



AFRICAN DEVELOPMENT
BANK GROUP

PROJECT: MULTINATIONAL: UGANDA/KENYA: KAPCHORWA-SUAM-ENDEBESS- KITALE-ELDORET BYPASS ROADS PROJECT

COUNTRY: UGANDA AND KENYA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT SUMMARY

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

SUMMARY

Project Title: Multinational: Uganda–Kenya (Kapchorwa – Suam – Endebess – Kitale – Eldoret Bypass Roads) Project

Project Number: P-Z1-DB0-107

Country: Uganda and Kenya

Department: OITC

Division: OITC.2

Project Category: Category 1

1. INTRODUCTION

The Government of Uganda (GOU) and the Government of Kenya (GOK) through their respective road agencies, Uganda National Roads Authority (UNRA) and Kenya National Highways Authority (KeNHA) is seeking funding from the African Development Bank (AfDB) to finance the multinational Uganda-Kenya road project from Kapchorwa – Suam Border Post (73Km) in Uganda and Suam Border Post – Endebess – Kitale road section (45Km) in Kenya and Eldoret Bypass road section (31Km). The road sections of Kapchorwa-Suam-Endebess-Kitale Road is an existing alignment of gravel or earth standard in most sections whereas the Eldoret by-pass involves construction of the road on completely new alignment. The Kapchorwa-Suam road section in Uganda traverses Kapchorwa, Kween and Bukwo Districts whereas Suam-Endebess-Kitale road section and Eldoret Bypass road section traverse Trans Nzoia and Eldoret Counties respectively. The road sections pass mainly through farmland and rural settlements and provides an important link between Uganda and Kenya.

On the Kapchorwa – Suam Road Section in Uganda, the study which covers feasibility and detailed design studies including the environmental and social impact assessment for the road was financed by Government of Uganda and the Bank and completed in 2010. Reviews were made within UNRA utilizing Technical Assistance (TA) teams of M/s IMC Consultants during the design stage. Further review and update was done by M/s Roughton International TA team in 2015. The Kitale – Suam ESIA, feasibility and detailed design studies were financed by the Government of Kenya and the Bank and completed in November 2015 by egis International. The Eldoret Bypass ESIA, feasibility studies and detailed designs were also financed by the Government of Kenya and the Bank and were completed in August 2015 by Apec Consortium.

According to AfDB Environmental and Social Assessment Procedures (ESAP), projects involving construction, upgrading and rehabilitation of major roads, are classified Category 1, and these require detailed environmental and social impact assessment studies to be carried out prior to project financing and implementation. Similarly, according to the requirements of Uganda's National Environmental Act (Cap 153) and Kenya's Environmental Management and Co-ordination Act (EMCA), 1999 the proposed project is under the list of projects requiring an Environmental Impact Assessment.

The ESIA studies for each road section in each country were therefore carried out in fulfilment of these requirements. The ESIA studies have been submitted to the National Environment Management Authority of Uganda and the National Environment Management Authority of

Kenya for review and disclosure to the general public in accordance with the respective environmental legislation and regulations. This ESIA Summary has been prepared from the project documents in accordance with AfDB's Environmental and Social Assessment Procedures (ESAP) for Category 1 project. Once approved, the Summary will be disclosed for a period of 120 days on the Bank's website prior to the presentation of the project to the Bank Board of Directors for consideration. Over 200 persons will be involuntarily displaced by the proposed project roads, therefore full Resettlement Action Plans (RAPs) have been prepared for each of the road sections and is included as Annex 1, Annex 2 and Annex 3.

2. POLICY LEGAL AND ADMINISTRATIVE FRAMEWORK

The relevant policy and legislative framework on environmental and social safeguards in each country was reviewed to make sure that the proposed project is in line with the applicable national policies, legislation and institutional / administrative framework. The 1995 Uganda Constitution is the principal law governing all environmental policies and regulations in Uganda. Article 39 of the Constitution gives every Ugandan a right to a clean and healthy environment. Article 245 among others pertains to the protection and preservation of the environment from abuse, pollution and degradation as well as managing the environment for sustainable development; and promoting environmental awareness.

The Uganda National Environment Management Policy (1994) aims to promote sustainable economic and social development mindful of the needs of future generations. The EIA is recognized as one of the vital tools considered necessary to ensure environmental quality and resource productivity on long-term basis. The policy requires projects or policies likely to have significant adverse ecological or social impacts to undertake an ESIA before implementation. This is also reaffirmed in the Uganda National Environment Act, Cap 153 which makes ESIA a requirement for eligible projects including roads. Both the Uganda National Environmental Management Policy and the National Environment Act Cap 153 are under review to include emerging environmental and social concerns.

Other policies reviewed by the project include Uganda Forestry Policy (2001); the Transport Sector Policy; the National Water Policy (1999); the National Development Plans (NDP); Wetlands Policy (1995); the Ministry of Works & Transport Policies (on Gender, HIV/AIDS, Occupational Health and Safety) 2008 and the National Gender Policy (1997). Several multi-sectoral laws relevant to the project were also reviewed to ensure that the project will comply with all national legislation during implementation.

Kenya's Environmental Management and Coordination Act (EMCA), 1999 provides for the establishment of a legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto. Just as in the Kenyan constitution (2007), Part II of EMCA confers to every person the right to a clean and healthy environment and to its judicial enforcement. The Constitution and EMCA therefore obligates the project's Executing Agency and Contractor to work in a clean environment and not to contravene the right of any person within its zone of influence, to this entitlement.

EMCA has provided for the development of several subsidiary legislations and guidelines which govern environmental management and are relevant to the project implementation. These include;

The Environmental (Impact Assessment and Audit) Regulations, 2003 Legal Notice No. 101; The Environmental Management and Coordination (Waste Management) Regulations, 2006 Legal Notice No. 121; The Environmental Management and Coordination (Water Quality) Regulations, 2006 Legal Notice No. 120; The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 Legal Notice No. 61; The Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006 Legal Notice No. 160; The Environmental Management and Coordination (Fossil Fuel Emission Control) Regulations, 2006 Legal Notice No. 131; The Environmental Management and Coordination (Controlled Substances) Regulations, 2007 Legal Notice No. 73.

The Uganda National Environment Act (Chapter 153) establishes and defines functions and authority of the Uganda National Environment Management Authority as a body responsible for management, monitoring and supervision of all environmental conservation activities (Section 4). This act provides for various strategies and tools for environment management, which also includes the ESIA (Section 19) for projects likely to have significant environmental impacts. The National Environment Management Authority in Kenya (NEMA-Kenya) is designated under EMCA with a mandate for general supervision and, co-ordination of all matters relating to the environment and is the principal instrument of government in the implementation of all policies relating to the environment. The authority is also responsible for monitoring compliance with all the NEMA regulations and issuance of licences under the EMCA and EIA regulations.

The African Development Bank's Integrated Safeguards System has been reviewed in preparation of the ESIA for the proposed road sections. The proposed roads exceed the Bank threshold of 50Km and there are likely to be significant disturbance and impacts on the traders, businesses and settlements along the road corridor hence Operational Safeguards (OS) 1 on Environmental Assessment and OS2 on Involuntary Resettlement are triggered. The project road on Uganda Section traverses a section of the buffer zone of Mt Elgon National Park whereas the Eldoret Bypass road section is entirely on new alignment through farmland. As such, the environment along the project roads corridor shall be require effective mitigation measures for environmentally sensitive sections in Uganda hence OS 3 on Biodiversity is triggered. OS 4 on Pollution Prevention and Hazardous Substances is triggered since construction will involve use of fuels and possibly some hazardous materials. OS 5 on Labour, Working Conditions, Occupational Health and Safety is triggered since the construction will involve a significant number of construction workers. On Climate Change, the project has been classified as Category 2 according to the Bank's Climate Safeguards System. This implies that the proposed project could be at risk from climate change and further review is therefore required to consider broad climate trends and identify practical risk management and adaptation measures that should be integrated into the project design and implementation plans.

3. PROJECT DESCRIPTION AND JUSTIFICATION

The proposed project road comprises three road sections: Kapchorwa – Suam Road Section (73Km); Kitale – Suam Road Section (45Km) and Eldoret Town Bypass (33Km).

The Kapchorwa – Suam section of the project road is 73Km, located in Eastern Uganda and traverses north of Mt. Elgon National Park through the districts of Kapchorwa, Kween and Bukwo ending at Suam at the border with Kenya. The road passes mainly through farmland and rural settlements along one of the most densely populated rural areas in Uganda and provides an important link between Uganda and Kenya. The project road has been receiving periodic maintenance but due to the black cotton soils in the area, the rolling and mountainous terrain of most of the sections, and heavy rainfall around the project area the road quickly deteriorates and becomes impassable once it rains. The current conditions of some section of the project road are in a non-trafficable state due to outcrop of boulders in the middle of the road which require blasting.

The Kapchorwa – Suam road section is designed as a class Iib Paved road. The geometric design and road classification was based on the Uganda Ministry of Works and Transport (MoWT) road design manual of 2010. Two lanes were adopted each 3.5m wide and 1.5m wide shoulders. A 2.5m wide parking lane and 1.5m wide footpath on either side of the carriageway have been provided in major built up town sections and trading centers.

The Kitale- Suam road section is located in Trans Nzoia County in the North Rift Region of Kenya. It starts at the junction with A1 Road in Kitale town and traverses through the trading centres of Endebess, and thereafter northwards up to Suam at the Kenya-Uganda border, a distance of 45Km. The road passes mainly through fertile farmland and comprises two distinct sections: (i) Kitale-Endebess, approximately 18 km long and currently of bitumen standard but in poor condition; and (ii) Endebess-Suam, about 27 km and gravel with lower traffic volumes.

The existing Kitale- Endebess-Suam road is designated as Class C road to be rehabilitated/upgraded as a multinational corridor to link Kenya and Uganda through Suam. The alignment is flat to rolling and crosses 4 major rivers, namely Sabueni, Kaibei, Mubere and finally Suam River at the project end. The alignment follows the existing road corridor except the realignment at Km 30+500 to Km 31+000 to improve substandard curves. In Kitale the existing road passes through a market and a bus stop on one side. The road is congested with local traffic, motorcycle and pedestrians.

The design proposes a dual carriageway in Kitale town to improve traffic congestion and safety with a provision of a service road on one side. The design considers moving the market out of the road reserve and has provisions for two truck parking lots and a bus stop.

The Eldoret Town Bypass (33 km) is located in Uasin Gishu County in North Rift Region of Kenya. It starts at Cheplaskei (Junction with A104 road) South East of Eldoret town and traverses in a north easterly direction terminating at Leseru near Maili Saba (junction with A104 road and Eldoret- Kitale Road). The project road is to divert through traffic from Eldoret town section of A104 road forming part of the Northern Corridor that links Uganda, Rwanda,

Burundi, South Sudan and Eastern Democratic Republic of Congo to the Port of Mombasa. The road passes mainly through farmland and rural settlements.

The proposed Bypass is a 7.0 m single carriage way wide with 2.0 m wide shoulders on each side. Grade separated junctions have been proposed at the following five locations: (i) Trumpet junction over A104 at Cheplaskei; (ii) half clover junction with loop over C39 at Kapsaret; (iii) overpass over the proposed Bypass at Simat (20+170); (iv) road over rail bridge on existing rail line at Km 28+100; (v) full clover junction with loops over A104 at Leseru. Two truck parking lots are also proposed at Kapsaret (9+700) and at Leseru close to the interchanges.

The project objective is to promote regional integration, improve access and connectivity between Uganda and Kenya as well as to stimulate economic activity in the eastern parts of Uganda and western part Kenya and improve the traffic congestion in Eldoret Town. The project development objectives are two-fold: at regional level, the objective is to contribute to improving road transportation and trade facilitation along the Suam border to foster transport linkage with Kenya, Uganda, South Sudan and Democratic Republic of Congo (DRC); and at national level, the development objective is to contribute to improving transport services and agricultural productivity in the Kapchorwa – Suam and Kitale-Endebess-Suam region and reduce the traffic congestion in Eldoret Town to stimulate and support local economic activities by reducing road maintenance costs, vehicle operating costs and travel time in the eastern Uganda and western part of Kenya.

4. DESCRIPTION OF THE PROJECT ENVIRONMENT

Physical Environment

Climate: The mean minimum temperatures at the Kapchorwa – Suam project area vary from 10°C to 14°C, while the mean maximum temperatures vary from 20°C to 25°C. The highest temperatures have been recorded in the months of January, February and March, while the lowest temperature have been recorded throughout the year. The road section from Kitale to Suam is within the cool to warm temperate zone and the annual mean temperature varies from 16°C to 18°C, with the mean maximum temperature ranging between 22°C and 26°C.

Eldoret is situated at approximately 65 kilometers north of the Equator, at an altitude of about 2080m above sea level. Its location within the proximity of the Equator makes it have a temperate climate throughout the year; with an average night temperatures of 9°C and day temperatures of 24°C. The minimum and maximum temperatures generally range between 1.6°C and 29.7°C respectively.

Rainfall: Rainfall on the mountain Elgon slopes falls within a double maxima high intensity rainfall regime with annual mean rainfall ranging from 1300mm to peaks of 2000mm. A double maxima rainfall regime is received with the first long wet season beginning in mid to late March and reducing somewhere in mid-June though off-season rains in some years will come in late June. The dry season is normally expected to begin in June through to early August while the second rains normally labelled the shorter season is expected from late August to November rendering December, January and the beginning of February relatively dry months.

Rainfall over much of Kitale – Suam area is fairly high. It is mainly controlled by altitude being lowest at Kitale and increasing northwards and westwards towards the lowest slopes of the Mount Elgon. The mean annual rainfall varies between 800 and 2800mm. In Eldoret, the total annual rainfall varies between 755mm and 1,478mm with a mean value of 1,124mm. Precipitation occurs mainly during April and May with a dry spell in June, followed by increasing rainfall in July and August. Rainfall tails off in September and October. A dry period with scattered showers of four to five months follows, until the following March. Rain falls mainly during the afternoon and night.

Topography: The Kapchorwa – Suam project area is located on the slopes of Mt Elgon giving the project area typical mountainous landscapes. Much as topography is generically characterized as mountainous, marked variations occur along the road alignment. A combination of rugged cliffs, sharp valleys and relatively flat landscapes make up the local topography of the three districts that make up the project area. In terms of elevation above sea level, lowlands occur at an altitude of 1000-1300m asl while the mid altitude areas are encountered at an altitude of about 1400m asl. Areas rising from 1400m-2000m asl have been categorized as high altitude zones. Given the nature of slopes some of which are above 10% gradient, slope failure and landslides are possible.

On the Kitale – Suam road section, the project region is very diverse with physiography that includes high elevation in the Mt. Elgon landscape to lowland plains in parts of Kitale. Typically the project area can be divided into two topographic divisions in each of which the relief, are more or less uniform: (1) The Kitale Plain and (2) Mount Elgon. The Kitale plain, which forms part of the pre-Miocene peneplain has a slight southerly tilt, with the principal drainage system flowing towards Lake Victoria. The project rises gradually from the Kitale plains to 2069 m asl at Suam within the Mt. Elgon highlands.

Eldoret and its surroundings are generally flat to undulating with few locations with mild depressions and hills. The land Physiography grounds are highly influenced by the undulating topography of the area that is characterized with mild valleys and short hills. The town lies at an average elevation of 2,200m to 2,700m above sea level within a district that rises from the south towards the north approaching the Cherangani hills. The general slope to the south is influenced by the Lake Victoria basin catchment.

Geology and Soils: Mt. Elgon is underlain by Mesozoic and Cainozoic rocks comprising of mainly volcanics and sediments. They are generally soda-rich agglomerates, lavas and tuffs that have been extruded. Much as the rocks belong to ancient rock systems, volcanic intrusions have occurred leading to material flows forming sediments in valleys rich in volcanic ash. Due to prolonged exposure weathering of volcanic ash has occurred releasing rock fragments ranging from cobbles to massive boulders that either lie on the slopes or are embedded in soils.

Soils on the slopes of Mt. Elgon are mainly classified as Acrisols, Ferralsols, Nitisols and Luvisols. On higher altitudes in the forest belt soils are brown to red-brown clay-loams, up to a meter or so deeper. Above 3,000m however, shallow black humus soils predominate. These soils are relatively young and fertile with high concentration of calcium, sodium, and potassium.

Under natural conditions, the soils support a varied tropical forest. Cleared of forest cover, these same soils support a high levels of agricultural productivity. However, given the steep slopes and their nature, soils on the slopes of Mountain Elgon are prone to landslides.

On Kitale – Suam road section, the first 2.5 kilometres from the Junction with A1 road into Kitale Town, along the project route lies on the Buff or light brown sandy soils which are produced by the breakdown of Kavirondian grits and bright red clayey soils of mud stones. The region from chainage 2+500 to 7+500 is covered with variable sandy and gravel soils. Chainage 7+500 to 13+500 is covered with Archean Basement System pediments overlain with undifferentiated semi-peltic gneiss, bitiotite and migmatite soils. Chainage 13+500 to 45+000 is covered with upper series phonolitic soils, melanephelinite, melilitite, lower and middle pyroclastic series, agglomerate, berccia and tuff of Mt. Elgon volcanic series.

The main types of erosion occurring in the area are splash erosion, rills, gullies and sediment deposition. A steep slope, low vegetation cover, erosive soil, high intensity rainfall and improper soil, crop and water management are factors leading to, or increasing, erosion.

Geologically, Eldoret area falls under the tertiary volcanic period. The geological composition of the project area mainly comprises of highly metamorphosed basement system formation, overlain by a sequence of tertiary volcanic strata. Exposure of the basement system is limited to the Elgeyo Escarpment, Karuna Hill and Sergoit Hill. The basement system rocks originally consisted of fine grained Precambrian sediments which with time, have been highly metamorphosed by heat and pressure, in long series of orogenic events. The result is a sequence of gneisses, schists and migmatites, which are extremely durable and bear little resemblance to the original sediments.

The soils in Eldoret area are generally red to brown friable clays with laterite horizon and grey mottled clays in the lower zones. Towards Lemook swamp, around Aturei Trading centre and just across River Sosiani the surface geology is characterized with rocky conditions and can only support limited agriculture while the situation changes towards Leseru characterized with reddish brown soils which are well drained and support large-scale wheat and maize farming.

Surface Water Resources and Hydrology: The Kapchorwa – Suam project area is located within the wider Mt. Elgon drainage system characterized by radial drainage arteries cascading from the mountain towards the lowlands. Fast moving streams punctuate the entire road alignment. There are numerous river crossings along the Kapchorwa – Suam road section, three of which have newly constructed bridge structures with composite concrete steel bridge decks located at Atari, Ngenge and Umchoni Rivers. There are bailey bridges at Nyalit and Bukwo Rivers. Other structures both bridges and culverts have narrow carriageway widths such as the bridge at Siti River with a 3.5m wide deck.

The Kitale – Suam road alignment crosses 4 major rivers namely; Sabueni River, Kaibei River, Mubere River and Suam River at the border of Kenya and Uganda. All these rivers originate from the highlands of Mount Elgon and flow from east to west direction crossing the project road from left hand side to the right hand side. The hydrology of Eldoret town is influenced by Sosiani and Kipkaren rivers that flow westwards. The corridor is drained by a number of streams

most of which have low flows during the dry conditions. Areas between Cheplaskei, Lemook and Simat areas have fewer streams draining the area, a situation that creates a number of wet areas acting as flood sinks. The streams and wetlands include; Km 2 Nandi Gaa Stream, Km 6 D-Block wetland, Km 8+800 Kapsaret wetland, Km 12 Tebeswet stream and wetland, Km 18+550 Mutwot Stream and Lemook Wetland, Km 24 Sosian River.

Climate Change: Climate change is a reality that will have strong bearing on project design, functionality and significance of impacts. IPCC fourth assessment report climate change models project an increase in average temperatures in Uganda of up to 1.5°C in the next 20 years and up to 4.3° by 2080. Changes in rainfall patterns and annual totals are also expected. Prediction models, indicate an increase in rainfall of 10-20%. From the predictions it is estimated that runoff will increase in the magnitude of 10-20% (UN-Habitat 2009). Data from the European Center for Medium –range Weather Forecast (ECMWF) Reanalysis shows average near-surface temperatures increased in Uganda between 1979 and 2005 by about 1°C though data from the Global Precipitation Center (GPCC) and Uganda Bureau of Statistics (2014) show that rainfall did not change significantly in Uganda from 1954 and 2014.

According to the Kenya National Climate Change Response Strategy, climate change is already being experienced in Kenya. For example from the early 1960s, Kenya has experienced generally increasing temperature trends over vast areas. Over the inland areas, the trends in both minimum (night/early morning) and maximum (daytime) temperatures depict a general warming (increasing) trend with time. There is a general positive trend (increase) in rainfall events of September to February period suggesting a tendency for the ‘Short Rains’ (October-December) season to be extending into what is normally hot and dry period of January and February over most areas. This may be attributed to possibly more frequent occurrences of El-Niño events occasionally coupled with relatively warmer sea surface temperatures over the western Indian ocean (along the coast of east Africa) and relatively cooler than average sea surface temperatures (SSTs) to the east of the Indian Ocean.

Biological Environment

Mt Elgon National Park: The Park covers an area of 1,279 km² and is bisected by the border of Kenya and Uganda. The Ugandan part of the park covers 1110 km² while the Kenyan part covers 169 km². A total of about 112 tree species are known to occur in Mt. Elgon National Park out of which, four are known to be endemic to Uganda. These are: *Senecio ambyphyllus*, *S. elgonensis*, *S. barbatipes* and *Philippia excelsa*. A number of mammalian species include: two species of diurnal primates, two species of duiker, a hyrax, bushbuck, leopard, buffalo and elephant. Other faunal species include more than 200 species of birds and 36 species of forest swallowtail and charaxes butterfly. Mt. Elgon in many cases represents the western range limits of species or races that commonly exist in Kenya and northern Tanzanian highlands. ***It is important to note that, the section of MNEP that is crossed by the road is of coniferous forest, hence, it's not rich in biodiversity. Secondly road works through this section of the Park will be restricted within the existing alignment without any re-alignments that would affect the Park giving a net negative impact of the project will be of small nature.***

Vegetation resources: There is intensive agricultural land use coupled with high population density in the Kapchorwa – Suam project area that has greatly altered the natural vegetation

cover. Much of the project area has been taken over by cropping regimes and soft woodlots. Remnants of original vegetation are only present on hillslopes where settlements are scanty. The only significant clusters of natural vegetation along the alignment are to be found towards Suam. One Major vegetation enclave is the Kapkwata softwood plantation stretching for over 10km along the project road. Also recorded is the replacement of indigenous tree species in form of soft wood plantation at Kapkwata.

On the Kitale – Suam road section, the road crosses part of Suam Forest Reserve at Suam which is dominated by indigenous trees. The project crosses an area where natural vegetation has been largely degraded and replaced by exotic tree species, thus biodiversity is already compromised. Furthermore the project will mostly be restricted to the current road reserve which has good vegetation cover but poor species diversity. The few sections that will be realigned are mainly covered with agricultural crops and exotic trees. In some cases the local farmers have planted crops within the road reserve.

Vegetation cover on Eldoret bypass road section seems to be influenced by the highland climatic and ecological conditions. There are no natural forests along the corridor, there is some agro-forestry, agricultural cover and wetlands areas. Common trees on the wider region are mainly exotic (gravellia, wattle tree, eucalyptus species, Jacaranda and palm trees etc.), limited indigenous trees, and shrubs such as bougainvillea, datura species and some grass species. Most land is covered with agricultural crops such as maize, beans, wheat.

Fauna: Much of the Kapchorwa – Suam road reserve and immediate project area has experienced anthropogenic changes leading to the loss of habitats for fauna. However, the Mt Elgon National Park which is in the proximity of Suam Border post in Bukwo is home to a number of mammalian species including: two species of diurnal primates, two species of duiker, a hyrax, bushbuck, leopard, buffalo and elephant. Other faunal species include more than 200 species of birds and 36 species of forest swallowtail and charaxes butterfly.

On the Kenya side, wildlife is found in the Mt Elgon protected areas, Suam forests rivers and farmland. There are 37 ‘globally threatened’ species in the Mt Elgon ecosystem (22 mammals, 2 insects and 13 bird species such as cave elephants, giant forest hog, oribi, rothschild giraffe, turacos and red-fronted parrots. Other mammals present in the region are leopards, waterbuck, bushbuck, duiker, black and white colobus monkey, blue monkey, spotted red tailed monkey and de brazza’s monkey.

There is no significant presence of wildlife within and around the Eldoret town bypass alignment due to the high human activities (agricultural, settlements, institutional and commercial activities). Some monkeys are noted at River Soiani, while the river and the major wetlands are habitats to fish species. There is presence of different bird’s species in the area. Livestock animals among them dairy cows, goats, poultry and fish ponds presents alternative animal presence in the corridor.

Socio-economic Environment

Population: In 2014, the project districts along Kapchorwa – Suam road section had a total population of 289,456 of which 144,156 were males and 144,938 females. The total number of

households in the project stood at 1887. Population projections indicate a rather moderate increase, from 2002 to 2014. On the Kenya side, the 2009 Population and Housing Census enumerated a total of 818,757 persons in Trans Nzoia County which hosts the Kitale – Suam road. Of these 407,172 were male and 411,585 were female. The intercensal growth rate was 3.7 percent between 1999 and 2009 which is above the national average of 3.0 percent. Assuming the growth rate is maintained, the population is projected to increase to 1,100,794 by 2017. The total population within Uasin Gishu County in 2009 was enumerated at about 894,179 persons. Of these 448,994 were male and 445,185 were female. The population of Uasin Gishu County is projected to increase to 1,211,853 by 2017.

5. PROJECT ALTERNATIVES

No Project or Zero Option Alternative: The zero option refers to the “No Action Alternative” which in essence refers to not implementing the proposed project at all. This alternative would imply that the current status quo would continue. Project actions predicted in the zero alternative will comprise routine maintenance works and activities aimed at preserving the current asset using recurrent expenditure. It is important to note that this zero alternative is the baseline against which all other alternatives and the development proposal have been assessed. The zero option will not register any of the impacts (both positive and negative) associated with any specific alternative or the development proposal. Assessing the other alternatives would therefore inadvertently provide an assessment of the zero option.

In addition to the direct implications of retaining the status quo there are certain other indirect impacts, which may occur should the Zero alternative be followed. The zero option will entail continued poor road conditions perpetuating long duration traffic hold ups in Eldoret Town, impassable roads for Kapchorwa – Suam – Kitale road sections whenever it rains. Such bad road carriage conditions will perpetuate slow connectivity.

Alternatives for Kapchorwa – Suam Road Section:

Alternative 1: Widening and Re-gravelling – This constitutes widening the existing road, improvement of curves and gradients on steep section and re-gravelling the road with murrum. Should this alternative be adopted, it is certainly a cheaper option as opposed to alternative 2. Economic assessment however, shows that this alternative is not economically sustainable in terms of costs and the life of the re-graveled road. A re-graveled road cannot effectively handle the predicted 15% annual traffic volume growth for this region which has high economic potential. Additionally, heavy rains ranging from 800-1200mm characteristic of the region will necessitate road re-gravelling every two (2) years to maintain it in modest motorable state. Re-gravelling will thus demand a frequent maintenance regime and high demand for murrum (gravel) which, not only is scarce in the project area, but also whose acquisition poses risk of environmental deterioration and landscape/ visual blight. The above-mentioned environmental and social-economic considerations render this option untenable.

Alternative 2: Upgrade to Bitumen Class II Paved Road – This alternative involves upgrading the current road to asphalt concrete surface with base course and sub base (natural gravel) layers. The alternative includes improving the geometric design of the existing road, drainage and safety conditions. Considering the landscape in the project area, this is the most sustainable approach that will ensure road stability, safety and economic viability. This alternative will further entail durability in the long run since major maintenance interventions are expected to begin after over 12 years of upgrading. Environmentally the option involves design based adaptation measures to climate change. Improved and back benched embankment will be grassed to reduce impacts of slope failure and subsequent landslides. Enhanced drainage including appropriate culvert location and size will reduce flooding at bridges and culvert sites. Improved geometric design will further improve road safety for the motorists and other road users including pedestrians. Environmental impacts associated with acquisition of maintenance materials including gravel are eliminated by this option. This Alternative was selected by the team for detailed design and implementation.

Alternatives for Kitale – Suam Road Section

Alternative 1 which proposes a dual carriageway through the town section and alternative 2 which proposes a single carriage way through the town section. The two options were evaluated accordingly and alternative 1 of Dualling through town was adopted. To meet social demands and support movements The dual carriageway have been complemented with service roads and parking areas which have been designed ,where space allows, to serve the local traffic in this area as well as to provide access control into the carriageway.

At the end of the dual carriageway section, the design introduces a roundabout to cater for the return traffic and to provide a smooth transition from the dual carriageway section into single carriageway as well as providing entry and exits for the Minor road (Ravine Road).

For the section from dual carriage way to project end at Suam the design adopts the existing carriageway as the required design standards are achieved. The section Km 6+600 to 19+700 is characterized by very long straights and curves of adequate parameters. The design adopts the straights but includes a 1 km re-alignment between Km 6+600 and 7+700 to meet the required design standard. In this particular situation, it was difficult to break the straights given the rich surrounding agricultural land that needed to be protected and to reduce environmental impacts. The danger brought by the long straight in terms of glare effect and tendency to excessive speeding has however been eliminated by the rolling terrain.

Alternatives for Eldoret Bypass

Six alternative alignment routes (including the current Uganda Road) were identified for analysis on Eldoret Bypass. This evaluation was based on the environmentally and socially acceptability, economic soundness, design viability and benefit distribution. The identification of the alternatives took into consideration the corridor terrain, built-up areas (business and residential), potential social displacements, public amenities, sensitive environmental features (water resources, vegetation, wetlands) and the drainage challenges. The preferred route was the Cheplaskei – Kapsaret – Leseru route that branches off A104 at Cheplaskei Market about

13km from the Eldoret City centre and runs west through a predominant semi-rural and agricultural Zone comprising of crops (mainly maize), settlements (with sparsely density) and limited livestock keeping. There are also a few institutions (churches and schools).

6. POTENTIAL IMPACTS

Positive Impacts

Regional Integration: The multinational project will support regional integration and cross border trade with Uganda and Kenya at Suam. The project will contribute to improving road transportation and trade facilitation along the Suam border to foster transport linkage with Kenya, Uganda, South Sudan and Democratic Republic of Congo (DRC); and at national level, the development objective is to contribute to improving transport services and agricultural productivity in the Kapchorwa- Suam-Endebess-Kitale area and reduce the traffic congestion in Eldoret Town to stimulate and support local economic activities by reducing road maintenance costs, vehicle operating costs and travel time in the eastern Uganda and western part of Kenya.

Employment opportunities: The design, feasibility and planning phase has provided financial benefit and employment for local and foreign consultants. However many of these are non-resident though this was a positive, short-term and reversible socio-economic impact. The construction phase is bound to provide more employment avenues to local people. Contract provisions for road construction require 30% of the labour force to be drawn from the local population with particular emphasis on women. Since construction is estimated to take about 3 years, this phase will provide short-term job opportunities for local people along the road. Districts and Counties within the project area have specified conditions that require labour on such projects to be sourced within their boundaries. This should apply to this project specifically for non-skilled positions.

Enhanced Agricultural Production: The anticipated efficient, reliable and cheap transport, will enhance rapid transportation of perishable farm produces (vegetables and fruits) to markets, increase acreages under crop production and improve marketing of agricultural products. Improved production of crops and enhanced transport may call for establishment of agro-processing plants to process the huge supply of fruits and vegetables from the Kenya side and better storage and processing of grains (wheat, barley and maize) from Uganda side. Improved transportation is likely to induce efficiency and multiplicity of transport alternatives to be availed as currently, farmers rely on trucks and draught animals to transport farm produce.

Improve Trade and Access: The project will result in socio-economic development induced with opportunities for rapid flow of commodities and enhancement of agricultural production and cross border trade. The project design includes the construction of One Stop Border facilities at Suam border. The construction of the road to bitumen standards shall enhance road safety and faster travel times which will be a boost for transporters and traders. This will have the overall effect of improving the living conditions of the people.

Reduced travel time: Reduction in travel time through Eldoret Town from improved traffic flow will include enhanced value of time from efficient movement. It is currently estimated that the base case vehicle speed is an average 20 – 30km/hr across Eldoret Town, a distance of ~11km. On a worse situation, it can take an average of 1 – 1.5hrs to traverse a distance of 11km through the city centre. With the bypass road, the vehicle speeds through the town could change to an average of 60 – 80km/hr with significant improvement on travel time (10 – 20min.) for the same distance.

Road-side business opportunities: Road construction will stimulate roadside businesses mostly owned by women, such as vending food to construction workers. The project areas will experience an upsurge in food kiosks. Although short-term and reversible, this is a positive impact to women (and their households) who would be involved.

Rental Income: Land will be required on which to set up temporary workers' camps and equipment yards. Owners of land on which these facilities will be erected will earn a rental income negotiated 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.

Negative Impacts

Climate Change Impacts: The main climate change threat to the project area is slope failure and landslides given the very challenging landscapes. The project road traverses through mainly rolling through mountainous to escarpments. All these landscape categories are prone to slope failure and landslides on account of the very steep slope gradients, heavy rainfall and in some places weak soils. The most prone sites to slope failure and landslides are sites with slightly weathered rocks which have close joints, sections with colluvial soils and sections with boulders and cobbles mixed with colluvial soil deposits such as at Km 33, Km 38, Km 39, Km 48 and Km 52.

For the Kitale – Suam road section, an initial screening has been done on climate risk by filling in a checklist. Risks considered are those resulting from temperature increase, precipitation change, wind speed change, sea level rise, solar radiation change, water availability, flooding, tropical storms, wildfire and landslide. The project area scores low on most accounts except flooding which is adjudged medium because changes in precipitation could still occur however subtle. In the event increases in precipitation occur then attendant increases in floods could undermine road drainage structures and foundations. In addition, short intensive rains which, however, are still not predicted for the region could result in flush floods with similar consequences on drainage structures. Overall therefore climate change impacts on the Kitale – Suam road section is adjudged to be minimum and the impact related to potential changes in precipitation and accompanying floods.

For the Eldoret Bypass, the road section is meant to reduce congestion in Eldoret Town. Key urban emissions that are largely associated with transportation include carbon dioxide (CO₂), carbon monoxide (CO), Nitrogen Oxides (NO_x), Sulphur Oxides (SO_x) and particulate matter

(PM2.5, PM5 and PM10). Of particular importance in climate change is CO₂ that provides a general measure of carbon emitted into the atmosphere as a greenhouse gas. On the other particulate matter associated with transportation comprises of hydrocarbons, fuel aerosols and soot. PM2.5 has a health concern due to its capacity to penetrate into the lung tissue compared to PM10. The bypass corridor is not expected to display any significant levels of these emissions due to the low level traffic, heavy vegetation cover and high air dispersal rate.

Land Take: The engineering design report and RAPs for the road sections detail properties affected by the proposed road project. Both commercial and residential buildings may be demolished or partially affected. Major areas affected will be from Kween to Suam on the Kapchorwa – Suam road section, Kitale – Endebess road section and new Eldoret Bypass road alignment. The ROW in Kapchorwa – Suam is through moderately dense population centres living close to the road alignment. The ROW in Kitale – Endebess road section is within a high activity intensity urban area of mixed commercial, and informal sector mills/timber workshops. The Eldoret Bypass is on farmland with small holder farms and numerous sub-divisions. As a result a significant number of households are affected by the proposed road project and need to be compensated and relocated from the road ROW.

Impacts on Biodiversity: The Kapchorwa – Suam road section is proposed to follow the existing alignment as much as possible even in the plantation forest section of the Mt. Elgon National Park (MENP). The section of the park traversed by the road is mainly a soft wood plantation with no other tree species. The road will not have any direct impact on the section of the park under natural tree cover since the buffer distance is wide enough and occupied by an extensive soft wood plantation. Outside the MENP anthropogenic modification has almost wiped up natural vegetation. These are intensively cultivated slopes occupied by a diversity of crops including maize, beans, coffee, bananas, and barley among others. During road construction, expansion of the carriageway may lead to loss of trees in the softwood plantation which will only be limited to an incremental distance since the plantation has observed the ROW in most sections. The overall biodiversity impact of the road will be on loss of softwood timber and carbon sequestration value of the affected trees.

For Kitale-Suam road section, at Suam, the road crosses part of Suam Forest Reserve which is dominated by indigenous trees. Currently the forest has limited access to people due to the poor condition of the road. Whereas it crosses forest land, natural vegetation in this section has been largely degraded and replaced by exotic tree species, thus biodiversity is already compromised. Furthermore the project will mostly be restricted to the current road reserve which has good vegetation cover but poor species diversity. The few sections that will be realigned are mainly covered with agricultural crops and exotic trees. In some cases the local farmers have planted crops within the road reserve. Impact of the project on vegetation is thus very specific to the site of the activities and therefore localized to the road corridor and to limited off-site areas. There are tree boulevards in some sections of the road in Kitale Town.

For Eldoret Bypass, there are no natural forests along the corridor, there is relatively heavy vegetation cover arising from intensive agro-forestry, agricultural cover and wetlands areas. Most land is covered with agricultural crops such as maize, beans, wheat. The impact on

biodiversity is therefore limited as anthropogenic activities have altered the natural environment in the corridor.

Impact on surface water courses and wetlands: Inappropriate work methods and practices at these sites are most likely going to increase level of sediment deposition in wetlands and streams that flow through. Disposal of cut-to-spoil, cleared vegetative biomass during grubbing could end up choking wetlands and natural water ways. Other forms of construction waste include waste concrete, bitumen, lime, paper bags, scrap metal among others may be deposited in wetlands and water courses. Increased soil erosion could result from bush clearance and grubbing near water course.

Impacts of Material Sourcing: Construction of the project roads will require two types of earth materials; sub-base (natural gravel commonly known as murrum) and base course materials (hard rock/crushed rock/aggregate or stones). Design engineers have identified candidate borrow pits along each of the roads. The choice to select borrow pits and quarries however rests with the contractor. Some of the candidate sites identified will be far away from the alignment. Whether materials are obtained from existing borrow pits or new ones, near or away from the alignment, there will be negative environmental and social economic impacts.

The method of their extraction, haulage and state in which sites are left upon project completion all have potential for socio-environmental impacts as follows: (i) Striping of vegetative biomass to create access to material sources; (ii) Excessive noise, vibrations and dust from borrow operations and rock blasting at quarries will occur. Noise would affect local communities and quarry workers and vibrations will crack structures and affect health of especially elderly people. (iii) Fly rock which damages crops, dwellings/ structures or injure people and livestock, (iv) Haulage impacts including accident risks and road dust will be realized, (v) Safety and public health risks of un-restored quarries and borrow pits including breeding of insect vectors, poisonous reptiles and possible drowning of children. Direct and secondary effects (noise, vibrations, dust, fly rock injuries, etc) associated with stone/ rock quarrying and excavation of gravel can pose negative and sometimes irreversible social impacts. Unrestored quarry or borrow pits cause visual blight and scarring of landscapes besides posing public health and safety risks.

Impacts of Utilities along the roads: The project road sections of Kitale – Endebess and Eldoret Bypass are traversed by utilities serving the host communities. There exists a network of water pipes, and the Oil Pipeline on the Eldoret Bypass. Electricity transmission lines pass through the project area as well as telecom fibres for the different networks. On the Kapchorwa – Suam road section, the widening will disrupt utilities at the trading centres. This will necessitate relocation of utility service lines causing temporary disruption of service delivery to clients. This could translate into financial losses to both utility companies and their clients.

7. MITIGATION MEASURES AND COMPLIMENTARY INITIATIVES

Adaptation and Mitigation Measures

Adaptation of Climate Change considerations in Design: The Kapchorwa-Suam road section has opportunely been designed to enhance resilience and adaptation to impacts of climate change most especially slope failure, landslides and flood episodes on the most vulnerable sections. Further attention on adaptation has been focused on fill sections to improve resilience to slope failure. Also river and stream crossings have been particularly designed to improve resilience of structures and further aid communities adapt to climate change.

Kenya's climate change adaptation strategy proposes that physical Infrastructure including transportation and telecommunication Networks be designed to ensure that the infrastructure is climate-proofed over its lifespan, which includes carrying out geotechnical site investigations (GSIs) to determine appropriate sites for infrastructure development; factoring a maintenance component into all infrastructural development funds; and designing infrastructure that can withstand the prevailing climatic conditions, e.g. structures that can withstand strong winds, tides as well as high temperatures. Kitale – Suam road section and Eldoret Bypass have both been designed taking into consideration climate adaptation strategies especially in the hydrological analysis and design of the drainage structures.

The following resilience and adaptation measures have been incorporated in the designs of the road sections; (i) Flattening and back benching slopes shall be undertaken on identified sections to improve embankment stability; (ii) construction of cut-off drains above cut slopes; (iii) construction of gabions on vulnerable sections; (iv) Grassing of cut and fill slopes shall be done to enhance embankment stability; (v) construction of chutes at reasonable intervals along the road to channel surface runoff into stilling basins down the slope to avoid wash out and protect infrastructure from erosion; (vi) re-design of bridges to accommodate high anticipated flooding episodes due to climate change scenarios as predicted for the Mt. Elgon zone (vii) Increased number and sizes of box culverts along the proposed project road sections; (viii) provision of steel bar racks upstream of bridges and box culverts especially where rivers or streams transport boulders that can damage structures or block them causing topping on the carriage way; (ix) undertake integrated watershed management including tree planting at degraded catchments and soil and water conservation technologies along the entire project road.

Mitigation for Land Take: Full Resettlement Action Plans have been prepared for the properties to be affected by the project roads and a summary of the Plans is included as an Annexes to this ESIA Summary. Both UNRA and KeNHA shall ensure smooth and effective implementation of the RAPs by (i) providing prompt, fair and just compensation to Project Affected Persons (PAPs) prior to commencement of civil works; (ii) provide adequate vacation notices to PAPs before construction commences. This will also allow affected property owners to plan appropriately or take any salvageable material from their demolished structures without delaying contractor's work. (iii) Institute a strong grievance committee so that complaints and dissatisfaction about the resettlement/ compensation process do not unduly delay contractors progressing works.

Mitigation for Impacts on Biodiversity: The following mitigation measures are proposed; (i) A Biodiversity Management Plan shall be appended to the Contractors Environment and Social Management and Monitoring Plan (CESMMP); (ii) Work on sections in the National Park shall not commence before a methods statement is produced by the contractor detailing his methods

at each of the sites. (iii) Undertake to identify land for offset tree planting within the park or immediate environment on the Northern slopes of Mt. Elgon. (iv) Work in the forest plantation shall begin by coordinating with MENP to harvest mature soft wood. (v) The Kenya Forest Service shall plan to improve surveillance and monitoring movements of forest resources within the area. Extra forest rangers could be hired if the situation demands extra protection. (vi) KeNHA through the project, will support the current efforts at establishing the indigenous tree buffer strip on either side of the road beyond the road reserve. (vii) Partner with KFS by providing complementary resources needed to improve the afforestation efforts currently ongoing at Suam forest. KFS estimates that such support could be in form of nursery establishment and planting of seedlings.

Mitigation for Material Sourcing: All borrow pits and quarry sites should be operated in accordance with a plan to be agreed in writing by the Engineer and the Contractor and approved by the regulatory authorities in each country NEMA (Uganda) and NEMA (Kenya). Each plan will clearly cover the following operational requirements: (i) Pit or quarry location and area; (ii) Access arrangements; (iii) A working plan giving an outline of the direction, phasing and depth of working; (iv) A reclamation/restoration plan giving details of final grading, drainage and sediment control, resoling and re-vegetation measures and design after use.

Materials not capable of supporting vegetation shall be used as fill and subsequently evenly covered with soft materials. Spoils from road building, excess stockpiled material etc. can only be used for fill in the borrow pit, provided it does not affect the hydrology of the site. If soft material/ top soil is not sufficient, the remaining portions shall be scarified along the contours to avoid erosion. Quarries sites have to be fenced to avoid people and animal falling into the pits. In additions, pits and quarries should preferably be away from the roads so as not to destroy the scenic view along the road. Final restoration should establish a full vegetation cover and restore the site to productive use (e.g. establishment of pasture or wood lots).

Mitigation for Impacts of Utility Relocation: Utility relocation plans shall be designed by the contractors before operations commence. UNRA and KeNHA shall facilitate joint planning with the utility companies to ensure minimum disruption of services to host communities.

Complimentary Initiatives

Several complementary initiatives shall be implemented as part of the project. These include:

Environmental Initiatives and Afforestation Program: In Uganda, a collaborative tree planting programme with Uganda Wildlife Authority, UNRA and district local governments will be designed. Through UWA, the project will undertake tree planting in degraded areas of the Mt Elgon National Park. UWA will take the lead in providing technical assistance and the project through UNRA shall provide the tree seedlings and resources. Local Authorities and host communities shall be engaged during tree planting outside the National Park.

On the Kenyan side, the project's ESMP has included a well elaborated program of tree planting as a way of replacing vegetation destroyed, support to Kenya Forestry Service (KFS) with tree seedlings for rehabilitation of degraded areas of Suam Forest, rehabilitation of borrow pits and

material areas, and also as part of a beautification program for the road corridor in Kitale and Eldoret. This activity will involve implementation of tree planting to create a buffer zone to offset soil erosion and sediment transport to the road.

HV/AIDS/STI & TB Awareness Campaign: A regional project of this nature tends to bear the risk of transmitting communicable diseases beyond one country. In this case, the project has included programs of HIV/AIDS, TB and malaria awareness and prevention. The HIV/AIDS prevention programs will be implemented for both construction workers and surrounding communities. The contractor will work closely with local authorities to craft a programme targeting project workers and surrounding communities. Critical in this programme will be sensitization of workers and adjacent communities on HIV/AIDS and drug resistance tuberculosis. The project will further establish testing centres along the project road serving both the community and project employees. Counselling centres shall also be set up to assist communities and project workers live positively and further aid in the screening. In Kenya, advice received from NACC is to create a Task Force or Working Committee coordinated by KeNHA and include all key stakeholders at both national and county levels. The purpose of this Committee would be to, among other things, ensure a concerted effort to combat the epidemic in a multi-sectoral manner and also share information and practices that have yielded the best outcomes.

Gender: Gender Mainstreaming shall be part of the sensitization and awareness to be implemented as part of the HIV/AIDS programs. Baseline presentation on gender reveals aspects of gender based violence including Female Genital Mutilation (FGM). The project area has also reported high incidents of teenage pregnancies and high school drop-out among girls. These are cross border concerns that have to be addressed through cross border initiatives. Much as there are punitive actions against FGM, it has nevertheless continued to prevail. The project shall, therefore, facilitate coordination as the practice has shown tendencies of border crossings fuelled by the fact that Uganda has passed a FGM Law while Kenya has not yet. The project has, therefore, included GBV and FGM awareness and sensitization programs which will be coordinated between the two countries especially at local government levels. The project will work with local authorities to design acceptable awareness programmes targeting perpetrators of FGM. Incentive based awareness programmes targeting core operators in the practice be adopted. Identified core operators will require re-tooling/skilling and channeling into new income streams.

The project design has taken into consideration provision equal employment opportunities during construction and operation by ensuring that contractor camps provide sufficient amenities for both men and women; consideration of particular needs of both men and women especially during resettlement and compensation; support to identified areas of income generation which is predominated by women and girls; and in the design and determination of activities aimed at the control of the spread of HIV/AIDS and STI. The project includes capacity building activities which will ensure equitable participation of men and women.

Roadside Markets: Four roadside markets could be affected by project activities on the Kapchorwa-Suam Section and a major market at Kitale Town on the Kitale-Suam road section. The markets support rural livelihoods and are a critical source of cash incomes to women and

other vulnerable groups of people. Road construction should in essence be an opportunity to enhance trading opportunities for market. However given the very narrow ROW at some of the markets, they may have to be moved. Alternative places along the road shall be identified or better designs procured for the development of existing markets in-situ.

Road Accesses and Parking Bays: Crop cultivation is the main source of household income in the proposed project area. Parts of the project impact zone cultivate maize, barley and wheat. These are high value crops whose returns are currently constrained by poor accessibility. Improvements on the transportation network will thus be meaningful only if access roads are also improved. On the Kapchorwa- Suam road section, the project will have included in the design, construction of 20Km of rural roads to support the transportation of agricultural produce from the farms along the project influence corridor. UNRA will identify the locations with criteria for selection of the roads.

On the Kitale-Suam road section, the dual carriageway will have service lanes and pedestrian walkways in addition to lanes exclusively for non-motorized transport. The entire road will be served by bus lay byes at all the main centres and adjacent to major institutions. The project has included in its design construction of a 2 km access road to social and public services including a spur to Endebess Health Center to improve its accessibility at all times. The Health Centre has a maternity wing which makes it even more important that it is passable. The spur will also provide decent transport service to the DC's offices.

On the Eldoret Bypass, the engineering design has factored in provision of two lorry parking zones at Kapseret and Leseru areas along the bypass road. This is essential infrastructure that is expected to provide rest facilities, secure adequate parking, limit traffic congestion along the proposed bypass. Lorry parking zones are aimed also at discouraging unsafe road side parking that leads to shoulder damage and restriction of sight distances to road users. The drivers are given an opportunity to rest more and be alert to improve on traffic safety. On the other hand the facility will enhance income generating activities for the county government and the local communities.

Disruption to Utilities (Water Provision, Power Lines and Communication): During public consultations, concerns were raised regarding the duration it takes for utilities to be reinstalled during construction. The Executing Agencies will set out service standards guiding the maximum period during which each of the utilities can be disrupted before being reinstalled. Of critical importance are water systems (both for domestic use and irrigation) and power lines. In addition, the contractor shall have to be instructed that water sources for road construction will have to be left to community use during and after works are completed.

Road Safety Campaign: The project shall, through services of a consulting firm, mount road safety awareness and educational (IEC) campaigns. These will be in addition to measures incorporated in the road design such as providing sealed shoulders, signage, etc. In collaboration with the District/County Education Offices, produce education materials for use in schools as extra-curriculum activities, instruct the pupil traffic wardens; and campaigns for communities along the road, motorists and other road users. Road safety awareness and

education campaigns shall be conducted for the project road during construction and soon after completion.

Post-Crash Care Centre: Much as the proposed design mitigates against accidents, errant driver behaviour coupled with road unworthy vehicles may precipitate fatal road accidents. The region has medical facilities that can serve as reception centres. However, given the specialised nature of attention and treatment required for crash victims, a specialized facility will be required. The facility should be equipped with high-tech equipment and an ambulatory service to reach potential crash sites.

While the proposal has been endorsed by the Ministry of Health in Uganda, UNRA will have to engage the Ministry to various modalities required to make the initiative effective and sustainable. Initially there will be need to agree on the district to host the center among Kapchorwa, Kween and Bukwo. The Ministry will provide the type of equipment required; level of staffing and training for medical personnel; training for local leadership into making them road safety advocates; training of first responders soon after a crash occurs; training of Village Health Teams; and provision of at least two ambulances. A provisional sum of USD 500,000 has been earmarked for this initiative.

8. RESIDUAL IMPACTS AND ENVIRONMENTAL HAZARD MANAGEMENT

During the operation phase, adverse impacts similar to the environmental problems observed on the existing project roads will continue to manifest if mitigation measures are not implemented and work camps and sites are not reinstated after completion of the construction and defects liability period. These impacts include: (i) Soil erosion on slopes and embankments cut and built up during construction phase; (ii) Landscape scars at un-rehabilitated quarries and borrow sites. (iii) livelihood loss for PAPs unable to restore businesses or access clients. (iv) disruption of the hydrological flows and frequent flooding if the drainage structures are not properly sighted and installed during construction.

Loss of livelihoods: When equitable compensation and appropriate resettlement is provided to restore livelihoods and property of affected households, residual impact of involuntary resettlement will be of low or moderate significance. Some PAPs may find it difficult to restore livelihoods to pre-exposure levels most especially due to loss of their informal enterprises including grain milling facilities, timber yards/carpentry workshops, metal fabrication, automobile repair workshops, and eateries among others. This category normally locates near the market or bus stop or where accessibility is easy. It could turn out to be difficult to engage in a similar enterprise on relocation.

Blasting / Explosives safety: the contractor will ensure the following: (i) Stone blasting is only done by licensed blasters; (ii) All explosives are delivered to quarry sites (under security escort) on the day of blasting and any remnants returned into security custody after blasting. (iii) After each blast, site inspection will be conducted for un-detonated explosives. (iv) Advance warning is given to local communities near quarry sites before a blasting episode. (v) After each blasting incident, inspection is conducted in communities around quarry sites to identify any offsite

damage to private property, which shall be duly and equitably compensated. (vi) All workers shall be adequately protected from risk of fly rock and blasting noise.

Emergency Response Plan: The contractors will develop and maintain an Emergency Response Plan. This shall include provision of a medical clinic and a standby vehicle to immediately transport any accident victims to a nearby hospital. First Aid facilities will be provided on construction sites, equipment yards and in camps. Only trained/ certified operators will operate motorised equipment. Should accidents occur on the construction sites or on the road during construction, the accident shall be immediately reported, recorded, investigated and measures to prevent recurrence shall be implemented.

Fire safety: Fire safety equipment and personnel will be provided in the workers' camp. Warning signs will be provided at areas of potential fire source, e.g. at fuel storage areas. Risk of burns/ scald at asphalt plant will be averted by contractors using only licensed operators following stringent safety guidelines and operation procedures. Operations involving hot bitumen shall be limited to daytime in adequate natural light.

Oil/ fuel spills: Accidental oil and/ or fuel spills would occur when the contractor's trucks or vehicles are involved in road accidents or negligence of staff while on duty. Accidents may be caused by improper use of equipment, mechanical faults in equipment or vehicles among others. Spills or leakages would result in contamination of soils and water resources with hydrocarbons. Hydrocarbons and particulate matter if released into the soil will affect its productivity and pose a health risk to the community, animals and plants around. In water resources, it would affect the aquatic vegetation and fauna in addition to disrupting water supply to the community that rely on these water resources. No vehicle or equipment shall be allowed to be used if any oil or fuel leak is observed. The contractor shall have spill control equipment on standby both at the workers camp and the road construction site to ensure that any leakage or spill is contained and cleaned on time.

Utility Disruption: If service relocation is not coordinated and service ducts introduced, haphazard relocation will result into frequent service outages and costly multiple relocation.

9. ESMP IMPLEMENTATION AND MONITORING PROGRAM

The primary oversight to ensure environmental mitigation actions and the overall ESMP are implemented will rest with the Executing Agencies in their respective countries, UNRA (Uganda) and KeNHA (Kenya). The Executing Agencies shall each appoint a Project Engineer working with the Environmental and Social Unit (ESU). The national regulatory agencies, NEMA Uganda and NEMA Kenya shall provide regulatory supervisory and monitoring roles.

UNRA and KeNHA shall require contractors to comply with the ESMP and assign a fulltime staff (Environmental Officer) to undertake environmental supervision during construction. UNRA and KeNHA confers full mandate to the supervising engineering consultant to supervise the road project on a day-to-day basis. The Supervising Engineer oversees the work of the

contractor by recruiting an environmental specialist, this specialist shall guide the contractor's fulltime Environmental Officer in undertaking his/her own responsibilities, including reporting.

Monitoring procedures will comprise; (i) Institution of a qualified environmentalist and social expert by the contractor and supervision consultant. (ii) Formulation of enforceable contractual terms to ensure that contractors implement the ESMP. (iii) Ensuring a project completion and handover process that will necessitate the Executing Agencies and Environmental Regulators approval for environmental and social aspects such as site restoration and removal of road construction waste.

Contractor(s): Upon project commencement, the contractors will each prepare a site-specific Construction ESMP (CESMP) based on requirements of the ESIA and the approval license conditions in each country. These include securing quarry licenses, permits for borrow sites, permits for work in environmental sensitive areas, permits for tree felling and water abstraction permits. The CESMP will be reviewed and approved by the supervising consulting engineer and the respective Executing Agency Environmental Staff. At project completion, the Contractors will prepare a final environmental completion and decommissioning report to be approved by the supervising consultant, the Executing Agencies and the national Environmental Regulatory Agencies.

The Supervising Consulting Engineer: Before construction, the supervising engineer will review the works contract and document environmental and social requirements, road safety, and quality assurance systems and plan the supervision functions to ensure that works are implemented while protecting the social and environment aspects. During the construction phase, the supervising engineer: (a) Monitors implementation of the CESMP and (b) prepares monthly and quarterly environment and social compliance reports, which are submitted to Executing Agencies for consideration, as well as annual environment and social audit reports submitted to the national environmental regulatory agencies. The Quarterly Reports and the Annual Report certified by the NEMA Uganda and NEMA Kenya for respective contracts shall be made available to the Bank for review.

NEMA (Uganda and Kenya): During the construction phase, depending on the implementation status of environmentally and socially sensitive project activities, NEMA in both countries shall a) commit and review annual or biannual environmental monitoring reports and b) give its opinion and recommendation in which environmental concern raised by the project reviewed alongside project implementation.

Compensation: For the compensation, UNRA and KeNHA will monitor implementation with assistance of the respective District and County Administrators. Progress of land acquisition will be monitored by the Executing Agencies. An independent consultant will undertake quarterly review of implementation activities and submit bi-annual reports to UNRA and KeNHA who will review the reports and through supervision verify milestones, livelihood restoration until compensation implementation is completed.

Internal Monitoring: Monitoring will verify if predicted impacts have actually occurred and check that mitigation actions recommended in the ESIA are implemented and check their

effectiveness. Monitoring will also identify any unforeseen impacts that might arise from road project implementation. Monitoring will be undertaken by both the Independent Consultant and the Environmental Sections of UNRA and KeNHA.

External Monitoring: External monitoring shall be done by NEMA in both countries according to their regulatory mandate as prescribed in their respective Environmental laws. The Occupational Health & Safety (OHS) Department in Uganda and the Directorate of Occupational Health and Safety Services in Kenya (DOHSS) shall also undertake external monitoring of labour issues and Occupational Health and Safety compliance. The OHS and DOHSS Departments in each country has authority to inspect any facility for compliance with national requirements on safety in workplaces. Monitoring will be done through site inspection, review of grievances logged by stakeholders and ad hoc discussions with potentially affected persons. Monitoring will be undertaken monthly over the construction period.

Reporting: Detailed monthly and quarterly monitoring reports shall be compiled by the contractor's environmental officer under oversight of the supervising engineer. The reports will be based on records kept as per requirements of the contract to be signed. These detailed reports with evidence of compliance shall be prepared and appended to summary monthly reports. An Annual Monitoring and Audit Report shall be prepared, verified by NEMA and submitted to the Bank for review.

10. PUBLIC CONSULTATION AND DISCLOSURE

In compliance with the National Environmental Act, CAP 153 and the EIA Regulations 1998, in Uganda and the EMCA, 1999 Clause 17 in Kenya consultations were undertaken. The consultations were aimed at: introducing the proposed road project and its objective to lead agencies, district authorities, NGOs and adjacent communities along the project road to seek views and concerns on proposed road construction from all stakeholders. Generally there was broad support for the project in both countries.

In Uganda, a two tiered process was used during the ESIA process to carry out consultations with stakeholders. A consultative approach was used to seek views from Lead Agencies, local Government officials and local leadership at LC five and three levels, while focused discussions, consultative meetings and personal interviews were used to seek views from residents along the road alignment. The most critical issues coming out of stakeholder consultations focused on land and property expropriation, injurious damage during and after construction, runoff and flood management, road safety and general public safety, residual plots of land, loss of livelihoods especially for urban informal sector operators in growth centers, employment of local people, access to properties, management of material source areas, grievance redress mechanism, disruption of service lines, illicit sexual relationships between construction workers and the young ladies in the local community among others..

In Kenya, consultations for the Kitale – Endebess – Suam Road was carried out in two phases namely general in depth interviews followed by consultative stakeholder and public participation. In-depth consultations were conducted with key informants including the County

Government and National Government Coordinators (the County and deputy Commissioners, Chiefs and Assistant Chiefs), as well as GoK heads of departments (NEMA and agriculture), civil society, CBOs, farmers, land owners and traders along the road corridor.

The in-depth interviews were used as a tool for stakeholder identification and mobilization as well as collection of baseline data and information. In addition, it provided an opportunity to the participants to raise their fears and concerns and make recommendations as pertains to the project road. A stakeholder consultative participation meeting was held at Kitale club on 14 April 2015. It brought together the National and County Government, Civil society and the private sector. A total of seven consultative public meetings were held along the project road between 13th and 17th April 2015.

The main concerns of the public were need for a complaint redress mechanism, fear of displacements and disruption of livelihoods along the road reserve, noise and vibrations associated with blasting, possible school drop outs and increased cases of teenage pregnancies and increased insecurity once road is completed. They recommended that the road should provide for adequate bus stops where at least four 14 seater vehicles can fit simultaneously; ensure road furniture are completed for safety, and provision of job opportunities to the locals.

Gender Perspectives: As all others, children, women, the elderly and people with disabilities use the Kitale- Endebess- Suam road for basic transportation of goods and people. However, due to the current condition of the road, being narrow, very dusty during the dry season and muddy during the wet season plus rough all year round with poor or no signs, the vulnerable category of people are particularly at a disadvantage. These disadvantages range from long wait for transport to access vital services and public institutions to reduced income from agricultural produce due to poor access to markets. During consultations women indicated they would benefit the most upon completion of the road. Majority of the women saw easing of transport and travel to be the most important benefit. Men on the other hand identified reduction of cost of production to be the important benefit.

For the Eldoret Bypass, initial public sensitization and consultations were done in October 2013 during the scoping phase to introduce the project to the public and seek the stakeholders opinion on the six road by-pass alternatives under considerations. Further consultations were held in February 2014 during the Draft ESIA Phase to assess the possible impacts that could result from the alignment alternative under consideration. This was followed by a Stakeholder Forum in June 2014 for the presentation of the options and selection of the preferred alignment and a validation workshop in May 2015 during the drafting of the Final ESIA.

Consultations and community participation is proposed to continue with regards to risk and mitigation management, including engagement with the community during implementation as follows: (i) Consultation meeting at all districts at the start of construction activities; (ii) Consultation meeting at all districts during construction activities; (iii) Consultation meeting at completion of the construction. Consultations are still ongoing with PAPs and will continue into project implementation with various stakeholders.

11. CONCLUSION

Overall the socio-economic impacts will be positive as the project road development is for the larger societal good. The road will enhance agricultural production in the agriculture rich catchment of Mt Elgon, through faster and cheaper transportation of farm produce and farm inputs. Ultimately the cost of agricultural production will be reduced potentially resulting in lower cost of food and other commercial crops from the area. More importantly the road will open up more cross-border trade between Uganda and Kenya, thus creating export and import opportunity for agricultural products for both countries.

Impacts on the bio-physical environment during construction are medium to low and most of them can be avoided or mitigated. During operation, impacts will be significant within farmlands and urban fringe between Kapchorwa and Kween in Uganda on the one hand and Kitale and Chepchoina on the other hand resulting in a gradual change of character. Landscape changes may contribute to a potential future urbanising impact changing the character of the area from rural to urban edge. Proactive planning on the part of the respective local administration could significantly mitigate these impacts.

Despite the identified impacts including impacts on drainage, forests, material extraction areas, land and property expropriation, public health, occupational safety, HIV/AIDS, ambient air quality, aesthetics, traffic accidents among others, the project roads are expected to meet environmental sustainability criteria. Mitigation measures have been proposed and when implemented, shall eliminate, reduce or compensate for the negative impacts assessed. The project implementing team shall be guided by the ESIA and ESMP to ensure environment and social specifications are adhered to hence increasing the probability of achieving project objectives.

Indirect benefits to the local people include increased access to social services such as education and health. Local community members shall benefit from improved access to external markets for their agricultural products. Trade and exchange between Uganda and Kenya will be improved through the Suam border zone of influence. In general and taking into consideration all factors, it is concluded that the proposed road project would have substantial positive impacts on livelihoods and the economy in Eastern Uganda and Western Kenya while long term potential adverse impacts mainly relate to the opening up of Suam and Mt Elgon forests to degradation, and this can be avoided.

For the Eldoret Bypass, there is an overall acceptability of the proposed bypass road project by the local community who have suffered challenges of transport for a long time. The local leadership including the County Government appreciates the intervention, not only as a flag ship project but also for decongestion of Eldoret town. For the motorists and transporters, this project is viewed positively in respect of travel time reduction, convenience and cost saving through Eldoret Town,

The bypass development will involve significant land-take since it traverses through a new corridor characterized with narrow rural access roads, settlements, agricultural and institutional premises. The residents, however, are ready to let go the land as long as appropriate

compensations are undertaken. A few challenges, however, were registered in regard to willingness in this regard arising from future uncertainties,

Overall, the project has been found to have significant positive benefits to the region and to the local communities, the negative impacts will be mitigated through design and good engineering practices.