



Kampala-Jinja Expressway PPP Project Phase 1 Environmental and Social Impact Assessment

Volume A: Executive Summary

prepared for

Uganda National Roads Authority (UNRA)

by

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August 2018

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1. INTRODUCTION

Earth Systems and Atacama Consulting, together referred to as the Consultant, were engaged by Uganda National Roads Authority (UNRA) to update the Environmental and Social Impact Assessment (ESIA) for the Kampala-Jinja Expressway (KJE) PPP Project, which consists of a limited access tolled expressway in the central and eastern region of Uganda in East Africa. The overall project (including Phases 1 and 2) comprises the Kampala Jinja Expressway Mainline from the capital city of Kampala to the town of Jinja in the east and the Kampala Southern Bypass (KSB). Phase 1 consists of a 35km section of the mainline expressway from Kampala to Namagunga as well as the KSB section.

This ESIA Executive Summary covers Phase 1 (hereafter the 'Project') and summarises the baseline setting, the environmental and social risks and impacts of the Project, as well as the proposed approach to mitigate and manage potential impacts to comply with legislative requirements as well as international standards including those of the International Finance Corporation (IFC) and the African Development Bank (AfDB).

The structure of the ESIA submission is comprised of the following volumes:

- ▶ Volume A: Executive Summary (this document);
- ▶ Volume B: ESIA Report;
- ▶ Volume C: Technical Appendices; and
- ▶ Volume D: Management Plans.

2. POLICY LEGAL AND ADMINISTRATIVE FRAMEWORK

The ESIA has been carried out in accordance with applicable environmental and road construction policies, standards, regulations and legislation in Uganda as well as relevant international conventions and standards.

The primary government agency responsible for the environmental and social assessment of the Project via the EIA process is the National Environment Management Authority (NEMA), which is an independent central government agency responsible for co-coordinating all environment-related matters to ensure the sustainable management of the environment.

The current ESIA and environmental permitting process in Uganda is based on the requirements of the National Environment Act, Cap 153 (1995) and the process stipulated under National Environment (Impact Assessment) Regulations (1998). Further guidance is provided in the Guidelines for Environmental Impact Assessment in Uganda, 1997 and the Reference Manual, Environmental Impact Assessment (EIA) (2002), and for the road sector specifically, in the Environmental Impact Assessment Guidelines for Road Projects (2008).

Under Schedule Three of the National Environment Act, Cap 153 any major roads such as the proposed KJE Project and roads passing through scenic, wooded or mountainous areas require an EIA. Based on the Environmental Impact Assessment Guidelines for Road Projects (2008) the proposed project is considered a Category IV project and thus requires a full ESIA prior to implementation. The completed EIA is required to be submitted to NEMA for review, including a Public enquiry process (which is conducted over approximately 28 days). After submission of the EIA report, a decision by the Executive Director is required within 180 days from the date of submission.

Other key relevant national and applicable legal framework and policies include *National Environment Management Policy (NEMP), 1994; The National Water Policy, 1999; National Policy for the Conservation and Management of Wetland Resources, 1995; The Uganda Wildlife Policy, 2014; The Uganda National Land Policy, 2013; Resettlement/Land Acquisition Policy Framework, 2002; Uganda Vision 2025; Uganda Vision 2040; Second National Development Plan (2015/16 – 2019/20); National Transport Master Plan; Kampala Capital City Authority (KCCA)*

Strategic Plan (2014/15 – 2018/19); The Constitution of the Republic of Uganda, 1995 (as amended); The Uganda Wildlife Act, Cap 200; The Uganda National Roads Authority Act, 2006; The Public Health Act, Cap 281; The Roads Act, Cap 358; The Water Act, Cap 152; The Land Act, Cap. 227 (1998) as well as the Land (Amendment) Act, 2010; Traffic and Road Safety Act, Cap 361, 1998; The Historical Monuments Act, Cap 46; The Occupational Safety and Health Act, 2006.

As the Project is being financed by the AfDB, the European Union and the French Development Agency, it is expected that the Project will be developed in alignment with relevant international standards and guidelines as an example of international best practice in road development. Key applicable standards and guidelines for the ESIA and project development include the IFC/World Bank Performance Standards and Guidelines; and the AfDB's Operational Safeguards (OS) form part of their Integrated Safeguards System (ISS).

The Project would be classified as a Category A project by the IFC as it has the potential to result in a range of significant adverse environmental and social impacts. Environmental Assessments for a Category A projects are required to examine the project's potential negative and positive environmental impacts, compare them with those of feasible alternatives (including the "without project" situation), and recommend any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The updated ESIA for the Project has been developed in alignment with the IFC's eight Performance Standards as well as the relevant IFC *Environmental Health and Safety (EHS) guidelines*.

The current Project would be classed as a Category 1 project by the AfDB as it is likely to induce significant adverse environmental and social impacts, and has significant resettlement requirements. Category 1 investment projects require an ESIA, as well as an ESMP. The requirement for an ESMP is covered by the ESMP included in Volume D of this ESIA. The ESIA has also been developed in line with the relevant AfDB Operational Safeguards (OS).

UNRA is committed to international standards of good practice in the areas of environmental protection, social development, and health safety and security. In support of this commitment, UNRA has developed an Environmental and Social Safeguards Policy (2016), as part of its Environmental and Social Management System, which governs UNRA's operations. The ESIA has been developed consistent with this policy.

3. PROJECT DESCRIPTION AND JUSTIFICATION

UNRA is proposing to construct a limited access 76 km tolled expressway between Kampala and Jinja to relieve the current congestion and reliance issues on the radial routes out of Kampala city and on the existing Kampala to Jinja highway to cater for future growth. This infrastructure development is part of the Northern Corridor – a vital international highway connecting the port of Mombasa in Kenya to the landlocked countries of Uganda, Rwanda, Burundi and the Democratic Republic of Congo.

The Project also includes the Kampala Southern Bypass which will provide a bypass to the capital city of Kampala, linking to the Kampala Entebbe expressway and the Northern Bypass to form a complete ring road around the city. The overall KJE Project is planned to be undertaken in two phases as follows (Figure 3-1):

- ▶ **Phase 1** – development of the first section (35 km) of the Kampala-Jinja Expressway (KJE) from Kampala to Namagunga and the Kampala Southern Bypass (KSB) (18 km) which is expected to be completed by 2023; and
- ▶ **Phase 2** - development of the second section of the Kampala-Jinja Expressway (KJE) from Namagunga to Njeru (41 km) at the new Nile bridge. Works for the second phase are anticipated to be completed by 2030.

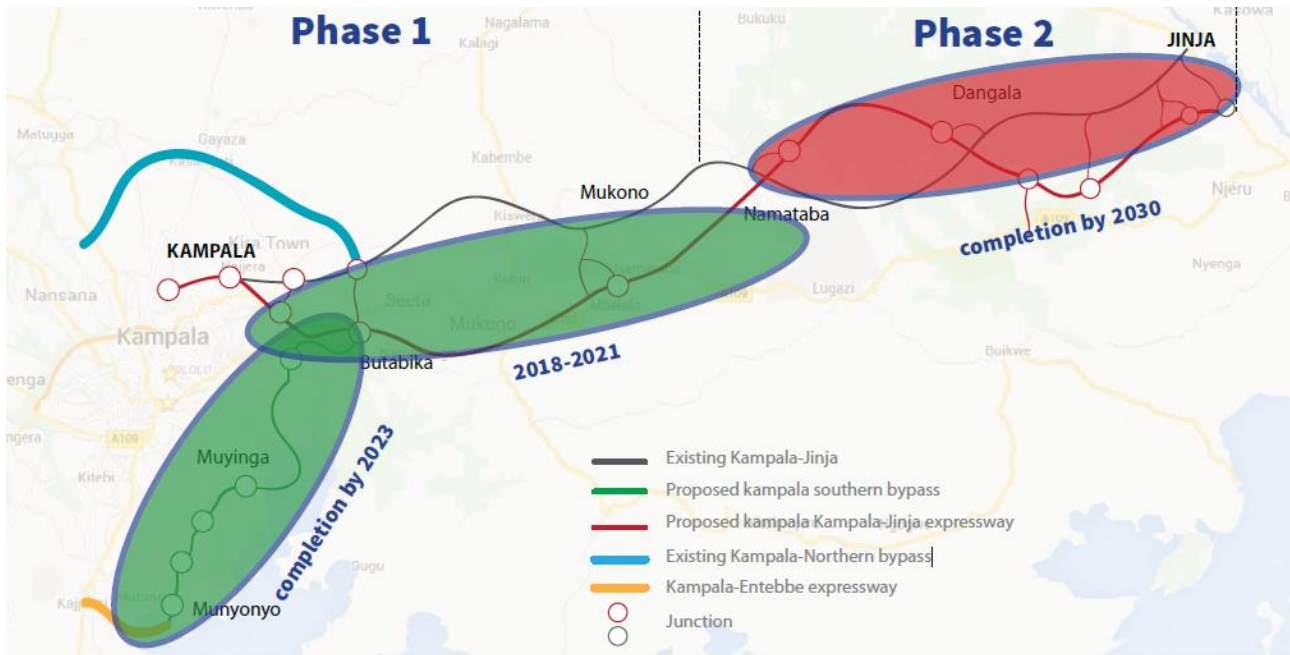


Figure 3-1: Kampala-Jinja Expressway Project Phases with indicative construction schedules (UNRA 2016c).

The overall KJE Project is currently planned for a 30-year term, based on a Design, Build, Finance, Operate and Transfer (DBFOT) model that will form the basis of the concession agreement between the Government of Uganda and the successful private sector concessionaire. The period is inclusive of the construction period, after which Project facilities will be transferred back to UNRA. The KJE Project is expected to generate approximately 1,500 jobs during construction and 250 jobs during operations, most of which will be taken up by Ugandans.

The KJE Project Phase 1 traverses Kampala City as well as three administrative districts of Wakiso, Mukono and Buikwe. This alignment has been selected based on detailed engineering design, feasibility and environmental and social studies conducted thus far which date back to 2011.

Key design features of the Project are shown in Table 3-1. The main component of the Project will be the Project Right of Way (ROW) consists of the main road body. The width of the ROW will vary between 45-90m along the alignment and will require full clearance of all structures and vegetation within these boundaries. The expressway will include flyovers, viaducts, interchanges, accessory/connector roads, bridges, underpasses, pedestrian crossings and toll gates. Ancillary infrastructure will also be required during construction including accommodation camps, quarries, borrow pits and an asphalt plant. The Construction Phase is expected to take five (5) years.

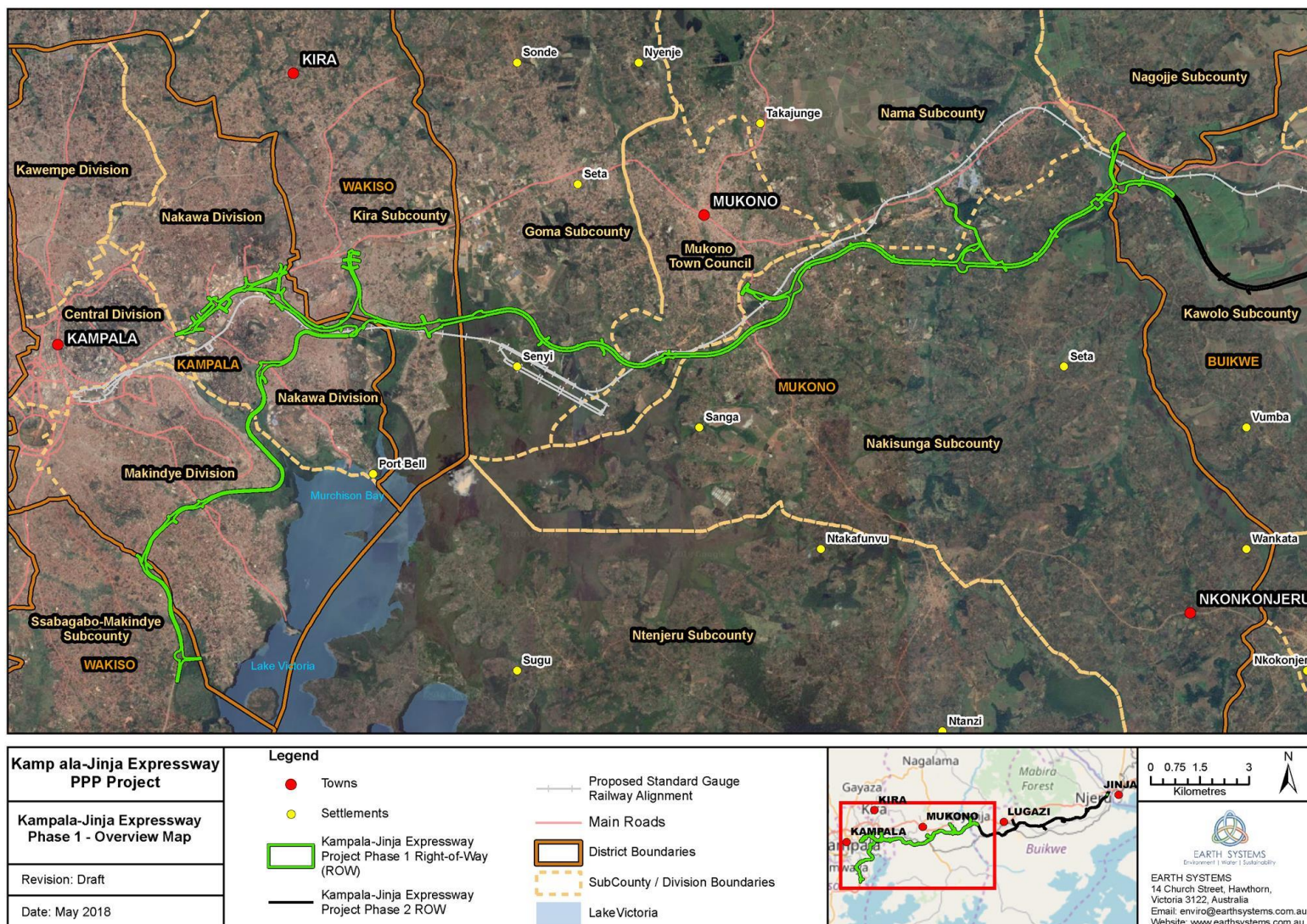


Figure 3-2: Overview of the Phase 1 Project Footprint

Table 3-1: Key design features of the Project, including the KJE mainline alignment (Phase 1) and Kampala Southern Bypass

Design features	KJE Mainline to Namagunga (Phase 1)	Kampala Southern Bypass
Total length	35 km - Greenfield (3km brownfield)	18 km - Greenfield
Design speed (urban)	85 km/hr (first 10 km)	100 km/hr
Design speed (rural)	120 km/hr	Not applicable
Lanes	4+4(3km); 3+3 (32km);	2+2 (18km)
Lane width	3.5 m (main line – urban), 3.7 m (main line – rural) and 3.65 m for link/connector roads	3.5 m (main line)
Median	2-5m with 0.5 m hard strip	2-5 m with 0.5 m hard strip
Shoulder width	3.5 m	3.0 m
Grade separated junctions	9	5
Potential length of viaducts	Approx. 2000 m at km 9+100 – km 10+640	Approx. 2700 m mainly over swamps
Nominal Right of Way width	90 m	60 m
Minimum vertical clearance	5.2 m	5.2 m
Maximum vertical gradient	6% (urban) and 4% (rural)	6 (urban) and 4% (rural)
Vehicular under/overpasses	23(+16 underpasses)	4 (+12 underpasses)
Tunnels	None	None
Pavement type	Asphalt	Asphalt

Source: UNRA, KJE 2017 feasibility study report.

3.1 Justification for the Project

The Project's primary objective is to develop and operate a limited toll expressway to relieve traffic congestion and cater for future economic growth that will benefit Uganda through promoting socio-economic development, reducing road transport costs, reducing vehicle emissions and improving road safety.

As a result of progressive economic growth over the last few decades, increased population and associated traffic in the region has led to capacity constraints on the existing Kampala-Jinja road, particularly between Kampala and Mukono. This has led to delays and unreliability issues not only on the existing highway but also on the surrounding local road network and the Kampala Northern Bypass. Congestion in these areas affects trade, commuting, the environment and vehicle operating costs. The capacity issues on the road network are such that if improvements are not implemented, the reliability of the transport network is forecasted to be severely affected by 2037 (UNRA, 2017).

As a regional and international transport corridor, the KJE Project will contribute to key strategic transport priorities for the region and help meet the objectives of regional integration, socio-economic development and investment in transportation infrastructure outlined in key national policies such as the Uganda Vision 2040, the National Development Plan II (2015/16 – 2019/20) and National Transport Master Plan (refer to Chapter 2 – Policy and Legislative Framework).

The proposed KJE Project forms part of a series of major infrastructure investments within Uganda and the city of Kampala. Transport infrastructure development is a critical element in the economic development policy of Uganda. The KJE Project (Phase 1 and 2) is expected to provide a range of direct and indirect benefits at the national, regional and local levels. Benefits of the KJE Project (Phase 1 and 2) include:

- ▶ Investment of approximately \$1.1 billion in capital expenditure for the KJE Project. This expenditure will likely result in flow on effects to the Ugandan national economy, resulting in an increased GDP and Foreign Direct Investments of at least \$300million (UNRA, 2017);
- ▶ Tax revenue of at least \$300m over the concession term (UNRA, 2017) and increased revenue through toll payments;
- ▶ Significant increase in regional and local employment opportunities with approximately 1,500 jobs created during construction and 250 jobs during operations (UNRA, 2017);
- ▶ Increased overall efficiency of the road network with a consequent improvement of the national/international road freight traffic through improving the reliability of transportation (UNRA, 2016);
- ▶ Improved conditions for road users through reduced vehicle-operating costs, time travel savings and fuel savings as a result of a more efficient road network. Road users will experience greater time savings of 70mins between Kampala and Jinja;
- ▶ Improved road safety through a high standard expressway with dual carriageway, improved alignment, improved road geometry, more overtaking opportunities and limited access;
- ▶ Increased operations and maintenance efficiency along the road network;
- ▶ Skills development and capacity building in the field of motorway infrastructure management by involving prospective international concessionaires; and
- ▶ Reduction in cost of doing business in the region through an improved road network and more reliable journey times.

3.2 Project Alternatives

A detailed analysis of Project alternative alignments considered during the Project design and pre-construction phase are provided in *UNRA (2017) Design, Build, Finance, Operate and Transfer of The Kampala-Jinja Expressway PPP Project (KJE) Draft Final Feasibility Study Report*. At the early stages of both the Kampala – Jinja mainline expressway and Kampala Southern Bypass (KSB) alignment design, several alternatives were outlined for both road alignments. These alternatives were assessed in detail with regards to their economic, environmental and social feasibility and changes made to the alignment to avoid unnecessary costs. The assessment of alternatives for the Kampala – Jinja mainline expressway included:

- ▶ A 'Business as Usual' option was considered and compared to the scenario of developing the road
- ▶ An initial assessment of suitable corridor options, including:
 - **Option 1:** Upgrading of the Existing Road
 - **Option 2:** New Northern Corridor
 - **Option 3:** New Southern Corridor (Southern Variant)
 - **Option 4:** New Southern Corridor (Northern variant)
 - **Option 5:** Bypasses and Existing Road Upgrade.

Following the multi-criteria assessment, Option 4 was taken as the most feasible of the three options with regards to economic viability, strategic transport objectives, commercial viability, sustainability criteria and construction and buildability (UNRA, 2017). Option 4 was thus taken to be the finalised design for the alignment. However, recent changes have been made to the alignment which are outlined in Chapter 4 of the ESIA report.

Various alternative alignments and options were also considered for the Kampala Southern Bypass (KSB) including (URS, 2013):

- ▶ **Alternative A (Open Cut)** – Every section being open cut and embankment or viaduct. There would be no tunnels associated with this alternative.
- ▶ **Alternative B (Tunnelled)** – Section 1, Section 2 and Section 3 would be tunnelled through the ridges.
- ▶ **Alternative C (Open Cut with small alignment change)** – Every section being open and cut as in Alternative 1. A small change to alignment was proposed around Muyenga hill to move the alignment away from permanently inundated wetland.
- ▶ **Alternative D (Business as Usual)** – No new route is developed and the existing road is not upgraded.

Further review of route options concluded that tunnel options were not viable for the Project and recommendations were made for an alignment avoiding the use of tunnels. This is partly due to the large economic costs of developing tunnelling infrastructure in Uganda.

The finalised alignments of the KSB and KJE Mainline were assessed again in 2017 after a review of the alignments in the context of newly available information, reviews of ESIA and RAP documentation and discussions with potential project donors. Changes were made to both the KSB and KJE Mainline alignments with the following objectives:

- ▶ To avoid conflict of the alignment with the Standard Gauge Railway Project which is being planned to follow a similar alignment to the KJE mainline between Kampala and Jinja;
- ▶ To avoid impacts on businesses along the ROW (e.g. Kampala Cement, Global Paper); and
- ▶ To avoid impacts on critical habitat wherever possible, focussing particularly on the Kasenge and Mabira Forests.

4. ENVIRONMENTAL AND SOCIAL SETTING

An extensive amount of environmental and social baseline data has been collected for the Project since 2011. This ESIA builds on the previous baseline work undertaken and also includes information collected from further targeted investigations undertaken under the scope of the ESIA update. In outline, the ESIA update process involved five key stages: baseline assessment, risk assessment, assessment of potential impacts, development of mitigation measures, and assessment of residual impacts and benefits. The environmental and social setting was determined based on reviews of publicly available information, as well as extensive field surveys.

4.1 Climate

The Project region has a tropical climate with the climatic conditions strongly influenced by the nearby Lake Victoria. Generally, Kampala and surrounding districts receive high and regular rainfall throughout the year, with January-February being drier than other months and rainfall highest in April. Annual rainfall is between 1750 mm and 2000 mm with an annual mean of 1212 mm in Kampala. Maximum 24-hour daily rainfall recorded at Entebbe over the last 30 years was 100.5 mm.

The Project area has high temperatures and a low mean annual range of only 2.4°C compared to the tropical savannah climate. Strong lake breezes, cloudiness and rainfall maintain Kampala's pleasant climate. The average annual maximum temperature in Kampala is approximately 26°C while the average annual minimum temperature is 17°C.

4.2 Land

Kampala Jinja Mainline (Phase 1)

Analysis of high-resolution satellite imagery and ground-truthing were undertaken to identify the current land cover and use of land resources within the ROW along the KSB and the KJE mainline components of the Project. Most of the land cover of the KJE mainline alignment has been modified by human activities, such as subsistence agriculture, the establishment of settlement areas and industrial activities, and commercial agriculture such as plantations. Land cover along the KJE alignment varies from the dense urban settlement areas in and around Kampala and Wakiso Districts, to agro-pastoral land, natural forest areas, plantations and smaller settlement areas where the alignment passes through Mukono District to Namagunga. The route also passes through several degraded wetlands and papyrus wetland areas. Key land cover features along the KJE alignment ROW include:

- ▶ The dominant land cover type within the KJE mainline alignment is agro-pastoral land (cultivated land / grazing pasture) which accounts for 138.0 ha (29%) of KJE mainline total land cover. The majority of agro-pastoral land along the alignment is located in Mukono District, followed by Wakiso District, with the section of the alignment in Kampala District having very little agro-pastoral land.
- ▶ After agro-pastoral land, settlement areas, cleared land and minor agriculture, and papyrus wetlands are the most common form of land use along the alignment covering 68.9 ha (14%), 34.2 ha (7%), and 31.4 ha (6.6%) respectively. The majority of settlement areas and industrial land along the alignment are located in Kampala and Wakiso Districts;
- ▶ Natural habitats areas are mainly present along the alignment through Mukono District, including shrubland, open forest/woodland, closed forest, grasslands and papyrus wetlands (e.g. Namanve wetland);
- ▶ Pockets of plantation land are also present in the alignment. The three main plantation types are tea plantation, tree plantation and sugar cane plantation comprising 28.9 ha (6%) , 10.0 ha (12.1%) and 3.6 ha (0.7%) of overall land cover in the alignment respectively. These are located along the alignment in Mukono District; and
- ▶ The route also intersects sections of cleared land, fallow land, a number of roads and tracks (25.3 ha), and watercourses such as the Sezibwa River.

Kampala Southern Bypass

Most of the land cover within the KSB section of the Project has been modified by human activities such as settlement areas, subsistence and intensive agriculture, and industrial activities. A key feature of the land use in the area surrounding the Project is the presence of Kampala City where a large proportion of the KSB alignment is located. In contrast to the KJE alignment, the dominant land cover in the KSB alignment is settlement areas, comprising 51.4 ha (44%) of total land cover in the alignment. Cleared and minor agricultural land, and cultivated wetland is also common, comprising 14.9 ha (13%) and 29.8 ha (26%) respectively of land cover.

Papyrus wetlands were identified along the alignment comprising 2.1 ha (2%) of land cover. Natural habitats such as semi evergreen forest and scrubland were not identified within the alignment although small pockets of urban forest are present, particularly where the alignment passes through Kampala District.

Spatial analysis and fieldwork reconnaissance indicated that a relatively significant amount of land use is sugar cane farming. These areas are intersected by the alignment where it traverses through the Bogolobi swamp. Roads and tracks comprised 8.8 ha (8%), and industrial land comprised relatively little (2.4 ha; 2%) of total land cover. Other minor land cover types include drainage areas and watercourses, and recreational areas.

4.3 Air Quality

The Project area ranges from the highly-populated Kampala city to rural areas near Njeru. The current alignment traverses densely populated areas in and around Kampala and Wakiso Districts, including several informal settlements. Heading east from Kampala, the land use varies from agricultural land, sugarcane plantations, aquaculture and forest land, among others. Several existing and proposed business parks, industrial areas, markets and small to large independent businesses are also present along the alignment. Ambient air quality conditions therefore reflect both anthropogenic and natural sources in these areas. Naturally occurring particulates include dust, smoke particles, pollen grains and fungal spores.

Smoke due to burning activities regionally can be a major source of particulates. There has been a steady increase in the use of wood fuel in informal settlements, due to lack of other sources. Wood fuel is used by approximately 75% of households, 10% of commercial establishments and 5% of industry. Charcoal production meets 10% of Kampala's energy needs. Dust from unpaved roads also contributes to the prevailing air quality in the region.

Monitoring data indicates existing vehicle emissions (SO₂, NO_x, CO) and dust particulates from nearby roads are a primary factor affecting air quality in the vicinity of the Project. Windblown dust and burning of vegetation in the dry season also impacts on air quality in the Project area, which results in enhanced particulate concentrations from smoke and ash. Long term monitoring data from Kampala indicates baseline PM_{2.5} levels are generally well above WHO health guidelines. Particulate concentrations in the wet season are generally lower due to natural suppression by the regular rainfall and the reduced amount of biomass burning during this period.

4.4 Noise and Vibration

The noise monitoring conducted by the various teams shows that ambient daytime noise is typically above or close to the WHO daytime noise guideline (55 dB) and sometimes exceeds the Ugandan requirements of Maximum Permissible Noise Levels for General Environment for residential areas (60 dB). Locations within Kampala have generally higher ambient noise than those outside the city. Maximum noise levels up to 100 dB were recorded for very short periods, likely associated thunder, waterfalls and passing trucks. Existing noise emissions in the vicinity of the Project largely originate from human activity. Thus, the main noise sources in the Project region are;

- Vehicle and motorcycle use;
- Agricultural machinery and sugarcane industry;
- Medium and small-scale industry;
- Schools, churches, a prison and a market;
- Railway lines;
- Wildlife and insect activity; and
- Thunder, rain, rivers and waterfalls.

Ground vibration was measured during the March 2018 field campaign. Typical ground vibrations recorded during the period were low, being less than 0.20 m/s².

4.5 Roads and Traffic

Currently, the primary road network in southern Kampala consists mainly of radial roads connecting the central city area with the main outlying suburbs, and the intermediate localities. There are virtually no contiguous sections of reasonable quality roadway for lateral traffic between the outer suburbs and the city centre. The

current network is poor, with lateral traffic being required to pass through residential areas or well into the central part of the city in order to make use of the radial roads. This has exacerbated traffic congestion in the Study area.

The existing road Kampala-Jinja road consists of an all-weather tarmac single carriageway road in fairly good condition. The road is part of an international highway, the Northern Corridor, that connects Uganda to the port of Mombasa on the Kenyan coast. This international highway is also the primary transit corridor for the transportation of imports via Kenya and Uganda to other land-locked countries west of Uganda, such as the Democratic Republic of Congo, Rwanda, Burundi and Southern Sudan. The existing Kampala-Jinja highway is the most heavily utilised national road in Uganda with some sections experiencing up to 70,000 vehicles per day in a single direction. The road also carries a high percentage of international cargo traffic in transit to Eastern Congo, Rwanda, Burundi, and Kenya and other countries. The section of the existing road between Kampala and Namagunga is one of the most heavily affected parts of the road in terms of traffic congestion. Public transport infrastructure along the existing road is poor with only a few buses running along this route.

4.6 Geology and Soils

The geology of Kampala is characterised by Palaeoproterozoic rocks (1600–2500 Ma) of the Buganda Group consisting of slate, phyllite, mica, schist and metasandstone, and older Neoarchaeon rocks (2500–2800 Ma) of the Kampala Suite, comprising granite and granite gneiss. The geology in the Phase 1 Right of Way is dominated by Archean Golomolo granite (~2.63 Ga) and Kampala Suite granitoids. Approximately 2 km east of Mukono on the Phase 1 ROW, the Lake Victoria Terrane (fault boundary) meets the West Tanzania Terrane of the Tanzania Craton. East of Mukono, the Lake Victoria Terrane is overlain by metasediments of the Palaeoproterozoic Buganda Group, and emerges only as elongated domes in the cores of anticlines.

Residual soils along the alignment predominantly cover higher topographic areas and are composed of reddish and reddish brown soils (at places lateritic) derived from the in-situ weathering of mainly Precambrian rocks (granitoid and ortho-gneisses) to a very large extent with varying proportions of gravels, sand, silt and clay. Alluvial/lacustrine soils are mostly confined to flat-bottomed plains of lower topographic areas which are predominantly swamps and wet lands. These soils are often dark to dark grey and brownish sandy silty clays and are locally being used for brick making. The first quarter of the route alignment crosses extensive areas of swamps filled by these soils. Recent deposits of slope-wash generated soils composed of reddish brown silty clay, up to 400 mm thick, cover the topmost parts of some swamps in and around Kampala city. This could be due to increased slope angles induced by urban construction on the adjacent higher grounds.

4.7 Water Resources

The hydrology of the KJE Phase 1 area is dominated by the catchment of Lake Victoria but also passes through the upper (southernmost) extent of the Lake Kyoga Basin, which drains to the north. The Mutungo, Makindye and Mbuya hills are located in the higher regions of Kampala and are sources of water that support downstream communities. Flooding occurs frequently in low-lying wetland areas in peak rainfall periods and generally occurs in urbanised regions.

A key aspect of the hydrology of the Project Area is the numerous wetlands present. Wetlands in Project corridor can be broadly categorized as fresh-water, palustrine, and man-made wetlands. Nine wetlands are potentially affected by Phase 1 of the Expressway. Six wetlands (Mayanja, Kyetinda, Kansanga, Nakivubo, Kinawataka and Namanve) flow in a southerly direction into Lake Victoria and the remaining three wetlands (Mwola, Kasala and Sezibwa) flow in a northerly direction towards Lake Kyoga.

Access to improved water supply (i.e. piped, infrastructure-based water) across the country is estimated to be 71% and 67% in urban and rural areas, respectively, and up to 86% have access to protected sources. Of these, only 26% of the urban population is estimated to have piped water on premises, and less so within informal

settlements. 2018 Census Survey data indicated that 16% of households in the ROW had water piped or collected at their homes, with the majority of households relying on community water points for drinking, cooking, cleaning and agriculture. Several community water points such as wells and taps were identified within the ROW that serviced a significant number of homes in surrounding communities.

4.8 Biodiversity

The ROW for the Project is dominated by modified habitats, relative to natural habitats, which is a reflection of significant human activity in the vicinity of the Project. The main modified habitats types present within the ROW are settlement areas, agro-pastoral land and industrial land. Four principal natural terrestrial habitats occur within the ROW and surrounding area, namely: forest habitats (i.e. closed forest and open forest/woodland), grassland, scrubland and wetlands (including degraded wetland). Aquatic habitats present include wetlands, small streams and larger rivers that cross the alignment such as Sezibwa River. All terrestrial habitat types within the ROW are common in nature and are unlikely to qualify as 'highly threatened and/or unique ecosystems' or 'areas associated with key evolutionary processes' in accordance with IFC criteria. However, wetlands are important for biodiversity conservation at the local and regional level and are therefore considered to be priority habitat types for the Project. Most wetlands within the Project Footprint are significantly degraded, however some areas of higher quality papyrus wetlands are present along the KJE mainline alignment east of Kampala. The most significant patch of forest crossed by the alignment is Sezibwa Forest which consists of a mosaic of mostly degraded patches of forest within the rural landscape. No primary forest or pristine vegetation is present along the alignment.

Baseline fauna surveys conducted for the ESIA identified a variety of mammals, birds, reptiles, amphibians and fish occurring in the vicinity of the Project Footprint. Most species recorded were common and widespread, however several threatened species were recorded including the IUCN Critically Endangered hooded vulture (*Necrosyrtes monachus*), Vulnerable sitatunga (*Tragelaphus spekii*), as well as the Endangered grey parrot (*Psittacus erithacus*) and grey crowned crane (*Balearica regulorum*). Other species with potential to utilise habitats within the Project area include the nationally vulnerable Saddle-billed stork (*Ephippiorhynchus senegalensis*), Blanding's tree snake (*Toxicodryas blandingii*) and Cape file snake (*Gonionotophis capensis*). Baseline flora surveys undertaken for the ESIA in 2017 identified the presence of 155 plant species along the alignment. No Threatened species based on the IUCN Red List (2018) were recorded.

No international protected areas such as sites on the World Heritage List designated for natural values or Ramsar Wetlands occur in the direct vicinity of the Project. No National Parks, Wildlife Reserves or Wildlife Sanctuaries occur in the vicinity of the Project, however several Central Forest Reserves (CFRs) occur in the vicinity of the Project which are managed by National Forestry Authority (NFA). Most notably, the proposed ROW intersects the Namanve Central Forest Reserve for approximately 2.5 km of the alignment. The Project Footprint will also intersect the Banda Tree Nursery which is a small Central Forest Reserve area in Kampala, covering approximately 2.3 ha.

Habitat quality and species diversity in the Project Footprint and surrounding environment has been significantly impacted by anthropogenic disturbance. Existing threats to biodiversity in Uganda and the Project Footprint include the clearance of habitat for the development of agricultural land, the use of fire for the clearing of land, overexploitation of non-timber products, the development of large industrial projects and the accidental or intentional introduction of alien invasive species (e.g. *Mimosa pigra*, *Imperata cylindrical*, *Bidens pilosa*, *Eichhornia crassipes*).

4.9 Ecosystem Services

Ecosystem services provided by environments in the Project Footprint and surrounding area are varied and provide important benefits to the surrounding communities. Communities living in and surrounding the

proposed ROW for the Project rely on the environment for several provisioning services. This includes agricultural production and fishing in wetlands and Lake Victoria. The importance of the provisioning services to local villages was higher in the more rural areas in the easterly sections of the Project alignment.

The wetlands surrounding Kampala provide important regulating services such as Water purification and pollutant removal, and existing vegetation also helps maintain soil levels and prevent the sedimentation of water courses. Other regulating services provided by vegetation includes reduction in flood risk, as well as improvement of air quality through reducing dust.

A variety of supporting services are provided by ecosystems in the Project Area from nutrient recycling to pollination and seed dispersal. Additionally, the ecosystems, landscapes and biodiversity in the Project area also provide important cultural services such as through providing green space and improving visual amenity. Sezibwa Falls also occurs nearby to the Project which is an important cultural site for the local communities.

4.10 Socioeconomic Setting

The Project is located in southeast Uganda, situated mainly to the east of the capital city of Kampala and to the north of Lake Victoria, which is the largest lake in Africa by area. The Project area stretches across two of the four main administrative regions in Uganda; the Central and Eastern Regions. Within these two Regions, the Project ROW intersects the four administrative districts of Kampala City; Wakiso District; Mukono District; and Buikwe District.

Data from 2018 Census Surveys of households within the Project ROW, indicated that an estimated of 29,983 occupants belonging to 6,177 households were living within the ROW. Just over half of this population are female. In terms of age distribution, occupants aged 18-60 were the largest group by age, comprising 13,818 (50%) of occupants. Occupants aged less than 18 years were accounted for 12,799 (47%) of occupants. Census data indicated that 92% of household heads were not born within their residing community and had migrated to the area, most of which were from rural Uganda or smaller cities, such as Jinja.

The most common household size was 5-7 members (34% of households), which is higher than the national average of 4.7. The 2018 Census Survey data indicated that the population density within the urban and peri-urban areas of Nakawa Division and to a lesser extent, Kira and Ssabagabo-Makindye sub-counties, greatly exceeded the national average population density of 173 persons per square kilometre km². In these areas, population density exceeded 1,000 occupants per km². This accounts for more than 80% of the population situated in the ROW, concentrated within the Nakawa Division and Kira Sub-county.

Socio-economic data indicates that Buganda is to be the most common ethnic group within the ROW. Other ethnic groups present within the ROW are the Banyankole, Bakiga, Japadhola, Basoga and Banyarwanda among others. Along the Project alignment, Luganda is the most commonly spoken language, however other languages are present, and their use varies regionally. The 2018 Census Survey data indicates that Christianity is the main practiced religion, followed by Islam.

2018 Census Survey data indicated that 20,190 (67%) of occupants belonging to 3,975 households had an average income less than 216,000 UGX per month, which is equivalent to the International Poverty Line of USD\$1.90 per day. 12,921 (43%) of households reported an average householder income of less than half of this amount, living on less than 101,000 UGX per month. The 2018 Census Survey data also indicated that 96% of surveyed household heads had some form of education. Education levels were relatively higher on the KSB section of the alignment.

Census data indicated that an estimated 2,965 households reported to be owner-occupied with legitimate land title, 309 claimed to be owner-occupied with no title, and 2903 claimed to be non-owner-occupied, either renting or caretaking a residence. The majority of residences identified within the ROW are small (with areas <0.004 ha), permanent structures roofed with iron sheets. Informal settlements and wetland areas are dominated by semi-permanent and temporary structures.

Vulnerable groups are people who by virtue of gender, ethnicity, age, physical or mental disability, economic disadvantage, or social status may be limited in their ability to claim or take advantage of development benefits. Key vulnerable groups for the Project include poor households, household with no ownership and the landless (including those in informal settlements), as well as female headed households.

4.11 Cultural Heritage

The proposed Kampala-Jinja Expressway Project is located in an area on the northern side of Lake Victoria. Archaeological records indicate the presence of agricultural communities in the Project area from approximately 500B.C onwards. The first agricultural communities introduced what is known as the Urewe culture of the great lakes region. Urewe pottery pot shards are found in cultivated fields in the region surrounding the Project Area. The area transitioned to the late Iron Age (LIA) around 1000 A.D which is represented by roulette decorated pottery and is associated with the start of the great lakes kingdoms. The countryside is littered with many roulette decorated pot shards.

The agriculture practiced in the prehistoric times of the Project area was facilitated by iron implements in form of hoes to till the ground and machetes and axes to prepare ground for agriculture by cutting trees and bush thickets. Iron slag found in the countryside of the northern side of Lake Victoria is the visible archaeological evidence of metal working activities in the area. A lot of iron slag called Masengere in the Luganda language is found in Mukono district in Ngogwe and Ssi areas. Observations at locations of iron slag indicate a technology used which was distinct from other smelting traditions of the great lakes.

Most notably the World Heritage listed Tombs of Buganda Kings at Kasubi are located approximately 6 km west of the western end of the alignment. Ancient graves are also found in the Study Area. These are represented by earth mounds covered with stones in homesteads and in the bush areas at the locations of past settlements.

Sites of local cultural significance found in the vicinity of the alignment include churches and other cultural/worship sites, burial sites, and heritage buildings such as Banda Palace and Kireka Palace.



Plate 4-1: Local people worshipping at the top of Sezibwa (Court of Sezibwa)



Plate 4-2: Worshipers at the top of the falls in



Plate 4-3: Offertory cave at Sezibwa belonging to Lubaale Musoke



Plate 4-4: One of the shrines (prayer points) at Sezibwa

5. IMPACT ASSESSMENT

The ESIA adopted the Mitigation Hierarchy in the impact assessment methodology for the proposed project component activities. This included prediction of the potential impacts, evaluation of significance of the impacts, and design of cost effective measures to avoid, reduce, mitigate or compensate for adverse impacts and to enhance benefits. The identified residual impacts, risks and opportunities have been summarized in the sections below.

5.1 Economic Development and Employment

The development of the Project is considered necessary by the Government of Uganda to ease traffic congestion in Kampala, facilitate the movement of exports to and imports from the Port of Mombasa in Kenya and improve the economic efficiency of the country. The investment required for securing the ROW and constructing the expressway is significant, and its anticipated that it will be a key driver of economic activity in Uganda and particularly in Kampala and the surrounding districts.

The anticipated economic benefits of the KJE Project include direct economic benefits (e.g. capital expenditure, taxes, and salaries) and indirect economic benefits (e.g. flow on effects, training and skills development, infrastructure development).

An investment of approximately \$1.1 billion in capital expenditure will be required for Phases 1 and 2. This expenditure will likely result in flow on effects to the Ugandan economy, resulting in an increase in GDP and Foreign Direct Investments of at least US \$300 million. Additional revenue will also be generated through taxes and toll payments over the concession term. For road users, the presence of the Project is expected to generate significant savings in transit times and vehicle operating costs, valued at US \$1,132 million and US \$3,254 million respectively over the concession period compared to the baseline scenario. The Project will also generate significant employment through the creation of approximately 1,500 jobs during construction and 250 jobs during operations.

The Project has been the subject of a series of feasibility studies reviewing the best options for the development of the expressway. As well as minimising costs and technical risks, option analysis has focused on reducing environmental and social impacts. The current alignment does reduce the impact on residences and businesses and also seeks to avoid sensitive ecological environments.

However, there will be environmental and social impacts and risks associated with the development of the KJE PPP that will need to be effectively managed to ensure that the Project is delivered and operated successfully. The key environmental and social impacts and risks are detailed below.

5.2 Displacement and Land Impacts

The Project (Phase 1) is estimated to displace approximately 29,983 people from the Project Right of Way, most of whom reside in Kampala District, in particular Nakawa Division and Kira Municipality.

The Project Right of Way will acquire 593.5 ha of land; 116.6 ha for the KSB and 476.9 ha for Phase 1 of the KJE. Most of the land to be acquired is currently used as agro-pastoral land in Mukono District and settlement areas in Kampala. The Right of Way also covers a significant area of wetland. Based on high resolution satellite imagery analysis and ground truthing, a total of 8,105 structural assets will be impacted that are fully or partially within the Project Right of Way; 4,888 within the KJE mainline section for Phase 1, and 3,617 within the KSB section. It is estimated that 76% of all non-industrial structures identified are residential.

5,378 businesses were identified as directly within the Project ROW. 3,482 (65%) of businesses were informal small-sole-trader or vendor businesses, with primary business activities focussed on residential rentals and retail of ready-made or raw food. Many rental businesses shared residential premises, however other businesses including retail and salons also operated out of multi-use residential-business premises.

103 major and prominent businesses were identified in or proximal to the alignment, 16 of which were considered large, with each respectively employing more than 20 staff. 35 major and prominent businesses had a structure or facility directly within the ROW, and 63 had major access restrictions to the business. The majority of major businesses are situated within urban and industrial areas of Nakawa Division—particularly along the existing Jinja Road, and Kira Municipality.

A number of community facilities were identified within the alignment, many of which have a structure or access significantly impacted by the ROW. These facilities included: 2 major pedestrian access points; 55 places of worship, 32 schools, 10 health centres, 3 community groups, 3 gravesites, 2 recreation centres and 1 police post. Again, these facilities were concentrated around urban and peri-urban areas in Nakawa Division and Kira Municipality. 34 public water and sanitation facilities were also identified as within the ROW, including: 5 toilets, 25 water points and 4 water pipes connecting water services.

Livelihood restoration will play a key role in transitioning affected people through the land acquisition process and assisting them in re-establishing their livelihoods and a place of residence. The Project's Resettlement and Livelihood Restoration Plan (RLRP) aims to achieve at minimum; pre-Project conditions for affected people, and where possible better conditions. Given the sensitivities associated with land tenure and vulnerability within informal settlements, the measures described in this RLRP aim to provide affected persons, especially those that are most vulnerable, with a better outcome for their wellbeing than they currently experience.

Given that many businesses will be impacted by the Project, it's important to ensure that these businesses are properly compensated for losses and assisted in their re-establishment as a way of mitigating commercial losses associated with the development.

5.3 Traffic, Transport and Accessibility

The Project will relieve current congestion and cater for future growth within the city of Kampala. It will facilitate greater access to towns serviced by the expressway, thus promoting economic development. The Project will also help improve the amenity of the towns along the expressway through a reduction of noise, air pollution and visual impacts associated with a reduction in traffic congestion and the separation of local and through traffic.

The Project will facilitate greater accessibility to the industrial and economic hubs in Kampala, Namanve, and Mukono, as well as to Kampala city through the KSB. This is expected to have a positive impact on the economy through the reduction of costs arising from congestion and the longer than expected delivery times for goods and services.

As a result of the Project, road users are expected to experience the following benefits:

- ▶ Increased capacity, which would enable the road network to accommodate the expected future traffic volumes;
- ▶ Time travel savings through a reduction in the number of intersections, provision of continuous overtaking opportunities and removing the need to reduce speed when driving through towns;
- ▶ Reduced vehicle operating costs and fuel saving through a more efficient road network; and
- ▶ Improved efficiency and safety for national and international road freight.

The Project will also improve road safety by providing an alternative to the existing undivided roads in Kampala and the Kampala-Jinja road, with a dual carriageway, improved alignment geometry, more overtaking opportunities and controlled access via interchanges.

The construction of the Project would have short term impacts on the existing road network including reduced speed limits near construction sites and access routes. Construction of the Project would be staged and traffic management plans will need to be implemented to reduce these impacts.

Land acquisition for the Project will result in significant accessibility issues for residents and businesses in areas where the Projects alignment disrupts or cuts off local access routes for motorised vehicles and pedestrians. Provision of motorised vehicle and pedestrian crossings in over passes and under passes will partially mitigate this impact.

5.4 Materials and Waste

The Project will generate a number of different waste streams, with the most significant waste expected to be generated during construction. The largest amounts of waste are likely to be demolition waste from land clearance and demolition activities during Project land acquisition, and construction waste (e.g. concrete, asphalt, piping, scrap metal etc.) from the production and sourcing of materials for road construction.

An opportunity exists to sustainably manage Project resources and minimise the amount of waste generated from the Project through the re-use and recycling of recovered materials either for Project activities or within the local industry and community. This is particularly the case for demolition and construction waste where a number of materials such as excavated material, timber, bricks, concrete, asphalt and steel can be recycled or reprocessed.

This is expected to help avoid excessive waste from being channelled to landfill, thereby reducing potential environmental and social impacts associated with waste generation.

5.5 Air Quality and Greenhouse Gases

The Project will lead to a change of traffic patterns including current traffic congestion in Kampala. There will be reduced air emissions associated with more efficient transportation, although traffic is expected to increase due to the more efficient transportation provided by the expressway. Air emissions especially during the dry season are a major issue in Kampala, especially as the city grows and the use of vehicles increases. In particular, the impacts of fine particulates from vehicle emissions is well known to affect the health of people living in proximity to major roads.

During construction of the Project, dust emissions from the unpaved road base and rock blasting at quarries may cause short-term impacts to near-field receptors. Maximum concentrations of CO, NO₂ and PM₁₀ generated by the Project are not predicted to exceed WHO or draft Ugandan air quality criteria on any section of the existing Kampala-Jinja Road, the Kampala-Jinja mainline expressway or Kampala Southern Bypass. However, PM_{2.5} WHO guidelines are expected to be exceeded at several sections of each road. Receptor impacts are predicted to be relative to the angle of the highway to the prevailing wind, with maximum concentrations predicted within 30 m of the roadside.

The greenhouse gas assessment indicates that the impact of the Project's emissions during construction and operations will only contribute to the country's emissions minimally (under 1% of the country's 2012 emissions). The Project is expected to generate more greenhouse gas emissions when compared to baseline emissions (under the 'Do Minimum' scenario) due to the increased traffic flows under the Project development scenario. Greening of the expressway route through the planting of vegetation has the potential to at least partly mitigate greenhouse gas emissions generated from vehicles using the expressway.

5.6 Noise

Noise generated by expressways is significant and measures will be required to protect people from the adverse impacts, especially in urban areas where there are a lot of dwellings close to the Project (e.g. <20m). In rural areas, the Project may add a new source of noise (e.g. where the alignment passes through communities in Mukono District). Noise mitigation via sound barriers will be required in certain sections of the expressway to ensure that noise emissions are within regulatory requirements, enabling remaining residences to not be severely impacted by the development.

Maximum noise levels remain relatively consistent along the KSB, but levels reduce with distance from Kampala along the KJE mainline section of the Project. Both expressways are predicted to exceed WHO and Ugandan daytime noise criteria without mitigation. Noise impacts from the Project include annoyances to community and wetland wildlife, with maximum noise receptor impacts predicted to be typically within 50 m of the roadside.

Construction noise activities will primarily be associated with the clearing of land, earthworks and hauling of construction materials. Some noise and vibration is also expected during the construction phase and this will be associated with rock blasting, excavation of rock, road cuttings and construction of overpasses. However, impacts will be localised and short-term.

5.7 Visual Amenity and Lighting

The Project is primarily located within cityscapes and is therefore not expected to have any major visual impact in urban areas. These landscapes have a high capacity for accommodating visual change and the Project would not significantly diminish the landscape character in these areas. In natural habitat areas such as wetland areas, the presence of the Project will be prominent and will certainly have an effect on landscape character and the ambience of the area. However, locating the expressway on the edge of wetlands reduces the social impact of the Project. Other key areas where landscape character is likely to be affected include areas where the Project does not follow the natural topography, thereby requiring significant cut and fill sections. Whilst there are some tourism features in the area surrounding the Project (e.g. Sezibwa Falls), it is not expected that these will be significantly impacted with regards to visual amenity. The expressway will not be visible from within the Sezibwa Falls site.

The lighting associated with the Project is necessary for safety and it will be prominent although the associated impact will be low. A number of measures to reduce the visual amenity impacts of the Project have been outlined in the ESMMP. In particular, implementation of progressive revegetation works for the Project in line with the Revegetation Plan (Volume D) will greatly assist in reducing visual amenity impacts.

5.8 Geology, Geomorphology and Soils

Residual impacts related to excavation of construction materials (rock, clay and sand) from local quarries and borrow areas are expected to be moderate to high in the quarry/borrow areas due to the large quantities of materials required. Rehabilitation of quarry/borrow sites to a state suitable for productive agricultural use or the establishment of a self-sustaining natural ecosystem will assist in reducing this impact over time. Residual impacts related to cuts and fills along the route will be moderate to high due to the extensive nature of the earthworks involved in construction of the Project.

Deposition of road and vehicle derived pollutants on soils proximal to the roadside is considered to have a low impact due to the provision of a sufficient ROW and verge/drain zone to contain and attenuate pollutants.

The excision of soils in the right of way from usable agricultural land area is considered to have a high impact, which is expected to be offset by the economic benefits of the constructed expressway.

5.9 Surface and Ground Water

The key potential impact on water quality that will need to be managed during construction will be the potential for increased erosion and sedimentation from construction areas. Careful planning for development of drainage control measures will be required for the Project including appropriate technical systems for sedimentation ponds, vegetation swales and other runoff measures needed to deal with the predicted pollution and flow alteration to minimise the risk of impacting the water quality and potential impacts on wetlands and rivers. Water sources downstream in the form of springs, wells and open water affected by the Project need to be protected and monitored to ensure that the people of Kampala and associated districts are not affected in the short or long term by the expressway.

The Project passes through alternating swamp and hilly terrain and will involve substantial earthworks in the form of a frequent succession of cuts and fills along the majority of its length. Therefore, there is the potential that significant quantities of sediment could be made their way into downstream environments resulting in impacts on downstream water quality, land and water/land users. A project-specific Water Management Plan (Volume D) has been prepared which outlines a variety of measures to minimise water quality impacts from the Project, including a proposed monitoring program.

Once operational, the Project will result in a linear impervious area (where there was previously mixed pervious areas) which will increase surface water run-off. The stormwater drainage system of the Project will need to be designed to manage these increased flows throughout the Operation Phase and particularly during high rainfall events.

5.10 Ecology and Biodiversity

Habitat condition varies throughout the ROW for the Project with natural habitats located within the ROW being significantly impacted by anthropogenic activities, which has resulted in habitat degradation, loss and fragmentation of most vegetation, and the remnant patches of higher quality habitat remain under threat.

No international protected areas or nationally significant protected areas such as National Parks, Wildlife Reserves or Wildlife Sanctuaries occur in the vicinity of the Project. The main protected area impacted by the Project is the Namanve CFR, with the ROW potentially resulting in disturbance to approximately 65 ha of the reserve. While the vegetation of this reserve is significantly disturbed by human activities, the ROW will impact approximately 22 ha of relatively high-quality papyrus wetlands. A small area of the Banda Tree Nursery (approx. 1 ha) in Kampala will also be directly impacted by the ROW; this is also a designated Central Forest Reserve.

In total, vegetation clearance and the construction of the Project is expected to result in the loss of approximately 156.6 ha of natural habitat (i.e. wetlands, forest, grassland and scrubland) and 436.2 ha of modified habitat, including the clearance of approximately 72.8 ha of degraded/cultivated wetland and 33.4 ha of higher quality wetland from the ROW. The higher quality wetlands impacted by the Project occur mainly in the Namanve CFR. The hydrology of some wetlands will be partially restored during the Operations phase in areas where viaducts are constructed, which will minimise long term impacts on key wetlands such as those within the Namanve CFR. All natural habitats to be removed from the ROW have been directly disturbed by anthropogenic sources in some way, but some retain important biodiversity values.

Habitat clearance and disturbance arising from noise, vibration, airblast, light-spill, and other human activity during construction will result in the displacement of fauna and the permanent loss of a small proportion of habitat for nationally and / or globally rare or threatened birds and mammals (i.e. hooded vultures, grey crowned crane, saddle-billed stork and sitatungas).

There is a significant risk of accidental mortality and injury to mammals and birds as a result of collision with vehicles during operation and the proposed expressway will fragment habitats and is likely to act as a barrier limiting the movement of fauna in some areas.

The Project is aligned with best practice with plans to avoid, minimise and restore adverse impacts to biodiversity. However, it is recognised that even after all feasible mitigation measures are put in place, residual impacts will remain for some priority habitats and species. A key priority for the Project is the conservation of priority habitats (particularly wetlands) and species including the Critically Endangered hooded vulture, the Endangered grey crowned crane and the Endangered grey parrot. It is therefore recommended that UNRA follows industry good practice guidance on biodiversity to develop and implement a biodiversity offsets programme that adequately compensates for significant residual impacts as part of the *Biodiversity Action Plan* for the Project (refer to Volume D).

5.11 Ecosystem Services

Ecosystem services provided by environments in the Project Footprint and surrounding area are varied and provide important benefits to the surrounding communities. Of particular concern are the wetland habitats impacted by the Project which provide several regulatory ecosystem services that will be costly to replace. These services have historically been, and continue to be, important for the city of Kampala and the ecological integrity of Lake Victoria.

The Project will lead to a loss of natural habitats (including areas of wetland and forest) but a more severe risk to ecosystems services are represented by the potential indirect loss of habitat due to urbanisation promoted by the improved transportation network. The further degradation of wetland ecosystems may lead to a loss of associated regulatory ecosystem services. If appropriate management and mitigation measures are implemented (as outlined in relevant chapters throughout the ESIA), then impacts on ecosystem services will be reduced.

5.12 Archaeology and Cultural Heritage

The Project will not impact on any known archaeological or cultural heritage sites of national or international significance. However, the alignment of the Project is proximal to some of the most significant archaeological finds that have been made in Uganda including being 800 m from where the 1000-year-old Luzira Head (which is now displayed in the British Museum) was found in 1929. The Sezibwa Falls is also a site of cultural and spiritual importance that is located approximately 600 m from the proposed alignment.

The Project Footprint passes directly over and near to sites of local cultural importance including churches, graves and cemeteries. As a result, several places of worship and burial sites will be directly impacted by the proposed

Project and will likely to need to be removed/relocated prior to the construction of the expressway. The other impacts on cultural heritage may be the separation of sections of the population from their places of worship as a result of severance attributed to the expressway. This may result in people having to travel long distances to find appropriate crossing points along the expressway to get to their places of worship. However, this impact can be mitigated by the appropriate establishment of pedestrian crossings.

The Project has the potential to impact on cultural heritage resources which currently lay unknown; buried beneath the ground surface. The extensive groundwork activities that will need to be undertaken may reveal unknown resources. The case of the discovery of the Luzira head during the construction of Luzira prison by the British colonial authorities is an indicator that future chance finds may be encountered during excavations and the construction of the expressway. A Chance Finds Procedure has been developed as part of the ESMMP and will need to be implemented during construction.

5.13 Community Health and Safety

The Project should help to reduce road traffic incidents in the region through the provision of a dedicated roadway with an improved alignment, which isolates vehicle traffic from pedestrians and non-motorised vehicles, provides a dual carriageway with central medians to separate oncoming traffic and also diverts traffic from the towns and villages bypassed by the expressway.

Aside from a potential improvement in the rate of road accidents, the largest impact on community health will be improvements in air quality in some areas. The air quality in Uganda is already heavily affected by traffic, cooking fuel and burning activities. Once operational, the Project should lead to more efficient motorised transport in Kampala and potentially a slight improvement in overall air quality due to reduced congestion. Improved fuel and car technology will be the biggest potential driver of air quality in Kampala.

Traffic on the expressway will generate significant traffic related noise for potential receptors in close proximity to the Project. Implementation of the outlined measures such as noise barriers will be important to minimise potential noise disturbance to acceptable levels in these areas.

Fencing of the expressway with appropriate barriers will be important to ensure that the community, animals and vehicle types which would be at risk in fast moving traffic (such as non-motorised vehicles, low powered motorcycles and agricultural vehicles) do not inappropriately access the expressway and compromise health and safety.

Some short-term localised impacts on community health and safety may occur during the construction period including air emissions, noise disturbance and changes in accessibility. Construction of the Project is expected to be staged and construction management plans will be implemented to reduce these impacts.

Finally, ensuring that construction contractors interact positively with the local community is an aspect that will need to be carefully managed and monitored.

5.14 Gender

In the context of the Project, women are typically more vulnerable to livelihood changes due to fewer available education, employment and training opportunities, and a higher reliance on agricultural activities. Women tend to be employed in less lucrative economic sectors and have substantially less access to inputs such as land and credit. Gender discrimination may limit women's access to resources, opportunities, and public services necessary to improve the standard of living for themselves and their families. As a result, the livelihoods of women affected by the Project may be disproportionately impacted if not managed appropriately. There is also the potential for instances of Gender-Based Violence (GBV) to increase as result of changes to the community

structure in and around the expressway, as well as from increased pressure on livelihoods, with a higher rate of GBV typically directed towards women than men.

The management program for the Project includes a number of gender based practical measures and strategic gender initiatives to help ensure women are not disproportionately impacted by the Project. These include specific measures to enhance the provision of prevention programs and response services for those at risk of GBV in the Project area.

5.15 Occupational Health and Safety

UNRA is committed to building a workforce that is motivated, healthy and has a good working ability, and to creating healthy and safe workplaces that are free from accidents and work-related disease, in compliance with the Ugandan Occupational Safety and Health Act (2006). The OHS program for the Project will also take into account the IFC *Environmental Health and Safety Guidelines for Toll Roads* (2007).

Workers on the Project will be exposed to a number of risks from dust, noise, blasting activities, traffic, and handling of hazardous materials. Appropriate precautions will need to be taken to avoid work-related accidents, injuries or illness. UNRA and the Contractor will work to: (i) identify potential hazards to workers, particularly those that may be life threatening; (ii) provide preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) train workers; (iv) document and report occupational accidents, diseases, and incidents; and (v) organise for emergency prevention, preparedness, and response.

Key OHS measures for the Project have been outlined in the ESMMP (Volume D). The construction contractor/concessionaire will also be required to develop, maintain and disseminate a detailed standalone OHS Plan for the Project, incorporating the measures outlined in the ESIA and other measures required to meet legislative requirements and relevant international standards.

5.16 Cumulative Impacts

The environmental health of Kampala City is affected by a complex network of natural and manmade features. At the centre of much of Kampala's environmental health, particularly in relation to water, lies the vast network of wetlands surrounding Lake Victoria, providing key environmental services in the filtration of surface water flowing from the city back into the Lake at Murchison Bay as well as a variety of provisioning services for local communities.

Wetlands in Kampala are under severe threat and are important for the provision of regulatory ecosystem services (e.g. water filtration, flood control, waste treatment) and regulating the quality of water entering Lake Victoria. If appropriate mitigation and management measures are not utilised, the Project may increase the current levels of degradation adding cumulatively to the impacts on wetlands from other existing and planned Projects in the region.

It is important that the construction of the Project takes into account the protection of wetlands, as well as considers the indirect impacts of land acquisition in a city already experiencing land pressures. Ensuring that the Project contributes positively to local communities is critical to ensure that wetlands are not further 'reclaimed' for residential uses and thus decreased in size and quality further.

6. STAKEHOLDER CONSULTATION

UNRA aims to meet the IFC Sustainability Framework (2012) and AfDB Integrated Safeguards Systems (2013), which require that informed stakeholder consultation and participation should be conducted throughout each phase of the Project life cycle. UNRA's approach to stakeholder engagement aims to fulfil the following core principles:

- ▶ Proactively engage to enable the early identification of potential issues and risks;
- ▶ Respect local culture and established political, social and economic relations; and
- ▶ Generate ideas and alternative solutions on early design questions.

Informal and formal consultations have been undertaken with relevant Government authorities, local communities and stakeholders dating back to the 2011 feasibility and preliminary environmental and social investigations. These were undertaken in accordance with NEMA EIA Guidelines (1997, 2004) for seeking opinions and views on social and environmental aspects relating to the Project. The overall stakeholder consultation and engagement process focussed on:

- ▶ Identifying and notifying stakeholders of the proposed project activities and the ESIA;
- ▶ Establishing dialogue between the Project and stakeholders;
- ▶ Collect perceptions, concerns, and proposals from stakeholders relating to concerns with the development of the Project; and
- ▶ Making provisions for incorporating stakeholder feedback into the planning and design of the Project.

In general, stakeholder feedback has been supportive of the Project provided fair compensation is paid to those who suffer loss as a result of the land acquisition for the Project. Most stakeholder feedback and concerns related to ensuring that Affected Persons are adequately and promptly compensated. Both the local community and local leaders had expectations for employment opportunities to be created for local people during the construction phase. The private sector stakeholders were primarily concerned with ensuring compensation for businesses affected (including impacts on access) and the potential for disruption of utility services for businesses. Other stakeholders have identified the need for the wetlands in the vicinity of the Project to be protected. Consultations with villages and businesses affected by the Project have also allowed them to provide input into the development of livelihood restoration strategies for the Project through identifying key priorities.

The future program for priority stakeholder engagement activities will involve regular consultations with affected stakeholders, including: (i) Project affected communities, with consideration of vulnerable groups, host communities and informal settlements; (ii) affected businesses and industries; (iii) service providers/infrastructure owners; and (iv) relevant governments and institutions. UNRA will be responsible for all communication activities related to the Project and will collate and document any comments and feedback associated with future activities in line with the Stakeholder Engagement Plan (Volume D).

As part of the finalisation of the Concession Agreement, an Operational Stakeholder Engagement Plan is to be developed detailing the ongoing engagement activities for the Project during the Concession Period. This operational plan should be developed by the construction contractor/concessionaire in collaboration with UNRA. The plan should provide a detailed schedule and responsibilities for the ongoing consultation activities, including planned meetings and commitments for implementation of information disclosure activities. Once funding is in place for the acquisition of the concession, a Stakeholder Engagement Plan specific to the livelihood restoration program will also need to be developed ('Initiatives SEP'). The Initiatives SEP should detail the specific consultation activities to be conducted for each of the seven livelihood restoration initiatives proposed, as well as schedules and specific roles and responsibilities for each consultation activity.

The Project will consider and address stakeholder concerns, complaints and grievances through a formal Grievance Mechanism to ensure an open and transparent dialogue between the community and UNRA throughout the life of the Project. Implementation of a formal grievance mechanism that applies to all environmental and social aspects of the Project is considered good industry practice for major development projects, and is in line with the AfDB Integrated Safeguard Systems and the principles outlined in the IFC *Good Practice Note – Addressing Grievances from Project-Affected Communities* (2009). The Project will use UNRA's established grievance mechanism which is considered to be in alignment with relevant international standards.

7. ENVIRONMENTAL MANAGEMENT PLAN

A professional management and mitigation program has been developed in accordance with Ugandan legislation and relevant international standards. The proposed management strategy for the construction and operation phases of the Project has been documented in the *Environmental and Social Management and Monitoring Plan* (ESMMP, Volume D). This plan also outlines the framework for the overall environmental and social management system for the Project including responsibilities and implementation arrangements for management and monitoring activities.

A *Resettlement and Livelihood Restoration Plan* (RLRP, Volume D) for the Project has also been prepared to meet Ugandan requirements and international standards. The RLRP provides the necessary strategic framework for the social planning of the Project and encompasses resettlement, livelihood restoration and compensation strategies. The RLRP identifies the potential needs for physical displacement and/or compensation resulting from the loss of land, livelihood and assets, and outlines the proposed institutional arrangements and cost estimates for the implementation of these measures.

Other management plans prepared as part of the ESIA (refer to Volume D) include a *Stakeholder Engagement Plan* (SEP), which outlines the approach for ongoing consultation and engagement and a *Biodiversity Action Plan* (BAP) which outlines the proposed framework for biodiversity management and mitigation for all stages of the Project. In addition, a *Water Management Plan* (WMP) has been prepared outlining the approach to surface and groundwater management, as well as a *Revegetation Plan* outlining a proposed revegetation scheme for the Project Footprint.

UNRA will hold ultimate responsibility for the environmental and social performance of the overall Project, including the performance of the contractor/concessionaire and all sub-contractors. Prior to construction, the construction contractor/concessionaire will be required to prepare the following plans/sub-plans to support the implementation of the management and monitoring program:

- ▶ Construction Environmental Management Plan (CEMP);
- ▶ Emergency Preparedness and Response Plan;
- ▶ Transport Management Plans;
- ▶ Blasting Plan;
- ▶ Air Quality Management Plan; and
- ▶ Noise and Vibration Management Plan.

An Operations Environmental Management Plan (OEMP) will also need to be prepared by the contractor/concessionaire prior to the Operations Phase.

The ESMMP, CEMP and OEMP and other management plans for the Project will need to be supported by a number of Standard Operating Procedures (SOPs) to guide implementation. A Chance Finds Procedure for the Project has been provided in Volume C of the ESIA. Other SOPs required will need to be prepared as required as part of the CEMP and OEMP for the Project.

8. ENVIRONMENTAL AND SOCIAL IMPLEMENTATION AND MONITORING PROGRAM

8.1 Responsibilities

Implementation of the ESMMP will require appropriate staff, financial resources, equipment and support systems. It is the responsibility of all the UNRA staff and contractors to comply with the requirements set out in the ESMMP. The responsibilities of Project contractors and suppliers will need to be defined through standard terms and conditions of contracts that are consistent with the commitments of the ESMMP.

The UNRA Project Director will have overall responsibility for environmental and social compliance for the Project. A position of UNRA Project Environmental and Social Manager is recommended to be established under the Director who would be in charge of overseeing the implementation and continued improvement of the ESMMP, RLRP and other Project management plans. The UNRA Project Environmental and Social Manager should be supported by teams of Environment, Community Relations and OHS staff. These are recommended to include a dedicated Project Environment Officer, Project Biodiversity Officer, Project Community Officer and Project OHS Officer supported as needed by professional specialists and technicians.

The primary contractor / concessionaire for the Project will be responsible for the direct implementation of the environmental and social measures outlined in the in the ESMMP and other management plans for the Project, including managing any subcontractors employed to ensure they meet the environmental and social requirements of the Project. Prior to construction, the primary contractor / concessionaire will be required to develop a CEMP including detailed procedures for management and monitoring. They will also be required to conduct internal monitoring and report on their environmental and social performance. An 'Initiatives SEP' specifically for the livelihood restoration program will also need to be developed.

UNRA staff and Project contractors should undertake internal training and education activities to ensure that Project expectations regarding environmental and social performance are achieved and maintain training records. All relevant employees involved in monitoring activities (particularly for field monitoring) should be given appropriate training, where required, by a competent person in the use of:

- ▶ Monitoring techniques, including: use, calibration and maintenance of field monitoring equipment, sample collection, labelling and transport;
- ▶ Review and interpretation of field and laboratory monitoring results; and
- ▶ Record keeping and reporting procedures, including using standard forms and databases.

8.2 Monitoring

The implementation of an appropriate monitoring strategy for the Project will be important to ensure that existing management measures are effective, and to identify the need for improved or additional measures. The objectives of the Project environmental and social monitoring programme are to:

- ▶ Detect and analyse environmental and social trends or changes to develop an appropriate response, where required;
- ▶ Ensure relevant environmental legislation and licensing commitments of the Project are complied with;
- ▶ Measure 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

- ▶ Provide early warning of potential impacts, determine the extent of anticipated impacts and identify any unforeseen impacts associated with Project activities.

Detailed monitoring measures for the Project are outlined in the ESMMP and other management plans prepared for the Project.

8.3 Auditing and Review

The ESMMP will be a dynamic document and should be reviewed and updated by UNRA as required to incorporate any significant changes (i.e. to Project activities, commitments, environmental and social conditions, regulatory requirements, and potential optimisation of best management practices) or at least annually during the life of the Project. This review process should include other management plans prepared for the Project as well as relevant procedures.

Regular audits of the Project ESMMP and associated management systems will also be required. The audits should assess:

- ▶ Adequacy of the ESMMP and associated plans with respect to the scale and nature of anticipated impacts and current development stage of the Project;
- ▶ Workforce awareness, competence and compliance with the ESMMP and associated plans and procedures;
- ▶ Performance of managers and operators in implementing, maintaining and enforcing the ESMMP and associated plans; and
- ▶ Suitability of allocated resources, equipment and budget for implementation of the ESMMP.

Corrective actions will require documentation including reporting of progress towards their completion.

Internal audits of ESMMP implementation should be conducted by the construction contractor/concessionaire on a quarterly basis during construction, and at least annually during operations. After the concession period, UNRA should continue these internal audits annually in line with UNRA's current audit schedule for their ESMS. Independent external audits will need to be conducted during the construction phase and on an annual basis (over the 5 years of construction).

In addition, site inspections of all Project facilities will be required 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) will be developed to enable environmental performance to be assessed objectively and quantitatively across the operation.

8.4 Estimated Budget for Environmental and Social Management Implementation

Separate budget estimates are provided for the implementation of the ESMMP, Biodiversity Action Plan (BAP), and Resettlement and Livelihood Restoration Plan. UNRA is committed to providing sufficient resources to ensure the successful implementation of the environmental and social management and monitoring of the Project. UNRA will also ensure that the contractors / concessionaire have sufficient resources for the environmental and social management of their activities.

Under the Public Private Partnership (PPP) agreement between UNRA and the Concessionaire, much of the environmental and social costs will be borne by UNRA until the ROW is transferred to the Concessionaire. UNRA will then have a monitoring and auditing role to ensure that environmental and social safeguards are met during construction and operation.

The estimated implementation budgets do not cover social and environmental mitigation costs that are expected to be captured in the design specifications and operational costs of the Project, such as:

- ▶ Contractor staffing requirements (e.g. Environment Team, Community Relations Team, OHS Specialists)
- ▶ Pedestrian crossings and other accessibility requirements.
- ▶ Construction of viaducts.
- ▶ Noise barriers.
- ▶ Public safety fencing.
- ▶ Drainage structures to prevent flooding and erosion.
- ▶ Landscaping and revegetation of the expressway.
- ▶ Preparation of OHS Plan, PPE, medical supplies and medical clinic for staff.
- ▶ Rehabilitation of construction material quarries and borrow pits.

The concession for the Project is expected to be for a period of 30 years. The budget estimates are based on a 2 year pre-construction (pre-concession) period, 5 year construction period and a 25 year operational period (32 years total). During the operational period, there is expected to be regular maintenance of the Expressway.

Total costs for implementation of the ESMMP as identified ESMMP budget over 32 years are **USD \$12,897,000** which represents an average cost of approximately USD \$400,000 per year. The final design of the Expressway will also have an influence on environmental and social costs. This cost estimate will need to be reviewed and adjusted during detailed design.

UNRA has completed a detailed compensation assessment for the Project as required under Ugandan law and the requisite UNRA policy. This has identified 9,320 individuals, families or entities requiring compensation amounting to a total payment of UGX 734,717 million (**USD 198.5 million**) which includes a 15% disturbance allowance. A 15% contingency for procurement and a 25% livelihood restoration fund should be established to ensure that the Project's livelihood restoration objectives are fully met. The details of the proposed expenditure are described in the RLRP.

General BAP implementation costs will be highest during the pre-construction and construction period. Annual costs during construction are approximately USD 120,000 per year while during operations, costs are expected to be significantly lower at approximately USD 60,000 per year. Total costs for the general implementation of the BAP as identified in the budget over the 32 year period are **USD 2,402,925** which represents an average cost of approximately USD 75,000 per year and includes a 5% contingency.

The preliminary budget for the establishment of the biodiversity offsets for the Project indicates that the total cost of offsetting activities over the 10 years of the offset program for Phase 1 will be approximately **USD 1,450,000** including a contingency of USD 100,000. This budget will need to be updated following further consultation with stakeholders regarding the offset management strategy and selection of final offsetting activities and sites.

9. CONCLUSIONS

The ESIA has identified the potential impacts of the Project and a professional management and mitigation program has been developed in accordance with Ugandan legislation and relevant international standards. The ESIA investigations have identified that the Project has the potential to result in a variety of benefits for local communities and the national economy, however, there will be environmental and social impacts and risks that will need to be effectively managed to ensure that the Project is delivered and operated successfully.

Being an integral part of a regional and international transport corridor, the KJE Project Phase 1 will contribute to key strategic transport priorities for the region and help meet the objectives of regional integration, socio-economic development and investment in transportation infrastructure outlined in key national policies. The Project is expected to provide a range of direct and indirect benefits at the national, regional and local levels. Direct benefits include; government revenue through fees and taxes, increased foreign direct investment in the country and new employment opportunities. Indirect benefits include flow on effects, training / skills development and infrastructure development. For road users, the Project will significantly reduce transit times and is expected to help to improve community safety and reduce road traffic accidents in the region through the provision of a dedicated roadway which isolates vehicle traffic from pedestrians and non-motorised vehicles.

While some impacts on land, assets, water quality and biodiversity will not be able to be avoided due to the establishment of the Right of Way and associated construction activities, impacts can be minimised and potential benefits maximised through appropriate management and mitigation as outlined in this ESIA. If mitigation and management measures identified in the ESMMP, Resettlement and Livelihood Restoration Plan and other management plans prepared (refer to Volume D) are implemented diligently and successfully, the Project is expected to deliver a net socio-economic benefit to Uganda and the East African region as a whole without significantly compromising the key environmental values of the surrounding environment. Ongoing consultation with the Government of Uganda, regional communities and other stakeholders will be important to ensure stakeholder interests continue to be taken into account in the planning and development of the Project.

Development Partners' requirements for the Project to be developed in accordance with international standards such as those of the IFC and AfDB provides significant opportunities to develop the Project in line with industry best practice for environmental and social sustainability. If implemented successfully this project could set a benchmark for the environmental and social management of future major road developments in Uganda and other parts of Africa.

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