Roads Authority
REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	KABAGEYI . T.		KACWAMBAI	F	—	K.J
2.	KABARINYA Z		KACWAMBA	F	0788277174	R
3.	BWABALI YORAMU		NYABUHURU	M	0758868240	B.Y
4.	DICHIRU MATURU		KACWAMBA	F	0785539973	—
5.	Kabagambe L	AISO	Nyabuhuru II	M	0773439479	[illegible]
6.	Kiiza OGDEN SMITH	Cman Kasco	Karugutu T/C	m	0782599296	[illegible]
7.	Kaijiza Godfrey		NYABUHURU		0782255965	[illegible]
8.	Sikamwa Christine		Karugutu	M	0782793[illegible]	[illegible]
9.	Basange Fama		KACWAMBAI	M	07791[illegible]	[illegible]
10.	KAGANDA SELESIO	C/Person	Karugutu South	m	0774796948	[illegible]
11.	KIIZA RICHARD.B		Karugutu S-	m	0783059862	K.R.B
12.	TINKASIMIRE ROBERT		Nyabuhuru II	m	0773107215	[illegible]
13.	Peter Ndatinsha		KACWAMBAI	m	078[illegible]	P.N
14.	BAMANYISA GETRID		KACWAMBAI	F	—	[illegible]
15.	MUSA Byaruhanga		Nyabuhuru	M	0789481159	—
16.	KIIZA DAVID		NYABUHURU	M	078781355[illegible]	[illegible]
17.	BASINGIREBA C		NYABUHURU II	F	0788314352	[illegible]
18.	Kansiime John		Nyabuhuru	M	0775827[illegible]	[illegible]
19.	Musinguzi Ibrahim		Kacwamba	M	078[illegible]006	[illegible]
20.	Bitrace Kabasonkole		Kacwamba	F	—	[illegible]

TOWN CLERK
KARUGUTU TOWN COUNCIL
07 JUL 2017
NTOROKO DISTRICT
LOCAL GOVERNMENT

UNRA
Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	Happy Moses Babaga	C/man L.C	Nyabuhuru	M	0773654782	[signature]
2.	Tinka Morgan	C/person LCII	C/Karugutu	M	0789934282	[signature]
3.	Marie Basemera	—	Kakwamba I	F	0782586279	[signature]
4.	Mutegeki M. Gad	-	Karugutu Sou...	M	0752783172	[signature]
5.	Mbabazi Nesya		" "	F	0772469900	MN
6.	Kaijja Wilson	[illegible]	"	M	0781393995	[signature]
7.	Mwesige patrick	Driver	Kacwamba	M	0789268855	[signature]
8.	Bamulesha Friend	C/man NRM	Kakoga	M	07826795	[signature]
9.	Simon Zaba				0778358216	ZABA
10.	Birungi Shamimu	--	Nyabuhuru		0771440126	SHAMI
11.	Fatuma Kaberesa	-	Karugutu North	F	0784688135	F.K.
12.	Kyenda Evenna	-	Kachwamba II	F		K.EV
13.	Kabanyoro Felesta	-	Kachwamba II		0778469154	K.F
14.	Basaliza Ismail	-	Kacwamba II		0775102958	[signature]
15.	Mrs Jastina Waswa	—	Karugutu N			J.W.
16.	Mwesigye Robert	-	Kacwamba		0788507303	[signature]
17.	Muhammad Abdulrazak	-	Kyabuhuru		0788449958	[signature]
18.	Rahamah Namatovu		Nyabuhuru	F	0703619378	[signature]
19.	Biira Peace	Member (LA)	Nyabuhuru	F	0774974639	[signature]
20.	Kabyahura Eva	—	Kacwamba II	F	—	K. Eva

TOWN CLERK
KARUGUTU TOWN COUNCIL
07 JUL 2017
NTOROKO DISTRICT
LOCAL GOVERNMENT

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	Ndora Yosam		Nyabuhuru North	m	0782445115	[illegible]
2.	KASAIJA Patrick		Kacwamba	M	0772137473	Kasaija
3.	KANYAMUSOKE		NYABUHURU II	m	0772530	
4.	Matte Julius		NYABUHUR	m	0787208830	Matte
5.	Fatuma K		Nyabuhuru		0788462288	
6.	Kisembo Albert		Nyabuhuru		0756515867	[illegible]
7.	Mbabazi T		Nyabuhuru			
8.	Kabagyo Annelia		Nyabuhuru	F		
9.	Mugenyi Hebert		Nyabuhuru	m	0782426574	[illegible]
10.	Kabadaki Agnes		Nyabuhuru	F		
11.	Basemera Beatrice		Kacwamba	F	0774739291	Beatrice
12.	MUGENI SADAM		NYABUHURU	M	0779078906	[illegible]
13.	KISEMBO PATRICK K	ELDERLY	KARUGUTU SOUTH	M	0773320821	[illegible]
14.	Asaba Juma		Kanyamukale	m	0780506352	[illegible]
15.	KITARA AMIRI		Kacwamba I	m	0785067914	KITARA
16.	ALAPO JENIFER		Nyabuhuru II	F	0783255206	[illegible]
17.	EDESI Kobalinda		Nyabuhuru II	F	---	EK
18.	Mungu Anneh		Kacwamba II	F	0775408087	SA
19.	Mbabazi Isha		K.T.C	F		M.I
20.	BIIRA JULIET		Kachwamba II	F	0781095413	[illegible]

TOWN CLERK
KARUGUTU TOWN COUNCIL
07 JUL 2017
NTOROKO DISTRICT LOCAL GOVERNMENT

UNRA
Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	GAMUKAMA	GIDIOEN	KACWAMBA	M	0776[illegible]	[illegible]
2.	Kabanokora Enidi		K.T.C	F	0778928690	ACE.
3.	Rusisoma Shimimu		[illegible]	F	0784750890	[illegible]
4.	Vusemba Sabani		[illegible]	M		
5.	OTONO JOHAN	PEASANT	KACWAMBA	M	0788861359	[illegible]
6.	Kule Zano	"	KARUGUTU	M	078834756	Kzano
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LOT 9

VENUE : KANARA T/C
KARUGUTU – NTOROKO ROAD

UNRA

REGISTRATION FORM

Activity: ESIA BASELINE : STAKEHOLDER ENGAGEMENT Date: 10/07/2017

SN	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	KYALIMPA MOHAMANE	PWD COUNCILLOR	KANARA T/C	M	0771879596		KHA
2.	KABARUKOLE MOUREEN	D/SPEAKER	KANARA T/C	F	0771879511	kabarukole moureen@gmail	[illegible]
3.	TUSIIMIRE MAGRET	ELDER COUNCILLOR	KANARA T/C	F	0772182858 / 0781229541		[illegible]
4.	BAKASWARA ROSE	SPEAKER	KANARA T/C	F	0781950697		[illegible]
5.	BALUKU ISMAIL	NTORO WARD COUNCILLOR	KANARA T/C	M	0785165311		Isma
6.	Kiwanuka Vincent	Sec. for finance	Kanara T/C	M	0787204552	Kvincent257@gmail	[illegible]
7.	KAGOYA EVELYN	OFFICE TYPIST	KANARA T/C	F	0774675698	evelynk@gmail.com	[illegible]
8.	BENJAMIN CAMUS	SECURITY OFFICER	KANARA T/C	M	0787333310		[illegible]
9.	DRACICI JOSHUA	Physical Planner	Kanara T/C	M	0781483645	dracicis@gmail.com	[illegible]
10.	REHEMA HABIBU	AUDITOR	Kanara T/C	F	0773016471	kanarahm@yahoo.co.uk	[illegible]

THE TOWN CLERK
KANARA TOWN COUNCIL

KANARA T/C

KARUGUTU – NTOROKO ROAD

UNRA

REGISTRATION FORM

Activity: ESIA BASELINE: STAKEHOLDER ENGAGEMENT Date: 10/07/2017

S/N	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CONTACT	MAIL ADDRESS	SIGNATURE
1.	BWAMBALE ERASTUS	Town clerk	Kanara T/C	M	0772850757	bwambaleerastus@gmail.com	
2.	MUGYME VINCENT	Sec. Production V/C/Person N.Rm.	Kanara T/C Ntoroko Dist.	M	0782357928		
3.	BITEYO – TOWASI	Councillor	KANARA T/C	M	0783865109		
4.	MULISO SWEASH	Councillor	Kanara T/C	M	0785158985	—	
5.	BEYUNGA SILVER	Area-Dist. Councillor	Kanara T/C.	M	0785159830 0773072880	beyungasilver@gmail.com	
6.	NANGOTE. PAULYNE	Youth. Councillor	Kanara T/c	F	0784087684		
7.	TUMUHIMBISE ZAHARA	SEC. SOCIAL SERVICE	KANARA T/C	F	0775965157		
8.	CHANCE	FRANCIS	KANARA T/C	M	0706181422	[illegible]	
9.	KAAANJA SAMUEL	YOUTH COUNCILLOR	KANARA T/C	M	0773983590		
10.	Nalubega Zaituna	PWDs Councillor	Kanara T/c	F	0781382156		

THE TOWN CLERK KANARA TOWN COUNCIL NTOROKO DISTRICT

LOT 4

VENUE : NTOROKO DISTRICT

Stakeholder : Ntoroko District

UNRA

REGISTRATION FORM

Activity: DISCLOSURE MEETING : KARUGUTU - NTOROKO RD Date: 11 - 07 - 2017

S/N	NAME	TITLE	ORGANISATION	SEX	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	Kagamba Stephen	For District Planner	Ntoroko DLG	M	0776-955987	kagambastephen82@gmail.com	[illegible]
2.	Bulobozi Ivan	Clerk to Council	Ntoroko DLG	M	0782-784404	bulobozivan@gmail.com	[illegible]
3.	Bwambale John Paul	Ag. Accountant	Ntoroko DLG D/HQs	M	0781-269633	bwambale.jp69@gmail.com	
4.	Friday Christopher (MOPD)	Head PDU	Ntoroko DLG	M	0772-371128	[illegible]	
5.	Bagonza Mustafa	For DHO	Ntoroko District	M	0782-583110	[illegible]@gmail.com	
6.	Tumwesige Lameck Kyaze	For DIS	Ntoroko DLG	M	0789-927788	Kyfag@gmail	[illegible]
7.	Kasunday Moreen	For Ag senior planner	Ntoroko	F	0771435761	reemollo@gmail	[illegible]
8.	Kusemererwa Moureen	Ag Senior Educ Officer	Ntoroko	F	0772381551	kusemerwamoureen@yahoo.com	[illegible]
9.	Bazara Anthony	Superintendent of Works	NTOROKO DLG	M	0772358507	bazaraanthony@gmail.com	[illegible]
10.	Mutegeki Moses	Ag. D/Engineer	Ntoroko DLG	M	0772827784	mutegekimoses[illegible]@gmail.com	[illegible]

For: DISTRICT [illegible] NTOROKO DISTRICT

LOI 7

VENUE: NTOROKO DISTRICT

Stakeholder: Ntoroko Dist.

UNRA

REGISTRATION FORM

Activity: DISCLOSURE MEETING: KARUGUTU-NTOROKO RD Date: 11-07-2017

SN	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	Maseresa Noah	Scdo	Ntoroko DLG	M	0712939145	masekranoah@yahoo.com	
2.	Musinguzi Robert	Asst. Eng. Officer	Ntoroko DLG	M	0777746641	musinguzirobert84@yahoo.com	
3.	KAMIGISA WINFRED	HUMAN RESOURCE	"	F	0782550224	wkamigisa@gmail.com	
4.	ZZIWA PHILLIP	Examiner of Accounts	Ntoroko DLG	M	0777682922	zaphillip2014@gmail	
5.	Ag. Baguma Patrick Ayinye	DPMO	Ntoroko DLG	M	0774403548	bagumapatrick@gmail.com	
6.	Nyakahuma Justus	Edo	"	"	0774687383	justus@gmail.com	
7.	Kidawalime Dennis	Ag. SIA	Ntoroko DLG	M	0774512107	kidawalime@gmail.com	
8.	Mugume Baro John	District Commercial Officer	Ntoroko DLG	M	0772986309	mugumebaro@gmail.com	
9.	Musana Edward	CFO	-do-		0772363651	musanaedward@gmail.com	
10.	BUKOMBI LAZAROUS	SEC. FOR SOCIAL SERVICES	NTOROKO DLG	M	0782499654	bukombilazarous@gmail.com	

DISTRICT ... NTOROKO

Stakeholder
Ntoroko District

Venue: Ntoroko Dist

REGISTRATION FORM

Activity: DISCLOSURE FOR KARUGUTU-NTOROKO RD Date: 11/07/2017

S/N	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CONTACT	EMAIL ADDRESS	SIGN
1.	NIWAHEREZA PHIONAH	ASS RECORDS OFFICER	NTOROKO DLG	F	0783592293	[illegible]	
2.	IWMBAIRWE GEOFFREY	PLANNING	"	M	0784307157	[illegible]	
3.	MAIAL NORBE	District Councilor	NTOROKO.D	M	0785469509	norbe.nodey2017@[illegible]	
4.	Musemeza Wilson	District Cashier/ Senior Accounts Ass	Ntoroko DLG HQTR	M	0772-969150	musemeza.w@yahoo[illegible]	
5.	Karaji Kenneth	Internee	CBS	M	0789460713	[illegible]@gmail	
6.	Kule Micheal	CBS Internee	Ntoroko DLG	M	0755815149	Kulemicheal234@gmail.com	
7.	MUGISA BRIZA	Clerk to the Council	Ntoroko DLG	M	0777-645064	—	
8.	MUSUMBA GEOFREY	Human resource unit internee	NTOROKO DLG	M	0781599817	geofreymusumba22@gmail.com	
9.	NAMATOVU VAIDA	FINANCE INTERNEE	NTOROKO DLG	F	[illegible]6295	[illegible]	
10.	MWEBESA JUSTUS	FINANCE	NTOROKO DLG	M	0775503429	Mwesa.Justus@gmail.com	

NTOROKO DISTRICT

LOT 9

UNRA

REGISTRATION FORM

Activity: DISCLOSURE & Baseline Date: 11/07/2017

S/N	NAME	TITLE	ORGANISATION	SEX (M/F)	TELEPHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	KEMIHONDO YOSINTA	SECRETARY	DIST. HQRS NTOROKO DIST	F	0774281504	kemiyosinta@gmail.com	[illegible]
2.	KAHUGA VIOLET	INTERNSHIP STUDENT (PDU)	DIST. HQRS NTOROKO DIST	F	0787807769	kahuga.viola@gmail.com	[illegible]
3.	JESSICA BAHATI .B.	SEC. PRODUCTION	NTOROKO DLG	F	0775963055	bahkatirabahati@gmail.com	[illegible]
4.	Asiimwe Jackson Jay	Sec for finance	Ntoroko DLG	M	0781265095	[illegible]	[illegible]
5.	MALIRO WILER	Intern (PDU)	Ntoroko DLG	M	0784375609	[illegible]	[illegible]
5.	Nyamanyora Timothy	LC V Chairperson	Ntoroko DLG	M	0772134932 / 0756196649	[illegible]@gmail.com	[illegible]
7.	Mugume Shaban	for CAO	Ntoroko DLG	M	[illegible]	shaban.mugume@gmail.com	[illegible]
8.							
9.							
10.							

FOR DISTRICT [illegible] NTOROKO DISTRICT

VENUE: KARUGUTU HC IV

PROJECT: KARUGUTU – NTOROKO

UNRA

REGISTRATION FORM

Activity: ESIA BASELINE: STAKEHOLDER ENGAGEMENT Date: 12/7/2017

SN	NAME	TITLE	ORGANISATION	SEX M/F	PHONE CONTACT	EMAIL ADDRESS	SIGN
1.	KABUGHO REBECCA	Nursing officer	Karugutu H/C IV	F	0772490822	[illegible]@gmail.com	[illegible]
2.	Komumbuga Joopista	Theatre Asst	Karugutu HC IV	F	0784628786		[illegible]
3.	MUHINDO Grace	Health inspector	Karugutu HC IV	F	0772945718	gracemuhindo@yahoo.com	[illegible]
4.	KULE ISAAC	Medical Records	Karugutu HC IV	M	0774870528	kuleisaac8@gmail.c[illegible]	
5.	Kabugho Roset	Enrolled midwife	Karugutu HC IV	F	0788869100	Kroset[illegible]@gmail.com	[illegible]
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KARUGUTU HEALTH CENTRE IV
12 JUL 2017
NTOROKO - DISTRICT

RWEBISENGO

ESIA BASELINE stakeholder Engagement for Karugutu-Ntoroko Rd.

14-07-2017

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	Kyalikunda Abusatu	Opinion leader		M	0704420806	[signature]
2.	KEMIGISA NALAH	SEC. FINANCE	R/SENGO S/C	F	0789036019	[signature]
3.	MUGUME BEZALEEL	MODERATOR	R/sengo T/C	M	0753/67757	[signature]
4.	KISAIJA Kenneth	CLERK ASSIST	R/sengo T/C	M	0750340927	[signature]
5.	KUSEMERERWA DAVID	[illegible]	Rwebisengo T/C	M	07[illegible]	[signature]
6.	Kanage Dan	HI	Rwebisengo T/C	M	0775948480	[signature]
7.	Mbabazi Yanice	V/C/P Rwebisengo T/C	Rwebisengo [illegible]	F	0704243607 0778503980	[signature]
8.	Tusiime Martin	ASKARI	R/sengo T/C	M	0775511235 0700411489	[signature]
9.	Kuza Jackson	office attendant	R/sengo S.C	M	0789834212	[signature]
10.	KABOYO Naume	P/chief	R/sengo S/C	F	0778392524	[signature]
11.	Baguma Peninnah	Secretary	R/sengo T/C	F	783-491717	[signature]
12.	Twizirize Unith	Ass vet officer	R/sengo T/C	F	0783111071	[signature]
13.	Bwambale Muthaka	Agric officer	R/sengo S/county	M	0786061476	[signature]
14.	Agabamwe Alex	Agric officer	R/sengo T/C	M	0774[illegible]	[signature]
15.	Ahmad Latifu Hussein	Sec finance R/C	R/sengo T/C	M	0750[illegible]	[signature]
16.	AHMED HUSSEIN	C/person LC III	R/sengo T.C	M	0782460285	[signature]
17.	ABYEBA CHRISTOPHER	C/Person LC III	R/sengo S/C	M	0772540670	[signature]
18.	KATO-RICHARD	R/Social-S	R/sengo T/C	M	0783[illegible]	[signature]
19.	Masamba Patrick	V/C/Person LC III	R/sengo S/C	M	0772307591	[signature]
20.	MWEANA PATRICK	TOWN AGENT	R/SENGO T-C	M	0782806585	[signature]

OFFICE OF THE TOWN CLERK RWEBISENGO TOWN COUNCIL July NTOROKO DISTRICT LOCAL GOVERNMENT

Witness

RWEBUSENGO S/C & T/C
ESIA BASELINE
KARUGUTU-NTOROKO
R.D.

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	MASEREKA GWOOK	Senior Treasurer	Rwebisengo Town Council	M	0782544162 0758007646	
2.	IRUMBA ROBERT	CDO	Rwebisengo Sub County	M	0774329917 0757766595	
3.	KORUSINTE BETTY	CDO	Rwebisengo Town Council	F	0782888224	
4.	Nyabenyaka John	Councillor	Rwebise	F	0784018944	
5.	Bekanabo Wilfred	Town Clerk	Rwebisengo TC	M	0751221110	
6.	Beatrice Mukasa	UNRA Sociologist	UNRA	f	0753845177	
7.	Kigoolo Stephen	UNRA Herpetologist	UNRA	M	0772627074	
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DISCLOSURE MEETING FOR KARUGUTU-NTOROKO ROAD

LOT 9

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	Maate Raphael G.	LC III C/P	Karugutu T/C	M	0782431933	[signature]
2.	Akugizibwe Robert	Youth Council	Karugutu T/C	M	0777872982	[signature]
3.	Tumwesige Agnes	For CDO	Karugutu T/C	F	0785114442	[signature]
4.	Byamukama Paddy	Intern Student	Karugutu T/C	M	0782327048	[signature]
5.	Bwambale Robinson	Intern Student	Karugutu T/C	M.	0782283982	[signature]
6.	Muhindo Yonah	Law Enforcement	Karugutu T/C	M	0773650346	[signature]
7.	Kaganda Solomon	C/man LCI	Karugutu S	M	0774776769	[signature]
8.	Kitobi Ogdon Smith	C/man Board Kaseo	Karugutu	M	0782549396	[signature]
9.	Locoge Juliet	DCFPO	Karugutu	F	0476299106	[signature]
10.	Kanyunyuze Annah	Health Agent	Karugutu	F	0771391003	[signature]
11.	Capt Gideon Makomba	Elder Karugutu T/C.	Karugutu South	M	0782506157	[signature]
12.	Nuvra Roset	V/chairperson LCIII	Karugutu T/C	F	0782460935	[signature]
13.	Mbabazi Nesta		Karugu T/C		0772469900	N M
14.	Kabugho Lady	Sec-Finance	Karugutu T/C	F	0771257595	[signature]
15.	Kasanja Francis	L.C I - Sec.	Karugutu Sou	M	0783424980	[signature]
16.	Kiiza Isaac	LC II C/P	Ibanda Ward	M	0782971929	[signature]
17.	[illegible]	C/P LC I	Bukonzo	M	0770463991	[signature]
18.	Kule Eric	M. Operator	K.T.		0787952997	[signature]
19.	Kamulindwa Julius	Scheme Operator	Karugutu T.C	M	0772265023	[signature]
20.	Kadoma Micheal	C/P Water Board	Karugutu T.C	M	0782362835	[signature]

TOWN CLERK
KARUGUTU TOWN COUNCIL
14 JUL 2017
NTOROKO DISTRICT
LOCAL GOVERNMENT

[signature]
T/C

LOT 9

UNRA

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	Hon. Bazonga Ramanata	Dist. Councillor	Ntoroko	M	0782995447 0750874130	[illegible]
2.	Tibagwa Joseph Nelson	Senior Assistant Clerk	Karugutu T/c.	M	0772 369 331	[illegible]
3.	Kabagambe Lawrence	G/S O	Karugutu T/c	M	0773-439-479	[illegible]
4.	Muthaka Vicent		Karugutu T/C		07...	[illegible]
5.	MASA V/C.NT		KArugutu	Twc	07837749	[illegible]
6.	SBBamuhiga Sheina TC		Kacwabai	M	-	SBB
7.	KATUMAMU Rashid.		KACWABA	M	0779775375	[illegible]
8.	BWAMBALE MOSES	SEC SOCIAL-SERVICE	BUKONZO	M	0777201060	[illegible]
9.	Mukonyezi Amos	Speaker	Karugutu T/c	M	0702034...	[illegible]
10.	Mutambi David	District Councillor	Ntoroko	F	0782-308...	[illegible]
11.	Tibenda Jonson	Member LC I	Kakoga cell	M	0788761359	[illegible]
12.	MBAMBU EVANCY			F	0770425035	[illegible]
13.	KABUGHO MWAJABO				0782276941	M.J.
14.	Kyakuwonza Abraham	Ofisum Leader	Karugutu	M	0774420346	[illegible]
15.	Beatrice Mukasa M.	Sociologist	UNRA	F	0787916437	[illegible]
16.	Kaganda Hope Atty	Councillor	KARUGUTU T/C	M	0777716891	Maganda
17.	KIGOOLO STEPHEN	ESIA Herpetologist	UNRA-HQ Kampala	M	0772624274	[illegible]
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TOWN CLERK
KARUGUTU TOWN COUNCIL
14 JUL 2017
NTOROKO DISTRICT
LOCAL GOVERNMENT

T/C

LOT 9

July 2017

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	Bagenda Samuson	Elder	Karugutu	M	0775113366	[signature]
2.	Kule Zamb North		Karugutu	M	0788347501	[signature]
3.	KANYARUSOKE	Elder	NYARUTHUKU	M	0778302300	[signature]
4.	TINKA M	COUNCILLOR	Kitu	M	0789921344	[signature]
5.	JIKABYAHORO A	Elder	Kagorombizi	M	0788317808	[signature]
6.	MUGOMBE NASHIRI	C/Person District Land Board	Karugutu	M	0785105131	[signature]
7.	AMANYO MILLY		KARUGUTU T/C	F	0774163085	[signature]
8.	KYAMANSO ZIPPORA	TOWN AGENT	KARUGUTU T/C KARUGUTU WARD	F	0777745447	[signature]
9.	Mugenyi Robert	C/P Land A	Karugutu	M	0785565246	[signature]
10.	MANUSIIME BRIAN	A.A.O	Karugutu T/C	M	0779484035	[signature]
11.	MBAMBU HOPE STELLA	Women Councillor MBANA WARD	Karugutu T/C	F	0787598051	[signature]
12.	Tumusiime V	Councillor	Karugutu	F	0780235775	[signature]
13.	Nyakato Tosinta	Youth Councillor	K.T.C	F	0787641393	[signature]
14.	NINSIIMA BENJAMIN	A.V.O	KTC	M	0784955586	[signature]
15.	MUIRA BRIAN	A.S.C	KTC	M	0755766551	[signature]
16.	Mukonyo Edmund	T/Agent	KTC	M	0779773164	[signature]
17.	PATRICIA BANURA	E.O.A.	KTC	F	0752 286025	[signature]
18.	Komurembo Jesca	UPE T.S	KTC	F	0789281813	[signature]
19.	Kahisaba Grace	T Agent	Mjabuhuru	F	0782500015	[signature]
20.	Mukirindo Agalia	elder	Karugutu	M	0778123728	[signature]

TOWN CLERK
KARUGUTU TOWN COUNCIL
14 JUL 2017
NTOROKO DISTRICT
LOCAL GOVERNMENT

T/C

Uganda Police
Kanara T/C

UNRA

REGISTRATION FORM

Activity: ESIA BASELINE Date: 15/7/2017

S/N	NAME	TITLE	ORGANISATION	SEX M/F	PHONE CONTACT	EMAIL ADDRESS	SIGN
1.	Akora Biruwsu Ali	Police officer	Kanara P. Station	M	0787201839		
2.	Musinguzi David	Police officer	Kanara Police Station	M	0788317912		
3.	Beatrice Mukasa	Sociologist	UNRA	F	0787916437		
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FGD – Male Group

UNRA

Rwabulingi L.

OFFICE OF THE CHAIRMAN LC1 KARUGUTU T/C NTOROKO DIS. DATE 16/07/2017 TU NORTH CELL

REGISTRATION FORM

Activity: ESIA BASELINE Date: 16th July 2017

S/N	NAME	TITLE	ORGANISATION	SEX M/F	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	Akugizibwe Rogers	Youth Councillor	Karugutu South	M	0772 772932	Akugizibwe rogers@ gmail.com	
2.	Mukonyezi Amos	Speaker	Karugutu T/C	M	0782053466	amosmukonyezi23@gmail	
3.	Hamadia Hassan	C/m L.1	Karugutu South	M	0784478575	—	
4.	Rwabulingi Lawrence	Chm L.I	Karugutu North	M	0772 972753	—	
5.	Hon [illegible] Majidu	Hon Councillor	K/South	M	0789921344		
6.	Kisaine Issa	Elder	K. North Cell	M	0782118450	—	
7.	Mirembe K. Joseph	C/man Kacwamba Ward	Kacwamba I cell	M	0774 864882		
8.	Mwesige Clovis	Youth	Kacwamba I cell	M	0779 142465		m.c
9.	Rulongoya Selwaster	Elder	Karugutu North	M	0782533722		
10.	Kaija Geoffrey	Youth	" North	M	0784307357	—	

FGD- Male Group

UNRA

OFFICE OF THE CHAIRMAN LCI
KARUGUTU T/C
16/7/2017
NORTH CELL

REGISTRATION FORM

Activity: ESIA BASELINE Date: 16th July 2017

SN	NAME	TITLE	ORGANISATION	SEX	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	HAPSI MOSES BAZARA	C/MAN LCI	NYABUHUMU II	M	0773654732		
2.	KISEMBO WILSON	C/MAN LCI	KACWAMBA II	M	0774170769		
3.	KISEMBO WILSON ATWOKI	ELDER	NYABUHUMU II ward	M	0779832676		
4.	KATUSABU Richard	C/PERSON LC II	KACWAMBA	M	0779975375		
5.	MUHUMUZA MICHEAL	Youth	Karugutu North	M	0775876549		
6.	NJURA BRIAN	YOUTH	[illegible]	M	0755566551		
7.	KYABIGONZA - ABUBAKAR	Opinion leader	Karugutu T/C	M	0774420346		
8.	George Bwambale	UNRA-Facilitator		M	0776802599		
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FGD – FEMALE

UNRA

KARUGUTU

Rwabukinga L.

OFFICE OF THE CHAIRMAN LCI
KARUGUTU T/C
16/7/2017
NORTH CELL

REGISTRATION FORM

Activity: ESIA BASELINE

Date: 16th July 2017

SN	NAME	TITLE	ORGANISATION	SEX M/F	PHONE CONTACT	E-MAIL ADDRESS	SIGNATURE
1.	HYAKANIKI JAMILAH	YOUTH	KARUGUTU SOUTH	F	0753456525	–	[illegible]
2.	Ithungu Anneth	Elder	Kacwambali	F	0775408087	–	IA
3.	Kabarongira	Disabled	Karugutu N	F	0785538158	–	Jeni
4.	NJURA ROSET	HON Councilor	NYABUHURU W	F	0782460935		[illegible]
5.	Syathamira Mary	Woman Representative	KARUGUTU N	F	0785702358		[illegible]
6.	KATUSABE LUCY	YOUTH	KARUGUTU N	F	0774251204		[illegible]
7.	NYANGOMA PAMELA	YOUTH	NYABUHURU	F	0704107486		APK
8.	TUSIIME PLAXENDA	YOUTH	KACWAMBALI	F	0781010179		T.P
9.	MBABAZI PERUSI	Elder	KACWAMBALI	F			m.P
10.	MBabazi Nesta	Elder	Karugutu		0772469		MN

FGD – FEMALE

UNRA

Rwabukingo K.

OFFICE OF THE CHAIRMAN LCI KARUGUTU T/C NTOROKO DIST. DATE: 16/7/2017 KARUGUTU NORTH CELL

REGISTRATION FORM

Activity: ESIA BASELINE – Date: 16th July 2017

S/N	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	Mutambi Olivia	District councillor	Karugutu South	F	0782300666	mutambaishaibrei@gmail.com	[signature]
2.	Kabasomi Angella	Sec for women	Kacwamba II	F	0787921379		Kabasomi
3.	Kabaitira Toepista	Hon councillor	Karugutu	F	0774223869		[signature]
4.	Hadijah Basaliza	Hon Councillor	Kacwamba ward	F	0787549814		[signature]
5.	Grace Kalisa	Citizen	Karugutu SC	F	0776785547	G.K	G.K
6.	Shamim Kabarozi	PWD	Kacwamba ward	F	0773114112	S.K	S.K
7.	Kezabbu Rosemary	As chairperson LCI	Karugutu South	F	0779256918	kezabburosemary@gmail.com	[signature]
8.	Kahwa Safina	PWD	Mabuhura II	F	---		
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Karugutu S/C

L.C.III CHAIRPERSON
KARUGUTU SUB-COUNTY
17 JUL 2017
NTOROKO DISTRICT

UNRA

REGISTRATION FORM

Activity: Stakeholder Engagement; Disclosure Date: 17-7-017

SN	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	BIAHWERE Luke	C/man L3	Karugutu S/C	M	0782360395	nyabilungu	[signature]
2.	BALUKU IBRAHIM	S/C CHIEF	KARUGUTU S/C	M	0772544510	NTANDI	[signature]
3.	Beatrice Mukasa	Sociologist	UNRA	F	0787916437	bitulosie@yahoo.com	[signature]
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Ntoroko HC III

UNRA

NTOROKO DISTRICT LOCAL GOVERNMENT 17 JUL 2017

REGISTRATION FORM

Activity: Baseline data for ESIA Date: 17/7/2017

NO.	NAME	ORGANISATION	SEX	TELEPHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	Umar Majid	MRA	M	0779223301	Amamaga16@gmail.com	
2.	Beatrice Mukasa	Sociologist UNRA	F	0787916437	b.mukasa@yahoo.com	
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UNRA

INTERNAL SECURITY OFFICE * NTOROKO DISTRICT
REPUBLIC OF UGANDA
Date: 17th/JUL/2017

REGISTRATION FORM

Activity:... Date: 17th/JULY/2017

SN	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	MUGISA MICHAEL	Ag. DISO	ISO	M	0772883522	–	
2.	Beatrice Mukasa M.	UNRA Sociologist	UNRA	F	0787916437	bitubasie@yahoo.com	
3.	Mayanja Charles	Research Asst.	~do~	M	0704549817	mayanjac@gmail.com	
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OFFICE OF C/P L.C.1
KISENYI B CELL
KANARA T/COUNCIL
DATE........

UNRA

REGISTRATION FORM

Activity: Focus Group Discussion — Karara Date: 17/July/2017

S/N	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	MASKA YOSIA Abooki		Kisenyi B	M	0783037091		
2.	Kyalimpa Wilson	L/Pat II	Kisenyi B.	M	0784999474		
3.	Nyangoma Alis		Kisenyi B	F			
4.	Isembo-J Samuel		Kisenyi B	M	0789297306		
5.	Musenuza Augustine patrice	fisher man	Kisenyi B.	M	0774850007		
6.	Tom Bingi	" "	" "	M	0781989317		
7.	Masika Might.	" "	Kisenyi B.	F	0783792222		masika
8.	Might Rose	" "	" " "	F	0778099742		Might
9.	Bwambale Bihuko	" "	" "	"	078126029		
10.	Gouga Shida	" "	" "	"	0781660125		

OFFICE OF C/P LC1
KISENYI B CELL
KANARA T/COUNCIL
DATE........

UNRA

REGISTRATION FORM

Activity: FGD at Kanara T/C ...... Date: 17/07/2017

SN	NAME	TITLE	ORGANISATION	SEX M/F	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	MUHINDERA Betty	Student	(See email address column)	F	.	Kisenyi B	[signature]
2.	Kasohuma Unice	-		F	-	Kisenyi B	Ku.
3.	[illegible] Sid.	C/Mamintee ~~0789731420~~		M	0789731420	KISENYI [illegible]	[signature]
4.	KADYOKA Kennedy	Fisherman		M	0774880952	KISENYI (B)	[signature]
5.	BALIKIGHAMBA JAMES	C/MAN LCI		M	0783918913	KISENYI B	[signature]
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VENUE: KANARA T/C
KARUGUTU – NTOROKO ROAD

UNRA

REGISTRATION FORM

Activity: ESIA BASELINE: ENGAGEMENT OF STAKEHOLDERS Date: 10/07/2017

SN	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	ASIIMWE PROSCOVIA	Health Assistant	Kanara T/C	F	0779822840	asiimweP20@gmail.com	
2.	TUMWESIGYE UTHUMAN	Internship stu	Makerere	M	0779422926	tumwesigyeuthuman@gmail.com	
3.	BALUKU JOHNSON	Ass. vet officer	Kamara T/C	M	0773-923425	balukujo@gmail	
4.	Thembo Sylvester	Senior L. Ext	Kanara T/C	M	0772518200	thembosyl@yahoo	
5.	BWAMBALE FELIX	Accounts Asst	KANARA T/C	M	0783324984	bwambalefelix@yahoo	
6.	MUHINDO WILSON	Senior asst T/C	Kanara T/C	M	0783707345		
7.	JESSICA BAHATI-B.	Sec. Production NLG	NTOROKO DLG	F	0778963055	balukabahati@gmail.com	
8.	Tembe Christine	Youth representative Ntoroko local council	Ntoroko LG	F	0778215860	Tembextine@gmail.com	
9.	MUHWEZI ISMAIL	C/PERSON NRM	KANARA T/C	M	0392962179	muhwezi.ismail@gmail	
10.	KOR DAVID	C/PERSON	LC III TC	M.	0776236247	0753528825	

THE TOWN CLERK
... TOWN COUNCIL
NTOROKO DISTRICT
10/07/17

VENUE : KANARA T/C
KARUGUTU - NTOROKO RD

UNRA

REGISTRATION FORM

Activity: ESIA BASELINE : STAKEHOLDER ENGAGEMENT Date: 10/07/2017

S/N	NAME	TITLE	ORGANISATION	SEX	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	KATIKIRO ANDREW	Accounts Asst	0785894228 Kanara T/C	M	0785894228 0750720...	[illegible]@gmail.com	[signature]
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THE TOWN CLERK
KANARA TOWN COUNCIL
NTOROKO DISTRICT
10/07/2017

Community Meeting

10/7/17

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	Bamanyiso francis	Fish man	Kanara B	M.		[signature]
2.	Mucaugo n police	Fisher man	NT. Kanara	M	[illegible]	[signature]
3.	Musoki Abudel	[illegible]	NTO South B	M	0789441187	[signature]
4.	AMosi Basyirma	Musoki	NTO South B	M	0789672[illegible]	[signature]
5.	TSAMba charles				[illegible]	[signature]
6.	KARAGANO Abus	bulding	Rwenyangere		07732050	Baragano
7.	NGARU-TOSIIN	Pastor	NT. NORTH	M	0789864121	[signature]
8.	Kyalimpa wilson	Z/P. TT	NT. Kisenyi	M.	0784999476	[signature]
9.	Asyenzitta Geoffrey	P.I.S.O	KANARA	M	0782500977	[signature]
10.	Kamali Marcel	catechist	Ntoroko	M	0750358416	[signature]
11.	ASABA ASTONE	Vicar	Ntoroko S'A	M.	0774473633	[signature]
12.	Kule Atoonia	T	Ntoroko East	M	0771627137	Kule
13.	UMALu HaSAN	ombalija	Nisenyi	M	0773071467	[signature]
14.	MUGARA BAHONA	NTOROKO SB CIMA		M	0771483770	[signature]
15.	Kabafuku Grace	NTOROKO	WEST	F	0782262067	K.G
16.	Kyalimpa Robert	BODE	SOUTH	M	0787552472	[signature]
17.	Ndaleme Moses	B/man	Ntoroko East	M	0789080687	[signature]
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THE TOWN CLERK
NTORONKO TOWN COUNCIL
NTOROKO DISTRICT

10/07/2017

Community Meeting

10/7/17

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	ASABA BONIFACE	Head Teacher	Brain model P.S	M	0772527834	[signature]
2.	Masululu Amos		Ntoroko	M	0787734735	[signature]
3.	Manual Mbel.	Nyampor	Kigungu	M	0758668658	[signature]
4.	KISEMBO MOSESI	BODA	KISEYI	M	0788576420	K
5.	AGASA AMOSI	BD	KAKARA	M	078670168	[signature]
6.	Nimusiima Sofia	BUDA	Kikugu	F	0773194408	
7.	Kenema morren	business	Kikugu	F		[signature]
8.	MAGEZI Clauice	business	Ntoroko NR	M	078871523	Clauce.
9.	Lomaru	mukimbo	Ntoroko	M	0773084961	[signature]
10.	Irumbe John	Town	Ntoroko	M	0778553	[signature]
11.	Kulemereiwa	B/m	Ntoroko	M	0772882114	[signature]
12.	AMIN SULAIMAN	DRIVER	NTOROKO	M	0758144377	[signature]
13.	Bagyuma Godfrey	omukoni	"	M	0774386071	[signature]
14.	ALI Basma	business	Ntoroko	M	0780489126	[signature]
15.	CHOTIVU FRIDAY	C/PERSON	NTOROKO	M	0782871610	[signature]
16.	SSemakula Ali	makanik	NTOROKO	M	0788532951	[signature]
17.	AYEBALE SUBAIT	peasant	NTOROKO	M	0779737716	[signature]
18.	MAGRET KEMIGISA	BUSINESS	NTOROKO	F		[signature]
19.	KABATORO SPECIOZA	B/WOMAN	NTOROKO	F		K.S.
20.	NYANGOMA BEATRICE	B/WOMAN	NTOROKO	F		[signature]

THE TOWN CLERK
NTOROKO TOWN COUNCIL
NTOROKO DISTRICT

10/07/2017

Meeting 10/07/2017

List of Churches and other places of worship on .... Road

S/No.	Name of School NAME	Location/SCounty Parish, Village	Contact	Comments
01	BAHATI B RICHARD	Kanara T.C	0787394250	Road from Karugutu to Kanara T.C
02	MWESIGWA SALIM	Kanara TC	0777839373	Road to Kanara T.C
03	KICONCO RABECCA	Kanara	0788151665	Road to Kanara T.C
04	Mercy Betty Tembe	Kanara	0772848247	connect the road from Karugutu to Kanara
05	Nangaye Kaliyni	N. West Ktc	0784061659	We need the road Karugutu - Kanara
06	Kabarokole Moureen	NT. West Ktc	0771879616	Road to Kanara T/C
	Faith Kabanyoro	Kanara T.C	-	Road from Karugutu to Kanara T.C
	Kajoine Faith	Kanara T.C Kisenyi Villa	0772634601	I want a road to Kanara.
	Ngabirano Isima	Karugutu	0789440329	Kanara
	OGOBI Bashir	Ntoroko KL	0788921210	Kanara
	TUHAISE MUJAFARI	NTORORO EASTA	0780861397	We need road
	GADAFI BEAKER	NTOROKO	0778001027	Need road
	ANDROZO RASHID	NTOROKO	0775784845	Good road
	OBEMU HERMAN	NTOROKO	0772162448	Good road
	B. HAMAD	KANARA TC	0782252131	Road to Kanara
	Mbabazi Betty	Ntoroko	- - -	Road.
	Nyamata Rose.	Ntoroko	0771828702	Road
	Mirembe Annith	Ntoroko	- -	Road
	Tusiime Francis	NTOROKO	0786767858	Road
	KAMYAKOLE	NTOROKO	0783124202	
	AFRICA STEVEN	MASUSI. NTOROKO WEST	0773471158	

TOWN CLERK
KANARA TOWN COUNCIL
NTOROKO DISTRICT

10/07/2017

Meeting. 10/7/2017

Uganda National Roads Authority

REGISTRATION FORM

No	NAME	TITLE	ORGANISATION/ VILLAGE	SEX M/F	PHONE CONTACT	SIGNATURE
1.	Agaba Joseph	Tobtist		M		[signature]
2.	Mutegeki E.	Boda	Kandle	M	-	[signature]
3.	Mwesige Adolf					
4.	KEmigisa Jane		South A			
5.	Uwegen Julius		Kisenyi			[signature]
6.	Busingye Umar		Kisenyi			[signature]
7.	Kaguma A		South A			[signature]
8.	Komuhimbo monica		Kisenyi			monica
9.	KATERE J		VISET		077829999	
10.	Nakibi					
11.	K. Wilson	Social worker	Kisenyi		0772113203	[signature]
12.	Hhungu mariam	Road	Kisenyi	F	0779006201	[signature]
13.	Komuhimbo	Gresi	Kisenyi		[illegible]	[signature]
14.	Kobusinge		Kingengu		0774862015	Harriet
15.	Tumwesigye	Peasant	KABUKANDA	M	0754392932	[signature]
16.	Baleeha Wilson	fishman	Ntoroko Gat	M	0785758974	Baleeha
17.	KAGORO WILLY	B. man	Ntoroko N	M	0788343664	[signature]
18.	HAJI M. GINGO	Businessman	Ntoroko E.	M	0779784375	[signature]
19.	HAMIDA NDAMBIRIGI	Businesswoman	NTOROKO	F	—	[signature]
20.						

TOWN CLERK KANARA TOWN COUNCIL NTOROKO DISTRICT 10/07/2017

LOT 9

10/7/2017

List of Churches and other places of worship on ....Road

S/No.	Name of School	Location/SCounty Parish, Village	Contact	Comments
01	Bechata Steven			
02	Kiro Wilson			
03	MUGISA MUSA	NTOROKO NORTH	—	Good.
	BWAMBALE ENOCK	KISENYI		
	Mustafah Saidi	Kanyansi		
	KATUSIIME ROBERT	KISENYI A		
	WASWA ZIADI	KISENYI		
	BABIRYE MARY	KISENYI		
	SHABAN MUKASA	KISENYI		
	TWEHEYO JUMA	KISENYI		
	MWANGUSHA RICHARD	KISENYI B		
	Sabiiti Wilson	Kisenyi	[signature]	[signature]
	Rugumba John	NTORoko East	–	[signature]
	omuhereza kighema			[signature]
	ABDUL KARIM	KISENYI		
	musiinguzi Rozeti	KISENYI		
	KABARWANI JEN			
	ISINGOMA HASSAN			
	Byarubanga Bernard	Ntoroko west		[signature]
	Ahabyona Richard	NTORoKO NORTH	0789231775	
	Tusiime John	NTORoKO NORTH	0776797954	

THE TOWN CLERK
KANARA TOWN COUNCIL
NTORoKO DISTRICT

10/07/2017

Semliki Safari Lodges

UNRA

Karugutu-Ntoroko

REGISTRATION FORM

Activity: Stakeholder Engagement Date: 14th August 20[illegible]

S/N	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CON.	EMAIL ADDRESS	SIGN
1.	Kigoolo Stephen	Herpetologist	MNRA	M	0772624274		
2.	Beatrice Mukasa	Sociologist	UNRA	F	0753184517	bitulesi@yahoo.com	[signature]
3.	Jonathan Wright	Owner	Wildplaces	M	0772594545		[signature]
4.	Amore Dr Met	GGM	Wildplaces	M	0784521111		[signature]
5.	Moses Masiga	Natural Resource Economist	UNRA	M	0772563919	[illegible]masiga@yahoo.co.uk	
6.	Nkumbu David Nelson	ESIA Team leader	UNRA	M	0772488621	dn.nkumbu@yahoo.com	
7.	Richard Ssemmanda	Ecologist	UNRA	M	0782480511	ssemmanda[illegible]	[signature]
8.							
9.							
10.							

STELLA MARIS NTOROKO HEALTH CENTRE
15 JUL 2017
P.O. Box 565, Fort Portal (U)

UNRA

STELLA MARIS NTOROKO HEALTH CENTRE
20 JUL 2017
P.O. Box 588, Fort Portal (U)

REGISTRATION FORM

Activity: ASIA BASELINE

Date: 15/7/2017

S/N	NAME	TITLE	ORGANISATION	SEX (M/F)	PHONE CONTACT	EMAIL ADDRESS	SIGNATURE
1.	Balikiy Tovan	E/NURSE	stella maris	m	0770966902	baluuwctoro@gmail.com	[signature]
2.	Beatrice Mukasa	Sociologist	UNRA	f	0787916437	bituless@	[signature]
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

Appendix 7: List of Plants that were recorded along the Project Corridor (2025)

Family	Species	Life form
Papilionaceae	*Abrus precatorious*	Climber
Malvaceae	*Abutilon angulatum*	Shrub
Malvaceae	*Abuliton mauritianum*	Shrub
Mimosaceae	*Acacia abyssinica*	Tree
Mimosaceae	*Acacia drepanolobium*	Shrub
Mimosaceae	*Acacia gerrardii*	Tree
Mimosaceae	*Acacia hockii*	Shrub
Mimosaceae	*Acacia kirkii*	Tree
Mimosaceae	*Acacia pentagonia*	Climber
Mimosaceae	*Acacia polyacantha*	Tree
Mimosaceae	*Acacia senegal*	Shrub
Mimosaceae	*Acacia sieberiana*	Tree
Euphorbiaceae	*Acalypa pyliosctachyus*	Shrub
Euphorbiaceae	*Acalypha bipartita*	Shrub
Euphorbiaceae	*Acalypha neptunica*	Shrub
Euphorbiaceae	*Acalypha ornata*	Shrub
Euphorbiaceae	*Acalypha vicaulis*	Shrub
Acanthaceae	*Acanthus pubscens*	Shrub
Passifloraceae	*Adenia cissampeloides*	Climber
Papilionaceae	*Aeschynomene elaphroxylon*	Shrub
Zingiberaceae	*Afromomum mildabraedii*	Herb
Agaveceae	*Agave sisalina*	Shrub
Asteraceae	*Ageratum conyzoides*	Herb
Caesalpiniaceae	*Albizia andianthifolia*	Tree
Caesalpiniaceae	*Albizia coriaria*	Tree
Caesalpiniaceae	*Albizia grandibracteata*	Tree
Caesalpiniaceae	*Albizia zygia*	Tree
Euphorbiaceae	*Alchornia cordifolia*	Shrub
Sapindaceae	*Allophylus africanus*	Shrub
Sapindaceae	*Allophylus dummeri*	Tree
Aloaceae	*Aloe sp*	Shrub
Amaranthaceae	*Alternanthera pungens*	Herb
Fabaceae	*Alysicarpus rugosus*	Shrub
Annonaceae	*Annona senegalensis*	Tree
Moraceae	*Antiaris toxicaria*	Tree
Euphorbiaceae	*Antidesma venosum*	Tree
Fabaceae	*Arachis hypogea*	Herb
Euphorbiaceae	*Artocarpus heterophyllus*	Tree
Poaceae	*Arundinaria alpina*	Shrub
Asparagaceae	*Aspagarus africana*	Shrub
Asparagaceae	*Aspagarus racemosus*	Climber
Asteraceae	*Aspilia africana*	Herb
Aspleniaceae	*Asplenium africanum*	Herb
Acanthaceae	*Asystasia gangetica*	Herb
Salvadoraceae	*Azima tetracantha*	Shrub

Family	Species	Life form
Balanintaceae	*Balanites aegytiaca*	Tree
Caesalpiniaceae	*Bauhinia variegata*	Tree
Asteraceae	*Berkheya spekeana*	Shrub
Asteraceae	*Bidens pilosa*	Herb
Acanthaceae	*Blepharis maderaspatensis*	Herb
Sapindaceae	*Blighia unijugata*	Tree
Urticaceae	*Boehmeria macrophylla*	Shrub
Nyctginiaceae	*Boerhivia diffusa*	Herb
Palmae	*Borassus aethiopum*	Tree
Poaceae	*Brachiaria brizantha*	Grass
Phyllanthaceae	*Bridelia micrantha*	Tree
Phyllanthaceae	*Bridelia scleronuera*	Tree
Acanthaceae	*Brillantaisia cicatricosa*	Shrub
Capparaceae	*Cadaba farinosa*	Shrub
Cairicaceae	*Cairica papaya*	Tree
Achariaceae	*Calancoba schweinfurthii*	Tree
Myrtaceae	*Callistemon citrinus*	Shrub
Apocynaceae	*Cantharasus roseus*	Herb
Capparaceae	*Capparis erythrocarpos*	Shrub
Capparaceae	*Capparis tomentosa*	Shrub
Sapindaceae	*Cardiospermum grandflorum*	Climber
Apocynaceae	*Carrisa spinarum*	Shrub
Apiaceae	*Centella asiatica*	Herb
Ulmaceae	*Chaetacme aristata*	Shrub
Poaceae	*Chloris gayana*	Grass
Sapotaceae	*Chrysophyllum albidum*	Tree
Menispermaceae	*Cissampelos mucronata*	Climber
Vitaceae	*Cissus araliodes*	Climber
Vitaceae	*Cissus quandragularis*	Climber
Vitaceae	*Cissus rotundiflora*	Shrub
Rutaceae	*Citrus aurantium*	Tree
Ranunculaceae	*Clematis hirsuta*	Climber
Verbenaceae	*Clerodendron capitulum*	Climber
Verbenaceae	*Clerodendron myricoides*	Shrub
Verbenaceae	*Clerodendron rotundifolium*	Shrub
Rutaceae	*Cleusena anisata*	Shrub
Sterculiaceae	*Cola gigantea*	Tree
Combretaceae	*Combretum aculeatum*	Shrub
Combretaceae	*Combretum adenogonium*	Tree
Combretaceae	*Combretum collinum*	Tree
Combretaceae	*Combretum molle*	Tree
Commelinaceae	*Commelina africana*	Herb
Commelinaceae	*Commelina benghalensis*	Herb
Commelinaceae	*Commelina diffusa*	Herb
Asteraceae	*Conyza floribunda*	Shrub

Family	Species	Life form
Asteraceae	*Conyza sumatrensis*	Shrub
Molluginaceae	*Corbichonia decumbens*	Herb
Capparaceae	*Crateva adansonia*	Tree
Papilionaceae	*Crotalaria cleomephylla*	Shrub
Papilionaceae	*Crotalaria incana*	Shrub
Euphorbiaceae	*Croton macrostachyus*	Tree
Poaceae	*Ctenium newtonia*	Grass
Curcubitaceae	*Cucumis figarei*	Herb
Araceae	*Culcasia falcifolia*	Climber
Curcubitaceae	*Curcubita sphaerica*	Climber
Araliaceae	*Cussonia scheffleri*	Tree
Amaranthaceae	*Cyathula cylindrica*	Herb
Poaceae	*Cynodon dactylon*	Grass
Cyperaceae	*Cyperus articulatus*	Herb
Cyperaceae	*Cyperus dubius*	Herb
Cyperaceae	*Cyperus latifolius*	Herb
Cyperaceae	*Cyperus papyrifera*	Herb
Vitaceae	*Cyphostemma adenocaule*	Climber
Vitaceae	*Cyphostemma cyphopetalum*	Climber
Fabaceae	*Delonix regia*	Tree
Papilionaceae	*Desmodium adscendens*	Herb
Papilionaceae	*Desmodium repandum*	Herb
Papilionaceae	*Desmodium salicifolium*	Herb
Papilionaceae	*Desmodium uncinatum*	Herb
Papilionaceae	*Desmodium vetilunum*	Herb
Convolvulaceae	*Dichondra repens*	Herb
Mimosaceae	*Dichrostachyus cinerea*	Shrub
Ebenaceae	*Diospyros abyssinica*	Tree
Flacourtiaceae	*Dovyalis macrocalyx*	Shrub
Draceanaceae	*Dracena fragrans*	Shrub
Ascepidaceae	*Dragea rubicunda*	Climber
Pontederiaceae	*Eichhornia crassipes*	Herb
Mimosaceae	*Entada abyssinica*	Tree
Poaceae	*Eragrostis sp*	Grass
Papilionaceae	*Erythrina abyssinica*	Tree
Euphorbiaceae	*Erythrococa bongensis*	Shrub
Erythroxylaceae	*Erythroxylum fischeri*	Shrub
Myrtaceae	*Eucalyptus sp*	Tree
Ebenaceae	*Euclea racemosa*	Shrub
Euphorbiaceae	*Euphorbia candelabrum*	Tree
Euphorbiaceae	*Euphorbia glomerifera*	Herb
Euphorbiaceae	*Euphorbia hirta*	Herb
Euphorbiaceae	*Euphorbia prostrate*	Herb
Euphorbiaceae	*Euphorbia triculi*	Shrub
Moraceae	*Ficus natalensis*	Tree

Family	Species	Life form
Moraceae	*Ficus ovata*	Tree
Moraceae	*Ficus sur*	Tree
Euphorbiaceae	*Flueggea virosa*	Shrub
Apocynaceae	*Funtumia elastica*	Tree
Rubiaceae	*Gardenia ternifolia*	Tree
Asteraceae	*Garlisonga parviflora*	Herb
Malvaceae	*Gossypium Sp*	Herb
Tiliaceae	*Grewia mollis*	Shrub
Tiliaceae	*Grewia simlis*	Tree
Proteaceae	*Grivellea robusta*	Tree
Asteraceae	*Gynura scandens*	Herb
Simaroubaceae	*Harrisonia abyssinica*	Shrub
Guttiferae	*Harungana madagascariensis*	Tree
Rhamnaceae	*Helinus mystacinus*	Shrub
Poaceae	*Heteropogon contortus*	Grass
Malvaceae	*Hibiscus cannabis*	Shrub
Malvaceae	*Hibiscus ovalifolius*	Shrub
Malvaceae	*Hisbicus fuscus*	Shrub
Labiatae	*Hoslundia opposita*	Shrub
Poaceae	*Hyparrhenia filipendula*	Grass
Poaceae	*Hyparrhenia ruffa*	Grass
Poaceae	*Hyparthelia dissoluta*	Grass
Balsaminaceae	*Impatiens sp*	Shrub
Poaceae	*Imperata cylindrica*	Grass
Papilionaceae	*Indigofera arrecta*	Shrub
Papilionaceae	*Indigofera dendroides*	Shrub
Papilionaceae	*Indigofera emerginella*	Shrub
Papilionaceae	*Indigofera paniculata*	Shrub
Papilionaceae	*Indigofera spicata*	Shrub
Convolvulaceae	*Ipomoea cairica*	Climber
Convolvulaceae	*Ipomoea involucratus*	Climber
Bignoniaceae	*Jacaranda mimosifolia*	Tree
Oleaceae	*Jasminium abyssinicum*	Climber
Oleaceae	*Jasminium eminii*	Shrub
Euphorbiaceae	*Jatropha curcas*	Shrub
Bignoniaceae	*Kigelia africana*	Tree
Asteraceae	*Laggera alata*	Shrub
Boraginiaceae	*Lannea barteri*	Tree
Boraginiaceae	*Lannea schweinfurthii*	Tree
Verbenaceae	*Lantana camara*	Shrub
Verbenaceae	*Lantana trifolia*	Shrub
Lamiaceae	*Leonitis nepetifolia*	Shrub
Lamiaceae	*Leucas martinicensis*	Herb
Mimosaceae	*Leucena lecocephala*	Shrub
Flacourtiaceae	*Lindackeria sp*	Shrub

Family	Species	Life form
Oleaceae	*Linociera johnsonii*	Tree
Verbenaceae	*Lippia abyssinica*	Shrub
Apocynaceae	*Landolphia buchananii*	Climber
Poaceae	*Loudetia arundinacea*	Grass
Capparaceae	*Maerua angolensis*	Tree
Myrsinaceae	*Maesa lanceolata*	Tree
Rhamnaceae	*Maesopsis eminii*	Tree
Euphorbiaceae	*Manihot esculenta*	Shrub
Melastomatacea	*Maranthacloa leucantha*	Shrub
Anarcadiaceae	*Mangifera indica*	Tree
Bignoniaceae	*Markhamia platycalyx*	Tree
Celestraceae	*Maytenus senegalensis*	Shrub
Meliaceae	*Melia azederach*	Tree
Poaceae	*Melinus repens*	Grass
Asteraceae	*Microglossa angolensis*	Shrub
Asteraceae	*Microglossa pyrifolia*	Shrub
Moraceae	Melicia excelsa	Tree
Moraceae	*Milicia excelsa*	Tree
Mimosaceae	*Mimosa pigra*	Shrub
Mimosaceae	*Mimosa pudica*	Shrub
Molluginaceae	*Mollugo sp*	Herb
Apocynaceae	*Mondia whitei*	Climber
Annonaceae	*Monanthotaxis buchananii*	Shrub
Caesalpiniaceae	*Milletia dura*	Tree
Vitaceae	*Mormodica foetida*	Climber
Moringaceae	*Moringa oleifera*	Tree
Commelinaceae	*Murdamia simplex*	Herb
Moraceae	*Morus lactea*	Tree
Musaceae	*Musa paradisiaca .*	Tree
Musaceae	*Musa sapientum*	Tree
Labiatae	*Ocimum gratissmum*	Shrub
Labiatae	*Ocimum rothii*	Shrub
Cecropiaceae	*Myrianthus holstii*	Tree
Oleaceae	*Olea africana*	Tree
Opiliaceae	*Opilia celtidifolia*	Climber
Cactaceae	*Opuntia cacti*	Shrub
Polygonaceae	*Oxygonum sinuatum*	Herb
Poaceae	*Panicum infestum*	Grass
Poaceae	*Panicum maximum*	Grass
Poaceae	*Panicum polystachion*	Grass
Poaceae	*Panicum sp*	Grass
Fabaceae	*Parkisonia aculeata*	Shrub
Sapindaceae	*Paulinia pinnata*	Climber
Poaceae	*Pennisetum purpureum*	Grass
Salicaceae	*Oncoba spinosa*	Tree

Family	Species	Life form
Lauraceae	*Persea americana*	Tree
Fabaceae	*Philenoptera laxiflora*	Tree
Poaceae	*Phragmites mauritianum*	Herb
Phyllanthaceae	*Phyllanthus capillaris*	Herb
Phyllanthaceae	*Phyllanthus nimularifolia*	Shrub
Phyllanthaceae	*Phyllanthus ovalifolius*	Shrub
Palmae	*Phoenix reclinata*	Tree
Caesalpiniaceae	*Piliostigma thoningii*	Tree
Piperaceae	*Piper umbellatum*	Herb
Pittoporaceae	*Pittosporum manii*	Shrub
Polypodiaceae	*Platycerium elephantitis*	Herb
Labiatae	*Plectranthus sp*	Shrub
Polygonaceae	*Polygonum setosulum*	Herb
Papilionaceae	*Pseudarthria hookeri*	Shrub
Pinaceae	*Pinus sp*	Tree
Meliaceae	*Pseudocedrella kotschyi*	Tree
Guttiferae	*Psorospermum febrifugum*	Shrub
Pteridaceae	*Pteris linearis*	Herb
Anarcadiaceae	*Pseudospondias microcarpa*	Tree
Sterculiaceae	*Pterygota mildbraedii*	Tree
Celastraceae	*Reissantia parviflora*	Climber
Icacinaceae	*Rhaphiostylis beninensis*	Climber
Vitaceae	*Rhoicissus tridedanta*	Climber
Anarcadiaceae	*Rhus natalensis*	Shrub
Anarcadiaceae	*Rhus vulgaris*	Shrub
Fabaceae	*Rhynchosia sp*	Climber
Palmae	*Raphia farinifera*	Tree
Poaceae	*Saccharum officinarum*	Herb
Draceanaceae	*Sansaveria dawei*	Shrub
Draceanaceae	*Sansaveria nilotica*	Shrub
Rubiaceae	*Rothmannia urcelliformis*	Tree
Euphorbiaceae	*Sarcostemma vimnalis*	Climber
Amarylidaceae	*Scadoxus multiflorus*	Herb
Rhamnaceae	*Scutia myrtina*	Shrub
Euphorbiaceae	*Sapium ellipticum*	Tree
Asteraceae	*Senencio angulatus*	Shrub
Caesalpiniaceae	*Senna hirsuta*	Shrub
Caesalpiniaceae	*Senna obtusifolia*	Shrub
Caesalpiniaceae	*Senna occidentalis*	Shrub
Polygalaceae	*Securidaca longipenduculata*	Tree
Caesalpiniaceae	*Senna spectabilis*	Shrub
Pedaliaceae	*Sesamum anguistifolium*	Shrub
Poaceae	*Setaria paretiana*	Grass
Poaceae	*Setaria sphacelata*	Grass
Poaceae	*Setaria verticillata*	Grass

Family	Species	Life form
Malvaceae	*Sida ovata*	Shrub
Solanaceae	*Solanum incanum*	Shrub
Scrophulariaceae	*Sopubia racemosa*	Shrub
Caesalpiniaceae	*Senna samea*	Tree
Rubiaceae	*Spermacoce princeae*	Herb
Poaceae	*Sprobolus africana*	Grass
Poaceae	*Sprobolus pyramidalis*	Grass
Araliaceae	*Steganoteania araliacea*	Shrub
Menispermaceae	*Stephania abyssinica,*	Climber
Boraginiaceae	*Spathodea campanulata*	Tree
Sterculiaceae	*Sterculia setigera*	Tree
Loganiaceae	*Strychnos innocua*	Shrub
Asteraceae	*Synedrella nodiflora*	Herb
Bignoniaceae	*Stereospermum kunthianum*	Tree
Myrtaceae	*Syzygium cordata*	Tree
Papilionaceae	*Tamarindus indica*	Tree
Rutaceae	*Teclea nobilis*	Tree
Papilionaceae	*Tephrosia linearis*	Shrub
Papilionaceae	*Tephrosia pumila*	Shrub
Papilionaceae	*Tephrosia punctatum*	Shrub
Lamiaceae	*Tectona grandis*	Tree
Combretaceae	*Terminalia brownii*	Tree
Combretaceae	*Terminalia glaucescens*	Tree
Euphorbiaceae	*Thecacoris lucida*	Shrub
Apocynaceae	*Thevetia peruviana*	Shrub
Thelypteridaceae	*Thylepteris dentalus*	Herb
Combretaceae	*Terminalia sp*	Tree
Cannabaceae	*Trema orientalis*	Tree
Asteraceae	*Tridax procumbens*	Herb
Tiliaceae	*Triumfetta macrophylla*	Shrub
Tiliaceae	*Triumfetta rhomboidea*	Shrub
Fabaceae	*Tylosema fassoglensis*	Climber
Urticaceae	*Urera trinervis*	Climber
Meliaceae	*Trichilia sp*	Tree
Asteraceae	*Vernonia amygdalina*	Shrub
Asteraceae	*Vernonia campanea*	Shrub
Asteraceae	*Vernonia cinerea*	Shrub
Viscaceae	*Viscum bagshawei*	Herb
Annonaceae	*Uvariopsis congensis*	Tree
Malvaceae	*Wissadula amplissma*	Shrub
Poaceae	*Zea mays*	Grass
Rhamnaceae	*Ziziphus pubscens*	Shrub
Labiatae	*Vitex doniana*	Tree

Appendix 8: List of Butterflies

Family/Species	Ecotype	IUCN status	River Wasa	Gallery Forest	Woodland	Wooded grassland
Nymphalidae						
Acraea acerata	W	NE	1		1	
Acraea alicia	W	NE	1		1	
Acraea egina	W	NE	1	1	1	
Acraea encedon	W	NE	1		1	
Acraea eponina	W	NE				1
Acraea jodutta	F	NE	1	1		
Acraea penelope	F	NE	1	1		
Acraea pharsalus	f.	NE	1	1	1	
Acraea pseudegina	W	NE				1
Acraea zetes	W	NE	1			
Amauris niavius	W	NE	1	1	1	1
Amauris tartarea	f.	NE	1	1		
Aterica galena	F	NE	1	1		
Bebearia absolon	F	NE	1	1	1	
Bicyclus jefferyi	f.	LC	1	1	1	
Bicyclus safitza	W	NE			1	1
Bicyclus vulgaris	W	NE	1	1	1	1
Byblia anvatara	M	NE		1	1	1
Charaxes bipunctatus	F	NE	1		1	1
Charaxes brutus	F	NE	1		1	1
Charaxes candiope	W	NE	1		1	
Charaxes etesipe	f.	NE	1	1	1	
Charaxes eupale	F	NE	1			
Charaxes fulvescnes	FL	NE	1	1		
Charaxes jasius	O	NE	1		1	1
Charaxes numenes	f.	NE	1	1		
Charaxes varanes	W	NE	1	1	1	
Charaxes zoolina	O	NE		1		
Cymothoe jodutta	F	NE	1			
Danaus chrysippus	M	NE	1	1	1	1
Euphaedra preussi	F	NE	1			
Euriphene ribensis	F	NE	1			
Eurytela dryope	W	NE		1	1	
Gnophodes bestimena	F	NE	1		1	
Hamanumida daedalus	W	NE			1	1
Henotesia perspicua	O	NE				
Hypolimnas misippus	M	NE			1	1
Hypolimnas salmacis	F	NE	1	1		
Junonia chorimene	O	NE	1	1	1	1
Junonia oenone	W	LC	1	1	1	1

Junonia orithya	M	NE	1	1		1
Junonia sophia	W	NE	1	1	1	
Junonia stygia	F	NE	1			
Junonia terea	W	NE		1	1	1
Junonia westernanni	F	NE	1			
Melanitis leda	W	NE		1		1
Neptidopsis ophione	f.	NE		1		
Neptis melicarta	F	NE	1			
Neptis saclava	W	NE	1	1	1	1
Neptis serena	W	NE	1	1	1	1
Precis Octavia	W	NE	1			
Salamis parphassus	f.	NE	1		1	
Sallya garega	M	NE			1	1
Tirumala petiverana	M	NE	1	1	1	1
Pieridae						
Appias epaphia	M	NE			1	
Appias sabina	F	NE	1	1		
Belenois aurota	M	NE	1	1	1	1
Belenois creona	M	NE			1	1
Belenois solilucis	O	NE	1		1	
Belenois subeida	f.	NE	1		1	
Belenois thysa	f.	NE	1		1	
Catopsilia florella	M	NE			1	1
Colotis antevippe	O	NE				1
Colotis aurigineus	W	NE				1
Colotis auxo	W	NE				1
Colotis danae	W	NE			1	1
Colotis eucharis	W	NE				1
Colotis evagore	M	NE			1	1
Dixeia pigea	W	NE		1	1	
Eronia cleodora	O	NE			1	
Eurema brigitta	M	LC	1	1	1	1
Eurema hapale	S	NE	1			
Eurema hecabe	M	NE	1	1	1	1
Eurema regularis	W	NE			1	1
Leptosia alcesta	W	NE	1	1		
Leptosia nupta	F	NE	1	1		
Leptosia wigginsi	F	NE	1	1		
Mylothris rubricosta	S	NE	1			
Nepheronia argia	F	NE	1			
Nepheronia buqueti	O	NE		1	1	
Hesperiidae						
Ankola fan	F	NE	1			
Borbo fallax	O	NE			1	1

Coeliades forestan	W	NE		1		
Eretis lugens	W	NE		1	1	1
Pardaleodes incerta	F	NE	1			
Sarangesa maculata	O	NE			1	1
Spialia spio	O	NE				1
Lycaenidae						
Abisara neavei	F	NE	1			
Anthene amarah	O	NE				1
Anthene larydas	F	NE	1			
Anthene lunulata	W	NE			1	1
Cupidopsis cissus	W	NE				1
Eicochrysops hippocrates	W	NE				1
Euchrysops malathana	O	NE				1
Leptotes pirithous	M	NE				1
Tuxentius cretosus	O	NE			1	1
Zizeeria knysna	W	NE	1	1	1	1
Zizina antanossa	W	LC	1	1	1	1
Zizula hylax	W	NE	1	1	1	1
Papilionidae						
Graphium policenes	f.	NE	1			
Papilio bromius	f.	NE	1	1	1	
Papilio cynorta	F	NE	1			
Papilio dardanus	W	NE	1	1	1	
Papilio demodocus	M	NE	1	1	1	1
Papilio nireus	f.	NE	1	1		
Papilio phorcas	F	NE	1	1		
106			**68**	**48**	**57**	**48**

Appendix 9: List of Birds recored within the project area (some extracted from the avaible literature)

Atlas No.	COMMON NAME Scientific Name (Alternative Name)	Class	C-Species
24	PURPLE HERON Ardea purpurea	R-NTW	R-NTW
26	BLACK-HEADED HERON Ardea melanocephala	w	w
28	HAMERKOP Scopus umbretta	w	w
32	ABDIM'S STORK Ciconia abdimii	AMAG	AMAG
33	WOOLLY-NECKED STORK Ciconia episcopus	R-NTW	R-NTW
35	SADDLE-BILLED STORK Ephippiorhynchus senegalensis	R-VUW	R-VUW
36	MARABOU STORK Leptoptilos crumeniferus	w	w
37	SHOEBILL Balaeniceps rex	VU, R-VUW	VU, R-VUW
42	SACRED IBIS Threskiornis aethiopicus	W	W
47	FULVOUS WHISTLING DUCK Dendrocygna bicolor (Fulvous Duck)	AMW	AMW
48	WHITE-FACED WHISTLING DUCK Dendrocygna viduata (White-faced Duck)	W	W
50	EGYPTIAN GOOSE Alopochen aegyptiaca	WG	WG
71	EUROPEAN HONEY BUZZARD Pernis apivorus	PMPF	PMPF
73	BLACK-SHOULDERED KITE Elanus caeruleus	G	G
75	BLACK KITE Milvus migrans	pA	pA
86	BROWN SNAKE EAGLE Circaetus cinereus	R-NT	R-NT
88	BATELEUR Terathopius ecaudatus	NTG	NTG
90	AFRICAN HARRIER HAWK Polyboroides typus (Gymnogene)	f	f
108	GRASSHOPPER BUZZARD Butastur rufipennis	AMA	AMA
116a	TAWNY EAGLE Aquila rapax		
118	WAHLBERG,S EAGLE Aquila wahlbergi		
119	AFRICAN HAWK-EAGLE Hieraaetus spilogaster		
125	MARTIAL EAGLE Polemaetus bellicosus	NT, R-VU	NT, R-VU
142	HELMETED GUINEAFOWL Numida meleagris	G	G
154	CRESTED FRANCOLIN Francolinus sephaena		
178	BLACK CRAKE Amaurornis flavirostris	W	W
185	GREY CROWNED CRANE Balearica regulorum	EN,R-NTWG	EN,R-NTWG
193	JACANA Actophilornis africana	W	W
248	WOOD SANDPIPER Tringa glareola	PMPW	PMPW
250	COMMON SANDPIPER Actitis hypoleucos	PMPW	PMPW
268	AFRICAN GREEN-PIGEON Treron calvus	F	F
271	BLUE-SPOTTED WOOD DOVE Turtur afer	F	F
272	BLACK-BILLED WOOD DOVE Turtur abyssinicus		
283	RED-EYED DOVE Streptopelia semitorquata	f	f
285	VINACEOUS DOVE Streptopelia vinacea		
309	RED-CHESTED CUCKOO Cuculus solitarius	AF	AF
317	AFRICAN EMERALD CUCKOO Chrysococcyx cupreus	F	F
319	KLAAS' CUCKOO Chrysococcyx klaas	f	f
320	DIDRERIC CUCKOO Chrysococcyx caprius (Diederik or Didric Cuckoo)		
323	WHITE-BROWED COUCAL Centropus superciliosus		
358	AFRICAN PALM SWIFT Cypsiurus parvus		

369	SPECKLED MOUSEBIRD Colius striatus		
371	NARINA,S TROGON Apaloderma narina	F	F
372	CHOCOLATE-BACKED KINGFISHER Halcyon badia	FF	FF
373	GREY-HEADED KINGFISHER Halcyon leucocephala (Chestnut-bellied Kingfisher)	Afw	Afw
374	BLUE-BREASTED KINGFISHER Halcyon malimbica	Fw	Fw
375	WOODLAND KINGFISHER Halcyon senegalensis	A	A
376	STRIPED KINGFISHER Halcyon chelicuti		
378	AFRICAN PYGMY KINGFISHER Ceyx pictus	fw	fw
388	SWALLOW-TAILED BEE-EATER Merops hirundineus	R-NTA	R-NTA
389	RED-THROATED BEE-EATER Merops bullocki	W	W
394	EUROPEAN BEE-EATER Merops apiaster	PMPf	PMPf
401	BROAD-BILLED ROLLER Eurystomus glaucurus	Afw	Afw
408	EURASIAN HOOPOE Upupa epops (Includes African Hoopoe)	PMp	PMp
409	ABYSSINIAN GROUND-HORNBILL Bucorvus abyssinicus		
418	AFRICAN PIED HORNBILL Tockus fasciatus	F	F
420	AFRICAN GREY HORNBILL Tockus nasutus		
422	BLACK-AND-WHITE CASQUED HORNBILL Bycanistes subcylindricus	F	F
426	SPECKLED TINKERBIRD Pogoniulus scolopaceus	F	F
430	YELLOW-THROATED TINKERBIRD Pogoniulus subsulphureus	FF	FF
431	YELLOW-RUMPED TINKERBIRD Pogoniulus bilineatus	F	F
433	YELLOW-FRONTED TINKERBIRD Pogoniulus chrysoconus	f	f
437	SPOT-FLANKED BARBET Tricholaema lachrymose	R-RR	R-RR
441	BLACK-BILLED BARBET Lybius guifsobalito		
443	DOUBLE-TOOTHED BARBET Lybius bidentatus	f	f
445	YELLOW-BILLED BARBET Trachyphonus purpuratus	FF	FF
455	GREATER HONEYGUIDE Indicator indicator (Black-throated Honeyguide)	f	f
456	LESSER HONEYGUIDE Indicator minor	f	f
465	NUBIAN WOODPECKER Campethera nubica		
470	BROWN-EARED WOODPECKER Campethera caroli	FF	FF
473	CARDINAL WOODPECKER Dendropicos fuscescens		
498	WHITE-HEADED SAW-WING Psalidoprocne albiceps (White-headed Rough-wing)	R-RRf	R-RRf
500	COMMON SAND MARTIN Riparia riparia (Bank Swallow)	PMPW	PMPW
530	RED-SHOULDERED CUCKOO-SHRIKE Campephaga phoenicea		
539	LITTLE GREY GREENBUL Andropadus gracilis	R-NTFF	R-NTFF
541	SLENDER-BILLED GREENBUL Andropadus gracilirostris	FF	FF
543	HONEYGUIDE GREENBUL Baeopogon indicator	FF	FF
556	WHITE-THROATED GREENBUL Phyllastrephus albigularis	FF	FF
558	RED-TAILED BRISTLEBILL Bleda syndactylus	FF	FF
562	COMMON BULBUL Pycnonotus barbatus (Yellow-vented Bulbul)	f	f
563	WESTERN NICATOR Nicator chloris	F	F
576	WHITE-BROWED ROBIN-CHAT Cossypha heuglini	f	f
577	RED-CAPPED ROBIN-CHAT Cossypha natalensis	F	F
578	SNOWY-CROWNED ROBIN-CHAT Cossypha niveicapilla	Fw	Fw

579	FIRE-CRESTED ALETHE Alethe diadematа	FF	FF
586	SPOTTED PALM-THRUSH Cichladusa guttata (Spotted Morning Thrush)		
584	RUFOUS FLYCATCHER-THRUSH Stizorhina fraseri	FF	FF
589	WHITE-BROWED SCRUB-ROBIN Cercotrichas leucophrys		
601	SOOTY CHAT Myrmecocichla nigra		
612	AFRICAN THRUSH Turdus pelios	f	f
621	MOUSTACHED GRASS WARBLER Melocichla mentalis (African Moustached Warbler)		
638	RED-FACED CISTICOLA Cisticola erythrops	w	w
639	SINGING CISTICOLA Cisticola cantans		
641	TRILLING CISTICOLA Cisticola woosnami		
645	RATTLING CISTICOLA Cisticola chiniana		
647	WINDING CISTICOLA Cisticola galactotes	w	w
650	CROAKING CISTICOLA Cisticola natalensis	G	G
658	TAWNY-FLANKED PRINIA Prinia subflava	fw	fw
662	RED-WINGED WARBLER Heliolais erythroptera	F	F
663	RED-WINGED GREY WARBLER Drymocichla incana	R-NTw	R-NTw
664	BUFF-BELLIED WARBLER Phyllolais pulchella	f	f
667	YELLOW-BREASTED APALIS Apalis flavida	f	f
677	GREY-BACKED CAMAROPTERA Camaroptera brachyura	f	f
682	YELLOW LONGBILL Macrosphenus flavicans	FF	FF
686	GREEN-BACKED EREMOMELA Eremomela pusilla		
691	RED-FACED CROMBEC Sylvietta whytii	F	F
692	GREEN CROMBEC Sylvietta virens	F	F
701	GREY-CAPPED WARBLER Eminia lepida	R-RRfw	R-RRfw
707	YELLOW-BELLIED HYLIOTA Hyliota flavigaster (Yellow-breasted Hyliota)	F	F
709	GREEN HYLIA Hylia prasina	F	F
723	AFRICAN DUSKY FLYCATCHER Muscicapa adusta	F	F
739	AFRICAN PARADISE-FLYCATCHER Terpsiphone viridis	f	f
740	RED-BELLIED PARADISE-FLYCATCHER Terpsiphone rufiventer	F	F
742	BLACK-AND-WHITE FLYCATCHER Bias musicus (Vanga Flycatcher)	f	f
743	CHESTNUT WATTLE-EYE Dyphorophyia castanea	FF	FF
746	BROWN-THROATED WATTLE-EYE Platysteira cyanea (Common Wattle-eye)	f	f
758	PUVEL'S ILLADOPSIS Illadopsis puveli	F	F
761	BROWN BABBLER Turdoides plebejus		
771	WHITE-WINGED BLACK TIT Parus leucomelas (Black Tit or White-shouldered Tit)	f	f
776	WESTERN VIOLET-BACKED SUNBIRD Anthreptes longuemarei	Af	Af
779	LITTLE GREEN SUNBIRD Anthreptes seimundi	FF	FF
787	SCARLET-CHESTED SUNBIRD Chalcomitra senegalensis	f	f
794	COLLARED SUNBIRD Hedydipna collaris	F	F
801	BEAUTIFUL SUNBIRD Cinnyris pulchellus		
811	AFRICAN YELLOW WHITE-EYE Zosterops senegalensis	f	f
812	COMMON FISCAL Lanius collaris	G	G
815	GREY-BACKED FISCAL Lanius excubitoroides	Afw	Afw
821	YELLOW-BILLED SHRIKE Corvinella corvina		

828	SULPHUR-BREASTED BUSH-SHRIKE Telophorus sulfureopectus	f	f
831	BROWN-CROWNED TCHAGRA Tchagra australis (Brown-headed Tchagra)		
833	BLACK-CROWNED TCHAGRA Tchagra senegalus		
836	NORTHERN PUFFBACK Dryoscopus gambensis	F	F
841	TROPICAL BOUBOU Laniarius aethiopicus	f	f
843	BLACK-HEADED GONOLEK Laniarius erythrogaster	f	f
844	BRUBRU Nilaus afer		
845	WHITE HELMET-SHRIKE Prionops plumatus (White-crested Helmet-shrike)	f	f
848	WESTERN BLACK-HEADED ORIOLE Oriolus brachyrhynchus	F	
853	FORK-TAILED DRONGO Dicrurus adsimilis (Common Drongo)	f/F	f/F
858	PIAPIAC Ptilostomus afer		
870	LESSER BLUE-EARED STARLING Lamprotornis chloropterus (Glossy Starling)		
872	RUPPELL'S STARLING Lamprotornis purpuropterus (Ruppell,s Long-tailed Starling)		
878	YELLOW-BILLED OXPECKER Buphagus africanus	R-VU	R-VU
891	CHESTNUT-CROWNED SPARROW-WEAVER Plocepasser superciliosus		
895	LITTLE WEAVER Ploceus luteolus		
896	BLACK-NECKED WEAVER Ploceus nigricollis	f	f
897	SPECTACLED WEAVER Ploceus ocularis	f	f
903	LESSER MASKED WEAVER Ploceus intermedius		
915	COMPACT WEAVER Ploceus superciliosus	fw	fw
922	RED-HEADED WEAVER Anaplectes rubriceps		
925	RED-BILLED QUELEA Quelea quelea	A	A
928	BLACK-WINGED BISHOP Euplectes hordeaceus (Fire-crowned Bishop)		
933	YELLOW-MANTLED WIDOWBIRD Euplectes macrourus	G	G
959	RED-BILLED FIREFINCH Lagonosticta senegala		
974	RED-CHEEKED CORDON-BLEU Uraeginthus bengalus		
980	BRONZE MANNIKIN Lonchura cucullata		
981	BLACK-AND-WHITE MANNIKIN Lonchura bicolor (Red-backed Mannikin)	f	f
985	PIN-TAILED WHYDAH Vidua macroura	G	G
995	YELLOW-FRONTED CANARY Serinus mozambicus		
1006	BROWN-RUMPED BUNTING Emberiza affinis	G	G

Appendix 10: Chance find procedure

CHANCE FINDS PROCEDURE (FOR ARCHAEOLOGICAL DISCOVERIES) REGARDING THE PROPOSED UPGRADE OF KARUGUTUNTOROKO (56.5KM), LINK TO RWEBISENGO (8.2KM) AND NTOROKO TOWN ROADS; TO BITUMINOUS STANDARD

1. Introduction

Archaeological sites are the only physical evidence that tells us about the past history of Uganda and are indicators of the indigenous people's cherished values and identity. The 1995 Constitution of Uganda, under the national objectives and directive principles of the state policy (XXV), obligates the state to protect and preserve Uganda's Heritage.

This emphasizes the Historical Monuments Act 1967 amended in a decree in 1977 that governs the protection of all cultural property in Uganda. The DMMs therefore is mandated to protect, preserve, gazette and rescue/salvage any material of archaeological, paleontological or historical importance on behalf of the State.

1.1 Purpose

To ensure that any archaeological or cultural heritage items discovered during construction are managed appropriately to preserve their historical value and to comply with relevant laws (e.g., Uganda's Historical Monuments Act). Regarding Chance Finds, the responsible authority: Typically, the Department of Museums and Monuments or national antiquities office.

1.2 Potential of Discovery of previous Unknown Archaeological Sites

As noted earlier Chance Finds are sites or materials such as pottery or Stone tools, Iron Slag, Charcoal that could be found during earthworks of any development. Pottery or broken pots may be decorated or plain, red ware or brownish or even yellowish-white for those that used kaolin.

Stone tools may also be in black/dark (Chert), white without or with crystals (Quartz/Quartzite) and many others. Some other people may find iron Slags, Spears, Knives or other objects made from iron ore and bones of either human or animal remains.

It is therefore important to follow the protocol provided below while operating from an archaeological/cultural heritage rich areas with the country.

2. Procedure to address chance find.

a) In line with the General Specification for Road and Bridge and WB Physical Cultural Resource Safeguard Policy Guidebook, the Contractor must stop work immediately after discovering evidence of possible scientific, historical, prehistoric, or archaeological data and notify the Resident Engineer giving the location and nature of the finds.

b) The Contractor shall exercise care so as not to damage artifacts or fossils uncovered during excavation operations and shall provide such cooperation and assistance as may be necessary to preserve the findings for removal or other disposition by the Employer.

c) The Contractor shall also document/record the Chance Find and provide a report with the following

(i) Date and Time of discovery
(ii) Location of the discovery
(iii) Description of the PCR
(iv) Estimated dimensions of the PCR
(v) Temporary protection implemented

Note: this report will first be submitted to the Resident Engineer who will report to responsible authorities for further communications and actions

a) The Resident Engineer should notify the Commissioner DMMs of such finds for verification and salvage by writing a notification letter or email and where urgency is needed a telephone call.

The contact details below;

Name: Rose Nkaale Mwanja;
Email; mwanjankale@gmail.com
Tell; 0414 232 707 0r 0772 485624.

This is in line with the Historical Monument Act 1967, Section 11(1 &4) and section 12b).

b) The DMMs should be able to provide a solution at least within 7 to 28 days after being contacted. This implies that where salvage archaeology is required, works of the contractor should be suspended for at least not more than 28 days. A report of the finds should be shared with all relevant authorities such as UNRA, UMEME, Oil and Gas Institutions or any other development companies and DMMs.

Appendix 12: Vulnerbility Management Plan (VMP) (Framework)

VULNERABILITY MANAGEMENT PLAN (VMP) FOR THE PROPOSED UPGRADE OF KARUGUTUNTOROKO (56.5KM), LINK TO RWEBISENGO (8.2KM) AND NTOROKO TOWN ROADS; TO BITUMINOUS STANDARD

1. Introduction

This Vulnerability Management Plan (VMP) is a structured approach to identify, assess, mitigate, and monitoring risks and vulnerabilities that could negatively affect the success, safety, environment, and sustainability of the project; during the implementation of Karugutu-Ntoroko Road project and the associated links.

This plan outlines the approach to managing vulnerabilities throughout the lifecycle of the road construction project. The objective is to minimize disruptions, enhance resilience, and ensure safety, compliance, and sustainability. The objectives of this VMP are to:

(i) Identify potential vulnerabilities in the project.
(ii) Assess the likelihood and impact of each vulnerability.
(iii) Implement mitigation and contingency strategies.
(iv) Monitor vulnerabilities throughout the project duration.

2. The Vulnerability Management Plan (VMP)

No.	Vulnerability Type	Mitigation Strategy	Monitoring indicators	Responsibility
1	**a. Environmental Vulnerabilities** (i) Flooding, Deforestation and biodiversity loss (ii) Climate change impacts	(i) Elevate roadbed and provide crossing waterways (ii) Build culverts and drainage (iii) Limit tree cutting where possible (iv) Plant trees within the Right of Way	• The Levels of cut and fill • Number of trees planted	Contractor MoWT
2	**b. Social Vulnerabilities** (i) Displacement of communities (ii) Start of project before compensation (iii) Disruption to local livelihoods (iv) Inadequate stakeholder engagement	(i) Ensure fully, Fair and adequate compensation prior project commencement. (ii) Conduct Continuous stakeholder engagements throughout the project cycle	• Records of compensation • Minutes from stakeholder meetings • Livelihood Restoration Plan	MoWT
3	**c. Technical Vulnerabilities** (i) Poor soil or geological conditions	(i) Installation of up to date material laboratory (ii) Use well maintained equipment	• Laboratory tests • Equipment maintenance schedule	Contractor MoWT

No.	Vulnerability Type	Mitigation Strategy	Monitoring indicators	Responsibility
	(ii) Design flaws or outdated engineering (iii) Equipment failures	(iii) Close supervision of the project implementation		
4	d. **Operational Vulnerabilities** (i) Supply chain delays (ii) Contractor performance issues (iii) Labor shortages or disputes	(i) Develop a Project Procurement Plan (ii) Conduct weekly meetings to assess the progress of the project (iii) Develop a Labour management Plan	• Status of the project procurement Plan • Minutes from progress meetings • Labour management Plan	Contractor
5	e. **Financial Vulnerabilities** (i) Budget overruns (ii) Funding delays or changes	(i) Accurate Cost Estimation (ii) Develop Comprehensive Funding Plans (iii) Define Scope Clearly (iv) Diversify Fund Sources (v) Use Contingency Reserves (vi) Implement Strong Project Management (vii) Strengthen Agreements and Contracts (viii) Set Realistic Project Timelines	• Accurate Cost Estimation • Comprehensive Funding Plans • Agreements and Contracts • Project timelines	Contractor
6	f. **Security/Safety Vulnerabilities** (i) Accidents during construction (ii) Theft/vandalism of materials (iii) Community resistance (iv) Wildlife attacks	(i) Develop Community Occupational Health and Safety Plan (ii) Work with UWA to provide security (Rangers) to protect workers from Wild-animal attack	• Community Occupational Health and Safety Plan • Incident reports	Contractor

3. Key Roles and Responsibilities

Personal		Key role
1. Project Manager:	:	Oversees risk management process.
2. Environmental Officer	:	Leads environmental impact assessment and monitoring
3. Community Liaison Officer	:	Coordinates stakeholder engagement.
4. Site Engineer	:	Monitors technical and operational risks.
5. Health & Safety Officer	:	Ensures site safety and security measures

4. Monitoring and Review

Monitoring and review shall be done through;

(i) Weekly site assessments

(ii) Monthly risk review meetings

(iii) Use of incident reporting system

(iv) Adaptive management for emerging risks

5. Communication Strategy

- Internal updates via project management
- Public communications through community meetings and reports
- Liaison with local authorities and NGOs