



**AFRICAN DEVELOPMENT
BANK GROUP**

PROJECT: Ethiopia Kenya Power Systems Interconnection Project

COUNTRY: Ethiopia & Kenya

ESIA SUMMARY

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) SUMMARY

Project Name: ETHIOPIA- KENYA POWER INTERCONNECTION
Country: Ethiopia and Kenya
Project No: P-Z1-FA0-022

1. Introduction

On May 7, 2006 Ethiopia and Kenya signed a memorandum of understanding that underscored the need to recognize the comparative advantage of Ethiopia over Kenya in terms of hydropower generation, and technically cooperate in power generation, transmission, rural electrification and customer services. In this regard, it was agreed that a power system interconnection between the systems of Ethiopia and Kenya be established. Following the memorandum of understanding, the two countries have reached an agreement to implement a power interconnection project between the two systems after taking into consideration recent developments in the countries and the region at large such as the Nile basin initiatives, Eastern Africa Power pool, eastern Africa Power master plan, etc. the memorandum of understanding for the implementation of the interconnection line has eventually been signed.

Ethiopia and Kenya have both small electricity sectors, with a total installed capacity below 2000 MW. Power shortages and unreliability of supply are common in both countries. The poor quality of electricity supplies is characterized by low voltage levels and voltage fluctuations beyond acceptable levels, resulting in frequent blackouts and brownouts. Ethiopia is endowed with a huge hydro generation potential which is estimated at approximately 45,000 MW. The Government of Ethiopia intends to develop these resources for domestic consumption and export to Kenya among other neighboring countries. The enormous potential for electricity trade in the Eastern Nile countries coupled with its socio-economic and environmental benefits will pioneer the idea of a regional power market and enhance the East African Power Pool (EAPP). A major setback to the development of such a market is insufficient transmission infrastructures. This project is expected to help overcome this setback and in addition, create transmission capacity needed in interchange of electric power between Ethiopia and Kenya, in the long run. Further, the project is expected to generate investment opportunities in electricity infrastructure and also give rise to development of other related industries.

The Ethiopia –Kenya Power Systems Interconnection Project Feasibility study was signed between the Ethiopian Electric Power Corporation and the Ministry of Energy of Kenya, the donor, KfW and the consultant, FICHTNER on January, 2008 to conduct the feasibility study of the project with the coordination office to be hosted under the Ethiopian Electric Power Corporation, Addis Ababa. Accordingly feasibility and ESIA/RAP study was completed in 2009. The proposed bipolar 500 kV HVDC line will originate from Welayta Sodo in Ethiopia and terminate at Suswa. The total length of the proposed transmission lines is approximately 1045 km, out of which approximately 433 km will be in Ethiopia and 612 km in Kenya. The routing in Ethiopia is in southerly direction along Lakes Abaya and Chamo, via Konso to the Ethiopia - Kenya border. It crosses the border approximately 90 km west of Moyale town. In Kenya, the transmission line route continues in a south-westerly direction through Marsabit, Wamba, Gilgil, Naivasha to Suswa. The proposed 500 kV HVDC transmission line is on conventional lattice self-supported steel towers of approximate height 38 m. The originating HVDC inverter substation is at Sodo in Ethiopia, the other inverter is located at Suswa in Kenya. At this proposed substation, HVDC will be inverted to HVAC.

The objective of the ESIA/RAP studies is to avoid, mitigate or/and offset the environmental and social potential negative impacts while enhancing the benefits arising from the interconnection. This summary presents project justification, policy and legal framework, description of project environment, project alternatives, potential impacts and mitigation/enhancement measures,

environmental and social management plan, monitoring program, public consultations and public disclosure, complementary initiatives and contacts. Two summary resettlement action plans have also been attached one for each country.

2. Project Description and Justification

2.1. The Project Location Ethiopia

In Ethiopia, the Project starts from Sodo Substation (at E 358941 N 763871) and passes through Arba Minch, Konso, Brindar, Yabbello, Mega and enters the Kenyan Border (at E 421519 N 397867). The route covers total length of about 433 km in Ethiopia and continues in southerly direction on Kenyan territory extending up to Suswa. The Project traverses ten woredas (districts) located in two Regional States; (1) South Nations and Nationalities People's Regional State (SNNPR) and (2) Oromia Regional State. The transmission line in Ethiopia could be divided into two distinct sections. The first section from Sodo substation to Konso woreda (the first 204 km) is known for its intensive cultivation and dense population settlement. The second section from km 204 to the 433- end of the Ethiopian section covers very wide uninhabited area with very low cultivation and thinly distributed population settlement. The communities in the second segment are mainly pastoralists and agro pastoralists. Land is required at different rural locations and a portion of crop, grazing and tree plantations along the route line will be affected by the project. The impact is limited to the dispossessions of strip of land which is needed for the RoW, the construction sites within this corridor, and the site for the substation. A total of 2841 ha will be required for the RoW and substation. Out of this 97.65 ha is expected to be required for the construction activities of the towers.

2.2. The Project Location Kenya

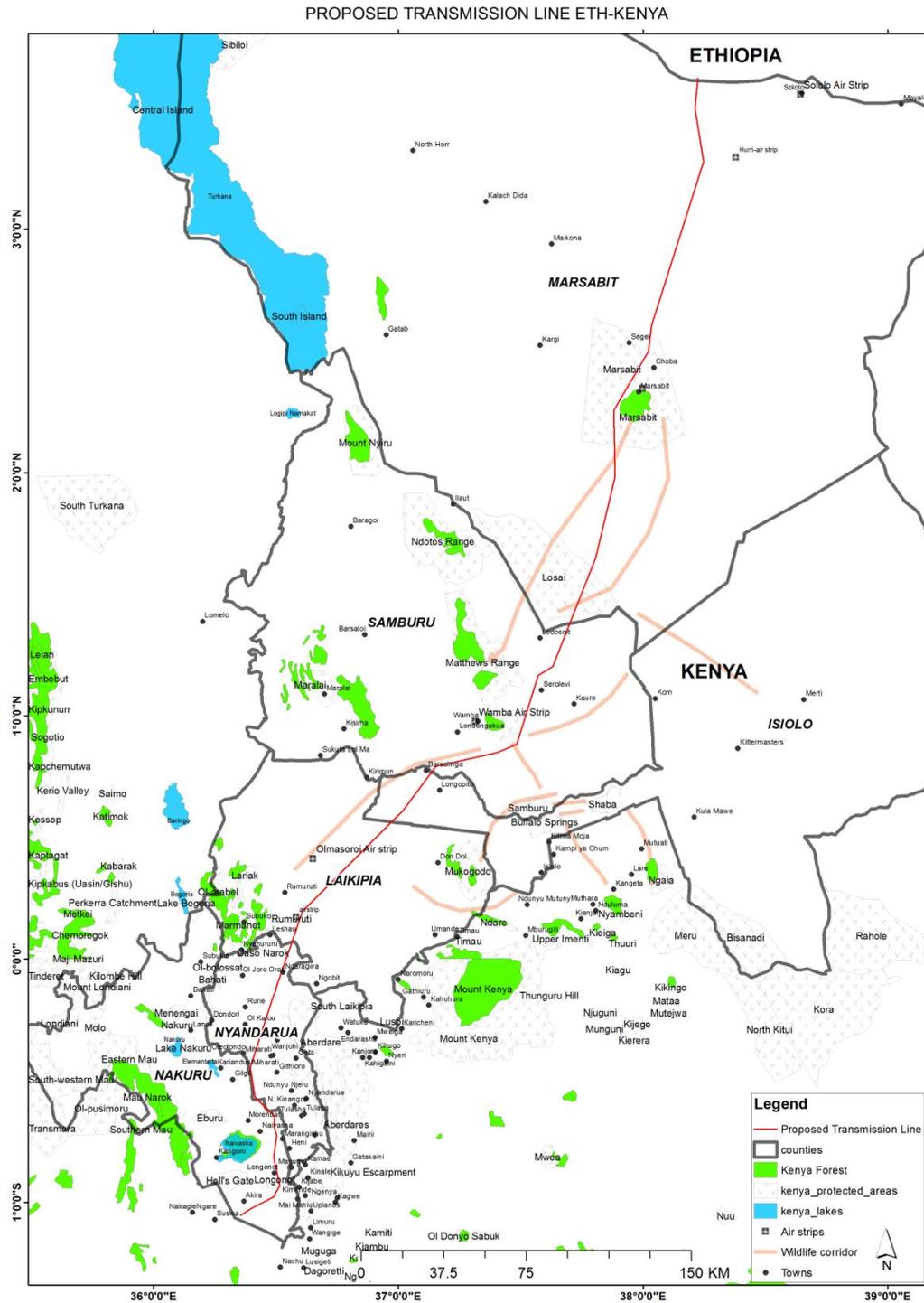
The proposed transmission line right-of-way (RoW) crosses from Ethiopia into Kenya approximately 90 km West of Moyale town (grid E 421519, N 397867) and traverses Marsabit, Samburu, Isiolo, Laikipia, Nyandarua and Nakuru. From Moyale the transmission line route runs adjacent to the Great North Highway (Marsabit – Moyale) in a southerly direction avoiding Marsabit National Park. From Marsabit area the route runs southwards at a maximum distance of 500 m parallel to the main Isiolo – Marsabit Highway to Laisamis. At Laisamis Town the proposed RoW runs close to the road as it enters Losai game reserve keeping a range of about 400 m to 800 m off the road reserve then runs further on to Merille where it diverts slightly westwards running east of Matthews Range, 6 km east of the Lololokwe Mountain peak. It then runs through a stretch of fairly flat land covered by thorny shrubs and bushes, and then turns southwards to the Ngoborbit plateaus and ridges dropping altitude down into Laikipia. In Laikipia, the proposed RoW continues through the extreme western section of Mpala Ranch which is covered by scattered thickets and bushes. Then it crosses Mutara River into Ndaragwa. The line runs on top ridge of Shamata and then sharply drops altitude to the flat plains of Olobolossat, 3.7 kilometres eastwards of Lake Ol Bolossat. It then traverses the Olkalou Settlement Scheme and cuts across Malewa River, climbing a steep hill then drops altitude to the flat land of Marangishu (karati) and on-wards to Kijabe after crossing the Nakuru – Nairobi highways into plains east of Mt. Longonot into the proposed Suswa Substation. A total of 3939 ha will be required for the RoW and substations.

2.3. Technical Description

A completely new transmission line with self-supporting steel lattice towers with concrete foundations will be built from Sodo in Ethiopia to Suswa in Kenya. Substations will be built at Sodo (Ethiopia), and Suswa in Kenya. Approximate average construction span length of the line is 400 m and with 65m RoW corridor. About 5m wide Access road along the line route will be required for repair and maintenance purposes. The 2009 technical feasibility study recommends adopting a conceptual design featuring:

- ± 500 kV HVDC bipolar overhead line, from Wolayta/Sodo S/S on the Ethiopian side to Suswa Kenyan side, sized for the Phase 2 link capacity of 2000 MW is needed.

The Ethiopia-Kenya Transmission Line Route



- 2x500MW line-commutated bidirectional bipole at Wolayta/Sodo and at Suswa
- Ground electrode lines at Wolayta/Sodo and Suswa
- Five 400 kV 1½ breaker diameters at Wolayta/Sodo on the Ethiopian side,
- Seven 400 kV 1½ breaker diameters at Suswa on the Kenyan side, including switched shunt compensation, dynamic compensation and stepdown transformers
- One synchronous condenser rated 200 MVar at Suswa S/S.

2.4. Project Justification

The Ethiopia – Kenya Power Interconnection Project will usher in the regional energy trade which has for a long time been envisaged with the formation of the Eastern African Power Pool (EAPP) by Heads of State and Government at the 11th Summit of COMESA in Djibouti in November, 2006 as a specialized institution of COMESA for electrical power for Eastern Africa. The overall objective of the EAPP is to facilitate regional integration and hence to realize sustainable growth and development. Other objectives include optimization of the usage of energy resources available in the COMESA region, increase in the power supply for the region, reduction in electricity production cost and creation of a conducive environment for investment. Trade in electrical energy between Ethiopia and Kenya will enhance trade between the two countries, stimulate other related trades and technologies and raise the level of socio-economic integration of citizens of the two countries especially those across the common border who have in the past relied mainly on a nomadic herding way of life and interaction. This type of interaction has in recent years seen bloody clashes in competition for grazing and water resources. With diversification into modern technology in trade and other socio-economic integration among the border communities, better harmony and improved security will be realized at the border region.

The Project helps Ethiopia mobilize the necessary financial resources to exploit fully its enormous hydro-energy resources and thereby improving its economic growth and livelihood of its people. Kenya too will benefit from its low level of interconnection and also raise its level of industrial growth which has been hampered by lack of more affordable electricity supply sources. Kenya will thus achieve the Millennium Development Goals (MDGs) through improved living conditions of its citizens through more reliable electricity supplies and improved economy. Under the Vision 2030 strategy, Kenya hopes to become a newly industrialized country by 2030 through increased manufacturing, tourism and other economic activities which will be enhanced by availability of adequate and more affordable electricity supplies.

Due to the global warming a phenomenon which is increasingly being felt in the horn of Africa where the worst drought in sixty years is currently biting, the measures for reversing or controlling the effects of the global warming need to urgently be put in place. The use of wood as fuel needs to be scaled down to save on existing forest cover. Access to affordable electricity by the population, industry and local governments will be one major step in meeting these needs and thereby help in holding back further effects of the global warming and the spread of Sahara desert in the area. Further, the electric power to be transmitted through the proposed transmission line is from hydro which is a green power source, more plus to the project. The project therefore will enhance conservation measures and thus help preserve rivers, lakes, forests wild life and other flora and fauna. The increase of CO_2 , NO_x and SO_x in the atmosphere has greatly contributed to atmospheric pollution and global warming. Increased generation of electricity from green sources will be one strategy of reducing CO_2 , NO_x and SO_x from being released to the atmosphere. Conversion of transportation and telecommunication systems from those that release CO_2 , NO_x and SO_x into the atmosphere will also be enhanced through use of electricity if it is adequately accessible and affordable. This project will play an important role in to achieving this end.

3 Policy Legal and Administrative Framework

3.1 In Ethiopia the Regulatory Framework is as follows:

The Constitution

The constitution of the Federal Democratic Republic Ethiopia issued on August 21, 1995, forms the fundamental basis for enhancement of specific legislative instruments governing environmental matters at the national level. It affirms the commitment of the government to ensure that all Ethiopians live in a clean and healthy environment, puts the principles that designs and implementation of development programs and project not to damage the environment and the need

to fulfill consultation and the expression of views in the planning and implementation of environmental policies on projects that affect them directly.

Policy and strategy

The environmental policy of Ethiopia (EPE) has overall policy goals of improving and enhancing of the health and quality of life of all Ethiopians, and the promotion of sustainable social and economic development through the adoption of sound environmental management principles.

Environmental and Sectoral Legislation

The Environmental Impact Assessment proclamation No. 299/2002, no person shall commence implementation of any project that requires environmental impact assessment without authorization from EPA or the relevant regional environmental agency. This Proclamation aims at eliminating or when not possible, to mitigate pollutions undesirable consequence of social and economic development activities.

The Federal proclamation on Expropriation of Land for Public Purposes & Compensation) sets the time limits within which land could be acquired after a request is received from a proponent and principles for assessment of compensation for properties on the land as well as for displacement.

Environmental Protection Institution Establishment Legislation

The Environmental Protection Organs Establishment directs every relevant sectoral agency of the Federal Government to set up an environment unit as part of its organizational structure and also for each Regional State to establish a Regional autonomous environmental agency. Assigns specifically defined responsibilities to the Environmental Protection Authority

Environmental Guidelines

Defines specific examinations to which a proposed project needs to be subjected in the process of environmental impact assessment. The procedural guideline requires a proponent to submit an initial environmental examination report to enable the relevant environmental agency to decide on the application.

3.2 **In Kenya** the regulatory framework is as follows

The Constitution of Kenya 2010: under which environmental issues, land issues and compensation have been given prominence. The Bill of Rights, Clause 42 provides for the rights of environmental protection of persons and the right to enact environmental laws.

The Environmental Management and Coordination Act No. 8 of 1999 (EMCA) & Associated Regulations: governs environmental issues including ESIA.

Applicable sector-specific legal framework will include provisions of the Energy Act 2006, environmental policies of KPLC and KETRACO and KPLC’s Resettlement/Land Acquisition Framework.

Other relevant statutes and regulations are:

• Energy Act No. 12 of 2006 of the Laws of Kenya	• Transfer of Property Act Chapter Group 8;
• Foreign Investments Protection Act (Cap 518);	• Water Act No. 8 of 2002
• Wildlife (Conservation and Management) Act, Chapter 376	• Companies Act (Cap 486);
• State Corporations Act, Chapter 446 of the Laws of Kenya;	• Employment Act (Cap 226);
• Land Acts: (Government Land Act (Cap 280); Registration of Titles Act (Cap 281); Land Titles Act (Cap 282); Trust Lands Act (Cap 288); Registered Land Act (Cap 300); Land (Group Representation	• Local Government Act, Chapter 265;
	• National Museums Act No. 6 of 2006;
	• Physical Planning Act No. 6 of 1996;

Act) – Cap 287; Land Adjudication Act, Cap 284; Land Planning Act, Cap 303; Land Control Act, Cap 302	• Fisheries Act, Chapter 378;
• The Standards Act, Chapter 496 of the Laws of Kenya;	• Factories Act, Chapter 514;
• Fertilizers and Animal Foodstuffs Act, Chapter 345;	• Refugees Act No. 13 of 2006;
• Armed Forces (Out of Bounds Area) Act, Chapter 202;	• Malaria Prevention Act, Chapter 246;
• Chief’s Authority Act, Chapter 128;	• Mining Act, Chapter 306;
• Civil Aviation Act, Chapter 394;	• Forests Act No. 7 of 2005
• Crop Production and Livestock Act, Chapter 321;	• Forests Act, Chapter 385;
• Public Archives and Documentation Service Act, Chapter 19;	• Industrial Property Act No. 3 of 2001
• Government of Kenya Draft Indigenous People Planning Framework (IPPF) of January 2010, etc	• Irrigation Act, Chapter 347;
• Public Roads and Roads of Access Act, Chapter 399;	• Public Health Act, Chapter 242;
• Workmen’s Compensation Act, Chapter 236;	• Valuation of Rating Act, Chapter 266;
• Lakes and Rivers Act, Chapter 409;	• Societies Act, Chapter 108;
• Antiquities and Monuments Act, Chapter 215	• Valuers Act, Chapter 532;
• National Commission of Gender & Development Act No. 13 of 2003	• Wayleaves Act, Chapter 292;
• Ewaso Ng’iro North River Basin Development Authority Act, Chapter 448;	• Registration of Persons Act, Chapter 107;
• Ewaso Ng’iro South River Basin Development Authority Act, Chapter 447;	• Trespass Act, Chapter 294;

3.3 Other Requirements:

The World Bank safeguard policies that are likely to be triggered include operational procedures for Indigenous People; Natural Habitats; Environmental Assessment; Forests; Pest Management; Physical Cultural Resources; Involuntary Resettlement; Projects in Disputed Areas and Environmental and Social Safeguard Policies.

The African Development Bank (AfDB) safeguard policies that are likely to be triggered include:

- Guidelines under the Handbook on Stakeholder Consultation and Participation in ADB Operations;
- Cooperation with Civil Society Organizations Policy and Guidelines;
- Environmental and Social Assessment Procedures for African Development Bank’s Public Sector Operations;
- Annex 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,15, and 16 of the ESIA Procedures for AfDB Public Sector Operations;
- Gender Policy , 2001;
- Bank Group Policy on Power Reduction, 2004
- Involuntary Resettlement Policy, 2003;
- The African Development Bank Group Policy on Disclosure of Information, 2005; and
- African Development Bank Group’s Policy on the Environment; 2004

4 Description of the Project Environment

4.1 Physical Environment (Ethiopia)

Altitude

The altitude starts at Soddo substation, about 1950 masl. The altitude decreases from there on until it reaches Konso Special Woreda at 1270 masl and then it gradually increases to 2035 m north of Yabello, and again decreases to 1900 m at Mega. After Mega the altitude decreases up to 965 m at Megado. The land setting of the route line varies between flatter areas and undulating hills and gentle slopes.

Climate

Existing literature (Daniel Gamachu, 1977) describes that the route line belongs to Type I and Type II Rainfall Regimes. Type I Rainfall Regime is characterized by one rainy season contiguously

distributed. Eight rainfall regimes are recognized in this type. The areas in the route including the highlands of Gamo Gofa and northern Sidamo (Including Sodo) and the Lakes Region (including Arba Minch) and areas a little bit beyond. In type II regime, the area generally experiences nine rainy months (January to October), comprising of small rains (January and September) and the big rains from March to August and in October. This Regime is characterized by two rainy periods. There are six regimes in this type. The route areas between Konso to the Kenyan border belong to Type II, found in southern Gamo Gofa and South West Sidamo (including Mega and Yabello), characterized by eight rainy months from February to July and in September and October. High concentration of rainfall is in April.

Geology/Geomorphology

Based on the information obtained from the Geological Map of Ethiopia, the area from Soddo to Mega to Megado are mainly of Precambrian origin. In various areas there are alluvial and lacustrine deposits (Q), basalt flows (Qb). There are various geological formations referred to as ARa, ARI, Gt4, Qd, Qr, ARI, Ntb, Pib, Pjb, etc. at various places.

Soils

The soil along the route varies with the topography. In the higher altitude where there is intensive cultivation, the soil is predominantly blackish clay with stone mulches. Gravels and pieces of stone along the route on farms and open land indicate that the soil is relatively non erodible, and as a result no serious gully formation were observed. The soil between Sodo and the Kenyan border varies between Nitosols, Lithosols, Fluvisols, Luvisols and Xerosols (Ethiopian Mapping Agency, 1988).

Water Resource

There are several perennial and seasonal rivers/streams draining the study areas. These rivers and streams are usually the source of water supply for human, domestic animal consumption and other uses, such as cleaning, bathing, and recreation (swimming). Therefore, care should be taken not to disturb the forest at the sides of these rivers and streams and pollute them.

4.2 Physical Environment (Kenya)

Geography and Topography

The proposed transmission line route traverses across the country from North to South through Marsabit, Samburu, Laikipia, Nyandarua and Nakuru Counties. Marsabit County approximately covers an area of 66,000.Km² which includes 4,956 Km² covered by Lake Turkana. Most of Marsabit County is low-lying at 400 and 700 masl. Land use in the county is mostly nomadic livestock herding. The area is interspersed with mountain ranges and hills including the Ndoto Mountains (2660 m) to the west, and Marsabit Mountain (1545 m) within Marsabit Town. The county is home to the Burji, Boran, Ariaal and Rendille communities who are mainly traders, pastoralists and also carry out some irrigation farming. The county borders Samburu County to the south. Samburu County is categorized into three agro-ecological zones with different climatic zones, landform and soils, and having a specific range of potentials and constraints for land use. These are:

- Zone IV, covering 5% of the district area is suitable for small-scale crop production and receives rainfall of 400 - 650 mm/pa.
- Zone V covers 30% of the district, has annual rainfall ranging between 300 - 350 mm which can only support a variety of grasses and some shrubs. Livestock keeping is the main occupation.
- Zone VI covers Merti and Sericho divisions, approximately 65% of the district. It experiences an annual precipitation of 150 - 250 mm. This zone is mainly barren with scanty vegetation and mainly supports browsing animals.

Samburu County lies between 1,600 and 2,300 masl but less than 1% of its total land mass is arable. There are no gazetted forests in the county, but the hills cover an area of approximately 9,933 ha and covered by dense vegetation which provides potential for wildlife conservation. The county is

vulnerable to natural hazards such as drought and floods along the Ewaso Ng'iro River and which give rise to rampant human confrontations for pasture and water. Recurring drought has resulted in loss of range biodiversity resulting in low vegetation cover. Constant migrations by the pastoral communities in search of water and pasture have enhanced environmental degradation. Another factor that has enhanced environmental degradation is exploitation of the scarce vegetation for fuel. The county borders Laikipia County to the south and extends in the semi-arid up to the high-altitude Laikipia Plateau to the north-west of Mount Kenya. Laikipia then borders Nyandarua County which has a total land area of 3,304 km². Some parts of Laikipia County and most of Nyandarua County are arable and support fairly high populations through agriculture and animal husbandry. Nyandarua County mainly lies in the Aberdares highland, comprising the Kinangop Plateau, Ol Kalou/Ol Joro Orok Plateau and Ol Kalou/Ol Joro Orok Salient. Nyandarua borders Nakuru County which lies at an average altitude of 1,890 masl, in the Rift Valley Province. Soil composition in the county is complex as it is influenced by intensive variation in relief rainfall climate, past volcanic activities and the underlying rocks.

Soil

The soil distribution in the project area is complex and is influenced by intensive variation in relief, climate, past volcanic activities and the underlying rocks. The main soil types are calcic gleysols, andohaplic pheozems, gleyic cambisols, ando-calcic regosols, lithosols, and calcic xerosols, from the lacustrine plain through the volcanic plain to the volcanic hills respectively. Generally, the soils in the project area have high phosphorus, calcium, magnesium and potassium concentrations but are low in respect of nitrogen and carbon. Pyroclastics-ashes, agglomerates and tuffs cover a considerable proportion of the project area over the entire volcanic plain in the Rift Valley. During the volcanic period of eruptions of the Mt. Longonot, easterly winds caused the heaviest accumulations of the ejected ashes to settle in and around the project area. More recent pyroclastics flows have resulted in acidic soil compositions. The ashes are usually interbedded with other volcanic soils. The most recent eruptions are reported to be approximately 2000 years ago.

Climate

Marsabit County is arid with low and unreliable rainfall ranging between 75 and 400 mm annually. The average temperatures range between 26 and 32°C. These temperatures are higher within the Chalbi Desert. The county is arid and has a mean annual rainfall of 200 mm in the lowlands and 800 mm in the highlands. Rainfall is distributed within two seasons in a year with an average of approx. 580 mm. The county lies astride the equator which gives it two distinct seasons: wet and dry.

Water (Surface and Groundwater Resources)

The northern part of Marsabit County is mainly dominated by the Chalbi Desert. There are no perennial rivers in the county, except seasonal rivers which are water-bearing when rare and usually torrential rain falls in the desert. Marsabit County has also no permanent rivers although mountain run-offs provide temporary surface water in the lowlands mainly through Milgis and Merille Rivers. The highlands are interspersed with several permanent lakes, including Lake Paradise and several water-filled craters on Mount Marsabit. The only permanent water bodies in the entire Chalbi Desert region, besides Mount Marsabit, are Lake Turkana to the West and Uaso Ng'iro River in Samburu County to the South. Uaso Ng'iro River plays an important role in supporting pastoral livelihood and is currently utilized by the pastoralist Samburu, Ariaal, Rendille, Somali, and Boran tribes. Samburu County has potential for both surface and sub-surface water sources. It has four perennial rivers: Ewaso Ng'iro, Isiolo, Kama and Bisanadi. Isiolo River is extensively used and is the main water source for Isiolo Town while the irrigation potential of the other rivers is yet to be determined. Preliminary assessments indicate that ground water and surface water potential in the region is limited. 43.5% of households in the region have access to tap water, and 18% of households have access to good quality water sources within a distance of 5 km.

4.3 Biological Environment (Ethiopia)

There are about 8 major ecosystems in Ethiopia. Of these, four types are found in the Transmission line between Sodo and the Kenyan Border along the line route. These include Dry Evergreen Montane forest and grassland, Acacia-Commiphora, Combretum-Terminalia and wetland Ecosystems (IBC, 2005).

4.3.1 Flora

Dry Evergreen-montane forest and grass land

The areas under Dry Afro-montane forest have canopies usually dominated by *Podocarpus falcatus* with *Juniperus procera* and also include *Croton macrostachyus*, *Ficus* spp., *Olea europaea* subsp. *cuspidata*, etc. This is also an ecosystem where livestock density is one of the highest in the country and hence contributing to the destruction of the ecosystem. The endemic animal species in this ecosystem, Mountain Nyala and Walia Ibex are considered rare as well as globally threatened. Threatened birds in the area are Lappet-faced Vulture, Pallid Harrier, Imperial Eagle, Lesser Kestrel and Wattled Crane. Erlanger's House snake, Bale Mountains Two-horned Chameleon, Arena Heather Chameleon, Ethiopian Mountain Viper, Stripped Ethiopian Mountain Snake and Ethiopian House-snake are representatives of the reptilian group.

Acacia-Commiphora Woodland Ecosystem

This ecosystem is characterized by drought resistant trees and shrubs, either deciduous or plants with small, evergreen leaves. The trees and shrubs form an almost complete stratum and include species of *Acacia*, *Balanites*, etc. The *Acacia-Commiphora* deciduous woodland is currently under strong environmental stress. Endemic mammals of the area include African Wild Ass, Grevy's Zebra and Black Rhinoceros. The endemic species of birds in the ecosystem include the Abyssinian Woodpecker, Yellow-fronted Parrot and Abyssinian Bush Crow. The three endemic mammals in this ecosystem are the African Wild Ass, Grevy's Zebra and Black Rhinoceros which are globally threatened. In addition to these, the endemics bird species like the Abyssinian Woodpecker, Yellow-fronted Parrot and Abyssinian Bush Crow and the near-endemics species of Lappet-faced Vulture, Imperial Eagle, Lesser Kestrel, Wattled Crane, Abyssinian Bush Crow, White-tailed Swallow and Nechisar Night Jar are categorized as vulnerable.

Combretum-Terminalia Woodland Ecosystem

This ecosystem is characterized by small to moderate-sized trees with fairly large deciduous leaves. These include *Boswellia papyrifera*, *Anogeissus leiocarpus* and *Stereospermum kunthianum* and species of *Terminalia*, *Combretum* and *Lannea*. The ground cover is a tall stratum of perennial grasses (*Poaceae*), including species of *Cymbopogon*, *Hyparrhenia*, *Echinochloa*, *Sorghum* and *Pennisetum*. The ecosystem includes also animal species that also occur in the *Acacia-Commiphora* woodland. The characteristic mammals include Common Eland, Bush Elephant, African Wild Dog, Leopard, Grevy's Zebra, Black Rhinoceros and Roan Antelope. The bird species include Lappet-faced Vulture, Lesser Kestrel, Stanley's Bustard, Crowned Crane, Griffon Vulture, European Sparrow Hawk, Long-toad Lapwing, Lizard Buzzard, Brown Parrot and Levillant's Cuckoo.

Common mammals-Eland, the Bush Elephant, African Wild Dog, Leopard, Grevy's Zebra, Black Rhinoceros and Roan Antelope, and four of the near endemic birds Lappet-faced Vulture, Lesser Kestrel, Stanley's Bustard and Crowned Crane are threatened. Relatively, *Combretum-Terminalia* woodland ecosystem is still perhaps the least affected of the ecosystems that are described in Ethiopia.

Riparian and Swamp vegetation

This ecosystem consists of two physiognomically different types; riverine and riparian forest with typical trees in riverine forest such as *Acacia polyacantha*, *Breonadia salicina*, *Phoenix reclinata*, *Sapium ellipticum*, and *Tamarindus indica* and open, almost treeless vegetation near Lakes Abaya and Chamo. The riverine and riparian forest vegetation of the study area is very variable, and the

floristic composition is dependent on altitude and geographical location. The riparian vegetation close to larger lakes may include *Acacia Albida*, species of *Ficus*, *Phoenix reclinata* and *Aeschynomene elaphroxylon*. The mammal species of this ecosystem include Hippopotamus, Nile Lechwe, Common Waterbuck and Bush Elephant. The ecosystem is also home for endemic and near-endemic aquatic birds such as Spot-breasted Plover, Blue-winged Goose and Rouget's Rail. The habitat is also used by considerable species of reptiles such as the Nile crocodile.

4.3.2 Fauna

Several species of large wild animals have been reported from the area. However encounter with large mammals during the field study was very rare. There are two important conservation areas along the Transmission route; the Nech Sar National Park and the Yabello wildlife Sanctuary

Yabello Sanctuary

The Ethiopian Wildlife and Natural History Society (EWNHS) have identified important bird areas in the Yabello Woreda. The area is located at 10038'-11004'N/36017'-37016'E, with an area of 1,318,440ha. It includes the Yabello Sanctuary, although not clearly demarcated, it stretches from 10 km east on the main Addis-Moyale road and north of the Yabello-Arero road. The Yabello sanctuary is designated as an important protected area for two globally threatened species, White-tailed Swallow and Abyssinian Bush Crow. The two species belong to the Southern Ethiopian Highland endemic. In addition, according to a record, another threatened species, the Taita Falcon was recorded from Yabello in the 1940's. The Important Bird Area Project had identified about 210 bird species (EWNHS, 1996).

Nechsar National Park

The Park is found in the Southern Nations, Nationalities and Peoples Regional State (SNNPR), East of Arba Minch town. The Park includes *Acacia-Commiphora* woodland, part of the Abaya and Chamo Lakes and their shore lines. The importance of the Park is due to the presence of restricted-range endemic species, Nech Sar Nightjar. In addition in the Park there are three globally threatened species (Lesser Kestrel, Pallid Harrier and Lesser Flamingo) and about 25 other species. The establishment of the Nechsar National park was mainly to protect the endemic Swayne's Hartebeest. There are about 37 mammal species in the Park, the prominent ones being Burchell's Zebra, Grant's gazelle, Greater Kudu, Leopard, Klipspringer, Crocodile, Hippopotamus and African Wild Dogs (EWNHS, 1996).

4.4 Biological Environment (Kenya)

Vegetation

The vegetation in Marsabit and Samburu Counties can be described in four categories: woodland, dwarf shrub bushland, shrubland and thickets.

The bushland is characterized by *Acacia tortilis*, *Commiphora africana*, *Grewia* species and dwarf shrubs such as *Lippia carvioidora* and *Vernonia cinerascens*.

Shrub or Bush Grassland consists of grassland with scattered trees and shrubs having a combined canopy cover of less than 20%.

Grasslands are dominated by grasses or sedges.

Woody plants are either lacking or are dwarfed and inconspicuous.

Evergreen forests are characterized by individual trees which shed leaves, but the canopy as a whole remains green throughout the year (e.g. *Olea eurpaea* subsp. *cuspidata*).

Deciduous forests are characterized by trees that lose their leaves during the dry season (e.g. *Acacia* and *Combretum* spp.). These are found between Shamata and Ndaragwa areas of Nyandarua County. The dominant tree species is *Acacia*. Fire-adapted grassland is common in the semi-arid central parts of Samburu County, which is partly the result of human activities including frequent fires, charcoal burning and over-grazing.

The area of Laikipia ranches has three main vegetation types mixed Acacia bushland, open grassland and Acacia woodland. Land use and natural vegetation types in the Upper Ewaso Ng'iro basin depend on the altitude, climate and soils. On mountain slopes, moist *montane* forests dominate. There are also riverine forests especially in higher altitude, and dry forests in the drier highlands such as Matthews Range. Shrub grasslands and bush grasslands occupy much of the Laikipia Plateau area, while in the plains of Isiolo and Samburu, shrubland is dominant. Within Naivasha in Nakuru County, only little natural vegetation is left in the project area. River Malewa which flows into Lake Naivasha originates from the Aberdare National Park and the adjoining gazetted forest. Vegetation in this region is humid *Afromontane* forest and bamboo.

Wildlife

Marsabit County has protected areas accommodating a wide range of animals including some rare species, such as Reticulate Giraffe, Beisa Oryx, and Somali Ostrich. Others include elephants, elands, buffaloes, zebras, giraffes, lions, baboons, gravy zebras, greater kudu and a few rhinoceros. The Somali Ostrich is also common in the Chalbi Desert. Regular ground counts and aerial surveys indicate long-term population changes in both wild and domestic animals. The number of livestock is increasing while populations of wild herbivores appear to be more stable than those of domestic herbivores. Wild herbivores are however unevenly distributed over the project area. Great Rift Valley is a migration flyway in Kenya. Lake Ol Bolossat and the associated wetlands support a diverse range of water fowl, which are either resident or migratory. A total of 92 waterfowl species have been recorded around the lake. Lake Naivasha is a renowned Important Bird Area (IBA) and holds over two hundred bird species, but endangered and rare species are hardly ever seen, for example.

Great Crested Grebe (critical), Maccua Duck (endangered), African Darter, Great Egret, Saddle-billed Stork, White-backed Duck, Baillon's Crake and African Skimmer (all vulnerable). Coot and Yellow-billed Duck, which formerly could be enumerated in ten thousands, reappear in single thousands in the years when submerged aquatic plants are found. Jacana or Lily Trotter, formerly present in thousands can now only be counted in few hundred at most, concentrated on tightly-packed Hyacinth fringes in northern areas. Lake Naivasha is also important for riparian mammals, primarily the population of approximately 600 - 700 Hippopotamus amphibious, which represents the largest meta-population of this specie in the Kenya Rift. Its numbers have remained stable for the past two decades. Marsh mongoose and otter are rarely-seen but important predators of Crayfish. Plains mammals inhabit the riparian zone of larger properties, such as the Marula - Morendat - Manera Ranches at the river entries and can move relatively freely around the north-west. Crescent Island is a private game reserve.

4.5 Socioeconomic and Cultural Environment.

Land use

The land use types of the project area can be categorized as cultivated, grazing land and other land. Within the cultivated land major crops include cereals, pulses, and cash crops like coffee, orchards, as banana, hops and enset (false banana). The farmers /pastoralist use grazing land for rearing their cattle, sheep, donkeys, camels and goats. The grazing land is highly degraded and not providing sufficient feed for free grazing animals of the farmers and pastoralists. Forest land mostly dominated by acacia wood lands serves as source of fire and construction wood, charcoal and grazing land for castles, goats, donkeys and camels. Most of the accessible acacia woodland is highly disturbed. The other forms of land use include bare lands, land under construction and land under parks. There are two parks along the line in Ethiopia, the Nechsar national park located in the Southern Nation, Nationalities and Peoples Regional state and The Yabelo wildlife sanctuary located in Oromia Regional State. These Parks are important habitat for diversified flora and fauna and good attraction for tourists.

In Kenya land is the most important and widely coveted resource, access to which is a pre-requisite to economic production. It offers security through abode, in old age and eventually upon death which all account for the huge interest that is vested upon land in Kenya. Under the Trust Land Act, Cap 288, land in the pastoral counties of Marsabit and Samburu is mostly held in trust for the local communities by the respective County Councils. The pastoral communities in those counties exercise communal ownership and utilization of natural resources. Against this background the requirement for land to be set aside for construction of the proposed transmission line is likely to impose a major impact within the traversed route.

Private and public investments

Many private and public investments including buildings, institutions, trees, developed farms, etc will be affected by the project with the prospect that quite a number of them will be removed from the Right-of-Way (RoW) corridor and measures must be put in place to insure against retrogressive impacts of infrastructure.

Existing infrastructure

Along the entire RoW, diverse infrastructure is encountered and this includes many power distribution lines, airstrips, roads, railway lines, etc. For some distance the proposed RoW runs along the Mai-Mahiu – Naivash – Gilgil and the Isiolo – Marsabit – Moyale highways and some other minor roads. These roads will be crucial during construction and maintenance phases of the project and also help reduce the negative impacts of the proposed transmission line since they will share some of the negative impacts. Between the proposed Suswa substation and Marmanet, the proposed transmission line route runs parallel east of the proposed 400 kV HVAC transmission line to the proposed Lake Turkana wind-turbine power generating site. Optimum separation of the two proposed transmission lines will be determined because although running the two lines is likely to reduce the negative impact, mutual technical effects of the two lines running in parallel will have to be investigated. All existing and planned structures are economically and strategically crucial hence the need to flag them to ensure planning for their mutual co-existence and harmony on the side of the project.

Population of the project areas

The Project touches ten woredas and three Zones with a total population of 1,467,651 people of which 727,963 people are male and the rest are female. (see table 1). The 2007 population census of Ethiopia calculated 2.9% growth rate per annum in both Oromia and SNNP regions. The population density of the project area ranges from 7.8 to 447.5 people/km². A high concentration of people is observed in Sodo Zuria and the rest of the project area has 7.8-20.8 people/km², See table 1.

Table 1. Population of Project Woredas by gender, 2011

No	Zone	Woredas	Town	Population			Woreda Area (km ²)	Pop Density (P/km ²)
				Male	Female	Total		
SNNP								
1	Wolayta	Sodo Zuria	Sodo	88,976	91,965	180,941	404.35	447.5
2		Konso (SW)	Bele	126,950	136,043	262,993	2273.79	115.7
3		Humbo	Tebela	70,623	69,909	140,532	659.36	7.0
4	Gamo Gofa	Mirab Abaya	Birbir	42,122	42,205	84,327	630.76	133.7
5		Arba Minch Zuria	Arba Minch	91,420	91,566	182,986	967.69	189.1
6		Bonke	Gerese	88,496	89,473	177,969	792.37	224.6
7		Derashe (SW)	Gidole	79,037	81,883	160,920	1487.38	108.0
Oromia								
8	Borena	Yabello	Yabello	58,103	57,268	115,371	5343.53	20.8
9		Dire	Mega	41,551	40,918	82,469	10317.18	8.0
10		Teltele	Teltele	40,691	38,452	79,143	10,145.80	7.8
Total				727,969	739,682	1,467,651	33,022.21	

Source: CSA, Population Projection Report 2011

Gender

In the Ethiopian part, in the two studied regions, women cannot possess property or land, unless the husband dies. Although the law gives the right to women to possess land, tradition is still dominating. Women are disadvantaged group and premature childbirth, lack of access to productive resources, poverty and unemployment factors negatively affect the women of the project area. On the other hand, women have played their part in farm activities and maintenance of community relation.

Cultural heritage

Situated at about 600 kilometers south of Addis Ababa, at the southern end of Ethiopia's Rift Valley, 5°23'97" North and 37°21'95" East and 1200- 2000 masl, Konso is marked by active geological area (Yonas, 1999:1). Replete with remarkable natural and cultural treasures, such as pale anthropological sites, beautifully constructed terraces, stone walled towns, wooden and stone funeral statues (the wakas), sacred forests, important ponds and many other antiquities. Konso is registered in June 2011 as the ninth world heritage site in Ethiopia. In addition to Konso, important heritage resources identified along the route are water wells, and living religious and burial sites located in Borena Administrative Zone.

Livelihood and Economic Practices

The major types of livelihood activities in the project area are Pastorals, agro-pastorals and trade. Pastorals are the most prevalent economic sources, especially in Borena zone. The vast arid and semi-arid region is conducive for production of livestock of different types such as cattle, camels and goats. Hides and skins are delivered to the central market while milk, butter, etc are either consumed or sold in the local market. The second principal source of livelihood is agro-pastorals, which is a mixture of extensive livestock rearing and rain fed crop production such as maize, sorghum, teff, haricot beans, field peas, coffee, cotton, avocado, mango, banana, hops, enset (false banana) root crops such as potatoes, sweet potatoes, taro and onions are cultivated. The third significant livelihood activity is trade which is mainly practiced by town and village dwellers. Another livelihood source is illegal production and sale of charcoal. The major employments of the population of the project area are crop and fruit cultivation and livestock rearing. Agriculture is the mainstay of the economy.

Socioeconomic Characteristics

The population profile of the project-affected counties in Kenya is given in the Table below.

County	Male	Female	Total	Population Density/km ²
Marsabit	151,112	140,054	291,166	4.41
Samburu	112,007	111,940	223,947	10.66
Laikipia	198,625	200,602	399,227	42.02
Nyandarua	292,155	304,113	596,268	180.47
Nakuru	804,582	798,743	1,603,325	320.67
Total	1,558,481	1,555,452	3,113,933	

Source: Kenya National Bureau of Statistics, National Population Census Report, 2009

The main ethnic groups distributed along the project area include Gabbra, Rendille and Samburu, in Marsabit, Samburu and Laikipia Counties; Kikuyu in Laikipia, Nyandarua and Nakuru Counties and Maasai in Laikipia and Nakuru Counties. The Maasai, Samburu, Rendille and Gabbra are mainly nomadic pastoralists. While the longest portion of line route lies within the land occupied by Gabbra, Rendille and Samburu (all pastoralists) its effect on the communities is low because they are sparsely populated in density and due to their migratory tendencies. The Kikuyu are the most affected because they have a relatively higher population density and are mainly settled peasant farmers. Other ethnic groups are mainly migrants to the project area. They include Meru, Kisii, Luyia, Luo, Turkana and Somali. The distribution of the main ethnic communities settled along the proposed line route is shown in Table 2 below.

Ethnic Group	Frequency	Percentage
Kikuyu	121	90.3
Maasai	12	9.0
Samburu	1	0.7
Total	134	100.0

Source: Gamma Survey, 2008

The proposed transmission line route traverses mainly rural areas of five counties. Most of the counties traversed are sparsely populated except the settlement areas of Nakuru and Nyandarua counties. The only two towns traversed by the proposed line are Mandera and Naivasha but on the overall, heavily populated areas have been avoided during route selection.

Economic Characteristics

In Kenya, the settlement pattern in the traversed districts are characterized by the potentiality of land, land use system and water availability. Agriculture is dominant in most of the affected counties, In Marsabit, Samburu, Laikipia and Nakuru Counties; nomadic pastoralism is the dominant occupation. In the area around Lake Naivasha horticultural farming for export market is intensely practiced. Crop-based peasant farming, ranching, traditional livestock keeping (pastoralism), trade and business are the principal sources of income and livelihood in the project area. Livestock rearing includes cattle, goats, sheep, donkeys and camel. In Nyandarua, Nakuru and parts of Laikipia County mixed farming is the dominant occupation. Common crops include: maize (94.9%), Potatoes (2%), wheat (1%), beans, onions (1%), Cabbage (1%) and horticulture.

5 Project Alternatives

Five project alternatives have been considered including no project options during the route selection study phase. All options (A, B, C, & D) have about 204 Km distance in common. The common route segment is characterized by dense population settlement, intensive agriculture and archaeologically sensitive area.

5.1 No Project Option

If the Project would not be realized, then both Ethiopia and Kenya would miss on the trade link that would be created and the social and economic ties between Ethiopia and Kenya. Kenya would continue using fossil fuel energy hence contributing negatively to climate change issues.

5.2 Route Option A

Option A starts from Sodo S/S and traverses Arba Minch, Konso, Brindar, Yabello, Mega areas and to the Kenyan border (at about 421630(E) and 399493 (N) From Ethio-Kenya Border, the line crosses through Marsabit, Seradupi, Isiolo, Gilgil, Naivasha and Suswa S/S. Environmentally, the line passes through or close to parks, bird sanctuary and endemic plant species. With respect to social, economic and cultural point of view, like all options, it passes through the areas of highly populated, intensive agriculture and historical and cultural sensitive areas. Additionally the line passes close to Yabello Bird sanctuary and passes through the Mega Plateau which is known for its endemic species in Ethiopia.

5.3 Route Option B

The route option B has the common route from Sodo S/S to Brindar and further extends to Yabello, Mega, Moyale where it crosses the border (at about 501364 (E) and 392827 (N)) and from border the route line passes through Turbi, Marsabit, Laisamis, Seradupi, Isiolo, Gilgil, Naivasha and Suswa S/S. It has the same environmental and socio-cultural concerns as option A.

5.4 Route Option C

Option C follows the same line route up to Mega. From Mega it extends to the border closely extending with line A with only 1.5 km distance apart in between the line A and C in Ethiopia. After entering the Kenyan border the line passes to the right of Marsabit, right of Laisamis, right of Seradupia, Left of Wamba, Rumuruti, Gilgil and Suswa S/S. This option has the same environmental and socioeconomic and cultural concerns as Option A

5.5 Route Option D

The option starts from Sodo S/S and passes through the most densely populated area of Sodo, Arma Minch, Konso , and Brindar town and it turns to left and continues to Telelle and straight south to the border (at 0297450 (E) and 0473159 (N). In Kenya the line passes through left of Dukana, Kalacha, Right of South Horr, Kisama, Rumuruti, Gilgil and Longonot S/S. Option D is the shortest of all the route options. It is attractive considering the distance of the line but inexistence of road makes construction and operation most difficult particularly during the rainy season where the route passes through swampy ground, raises the cost of the project. Option D raises lesser environmental, economic and cultural concerns compared to the other three alternatives. After Konso (common route) the line poses minimal threat to the environment and society.

5.6 Preferred Alternative

In view of this consideration, Option B was mooted with a prime objective of avoiding the environmentally sensitive areas. The three route options were analyzed and while Option D was the most suitable environmentally, option A/C was found to be the most optimum on account of lack of time, lack of adequate road accessibility necessitating construction numerous access road during construction and maintenance phases of the project and likely extra cost of specialized construction methods to be employed through marshlands in Marsabit County near Lake Turkana. In conclusion among the options route A/C is considered relatively better in terms of overall cost, availability of road for O & M and using the line for OPGW that benefit urban centers.

6 Potential Impact and Mitigation/Enhancement Measures

6.1 Potential Positive Impacts:

Positive socio-economic effects of the project during construction on those communities located in the vicinity of the transmission line would include short term employment, income generation by

transporters, food selling individuals and shops and accommodation. At national level Ethiopia will be able generate income from power sale to Kenya and Kenya will get sustainable electricity supply. With the additional substations and transmission line, there will be increased capacity and reliability of power supply which will have a positive impact by being able to meet the ever rising power demand. Provision of energy has an in direct link to better living standards.

Development of ICT Hubs

Under the Vision 2030 strategy, Kenya is developing rural-based ICT networks that are geared to benefit the local populations and supply local schools with ICT terminals as ICT is being integrated into school curriculum in line with the country’s MDGs. KETRACO’s policy is to incorporate optical-fibre ground wire (OPGW) in all new lines. The OPGW will therefore be able to supply broad-band communication telecommunication hubs, mobile telephone networks and digital television to population centres and schools along the project affected area.

Conservation Measures

Access to adequate and affordable energy for households and industry will help in rolling back the rate of deforestation and thus help in conserving water resources. Access to affordable energy will revolutionize transportation and farming methods hence cutting down on carbon emissions and NO_x and SO_x to the atmosphere and thus help in reducing the effects of global warming.

6.2 Potential Negative Impacts (Ethiopia)

Before construction begins the project need to secure land from responsible organs. There will be negative impacts on land associated with the construction activities. Some of the lands required are temporary and some others are permanent. Lands needed are for camp, storage, foundation, access road and RoW. This will be secured before construction is started.

POTENTIAL IMPACT	MITIGATION
Loss of land due to erosion; Soil sealing, Damage or clearance of vegetation cover (resulting in increased erosion) Increased risk of soil contamination by spillages or inadequate handling with paint, fuel or oil	The tower and substation site erosion stabilization works including replanting of the sites will be a part of the tender specification. Soil contamination will be reduced by maintenance of vehicles and construction machines. By and large these impacts will be controlled by executing all construction works according to AFDB ESAP.
Groundwater pollution from spillages	Maintenance of machinery and designating areas for fuelling and maintenance
Air pollution from dust and vehicle and machinery emissions	Scheduled maintenance of machinery and proper planning of vehicle movements to avoid dust only resorting to water spraying for serious cases.
transmission line will cause noise and vibration disturbance to fauna and people	Noisy construction should be scheduled to the day time and local people should be informed prior to the activities
Construction of substation, RoW, storage, camp sites and access road will result in the clearance of different vegetation cover along the route (14.20 km ²). A total of 187,967 trees will be cleared by the project, of which about 75% is located solely in Sodo Zuria woreda	Trimming and removal of trees and shrubs shall be limited to and extend as small as possible. It is recommended to compensate the loss of individual trees by a compensation rate of 1:5, while the loss of forest area and some parts in <i>Acacia-Commiphora</i> shall be based on a compensation rate of 1:10. The compensation rate includes as well the impacts on fauna
Impact on Fauna and habitats	No migratory bird routes along the proposed route and important Bird species and other protected areas

	have been avoided in Ethiopia. The Project's routing passes through a landscape which is already partly affected by pastorals and farming. Fauna species might be affected by noise and traffic caused by construction activities and the loss of vegetation and land, or habitats respectively
Landscape impact due to cutting of trees	The sites for the towers and the access roads are carefully selected to mitigate landscape issues.
The impact on the People's income due to disturbance of farming activities, or loss of land due to the construction works. A total of 327.82 ha of farming and pasture land will be affected by the Project. The main impact will be the loss of farmland for cereal and perennial crops. Fruits and construction wood are the major sources of income on which the farmers mostly depend on..	Compensation shall be paid to the affected. As land for land compensation is expected to be difficult to realize due to very little availability of suitable land in the mentioned first section of the route
Loss of physical assets as settlements of the RoW, all housing structures located within the RoW will need to be demolished and re-established outside of it. According to the current information, a total of 232 housing structures, 1 fence, 1 store, 2 churches, 3 granaries and 1 barn will be directly affected by the Project.	Payment of compensation for all lost assets and replanting of tree will be appropriate mitigation in this case.
Tensions between local people and skilled workers from other areas and spread of diseases including HIV/AIDS	implementation of adequate prevention measures including education and training as well as enhancing health facilities near project construction sites
Construction activities are providing potential risks to both workers and locals during construction	Workers need to be equipped with provision of appropriate protective clothing and equipment; working in line with IFC EHS Guidelines for Electric Power Transmission and Distribution, awareness creation; strict access control (fencing) to the construction site;.
Traffic interference	Traffic awareness measures will be implemented and traffic management will be introduced
Most important cultural and historical sites are the natural and cultural treasure of Konso area that is currently recorded as the world heritage sites by UNESCO	The transmission line that was passing through some parts the Konso sensitive area is rerouted to the east of the demarcated site. In order not to affect the identified burial places and animal pens at the location southerly of Yabello (410576 E, 519607N) by construction activities, the tower location/RoW should be shifted away from this site.
The Nechisar National Park is located East of the RoW, with a distance of at least 7 km between the proposed routing and the nearest park border. As the town Arba Minch lies between the proposed routing and the park it	Careful monitoring of movement and settlement caused by the project will be implemented

is not expected that the Project will have effects on Nechisar National Park. Yabello Sanctuary is located 10 km east of Yabello town in the Borana Zone, with the Yabello-Arero road passing through its southern part. As the precise boundaries for this protected area have not been set, it is difficult to determine the actual distance between the Project and the Sanctuary. The only worry in this regard accidental interference of the protected area by workers and local who are trying to resettle themselves away from the RoW.	
OPERATIONAL PHASE	
Impact on electric and magnetic fields	The proposed 65 m ROW is considered to be sufficient to mitigate any perceived health effects from the transmission line
Soil contamination from spills	Training and awareness
Dust; the Harmatan phenomenon and air pollution	Re-vegetation of areas where vegetation was cleared
Noise & the corona effect	sound limit values will be included in the tender documents, the same is applicable for the substations
Uncontrolled vegetation growth can pose safety risks	Periodic maintenance will be part of the ESMP. trees and shrubs need to be cut to a height less than 4 meters within a 20 m corridor, and within the rest of the RoW, trees must be lower than 8 meters
noise of vehicles and machines impact on wildlife and collision of animals with the infrastructure	No use of heavy machinery, instead create jobs for the locals to maintain the RoW. Ensure height of the towers will be approximately 37 meters for visibility.
visual intrusive nature of the tower and the barrier effect of the conductors	more artistic tower shapes, camouflaged structure, non-reflecting conductors, special colored insulators, are expected to have only a very limited positive effect and are extremely costly so they will not be used

6.2.1 Potential Negative Impacts & Mitigation (Kenya)

Impacts to Agricultural Land

Transmission lines will affect farm operations and increase costs to farmers. Destruction to farmland will occur especially during construction of tower pads and during stringing. Though these will be temporary and localized along the RoW, tree plantations and orchards will be affected as they will not be permitted to grow beyond 4 m height. This is a concern especially along sections where residents have small land holdings. KETRACO will repair much of the damage that will occur during construction and provide monetary compensation for damages that cannot be easily repaired. Compensation details are provided under the RAP. Effort will be made to ensure that some of the access roads required during project implementation do not become permanent or are turned into dumping sites.

Impacts on Drainage, Surface Waters and Water Resources

Where the area is characterized by heavy rainfall, construction of towers has the potential of interfering with the natural drainage systems and modifies flow of surface water, and these changes

can contribute to soil erosion, flooding, channel modification, downstream scouring and sedimentation in streams and other drainage channels. Positioning of towers away from natural drainages and floodways can minimize interference to natural drainage systems. The overhead transmission line (OHTL) route will cross some rivers. The towers will be placed so as to leave a protection zone of 15 m at river and streams crossings with the span ranging 10 - 15 m, and 5 m when crossing any drainage channels. There will be no wastewaters from construction process because construction workers will be staying at the nearest shopping centers along the project route.

Potential Aesthetic Impacts

The overall aesthetic effect of a transmission line is likely to be negative to most people, especially where proposed lines cross natural landscapes. Landowners can potentially find transmission lines bordering their property particularly disruptive to scenic views. To some, new transmission lines are viewed in a positive light because it represents economic development. The proposed development will have minimal effects on the landscape. The OHTL routes have been established so as to meet the co-inhabitancy requirements imposed by the natural landscape, objects, buildings and facilities in the neighborhoods by ensuring that they merge into the existing landscapes and thereby having minimum impacts on surrounding land. In particular, most of the transmission line route has been selected to follow hilltops where there is minimum human settlements and where the view of the conductors will be against the sky and thereby having less impact than when viewed sideways or from above against the background of the horizon or the ground.

Electric and Magnetic Fields

High Voltage electric overhead lines generate electric and magnetic fields which perceived to have health effects but studies have not come up with any conclusive evidence. The strength of both electric and magnetic fields is a function of the voltage, and distance from the conductors to the receptor. The electro-magnetic field (EMF) however decays very rapidly with distance from source and there should therefore be no potential health risks for people living outside the 65 m wide wayleave corridor. Regarding vibration, the design will incorporate vibration dumpers along the entire OHTL length to damp vibration caused by the conductors exposed to the dynamic load of wind. In any case it is expected that vibration on a DC line will mainly be caused by wind and not power flow.

Impacts on Natural Vegetation

The proposed transmission line will traverse a variety of terrains, where savannah with scattered trees and shrubs dominate. It will also traverse farms and small cultivation land holdings. The land will invariably have different types of exotic trees including Eucalyptus, Grevellia Robusta, Cypress, Pine trees, etc. While impact on woody vegetation is permanent, impact on grasses and herbs will mostly transient during construction. In order to minimize such environmental impacts, it is recommended that clearing is, as much as possible, done manually without burning the cleared vegetation. It is important that vegetation clearance within the Protected Areas be done under supervision of KWS and KFS personnel.

Impact on Flora and Fauna

There is potential of the proposed transmission line inducing physical hazards to birds, climbing animals and people. Bird strikes and mortality will be of concern in the areas of their high densities and those areas with large birds such as waterfowl colonies and migratory bird species. In areas of known bird flight paths (such as at Lakes Naivasha and Ol Bolossat) this is likely to be of concern during the operation stage of the project. This hazard has been identified and will be mitigated at specifically identified locations by use installation of coloured warning spheres on the ground conductors atop the towers. Such spheres have been proved to drastically cut down on bird collision by improved visibility. The design will also include building raptor platforms on top of pylons for roosting and nesting; and include collection of monitoring data on avifauna electrocuted along the

proposed transmission line. In the project design every steel tower and pole will have a danger sign and anti-climbing barbed wire for safety purposes. A safety officer will be present at all the time during the construction phase. The safety officer will among his/her other duties, ensure that a first aid kit is always available and skilled workers are kept aware of the safety rules. A safety campaign will periodically be conducted among the population along the entire RoW.

Land Excavation, Access Roads and Campsite

Construction of access roads has potential impact to the environment from clearance of vegetation, compaction of land and a permanent loss of farming and grazing land. In order to minimize the impact, the transmission line route will be close to existing roads or line corridors. Provided temporary access roads are rehabilitated and existing roads/tracks are used for access to minimize the number of new roads required, the impact is not expected to be significant. Camp sites and workshops will be located according to local physical plans and constructed in such a way that they can have residual values like turning them into schools and other public facilities.

Soil Erosion

Construction of foundations for transmission line towers could potentially exacerbate soil erosion. In addition to the loss of productive land due to soil erosion and land acquisition for tower construction, soils could be impacted as a result of disposal of waste materials, and compaction with heavy machinery used for the construction of towers and the transmission line. These impacts can be managed by restricting the use of heavy machinery and vehicles to designated work areas and installing soil protection works in areas sensitive to erosion prior to undertaking the line construction.

Noise, Ozone and Corona

During line construction, there is the potential for permissible/acceptable human noise levels that have potential of being temporarily exceeded due to the operation of trucks and heavy equipment in the vicinity of the OHTL site. Noise abatement measures will be taken in the areas crossing residential areas, including agreed upon work schedules. Corona or electrical discharges has the potential of occurring on humid days/nights in rainy seasons and can produce noise and ozone discharge. Both the noise levels and ozone concentrations around power lines have no health consequences as they have purely localized impacts.

Chemical Pollutants

Weed-killers, termite, ant and mosquito repellants and other similar chemicals will potentially require application during bush clearing, line construction and in the O&M phase of the project. Only approved types shall be used and strict controls shall be ensured through storage and handling as recommended by the Laws of Kenya and WB OP 4.09 Policy. A specialist in herbicides and insecticides will supervise application wherever required. In particular, no construction materials with chemical based insulation shall be used on the project. These include Polychlorinated Biphenyl (PCB), asbestos and the like.

Social Impacts

Settlements and Community Facilities

In order to establish a clear wayleave, removal of residential houses and private buildings will be one of the negative impacts of the project. Some of the social structures affected by the project include a dispensary and church buildings, school abolition blocks, water reservoirs and commercial buildings. Where it is not possible to realign the line route further than already achieved so as to avoid the few affected structures, compensation and assistance shall be provided to for affected land and assets, logistical provision for resettling the people, and compensation on loss of earnings. More details about resettlement and compensation are provided under the RAP brief.

Fragmenting of Lands

Establishment of the wayleaves could result in fragmentation of cultivation and grazing land thereby compromising productivity and incomes, loss of crops, fruit trees and grazing land. In most cases loss of cultivation land will be a temporary impact which will be compensated for in terms of crop and financial losses in cash. Trees that grow beyond 4 m in height will be similarly compensated in cash. Growing of up to 4 m high crops and orchards under the line and grazing will be permitted during operation and maintenance phase of the project.

Substance Abuse and Communicable Disease Control

Substance (alcohol and drugs) abuse and spread of HIV/AIDS/STI and other Communicable diseases are of concern. Use of alcohol and illicit drugs among the working crew has potential effect on the local population negatively through increased violence and sexual abuse. There will also be an increased risk of the spread of sexually transmitted diseases such as HIV/AIDS/STI in the project area. Intensive campaign of awareness, prevention and treatment will be undertaken among the workers and the communities living in the vicinity of the project. Sensitization and education campaigns against substance abuse will also be part of the mitigation measures under the project.

Other Health Issues

Influx of workers from outside the affected communities brings risk of the spread of communicable diseases such as waterborne diseases like diarrheal. The construction sites, contractor's accommodation areas, offices and store facility will be supplied with portable water and will have well-maintained sanitation and wastewater installations.

Archaeological and Historical Sites Impacts

Archaeological, historical and cultural sites (including cemeteries) are protected resources. They are important and increasingly rare tools for learning about the past. Negative impacts will potentially emanate from damage caused by construction and maintenance work through digging, crushing by heavy equipment, uprooting trees, exposing sites to erosion or the elements, or by making the sites more accessible to vandals. Two grave sites were identified in the RoW and in the event that archaeological resources are discovered during the construction process, a Chance Find Procedure as described in Performance Standard 8 of IFC will be implemented. The procedure includes record keeping and expert verification procedures, chain of custody instructions for movable finds, and clear criteria for potential temporary work stoppages that will be potentially necessary for rapid disposition of issues related to the finds.

Solid Waste

The project does not envisage major excavation works; solid waste will therefore be minimal. Topsoil excavated from construction sites will be the main form of solid waste. Some of the excavated soil will be reused for backfilling while the rest will be disposed of at designated areas. Other solid wastes will include metallic pieces, wooden planks, and stone debris. All these waste items will be disposed of in accordance with the legislation or other guidelines on the same. Particular care will be taken in forest reserves, national parks and other protected areas where materials and plants brought in during construction shall be taken out at completion of the works.

Impact on Ambient Air

The air emissions from construction machinery and traffic will be low and will therefore have negligible impact on ambient air quality.

Safety Issues

- (i) During the construction phase, the work will involve use of sharp objects, noisy machineries and dusty environment. The constructors will be required to provide workers

with the relevant protective gear including safety boots, gloves, protective clothing, dust masks and ear-mufflers, etc.

- (ii) Falling from heights: The nature of the work shall make it unavoidable to climb towers during construction and operation. This brings in the risk of falling from heights. Among other mitigation measures to be taken shall be ensuring that workers are free from any influence of alcohol or drugs; testing structures for integrity prior to undertaking work; implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; and inspection, maintenance, and replacement of fall protection equipment.
- (iii) Since the proposed line traverses settled areas, the danger of uncovered holes might pose danger to people and animals. This could be avoided by covering tower excavations and holes, pole installation holes and other any other holes dug during the project after their use and especially at the end of the day and providing visible warning signs and barriers if not covered.

Impacts on Aviation and Communication

Airplane flight paths in and out of the three identified aerodromes and low-flying aircrafts anywhere along the entire transmission line route. Aircraft navigation and communication facilities have the potential of being affected by the project. The Kenya Civil Aviation Authority will be requested to conduct a survey along the RoW and in particular at the three identified aerodromes and advise on the safety distances of the RoW from the aerodromes and safe tower heights and/or need for installation of warning lights and/or warning spheres in the vicinity of the aerodromes and at any other point along the entire RoW.

7 Environmental Hazard Management

Anticipated Hazards

Potential hazards leading to possible disaster include transmission line snapping, transmission tower collapse, vandalism, theft of tower steel and flooding.

Transmission line snapping: could be caused by strong wind, snow deposition, ice formation and overheating. The wire snapped could fall on the water, contact with conducting materials and contact with inflammable materials. This will cause human and animal (including aquatic life) electrocution and fire and smoke hazards.

Transmission tower/pylon collapse: This could be caused by natural phenomenon such as lid slides or anthropogenic activities such as sabotage and terrorists act.

Flooding and fire hazards of substation and transmission line: Flooding accident is generally not considered significant but if happened cause a lot of destruction inside substation causing disruption and property can lose. The transmission line could catch fire if vegetation height is not properly managed.

Hazard Management

A number of hazard management mechanisms could be devised to prevent and control potential hazards along the transmission line corridor and substations. These include prevention, control and management mechanisms.

8 Monitoring Program

During the monitoring program the Contractor's responsibility is to ensure that the construction works are carried out as per the detailed design, the measures defined in the ESMP's (attached as annex 3& 4), and the applicable National, AfDB and IFC guidelines. All construction activities are

carried out according international best practice and adhere to the applicable requirements regarding health, safety and environment. Monitoring of the construction activities will be limited to the construction area, which includes the construction sites, temporary storage areas, workers camps and their adjacencies. The topics and parameters that will be considered as a minimum for the environmental monitoring of the Project are Water Quality Monitoring; Noise Levels Monitoring; Monitoring of Vegetation Clearing; Soil Erosion Monitoring; Monitoring Rehabilitation of Work Sites; and Monitoring of Health status and Accidents.

9 Public Consultation and Public Disclosure

The public and stakeholder consultations were carried out through formal meetings and public gatherings, and focused group discussions in each of the woreda traversed by the line. On top of that discussions and consultations took place with concerned authorities of public agencies at federal, regional and woreda level. Involved were sector office heads, community members, elders and women groups, teachers and health professionals. Further information was obtained through informal meetings held with different sections of the community. The consultations and field level investigations were carried out in all major urban centers and in those villages located in the project area. Public consultations were carried out with the aim of:

- Informing the public on the potential impacts of the project, the implementation of the proposed mitigation measures for the negative impacts, and on measures of reinforcement for the positive impacts, and
- protecting the interest of affected persons and communities, especially of vulnerable groups
- providing the opportunity for the affected people to address their objections, influence the project at a planning stage, to reduce adverse impacts, maximize additional benefits, and ensure that they receive appropriate compensation

The consultations focused on nature of potential environmental, social, historical and cultural, and economic impacts of the transmission line. Identification of major social impact issues, such as resettlement, community severance and vulnerable groups that are at particular risk of project impacts, and compensation for affected properties and assets were the issues. Data and information on the current usage and ownership of land in the RoW, fixed and movable structures, trees, wells and other assets, areas of significant squatting and/ or encroachment were sufficiently discussed. During Public consultations with PAPs and local communities people reaffirmed their support to the project. Officials and the local authorities agreed to ensure that no person will be allowed to encroach to the RoW after the cut-off date.

10 Complementary Initiative

Further to the power interconnection, the project has additional initiatives such as benefit from the shield wire for telecommunication services using OPGW in all towns of Ethiopia and Kenya along the transmission routes that has a potential for development of ICT hubs; and the HIV/AIDS prevention and awareness programs that will accompany the project activities.

11 Conclusion

The intensity of impacts will be mainly at the construction sites within the RoW and at the substation construction site, as majority of construction activities will take place at those sites. Impacts will also occur in the rest of RoW, but in a less intensity.

The impacts on local communities and enterprises are at the one hand positive, as the construction activities provide job opportunities and create income from trading, as the foreign workers will spend some money in the project area. However these positive impacts are limited to the duration of the construction activities and would not have a significant sustainable positive impact on the local economy.

At the other hand it is based on the current information assumed that, the impact on local people and enterprises would not be mitigated to an acceptable level, especially in the first section which traverses the SNNPR State, because:

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ESIA Summary Annex1

Summary of Resettlement Action Plan (RAP)- Kenya

5. Project Name: Ethiopia – Kenya Power Systems Interconnection Project

Country: Ethiopia and Kenya

Project Number: P-Z1-FA0-022

1 Preamble

The Ethiopia – Kenya Power Systems Interconnection will create transmission capacity needed in interchange of electric power between Ethiopia and Kenya. The project will give rise to some negative impacts including people being resettled and properties and services relocated. As a result, Resettlement Action Plans were prepared by Fichtner in 2009 based on the African Development Bank and World Bank policies and guidelines; and the Kenyan legislations and regulations. The two organizations, African Development Bank and the World Bank are among the financing agencies approached by the two Governments. The RAP is now being updated along the same route, other options having been disqualified due to time considerations and due to other technical reasons. The aim of the RAP is to assess the potential social impacts (positive and negative) of the proposed transmission line. In addition the RAP study shall deal with social issues related to land acquisition, such as loss of economic activities and livelihoods or resettlement arising from the project implementation.

The underlying principles in the preparation of the RAP report require that (i) Involuntary resettlement should be avoided or minimized where feasible; (ii) if feasible, resettlement activities should be conceived and executed as sustainable development programs where the Project Affected Persons (PAPs) share in project benefits; (iii) displaced persons should be fully consulted and have opportunities to participate in planning and implementing of resettlement programs; and (iv) displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least restore them, in real terms, to pre-displacement levels or levels prevailing prior to commencement of project implementation whichever is higher.

1. Description of Project and Project Area

The proposed transmission line route crosses from Ethiopia into Kenya approximately 90 km West of Moyale town (grid E 421519, N 397867) and traverses Marsabit, Samburu, Laikipia, Nyandarua and Nakuru Counties of Kenya. From Moyale the transmission line route runs along the Great North Highway (Marsabit – Moyale Road) in a southerly direction. From Marsabit the route runs southwards at a maximum distance of eight kilometres parallel to the main Nanyuki – Marsabit Road to Laisamis and further on to Merille where it diverts westwards through a pass in the Wamba Mountains. It then runs through a stretch of fairly flat land covered by thorny shrubs and bushes, and then turns southwards to the Ngoborbit plateaus and ridges dropping altitude down into Laikipia. The route continues through the extreme western section of Mpala Ranch which is covered by scattered thickets and bushes. Then it crosses Mutara River and traverses the diminished Pesi Swamp into Ndaragwa. The line route runs on top ridge of Shamata and then sharply drops altitude to the flat plains of Olobolossat, two kilometres eastwards of Lake Olobolossat. It then traverses the Olkalou Settlement Scheme with its adulating ridges and cuts across Malewa River and runs and then runs along the river. At Malewa farm, the proposed line route turns in the south-east direction, climbing a steep hill and runs along the Rift Valley and Central provincial boundary. The route then drops

altitude to the flat land of Marangishu (karati) and onwards to Kijabe after crossing the Nakuru – Nairobi highways near Naivasha and near Mai-Mahiu on the old Naivasha – Nairobi highway. The route then passes six kilometers east of Mt. Longonot into the proposed Suswa Substation. Potential Impacts

1.1 The project will traverse a long stretch of land with considerable levels of mitigable impacts to the flora and fauna. There are also impacts which will be socio-economic in nature especially during the construction phase that need mitigating interventions as provided for in the ESIA report. Most notable will be disruption to residential, commercial and institutional buildings, loss of cultivation land, trees and crops. A total of 386 households will be impacted in one way or the other, of these 79 are primary structures and 166 are secondary structures. Of the 79 primary structures, 9 will have to be totally relocated while 70 will partially be affected. While of the 166 secondary structures, 16 would have to be totally reallocated and 150 are partially affected. The cut-off date established is 31 October, 2011.

2. Organizational Responsibility and Implementation of the RAP

2.1 As the project sponsor in Kenya, KETRACO will be responsible for coordinating all issues relating to compensation and resettlement. Policy and strategic decisions in compensation and resettlement of the project affected persons (PAPs) lies with the following Kenya Government Ministries:

- Ministry of Finance
- Ministry of energy
- Ministry of Environment and Mineral Resources
- Ministry of Lands (Physical Planning Department)
- Ministry of Roads and Public Works
- Ministry of Agriculture
- Ministry of Local Government
- Ministry of State for Provincial Administration

2.2 After assessing and determining the characteristics of all project affected persons (PAPs), valuation of assets to be compensated and tallying of complete list of eligible PAPs will be the responsibility of KETRACO. The enormous experience acquired during RAP implementation of the World Bank financed Energy Sector Recovery Project, the multi-donor financed Mombasa-Nairobi transmission line in which the African Development Bank participated and other on-going projects will be put to use in the implementation of this RAP.

The implementation times will be pegged on the following process:

- (i) County Resettlement Action Plan Committees (CRAPCs) are constituted
- (ii) Project Implementation Unit (PIU) is constituted
- (iii) PIU signs off the RAP. This marks acceptance of the terms of the RAP
- (iv) KETRACO draws up offer documentation for PAPs
- (v) The PAPs review the offers made and enter into agreements with KETRACO through their respective CRAPCs
- (vi) The PAPs identify alternative sites and move to them or move to new locations of their farm
- (vii) Monitoring of the “willing buyer - willing seller” affected people commences
- (viii) Monitoring of grievances procedure commences

3. Public Participation and Consultation

Field data collection at any point on the RoW was preceded by making contact with the relevant area Government administrators such as chief, sub-chief, District Officer (DO). Other key persons who played this role were religious leaders in and around religious missions, head teachers in and around large educational facilities, etc. These community opinion leaders played the role of providing information about the community and its culture while they helped organize community mobilization and peer consultations. Also consulted during the field data collection were community business organizations (CBOs) including the wildlife conservancy management, group ranching management organizations as well as non-governmental organizations (NGOs).

4. Institutional and Legal Framework

4.1 Institutional Framework

The implementation of the RAP shall require close collaboration among all the stakeholders. A properly constituted structure for administration of its implementation is imperative. The roles and responsibilities of the various stakeholders in the implementation and administration of the RAPs are elaborated in the RAP Report. The report has further clarified the role of PAPs and their responsibility in the entire process. Since KETRACO will take responsibility of executing the RAP. The structure of KETRACO Project Implementation Unit will as a minimum consist of a legal advisor, land surveyor, transmission line expert, socio-economist, wayleave officer, environmental expert, accountant, community liaison officer, database management officer, and a registered valuer.

4.2 Responsibility of PCS

The responsibility of PCS will include but not necessarily be limited to the following:

- (i) Oversee the implementation of the RAPs;
- (ii) Ensure initial baseline data is collected for the purpose of monitoring and evaluation reports as per the indicators provided by the RAPs;
- (iii) Oversee the formation of County Resettlement Action Plan Committees;
- (iv) Ensure maximum participation of the PAPs in the planning of their own resettlement and post resettlement conditions;
- (v) Ensure detailed valuation of the structures in order to determine case by case value of each component of the project and agree upon the compensation budget;
- (vi) Accept financial responsibility for payment or compensation and other designated related costs;
- (vii) Pay the PAPs compensation in the amounts agreed; and
- (viii) Ensure monitoring and evaluation of the PAPs and undertaking of appropriate remedial action to deal with grievances and ensure that income restoration are satisfactorily implemented.

4.3 Under the guidance and coordination of PCS, the CRAPCs will be formed which will act as a voice for PAPs. Each of the committees shall as a minimum comprise the following:

- 1) County Government Administrator as shall be constituted under the Constitution of Kenya, 2010 to succeed the District Commissioner (DC);
- 2) 4 representatives of the District PAP – Community-Based Organization (CBO), PAP – Self-Help Groups (SHG) and PAP Area Forum (AF) elected by PAP;
- 3) 2 representatives of NGOs;

- 4) Successors of the district officers (DOs) in-charge the affected divisions in formative stage under the Constitution of Kenya, 2010;
- 5) Successors of chiefs in-charge of the affected locations in formative stage under the Constitution of Kenya, 2010;
- 6) County Legal Counsel
- 7) County Government Surveyor;
- 8) County Lands Officer;
- 9) County Physical Planning Officer;
- 10) County Agriculture Officer;
- 11) County Veterinary Officer;
- 12) County Forest Officer;
- 13) County Environment Officer;
- 14) County Government Accountant;
- 15) County Senior Superintendent to Police;
- 16) County Social Services Officer;
- 17) KETRACO Wayleaves Officer;
- 18) KETRACO valuer; and
- 19) KETRACO lawyer.

4.4 The CRAPCs will be responsible for (i) public awareness (concerns, interests and grievances); (ii) compensation (rates, resettlement process), (iii) monitoring and evaluation, (iv) logistics, and (v) employment, training and counseling. KETRACO through its Wayleaves Officer shall prepare a wayleaves agreement detailing the specific affected plots, the proposed route and all the compensation cost (calculated by the PIU) for all PAP. The agreement will also contain all the public safety requirements that the PAP are expected to adhere to. Landowner will be requested to give consent if satisfied with the agreement. Compensation will be separately made to the PAP currently using the land and the registered owners. The PIU will monitor all payments.

4.5 Legal Framework

4.5.1 Under Section 61(1) of the Constitution of Kenya, 2010 it is stated that all land in Kenya belongs to the people of Kenya collectively as a nation, as communities and as individuals. Under Section 62 of the Constitution; land in Kenya is classified as public, community or private. The Constitution spells out conditions for ownership of land by the state, community and individuals (citizens and non-citizens). Sub-section 60(1)g, states about encouragement of communities to settle land disputes through recognized local community initiatives consistent with the Constitution. 62(1)c, states that private land can be transferred to the State by way of sale, reversion or surrender and under 62(1)h, all roads and thoroughfares provided for by an Act of Parliament. The Constitution classifies community land under 63(2)d(i) land lawfully held, managed or used by specific communities as community forests, grazing areas or shrines; and (ii) ancestral lands and lands traditionally occupied by hunter-gatherer communities. Section 63(2)d(4) Community land shall not be disposed of or otherwise used except in terms of legislation specifying the nature and extent of the rights of members of each community individually and collectively

4.5.2 All land in urban areas of Kenya and much of the land in rural areas have registered title deeds. Title to land is either freehold, leasehold or any other tenure declared under the Act of Parliament (Constitution 64(a, b & C). The development and use of freehold title is controlled by land planning regulations which are administered by both the Central Government and the County Government in which the land is situated.

- 4.5.3 Expropriation is provided for in the Constitution under Sections 62(1)c. The Constitution only provides general guidelines on land ownership. Detailed procedures for acquisition are elaborated under the Land Titles Act, Cap 282. Section 54 of the Energy Act, 2006 provides for compulsory acquisition of land for purposes of constructing electricity infrastructure. This provision is necessary to ensure a final fallback position in the event of protracted legal tussles with property owners which will potentially jeopardize the project. The Land Acquisition Act, Cap 295 provides for the compulsory acquisition of private land and property held under Registered Lands Act, Cap 300 and the Land Titles Act, Cap 281. Under such circumstances WB OP/BP 4.12 Guidelines and associated Annex will be evoked. Public land administered under the Government Lands Act, Cap 280 but used for private development in leases can also be compulsorily acquired under the Land Acquisition Act. Section 12 of the Act allows the Commissioner of Lands to award land of equivalent value as compensation.
- 4.5.4 Preparation of the RAP has taken into consideration all the relevant laws and by-laws in Kenya and is consistent with safeguard policies of the International Financial Institutions such as African Development Bank (AfDB) and the World Bank.

5. Grievance Redress Mechanism

- 5.1 Procedures for grievances will be clearly explained to PAPs during chiefs' *barazas*. Minor grievances will be heard and determined by the CRAPC. Such grievances include:
- Wrongly recorded personal or community details
 - Wrongly recorded assets including land details and/or affected land area
 - Change of recipient due to recent death or disability
 - Recent change of asset ownership
 - Wrong computation of compensation
 - Name missed out of register
- 5.2 Grievances that are beyond the scope of the CRAPC will be handed-over to PIU for determination. Any grievance that cannot be determined by PIU will be handed-over to the Land Compensation tribunal of the National Land Commission for determination. If still unresolved, the PAP shall appeal against the ruling of the Land Compensation Tribunal to the High Court. Such grievances include but are not necessarily limited to:
- Refusal to assent to the wayleaves notice
 - Appeal against the whole process
 - Where the legal land or business owner is not positively identified
 - Where there is conflict in legal ownership to land or business

Other types of grievances including fraud, war-like activities, etc will be referred to the police.

6. Valuation of Assets and Losses

- 6.1 Legally acceptable valuation procedures that are adaptable to the Government of Kenya, AfDB and the World Bank (WB) shall be applied for purposes of fairness and consistency. These will include computation of replacement cost, compensation for lost earnings, disturbance allowance and other compensation as specified under the Laws of Kenya and the relevant safeguard policies of AfDB and the WB. Valuation of lost assets will be made at their full replacement cost. The approach involves direct replacement of expropriated assets and covers an amount that is sufficient for asset replacement without depreciation, movement expenses and other transaction cost. The table below summarizes the valuation processes to be followed.

Table 7: Valuation Process Relevant to RAP

Asset	Process
Land with Structures	<p>Steps:</p> <ol style="list-style-type: none"> A detailed inventory of all persons, possessions, assets and stock requiring resettlement will be made Accurate and real valuation of dwelling will be taken Determine compensation packages according to valuations will be carried out Allow a reasonable time period prior to moving, for salvage of building materials. PAP's shall salvage any material without the same being deducted from their compensation entitlements Provide temporary housing/shelter if necessary <p>Recommendations:</p> <ol style="list-style-type: none"> KETRACO will pay compensation for the lost housing structures KETRACO will provide transport for the occupants and their belongings to their new place of residence The owner will be entitled to remove any materials he/she wishes to salvage within one month of vacating the old dwelling KETRACO will provide transport for these materials, other than masonry, to the new residential site
Land without structures	<ol style="list-style-type: none"> Inventory: As part of the RAP phase, KETRACO will acquire names and contact details of all persons affected by the project Compensation: The RAP data sheet prepared will spell out how each person is affected and indicates how much compensation will be paid for crops and trees lost
Lost business profits and employment earnings	Where business profits are affected, compensation will be paid in accordance with documented valuation & audited results of the business' monthly income
Crops/Fruits/Trees on PAP plantation	<ol style="list-style-type: none"> Tree/seasonal crops: Harvesting of the crops will be given a first priority but where harvesting is not possible, counting of the affected crops will be done by a registered valuer and KETRACO agent in the presence of the owner. Computation of the costs will be done according to market rates and payments thereafter made either at KETRACO offices, or through the local chief's office Annual crops: Crops will be harvested by the owner and therefore no compensation will be paid for crops. Where crops cannot be harvested, KETRACO will pay compensation at the market rate

7. Compensation and Entitlements

7.1 Consistent with WB OP/BP 4.12 and associated Annex and the relevant AfDB Policy on Involuntary Resettlement, affected persons, irrespective of their legal status are eligible for some form of compensation if they occupied the land before the entitlement cut-off date which is the date when the assessment of persons and their property in the project area is carried out. The key determinant for compensation is on the basis of a pre-project census during which all residents were identified. Replacement costs have been categorized separately from houses, structures, crops and trees. Resettlement will not necessarily require (except by choice of the PAP) relocation to another village or area. In most cases the PAPs will chose to step back within their compounds. The Physically Displaced Persons will be allocated alternative sites and/or given materials to replace their structures affected by the project. The PAPs will be

informed of the different options available during the disclosure process. The vulnerable PAPs will receive special assistance in establishing replacement homes.

7.2 Compensation and entitlements will be triggered by particular and specific impacts resulting from the project. Using a holistic approach, these general impacts emanating from the project shall include losses at household and community level (public assets, commercial assets, and communal assets). Losses will mainly fall into the following categories:

- Loss of assets (structures and agricultural land)
- Loss of livelihood
- Loss due to severance

Category 1 Structures: Those who will lose all structures such as residential, kiosks, stalls, etc and have relevant licenses; those who will lose some part of their structures such as residential, kiosks, stalls, etc. and have relevant licenses; those who will lose all structures such as residential, and have not acquired relevant license; and those who will lose some part of their structures such as residential, kiosks, stalls, etc. and have no relevant licenses e.g. Temporary Occupation License.

Category 2 Agricultural Land: Those who will lose all land and have titles; those who will lose partial land and have titles; those who will lose all land and have no titles; those who will lose partial land and have no titles; those who will lose all trees; those who will lose part of their trees; those who will lose all field crops; and those who will lose part of their field crops.

Entitlement Matrix: The Kenyan law recognizes compensation for loss of property including houses, crops and trees due to implementation of development projects. The law recommends a fair compensation for loss of property. The government has established a compensation principle, and that is, compensation for loss of property is paid at market value. Property loss falls under four categories namely property owners, business tenants, residential tenant, encroachers (using land) and squatters.

8. Integration with Host Communities

Nine households to be totally relocated will be resettled elsewhere. As is the case the affected land comprises peri-urban residential plots and therefore the affected PAPs will easily be able to buy similar plots in the neighbourhood as these types of plots are readily available. Integration with other communities will therefore need to be incorporated within their resettlement package. The most preferred mode of compensation would have been land for land but the Government bureaucracy would be cumbersome in procurement of small pieces of land and therefore the most efficient method of resettlement in this case would be in the form of cash. Since public and squatter relocations are expected, there will be no need for integration plan for this category with host communities.

9. Costs and Budget

The right to benefits will only be granted to PAPs whose assets will be demolished and those who will have to move their assets to a different location. KETRACO will use prevailing market rates for land structures and trees as practiced by the international valuation standards committee (2008) rules and the Institution of Surveyors of Kenya, valuation rules. KETRACO shall choose to apply Resettlement Policy Framework for KPLC Projects, 2011 that provides guidelines for ensuring that any cut or uprooted vegetation is left for owners use after compensation. Assets that are not

vegetation shall require valuation before compensation and resettlement. An estimate of the replacement costs of structures demolished along the proposed power line route will be undertaken by licensed valuers, appointed by KETRACO for the exercise. It is from this that the compensation amount of the affected households will be determined.

9.1 All compensation activities and those related to other forms of assistance including disturbance allowance, and any other associated activities that are necessary have been estimated but are due for updating. The compensation and implementation/monitoring cost for the RAP was estimated at KShs. 1,195,732,635 (USD 14,067,442 at USD1 to KShs. 85). Resettlement/Compensation (RAP) estimates for compensation are based on engineering and initial PAP surveys conducted by the Study Team. Various alternatives were considered with the best options which minimized resettlement and destruction to property were selected.

10. Monitoring and Evaluation

10.1 The purpose of monitoring and evaluation is to report on the effectiveness of the implementation of the RAP, covering physical resettlement, disbursement of compensation and effectiveness of public consultation, amongst others. The Ministry of Energy will ensure that all aspects of RAP have been adequately and expeditiously executed according to the implementation plan. The monitoring will cover the review of survey results, formation of relevant committees (including the Grievance Committee), the identification of alternative land for resettlement and farming, adherence to compensation payment schedule, movement and support of project affected persons including the vulnerable households. A review of regular progress reports produced by KETRACO will be carried out by all stake holders both at national and local levels including the AfDB and the WB.

Internal Monitoring

10.2 The responsibility of internal monitoring for performance of the resettlement and compensation through PIU will be the responsibility of KETRACO. The monitoring will be a systematic evaluation of the activities of the operation in relation to the specified criteria of the condition of approval. The objectives of internal monitoring and supervision will be (i) to verify that the valuation of assets lost or damaged, and the provision of compensation, resettlement and other rehabilitation entitlements, has been carried out in accordance with the resettlement policies provided by the GOK, WB and AfDB Policies and guidelines; (ii) to oversee that the RAPs are implemented as designed and approved; (iii) to verify that funds for implementation of the RAP are provided for by the project authorities in a timely manner and in amounts sufficient for their purposes, and that such funds are utilized in accordance with the provisions of the RAP.

10.3 The main internal indicators that will be monitored regularly include: (a) that KETRACO's entitlements are in accordance with the approved policy and that the assessment of compensation is carried out in accordance with agreed procedures; (b) payment of compensation to the PAPs under the various categories is made in accordance with the level of compensation described in the RAPs; (c) public information and public consultation and grievance procedures are followed as described in the RAPs; (d) relocation and payment of subsistence and shifting allowances are made in a timely manner; and (e) restoration of affected public facilities and infrastructure are completed prior to construction.

External Monitoring and Evaluation

- 10.4 KETRACO will engage an independent monitoring unit (IMU) to be established for purposes of external monitoring and evaluating implementation of compensation and resettlement activities. In establishing the IMU effort should be made to draw on personnel with resettlement and social development experience. The IMU shall be appointed to monitor the resettlement and compensation process and implementation of requirements to verify that compensation, resettlement and rehabilitation have been implemented in accordance with the agreed RAPs. The IMU will also be involved in the complaints and grievance procedures to ensure concerns raised by PAPs are addressed.
- 10.5 The RAP will be implemented mainly by KETRACO. The M&E will be carried out by the PIU and CRAPCs. The PIU will be responsible for the overall M&E while the CRAPCs will monitor and evaluate respective communities where they will have been formed. Hence the IMU will carry out the following (i) review the results of the internal monitoring and review overall compliance with the RAPs; (ii) assess whether relocation objectives have been met especially with regard to housing, living standards, compensation levels, etc.; (iii) assess general efficiency of relocation and formulate lessons for future guidance; (iv) determine overall adequacy of entitlements to meet the objectives; and (v) provide a forum for skills-sharing and to develop institutional capacity. Further external monitoring of RAP will be provided by the WB and AfDB who will monitor the entire process through regular reports and supervision missions.

ESIA Summary Annex 2
Summary of Resettlement Action Plan (RAP)- Ethiopia

Project Name: Ethio-Kenya Power Interconnection
Country: Ethiopia and Kenya
Project Number: P-Z1-FA0-022

1. Description of the project and area of influence

Project Description: The Ethio-Kenya interconnection project is to provide reliable power supply to Kenya from Ethiopia's hydropower schemes. The transmission line to be constructed is a High Voltage Direct Current (HVDC) having 400 kV double circuit line. The infrastructure to be constructed for the power interconnection projects are mainly conventional lattice self-supported steel tower and sub stations.

Project Area: In Ethiopia, the interconnection project is located in the Southern part of the country. The total length of the transmission line inside Ethiopia is about 433 km. It traverses eight administrative woredas (or districts) and 34 rural kebeles (or counties) located in two Regional States, namely Southern Nations and Nationalities People's Regional State (SNNPRS) and Oromia National Regional State. About 53% of the interconnection project lies within SNNPRS and about 47% is in Oromia region. The first section of the interconnection project crosses areas that are intensively cultivated and densely populated, namely, Wolyta Sodo, Humbo, Mirab abaya, Arba Minch Zuria, Derashie and Konso woredas. The second section of the route for the transmission line traverses mostly forest & bushy areas, and partly areas that are occupied by agro pastoralist; and also by pastoralist nomads.

2. Potential Impacts

The major potential impact of the transmission line on the socio-economic environment and on the livelihood of the communities will be due to land acquisition. The impact of the transmission line project is mainly on farm lands, irrigation canals, permanent crops, housing, and trees. Since the project is a linear one it is only portion of farmlands or irrigation structures that will be affected. In such cases there will be no geographical relocation to other parts but rather shifting or stepping back within the premises. Since the project is a linear one the impact is mainly concentrated within the 65 meters width of the Right of Way. A PAP who will lose part of his or her farmland will be able to survive and continue his or her farming activities in the remaining plot. The right of way under the interconnection project does not fully avoid the use of land either for cultivation or grazing. The only exceptions will be tree plantations that are more than 8 meters of height and housing structures.

Access road construction: Construction of access roads shall be required in places which do not allow easy access to transport construction materials & equipment for the tower construction and also for its future maintenance works. The construction of access roads will affect farmlands, perennial crops and trees located within the right of way.

Construction of Tower foundation: The construction of tower foundation will affect crops, trees and houses that are located in the area selected for the construction. The location selected for the construction of tower foundation in most cases is in those areas which do not have housing structures.

Construction of substation: In Ethiopia, the interconnection project shall construct one substation located at in Wolyta Sodo area. The area identified for the construction of the substation is mainly used as a community grazing land by the villagers in the area. The construction of the substation will force the community to look for another grazing area outside of their locality.

Project Affected Persons: Through a census survey that was carried out, it is estimated that a total of 5743 Project Affected Persons (PAP) from 1165 households. Almost all PAPs reside in rural areas and farming is their main economic activity, except few households who have employed jobs either in the public or private sector. Among the total number of PAPs 6.3% are female headed households and 0.5% child headed households. These groups of people need special attention and care during the implementation phase of the project.

Impact on Vulnerable groups: Among the total number of PAPs, 214 are vulnerable people who will need special attention and care during the implementation of the project activities. The affected vulnerable persons include 74 Female Headed Households (FHH), 135 elders above 60 years of age, and 5 child headed families.

Vulnerable groups require special need and support to be provided by the project office & woreda officials during the implementation of the resettlement/relocation.

Impacts on Public utilities and community institutions: A total of 18 public enterprises, religious and community institutions will also lose different types of assets and property due to the project construction works. The properties to be affected include government owned farmland which is used to grow crops, nurseries, fruit trees, and also trees for construction and building structures. Among the affected public enterprises the major one is a State owned farm in Arba Minch which will lose crops such as Cotton, Banana and Maize. Humbo & Sodo Zuria Woreda Agriculture and Rural Development offices will also lose three tree nursery sites and two forest reserve areas. The nursery sites mainly grow tree and coffee seedlings planted for distribution to farmers and for plantation on community forest areas.

Impact on Agricultural Land: The major impact of the transmission line in Ethiopia will be on farmlands and on income of farm households who are fully dependent on farming activities. The impact on agricultural land is a very critical & crucial for those areas where there is shortage of land and population pressure is high. A total of approximately 341 hectares of land will permanently be affected due the construction of the transmission line. Of this number, 321 hectares is farmland and 20 hectares is communal grazing land. The major impact of the project will be loss of farmland used to grow cereal crops and perennial crops (Banana, Mango, and etc.).

Impacts on cereal and root crops are mainly assumed to be a temporary. Temporary effects include damage to crop fields, soil bunds and structures, irrigation canals during construction activities in the area. Once the construction activities are over the owners of the land could be able to cultivate cereal, vegetable and root crop. These are crops that whose height is below 4 metres.

Impact on Housing: The selection of the route for the transmission line has deliberately avoided or by passed urban sections, as not to cause relocation of houses and disturb the existing socio economic facilities. In all major towns and villages located along the transmission line no significant disruption is expected due to the construction works. The construction of the transmission line requires relocation of houses located within the RoW. Most housing structures will be relocated within the existing village or farmland. Since some plots are expected to be too small for relocation, some houses will need to be re-established at another site which has been identified within the same village without losing their social network. A total of 256 housing structures, 1 fence, 1 store, 2 churches, 3 granaries and 1 barn will be affected by the Project. Most of the affected houses are of two types, the first type of houses are constructed from wood and mud and covered with corrugated iron sheet 149 of them or 58%; and the second type of affected houses (107 or 42%) include houses (hut) constructed with wood and mud and covered with thatched grass. There are also other types of houses, however small they are. All the affected houses are located in the rural sections.

Impact on Planted Trees: A total of 169,751 different types of trees located within the 65 metres of ROW will be affected by the project, of which, about 75% is located in Sodo Zuria woreda alone. The different types of trees that will be affected include Eucalyptus, Zigiba and Wanza (Cordia Africana), and etc. Among the different types of trees affected Eucalyptus tree is largest and constitute about 70% of the trees to be affected.

3. Organizational responsibility

EEPCO and Ministry of Finance and Economic Development play significant role at the Federal Government level. EEPCO in consultation with Ministry of Finance and Economic Development (MoFED) shall carry out the coordination work among the different actors at Federal Government level especially in identifying resources to meet the resettlement and compensation costs; and the jurisdiction between the different donor agencies shall be mainly the responsibility of Ministry of Finance & Economic Development (MoFED). The Ethio-Kenya power interconnection project office will have a major role in the coordination, facilitation and implementation of the RAP.

At the Regional Government level it is the woreda administration offices that have the mandate the responsibility to administer and coordinate most of the activities that are related to the implementation of the resettlement and relocation issues. Regional Government level EPA offices in collaboration with other agencies will also play a monitoring role.

The Ethio-Kenya interconnection project office shall establish a resettlement implementation unit to implement this RAP in collaboration with EEPCO’s Environmental and Social Management Unit. The following table shows organizations that will have role and responsibility at Federal and Regional level in the implementation of the RAP.

Table 2 Institutions that will have role during implementation of the RAP

A. Federal Government Level

No	Organizations involved	Responsibility
1	Ethiopian Electric Power Corporation	Overall Management and Budget Allocation for the RAP
2	Ethio-Kenya interconnector project office	Coordination and implementation of the compensation and Resettlement Action Plan, income restoration of

No	Organizations involved	Responsibility
		PAPs, Develop skill training and Social Development Plan, Monitor the restoration of services/utilities affected by the construction works, such as, water supply, etc
3	EEPCO's Environmental and Social Management Unit	Monitor and Evaluate the implementation of the RAP Provide technical support for the project office in training, etc.
4	Ministry of Finance and Economic Development	Approval and signing of loan with AfDB and other donors, Release and approval of fund for compensation

B. Regional Government Level

No	Organizations involved	Responsibility
1	SNNPRS and Oromia Regional Governments	Facilitate the construction of the transmission line by informing the zonal and Woreda authorities to provide the necessary support and cooperation for its smooth implementation
2	Woreda Administration & Agriculture and Rural Development Offices &	Coordinate the whole resettlement issue, facilitate compensation for PAP, and facilitate land for land compensation, facilitate the relocation sites and the restoration of services. Coordination and support of PAP and preparation of cost estimates
3	Municipalities	Identify land for the relocation of PAP and provide support in restoration; and provide special attention and support for the disabled, sick, elderly and female headed households
4	Kebele Administrations	Provide advice on the fairness in relocation process and valuation of compensation and coordinate on the support to be made for vulnerable groups

6.

4. Community Participation & Public consultation

Community participation & Public consultation was carried out in all woredas crossed by the interconnection project. The different groups who participated in the public and stakeholders consultations include; Project Affected Persons (PAP), Clan leaders, Elders and informal leaders, Woreda Administration and Sector Offices, Kebele Administrations, Agricultural Development Agents, School Teachers, Health Workers and etc. The public consultation was carried out with the project affected population through formal meetings & public gatherings and also in a form of focused group discussions. The consultations were carried out with 698 PAPs and kebele administration authorities, responsible sectoral office representatives in 18 rural kebeles; and also with 92 woreda officials members from 9 woredas crossed by the interconnection project.

Community participation & Public consultations were carried out with the objective of identifying the potential social impacts (positive and negative); and on the implementation of the proposed mitigation measures for the negative impacts and on measures of reinforcement for the positive impacts; to inform the public on the potential impacts and seek the participation and contribution of the public during the construction of the project. FDRE Constitution, Article 43 No.2 states also reaffirms the participation of citizens in national development, in policies and projects that affect their livelihood.

The consultations focused on:

- The nature of potential social impacts of the transmission line, and its impacts on social, cultural and economic ties and networks during and after construction works; on the loss of productive resources; loss of grazing and forest areas;
- Identification of major social impact issues, such as involuntary resettlement, community severance and vulnerable groups that are at particular risk of project impacts; and compensation for affected properties and assets.
- Data and information on the current usage and ownership of land in existing width of the ROW, fixed and movable structures, trees, wells and other assets, areas of significant squatting and/ or encroachment.
- Soliciting the views of local population as how to pragmatically provide for their needs within the basic format of the project, and what beneficial impact they expect from the transmission line.

The results of the public consultations and consensus reached include:

- All the woreda administration offices have agreed to provide support and assistance for people who will lose their farmland, houses & trees for the construction of the transmission line.
- Special support will be made by the Woreda and Kebele administration to Female headed households and also vulnerable groups affected by the construction of the transmission line.
- Woreda and kebele administrations shall facilitate the smooth implementation of the construction works and provide other routine administrative supports if need be.

Grievance procedures: Grievance procedures allow PAPs to address their complaints and specific issues that they might need to be clarified by pertinent authorities. Grievance procedures are first preferred to be settled amicably whenever possible. That is, positive discussions will be made to convince PAPs in the presence of elders, local administration representative or any influential person in the locality if they refuse to agree on issues such as, relocation sites, compensation estimates of affected properties. If grievance redress issues could not be resolved amicably litigation shall be settled by regular courts. A party dissatisfied by the decision of the administrative organ and the court he/she has the right to appeal to the regular appellate court or municipal appellate court according to FDRE Proclamation N0.455/2005, (Article 11, sub article 1) within 30 days from the date of decision. However, the preferred option of dispute settlement shall be through amicably way because recourse to courts may take very long time even years before a final decision is made and therefore, shall not be the preferred option for both parties concerned.

5. Integration with host communities

Since the project does not require resettling PAPs outside of their present area of settlement there is no need of integration with host population.

6. Socio economic assessment

Demography: The total population that resides in the woredas that are traversed by the interconnection project is estimated to be 1,289,682. Most of the above population resides in the rural areas and lacks basic services & infrastructural development. The following table shows the distribution of the population by woreda.

Table 3 Population distribution by woreda

No.	Woreda	Population
1	Sodo Zuria	176,725
2	Humbo	136,679
3	Kindo Koysha	113,923
3	Mirab Abaya	81,819
4	Arba Minch Zuria	178,740
5	Derashie	155,941
6	Konso	256,001
7	Teltele	79,143
8	Yabelo	115,371
9	Dire	82,469
Total		1,376,811

Source: CSA, Statistical Abstract, July 2010

Economic activities: The mainstay of the population in the project areas traversed by the transmission line is dependent on agriculture, agro-pastoralism and nomadic pastoralism. Agriculture is predominately carried out by small holder farmers whose land size is highly fragmented. Farming is practiced by using traditional methods of oxen plough and hoe cultivation. Due to high population pressure and limited arable land in the project area, the average holding size in most woredas is below 1 hectare. Economic activities outside of farming and livestock keeping are very limited and non-existent in some localities. Industrial growth and other economic activities are very limited and are in its infancy stage.

The major food crops grown in the project area include Cereal crops, Root crops, and Perennial crops. Cash crops, such as Coffee and Chat also grow in some localities to some extent. In two of the woredas (Mirab Abaya and Arba Minch Zuria) crossed by the transmission line farmers mainly grow Banana and Mango trees. These two crops are major cash crops to the local community. The two woreda are major suppliers of Banana to the central market in Addis Ababa and also for export to the Middle Eastern countries. Among the total number of PAPs (1165 households) PAPs, the large majority depend on farming activities.

7. Legal framework including mechanisms for conflicts resolution and appeals

Ethiopia has a number of policy and legal framework to take care of involuntary resettlement, land expropriation of land holdings and compensation payment. The following are the main legislations to be considered;

- a) The Constitution of Federal Democratic Republic of Ethiopia, August 1995
- b) Proclamation on Expropriation of Land Holdings for Public Purposes and Payment of Compensation (Proclamation No. 455/2005), July 2005
- c) Council of Ministers Regulation No. 135/2007, Payment of compensation for property situated on land holdings expropriated for public purposes, May 2007
- d) Proclamation on Rural Land Administration and Land Use (Proclamation No. 456/2005), July 2005.
- e) The Environmental Policy of Ethiopia, April 1997.

FDRE constitution, the above three legislations and the Environment policy provide the basis, principles and procedures towards land expropriation and compensation payment in Ethiopia.

The Constitution of Federal Democratic Republic of Ethiopia: The Constitution of Federal Democratic Republic of Ethiopia is the legal basis for land acquisition and resettlement. In Ethiopia, rural or urban land could not be sold or mortgaged, citizens have usufructuary right over land. A usufructuary right gives the user of the land, the right to use the land and the right to benefit from the fruits of her/his labor which may be crops, trees, etc. found on the land or any permanent works such as buildings etc.

Legislation on Expropriation of Land Holdings (Proclamation No. 455/2005): In Ethiopia, rural land users have the right to rent or contract their land either for farmers or investors and the contract duration depends on whom it is rented out. Hence, no formal land transaction exists by law except giving out in a form contract or lease for certain period. The maximum period to rent out is up to 25 years for investors who grow perennial crops. To ensure land use rights the government has started issuing out of land entitlement certificates for each rural land owner.

The proclamation Expropriation of Land Holdings for Public Purposes and Payment of Compensation clarifies and defines who has the power to expropriate landholdings either in urban or rural sections of the country. Hence, as per the proclamation, the power of expropriation of landholdings mainly rests on Woreda or urban administration authorities.

Council of Ministers Regulation No. 135/2007: The regulation provides the basis for compensation of affected properties and to assist the displaced or affected persons to restore their livelihood. It sets the methods for the assessment of compensation, provision of replacement land and payment of displacement compensation. Assessment of compensation establishes the basis for compensation for the different assets and categorized into, Compensation for buildings, fences, crops, trees, protected grass areas, improvement on farm land, burial ground and natural resource exploitation.

2 African Development Bank Policy & Regulations: The African Development Bank (AfDB) policy on involuntary resettlement is designed to ensure that PAPs are treated equitably and that they share the benefits of the project.

AfDB objectives are mainly related to:

- To avoid resettlement where feasible, or minimize resettlement impacts where population displacement is unavoidable, exploring all viable project designs,

- Ensure that displaced persons received resettlement assistance, preferably under the project, so that their standards of living, income earning capacity, and production levels are improved.
- Provide explicit guidance to Bank staff and to the borrowers on the conditions that need to be met regarding involuntary resettlement issues in the Bank operations in order to mitigate the negative impacts of displacement and resettlement and establish sustainable economy and society
- Set up mechanism for monitoring the performance of involuntary resettlement programs in Bank operations and remedying problems as they arise so as to safeguard against ill prepared and poorly implemented resettlement plans.

The guiding principles of the AfDB policy states that compensation for project affected persons has to be made at the full replacement cost. Compensation for loss of lands and other assets shall be paid prior to projects implementation with the view to improve the former living standards, income earning capacity and production levels of the affected population. The policy also recognizes that squatters and displaced person without having recognized legal right to be compensated and to be entitled for resettlement assistance in lieu compensation for land. Particular attention shall be given for disadvantaged groups among those displaced, especially those below the poverty line.

World Bank Policy & Regulations: The World Bank (WB) has set a policy and procedures on involuntary resettlement (OP/BP 4.12). The policy addresses the need for the treatment of project impacts, which cannot be avoided. The policy also sets eligibility criteria, resettlement instruments and monitoring, and other provisions.

The objectives of the WB policy include;

- Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.
- Where it is not feasible to avoid resettlement, resettlement activities shall be conceived and executed as sustainable development programs, providing sufficient investment resources to enable persons displaced by the project to share in project benefits. Displaced should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.
- Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

- 3 Ethiopia's policy, legal and administrative framework on land expropriation and compensation payment is consistent with international conventions which Ethiopia is signatory and also with that of African Development Bank and World Bank policy on involuntary resettlement.

8. Institutional framework

Ethiopian Electric Power Corporation: EEPCo through the Ethio-Kenya Power Interconnection project will be the primary responsible body for the implementation of the project. EEPCo is a government organization established in July 1997 with the Council of Ministers regulation No. 18/1997 as a public enterprise corporation. It is established with purpose to engage in the business of producing, transmitting, distributing and selling electrical energy. It is a vertically integrated utility which is the only company active in grid-based generation, transmission and distribution. EEPCo owns and operates power plants (mostly hydropower) in two separate supply systems: the Interconnected System and the Self-Contained System. Organizationally, it is structured under the Ministry of Water and Energy, and operationally it is sanctioned by a Board of Directors.

Ethiopia-Kenya Interconnector Project Office: EEPCo's Project Implementation Unit (PIU) or Ethiopia-Kenya Interconnector Project Office respectively is responsible for the overall project coordination between all involved parties.

Environmental & Social Monitoring Unit (ESMU): EEPCo's Environmental Monitoring Unit (ESMU) is responsible for addressing major environmental and social issues in power sector development works to ensure that power generation, transmission and distribution services are environmentally and socially sound and sustainable. Regarding ESIA and RAP relevant themes, EMU and Project Office both have a major role in the coordination, facilitation and implementation of the RAP as they operate project-related at federal and regional level. EMU and the

Project Office both are responsible for:

- Coordination of preparation and implementation of the RAP,
- monitoring of adverse environmental and social impacts,
- monitoring of compliance of contractors with the technical specifications.

SNNPRS and Oromia National Regional States: Both SNNPRS and Oromia Regional States will play important role in the implementation of this RAP in their respective regions. Both regional states will facilitate the implementation by providing support and guidance to those woreda administrations that are traversed by the interconnection project. Woreda administrations are also legally responsible to allocate land (if available) for those PAPs who have lost their land for the construction of the interconnection and to closely monitor and oversee the implementation of this RAP as presented in the document.

Both Regions EPAs are also responsible to closely monitor and oversee the implementation of this RAP as presented in the document.

Environmental Protection Authority: The Environmental Protection Authority (EPA) was established in August 1995, under Proclamation 9/1995, and is an autonomous government body reporting directly to the Council of Ministers. It has a broad mandate covering environmental matters at federal level. EPA's proclamation sets out the main responsibilities and broad organizational structure, which includes : to establish a system for EIA of projects, policies, strategies, laws and programs and to enforce implementation of this EIA process (i.e. Review EIA reports) and the recommendations which result from it for projects that are subject to Federal licensing, execution or supervision. EPA is also responsible to provide advice and technical support to the regions on environmental matters.

9. Eligibility

AFDB's and World Bank's (OP/BP 4.12) policy on Involuntary Resettlement sets the criteria which are adopted for this RAP. PAPs that are eligible for relocation/resettlement and be able to receive compensation:

- If they have formal legal right to land (including customary and traditional rights recognized by law of the country);
- In case they do not have formal legal rights to land at the time the census but have a claim to such lands or assets - provided that such claims are recognized under the laws of the country or become recognized through a process identified in the resettlement plan
- Those who have no recognizable legal right or claim to the land they are occupying

It is also evident that all affected parties or PAPs may not be eligible for resettlement and there may be encroachers to the ROW or some new inflow of people into the ROW seeking eligibility for compensation. Hence, those persons who encroach on the area after a 'cut-off date' will be subject to expropriation and will not be entitled for compensation. During Public consultations with PAPs and local communities, and also meetings held with local officials, it was confirmed that local authorities agreed to ensure that no person will be allowed to encroach to the ROW after the cut-off date, which is 21 August 2011.

However, during implementation of this RAP each affected Household head or individual person or party that claim entitlement have to prove their ownership through the traditional leaders and legal rights if they obtained them over the immovable to be expropriated in order to qualify as a legitimate owner to receive compensation. Squatters (in urban or rural areas) and encroachers (into community and state forest areas) may be relatively recent arrivals on unused land. If such people arrived before the entitlements cut-off date they are eligible for compensation for any structures, crops or land improvements that they will lose. The government will pay the equivalent amount of relocation/rehabilitation assistance. For squatters who do not depend on agriculture, Woreda officials will identify alternative income restoration options in close consultation with the squatters themselves. Squatters who occupy right of way will be provided with housing or income-earning opportunities elsewhere. Since the rationale is to protect vulnerable groups.

Delivery of Entitlements: Persons affected by land acquisition, and relocation and/or rehabilitation of structures/assets, are entitled to a combination of compensation measures and resettlement assistance, depending on the nature of ownership rights of lost assets and scope of the impact, including social and economic vulnerability of the affected persons. In general terms, the affected persons by the project will be entitled to various types of compensation and resettlement assistance that will help in the restoration of their livelihoods, at least, to the pre-project standards.

10. Valuation of compensation for losses

The principles of valuation of compensation approach adopted in this RAP are as per FDRE proclamation No. 455/2005 and AfDB policy on Involuntary Resettlement. Compensation for land structures, business, fixed improvements and other temporary impacts are based on among other things on market valuation, productivity valuation, negotiated settlements, material and labour valuation, disposition of salvage materials and other fees paid. If relocation of business becomes necessary, access to customers and suppliers will have to be assured. In addition, workers losing employment in the process of relocating will also be entitled to transitional income support be given priority job opportunities during construction. The compensation approach will be determined on the willingness and readiness of owners of a resource to give up their rights.

Compensation for temporary impacts will be calculated on the basis of the following criteria/principles;

- Compensation equivalent to lost income required for the duration of impact,
- Compensation equivalent to lost income required for loss of access,
- Physical restoration of assets (or access) required prior to return,

In addition, PAPs will be entitled to transitional assistance which include moving expenses, temporary residence (if necessary), employment training and income support while awaiting employment and should have an option for full compensation if duration of impact is to exceed two

years. In preparing the valuation average costs will have to be assumed. It should be noted that costs of construction vary from one locality to the other.

AfDB policy recognizes that squatters are also entitled for compensation payment. It should be noted that even squatters have construction costs relative to design, materials employed, workmanship and final finish. However, in the project area there are no squatters that have been identified during the census carried out.

Valuation of Losses: The strategy adopted for the expropriation and compensation of the affected properties / assets follows the Federal Government laws and regulation prepared for valuation and compensation estimate. In addition to FDRE laws and regulations, AfDB policies and Regional Government laws and other supplementary guidelines are considered to achieve replacement cost for the lost assets.

Compensation for lost assets will include the following three steps;

- a) Establishment of compensation committees at each woreda level & kebele level. The woreda & kebele level committee is the only appropriate committee that is closer to PAPs and where actual representation of PAPs is required.
- b) All assets affected by the project will be assessed at a at full replacement value (replacement cost in the local market).
- c) Compensation rates will be established for each of the affected properties and assets expropriated due to the construction works on the basis of the current market value.

Valuation/Compensation of crops lost from permanent dispossession of Agricultural land: The principle for permanent loss of agricultural land is that it should be compensated with land for land compensation (or land for land replacement) in those areas where land is available for replacement. In the extent at which the agricultural land lost cannot be replaced, the principles for monetary compensation will apply.

Cash compensation is paid for loss of crops and trees found on permanently and temporarily lost agricultural land and acquired for the construction of the transmission line. The compensation rates for loss of trees and crops from lost agricultural land are established by the woreda agriculture and rural development office.

The principle of compensation also follows that of income restoration of PAPs. According to the five year average crop budget and gross income is calculated and the proportion of income equivalent to land loss is determined. In the case of fruit trees, the calculation has to take into account a major interruption of the income series after a tree has reached its economic limit of life and a new tree planted instead will have reached its fruit bearing age.

Valuation/Compensation for crop (annual and perennial) loss from temporary dispossession of Agricultural land: The project will dispossess agricultural land on temporarily basis for use as storage, access road and other activities. The compensation to be made for the amount of crop obtained from temporary loss of agricultural land will be calculated by identifying; average price per crop type (five year average price for total loss); land type (irrigated and non-irrigated) and size for each type of crop; average production per hectare. The average net income earned from one hectare

of land can be calculated according to a farm budget by using local market prices, based on expertise given by the agricultural representative of the concerned Woredas or Central Statistical Agency's (CSA) price index. The final compensation payment will be calculated and paid by the compensation committee according to the five year average annual income of the PAP. Compensation for trees will take into account the distinction between various types of trees and their economic values; fruit trees versus non-fruit trees etc. Fruit trees will be compensated for the value of lost production until another tree comes to the same stage of productivity.

11. Implementation schedules

There will be a number of crucial and important activities to be performed to make the physical relocation of the people under this project possible. Activities will be undertaken either through the direct involvement of the Woreda administration offices and compensation (or property valuation) committees. Assuming that there are no hurdles, the tentative time schedule within which the compensation payment will take place is proposed to be 6 -12 weeks. All the compensation payments, relocation of PAPs could be completed ahead of the civil works if it is implemented as per the plan shown in the RAP.

At each woreda level, an implementation committee composed of a number of professionals such as, agriculture experts and surveyors will be involved in the measuring the size of land and property. The involvement of the different experts will assist and speed up in the day-to-day task of the valuation of the affected assets. The Implementation Committee will have the mandate, authority to ensure the proper implementation as per the RAP, assess the timely payment of compensation to the PAPs and other support mechanisms. The committee will report directly to the Woreda Administration offices and to Ethio-Kenya interconnector project office.

Table 4 Proposed Time Schedule for Implementation of RAP on Quarterly Basis

Activities	2012				2013				2014			
	Quarter				Quarter				Quarter			
	1	2	3	4	1	2	3	4	1	2	3	4
Disclosure of RAP												
Re-evaluation of assets and properties												
Re-activating all the three Committees established at each woreda level												
Property valuation committee reviews the list of PAPs by woreda												
Property valuation committee reviews impacts and costs per woreda												
Resettlement/Implementation committee conducts education and awareness creation about RAP procedures and compensation												
PIU carries out Stakeholder Consultations on the implementation of RAP												

Compensation payment made for all affected properties and assets												
Skills training identified & organized for PAPs that require it												
Grievance redress committee addresses complaints and grievances raised by PAPs and ensures that appropriate measures are taken												
Monitoring and Evaluation												
Preparation of completion report by all three committees and PIU												

12. Costs and Budget

An itemized budget will be prepared for the implementation of RAP including compensation. The RAP specifies the mechanisms for transferring and channeling funds to responsible organizations and agencies, for disbursement to PAPs. Financial resources to carry out the compensation and re-housing plans for PAPs will be made available by EEPCO when and where required and construction plan will be prepared in concert with relocation plans. The cost and budget to be prepared will include compensation for loss of different types of assets and properties, for income restoration, transportation costs and contingencies. The budget requirement for the different institutions and compensation committees will be prepared on the task and responsibility of each organization. The Ethio-Kenya project office will be responsible to plan, administer and oversee the resettlement and compensation process and to establish Compensation committee and for the implementation of this RAP at each Woreda level.

Budget requirement: The total amount of compensation estimate, which includes direct cost for PAPs and administrative costs, was estimated to be Birr 237,592,397 (or USD13,576,708.40 at exchange rate of 1USD = 17.5 Birr). These costs will be updated for current full replacement costs.

13. Monitoring & Evaluation

Monitoring and evaluation is an integral part of this RAP and will oversee re-establishing process of the Project Affected Person (PAP). It will be a compliance monitoring and this will assist to follow the type of measures incorporated in RAP documents, and the extent to which on these matters, as set out in the RAP, are complied with. It is the objective of EEPCO to use lessons from the monitoring and evaluation results to enhance the preparation and implementation of future resettlement action plans. The monitoring and evaluation process will assess the implementation of the project and ensure that it is carried out as per the plan and as per the requirements of FDRE laws, policies and guidelines. RAP reports indicate the arrangements for monitoring of resettlement activities by the implementing agency, supplemented by independent monitors as considered appropriate by the donor, specially the African Development Bank for this particular project. This is to ensure complete and objective information; performance monitoring indicators to measure inputs, outputs, and outcomes for resettlement activities; involvement of the PAPs in the monitoring process; evaluation of the impact of resettlement for a reasonable period after all resettlement and related development activities have been completed; using the results of resettlement monitoring to guide subsequent implementation.

Internal Monitoring: The internal monitoring of the RAP activities will be carried out by EEPCO's Environmental Management unit in consultation with the Project office & Woreda administration office by establishing appropriate and measurable monitoring indicators. Woreda administration offices will produce a report regarding their accomplishments and submit to the project office and also to their respective regional Governments. The report will inform the client about the accomplished compensation process and make the site is ready for the construction of the transmission line.

External Monitoring and Evaluation: The external monitoring and evaluation will be done in a predictable manner and period. The Federal EPA and the Regional EPAs will be responsible for the external monitoring of the RAP. Both the Federal and Regional EPA's have significant role in the external monitoring and evaluation of the RAP. The objective of the external monitoring and evaluation, which is also a post resettlement assessment will be done by an Independent consultant (or an NGO) commissioned by EEPCO, to ensure that the project affected persons have secured and able to maintain at least their livelihood.

Hence, at the end of all expropriation/compensation operations a household survey will be carried out to evaluate the impacts of the resettlement and other implemented social mitigation measures. During the survey, Woreda and Kebele level administrations will be consulted to provide their assessments of the impacts of the mitigation measures applied. After completion of the resettlement operations, it is expected that livelihood of PAPs shall be better than prior to the resettlement. Therefore, resettlement operations need to be monitored as regard performance and compliance with the set goals. The evaluation report will be used as a planning instrument to correct pending issues and suggest a post-project monitoring period in the aim to ensure that PAPs have not been subject to impoverishment induced by the project.