

**LAKE TURKANA WIND  
POWER LIMITED**



**DRAFT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)  
REPORT FOR THE PROPOSED STRENGTHENING OF LAISAMIS- SOUTH  
HORR (D371) AND SOUTH HORR- LOIYANGALANI (C77) ROAD**



**VOLUME IV**

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## ABBREVIATIONS AND ACRONYMS

AIDS	-	Acquired Immune Deficiency Syndrome
ASALs	-	Arid and Semi-arid lands
ASL	-	Above Sea Level
CBOs	-	Community Based Organisations
DDPs	-	District Development Plans
DO	-	District Officer
DSDO	-	District Social Development Officer
DWO	-	District Water Officer
EA	-	Environmental Audit
EIA	-	Environmental Impact Assessment
EHS	-	Environmental Health and Safety
ESMP	-	Environmental and Social Management Plans
EMCA	-	Environmental Management Coordination Act
EMP	-	Environmental Management Plan
FDG	-	Focus Discussion Groups
FPE	-	Free Primary Education
GDP	-	Geo-Data-Base
GIS	-	Geographical Information System
GoK	-	Government of Kenya
GPS	-	Geographical Positioning System
GRC	-	Grievance Redressal Committee
GRM	-	Grievance Redressal Mechanism
Ha	-	Hectares
HIV	-	Human Immuno-deficiency Virus
Hr	-	Hour
ICT	-	Information Communication Technology
IFC	-	International Finance Corporation
KeNHA	-	Kenya National Highways Authority
KeRRA	-	Kenya Rural Roads Authority
Km	-	Kilometres
KFS	-	Kenya Forest Service
KRB	-	Kenya Roads Board

KURA	-	Kenya Urban Roads Authority
KWS	-	Kenya Wildlife Service
MoH	-	Ministry of Health
MoR	-	Ministry of Roads
NEAP	-	National Environment Action Plan
NEMA	-	National Environmental Management Authority
NGOs	-	Non-Governmental Organizations
NRT	-	Northern Rangeland Trust
PAPs	-	Project Affected Persons
PRSP	-	Poverty Reduction Strategy Paper
RMLF	-	Road Maintenance Levy Fund
RPF	-	Resettlement Policy Framework
STIs	-	Sexually Transmitted Infections
TOR	-	Terms of Reference

## **EXECUTIVE SUMMARY**

### **THE PROJECT OVERVIEW**

Lake Turkana Wind Power Limited (LTWP) Ltd has been granted permission by the Ministry of Roads to strengthen identified weak sections of the 195 km of the Laisamis- South Horr (D371) and South Horr-Loiyangalani Road (C77). The road is to be strengthened to a standard engineered gravel for the purpose of easing the transportation of materials and equipment to the project staging area during construction of a proposed wind farm at Loiyangalani. According to the existing road classification and the new institutional arrangement in the road sector, the 131 km Laisamis-South Horr (D371) section fall under the jurisdiction of the Kenya Rural Roads Authority (KeRRA) while the 64 km South Horr-Loiyangalani section fall under the Kenya National Highway Authority (KeNHA). Thus administration and execution of the work will be carried out in close collaboration of these statutory bodies and the Ministry of Roads which has granted the authority to LTWP to execute the work. In order to contribute towards sustainable development, an Environmental and Social Impact Assessment (ESIA) is necessary for the proposed road construction.

### **PROJECT LOCATION AND SCOPE**

The proposed work is located in Marsabit South District which was hived out of the bigger Marsabit district in 2008. The road is an existing road and branches off from the main A2 Isiolo-Moyale road at Laisamis as D371 in Northerly direction and passes through various centres which include Ngurunuit, Illaut and South Horr. From South Horr the road becomes C77 after joining the main road from Baragoi and moves on through Kurungu all the way to Loiyangalani. The entire stretch is a murrum road that is marked by low lying terrain lying between numerous hills and dry sand river beds. In general the road is in a motorable status. However, sections of the road cut across the dry sand river beds and are extensively damaged and are unstable for heavy vehicular loading.

The rehabilitation work entails light and heavy excavation, gravelling, reconstruction of some sections, light grading and improvement of drainage structures. The main output of the work is a motorable standard engineered gravel road with a gravel running surface, road cross drain comprising of culverts and perforated drifts. The geometrics of the existing road will also be improved by widening of existing horizontal curves and improvement of vertical curves. The road strengthening project is estimated to cost about KShs1.2 billion putting the average cost to be KShs 6.2 million per kilometre. The actual construction is expected to take one year.

### **TERMS OF REFERENCE**

LTWP Ltd has contracted Eng. Prof. B. N. K. Njoroge, a registered EIA/EA Lead Expert to carry out an ESIA study on the proposed strengthening/rehabilitation of Laisamis – South Horr – Loiyangalani road in accordance to NEMA regulations and the IFC guidelines. The Terms of Reference for the ESIA are:

- Description of the road furniture with regard to its geographic, ecological and social.
- Review the policy, legal and administrative framework within which the assessment is carried out, including Kenyans environment protection regulations and IFC guidelines on social and environmental suitability and sustainability of road construction projects.
- Concise description of the baseline environment of the study area with regard to relevant physical, biological, socio-economic and labour conditions including any anticipated changes before the start of the project.
- Determination of the social and environmental impacts and risks (including labour, health and safety) of the proposed rehabilitation/strengthening works. The assessment should also propose relevant and appropriate mitigation and management measures.
- Development of Action Plan and Management System which describes and prioritises the actions needed to implement mitigation measures, corrective actions and monitoring measures

necessary to manage the impacts and risks identified in the Assessment. The management system must incorporate operational policies, procedures and practices that will be followed when carrying out the mitigation measures.

- Development of monitoring plan that gives specific description and technical details of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements and definition of thresholds that will signal the need for corrective actions as well as deliver a monitoring and reporting procedure.
- Consultation with project affected communities in a structured and culturally appropriate manner. The consultation should be free, prior, informed and apply to all stages of the project.
- Compilation of the Environmental and Social Assessment Report for submission to NEMA for approval.

## **ANALYSIS OF ALTERNATIVE ROUTE**

The alternative to the proposed Laisamis -Khorr- Ilaut-South Horr - Loiyangalani road is Marsabit – Kargi – Loiyangalani road. The Marsabit – Kargi – Loiyangalani route branches off from the main Isiolo – Marsabit 10 km from Marsabit town and runs 218 km in a westerly direction. The road has reasonable horizontal geometrics with long straight sections and curves with large radii. The road however has unfavourable vertical curves, is poorly drained although in most sections the alignment is free draining. There are a few drifts located at seasonal river beds. In addition, there is no guarantee for the availability of adequate construction materials since the alignment soils are mostly loamy sands. Strengthening of this route will be more expensive than the proposed Laisamis – South Horr – Loiyangalani. The Kargi route would also lengthen the haulage distance of the wind farm equipment by an additional 50 kilometres, the distance to the takeoff point from Isiolo on the Isiolo-Marsabit road. The Kargi route in addition did not show evidence of availability of adequate water needed during construction stage. Thus, the Laisamis-Khorr-Ilaut-South Horr-Loiyangalani was selected for strengthening.

Air and railway transportation were not found feasible alternatives as the area is not served by railway line or large cargo airports.

## **PERFORMANCE STANDARDS, LEGAL AND INSTITUTIONAL FRAMEWORK**

Kenya has a policy, legal and administrative framework for environmental management. Under the frame work, the National Environment Management Authority (NEMA) is responsible for ensuring that environmental impact assessments (EIA's) are carried out for new projects and environmental audits on existing facilities as per the Environmental Management and Coordination Act 1999. The financing institutions such as the World Bank through its IFC branch have also developed guidelines for carrying out an Environmental and Social Impact Assessment (ESIA) for new development. These guidelines are generally known as the Performance Standards and the Environmental Health and Safety (EHS) guidelines. The key objective of the Kenyan policies and IFC guidelines is to ensure protection of environment, Community and Occupational Health and Safety.

The aim of both the Kenyan environmental policy and the IFC guidelines is to ensure that projects are developed in manner that is socially responsible and reflect sound environmental practices. Therefore the risks and impacts to the environment and communities within the project area must be avoided and if avoidance is not possible, mitigation measures must be developed. In addition, IFC guidelines also aim at ensuring that affected communities are appropriately engaged. This is normally done through public consultation where the affected communities express their views on project risks, impacts and mitigation measures. The client then considers and responds to these concerns and opinions. After carrying out an ESIA, management policies should be established that consist of a combination of operational policies, procedures and practices for addressing

identified impacts and risks. Where specific mitigation measures and actions necessary for the project to comply with applicable laws and regulations are identified, an action plan will be prepared.

The protection of basic rights of workers is necessary in a project. They should be provided with safe and healthy working conditions. In the proposed Pollution prevention and control techniques and practices during the design, construction, operation and decommissioning of the project must be applied. The project-specific pollution prevention and control techniques applied during the project life-cycle will be tailored to the hazards and risks associated with project emissions, wastewater and solid management. Measures must be put in place in the proposed project to avoid or minimize risks to and impacts on the health and safety of the local community during the project cycle. Involuntary settlements necessitated for in the proposed project must be compensated for. In this project, design has been done to ensure that the road passes through the road reserve. The proposed road passes through a vast area with wildlife and indigenous plants. Biodiversity and natural resources must be conserved. The proponent of the proposed project should ensure that the development process fosters full respect for the dignity, human rights, aspirations, cultures and natural resource-based livelihoods of Indigenous Peoples. Existing cultural heritage in the project area must be protected.

## **PUBLIC CONSULTATION**

Public Consultation of the project is a requirement for an environmental assessment process. The aims of public consultation are disclosure of planned activities of the proposed project and impacts identified through the Environmental and Social Impact Assessment; identification of concerns and grievances from interested and affected people; harnessing of local expertise, needs and knowledge from interested and affected people and response to grievances and enquiries of affected people.

The key stakeholders identified in this project were;

1. Area sub chief, chief and District Officers
2. Forester from Kenya Forest Service (KFS)
3. Senior Warden from Kenya Wildlife Service (KWS)
4. Town clerk and treasurer from Marsabit County Council
5. Regional manager from Kenya Rural Roads Authority (KeRRA)
6. An engineer from Kenya National Highway Authority( KeNHA)
7. The District Water Officer
8. Affected communities living along the road alignment.

The approach adopted included public meetings, administration of questionnaires and discussions with the key stakeholders.

Through the public consultation, some of the key concerns raised were;

- There should be adequate and timely compensation of the affected people who will be required to relocate to pave way for the road. The affected persons should be compensated before construction begins. However, the road passes through the existing road reserve and thus compensation will not be anticipated.
- The contractor should make use of locally available resources such as casual labourers, construction materials as well as hired vehicles.
- The contractor should work closely with the local communities', local provincial administration, village elders, area leaders like chiefs, sub chiefs and other community opinion leaders.
- The Contractor should find technical solutions for preserving the available water facilities and sources especially the ones found very close to the road.
- The Contractor should preserve and/or improve accesses to any available feeder roads.
- Cutting down of trees should be avoided as much as possible to avoid destruction of indigenous trees as well as habitats. The Contractor should also plant trees after construction works.

- The communities expressed concerns on the possibility of destruction of their grazing land and pastures for their animals during upgrading of the road. This should be kept to a minimum

## **PROJECT IMPACTS**

### **Construction Impacts**

The positive impacts that were identified during the construction of proposed road were;

1. Creation of employment for the skilled and semiskilled locals such as sociaeconomists, trainers, casual labourers for road construction and cooks and cleaners at the construction camps and casual workers
2. Flourishing of businesses mainly at trading centres located along the road due to increased demand of basic commodities and services such as food, accommodation and construction materials.

The negative impacts identified during the construction of the proposed road are

1. Increased soil erosion due to excavation works along the road alignment as well as improper drainage of runoff from the road to lower catchment areas. This is likely to be of high magnitude in the steep areas.
2. There may be pollution of air, soils, crops and water sources along the road profile resulting from exhaust and engine emissions from vehicles and equipments used during the construction.
3. The proposed road realignment at the road junction and acquisition of borrow pits located on private land are likely to result into loss of land. This may also be caused by temporarily traffic diversions on private land where the road reserve is not adequate.
4. There may be increased solid and liquid waste which may lead to pollution of air, land and water sources in the area.
5. The road construction works may also lead to increases cases of sexually transmitted due to influx of workmen who are associated with irresponsible behaviours.
6. There is likely to be destruction of biodiversity along the road profile, access routes to the borrow pits and the borrow pit sites.
7. The noise from vehicles and equipment used during construction may scare away the wild animals.

### **Implementation Impacts (Operational phase)**

The positive impacts identified when the road will be under use are;

1. Increased business opportunities due to opening up of the area as well as demand for basic commodities. The road may lead to development of trading centres as well as improvement of existing ones in terms of basic needs such as housing, water and sanitation facilities.
2. The water available to the surrounding communities will increase since the water sources developed by the contractor for construction works will be handed over to them.
3. There will be enhancement of industries in the area such as livestock and fishing due to reduce transport costs and time to market centres.
4. There may also be limited employment opportunities for people who will be involved in maintenance of the road.
5. The road may also open up the area to tourists since the road traverses a forest that has are indigenous and wild animals.
6. The road will also ensure that the community along the road alignment get relief which they mainly rely on.

The negative impacts anticipated during operation of the road are,

1. Exhaust and engine emissions from vehicles used for transportation of materials and equipments may cause air pollution, which can have an impact on public health, crops and

- vegetation along the road, soils and water sources. Regular servicing of these vehicles may reduce the emissions.
2. Increased traffic along this route may lead to accidents along the road network. The designs should make provision for bumps in the appropriate places.
  3. The road will be used for transportation of heavy loads to the wind farm. This may lead to development of pot holes along the road. The Contractor must ensure regular maintenance of the road in adequate time.
  4. There may also be increased sexually transmitted diseases especially from the workers and truck drivers who are associated with irresponsible sexual behaviours. Training should continue in the trading centres and in the areas where the workers will be accommodated.

### **Decommissioning Impacts**

#### **Positive Impacts**

1. There will be creation of employment although short lived for locals who will be involved in dismantling the labour camps.
2. The contractor may consider selling off the construction materials such as campsite to community living around the construction camps. This will come at a subsidized rate to the locals.

#### **Negative Impacts**

1. There are likely to be accidents during the dismantling of the road construction camps and burying and making good of borrow pits. Barriers should be put where heavy machinery will be under use to avoid people trespassing. The Contractor should also employ competent people to operate the machines used in order to maintain this to a minimum.
2. During the dismantling works, there is likely to be noise to the households living around the camps. The Contractor should consider putting up the camps in less occupied areas.
3. There will be air pollution from the equipment that will be used during the demolition works from dust. The exhaust fumes from vehicles and equipment used is also likely to pollute the soils, vegetation and water sources around the camp. The Contractor may consider watering the area before demolition work starts.

### **Proposed Mitigation Measures**

The mitigation measures that can be incorporated into the design of the road network, during construction and operation stages of the Laisamis - Loiyangalani road in order to mitigate the negative environmental impacts are;

1. Construction of culverts will be accounted for in the road design so that flow in the rivers and streams is unimpeded, and improved drainage along the project road through side drains. These features must be properly designed and regularly maintained to prevent runoff from accumulating by the side of the road
2. Scour checks and gabion mattresses will be introduced in the side drains at specified intervals to reduce the impact of runoff. Grouted stone pitching and rock fill gabion works will be necessary to protect culvert inlets and outlets and control soil erosion. Embankments should be planted with shrubs and grasses to reduce erosion of road embankments. Gravel sites must be made good and indigenous trees and shrubs planted along the road.
3. Dust emissions can be reduced during construction by dumping the gravel pit area, and occasional spraying with water along the deviation routes or earth along the road section. In the case of deviations, slowing the speed of traffic by using bumps and/ or clearly marked road signs may contribute to reducing dust levels. Haulage routes will need to be identified and maintained by watering to minimize the impact of dust.

4. Vehicles to be used during construction must be regularly maintained. Proper disposal of oil drained from Contractor's trucks and lorries and used oil filters should be done sensibly with the Resident Engineer approving method of disposal.
5. The area to be excavated should be cordoned off to avoid accidents both to human and animals. Gravel pits must be landscaped and reinstated or back-filled with overburden if the depth of the overburden is sufficient to allow for this.
6. Blasting of rock outcrops along road alignment should be done during the day, and residents in the vicinity of the area being blasted should be suitably warned of blasting activities, including the time and date that the blasting is to take place.
7. People should be informed of intended roadwork activities, including likely dates for commencement and completion of works. Warning signs should also be introduced on the approach to market/settlement areas.
8. Alternative water sources for the project must be developed such as boreholes to avoid stressing the already scarce commodity. The water quality supplied to the construction camps must meet the WHO regulations on drinking water.
9. The camp should not be located at isolated points along the road where they will attract periphery businesses, and provide a nucleus for the growth of unplanned settlements.
10. A central canteen for the workforce at the construction camp would contribute towards the general good health in the camp as kitchen wastes can be disposed of in an organized manner and hygiene can be monitored.
11. Workmen should be provided with suitable protective gear (such as nose masks, ear muffs, helmets, overalls, industrial boots, etc.), particularly during blasting, drilling, while working on the asphalt, and handling tar. There must be a fully equipped first aid kit and a Health Safety and Environment Officer who has first aid training and knowledge of safety regulations. In addition, the Contractor must have workmen's compensation cover.
12. The location of latrines in the camp should preferably be downhill of potable water sources, or 50 m to 100m from any water body. Communal bathrooms/ lavatories with soak away pits are less polluting option, but would be slightly more expensive.
13. Sexually Transmitted Diseases (STDs) awareness campaigns should be conducted in the camp as well as in the settlements/ trading centres.
14. Road safety should be observed through use of signs and especially near market centres.
15. All the people who live along the road as well as affected communities will be alerted of the improvement works through public consultation.

## **RECOMMENDATIONS AND CONCLUSIONS**

### **Recommendations**

Following the impact analysis presented in the previous sections, here below are the recommendations:

- The Proposed project to be implemented in compliance with the relevant legislation and planning requirements. The proponent must ensure that the impacts are kept to a minimum level
- A clear environmental and social management plans have been developed. The proponent should ensure the implement the mitigation guideline provided in the EMP in collaboration with the Contractor. The Resident Engineer for the project needs to make progress reports indicating the implementation of the plans.
- The groundwater exploration has indicated limited sources of water with low yields with daily estimate of 130 m<sup>3</sup>. The amount required for construction and use by people on site will be in the region of 450 m<sup>3</sup>/d. Thus there is required investigation of additional water sources to meet the daily demand as well as for the different uses in relation to quality consideration.

## **Conclusion**

From the foregoing the following conclusions are made:

- No serious and adverse objections were received from the communities occupying the entire corridor. The road will also lead to economic improvement to people living along the road profile. It is therefore considered suitable for the local area.
- The proposed project has actively involved the key stakeholders who did not object the development. Thus the success of the implementation project can be guaranteed.
- The proposed project does not pose adverse socio-economic impacts and is an initiative towards improving accessibility in the area. Therefore, it is a project worth to be supported by donor agencies.

In conclusion, the study recommends timely implementation of the project with strict adherence to the proposed Environmental Management and Social Management Plans. The project benefits have been identified to far outweigh the negative impacts for which a mitigation plan has been prepared. Further, the proponent has carefully considered and applied acceptable local and international standard/regulations at all stage of project planning and would thus qualify for donor funding.

# **CHAPTER 1: PROJECT BACKGROUND**

## **1.1 Introduction**

Lake Turkana Wind Power Limited (LTWP) is an Independent Power Producer (IPP) and is proposing to generate 300MW electric power by developing a wind farm at Loiyangalani in Marsabit District to be connected to the national grid through a 400kV transmission line at Suswa. LTWP Ltd has conducted the requisite studies entailing the Environmental Impact Assessment of the proposed wind farm, transmission line and associated substation. These reports have been submitted to the National Environmental Management Authority (NEMA) and duly approved. The wind project herald a new dawn in the energy sector by its sheer size and the amount of renewable energy to be generated which will be approximately 25% of the country's installed capacity. In addition the power project is an initiative in the developing of cheap green renewable energy source in the country in the face of unreliable hydro power due to poor rainfall pattern and the more expensive and environmental unfriendly thermal power alternatives.

The location of the wind farm is about 236 km from Laisamis town. The access to the farm from Isiolo is through Laisamis – South Horr – Loiyangalani road. This is a murram road that is marked by low lying terrain juxtaposed between numerous hills and dry sand river beds. The sections of the road cutting across the dry sand river beds are extensively damaged and are unstable for heavy vehicular loading especially during the rainy seasons.

## **1.2 Justification of the project**

The envisaged construction work of the wind farm will necessitate extensive hauling of materials and equipment to the site. The key equipment including wind turbines and vanes will be imported through the Mombasa port and transported by road through Nairobi, Isiolo, Laisamis, South Horr to the project staging area at Selima near Loiyangalani. The Mombasa - Nairobi – Isiolo- Laisamis section is fairly motorable and in good condition. However, some sections from Laisamis – South Horr (D371) and South Horr- Loiyangalani (C77) of about 190km long is extensively damaged especially through the dry river beds and are unstable for heavy vehicular loading. It is for this reason that LTWP requested authority from the Ministry of Roads in 2009 to strengthen identified weak sections of the road to a standard engineered gravel road to enhance the transportation of the said equipment and materials

## **1.3 Objectives of the ESIA**

In order to contribute towards sustainable development, an Environmental and Social Impact Assessment (ESIA) is necessary for any new development. The objectives of the ESIA is to identify and evaluate the significance of biophysical and socio-economic impacts of the project, suggest ways to avoid or if avoidance is not possible to mitigate any negative impacts, to optimise on the positive impacts, to ensure that affected communities within the project's area of influence are appropriately engaged and to provide recommendations to manage the impacts. In order for the ESIA to contribute in this positive manner, it needs to start in the early stages of planning. This will ensure that the management of social and ecological risks, their potential impacts as well as the costs of the development are minimised, and that the benefits are enhanced throughout the cycle of the project.

## **1.4 Project Location**

The proposed work is located in Marsabit South District which was hived out of the bigger Marsabit district in 2008. The road is an existing road and branches off from the main A2 Isiolo-Moyale road at

Laisamis as D371 in Northerly direction. It passes through various centres which include Ngurunuit, Illaut and South Horr. From South Horr the road becomes C77 after joining the main road from Baragoi and moves on through Kurungu all the way to Loiyangalani as shown in Figure 1. The scope of the envisaged work involves realignment of the road where necessary such as in highly settled areas, strengthening of approximately 190km of the road to a standard engineered gravel road and construction of drainages.

According to the existing road classification and the new institutional arrangement in the road sector, the 131 km Laisamis-South Horr (D371) section falls under the jurisdiction of the Kenya Rural Roads Authority (KeRRA) while the 64 km South Horr- Loiyangalani section falls under the Kenya National Highway Authority (KeNHA). Thus administration and execution of the work has to be carried out in close collaboration of the two statutory bodies and the Ministry of Roads which has granted the authority to LTWP to execute the works as shown in the letter of authority attached in Annex 1.

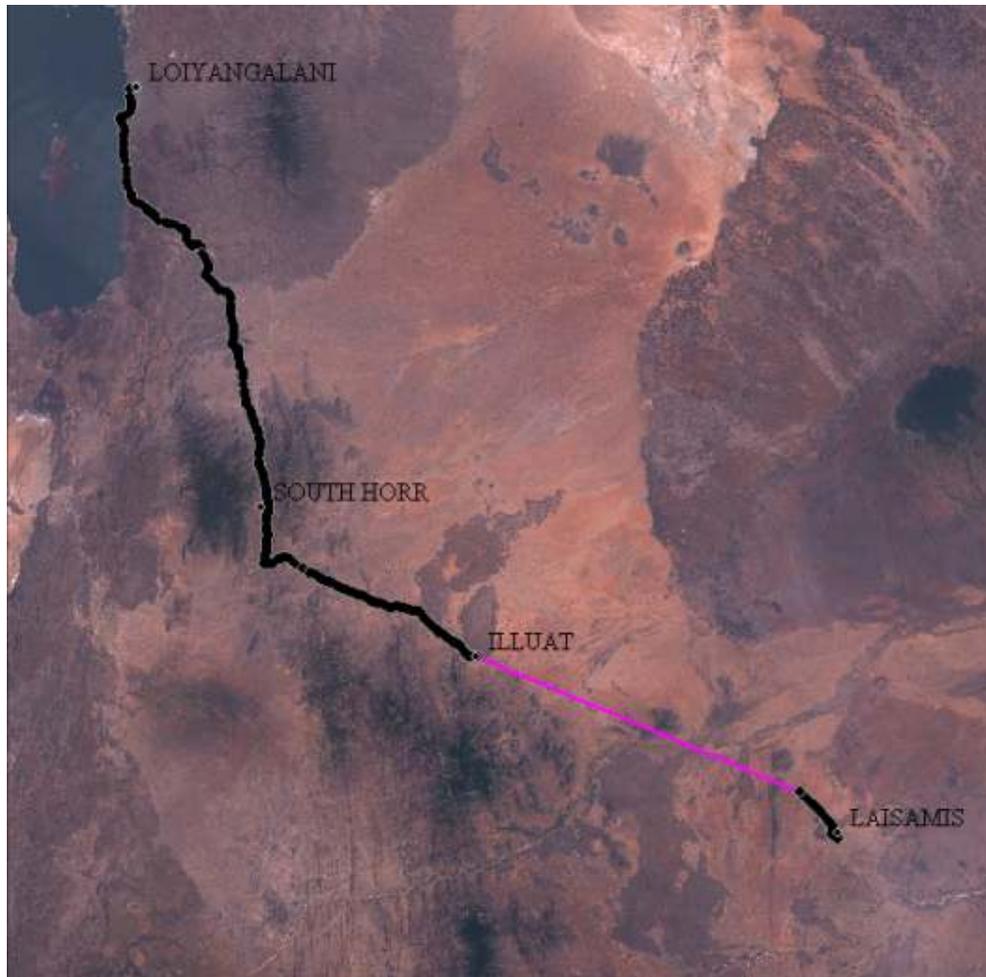


Figure 1: Route plan of the proposed road works (Laisamis – Illuat – South Horr - Loiyangalani)

### **1.5 Terms of Reference (TOR)**

The proposed strengthening/rehabilitation of the road falls under Schedule 2 of projects in the Environmental Management Coordination Act (EMCA, 1999) that requires Environmental and Social Impact Assessment (ESIA) to be carried out. The project will be funded by donor funds and thus the ESIA will be conducted in accordance to the IFC guidelines Social and Environmental Sustainability of any development projects. LTWP Ltd has therefore contracted Eng. Prof. B. N. K. Njoroge, a registered EIA/EA Lead Expert to carry out the study. The ToR for the ESIA are:

- Description of the road furniture with regard to its geographic, ecological and social context including general layout of facilities and maps at appropriate scale where necessary
- Review the policy, legal and administrative framework within which the assessment is carried out, including Kenyans environment protection regulations and IFC guidelines on social and environmental suitability and sustainability of road construction projects.
- Concise description of the baseline environment of the study area with regard to relevant physical, biological, socio-economic and labour conditions including any anticipated changes before the start of the project.
- Determination of the social and environmental impacts and risks (including labour, health and safety) of the proposed rehabilitation/strengthening works. The assessment should also propose relevant and appropriate mitigation and management measures.
- Development of Action Plan and Management System which describes and prioritises the actions needed to implement mitigation measures, corrective actions and monitoring measures necessary to manage the impacts and risks identified in the Assessment. The management system must incorporate operational policies, procedures and practices that will be followed when carrying out the mitigation measures.
- Development of monitoring plan that gives specific description and technical details of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements and definition of thresholds that will signal the need for corrective actions as well as deliver a monitoring and reporting procedure.
- Consultation with project affected communities in a structured and culturally appropriate manner. The consultation should be free, prior, informed and apply to all stages of the project.
- Compilation of the Environmental and Social Assessment Report for submission to NEMA for approval.

## **CHAPTER 2: PERFORMANCE STANDARDS, LEGAL AND INSTITUTIONAL FRAMEWORK**

### **2.1 Introduction**

Kenya has a policy, legal and administrative framework for environmental management. Under the frame work, the National Environment Management Authority (NEMA) is responsible for ensuring that environmental impact assessments (EIA's) are carried out for new projects and environmental audits on existing facilities as per the Environmental Management and Coordination Act 1999. Projects subject to this requirement are specified in the Second Schedule of the EMCA, 1999.

The financing institutions such as the World Bank through its IFC branch has also developed a policy on Social and Environmental Sustainability that strives for positive development outcomes in the private sector. In order to achieve this, it has set up Performance Standards as well as General and Industry specific Environmental Health Safety guidelines against which projects are reviewed. These guiding principles are referred to as the Equator Principles. The thrust of the Equator Principles is to ensure that projects under financing are developed in a manner that is socially responsible and reflect sound environmental management practices.

ESIA's are carried out in order to identify potential positive and negative impacts associated with the proposed project with a view to taking advantage of the positive impacts and developing mitigation measures for the negative ones. The ESIA also ensures that baseline data for the proposed project is collected. This is then used for monitoring and evaluating the impacts during the project cycle. It is a requirement by both NEMA and IFC that a clear management plan and action plan that describe and prioritise the actions needed to implement mitigation measures. In this Chapter, a review of regulations that guide an ESIA on a road project will be done.

Environmental auditing (EA) is a tool for environmental conservation and has been identified as a key requirement for existing facilities to ensure sustainable operations with respect to environmental resources and socio-economic activities in the neighbourhood of the facilities. The government has established regulations to facilitate the process on ESIA's and environmental audits. The regulations are contained in Kenya Gazette Supplement No. 56, legislative, Supplement No.31, Legal Notice No.101 of 13<sup>th</sup> June 2003 and Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2009.

### **2.2 Inventory of Kenya Road Policy Framework**

The Kenya Road Policy framework shows that

- i) The main policy initiatives during the first post independence decade involved provision of infrastructure by public sector and development of rural roads using cess funds from sale of rural output;
- ii) The rural access and minor roads programmes have characterized the Kenya Road policy since the second decade, and
- iii) Several policy reforms for road infrastructure development typify the third and fourth decades. The landmarks in the road policy evolution include the formation of the Kenya Roads Board, the introduction of a Road Maintenance Levy Fund (RMLF) and axle –load limits and moves towards increased private participation in all facets of road service delivery.

The impact of Kenya's road policy is demonstrated by the size of the classified roads network, which is approximately 64,000km. It is estimated that there are in excess of 120,000km of an unclassified road network. However, the network's operating condition has suffered from inadequate maintenance, repair and rehabilitation and the fragmentation of the institutional framework within which it is managed.

In previous years, the overall policy framework had not been integrated to promote a positive impact and generate cumulative externalities. It did not provide a balanced approach to strengthening and rehabilitating existing assets on the one hand and constructing new roads and bridges, improving low grade sections and widening roads on the other.

Since 1997, the Minor Roads Programme (MRP) which was the framework under which rural roads were developed and maintained was replaced by the Roads 2000 Maintenance Strategy.

This strategy aims to bring the road network in Kenya up to a maintainable standard, such that future maintenance can be undertaken effectively making optimum use of local resources. Its approach places emphasis on routine maintenance and selective partial rehabilitation for both paved and unpaved roads, in contrast to the traditional approach of construction and rehabilitation. It focuses on a network consideration of maintenance needs rather than a project-oriented system.

### **2.3 Institutional Framework**

One of the strategic policies that the Kenya government has adopted for improving road maintenance is to strengthen institutional framework for roads. A study on road sector institutions was commissioned between 1995 and 1999 with support from the European Union. The objective was to develop an institutional framework within which the management of the entire road network would most effectively be undertaken. In 1998, a Kenya Roads Board (KRB) Bill was drafted for establishing an autonomous, executive roads board to manage the Roads Maintenance Levy Fund (RMLF) and execute maintenance, repair and rehabilitation of roads. The bill was passed by parliament in December 1999 as the KRB Act 1999. The Act outlines the major tasks of the KRB as follows:

- Coordinate implementation of all policies relating to the maintenance, rehabilitation and development of the network;
- Coordinate maintenance, rehabilitation and development of the road network with a view to achieving efficiency, cost-effectiveness and safety
- Administer funds derived from the fuel levy and any other funds that may accrue to the board;
- Determine the financial allocations for road agencies and evaluate the delivery of works through technical financial and performance audits;
- Ensure that all procurement of works is conducted in accordance with the guidelines and criteria set by the board;
- Recommend to the minister responsible for roads the areas for study and research; the specifications, design standards and classification for roads; vehicle types and dimensions for axle-load limits; and road safety measures.

The board provides an institutional framework within which the entire road network is managed and is entrusted with authority to efficiently use KRB funds to develop, rehabilitate and maintain the road network. The KRB Act provides for broad allocation of funds, with 57% going to international, national trunk and primary roads while 24% goes to secondary roads, 16% to rural roads and 3% to KRB operations.

Stakeholders represented in the board include the Institution of Engineers of Kenya, the Kenya National Chamber of Commerce and Industry, the Institution of Surveyors of Kenya, the Kenya National Farmers Union, the Automobile Association of Kenya, the Kenya Association of Tour Operators, the Institute of Certified Public Accountants of Kenya and the Kenya Transport Association. The government is represented by the Ministries in charge of Roads, Transport, Communications, Finance, Local Government and Regional Cooperation.

The successful implementation of the KRB Act is expected to translate into the physical improvement of the road network, improved utilization of the fuel levy funds reduction in vehicle operating costs and travel times, open and accountable procurement of road works and effective financial and technical auditing of road works.

#### **2.4 The Kenya Roads Act No. 2 of 2007**

An Act of Parliament to provide for the establishment of the Kenya National Highways Authority, the Kenya Urban Roads Authority and the Kenya Rural Roads Authority, to provide for the powers and functions of the authorities and for connected purposes According to the Roads Act 2007 enacted by Parliament in July 2007, all roads in the country including those controlled by Local Authorities will now fall directly under the new Authorities when they become fully operational. The Minister for Roads will be responsible for all issues pertaining to roads in the country.

In addition, the Minister for Roads will be the authority in the roads subsector and will coordinate issues like policy, strategy and supervision in chief as well as investment plans for the whole sub-sector including urban roads.

#### **2.5 The Kenya Roads Board Act Cap 408**

This is an Act of Parliament that provide for the establishment powers and functions of the Kenya Roads and for connected purposes. Under the Roads Act 2007 the Kenya Roads Board (KRB) will concentrate on funding of maintenance of all roads including approval of maintenance work programmes, technical and financial audits of works funded by KRB. KRB will remain under the Ministry of Roads and report to the Minister responsible for Roads.

The responsibilities of the three Authorities are:

##### **2.5.1 The Kenya National Highways Authority (KeNHA)**

This authority is the government's implementing agency endowed with the responsibility of managing and maintaining all road works on Class A, B and C roads. In addition to implementation of works, KENHA advises the Ministry of Roads on technical issues such as standards, axle loads, research and development. KEHNA also creates regions and have overall staffing levels of around 400-500 personnel. KENHA reports to the Ministry of Roads that will approve its development budgets while the Kenya Roads Board approves the maintenance budget.

##### **2.5.2 Kenya Rural Roads Authority (KeRRA)**

The authority is responsible for all rural and small town roads, Class D and below including special purpose roads and unclassified roads (currently under County Councils and town councils), also responsible for Forest Department Roads and County Council Game Reserve Roads.

##### **2.5.3 The Kenya Urban Roads Authority (KURA)**

This authority is endowed with the mandate of managing and maintaining all road works on urban roads in cities and major municipalities. KURA also falls under the Ministry of Roads where the Ministry approves its Roads Development budgets. Kenya Roads Board approves KURA's road maintenance budget.

##### **2.5.4 The Kenya Wildlife Service (KWS)**

The KWS is also a roads agency responsible for roads under their jurisdiction as well as access roads allocated to KWS by the Ministry of Roads. KWS report to the Ministry of Roads on development projects while Kenya Roads Board approves its maintenance works. In the recent Government reorganization that created the Ministry of Roads and that of Public Works, the Materials Department,

Mechanical and Transport Department and Kenya Institute of Highways and Building Technology are being transformed into semi-autonomous bodies under the Roads Ministry.

## **2.6 Environmental law in Kenya**

The main environmental law in Kenya is the Environmental Management and Coordination Act No 8 of 1999. The main Objective of this law is to provide for the establishment of an appropriate legal an institutional framework of the management of the environment in Kenya. The act further seeks to improve the legal and administrative coordination of the diverse sectoral initiatives in the field of environment. In addition, the Act harmonizes the sector specific legislation touching on environment. The Ultimate goal is however to provide a framework for integrating environmental considerations into the country's overall socio-economic development.

The Environmental Management and Co-ordination Act (EMCA) No. 8 of 1999 has provisions on EIA studies. Environmental Impact Assessment (EIA) study and Environmental Audit (EA) are legal requirements in Kenya for all projects. Transportation projects including Roads are included in the Second Schedule of the Act, as projects, which must undergo EIA studies in accordance with section 58(1-4) and 68 of the Act. These projects are considered to pose significant potentially negative environmental impacts. Part 3 of the Second Schedule, refers to transportation projects, which include *inter alia*, all major roads and all roads in scenic, wooded or mountainous areas and wetlands.

### **Administration of the Act**

EMCA established two institutions, namely the National Environmental Council (NEC) which is chaired by the Minister for Environment and Natural Resources. The NEC is responsible for formulation of policies, goals, objectives and prioritization for environmental protection. The National Environment Management Authority (NEMA) is charged with supervising and co-ordinating all environmental activities including EIA and EA. The EIA/EA reports are then submitted to NEMA for approval and issuing of license to proceed with construction. Other duties include research, investigations and surveys, education and awareness creation and making of legislative proposals to the Attorney General (AG)

The Act set-ups the National Environmental Management Authority (NEMA) whose objective and purpose is to perform general supervision and coordination over all matters relating to the environment and to be the principal instrument of the Government in the implementation of all policies relating to the environment.

With the introduction of Environment Impact Assessment and Audit Regulations, (2003) issued through the Kenya Gazette Supplement No. 56 of 13 June 2003, the submission of environmental reports became mandatory. According to these regulations no proponent shall implement a project likely to have a negative environmental impact or one for which an Environmental Impact Assessment has been concluded and approved in accordance with these regulations.

## **2.7 The Environment (Impact Assessment and Audit) Regulations 2003**

The Environmental Impact Assessment (EIA) is a critical examination of the effects of a project on the environment. The goal of an EIA is to ensure that decisions on proposed projects and activities are environmentally sustainable. An EIA is conducted in order to identify impacts of a project on the environment, predict likely changes on the environment as a result of the development, evaluate the impacts of the various alternatives on the project and propose mitigation measures for the significant negative impacts of the project on the environment.

The EIA also generates baseline data for monitoring and evaluating impacts during the project cycle as well as highlighting environmental issues with a view to guiding policy makers, planners,

stakeholders and government agencies to make environmentally and economically sustainable decisions. It seeks to minimize adverse impacts on the environment and reduces risks. EIA also identifies measures to mitigate the negative impacts while maximizing on the positive ones.

Environmental Audit (EA) is the systematic documentation, periodic and objective evaluation of activities and processes of an ongoing project. The goal of EA is to establish if proponents are complying with environmental requirements and enforcing legislation. The purpose of EA is to determine the extent to which the activities and programs conform to the approved environmental management plan. A comprehensive EA ensures a safe and healthy environment at all stages of project operations and decommissioning.

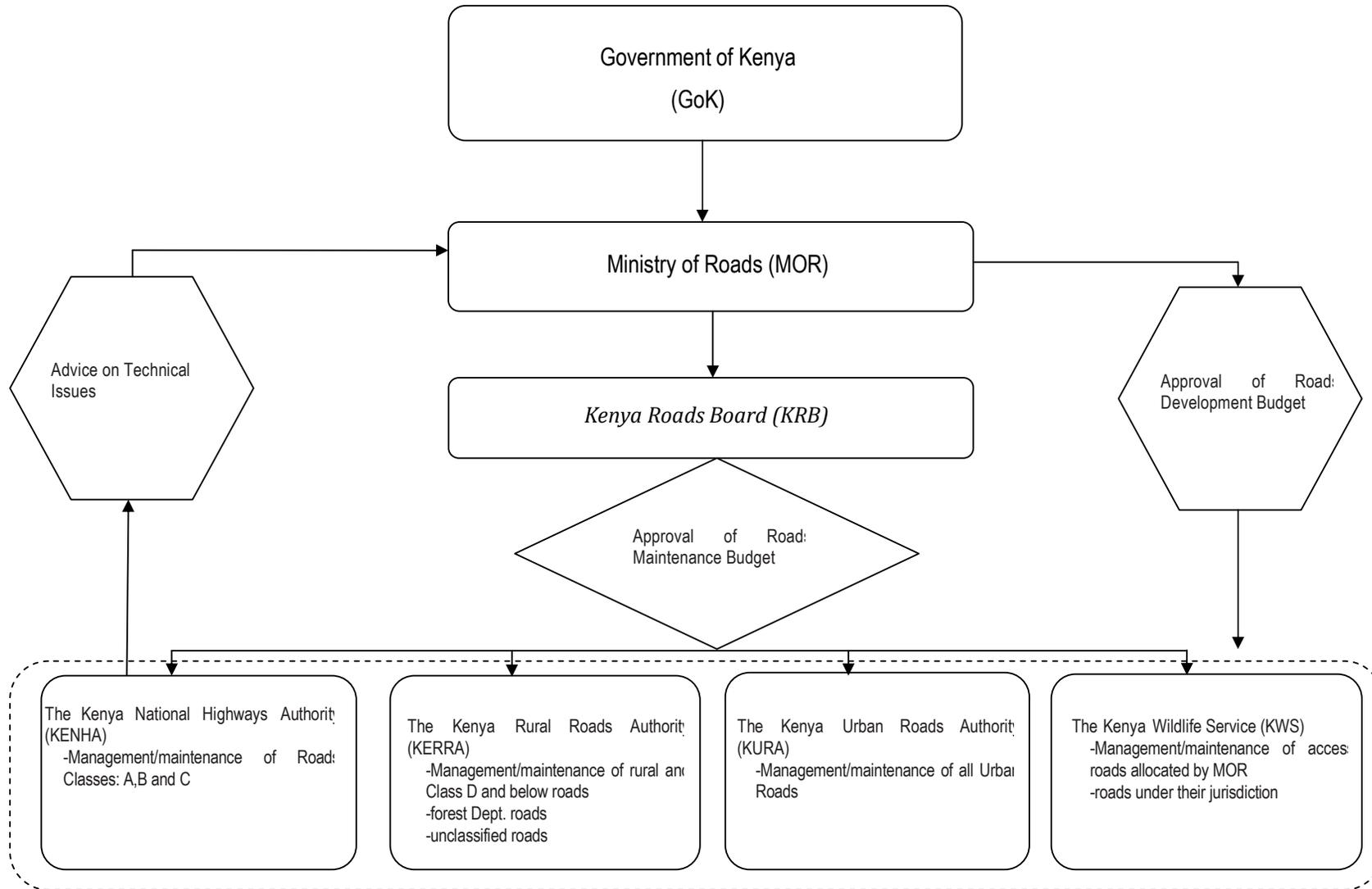


Fig 2: Schematic presentation of the road works Institutional framework

## **2.8 The World Commission on Environment and Development**

The Commission commonly referred to as “the Brundtland Commission” focused on the environmental aspects of development, in particular, the emphasis on sustainable development that produces no lasting damage to biosphere, and to particular ecosystems. In addition, environmental sustainability is the economic and social sustainability. Economic sustainable development is development for which progress towards environmental and social sustainability occurs within available financial resources. While social sustainable development maintains the cohesion of a society and its ability to help its members work together to achieve common goals, while at the same time meeting individual needs for health and well-being, adequate nutrition, and shelter, cultural expression and political involvement.

## **2.9 The Rio Declaration**

Agenda 21 – a programme of action for sustainable development worldwide, the Rio Declaration on Environment and Development was adopted by more than 178 governments at the United Nations Conference on Environment and Development, known as the Earth Summit, held in Rio de Janeiro, Brazil from 3<sup>rd</sup> to 14<sup>th</sup> June 1992. Principle No. 10 of the declaration underscores that environmental issues are best handled with participation of all concerned citizens at all the relevant levels. At the national level, each individual shall have appropriate access to information that is concerning environment that is held by public authorities. States shall encourage and facilitate public participation by making information widely available.

Effective access to judicial and administrative proceedings, including redress and remedy shall be provided. The foregoing discussion is relevant to the proposed development because EMCA demands that public must be involved before any development project that is likely to have adverse impacts to the environment is initiated by a proponent. The Act has further established Public Complaints Committee (PCC) where the issues raised by the public in regard to any proposed development can be addressed.

## **2.10 Sessional Paper No. 6 of 1999 on Environment and Development**

Every person in Kenya is entitled to a clean and healthy environment and has a duty to safeguard and enhance the environment. As envisioned in Sessional Paper No. 6 of 1999 on Environment and Development, Kenya should strive to move along the path of sustainable development to meet the needs of the current generation without compromising the ability of the resource base to meet those of future generations. The overall goal is hence to integrate environmental concerns into the national planning and management processes and provide guidelines for environmentally sustainable development. The policy paper emphasizes that environmental impact assessment must be undertaken by the developer as an integral part of a project preparation. It also proposed for periodic environmental auditing to investigate if developer is fully mitigating the impacts identified in the assessment report.

## **2.11 The National Environmental Action Plan (NEAP)**

The NEAP for Kenya was prepared in 1994. It was a deliberate policy to integrate environmental considerations in the country’s social and economic development process. The integration was achieved through multi-sectoral approach and a comprehensive framework to ensure that environmental management and conservation of natural resources is an integral part of societal decision-making process.

## **2.12 The Poverty Reduction Strategy Paper (PRSP)**

The PRSP has the twin objectives of poverty reduction and economic growth. The paper articulates Kenya’s commitment and approach to fighting poverty, with the basic rationale that the war against poverty cannot be won without the participation of the poor themselves. The proposed project, during and after implementation, will offer jobs to many Kenyans as a way of contributing to this noble objective of reducing poverty.

### **2.13 The Water Act (Act No.8 of 2002)**

This is an Act of Parliament to provide for the management, conservation, use and control of water resources and for the acquisition and regulation of rights to use water; to provide for the regulation and management of water supply and sewerage services; to repeal the Water Act (Chapter. 372 of the Laws of Kenya) and certain provisions of the Local Government Act; and for related purposes.

In addition to this act and in furtherance of the said related purposes the Minister for Water and Irrigation, through the powers conferred to him by Sections 47(6) and 110(1) of the Water Act, 2002, made the Water (Water Services Levy) Regulations, 2008. This sought to impose a levy of one per cent (1%) of all sales of water services to consumers by each water service provider operating under the Act.

The Water Act, in general, gives provisions regarding the ownership of water, institutional framework, national water resources, management strategy, and requirement for permits, state schemes and community projects. Part IV of the Act addresses the issues of water supply and sewerage. Section 59 of the Act states that the National Water strategy shall contain details of:-

- ✓ Existing water services.
- ✓ The number and location of persons who are not being provided with basic water supply and basic sewerage.
- ✓ Plans for the extension of water services to underserved areas.
- ✓ The time-frame for the plan; and
- ✓ An investment programme.

Construction of the road may have a bearing on the water quality due to the presence of hazardous materials used in the process. Disturbance of soil may also lead to erosion which has negative impact on the quality of the natural streams. It is imperative therefore that the execution of the proposed project take utmost care of this valuable resource and in accordance to the Water Act 2002 during construction and operation phases.

### **2.14 Occupational Safety and Health Act 2007**

This Act came into operation in the year 2008. The Act applies to all workplaces where any person is at work, whether temporarily or permanently. The purpose of the act is to secure the safety, health and welfare of persons at work; and protect persons other than persons at work against risks to safety and health arising out of, or in connection with, the activities of persons at work.

Section 19 of the Act provides that an occupier of any premises likely to emit poisonous, harmful, injurious or offensive substances, into the atmosphere shall use the best practicable means to prevent such emissions into the atmosphere; and render harmless and inoffensive the substances which may be emitted.

Section 16 provides that no person shall engage in any improper activity or behavior at the workplace, which might create or constitute a hazard to that person or any other person.

### **2.15 The Traffic Act**

This act reserves the use of the road corridor for road facilities only. Any vegetation grown to protect the road edges should not cause problems during maintenance. Encroachment along the road corridor will have to be checked especially during the operational phase of the project.

### **2.16 Agriculture Act (Chapter 318 of the Laws of Kenya)**

This statute seeks to promote and maintain a stable agriculture, to provide for the conservation of the soil and its fertility and to stimulate the development of agricultural land in accordance with the accepted practices of good land management and good husbandry.

The Minister administering the Act, after concurrence with the Central Agricultural Board and consultation with the District Agricultural Committee, can impose land conservation orders on lands to control cultivation, grazing and clearing. These controls may be necessary to protect the land against soil erosion, to protect fertility, and to maintain catchments. Local authorities are generally empowered to administer these sections of the Act and the District Agricultural Committee is entitled to make regulations relating to these controls.

Agricultural Rules are prescribed under the Act, whereby vegetation clearing in steep slopes areas or adjacent watercourses, without authorization, is controlled.

Much of the vegetation along the road corridor will have to be cleared to pave way for the road construction. However, controlled vegetation clearing will have to be observed by the project proponent and the contractor during the works to avoid excessive vegetation destruction.

### **2.17 Wildlife Conservation and Management Act Chapter 376**

This Act of Parliament deals with the consolidation and amendment of the law relating to the protection, conservation and management of wildlife in Kenya; and for purposes connected there with and incidental thereto.

The act provides that where it is desirable that the present powers relating to the management and conservation of wildlife in Kenya should be amalgamated and placed in a consolidated Service of the Government and the prime objective of the Service should be to ensure that wildlife is managed and conserved so as to yield to the Nation in general and to individual areas in particular, optimum returns in terms of cultural, aesthetic and scientific gains as well as such economic gains as are incidental to proper wildlife management and conservation and which may be secured without prejudice to such proper management and conservation.

For the achievement of that objective, that full account should be taken of the varied forms of land use and the inter-relationship between wildlife conservation and management and other forms of land use.

The Act controls activities within the park, which may lead to the disturbance of animals. Unauthorized entry, residence, burning, damage to objects of scientific interest, introduction of plants and animals and damage to structure are prohibited.

The road traverses vast land inhabited by wildlife of various types. The road construction works will involve some destruction of habitats for some of these animals. The contractor will have to observe that this is minimal and does not affect much of this wildlife.

### **2.18 Land Group Representatives Act (Chapter 287)**

This is an Act of Parliament to provide for the incorporation of representatives of groups who have been recorded as owners of land under the Land Adjudication Act, and for purposes connected therewith and purposes incidental thereto.

The proposed project will affect both private and public land. No group land will be taken by the proposed project.

### **2.19 Land Acquisition Act (Chapter 295)**

The Land Acquisition Act makes provisions for the compulsory acquisition of land for the public benefit. Under the Act the Commissioner of Lands may in writing authorize any person, together with servants and workmen, to enter upon any land specified in a notice and to survey the land and to do all things which may be reasonably necessary to ascertain whether the land is suitable for the purpose for which it may be required.

Where land is acquired compulsorily under this Act, full compensation shall be paid promptly to all persons interested in the land.

In Kenya we have a plethora of enactments all governing land and transactions in land. Thus the substantive land law is to be found in two different statutes while the adjectival land law is to be found in five different statutes not forgetting the customary land law of the various tribes in Kenya.

### **Systems of Substantive Land Law**

There are two systems of substantive land law in Kenya these are:

- The Indian Transfer of Property Act 1882 as amended by the 1959 Amendment Act. This Act sought to amend the law relating to the transfer of property by act of parties, whereby the transfer of property means an act by which a living person conveys property, in present or in future, to one or more other living persons, or to himself, or to himself and one or more other living persons.
- The Registered Land Act (Chapter 300 of the Laws of Kenya.) The intention of this Act of Parliament is to make further and better provisions for the registration of title to land, and for the regulation of dealings in land so registered, and for purposes connected therewith.

### **Conveyance systems**

There are three systems of conveyance and these are those applicable to land registered under:

- ✓ The Government Lands Act (Chapter 280 of the Laws of Kenya). This Act of Parliament seeks to make further and better provision for regulating the leasing and other disposal of Government lands. The Land Titles Act (Chapter 282 of the Laws of Kenya). This Act of Parliament seeks to make provision for the removal of doubts that have arisen in regard to titles to land and to establish a Land Registration Court.
- ✓ Registration of Titles Act (Chapter 281 of the Laws of Kenya): This is an act of parliament to provide for the transfer of land by the registration of titles. Section 32 provides that no instrument, until registered in the manner prescribed in the act shall be effectual to pass any land or any interest therein, or render the land liable as security for the payment of money, but upon the registration of an instrument in the manner prescribed the land specified in the instrument shall pass, or, as the case may be, shall become liable as security in the manner and subject to the agreements, conditions and contingencies set out and specified in the instrument, or declared by this Act.
- ✓ Registered Land Act (Chapter 300 of the Laws of Kenya.) This is an Act of Parliament intended to make further and better provision for the registration of title to land, and for the regulation of dealings in land so registered, and for purposes connected therewith.

### **Registration Systems**

The five registration systems are those under: -

- ✓ The Government Lands Act (G.L.A.)
- ✓ The Registration of Titles Act (R.T.A)
- ✓ The Land Titles Act (L.T.A)
- ✓ The Registration of Documents Act (Chapter 285 of the Laws of Kenya): This is an Act of Parliament to provide for the registration of documents. It states that: all documents conferring, or purporting to confer, declare, limit or extinguish any right, title or interest, whether vested or contingent to, in or over immovable property (other than such documents as may be of a testamentary nature) and vakallas shall be registered. It should be noted that this Act isn't peculiar to Land Law, as documents completely unrelated to land can be registered under it.
- ✓ The Registered Land Act (R.L.A)

### **Land Ownership**

Absolute or complete ownership in land vests in the state. Under the Government Lands Act the Commissioner of Lands, on behalf of the Republic of Kenya grants leases of town plots for any term not

exceeding ninety-nine(99) years and of agricultural land for a term not exceeding nine hundred and ninety-nine(999) years.

The grantee (the person receiving the land) becomes the owner and subject to the terms and conditions of the lease he possesses the bundle of the rights of ownership. The 999-year leases can be converted into freehold leases and the 99-year leases into 999-year leases.

On conversion or expiry of the Lease, a new grant may be issued under The R.L.A or the R.T.A. All unalienated land other than trust land and all reversion of Government leases are vested in the Government, other lands whether held on freehold or leasehold are vested in the grantees as owners having the rights over them.

The power of the State to qualify (extinguish) property rights in the public interest is embodied in Section 75 of the Kenyan Constitution. The Section however makes the exercise of that power subject to due process (this includes the payment of prompt and adequate compensation) Section 117 of the Constitution further provides that an Act of Parliament may empower a county council to set apart trust land for the use and occupation of any person or persons for a purpose which is likely to benefit the residents of that area.

Section 117(4) stipulates that the setting apart of such land is void unless the law under which it is made makes provision for the prompt payment of full compensation. The Trust Land Act, in Sections 7 to 13, makes provisions for the setting apart of land and payment of compensation with regard thereto. All land in urban areas of Kenya and much of the land in rural areas has a registered title. The title to land is either freehold or leasehold. The development and use of freehold title is controlled by land planning regulations which are administered by both the Central Government and the Local Authority in which the Land is situated. (A local Authority is either a County Council or a Municipal Council whose activities are established and controlled by the Local Government Legislation.)

Leasehold land is held on leases from the Central Government or, less frequently, from the Local Authority and such lease will contain provisions governing the development of the land and the use to which the land can be put. The leases frequently contain provisions against any dealing with the land without the consent of the landlord. The Central Government administers its land through a Department of Lands which is headed by a Commissioner of Lands.

### **2.20 Physical Planning Act (No. 6 of 1996)**

This Act of Parliament provides for the preparation and implementation of physical development plans and for connected purposes.

Section 36 of this Act provides for Environmental impact assessments and states that:-

If in connection with a development application a local authority is of the opinion that proposals for industrial location, dumping sites, sewerage treatment, quarries or any other development activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an environmental impact assessment report.

### **2.21 The Public Health Act (Chapter 242)**

This Act of Parliament makes provisions for securing and maintaining health. It contains directives that affect human health. Section 3 of the Act establishes the Central Board of Health which shall consist of the Director of Medical Services (who shall be chairman), a sanitary engineer, or such person as may be appointed by the Minister to perform the duties of sanitary engineer, a secretary, and such other person or persons not exceeding six (three of whom shall be medical practitioners) as are appointed from time to time by the Minister.

There are provisions within the Act to deal, in a general way, with water, air and noise quality as they pertain to human health. An environmental nuisance is defined and includes the emission from premises

of wastewaters, gases and smoke which could be regarded as injurious to health. The owner and/or occupier of premises responsible for such nuisances are liable to prosecution under the Act.

The construction works involve some pollution of water and air. However the contractor shall ensure that this pollution is controlled and not to the extent that it will affect the human health living along the road and even the workers at the construction camps.

### **2.22 Local Government Act (Chapter 265)**

This is an Act of parliament, which provides for the establishment of authorities for local government; to define their functions and to provide for matters connected therewith and incidental thereto. The Act is connected with a wide range of matters that affect the day-to-day activities of individuals and organizations.

Section 163A of this Act gives the local authority the power to grant business permits. It states that a local authority may on receipt of an application under this Act grant a business permit to allow the conduct of a business or trade, including a profession or occupation within its area. Provided that in the case of a business, trade, profession or occupation regulated by the provisions of any other written law, a person shall prior to the submission of an application for a business permit pursuant to this subsection, satisfy all the requirements of that other written law.

Section 163 is another important part of the Act it gives every town council and urban council power, to control or prohibit all businesses, factories and workshops which, by reason of smoke, fumes, chemicals, gases, dust, smell, noise, vibration or other cause, may be or become a source of danger, discomfort or annoyance to the neighborhood, and to prescribe the conditions subject to which such businesses, factories and workshops shall be carried on.

Section 145 of the Act is concerned with the miscellaneous powers of local authorities subsection (w) empowers local authorities to take measures that may be necessary or desirable for the preservation or protection of wildlife, and provide amenities for the observation of wildlife.

Section 146(d) empowers a local authority, with the consent of the Minister to make grants for the establishment and maintenance of game parks and other related facilities.

Section 147(d) controls the cutting of timber and the destruction of trees and shrubs.

Under section 265(1) of the Act, any officer of a local authority duly authorized in writing shall, on producing, if so required, some duly authenticated document showing his authority, have a right to enter any premises at all reasonable hours for the purpose of ascertaining whether there is, or has been, on, or in connection with, the premises, any contravention of this Act or of any by-laws, whether made under this Act or any other written law, being provisions which it is the duty of the local authority to enforce.

### **2.23 The Fisheries Act (CAP 5 of 1989)**

This act applies to both inland and sea fish. Lake it prohibits unlawful interference of the fish and marine life. The Fisheries Act and fisheries policies are state centered to help in the protection of marine life. Lake Turkana is famous for fishing activities. The proponent and the contractor will have to observe that this act is not contravened in any way by avoiding such interference in these places.

The act provides that no interference should be made to the lake that would endanger marine life and also affect the communities living around the lake who depend on fishing and or on the lake for their livelihood.

### **2.24 The Forest Act (CAP 385)**

This act provides for the establishment, control and regulation of central forests, forests and forest areas and on un-alienated Government land. The act further provides that sacred groves found in any state forest, nature reserve, local authority forest or private forest shall not be interfered with and any person who, without lawful authority, fells, cuts, damages or removes any such grove or tree or regeneration thereof, or biodiversity therein, or abets in the commission of any such act commits an offence.

In this region trees serve an important role where communities living here harvest seeds for food, use them as places of worship and meeting places and also some trees are an indication of water availability. Such trees should be conserved by the contractor once the construction works commence.

### **2.25 The Trust Land Act (Chapter 288)**

This is an Act of Parliament which makes provision for Trust land. Section 38(1) of the Act provides that a way leave license may be granted to any person empowering him and his servants and agents to enter upon Trust land vested in the council and to lay pipes, make canals, aqueducts, weirs and dams and execute any other works required for the supply and use of water, cables or aerial ropeways and erect poles and pylons therefore, and to make such excavations as may be necessary for the carrying out of any such purposes, and to maintain any such works as aforesaid.

Section 8 of the Act provides that where land is set apart, full compensation shall be promptly paid by the Government to any resident of the area of land set apart who -

- ✓ Under African customary law for the time being in force and applicable to the land has any right to occupy any part thereof; or
- ✓ Is, otherwise than in common with all other residents of the land, in some other way prejudicially affected by the setting apart.

Before granting any way leave license, the council shall satisfy itself that compensation in respect of disturbance or of any other loss or expenses likely to be caused by construction of any structure has been or will be paid to those concerned in like manner and to the same extent as if the land had been set apart under the Act and as if the compensation were being paid under section 8 of the Act.

Most of the land in the project area is trust land held in trust on behalf of the community by the Marsabit County Council.

### **2.26 The Penal Code (Cap. 63)**

The chapter on "Offences against Health and Conveniences" contained in the Penal Code enacted in 1930 strictly prohibits the release of foul air into the environment, which affects the health of other persons. Any person who voluntarily violates the atmosphere at any place, to make it noxious to health of persons in general dwelling or carrying out business in the neighbourhood or passing along public ways is guilty of misdemeanour, i.e. imprisonment not exceeding two years with no option of fine. Under this code, any person who for the purpose of trade or otherwise makes loud noise or offensive awful smell in such places and circumstances as to annoy any considerable number of persons in the exercise of their rights, commits an offence, and is liable to be punished for a common nuisance, i.e. imprisonment not exceeding one year with no option of fine.

The contractor will ensure that a controlled emission is observe during construction works to avoid interference on health of the locals and the workers.

### **2.27 Way leaves Act (Chapter 292)**

This Act of Parliament provides that any person in the service of the government and any contractor executing any work for the Government, together with his agents and servants, may at any time enter upon any land for the purpose of surveying, setting out and marking the line of any intended sewer, drain or pipeline, or for the purpose of inspecting, repairing, removing, re-laying or cleansing any sewer, drain or pipeline the property of the Government, or for any other purpose under this Act.

In clearing the road corridor proper observations will have to be made by the contractor that he does not cross over to the people land and does not contravene the provisions of this act.

### **2.28 Noise and Excessive Vibration Pollution (Control) Regulations, 2009**

The act prohibits excessive noise and vibration. It states that no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or

endangers the comfort, repose, health or safety of others and the environment. The contractor will have to observe that no such noise is made during the construction works.

In this case the strengthening of the road involve a lot of noise and vibration during construction due to heavy earthmoving equipment in which case these must be observed to be at the required level and time.

In determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered:

- (a) Time of the day
- (b) Proximity to residential area
- (c) Whether the noise is recurrent, intermittent or constant;
- (d) The level and intensity of the noise
- (e) Whether the noise has been enhanced in level or range by any type of electronic or mechanical means
- (f) Whether the noise can be controlled without much effort or expense to the person making the noise

Motor vehicles used during the construction should adhere to the regulations which prohibit excessive noise. The provision of the act on motor vehicle states that no person shall operate a motor vehicle which-

- a) produces any loud and unusual sound; and
- b) Exceeds 84 dB(A) when accelerating.
- c) No person shall at any time sound the horn or other warning device of a vehicle except when necessary to prevent an accident or an incident.
- d) The provisions of the Traffic Rules shall apply to this Regulation.

Any person carrying out construction, demolition, mining or quarrying work shall ensure that the vibration levels do not exceed 0.5 centimetres per second beyond any source property boundary or 30 metres from any moving source.

### **2.29 The Valuers Act cap 532**

The revised edition 1985 of the valuers act cap 532 makes provisions for the relevant charges and conducts of valuers in relation to valuation of assets. The constructions of the proposed road upgrading works will incorporate a lot of land valuations for the affected people along the road corridor. This act help protect these people by providing the relevant regulations and guidelines in the undertaking of the valuation works.

In incidences where compensation will have to be made adequate valuation shall be carried out to help meet the actual compensation measures and the market rates and reduce any acts of malice in the exercise. A competent valuer will have to be deployed to site to carry out the professional valuation of assets for compensation

### **2.30 Waste Management Regulations, 2006 (Legal Notice No.121)**

Waste Management Regulations are meant to streamline the handling, transportation and disposal of various types of waste. The aim of the Waste Management Regulations is to protect human health and the environment. Currently, different types of waste are dumped haphazardly posing serious environmental and health concerns. The regulations place emphasis on waste minimization, cleaner production and segregation of waste at source.

The regulations have classified various types of waste and recommended appropriate disposal methods for each waste type. Under the Waste Management Regulations, NEMA licenses

transporters, incinerators, landfills, composers, recyclers and transfer stations. Facilities to be licensed include local authorities, transporters and handlers of various types of waste. The licensing employs a risk-based approach by concentrating on facilities considered to pose a high risk to the environment.

The Waste Management Regulations also provide an opportunity for investment in various aspects of waste management. A copy of the regulations is available at [www.nema.go.ke](http://www.nema.go.ke). Hard copies can also be purchased from the government printers.

Proper disposal of wastes shall be observed by the contractor during the road construction at the camps and the road works. This is aimed at sustaining good hygiene and proper working environment.

### **2.31 Environmental Management and Co-Ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009**

The Act applies to all wetlands in Kenya whether occurring in private or public land. The objectives of the act is to provide for the conservation and sustainable use of wetlands and their resources in Kenya and promote the integration of sustainable use of resources in wetlands into the local and national management of natural resources for socio-economic development. It also aims at ensuring the conservation of water catchments and the control of floods and the sustainable use of wetlands for ecological and aesthetic purposes for the common good of all citizens. Further the act makes provision for the protection of wetlands as habitats for species of fauna and flora and provision a framework for public participation in the management of wetlands.

The Wetland resources shall be utilized in a sustainable manner compatible with the continued presence of wetlands and their hydrological, ecological, social and economic functions and services. Special measures shall be essential to promote respect for, preserve and maintain knowledge innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices;

Sustainable use of wetlands shall be integrated into the national and local land use plans to ensure sustainable use and management of the resources. The road does not cross wetlands, however there are areas of rich biodiversity such as Milgis lagga which the contractor will have to conserve.

### **2.32 The Environmental Management and Co-Ordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006**

The Act provides that no person shall engage in any activity that may have an adverse impact on any ecosystem; may lead to the introduction of any exotic species or to unsustainable use of natural resources, without an Environmental Impact Assessment License issued by the Authority under the Act.

The Authority shall, in consultation with the relevant lead agencies, impose bans, restrictions or similar measures on the access and use of any threatened species in order to ensure its regeneration and maximum sustainable yield.

The road traverses areas with diverse ecosystems in the entire stretch including and should be conserved during construction works.

### **2.33 The Radiation Protection Act (revised 1985)**

The act makes provisions for the manufacture or otherwise produces or possess or use or either sell, dispose of or lease, loan or deal with or import or cause to be imported; or any irradiating device or radioactive material except under and in accordance with a license issued under this Act. The act states that no person shall sell an irradiating device or radioactive material unless at the time of sale the purchaser produces to the vendor a valid license authorizing him to use that type of irradiating device or radioactive material.

An irradiating device or radioactive material shall be deemed to have been exported when it is placed on a ship, aircraft, train or any other vehicle within Kenya for the purposes of export. The plight of workers should be observed where handling of corrosive substances is inevitable during the road construction works.

### **2.34 The Limitation of Actions Act Cap 22**

An Act of Parliament to prescribe periods for the limitation for actions and arbitrations, and to make provision concerning the acquisition of easements by prescription, and for matters incidental thereto and matters connected therewith.

The Act makes provision for the extension of the periods of limitation in the case of disability, acknowledgement, part payment, fraud, mistake and ignorance of material facts.

### **2.35 The Employment Act, 2007**

An Act of Parliament to repeal the Employment Act, declare and define the fundamental rights of employees, to provide basic conditions of employment of employees, to regulate employment of children, and to provide for matters connected with the foregoing.

The contractor on site will have to employ casuals probably from the communities where the road traverses and also other workers during construction. The basic conditions of employees should be observed to avoid unnecessary conflicts during the construction works.

The Contractor shall pay the entire amount of the wages earned by or payable to the workers. Payment of such wages should be done at the end of a working day at or near the place of work.

### **2.36 The Lake and Rivers Act Cap 409**

The Act makes provision for regulating the use of lake or river for the transport of floating timber; regulating the traffic on a lake or river; for protecting the bird or animal life on or in a lake or river. The road traverses several seasonal rivers and should be conserved.

### **2.37 Land Adjudication Act Cap 95**

Land Adjudication has been defined as the process through which existing rights in a particular parcel of land are finally and authoritatively ascertained. In Kenya this process has been critical in the conversion of land held under customary tenure into individual holdings. While the program has resulted in the registration of millions of land parcels, its potential has not been fully exploited. Large areas of the country remain un- adjudicated due to incomplete land registers, pending adjudication appeals or absence of the land adjudication exercise altogether.

### **2.38 The Antiquities and Monuments Act 1983 Cap 215**

The Act makes provision for the conservation of historical building/sites and monuments. Features like shrines used by some communities here in Kenya need to be conserved. The road traverses areas with sacred trees used for worship centres and meeting points. The proponent should work hand in hand with the contractor to conserve these trees.

### **2.39 Public Roads and Roads of Access Act Cap.399**

This Act states that a public road is any road which the public has a right to use immediately before the commencement of this Act, or all proclaimed or reserved roads and thoroughfares being or existing on any land sold or leased or otherwise held under the East Africa Land Regulations, 1897, the Crown Lands Ordinance, 1902, or the Government Lands Act at any time before the commencement of this Act and all roads and thoroughfares hereafter reserved for public use.

### **2.40 Codes, Specifications and Standards**

The Standard Specifications for Road and Bridge construction has guidelines on environmental protection and mitigation. Standard Specification Clauses 116,117,125,135,137 address protection of the environment, with regard to water, health, safety and accidents, water supply, maintenance of the engineers' staff houses, offices, laboratories, and attendance upon the engineer and his staff.

The provisions of these laws, standards and codes must not be contravened during project implementation, thus the provisions are largely supportive of EMCA 1999; must form part of the legal basis for environmental mitigation, avoidance, prevention, compensation, restoration and enhancement.

### **2.41 International Guidelines, Agreement, Conventions and Treaties**

Kenya is a signatory to various international guidelines, agreements, conventions and treaties that have environmental implications/provisions and as such cannot be contravened during project development phases. The Environmental Assessment Expert must consider the provisions of these guidelines, agreements, conventions and treaties when carrying out EIA/EA studies. Some international guidelines, agreements, conventions and treaties have provisions, which are generally respected in Kenya. They include:

- The Convention on Trade in Endangered Species (CITES)
- The Ramsar Convention on Wetlands of International importance especially as Waterfowl Habitat.
- The Convention on Biodiversity (1992)
- The United Nations Framework Convention on Climate Change (1992)
- The convention concerning the protection of workers against occupational hazards in the working environment.
- The Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes (1989).
- The World Bank Operational Directives 4.01 and Environmental Assessment Source Book Volume Highway Design Code
- World Health Organization Air Quality and Emissions Guidelines
- World Health Organization Drinking Water Quality Guidelines (1993)
- World Health Organization Environmental Guidelines and standards for industrial Discharge (1983)

### **2.42 IFC Performance Standards**

#### **2.42.1 Social and Environmental Assessment and Management System**

This Standard is similar to the NEMA Environment Regulations 2003. In addition to identifying risks and impacts of proposed projects, it also aims at ensuring that affected communities are appropriately engaged on issues that could potentially affect them.

The Standard requires that the area of influence encompasses, as appropriate: (i) the primary project site(s) and related facilities that the client (including its contractors) develops or controls , such as power

transmission corridors, pipelines, canals, tunnels, relocation and access roads, borrow and disposal areas, construction camps; (ii) associated facilities that are not funded as part of the project (funding may be provided separately by the client or by third parties including the government), and whose viability and existence depend exclusively on the project and whose goods or services are essential for the successful operation of the project; (iii) areas potentially impacted by cumulative impacts from further planned development of the project, any existing project or condition, and other project-related developments that are realistically defined at the time the Social and Environmental Assessment is undertaken; and (iv) areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location. The area of influence does not include potential impacts that would occur without the project or independently of the project.

### **Management System**

The standard requires that after EIA, the client should establish management programs that consist of a combination of operational policies, procedures and practices. The measures and actions to address identified impacts and risks will favour the avoidance and prevention of impacts over minimization, mitigation, or compensation, wherever technically and financially feasible. Where risks and impacts cannot be avoided or prevented, mitigation measures and actions will be identified so that the project operates in compliance with applicable laws and regulations, and meets the requirements of the other Performance Standards. The program will define desired outcomes as measurable events to the extent possible, with elements such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods, and with estimates of the resources and responsibilities for implementation. Recognizing the dynamic nature of the project development and implementation process, the program will be responsive to changes in project circumstances, unforeseen events, and the results of monitoring.

### **Action Plan**

Where the client identifies specific mitigation measures and actions necessary for the project to comply with applicable laws and regulations the client will prepare an Action Plan. These measures and actions will reflect the outcomes of consultation on social and environmental risks and adverse impacts and the proposed measures and actions to address these. The Action Plan will: (i) describe the actions necessary to implement the various sets of mitigation measures or corrective actions to be undertaken; (ii) prioritize these actions; (iii) include the time-line for their implementation; (iv) be disclosed to the affected communities (v) describe the schedule and mechanism for external reporting on the client's implementation of the Action Plan

### **Organizational Capacity**

The client will establish, maintain, and strengthen as necessary an organizational structure that defines roles, responsibilities, and authority to implement the management program, including the Action Plan. Specific personnel, including management representative(s), with clear lines of responsibility and authority should be designated. Key social and environmental responsibilities should be well defined and communicated to the relevant personnel and to the rest of the organization. Sufficient management sponsorship and human and financial resources will be provided on an ongoing basis to achieve effective and continuous social and environmental performance.

### **Training**

The client will train employees and contractors with direct responsibility for activities relevant to the project's social and environmental performance so that they have the knowledge and skills necessary to perform their work, including current knowledge of the host country's regulatory requirements and the applicable requirements of Performance Standards 1 through 8. Training will also address the specific measures and actions required under the management program, including the Action Plan, and the methods required to perform the action items in a competent and efficient manner.

### **Community Engagement**

Community engagement is an on-going process involving the client's disclosure of information. When local communities may be affected by risks or adverse impacts from a project, the engagement process will include consultation with them. The purpose of community engagement is to build and maintain over time a constructive relationship with these communities. The nature and frequency of community engagement will reflect the project's risks to and adverse impacts on the affected communities. Community engagement will be free of external manipulation, interference, or coercion, and intimidation, and conducted on the basis of timely, relevant, understandable and accessible information.

### **Disclosure**

Disclosure of relevant project information helps affected communities understand the risks, impacts and opportunities of the project. Where the client has undertaken a process of Social and Environmental Assessment, the client will publicly disclose the Assessment document. If communities may be affected by risks or adverse impacts from the project, the client will provide such communities with access to information on the purpose, nature and scale of the project, the duration of proposed project activities, and any risks to and potential impacts on such communities. For projects with adverse social or environmental impacts, disclosure should occur early in the Social and Environmental Assessment process and in any event before the project construction commences, and on an ongoing basis

### **Consultation**

If affected communities may be subject to risks or adverse impacts from a project, the client will undertake a process of consultation in a manner that provides the affected communities with opportunities to express their views on project risks, impacts, and mitigation measures, and allows the client to consider and respond to them. Effective consultation: (i) should be based on the prior disclosure of relevant and adequate information, including draft documents and plans; (ii) should begin early in the Social and Environmental Assessment process; (iii) will focus on the social and environmental risks and adverse impacts, and the proposed measures and actions to address these; and (iv) will be carried out on an ongoing basis as risks and impacts arise. The consultation process will be undertaken in a manner that is inclusive and culturally appropriate. The client will tailor its consultation process to the language preferences of the affected communities, their decision-making process, and the needs of disadvantaged or vulnerable groups.

For projects with significant adverse impacts on affected communities, the consultation process will ensure their free, prior and informed consultation and facilitate their informed participation. Informed participation involves organized and iterative consultation, leading to the client's incorporating into their decision-making process the views of the affected communities on matters that affect them directly, such as proposed mitigation measures, the sharing of development benefits and opportunities, and implementation issues. The client will document the process, in particular the measures taken to avoid or minimize risks to and adverse impacts on the affected communities.

### **Grievance Mechanism**

The client will respond to communities' concerns related to the project. If the client anticipates ongoing risks to or adverse impacts on affected communities, the client will establish a grievance mechanism to receive and facilitate resolution of the affected communities' concerns and grievances about the client's environmental and social performance. The grievance mechanism should be scaled to the risks and adverse impacts of the project. It should address concerns promptly, using an understandable and transparent process that is culturally appropriate and readily accessible to all segments of the affected communities, and at no cost and without retribution. The mechanism should not impede access to judicial or administrative remedies. The client will inform the affected communities about the mechanism in the course of its community engagement process.

#### **2.42.2: Labour and working conditions**

Performance Standard 2 recognizes that the pursuit of economic growth through employment creation and income generation should be balanced with protection for basic rights of workers. For any project, the workforce is a valuable asset, and a sound worker-management relationship is a key ingredient to the sustainability of the project. Failure to establish and foster a sound worker management relationship can undermine worker commitment and retention, and can jeopardize a project. Conversely, through a constructive worker-management relationship, and by treating the workers fairly and providing them with safe and healthy working conditions, clients may create tangible benefits, such as enhancement of the efficiency and productivity of their operations.

The requirements set out in this Performance Standard have been in part guided by a number of international conventions negotiated through the International Labour Organization (ILO) and the United Nations (UN).

Children below the age of 18 years will not be employed in any form of work. The client will not employ forced labor, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labor, such as indentured labor, bonded labor or similar labor-contracting arrangements

#### **2.42.3 Pollution Prevention and Abatement**

This performance Standard recognizes that increased industrial activity and urbanization often generate increased levels of pollution to air, water, and land that may threaten people and the environment at the local, regional, and global level. On the other hand, along with international trade, pollution prevention and control technologies and practices have become more accessible and achievable in virtually all parts of the world. According to this standard, the Client should consider the ambient conditions and apply pollution prevention and control technologies during the design, construction, operation and decommissioning of the project that are best suited to avoid or, where avoidance is not feasible, minimize or reduce adverse impacts on human health and the environment while remaining technically and financially feasible and cost-effective

The project-specific pollution prevention and control techniques applied during the project life-cycle will be tailored to the hazards and risks associated with project emissions and consistent with good international industry practice as pollutants in the solid, liquid, or gaseous forms, and is intended to include other forms such as nuisance odours, noise, vibration, radiation, electromagnetic energy, and the creation of potential visual impacts including light.

#### **2.42.4 Community Health, Safety and Security**

The IFC Performance Standard 4 on Community Health, Safety and Security recognizes that projects can increase the potential for community exposure to risks and impacts arising from equipment accidents, structural failures, and releases of hazardous materials. Communities may also be affected by impacts on their natural resources, exposure to diseases, and the use of security personnel.

It is the responsibility of the client in the proposed project to avoid or minimize risks to and impacts on the health and safety of the local community during the project life cycle from both routine and non-routine circumstances. The client should also ensure that the safeguarding of personnel and property is carried out in a legitimate manner that avoids or minimizes risks to the community's safety and security

#### **2.42.5 Land Acquisition and Involuntary Resettlement**

Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or means of livelihood) as a result of project-related land acquisition. Resettlement is considered involuntary when affected individuals or communities do not have the right to refuse land acquisition that

result in displacement. Unless properly managed, involuntary resettlement may result in long-term hardship and impoverishment for affected persons and communities, as well as environmental damage and social stress in areas to which they have been displaced. For these reasons, involuntary resettlement should be avoided or at least minimized. However, where it is unavoidable, appropriate measures to mitigate adverse impacts on displaced persons and host communities should be carefully planned and implemented. Experience demonstrates that the direct involvement of the client in resettlement activities can result in cost-effective, efficient, and timely implementation of those activities, as well as innovative approaches to improving the livelihoods of those affected by resettlement. Negotiated settlements help avoid expropriation and eliminate the need to use governmental authority to remove people forcibly. Negotiated settlements can usually be achieved by providing fair and appropriate compensation and other incentives or benefits to affected persons or communities, and by mitigating the risks of asymmetry of information and bargaining power. Clients are encouraged to acquire land rights through negotiated settlements wherever possible, even if they have the legal means to gain access to the land without the seller's consent. The Proponent should aim at improving or at least restoring the livelihoods and standards of living of displaced Persons.

#### **2.42.6 Biodiversity Conservation and Sustainable Natural Resource Management**

In order to avoid or minimize adverse impacts to biodiversity in the project's area of influence the client will assess the significance of project impacts on all levels of biodiversity as an integral part of the Social and Environmental Assessment process. The Assessment will take into account the differing values attached to biodiversity by specific stakeholders, as well as identify impacts on ecosystem services. The Assessment will focus on the major threats to biodiversity, which include habitat destruction and invasive alien species.

The Client should try as much as possible to minimize any conversion or degradation of habitat unless there are no technical or financially feasible alternatives, the overall alternatives outweigh the costs, including those to the environment and biodiversity and any conversion or degradation is appropriately mitigated. The mitigation measures will be designed to achieve no net loss of biodiversity where feasible, and may include a combination of actions, such as;

- Post-operation restoration of habitats

- Offset of losses through the creation of ecologically comparable area(s) that is managed for biodiversity

- Compensation to direct users of biodiversity

In areas of critical habitat, which includes areas with high biodiversity value<sup>3</sup>, including habitat required for the survival of critically endangered or endangered species the client will not implement any project activities unless:

- There are no measurable adverse impacts on the ability of the critical habitat to support the established population of species

- There is no reduction in the population of any recognized critically endangered or endangered species

- Any lesser impacts are mitigated.

In circumstances where a proposed project is located within a legally protected area, the client will act in a manner consistent with defined protected area management plans, consult protected area sponsors and managers, local communities, and other key stakeholders on the proposed project and implement additional programs, as appropriate, to promote and enhance the conservation aims of the protected area

Intentional or accidental introduction of alien, or non-native, species of flora and fauna into areas where they are not normally found can be a significant threat to biodiversity, since some alien species can become invasive, spreading rapidly and out-competing native species. The client will not intentionally

introduce any new alien species (not currently established in the country or region of the project) unless this is carried out in accordance with the existing regulatory framework for such introduction, if such framework is present, or is subject to a risk assessment (as part of the client's Social and Environmental Assessment) to determine the potential for invasive behavior. The client will not deliberately introduce any alien species with a high risk of invasive behavior or any known invasive species, and will exercise diligence to prevent accidental or unintended introductions.

The client will manage renewable natural resources in a sustainable manner. Where possible, the client will demonstrate the sustainable management of the resources through an appropriate system of independent certification.

#### **2.42.7 Indigenous people**

The Indigenous Peoples are recognized as social groups with identities that are distinct from dominant groups in national societies, are often among the most marginalized and vulnerable segments of the population. Their economic, social and legal status often limits their capacity to defend their interests in, and rights to, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. They are particularly vulnerable if their lands and resources are transformed, encroached upon by outsiders, or significantly degraded. Their languages, cultures, religions, spiritual beliefs, and institutions may also be under threat. These characteristics expose Indigenous Peoples to different types of risks and severity of impacts, including loss of identity, culture, and natural resource-based livelihoods, as well as exposure to impoverishment and disease. Private sector projects may create opportunities for Indigenous Peoples to participate in, and benefit from project-related activities that may help them fulfill their aspiration for economic and social development. In addition, this Performance Standard recognizes that Indigenous Peoples may play a role in sustainable development by promoting and managing activities and enterprises as partners in development.

The proponent of the proposed project should ensure that the development process fosters full respect for the dignity, human rights, aspirations, cultures and natural resource-based livelihoods of Indigenous Peoples; avoids adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not feasible, to minimize, mitigate, or compensate for such impacts, and to provide opportunities for development benefits, in a culturally appropriate manner; establishing and maintaining an ongoing relationship with the Indigenous Peoples affected by the project throughout the life of the project; fosters good faith negotiation with and informed participation of Indigenous Peoples when the project is to be located on traditional or customary lands under use by the Indigenous Peoples

#### **2.42.8 Cultural Heritage**

This Performance Standard recognizes the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, the Contractor will protect and support irreplaceable cultural heritage by undertaking internationally recognized practices for the protection, field-based study, and documentation of cultural heritage. The client is responsible for siting and designing a project to avoid significant damage to cultural heritage. The client will consult with affected communities within the host country who use, or have used within living memory, the cultural heritage for longstanding cultural purposes to identify cultural heritage of importance, and to incorporate into the client's decision-making process the views of the affected communities on such cultural heritage. Consultation will also involve the relevant national or local regulatory agencies that are entrusted with the protection of cultural heritage.

### **2.43 IFC Environmental Health Safety (EHS) Guidelines**

The IFC has also outlined Environmental, Health and Safety guidelines which contain performance levels and measures that are generally considered to be achievable in new facilities by existing technologies at reasonable costs. The EHS guidelines have broadly been classified into environment, Occupational Health Safety and Community Health Safety.

Environmental guidelines that are applicable to the proposed road strengthening project are related to;

- Generation of emissions to air at any stage of the project lifecycle such as dust. The guideline provides an approach to the management of significant sources of emissions including specific guidance for assessment and monitoring of impacts related to air pollution.
- Discharge of wastewater from utility operations such as the construction camp to the environment. The project should incorporate the necessary precautions to avoid, minimize, and control adverse impacts to human health, safety, or the environment from the discharge such as wastewater management and reuse methods. If septic tanks are used, then they should be properly designed and installed in accordance with local regulations.
- Generation of solid waste. Procedures must be developed that aim at waste minimization through reuse and recycling, transportation and proper disposal of solid waste
- Noise emissions from blasting activities and operation of equipment and machinery that will be under use in the project. Technologies that may be used include installing mufflers on engine exhausts, limiting hours of operation for specific pieces of equipment, relocating noise sources to less sensitive areas

The Occupational Health and Safety guideline provides for implementation of reasonable precautions to protect the health and safety of workers by employers and supervisors. This includes design of structures with all required facilities that will be used during work such the construction camp, communication and training, protection against physical hazards such as rotating and moving equipment, personal protective equipment among others.

The Community Health and Safety provides for protection of people living within the project area. Key areas that are of concern in this project are water quality and quantity protection, traffic safety, disease prevention especially communicable and sexually transmitted among others.

### **2.43 World Bank Safeguard Policies**

The objective of the World Bank policies is to prevent and mitigate undue harm to people and their environment in the development process. Safeguard policies also provide a platform for the participation of stakeholders in project design and have been an important instrument for building a sense of ownership among local populations. In essence, the safeguards ensure that environmental and social issues are evaluated in decision making, help reduce and manage the risks associated with a project or program, and provide a mechanism for consultation and disclosure of information. The safeguards are listed Table 3. World Bank Environmental and Social Safeguards and their Policy Objectives

Table 3. World Bank Environmental and social safeguards

OP/BP	Safeguard	Policy objectives
4.01	Environmental Assessment	<p>Help ensure the environmental and social soundness and sustainability of investment projects.</p> <p>Support integration of environmental and social aspects of projects in the decision-making process.</p>
4.04	Natural Habitats	<p>Promote environmentally sustainable development by supporting the protection, conservation, maintenance, and rehabilitation of natural habitats and their functions.</p>
4.12	Involuntary Resettlement*	<p>Avoid or minimize involuntary resettlement and, where this is not feasible, assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.</p>
4.20	Indigenous Peoples*	<p>Design and implement projects in a way that fosters full respect for indigenous peoples' dignity, human rights, and cultural uniqueness and so that they (1) receive culturally compatible social and economic benefits, and (2) do not suffer adverse effects during the development process.</p>

## **CHAPTER 3: PROJECT STUDY METHODOLOGY**

### **3.1 Introduction**

The road strengthening project will require approval by the Ministry of Roads, NEMA and the financing institutions. Therefore the ESIA was conducted in accordance with the Environmental Assessment and Audit Regulations as promulgated in 2003 and IFC guidelines on social and environmental protection of development projects.

The prediction and assessment is precisely aimed at identification of possible effects the project may have on the environment that is flora and fauna, physical environment, land, biodiversity, animals, human settlement, economic activities and social settings, workers as well as the community within and outside the project area. The ESIA starts with establishment of existing policies, standards as well as any guidelines related to road construction works in Kenya and the ones stipulated by financing institutions such as the World Bank. Specifically, the study will aim at identifying the guidelines that have been stipulated for the protection of environment, pollution prevention, enhancement of community health, safety and security, resettlement of communities that may be affected by the road construction works and conservation of biodiversity, indigenous people and existing cultural heritages. The policies will be used in outlining the measures that the Contractor will need to put in place to avoid or if avoidance is not possible, minimize the impacts. This is then followed by collection of baseline information that indicates the existing conditions before the commencement of the Project. The baseline data include relevant physical, biological, socio-economic and labour conditions including any anticipated changes before the project commences. The baseline information is used for monitoring and evaluation how well the mitigation measures are being implemented during the project cycle.

### **3.2 Screening**

Screening enables the project developers to decide early at planning and design stage whether an ESIA study will be required or not. Using the Equator Principles 1, projects have been categorized into three main groups based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC. Using this criteria, a project falls in Category A if the potential significant adverse social or environmental impacts are diverse, irreversible or unprecedented, Category B if the potential limited adverse social or environmental impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures and Category C if it has minimal or no social or environmental impacts. Considering the envisaged works, the project may be considered as falling in Category B.

### **3.3 Scoping**

If the project screening indicates that an ESIA study is required, the next important task is "Scoping". The aim of scoping is to ensure that the ESIA study addresses all key environmental and social issues of importance to the decision makers. It involves deliberations of environmental issues with the project stakeholders including project developers, decision makers, the regulatory agency, concerned government and semi-government departments, local community leaders, local NGOs and other concerned to ensure that all environmental and social issues and concerns are discussed and key environmental and social impacts are identified. Scoping will be carried out through consultations with the affected communities, development of management and monitoring plan in accordance to relevant policies as well as recommendations from and agreements with the affected communities, local leaders and area administrative authority, site surveys, focus group discussions with affected communities and collected information using questionnaires administered to key stakeholders such as Kenya Wildlife Service, Northern Rangeland Trust, County Council, Kenya Rural Roads Authority and Kenya National Highway Authority among others.

### **3.4 Study Approach**

The Study was commenced after establishment of applicable Kenyan's Laws and Policies and IFC Performance Standards related to the construction of roads. These policies and standards have extensively been discussed in Chapter 2. This information was mainly obtained from literature review.

The baseline information/data that was found relevant in this report and needed to be evaluated included:

- Physical characteristics of the project area, viz;
  - Location the proposed road strengthening project
  - Topography
  - Characteristic of existing soils where the road passes through
  - Natural resources such as water, minerals, wetlands
- Biological life forms in the project area that are likely to be affected by the project, viz;
  - Biodiversity which includes vegetation cover, forests, indigenous species
  - Wildlife animals that are in existence in the area.
- Socio-economic profile of the communities living along the road alignment, viz;
  - Economic activities that the communities living along the road profile are engaged in,
  - Settlement patterns along the road profile
  - The size and demographic feature of the population within the project area.
  - Poverty index of the communities living along the road profile
  - Community health, safety and security conditions
  - Indigenous people living in the area
  - Cultural heritage including antiques and monuments that are in existence in the area

This information was mainly obtained from existing area/district literature such as District Development Plans, information from various Ministries (Ministry of Water, Ministry of Roads, Ministry of Health among others) and other relevant government organisations.

The impacts anticipated during the construction and operation of the road were related to degradation of natural environment such as loss of soil through erosion, excavations, destruction of vegetation, animal habitats and indigenous species, relocation of people and loss of land, pollution of air from dust, noise and water from sediment, waste management, stress on available water sources, community health and safety, creation of employment opportunities, improvement of means of transport, improvement of fishing and livestock industry among others.

The identification of these impacts was done through site visits and surveys, consultation with local opinion leaders and affected communities, focus group meetings with the local communities, interviews to relevant authorities such as roads institutions and hospitals. Minutes of the any meeting held were recorded. Management plan was then developed in accordance to the IFC Performance Standards and Kenya's laws and policies on environment taking into account the concerns and recommendations of the affected communities.

### **3.5 Study tools and techniques**

#### **3.5.1 Questionnaires**

Questionnaires were mainly used to collect information from key stakeholders such as staff from Kenya Wildlife Service, Northern Rangeland Trust, County Council, Kenya Rural Roads Authority and Kenya National Highway Authority among others. The information that was sought using the questionnaires was related to perception of the community of the intended project, any anticipated conflicts as a result of the project, socio-economic impacts, collaboration opportunities, benefits accrued from the project and any measures to mitigate negative impacts.

### **3.5.2 Site visits and Survey**

To understand the biophysical nature of the project area the field team visited the site. A survey along the road alignment was done and observations made on the settlement patterns, vegetation and existing ecosystems, forests, cultural heritages, socio-economic activities among others. During the site visits, the team was also able to meet the stakeholders.

### **3.5.3 Public Consultations**

Public Consultation is a requirement for ESIA study by NEMA and donor agencies such as IFC. The Consultant through the help of area district officers, chiefs, assistant chiefs and councillors organized meetings with affected communities living along the road alignment. During these meetings, the communities were briefed on the project background, scope design outline and the regulatory requirements for all the projects of lesser /similar/ higher magnitude whose implementation approval is vested on National Environmental Management Authority (NEMA). The main objective of the meetings was to give them an opportunity to present their concerns and opinions regarding the proposed project. Key among the concerns were the resettlement of people living along the road alignment, destruction of trees and other vegetation especially pasture and use of locally available materials. Through the meetings, the communities were informed of the measures the proponent through the contractor was going to put in place to mitigate the impacts incorporating their views.

## **3.6 Data analysis and presentation**

Information/data obtained from the field was both qualitative and quantitative although the latter formed the bulk of it. In this case therefore the information was synthesised into a report on project impacts, proposed measures for mitigating the impacts including the opinions and concerns of the affected communities.

## **3.7 Management Plans**

After carrying out the ESIA, environmental and social management plans were then developed. The Environmental Management plan clearly showed proposed mitigation measures to identified impacts, parties responsible for mitigation, means and frequency of monitoring and estimated costs.

## CHAPTER 4: PROJECT AREA BASELINE INFORMATION

### 4.1 Description of the project Area

#### 4.1.1 Location

The proposed Laisamis - Loiyangalani Road lies entirely within Marsabit South district which was hived off the larger Marsabit District in 2008. At the time of the study, very little information was available on Marsabit South. Therefore much of the information in this section will be based on Marsabit District. The larger district lies between latitude 01° 15' North and 04° 27' North and longitude 36° 03' East and 38° 59' East. It has an area of 66,000 Sq.Km, which includes 4,956 Sq. Km. covered by Lake Turkana. It is the second largest district in the country covering about 11 % of the total area of the Republic of Kenya. The district borders Ethiopia to the north, Moyale district to the north west corner, Wajir district to the east, Isiolo district to the south, Samburu district to the southwest, and Turkana district to the west with boundary passing through the lake Turkana.

#### 4.1.2. Topography

Most of the district is generally extensive plains lying between 530-760 a.s.l., and occasionally interrupted by mountain ranges like the Ndoto ranges (2500m) and Mt. Nyiru in southwest part of the district along Samburu-Marsabit district border, Mt. Marsabit (1700m) on eastern flanks, and Mt. Kulal (2430m) in the north west. Other landforms are sedimentary plains, volcanic plateaus, volcanic or gneissic ranges and hills. Chalbi desert, an old saline lake bed, lying at altitude of 435-500m a.s.l is the lowest land surface in the district. Plate 1 shows Lodomil hill located 14km from the Laisamis Junction



Route plan of the proposed road works (Laisamis – Illuat – South Horr – Loiyangalani)



Plate 1: Lodomil hill Located along the road 14km from Laisamis

#### 4.1.3 Soils

The higher parts of Mts. Kulal, Marsabit and Hurri Hills have rich well developed volcanic soils with high water retention capacity. On the lower slopes of the mountains, the soils are basically cambisols. In some areas the soils are moderately deep clay loams, while in others, the soils are stony or rocky. These soils are generally suitable for agriculture and dairy farming in those places with sufficient rainfall.

The rest of the district consists of rocky, stony and rugged lava plains and sandy clay loams on alluvial plains and basement rock. The Chalbi area is completely devoid of plant life, due to its salinity, and in some other isolated areas the soils are too acidic to allow the growth of vegetation.

The district is divided into 4 agro ecological zones namely sub humid III, Semi Arid IV, Arid V and Very Arid VI. Table 1 below shows the area occupied by each zone, while Map 3 indicates their spatial coverage.

Table 1 Agro-Ecological Zones of the Marsabit District (Estimated Area)

Zone	Condition/Type	Area (%)	Hectares
III	Sub-humid	1	76,858
IV	Semi-Arid	2	164,698
V	Arid	28	2,042,227
VI	Very Arid	69	5,034,999
<b>Total</b>		100	7,316,982

### **Ecological Zone III:**

This covers about 1 % of the district and includes Mt. Marsabit, Mt. Kulal and Of Donyo Mara range. These mountain areas have high rainfall and low evaporation which have induced dense evergreen forests. These forests are most extensive on the wetter southern and eastern faces and serve as catchments areas. Immediately below the dense evergreen forest lies a belt of woodland vegetation characterized by deciduous thorn trees (5-15m high) and tall perennial grasses.

The zone is suitable for agriculture and a variety of horticultural and food crops are grown. These include maize, beans, citrus fruits, paw paws, tomatoes and bananas among others. Coffee is also grown, though for local consumption only.

### **Ecological Zone IV:**

The zone covers 2% of the district's total area and covers the top of the Hurri Hills, the lower slopes of Mt. Marsabit and the middle slopes of Mt. Kulal. It is suitable for livestock grazing due to its long grazing season. Sedentary cultivation is practiced, with fruits, vegetables, maize and millet as some of the major crops grown.

### **Ecological Zone V:**

This zone covers about 28% of the total area of the district and includes the highland masses falling between 700m and 1000m, the plains of Dida Galgallu, Bure Dera, Kaisut, Milgis and part of the slopes of Mt. Marsabit and Hurri Hills.

The dominant vegetation consists of mixed acacia woodland on stony soils and acacia commiphora bush land on deeper soils. The grass consists of tufted annual grass that is suitable for cattle. Grazing in this zone starts at the onset of the dry season and lasts for 3 to 7 months, during which time the herds gradually prepare to move to the permanent watering points.

### **Ecological Zone VI:**

This zone covers about 69% of the district total area lying below 700m. The annual grasses are poor and irregularly distributed. The high rates of evaporation and salt deposits inhibit the growth of grasses, particularly in Chalbi desert. The grazing season is short, lasting about 2 months after effective rains. When rains fail only camels and goats can graze in the area.

While over 60% of the district is not fully utilized due to lack of water and insecurity, slow land adjudication process, conflict between communal land use and private ownership and wildlife conservation further inhibit full exploitation of the remaining land, and these problems also constrain conservation measures.

If these constraints were overcome, more land would be available for both livestock and agricultural activities. This would increase the overall district livestock carrying capacity and reduce the rapid degradation of the fragile ecology.

#### **4.1.4 Rainfall**

The district is located in the driest region of the country. Rainfall varies between 200 and 1000mm, per annum, with the high elevation areas receiving most of the rain. Agricultural production is mainly practiced on mount Marsabit, where the soils and climate are favourable, but some minimal crop production is practiced on the hilly areas of the district. The rainfall is distributed two distinct wet seasons occurring between mid April to may and mid September to October.

#### **4.1.5 Climate**

The District occupies the driest region in the country. It is located in the so called Somali-Chalib desert belt that transcends and spill over to the Northern Kenya. Most of the district receives low rainfall and high temperatures combined with potential ever transpiration exceeding annual precipitation that leads to marked moisture deficiency for most of the year. The rainfall displays both temporal and spatial

variations and is bimodal in distribution. Mean max temp peaks at 30°C in dry season and minimum temperature drop to 15°C.

#### **4.1.6 Vegetation**

The District has two gazetted forests; these are the tropical rain forest of Mount Marsabit which covers about 15,280 ha and Mount Kulal biosphere conservation which covers about 45,729 ha. Other forests are found on Hurri Hills (30,000 ha), Kofia Hills, and Karare Hills.(GOK 2002)

The forests of Marsabit and Kulal have a wide variety of plant species, largely the same for both mountains. The dominant trees species found in Marsabit Forest are Olea African, Croton Meglocarpus, Strombosia Scheffleri, Cassipourea Matosona and Diophrus Abyssinica. Due to its higher elevation, Mt. Kulal forest has cedar trees species.

These two forests attract rainfall apart from reducing soil erosion. They also provide firewood, climate amelioration and act as grazing lands during dry periods. However the forest reserves are not sufficiently large to support timber industries hence there are none in the district.

- **Forest Resource of Cultural Significance**

#### **Acacia Seyal**

The species is highly valued by the community living around Loiyangalani for production of gum Arabica. The tree is thus conserved by the locals and out of necessity; it must be protected during construction of the road.

#### **Bosilia Species**

The Bosilia species and in particular the Malala-doomberger is of economic importance to the locals for making of traditional baskets.

- **Afzequensis**

The species is a sacred tree among the Samburu Community. During clearing of the road corridor the specie must avoided.

- **Acacia Totillis**

The tree is highly regarded by the local community as an indicator of presence of ground water. The presence of ground water is deduced from the lining pattern.

- **Ficus Species**

The tree produces fruits that eaten by wild animals. They are therefore a perpetual habitat for some animals and therefore they should be preserved during construction of the road.

- **Sandal wood**

The tree is of high economic value, mainly for illegal export purposes. According to the area Forester, construction of the road must take into account the possibility of heightened destruction he highly valued sandal wood species.

- **Charcoal Burning**

Tree felling may fuel charcoal burning business. The locals may be tempted to economise the felled trees and therefore the road construction works must avoid excessive felling of trees. In situations where this may not be avoided, the proponent must include disincentives such as hewing into small pieces that less attractive to charcoal burners.

In general, and according to the area Forester, the road alignment must avoid felling of trees. Where the change in alignment will necessitate felling of trees, the proponent must work with the local communities, who have formed environmental committees, to safeguard the forest cover. The ecosystem in the project area is very fragile, principally because the forest cover is mist forest cover as

opposed to the rain fed forest growth. Cutting of trees among the local community attracts fines in form of livestock, e.g. a goat for felling a single tree.

These forests are a habitat of a variety of wildlife including elephants, warthogs, hyenas, buffalos, bushbucks, wild dogs, jackals, lions, baboons, kudu, leopards, zebras, oryx, gazelle, giraffes, rhinoceros and a variety of birds.

#### **4.1.7 Commercial Minerals and Materials**

The district has no known major mineral deposits, since little geological survey has been carried out. However the existence of such minerals as copper, gypsum, graphite and corundum in the adjacent district of Turkana raises the possibility of finding minerals in the district.

Salt deposits are found in Chalbi Desert and building stones are found around Korra and Kargi in Laisamis Division. However, the cost of their exploitation and transportation is prohibitive due to inadequate infrastructure. Extraction of building stones which is currently undertaken is only to meet very localized demand around the two town centers. Sand is found in almost all the river beds in the district and in Chalbi desert. However, it is only used to meet the demand of the district.

#### **4.1.8 Tourist Attractions**

The district has a potential for tourism which if exploited would attract both domestic and foreign tourists. Rare species of wildlife like the Black Rhino, Greater Kudu and Topi are found in the district. The district also has a good variety of plains game and forest animals which include elephants and buffalos as well as bushbucks, lions, baboons, kudu, leopards, zebras, oryx, gazelle, reticulate giraffe, rhinoceros and a variety of birds. Plate 2 shows a Grevy zebra



Plate 2. The endangered Grevy zebra spotted near Namarei

Lake Turkana is a refuge to a variety of desert animals and also harbours a great variety of aquatic animals like crocodiles, hippos and birds and is also a stopping place for the migratory birds which move to and from the temperate lands. This has resulted in the creation of Sibiloi National Park, which covers an area of 10,000 Km<sup>2</sup>. Prehistoric sites where fossils of early man and animals have been discovered are also found in this Park. The South Island National Park covers about 38.8 Km<sup>2</sup> and lies on the southern tip of Lake Turkana. It has a unique herd of wild goats and is an important breeding ground for crocodiles and other aquatic life. The tourist potential can therefore generate substantial income for the district if adequate infrastructure were provided to exploit it fully.

- **Fishing**

There is a vast fishing potential in Lake Turkana, but this resource is under-utilized due to poor fishing methods and equipments. The local people catch fish for subsistence only. Fishermen from outside the district exploit this resource commercially, but on a limited scale due to poor infrastructure which discourages potential investors.

Forty eight fish species inhabit the lake. Of these, twelve are of various degrees of economic importance. These include Lobeo Horr, Tilapia, Nile Perch, Barbus Bynne, Bagrus SSP, Synodonti Schall, Catharinus Citharas, Elastase SPP, Heterotis SPP, Distichous Niloticus, Hydrocyrus Forskalii and Claria Lezera.

- **Solar and Wind Energy**

Energy is recognized as an essential resource for promoting and sustaining industrial and other economic activities. Solar energy is by far the most abundant resource of the district and if utilized, could provide an unlimited amount of energy. Wind is another resource that can be harnessed to drive windmills for pumping water.

## 4.2 Socio-Economic Profile

### 4.2.1 Economic Activities

Pastoralism is predominantly practiced by communities in the entire region with minimal cultivation. In the regions of South Horr and Marsabit, Mt. Kulal and Hurri Hills there are some agricultural activities where some of the main crops are maize, citrus fruits, beans and vegetables.

Sheep, goat and poultry keeping are also prevalent activities in the project area. Livestock production has great potential particularly the establishment of more large scale milk processing plants to produce butter, cheese, yogurt, and other milk products. Tanning industry for processing of leather products is also viable in view of the availability of hides and skins.

The improvement of the proposed road will have a positive impact by enhancing movement of animals and animal products from the area to markets in Laisamis. This in turn will mean increased income to the local communities and consequently improved livelihoods. Plate 4 shows camel rearing in Ndikir sub location



Plate 3: Herd of camels grazing at the Milgis Lagga

Other economic activities related to commerce, services, fishing and industrial activities. They form important activities undertaken within the project area. In the urban centres commercial enterprises, trading and provision of services are important undertakings. Major commercial activities are sale of raw milk, water and horticultural produce. Other activities to be noted are wholesale and distribution of food stuff, animal feeds and fertilizer.

### 4.2.2 Communities in the project area

The project area is predominantly inhabited by Turkana occupying the upper regions of Loiyangalani in Turkana district, Samburu mostly in south Horr, Boran found in some town centres, and the Rendille in Laisamis, Illaut and South Horr areas.

The Rendille Community occupies the area between Laisamis, Dikir, Mt Bayo and partly Ngurunit area. The community's main abode, also known as Manyatta, are temporary structures, comprising of

Manyatta Arnika / Ntiliya, Lorokushu I & II, ndikir I & II, Bayo Lengima, Namalei and Ngurunit town centre, all situated within a Km of either side of the road corridor .

Ngurunit town centre is composite of permanent, semi permanent and temporary structures (Manyatta) and is a near transition of the Rendille and Samburu Communities. The Rendille people are pastoralist nomadic community. They keep cattle, shoats, camels, donkeys and to a lesser extent poultry. The community moves far and wide in search of pasture and water. This work is normally undertaken by the young men also known as Morans. The small animals, mainly the shoats are grazed within close proximity of the Manyattas by young girls and boys and women. The bigger animals, cattle, camels and donkeys are herded all over the wider Marsabit District. However, during periods of abundant pastures, the animals grazed close to the Manyattas. The old men and the middle aged men who have graduated into elders are charged with the responsibility of overseeing the performance of their livestock herds. They spend most of their time under a tree discussing matters affecting the community, gambling and later in the day they audit their livestock after returning from the fields.

- **Ngurunit, Illaut, South Horr and Selima**

The section of the road between Ngurunit, Irauti, South Horr and Selima is occupied mainly by the Samburu Community. However, the section between Ngurunit and South Horr also hosts the Rendille community. The Samburu mainly occupy the Samburu District of Rift Valley Province, while the Rendille occupy Marsabit South (Laisamis). Each of the community has a distinct administrative boundary. The Samburu people are mainly livestock keepers, rearing cattle, shoats, camels and donkeys. They too lead nomadic live, moving their livestock from one place to the other in search of pasture and livestock. Young boys, girls and women are in charge of the shoats, which are grazed close to the family dwellings, Manyatta, while the young men move the larger stocks, comprising the camels, donkeys and cattle to the wider frontiers of Samburu and Marsabit Districts. Men are heads of the family units and their role is to oversee the performance of the livestock heads.

- **Selima – Loiyangalani**

The area between Selima and Loiyangalani is mainly occupied by the Turkana Community. Loiyangalani is a cosmopolitan town, hosting several other communities, who carry out various businesses within the town. However, the Turkana people are the predominant community in the town.

The Turkana people are mainly livestock keepers. They keep cattle, shoats, camels and donkeys. Those living near Lake Turkana engage in fishing, besides livestock keeping. The fish is sold to hotels and fish merchants in Loiyangalani town. The traders transport the fish to Nairobi for sale.

Turkana people move with their livestock in search of pastures and water. Their movement is revolves around Turkana, Samburu, Pokot and Marsabit Districts. This movement has in several occasions lead to conflicts with the host district communities such as Samburu and Pokot over scarce pastures and water, resulting in cattle rustling.

#### **4.3 Poverty**

Poverty can be described as a situation where individuals or households cannot afford basic food and non-food items. Thus they cannot satisfy their basic needs such as food, shelter, clothing health and education for their children.

Poverty in the district can be classified into three types that is, food poverty, overall poverty and hardcore poverty. Food poverty occurs where the population cannot meet average cost of food requirement per person thereby falling below the rural poverty line. The food poor form 86 per cent of the district's estimated population.

The populations that cannot meet the minimum cost of food and non-food items for human life and fall below the national overall poverty line are considered to be obsolete poor. This comprises 88 per cent of the district's estimated population.

The hardcore poor is the group that can be described as being unable to meet the basic minimum non-food requirement after spending all their income on food alone. The hardcore forms 82 per cent of the district's population.

Marsabit District is one of the poorest districts in Kenya. The main causes of poverty in the district include: entail severe drought, inadequate water for domestic and non-domestic use, wildlife menace, low agricultural production due to climatic unreliability, economic, relating to lack- of markets for livestock and livestock products, lack of employment opportunities, corruption, over-dependency on relief food and livestock economy, landlessness and unexploited and unutilized resources, and socio-political conflicts, which include ethnic clashes, banditry, cattle rustling, illiteracy and gender inequality.

Geographically, poverty incidences are high in lowlands than around the mountain areas. According to district reports on nutrition survey/assessment, which was carried out by FHI/Tear Fund in collaboration with the MOH office, the division with the highest incidence of poverty is Loiyangalani and North Horr while the lowest is Central and Gadamoji Divisions. The District Poverty Assessment report also showed the same trend.

#### **4.4 HIV/AIDS**

HIV/AIDS prevalence has been on the increase in the district over the years since the first case was reported in 1984. According to MOH records, the trend of the disease over the last six years shows a gradual increase from 27 HTV positive cases in 1995 to 50 HIV positive cases in 2,000. The infection rates are more for females compared to males due to socio-cultural and physio-biological factors, which make females more vulnerable.

The nature of HIV/AIDS pandemic is directly related to the cultural values, tradition and norms embedded in African culture, some being linked to demographic factors, age and sex distribution, morbidity and mortality patterns and increasing urbanization while others are linked to the cultural institutions of marriage and child bearing. Cultural practices in the district as initiation rites, wife sharing, remarriages after divorces and traditional surgery have contributed significantly to HIV/AIDS prevalence. This is further compounded by rampant practicing of commercial sex among the young girls in the main urban centres in the district.

HIV/AIDS epidemic is now recognized as a National Disaster and as a development problem since its effects and impacts have far reaching social, economic and cultural ramifications within all sectors.

The home-based care currently available is not only limited, but also the care providers' concentrate only on women and young girls. This group is already overburdened with heavy domestic workloads. The numerous responsibilities include care for the young in the family, gathering and preparation of food, fetching water, firewood, income generation and general management of the entire household. The emergence of the AIDS epidemic has compounded and further overburdened the women and young girls in the district.

Some of the identified obstacles on control and management of HIV/AIDS include inadequate community awareness of the impact of disease due to low levels of accessibility to the communication media such as radios, television, local news papers and high level of illiteracy. Existing cultural practices do play a major role in control off the HIV/AIDS.

Another major constraint relates to the inadequacy of resources to strengthen the coordination, monitoring, testing at the major health institutions in the district.

The major coping strategies which will be pursued by the district will include; increase public awareness/education at all levels, strengthening voluntary counselling services promote use of condoms

by improving its supply, and access to the community encouraging voluntary testing and opening HIV/AIDS testing centres in all major health facilities, facilitating/lobbying for improved social, spiritual and economic support for orphans, widow and widowers, establishing HIV/AIDS Resource Centres, availing home based care services for those infected with AIDS, improving prompt treatment opportunistic infections, enhancing multi-sectoral approach to affordable anti-retroviral drugs and strengthening coordination and monitoring of HIV/AIDS activities in district.

#### **4.5 Settlement Pattern**

Population density varies between 1 person per Km<sup>2</sup> to about 22 persons per Km<sup>2</sup>. High population densities are found in permanent and semi-permanent settlements mainly on the Mount Marsabit and other high elevation areas where agro-pastoralism is practiced, and around permanent water sources where markets and other social amenities are found. Most of the people who have lost their livestock due to droughts and other causes migrate to these areas in search of employments and other sources of livelihoods. Most settlements comprise of manyattas where communities live and some act as market centres as shown in Plate 4.



Plate 4: Typical house in a Manyatta

About 80% of the total population are pastoralists and derive their livelihood from livestock and livestock based industries, they move with their livestock in search of water and pasture, about 10% of the population practice subsistence agriculture and reside mainly around Mount Marsabit, about 7% are involved in commerce and trade, the rest are salaried employees.

Pockets of poverty are predominantly found in Loiyangalani and North Horr Divisions, these areas depend wholly on livestock as a source of livelihood. Poverty is also found in Central Division especially in Marsabit town among the victims of tribal clashes, cattle rustling and immigrants from other parts of the district in search of relief food.

##### **4.5.1 Demographic Profile**

The size and demographic features of population are important variables in the equation of the development process, for they determine the pattern of resource utilization. Accordingly, this section

presents the population profile of Marsabit District and among the demographic features analyzed are size, structure and distribution of the population by division.

#### 4.5.2 Population Size

Table 2 shows the population projections for the various age groups over the plan period. Natural increase due to the excess of births over deaths and movement of the people into the district explains the increase of the population over the times.

Table 2: Population projection of the divisions traversed by the road

Division	1999	2002	2004	2006	2008
Central	18.1	19.2	20.1	21	22
Gadamoji	21.3	22.7	23.65	25.67	25.73
Laisamis	3.2	3.4	3.55	3.7	4.0
Maikona	1.1	1.17	1.22	1.27	1.32

The district had a population of 92,112 persons in 1989. It is projected to increase to 112,144, 117,798 and 123,736 in the years 1997, 1999 and 2001 respectively. This assumes an annual growth rate of 2.46%, constant fertility and mortality and zero external migration. The implication of population growth for the development of the district is a negative impact on the fragile environment due to environmental degradation caused by reduction of the vegetative cover, soil erosion, and concentration of population around mountain areas and overgrazing around the permanent watering points.

#### 4.6 Water Resources

Both humans and livestock in Marsabit District rely on surface and sub-surface water since there are no permanent rivers. The seasonal flow of rivers ensures recharge of sandy alluvium so that there are traditional perennial water holes. Availability of water varies among the different regions of the district.

In the sub humid area of Mt. Marsabit, which covers Marsabit Town, the supply of piped water is highly inadequate; and to supplement this, the population in the area relies on water from wells, surface pans and roof catchments while in Mt Kulal the supply is from several springs tapped from the mountain and collected in reservoirs.

In the semi arid regions, the water resources situation varies in the different parts. The southern and eastern slopes of Mt. Marsabit rely on springs, surface pans and wells. The lower slope of Mt. Kulal relies on water from the mountain or from lagas and pools during the rainy season. Oldonyo Mara relies on water from springs while the rest of the region relies on water from boreholes.

In the arid region, water availability is limited to supply from boreholes and wells. Some of the ground water is saline like in the Chalbi desert. The water available in the whole district is inadequate for fostering industrialization, irrigation or even to satisfy human and livestock needs.

Information from Water Supply report by GASS Associates Ltd indicates that the existing boreholes there exists a borehole at Korr whose depth is 120m and water rest level at 43 m. There are also occurrences of groundwater at depths suitable for shallow wells, subsurface wells or collector wells widespread in the sandy lagas of milgis, Illaut and Arsim rivers. Shallow wells are also found at Laisamis, Nkurunit and Illaut.

GASS Associates Consultant has proposed that five boreholes be drilled at Saangani river site, Arsim junction, South Horr – Baragoi junction, Milgis River and Laisamis to supply water for the construction of the road. These boreholes have an average yield amount of 13 m<sup>3</sup>/hr. Assuming 10 hours operation, the amount of water that will be available for the project will be about 130 m<sup>3</sup>/day. This water will hardly be enough for the construction of the proposed road that requires about 400 m<sup>3</sup>/day. More water sources must be evaluated. The water supplied to the workers especially at the construction camps

must meet the WHO guidelines on drinking water. Water can be a source of conflict between the community and the contractors and must be adequately addressed through consultations with the local community and the local administration.

#### 4.7 Education

By the year 2002 the district was served by 6 secondary schools, 47 primary schools and 81 pre-primary schools. Table 3 shows enrolment rate, dropout rate and teacher /pupil ratio for the district.

Table 3: Enrolment rate, dropout rate and teacher /pupil ratio for the Marsabit District

Category	Parameter		
Pre-primary	Enrolment rate (total %)	Boys and Girls	33.5
		Teacher/pupil ratio	1:36
	Dropout rate (%)	Boys	10
		Girls	10
Primary	Enrolment rate (%)	Boys	54
		Girls	38
	Teacher/pupil ratio		1:34
	Dropout rate	Boys	5
		Girls	6
Secondary	Enrolment rate (%)	Boys	12
		Girls	5.7
	Teacher/pupil ratio		Not available
	Dropout rate (%)	Boys	58
		Girls	67

#### 4.8 Health

The project area has three most prevalent diseases namely respiratory, malaria and diarrhoea. Health facilities are located in the trading centres with the average distance to health facility being 80km. There are government and missionary run health facilities in Laisamis, Ngurunit, South Horr and Loiyangalani. According to the District development plan 2002-2008 the district average of Doctor/Patient ratio is 1:63,825 and household with access to health centres is 50%.

#### 4.10 Energy

In the entire district, only Marasabit town is connected to electricity. According to District Development Plan 2002 – 2008, about 513 households have electricity connections. Despite there being solar energy, it is not being utilized. Firewood and charcoal are mainly used for cooking purposes.

## CHAPTER 5: PROPOSED PROJECT DESCRIPTION

### 5.1 Project Alternative Routes

#### **Roads:**

The access to the Loiyangalani site where the wind farm will be sited is possible through two routes both branching off from the Isiolo-Marsabit road as follows:

- Marsabit- Kargi-Project site( Loiyangalani)
- Laisamis-Khorr- Ilaut- South Horr- Project site( Loiyangalani)

Both access roads are located in Eastern province and traverses the newly created Laisamis District (curved out of Marsabit District) and the larger Marsabit District. These are the least populated District in the country with a population density of two persons per square kilometer. According to the socio-economic and political profiles of Kenya districts Factbook compiled by the Institute of Economic Affairs in 2002, there is no comprehensive comparable socio-economic statistics consistently collected for the Districts. A brief description of the two routes characteristics is as follows:

#### **Marsabit- Kargi-Project site( Loiyangalani)**

The road branches off from the main Isiolo -Marsabit 10km from Marsabit town and runs 218km in a westerly direction descending from approximately 1200m above sea level to 500m at the terminal point located 36.4 km from Loiyangalani town.

#### *Horizontal geometrics*

The road has reasonable horizontal geometry with long straight sections and curves with large radii. There are a few sections with poor geometrics which can be improved provision of bigger radius to achieve recommended standards.

#### *Vertical geometrics*

The general descent implies that there are some sections that have unfavorable steep vertical curves especially 800m after the turn off from the main Isiolo-Marsabit Road, there are a series of steep descents that may require improvement. The other sections of the roads are located on flat to gently sloping undulating terrain. Ideally, a road constructed in such terrain would be raised by a minimum of 1 m above that surrounding ground.

#### *Availability of road construction materials*

The road traverses Located along the road alignment traverses areas of variant physiographic characteristics. At the turn of point, the alignment soils are basically loamy sands which gradually give way to sands through the whole stretch of Koroli Desert and some area loose volcanic materials interspersed with loose boulders. Initial investigations indicate that there are several possible sites that can yield adequate construction materials. A through material investigation should be conducted to confirm or refute this assertion. There was however no discernible indicator of surface water in the absence of which thorough hydrological survey is necessary to assess the ground water potential of the road alignment.

#### *Road cross section*

The existing road width ranges from 4m at concrete section on steep grades to 6m on the flat and gently sloping areas.

The lowest category of cross sections from road Design manual, Part 4, Geometric Design of rural roads gives a minimum width of carriageway of 6m; the normal cross fall is 5%.

#### *Drainage*

The existing road is poorly drained and although in most of the sections the alignment is free draining. There are a few drifts located at seasonal river beds.

#### *Environmental aspects*

Initial scoping of the project indicates that the area traversed by the project is sparsely populated and has one main centre Kargi. The negative environmental impacts likely to arise during implementation of the rehabilitation/strengthening of the road include:

- Loss of vegetation and biodiversity in some areas
- Disturbance of soil and scouring
- Increased vehicular traffic
- Noise Nuisance
- Dust and air pollution
- Incidences of sexually transmitted diseases
- Distortion of landscape

Positive impact includes employment creation, improved accessibility of the remote area and general improvement of the economy of the area.

#### **Laisamis-Khorr- Ilaut- South Horr- Project site ( Loiyangalani)**

The road branches off from the main Isiolo -Marsabit at Laisamis town and runs 195km in a Northerly direction descending approximately 750m above sea level to 500m at the terminal point located 36.4 km from Loiyangalani town.

#### *Horizontal geometrics*

The road has reasonable horizontal geometry with long straight sections and curves with large radii. There are a few sections with poor geometrics especially at South Horr 138.6km from Laisamis where there are sharp horizontal curves which can be improved provision of bigger radius to achieve recommended standards.

#### *Vertical geometrics*

The road runs on a flat to gently sloping undulating terrain. There are however abrupt interruptions on the general terrain especially at South Horr where there are steep slopes. Ideally, a road constructed in such terrain would be raised by a minimum of 1 m above that surrounding ground.

#### *Availability of Road Construction materials*

The road alignment traverses areas of variant physiographic characteristics giving rise to different alignment soils. There is notable prevalence of quartzite gravel along the alignment particularly on chainages 61km, 101km and 146 from Laisamis. This indicates that there are numerous possible borrow sites that can be investigated. It was also observed that water is available from small rivers at Kurungu and South Horr. There is also potential of exploitation of ground water at Serem and Khorr as indicated by the presence of productive shallow wells along the dry river beds.

### *Cross section*

The existing road width ranges from 5m at some culverts to 7m on the flat and gently sloping areas. The lowest category of cross sections from road Design manual, Part 4, Geometric Design of rural roads gives a minimum width of carriageway of 6m; the normal cross fall is 5%.

### *Drainage*

The road is drained by a combination of structures including 13 drifts and 42 single and double culvert lines in addition to box culverts. There are however a total of 59 dry river beds/ deep gullies crossing with no particular drainage structure. The road also traverses a number of low lying laggas.

### *Environmental aspects*

Initial scoping of the project indicates that the area traversed by the road has a relatively higher population compared to the other route through Kargi. The main centres along the route from Laisamis include Khorr, Ilaut, South Horr, and Kurungu. The negative environmental impacts likely to arise during implementation of the rehabilitation/strengthening of the road include:

Disruption of livelihoods

Loss of vegetation and biodiversity in some areas

Disturbance of soil and scouring

Increased vehicular traffic

Noise Nuisance

Dust and air pollution

Incidences of sexually transmitted diseases

Distortion of landscape

Positive impact includes employment creation, improved accessibility of the remote area and general improvement of the economy of the area.

### **Selected route**

Based on the foregoing analysis, it is important that a decision on the access road to be improved made on the technical criteria at the beginning. From the preliminary site visit and the analysis, it is apparent that:

- The Marsabit- Kirgi –Loiyangalani route is longer than South Horr route and has no guarantees for the availability of construction materials and water compared to the latter.
- The Laisamis-Khorr- Ilaut- South Horr- Project site ( Loiyangalani) follows a generally flat terrain and presents only a few geometric challenges compared to the Kargi route.

The distance between Laisamis to turnoff of the Kargi route on the Isiolo-Marsabit road is 50 kilometres, thus the Kargi route lengthens the haulage distance for the wind farm equipment by an additional 50kilometres. Thus the Laisamis-Khorr-Ilaut-South Horr route was selected for strengthening. Plates 1-6 show features of the two routes.

### ***Railway and Air Transport***

Air and railway transportation of the wind project equipment were not found to be feasible alternatives. The area is not served by railway line. The railway line terminates at Nanyuki. The area lacks large airports for large cargo planes and thus air transport of the equipment is not possible.



Plate 1. Steep descent immediately after turn off from main Isiolo- Marsabit road (Route 1)



Plate 2: Rock boulder along road alignment (Route 1)



Plate 3: Koroli Desert (route 1)



Plate 4: Terminal point of the proposed Accesses



Plate 5: Existing borrow site on Chainage 145km from Laisamis (Route 2)



Plate 6: Box culvert Near South Horr( Route 2)

## 5.2 The Laisamis, South Horr – Loiyangalani Road Profile

The road between Laisamis and South Horr is classified by the Ministry of Roads as D371 and falls under the jurisdiction of Kenya Rural Roads authority (KeRRA). Between South Horr and Loiyangalani, the road is classified as class C77, and falls under Kenya National Roads Authority (KeNHA). The entire stretch is a murrum road that is marked by low lying terrain juxtaposed between numerous hills, dry sandy river beds. In general the road is in a motorable status. However, sections of the road, cutting across the dry sand river beds are extensively damaged and are unstable for heavy vehicular loading. Besides, crossing the valleys, during the rainy seasons is near impossible, even for four wheel drive vehicles. Plates 7 to 10 show some of the key features of the existing road.



Plate 7: Junction with A2 Isiolo-Marsabit road



Plate 8: 7 lines of 900mm dia. culvert drains



Plate 9 Running surface washed away by flood waters chainage 12+000



Plate 10: Dry sand river bed

The existing road formation is composed of sandy soils which exhibit poor cohesive properties. In consequence, rivulets adorn the formation and gullies have eaten into the slopes of the embankments.

### **5.3 Proposed Works**

#### **a) Material Investigations and Testing**

The road works will involve considerable construction materials usage. The quality and availability of materials for road construction is critical in road construction works, and hence the need for material

testing and investigations. In addition the, the road profile formation requires to be investigated for its strength to carry the anticipated vehicular loading and permeability. Ideally, material investigation involves will be concentrated to locations along the existing road alignment.

## **Materials for the road work**

### **Soils**

The existing road subgrade is mainly composed of silty sandy soils. The subgrade soil's main function is;

- Provides stability and durability to the road pavement under adverse climatic and loading conditions.
- Support the road pavement
- Provide proper drainage to rain and underground water.

Road defects such as waves, corrugation, rutting is caused by poor subgrade soil conditions. Hence the soils that are used for subgrade should be compacted and stabilised to provide the stability and durability to the road. Sites along the road alignment have been identified as sources for subgrade soils.

- **Aggregates**

Aggregates are a major component used in road construction. In the proposed project, aggregates will be used in, granular base and subbase, concrete works for drainage structures such as culverts, river crossing drifts. Aggregates bear the stresses occurring on the roads and have to resist wear due to abrasive action of traffic.

The tests have been undertaken to decide on the suitability of the road aggregates for the road construction which include impact tests, los angles abrasion test, crushing strength test, water absorption test and soundness test. The materials investigation study for the road construction works has been carried out and thirteen (13) sites been identified along the road, with all the borrow pit logged showing the materials consist of either lateritic, quartzitic gravel or a mixture of the two.

- **Cement**

Ordinary Portland cement will be used in the construction works such as road hydraulic structures, site offices and stores, stabilisation of the subgrade, subbase and bases of the road.

Sand for construction is available in the rivers traversing the Basement System rocks over which the road travels for the bulk of its length.

### **b) Excavations**

The Laisamis, South Horr-Loiyangalani Road is a flexible pavement, whose construction will involve light and heavy excavations. Heavy excavations will involve excavations up to a firm subgrade, from where the road formation will begin. Light excavation will be undertaken where the road subgrade, sub bases and bases are in fairly good condition.

### **c) Drainage Works**

Road drainage is the process of interception and removal of water from over, under and vicinity of the road surface. For safe and efficient design of road, road drainage is very important. Stability of road pavements can be maintained if surface and foundation bed remain in dry condition. Drainage works on the proposed road form a major component of the strengthening works, since most of the existing hydraulic structures are damaged or inadequate.

## **Necessity of Road Drainage**

- Excess moisture content in soil subgrade lowers the stability of the road
- Entrance of water into the road subgrade causes reduction in bearing capacity of the stabilised soil subgrade.
- Due to poor drainage, waves and corrugations are formed which causes failure of the pavement.
- In rigid roads, failure occurs by mud pumping due presence of water in the subgrade soils
- Variation of moisture content in expansive soils causes variation in the volume of subgrade and contributes to failure of the road.
- Poor road drainage work causes erosion of soil from the top of unsurfaced road and slopes.
- Excess moisture content causes considerable increase in weight and thus stress and simultaneous reduction in strength of the soil mass
- The shoulders and road edges get damaged due to excess water.

The Laisamis, South Horr – Loiyangalani Road is located on poorly drained, low lying terrain. During the rainy season, a significant section of the road is transformed into a drainage channel. The drainage structures are missing and where available, they are inadequate, to convey the water on the road alignment and adjoining areas. The soils along the road alignment have poor permeability and hence pools of water collect on the side of the road, undermining the stability of the road.

In this respect, the design to strengthen the road will involve several drainage structures for intercepting, removing and controlling surface and subsurface water, from entering the road structure, as highlighted below;

### **1) Surface Drainage**

This is the removal and diversion of surface water from the road and adjoining land. The system allows surface water to flow from the road surface without percolating into the shoulders. The water is collected in side drains and disposed off at the nearest stream or valley.

Drainage structures for this purpose will include, side drains, mitre drains, longitudinal drains. The side drains, mitre drains and longitudinal drains will have sufficient slopes to allow free flow of water into the nearest streams and valleys. The road camber and shoulders equally shall have sufficient slope to convey the water from the road surface into the side and longitudinal drains.

### **2) Sub-Surface Drainage**

This is a system of diversion or removal of excess soil water to the ground water. The main function of subsurface drainage structures is to keep the variation of moisture in subgrade soil to a minimum. This is achieved by lowering the water table, controlling seepage and controlling water rise through capillarity.

Subsurface structures for this purpose will include longitudinal drains and transverse drains or cross drains. Where the longitudinal drains are deemed inadequate on their own, transverse drains situated at appropriate intervals will be provided.

### **3) Cross Drainage Works**

Cross drainage works main function is to discharge water, collected in side drains or natural streams, across the road from one side to the other as quickly as possible. Adequate functioning of the road depends to a large extent on the effectiveness of the cross drainage work. Quick drainage prevents water from penetrating into the soil sub grade and thus prevents failure.

The cross drainage structures that will be incorporated in the design include culverts and perforated drifts. The cross drainage structures, mainly culverts and drifts, will abound along the entire stretch of the proposed road. This is necessitated by the numerous dry river beds cutting through the proposed road.

Drifts will either be submerged culvert drift or concrete slab drifts. Both types are ideal solution to the several dry rivers crossings problem on the proposed road that is located on a low development area, low traffic and flash floods abound.

#### **d) Change in Alignment**

The proposed work involve slight change in the existing road alignment to adequately cater for the extra vehicular loading, avoid sections of the road that are completely damaged, avoid the highly settled areas and dwelling structures located in the small towns of South Horr and Ngurunit, change the junction at Laisamis town, off the Isiolo Marsabit A2 road, into a T-junction.

#### **e) Light & Heavy Grading**

Where the road alignment on the proposed road is in fairly good condition, the main works will be light grading to maintain proper camber for the road drainage. Light grading will be concentrated around; Bayo hills and Ngurunit, Ngurunit and South Horr and South Horr and Selima.

Heavy grading works will be carried out on sections of the proposed road where the road alignment is extensively damaged. The initial 25km section of the road alignment requires heavy grading.

### **5.3 Equipments to be used in the Construction Works**

#### **a) Tractors:**

They will mainly be used to pull and push loads during construction works. They will also be used as mounts for accessories, such as rippers, bulldozer blades, front end shovels and trenchers.

#### **b) Bulldozers**

Bulldozers are versatile machines that will be used for the following operations; To level the earth, to clear sites of debris and vegetation, excavation of the borrow pits, clear feeder roads, construct temporary roads, to move earth fill within short distances, maintain haul roads

#### **c) Scrappers**

The scrappers will be employed in the earth moving fields to dig loads of soil, haul and discharge the excavated materials on the road. The scrapper aids in depositing, spreading and levelling the earth fill load in uniformly thick layers.

#### **d) Shovels**

Shovels will primarily be used for excavation and loading the road construction fills into trucks or tractor pulled wagons. They are capable of excavating in all types of earth except solid rock.

#### **e) Rollers/Compactors**

Rollers are essential equipments required for road construction. Rollers will be used for compaction of soils to achieve the required consolidation levels. They are of two types; smooth wheeled rollers and sheep's foot rollers. Smooth rollers are effective in compacting granular soils such as sand, gravel and crushed stones. Sheep's foot rollers are suitable for cohesive soils.

#### **f) Graders**

A grader is a self propelled machine which has its blade within the wheel base. The length of the blade is about 35 m, but its effective length during spreading becomes 2.75m. The purpose of a grader in this work will be to spread the heaped earth into layers, maintain the cross section of the embankment and shaping the cross section during construction.

#### **g) Dump Trucks**

Dump trucks will be employed in hauling materials from the borrow pits heaps to the road construction sites situated over short and long distances.

#### **h) Concrete Mixers**

The road project will involve considerable concrete works, both mass and reinforced concrete, for construction of structures such pipe and box culverts, drifts, small bridges, retaining walls, site offices and stores and duty camps. Concrete mixers will be used for concrete batching.

### **5.4 Project output**

The main output of the work is a motorable standard engineered gravel road with a gravel running surface, road cross drain comprising of culverts and perforated drifts. The geometrics of the existing road will also be improved by widening of existing horizontal curves and improvement of vertical curves.

### **5.5 Project Budget and timeline**

The project is estimated to cost about KShs1.2billion putting the average cost to be KShs 6.3 million per kilometre. The actual construction is expected to take one year.

## CHAPTER 6: PROJECT IMPACTS

### 6.1 Introduction

A project with the magnitude of the proposed upgrading of the Laisamis – Loiyangalani road is expected to have environmental impacts on certain aspects of biophysical and socio-economic environment of the project area both during construction and operation stages.

The impacts of the project were assessed and are generally grouped into those affecting soil, water resources, air quality, flora and fauna, community and their economic activities, vegetation and forests, land acquisition and resettlement, aesthetics and landscape, noise and human health. Appropriate mitigation measures are also discussed. These impacts were considered for the various phases of the project as:

- During construction of the Laisamis – South Horr – Loiyangalani road;
- During operation when the road will be used for transportation of materials and equipment for the construction of the wind farm;
- Decommissioning of the facilities such as construction camps, equipment and materials used for the construction and maintenance of the road when it will be in operation.

Impacts can be positive or negative, direct or indirect. The magnitude of each impact is described in terms of being significant, minor or negligible, temporary or permanent, long term or short term. These qualities are indicated in the assessment Table 5:

Table 5: Impacts Assessment Criteria

Key	Type of impact	Key	Type of impact
R	Reversible	Irr	Irreversible
P	Permanent	T	Temporary
Lt	Long-term	St	Short-term
Sg	Significant	Ng	Negligible
X	No impact	No	-

Generally, temporary impacts having no obvious long-term consequences are regarded as minor.

### 6.2 Impacts during construction phase

#### 6.2.1 Positive impacts

During the construction phase, the proposed project will have the following benefits to communities living in the project area.

1. Creation of employment for the locals. The contractor will engage skilled and unskilled labourers from the local community such as socioeconomists, trainers for HIV and other sexually transmitted diseases, security personnel, casual labourers for road construction, cooks and cleaners for the construction camps among others. This has the main benefit of increasing income to the locals and consequently improving their livelihoods.

2. Small scale traders and businesses in centres located along the road will flourish from the increased volume of trade due to increased demand of basic commodities and services such a food, construction materials and accommodation during construction stage.

### **6.2.2 Negative impacts**

The negative impacts anticipated during the construction phase are as follows.

- **Soil Erosion**

The project will involve both light and heavy excavations. These earthworks will result in soil erosion and especially along the steep sections. Improper drainage of runoff from the road to lower catchments can also cause erosion. Incorporating soil conservation measures during construction would help to mitigate damage caused by erosion. Clearing of vegetation for the new road, and excavating murrum from gravel pits with slopes exceeding 4% could result in an increase in runoff along the slopes and thus encourage erosion.

- **Pollution**

Heavy equipment and vehicles will be used during construction of the road. Exhaust and engine emissions from these vehicles and equipments may cause air pollution, which can have an impact on public health, crops and vegetation along the road, soils and water sources. Oil wastes may also become a source of pollution to the soils, water sources and vegetation along the road network if carelessly handled, stored or drained from construction vehicles and equipment. There will also be increased sediment loads to the rivers and streams resulting from excavation works and construction debris.

The Contractor should ensure proper disposal off all construction debris in a sensible manner and not thrown it into any of the rivers/stream.

- **Diversions**

Diversions during construction will only be required in some sections but generally traffic will be allowed to pass through the works. These diversions will ideally remain within the road reserve. In sections where this will not be possible, traffic may have to be diverted temporarily across private land. In such cases, landowners will have to be compensated for loss of crops/ grazing land, nuisance fencing, etc.

If diversions are made, then they should be demolished, scarified and re-vegetated after construction. The Contractor will need to institute traffic control measures. This level of construction work requires deviations for safety reasons and to reduce construction costs but is subject to availability of space.

- **Material Sites**

Major concerns relating to gravel sites include vegetation clearance, landscape scares, dust and general disturbance during excavation, and the need to reinstate or landscape the sites when the Contractor has completed quarrying.

Most of the gravel sites are on privately owned land with homesteads on them or located fairly close by. Dust and noise during excavation and quarrying will therefore affect most of these homesteads; the contractor will need to establish the general wind directions on project roads and work accordingly.

Traffic to the materials sites will also pose a nuisance to people living around them. To Contractor should also ensure that the borrow pits are well fenced to avoid occurrence of accidents. Erodibility depends largely on soil type and to some extent on the gradient of the site (slope). Gravel pits are more susceptible to erosion than hard stone quarries. In general, the soil types found at the gravel pit locations are fairly stable and on relatively flat ground reducing the chance of extensive erosion.

- **Contractors' Workmen Camp**

Construction teams have the potential to cause natural resource degradation in terms of accelerating tree felling, hunting and vegetation clearance at the location. In setting up the workmen's camp,

consideration must be given to fuel supplies and water availability. It is likely that the workforce will put an additional demand on fuel wood for cooking. This demand may affect local fuel wood supplies and may also compromise its availability to the local people. Water sources are limited in the entire road corridor and are quite a challenge. The demand for water will put temporary pressure on local supplies. Water in the camp is important in terms of maintaining hygiene and sanitary conditions. The Contractor may need to sink several boreholes, and for this, he would require an environmental impact assessment study for the same.

The camps are also causes visual intrusion in breaking the natural scenic beauty. The camp would also generate solid and liquid waste, the disposal of which will need to be addressed, as the settlements/towns along the project road are not served by sewage systems or waste collection services.

The Construction Camps must meet the set criteria and standards for such facilities as approved by the Resident Engineer on site.

- **Public Health**

Improvement works and traffic during operation will create dust, air and noise pollution, which can have an impact on public health. Oil wastes from vehicles can also impact on public health if they find their way into water sources. The leaded compounds will accumulate on any roadside vegetation planted for consumption purposes.

Sanitation and hygiene in the workmen's camp are also issues of concern, and if not properly addressed can lead to outbreaks of illness such as hepatitis, typhoid, intestinal worms, etc.

Road projects are associated with an increase in sexually transmitted diseases such as STDs and, HIV/AIDS due to the influx of workmen interacting with the local people. Construction teams can also cause social upheaval among communities along the project road.

### **6.3 Impacts during Operation phase**

#### **6.3.1 Positive impacts**

The construction of the wind farm is expected to take one year. During this time, the road will be used for transportation of materials and equipments to the wind farm. The communities living along the road network and surrounding areas will reap benefits from the constructed road which include;

1. The road network will lead to opening up of the area which may lead to development of business centres along the road network. This may even lead improvement of living conditions in the existing trading centres such as Ngurunit and South Horr such as housing, water and sanitation facilities
2. Business opportunities especially in centres located along the road will flourish due to increased demand for basic commodities and services such as food, accommodation and construction materials.
3. The water facilities developed by the Contractor for the road construction will be handed over to the communities. This will increase the amount of water available to the local communities.
4. There will be enhancement of industries in the area such as fishing and livestock due to improved transportation resulting to reduced transportation costs as well as time to the markets.
5. There will also be need to maintain the road during the operation phase. This will create employment to the locals who will be involved in clearing of drains and culverts, repairing of any pot holes, clearing of bushes along the road profile, repair of transportation vehicles.
6. Improved accessibility will open up the area as a tourist destination and will lead to development of tourist related activities such as camping sites. This will go a long way in alleviating poverty since most of the youth will be employed in productive economic activities.

7. The entire community along the road alignment depends on food aid/relief which is hampered by the poor road network. Improvement of the road will enable communities to get the relief food in good time.

### **6.3.2 Negative impacts**

5. Exhaust and engine emissions from vehicles used for transportation of materials and equipments may cause air pollution, which can have an impact on public health, crops and vegetation along the road, soils and water sources. Regular servicing of these vehicles may reduce the emissions.
6. During the operation of the project, it is expected that there will be increased traffic along this route. This may lead to traffic accidents along the road network. The designs should make provision for bumps in the appropriate places.
7. The road will be used for transportation of heavy loads to the wind farm. This may lead to development of pot holes along the road. The Contractor must ensure regular maintenance of the road in adequate time.
8. There may also be increased sexually transmitted diseases especially from the workers and truck drivers who are associated with irresponsible sexual behaviours. Training should continue in the trading centres and in the areas where the workers will be accommodated.
9. There will be generation of solid and liquid wastes at the road construction camps. This will be from food preparation and cooking activities as well as from the people who will be living there. These may lead to outbreak of diseases such as diarrhoea, typhoid and intestinal diseases. The design of the camps will need to include areas where these wastes will be disposed off such as compost pits and soak away areas for liquid waste.
10. There is likely to be noise pollution as the camps are being dismantled. However this is expected to be short-lived say at most one day. The Contractor should try to maintain this to a minimum.

### **6.4 Impacts during decommissioning phase**

After the construction of the wind farm, the Contractor is expected to pull down the road construction camp and remove any equipment on site as well as the remaining materials. He should also rehabilitate any open borrow pits using back fill and planting of vegetation where necessary. Most of the impacts expected during this stage of the project are short lived say for about 1 – 3 days thus not significant.

#### **6.4.1 Positive Impacts**

3. Creation of short lived employment for locals who will be involved in dismantling the labour camps.
4. The contractor may consider selling off the construction materials to put living around the construction camps. This will come at a subsidized rate to the locals.

#### **6.4.2 Negative Impacts**

4. There are likely to be accidents during the dismantling of the road construction camps and burrying and making good of borrow pits. Barriers should be put where heavy machinery will be under use to avoid people trespassing. The Contractor should also employ competent people to operate the machines used in order to maintain this to a minimum.
5. During the dismantling works, there is likely to be noise to the households living around the camps. The Contractor should consider putting up the camps in less occupied areas.
6. There will be air pollution from the equipment that will be used during the demolition works from dust. The exhaust fumes from vehicles and equipment used is also likely to pollute the soils, vegetation and water sources around the camp. The Contractor may consider watering the area before demolition work starts.

## 6.5 Summary of Project Impacts

The summary of impacts from the proposed road upgrading works is as described in Table 7.

Table 7: Summary of Proposed Project Impacts

Impacts	Construction		Operation		Remarks
	Lt	R	Lt	R	
Soil erosion	Lt	R	Lt	R	<ul style="list-style-type: none"> <li>• Earthworks during upgrading works and excavation of gravel pits and construction of deviations will have an impact on soil erosion, which may continue after construction.</li> <li>• Incorporating soil conservation measures and proper drainage facilities during construction would mitigate impacts during operation.</li> <li>• During operation maintenance of structures would also prevent soil erosion.</li> </ul>
Water resources	Sg/St	R		R	<ul style="list-style-type: none"> <li>• The increased demand for water during construction is will be a challenge.</li> <li>• However, during operation, the water challenges could be minimal if additional sources are developed, to be transferred to the community upon completion of road works e.g. Boreholes, water pans, rock catchments and shallow wells established during road upgrading works.</li> </ul>
Employment opportunities	St/T		Lt		<ul style="list-style-type: none"> <li>• The local communities will benefit from temporary employment and small works subcontracts during road improvement activities.</li> <li>• There will also be business ventures due to demand of basic commodities like food and accommodation</li> <li>• This will have a positive impact to the local economy.</li> </ul>
Vegetation	P	Irr	x		<ul style="list-style-type: none"> <li>• Clearing of the vegetation will be necessary during construction.</li> <li>• Clearing activities could encourage soil erosion.</li> <li>• Clearing could also destroy habits</li> </ul>

Public Health	St/Sg	Irr	St/ P	Irr	<ul style="list-style-type: none"> <li>Workers on road projects and truck drivers are associated with irresponsible sexual behaviour that would result to the spread of sexually transmitted diseases.</li> <li>Awareness campaigns in centres and at the workmen's camp would help to mitigate such a problem.</li> <li>Increased dust, noise and air pollution during construction and operation containing leaded exhaust fumes levels would impact on public health.</li> </ul>
Workmen's camp	St/Lt	R	x		<ul style="list-style-type: none"> <li>The camp is likely to put pressure on the available local resources such as water, fuel wood. Disposal of solid waste and sanitation problems are likely to be issues of concern.</li> <li>The camp should be preferably located at appropriate urban centres.</li> <li>There will be increased business due to the workforce at centres along the road.</li> </ul>
Forests					<ul style="list-style-type: none"> <li>Forests on the way will be affected by the construction of this project road.</li> <li>This is unavoidable.</li> </ul>
Loss of land	T/St	R	x		<ul style="list-style-type: none"> <li>Deviations would be created necessitating temporary loss of land in some places if it goes beyond the road reserve.</li> </ul>
Material sources	P	Irr			<ul style="list-style-type: none"> <li>Negative impacts such as soil erosion, loss of crop, low productivity, hazards to children and livestock, water accumulating in the pits providing a breeding ground for mosquitoes may result in pits and quarries that are not reinstated/landscaped or fenced.</li> </ul>
Pollution	T	Irr	P	Irr	<ul style="list-style-type: none"> <li>There will be air, dust and noise pollution during construction that will be temporary in nature. Blasting of rock outcrops will be necessary. Oil wastes however will have long-term effect. Sediment loads (building debris) in watercourses will increase due to the construction of culverts, and deviations.</li> <li>During operation, air, noise, dust and oil waste pollution will have an effect due to sediment loads (apart from soil) will not be a problem during operation.</li> </ul>
Air, Dust,	T	Irr	P	Irr	
Noise, Oil wastes,	T	Irr	P	Irr	
sédiments	Lt	Irr	Lt	Irr	
	T	Irr	Lt	Irr	

## **6.6 Mitigation of Impacts**

### **Proposed Mitigation Measures**

This section focuses on measures that can be incorporated into the design of the road network, during construction and operation stages of the Laisamis - Loiyangalani road in order to mitigate the negative environmental impacts and enhance the positive ones described earlier.

- **Hydrology and Drainage**

Changes to the hydrological regime will be taken into account in the road design through the construction of culverts so that flow in the rivers and streams is unimpeded, and improved drainage along the project road through side drains. These may be lined, and may require cascades to break the impact of water flow in them, particularly in sections with gradients greater than 4%.

These features must be properly designed and regularly maintained to prevent runoff from accumulating by the side of the road, and to ensure that water that is drained off the road does not create gullies, and that siltation of the structures does not occur. Safe final disposal and self-cleaning are essential elements in designing drainage structures. In some cases, the construction of lined drains may be necessary to facilitate the safe discharge of runoff to the final recipient body.

- **Soil Erosion Control**

The speed of road runoff is one of the major contributing factors to erosion and scouring in the side drains along the slopes of a road. In order to reduce the impact of runoff, scour checks and gabion mattresses will be introduced in the side drains at specified intervals, depending on the gradient of the slope. Grouted stone pitching and rock fill gabion works will be necessary to protect culvert inlets and outlets and control soil erosion.

The specified cut and fill gradients must be adhered to, and the embankments should be planted with shrubs and grasses to reduce erosion of road embankments.

Areas that have been cleared of vegetation, e.g. gravel sites or deviations, must be planted after completion of works. Indigenous trees and shrubs should be planted along the project road. This has the advantage of controlling soil erosion, reducing soil stability problems and beautifying the road.

In order to ensure that environmental protection is taken into account during construction, these issues must be specified in the contract documents.

- **Pollution**

Dust emissions can be reduced during construction by dumping the gravel pit area, and occasional spraying with water along the deviation routes or earth along the road section. In the case of deviations, slowing the speed of traffic by using bumps and/ or clearly marked road signs may contribute to reducing dust levels.

Poorly maintained vehicles often emit noxious fumes (carbon dioxide, carbon monoxide, and nitrogen and Sulphur oxides) there is also much documentation on lead concentrations in the blood of people residing beside roads. Such issues need to be addressed at a national level, through encouraging the use of lead free petrol, and introducing "road worthiness tests" which must be passed before road licenses are issued. Proper disposal of oil drained from Contractor's trucks and lorries and used oil filters should be done sensibly with the Resident Engineer approving method of disposal.

Installing culverts during the dry season, wherever possible can reduce sediment loads in the rivers and stream. In addition, the Contractor should dispose all construction debris, including oil and oil wastes, in a

sensible manner. Disposal of waste into any water bodies (rivers/ streams) or in the compounds should be prohibited.

In the sections having excess excavated soil, construction works will require the excavation and removal of all the materials, and replacing it with gravel. A site, to be approved by the local authorities and NEMA, will have to be identified in order to dump this spoil. The Contractor will be responsible for the identification of the dumpsite.

- **Deviations**

Deviations may be necessary for only a few small sections of the project road. They should, whenever practical, adhere to the road reserve. All deviations must be planned and their routes specified.

As a condition of contract, any trees removed for the purposes of the deviation, must be replaced when the road works are completed and the deviation ceases to be of use. After upgrading works, the deviations should be demolished, scarified and re-vegetated.

- **Gravel Pits and Quarries**

At the stage of the study, investigations on gravel pits have been completed. Hard stone will be obtained from new sources along the project road. The gravel pits and quarries will be operated as instructed by the Engineer taking into consideration the safety aspects to avoid accidents and incidents.

- **Excavation of Gravel Pits**

Normally before excavation begins, landowners sign contracts with the MoR which include terms and conditions of payment, the amount of land to be excavated and rehabilitation measures to be carried out.

The area to be excavated should be cordoned off, which tend to be very deep and pose a danger to livestock and children. The contract documents should instruct the Contractor to maintain fences and “make good afterwards”.

Ideally, the side of the road should not be the place to carry out excavation activities. All access routes to gravel pits and crossing over pipelines should be planned ahead of construction and described in the contract documents. Haulage routes will need to be identified and maintained by watering to minimize the impact of dust.

- **Rehabilitation**

When gravel pits are being excavated, the owner cannot use the land. Excavation also sometimes leaves an uneven land surface, which makes it difficult to cultivate.

Gravel pits must be landscaped and reinstated or back-filled with overburden if the depth of the overburden is sufficient to allow for this. If excavation is properly planned, organized and executed, it would be possible to rehabilitate most gravel pits. It is therefore important to have separate stockpiles for topsoil, overburden, gravel, etc. Terracing and replacement of fencing is part of the rehabilitation process. Contract documents should instruct Contractor to plant trees to replace those that have been removed during excavation.

Sometimes landowners wish to leave the gravel pits as they are, so that they can be used as temporary water sources (pans) for livestock. Apart from encouraging the breeding of mosquitoes (the vectors for malaria), the pans will encourage localized erosion caused by trampling. On the other hand, some landowners wish to continue excavation as a source of income. This should generally be discouraged, due to the possible hazards discussed here.

Landowners must be informed of the environmental implications of the excavation works at the time of identification of the gravel sites. They should be told at the earliest whether testing has revealed that material from their plot was acceptable or not for use on the project road. They must also be told of the options available to them after excavation, i.e. rehabilitation/ landscaping, or construction of water pans. It is very important that they understand the conditions on the contract form before they sign it, and must ensure that these conditions include their requirements such as back filling, fencing, landscaping, terracing, or alternatively payment in kind such as grading murrum roads etc.

- **Blasting of Rocks**

Blasting of rock outcrops along road alignment and within the hardstone quarries will be of an operational necessity. It should be done during the day, and residents in the vicinity of the area being blasted should be suitably warned of blasting activities, including the time and date that the blasting is to take place. Blasting should not be carried out at night. This must be specified in the conditions of contract.

- **Trade Centres**

Activities at major market centres and other settlements and homesteads along the project road should, as far as is possible, not be disturbed. People should be informed of intended roadwork activities, including likely dates for commencement and completion of works. Warning signs should also be introduced on the approach to market/ settlement areas.

- **Vegetation**

Vegetation should not be cleared unnecessarily during the construction works, whether for the road carriageway, or for the excavation of gravel pits. This should be specified in the Contractor's contract.

Along the whole road, trees should be planted along the edge of the road reserve after completion of the roadwork. The Contractor should be instructed to do this by the Resident Engineer, but the town councils or chiefs should care for the trees. This would augment the aesthetics of the settlements/ towns, and would also help to prevent soil erosion along the roadside.

Planting of trees, shrubs, and grassing must be specified in the standard Specification, and as an item in the Bill of Quantities.

- **Workmen's Camp**

Considering that the area has great challenges in water supply, the impact on water sources will be influenced by the location of the workmen's camp. Care should be taken not to stress the local supply at the expense of the local population. The Contractor should consult with the local authorities on where water can be sourced from, and then assess which options are viable. The obvious source will have to be the drilling of boreholes which will then be relinquished to the communalities along the project road.

The workforce should be discouraged from buying fuel wood including charcoal. The camp should have a central canteen to serve the entire workforce, and gas, kerosene or electric cookers should be used.

- **Location of Contractor's Camp**

The camp should not be located at isolated points along the road where they will attract periphery businesses, and provide a nucleus for the growth of unplanned settlements.

- **Public Health and Occupational Safety**

A central canteen for the workforce at the construction camp as recommended above sections, would contribute towards the general good health in the camp as kitchen wastes can be disposed of in an organized manner, while hygiene can be monitored.

Workmen should be provided with suitable protective gear (such as nose masks, ear muffs, helmets, overalls, industrial boots, etc.), particularly during blasting, drilling, while working on the asphalt, and handling tar. There must be a fully equipped first aid kit and a Health Safety and Environment Officer who has first aid training and knowledge of safety regulations. In addition, the Contractor must have workmen's compensation cover.

The location of latrines in the camp should preferably be downhill of potable water sources, or 50 m to 100m from any water body. Communal bathrooms/ lavatories with soak away pits are less polluting option, but would be slightly more expensive.

Sexually Transmitted Diseases (STDs) awareness campaigns should be conducted in the camp as well as in the settlements/ trading centers. The control of unplanned structures along the project road should be discouraged, as this will also curb the spread of STDs.

These issues should be included in the conditions of contract (Standard Specification).

- **Road Safety**

Although the area traversed by the proposed road for upgrading has a very slowly trafficked it is important to observe road safety through use of signs and especially near market centres. The danger posed to locals and livestock due to increased traffic volumes can be mitigated by installing clear and frequent road signs.

- **Visual Enhancement**

A well-designed road fits in well with its surrounding because its design reflects the principles of regional landscape design. These principles can and should be applied whether or not the area being considered is one of special physical beauty (refer Roads & the Environment book: A Handbook). Indigenous trees and shrubs should be planted along the road reserve especially. This will enhance the beautification of the road.

People who resides next to the road reserve should be encouraged to be involved in this exercise to prevent them from uprooting of the plants and planting them on their own farms or using the trees the were originally there for charcoal.

Once road works are complete, the Contractor must ensure that the landscape is restored as much as possible to its original form. Landscaping/ reinstating and re-planning gravel pits and deviations would reduce the visual intrusion caused by the excavation and clearing works.

- **Public Awareness**

All the people who live along the road will be alerted of the improvement works. The proponent in collaboration with the District Works Officer (DWO) will be expected to disseminate information regarding the road design and upgrading works progress to all the other stakeholders along the project route.

- **MoR Environmental Requirements**

The Ministry of Roads has recently set up an environmental Unit in its Planning Branch whose responsibility is to oversee environmental compliance in all road related activities. The Consultant will carry out designs that comply with the MoR environmental requirements including those contained in the Design Manual.

Construction activities, protection from water, removal of the camp, safety and public health requirements, site clearance and removal of topsoil and overburden, and maintenance of deviations are addressed in the Ministry's Standard Specification for Road and Bridge Construction.

Road safety, security and protection of the environment with regard to quarries and borrow pits, soil erosion, diversions, haulage routes, workmen's camp, asphalt plant, rock blasting, spillage of oil/fuel etc. and liaison with authorities in charge of wildlife and natural resources are stipulated in the general conditions of the contract. All remedial measures have been stipulated in detail in the contract documents.

## CHAPTER 7: PUBLIC CONSULTATION

### 7.1 Introduction

The IFC and NEMA procedures and standards of conducting ESIA requires stakeholder consultation be conducted as part of the environmental assessment process. The aims of public consultation are;

- Disclosure of planned activities of the proposed project and impacts identified through the Environmental and Social Impact Assessment;
- Identification of concerns and grievances from interested and affected people;
- Harnessing of local expertise, needs and knowledge from interested and affected people;
- Response to grievances and enquiries of affected people.

In this project, public consultation meetings were conducted with the affected and interested communities living along the proposed road from Laisamis to Loiyangalani. The approach adopted included, public meetings and administration of questionnaires to individual persons affected. In total eleven public meeting were held in trading centres and Manyattas along the road. Table 6 shows schedule of the public barazas that were conducted.

Table 6: Schedule of public meeting along the road alignment

S/no.	Date	Division	Place
1.	11/4/10	Laisamis	Manyatta
2.	11/4/10	Laisamis	Manyatta Lorokushu 1&2
3.	11/4/10	Laisamis	Ndikir 1
4.	11/4/10	Laisamis	Ndikir 2
5.	11/4/10	Khorr	Manyatta Lengima Bayo
6.	12/4/10	Khorr	Ngurunit Shopping centre
7.	12/4/10	Khorr	Illaut Shopping Centre
8.	13/4/10	Loiyangalani	South Horr Shopping entre
9.	13/4/10	Loiyangalani	Kurungu Shopping centre
10	14/4/10	Loiyangalani	Manyatta Selima
11	16/4/10	Khorr	Manyatta Namarei

Plates 11 to 21 show the photographic documentation of the public meetings



Plate 11 Meeting held at Manyatta Analyka



Plate 12: Meeting held at Manyatta Lorokushu



Plate 13: Public meeting held at Ndirir 1



Plate 14: Public meeting held at Ndirir 2



Plate 15: Public meeting held at Manyatta Lengima Bayo



Plate 16: Public meeting held at Ngurunit

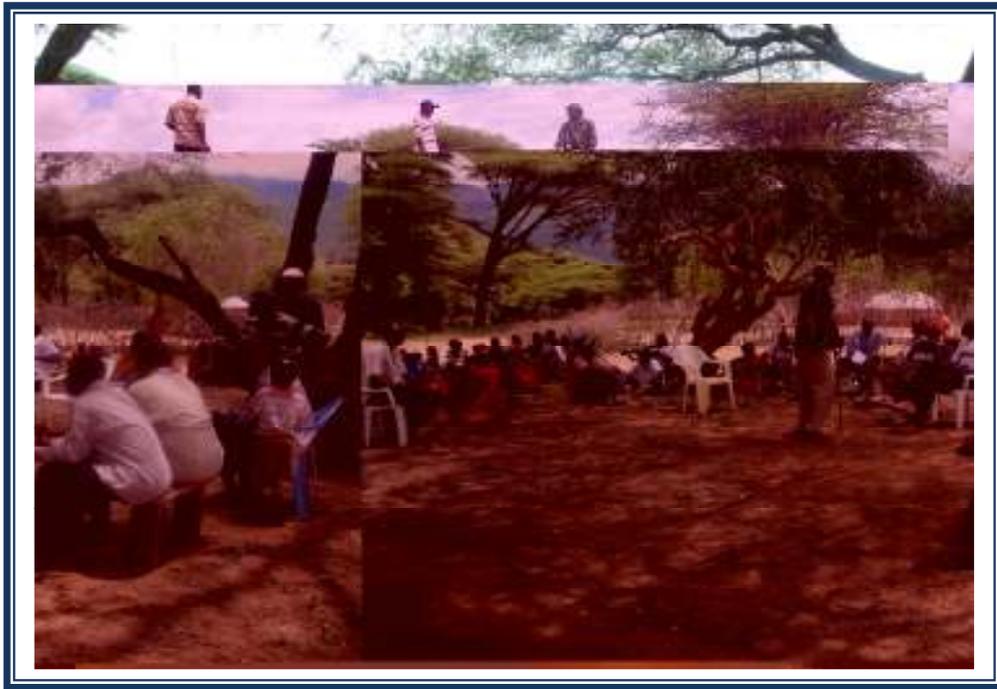


Plate 17: Public meeting held at South Horr



Plate 18: Public meeting held at Kurungu town centre



Plate 19: Public meeting held at Manyatta Selima



Plate 20: Public meeting held at Manyatta Namerei



Plate 21: Public meeting held at Illaut trading centre

In addition, various lead agencies and interested groups were consulted through administration of questionnaires and discussions. Among the key governmental and non-governmental personnel consulted were:

1. Area sub chief, chief and District Officers
2. Forester from Kenya Forest Service (KFS)
3. Senior Warden from Kenya Wildlife Service (KWS)
4. Town clerk and treasurer from Marsabit County Council
5. Regional manager from Kenya Rural Roads Authority (KeRRA)
6. An engineer from Kenya National Highway Authority( KeNHA)
7. The District Water Officer
8. Affected communities living along the road profile.

## 7.2 Community concerns

Through the public consultation with communities along the road, community leaders and lead agencies the following were some of the key concerns arising.

- ❖ **Use of locally available human resources:** The proponent to ensure that casual labourers are sourced from the area they come from where the road traverses. He should also use construction materials from local sources such as sand, aggregate and stones.
- ❖ **Preservation of water facilities/sources:** The water wells in some of the sand river beds especially at Illaut are a valuable source of water to the community and their location is very close

to the road. It is therefore imperative that the proponent and the contractor afford technical solution avoid damage to these sensitive facilities

- ❖ **Preservation/improvement of accesses to feeder roads:** The community expressed concerns on the possibility of destruction of their local access road to Manyattas and cattle truck during upgrading of the road. The contractor should ensure that entry to the accesses is maintained at the same levels so that they are not cut off.
- ❖ **Cutting down of trees:** Kenya Forest Service expressed concerns on possibility of trees destruction which are used by some community like Rendille as water marker to indicate water is present there. In addition destruction of trees which may be the breeding ground of some animals and also some trees are endangered and need to be conserved .It is therefore necessary that the proponent should try to avoid much destruction and liase with local environmental management committees in key centres such as Ngurunit and South Horr to rehabilitate unavoidable tree cutting.
- ❖ **Quality of works:** The community expressed concerns that they have evidenced poor workmanship on roads project a lot which have lead to road network be destroyed by vehicles. It's therefore imperative that the proponent address this concern by doing a very good work on the road fulfilling all the standards on road building. However, the road is being put up by a private investor to enable passage of equipment to the wind farm.
- ❖ **Loss of pasture:** The communities expressed concerns on the possibility of destruction of their grazing land and pastures for their animals during upgrading of the road. The Contractor should ensure that planting of grass is done after the completion of the project.

### **Summary**

The community support the improvement of the road since it will bring about numerous social economic benefits along the entire road alignment. However, it emphasizes the need to be involved in the overall project and more specifically in sustainable utilization of the available natural and human resources. Local leaders are an entry point into the community hence the Contractor should ensure that they are involved at all stages of the project. In so doing, this will go a long way in ensuring the smooth implementation of the project.

## CHAPTER 8: THE ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan (EMP) of a project provides a logical framework within which identified negative impacts shall be mitigated and monitored. EMP assigns responsibilities of actions to various actors and provides timeframe within which mitigation measures are to be carried out.

The EMP is a vital output of an Environmental Impact Assessment as it provides a checklist of project monitoring and evaluation. It assigns responsibilities and allocates costs in prevention, minimisation and monitoring of significant negative impacts and maximisation of positive impacts associated with the construction phase of the proposed project. The EMP below addresses the identified potential negative impact and mitigation measures of the proposed road project.

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
Air pollution by dust generated during road construction process.	<ul style="list-style-type: none"> <li>⊕ All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction.</li> <li>⊕ Heavy earth moving construction equipments drivers will be under strict instructions to minimize unnecessary trips, refill petrol fuel tanks in the afternoon and minimize idling of engines.</li> <li>⊕ Careful screening of construction site to contain and arrest construction-related dust.</li> <li>⊕ Exposed stockpiles of e.g. dust and sand, will be enclosed, covered, and watered daily, or treated with non-toxic soil binders.</li> <li>⊕ All workers on the site will be required to wear protective clothing while on duty.</li> <li>⊕ Sprinkle water on the graded road during construction.</li> <li>⊕ Strict enforcement of speed limits adopted during the construction phase of the project.</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Project proponent/contractor</li> <li>⊕ Ministry of Health: provincial public health officer</li> <li>⊕ Ministry of Roads</li> <li>⊕ NEMA inspectors</li> <li>⊕ Ministry of Labour</li> </ul>	Periodic Activities	Periodic and surprise checks	100,000 per Month over the construction period

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
Pollution from Hazardous waste	<ul style="list-style-type: none"> <li>⊕ Handling of the materials using the material safety data provided by the manufacturers</li> <li>⊕ Appoint a safety officer to ensure that proper disposal guidelines are observed</li> <li>⊕ Ensuring that maintenance and/or piece of work carried out on any piece of equipment or construction work is undertaken by qualified personnel</li> <li>⊕ In case of spillage emergency spillage control and correction measures to be instituted immediately.</li> <li>⊕ Containerization of any wastes and disposal through a licensed waste handler.</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Proponent/Contractor</li> <li>⊕ Ministry of Health: provincial public health officer</li> <li>⊕ Ministry of Roads</li> <li>⊕ NEMA inspectors</li> </ul>	Periodic inspection	Periodic and surprise checks	100,000 per month
Solid waste generation.	<ul style="list-style-type: none"> <li>⊕ Wastes to be collected regularly to control air pollution and vermin/insects etc.</li> <li>⊕ Receptacles will be provided for waste storage prior to collection.</li> <li>⊕ Resource recovery will be encouraged once the project takes off so as to shrink waste stream and recover non-recyclables.</li> <li>⊕ Refuse collection vehicles will be covered to prevent scatter of wastes by wind.</li> <li>⊕ Wastes will be collected by a licensed operator to avoid illegal final dumping at unauthorized sites.</li> <li>⊕ All persons involved in refuse collection shall be in full protective attire.</li> <li>⊕ Use durable and long lasting materials that will not need to be replaced as often, thereby reducing the amount of</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Proponent</li> <li>⊕ Hired private contractor</li> <li>⊕ Ministry of Roads</li> <li>⊕ Provincial Public Health Officer</li> <li>⊕ NEMA inspectors</li> </ul>	Routine Activities	Periodic and surprise checks	150,000 per month

	construction waste generated overtime.				
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Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
Loss of vegetation cover during construction	<ul style="list-style-type: none"> <li>⊕ Avoidance of unnecessary vegetation clearing and reinstating cleared vegetation</li> <li>⊕ Replanting of trees where possible</li> <li>⊕ Avoid clearing culturally, economically and biologically valued trees.</li> <li>⊕ Design of the road to reduce frequent change of alignment so as to use the existing road alignment.</li> <li>⊕ Where road realignment of the road is necessary, choose the least vegetated routes</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Contractor</li> <li>⊕ Proponent</li> <li>⊕ Ministry of Roads</li> </ul>	Planting of more trees	Periodic checks	Part of project cost
Demolition of houses	<ul style="list-style-type: none"> <li>⊕ Adequate and timely compensation for those to be displaced including the squatters as per International Financing Corporation.</li> <li>⊕ Advance payment of residential property</li> <li>⊕ Allow owners to salvage valuable demolished materials.</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Contractor</li> <li>⊕ Proponent</li> </ul>	-	Once off activity	Provided in the project budget
Injuries arising from accidents during the road construction phase.	<ul style="list-style-type: none"> <li>⊕ All workers will be sensitized before construction begins, on how to control accidents related to road construction works.</li> <li>⊕ Ensure the machinery, equipments, personnel protective clothing, appliances and hand held tools comply to the set safety and health standards and are maintained accordingly.</li> <li>⊕ Machines and equipments shall be enclosed or guarded and must always be operated by suitably trained plant or machine operators.</li> <li>⊕ Provide first aid kits and fire extinguishers at strategic locations. Fire extinguishers shall be examined by authorised persons or entities and must never be used before a certificate of examination is issued.</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Project proponent/contractor</li> <li>⊕ Divisional Public Health Officer</li> <li>⊕ Ministry of Labour</li> <li>⊕ Workers</li> <li>⊕ NEMA inspectors</li> </ul>	Routine Activities	Periodic checks	60 000 per month

	<ul style="list-style-type: none"> <li>⊕ A comprehensive contingency plan will be prepared before construction begins, on accident response.</li> <li>⊕ Accordingly, adherence to safety procedures will be enforced.</li> <li>⊕ All workers shall wear protective clothing during construction, including helmets.</li> <li>⊕ Construction work will be limited to daytime only</li> </ul>				
Mushrooming of food kiosks	<ul style="list-style-type: none"> <li>⊕ Eating places will be provided on site, with adequate wholesome water and waste disposal handling services, during construction process.</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Divisional Public Health Officers/Ministry of Health</li> <li>⊕ NEMA inspectors</li> </ul>	Periodic Activities	Periodic and surprise checks	100,000 per annum
Human waste disposal by workers during construction process	<ul style="list-style-type: none"> <li>⊕ As provided for by the Building Code, temporary latrines will be provided on site to be used by construction workers</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Project proponent</li> <li>⊕ Contractor</li> <li>⊕ Ministry of Health</li> <li>⊕ Ministry of Roads</li> <li>⊕ Ministry of Labour</li> <li>⊕ NEMA inspectors</li> </ul>	Periodic Activities	Periodic checks	50,000 at once
Storm water drainage	<ul style="list-style-type: none"> <li>⊕ Design and implement adequate hydraulic structures for storm water disposal.</li> <li>⊕ Use the existing drainage channels adjacent to the existing roads as cut off drainages.</li> <li>⊕</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Project proponent</li> <li>⊕ Contractor</li> <li>⊕ Ministry of Roads</li> <li>⊕</li> </ul>	Periodic Activities		Part of project budget
Increase in STI infections	<ul style="list-style-type: none"> <li>⊕ Sensitisation of local communities and staff working on the road project on dangers of HIV/AIDS and STI infections through training and brochures.</li> <li>⊕ Provision of condoms at strategic places at the work places using condom dispensers.</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Proponents</li> <li>⊕ Ministry of Health</li> </ul>	Periodic random screening Secondary data from health institutions	yearly	Part of project budget
Disturbance of top soil and destruction of soil structure through excavation	<ul style="list-style-type: none"> <li>⊕ Excavated materials will be loaded on trucks and transported to designated disposal sites</li> <li>⊕ Design and implement an appropriate landscaping program of the road furniture.</li> <li>⊕ Reuse the excavated top soil in landscaping</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Project proponent</li> <li>⊕ Contractor</li> <li>⊕ Ministry of Roads</li> <li>⊕ NEMA inspectors</li> </ul>	Continuously	Periodic checks	Part of project budget

Possible Impacts	Proposed Mitigation Measures	Responsibility for Mitigation	Means for Monitoring	Frequency for Monitoring	Estimated Cost (Kshs)
Noise pollution by construction activities.	<ul style="list-style-type: none"> <li>⊕ Use of equipment designed with noise control elements will be adopted where necessary.</li> <li>⊕ Ensure construction machineries are kept in good working condition through regular maintenance.</li> <li>⊕ Trucks used at construction site shall be routed away from noise sensitive areas where feasible.</li> <li>⊕ Idling time for pickup trucks and other small equipment will be minimized to limited time.</li> <li>⊕ All workers operating in noisy areas or operating noisy equipment will be provided with earpieces to protect against extreme noise.</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Project proponent/contractor</li> <li>⊕ Divisional Public Health Officer</li> <li>⊕ Ministry of Labour</li> <li>⊕ Workers</li> <li>⊕ NEMA inspectors</li> </ul>	Routine Activities	Periodic and surprise checks	40 000 per month over the construction period
Workers accidents and hazards when handling hazardous wastes.	<ul style="list-style-type: none"> <li>⊕ Adequate collection and storage of waste will be provided on site, and safe transportation to, and display methods at designated areas.</li> <li>⊕ All receptacles for storing hazardous wastes shall be adequately covered.</li> <li>⊕ All employees will be required to wear protective clothing when handling hazardous wastes.</li> <li>⊕ All workers will be adequately insured against unforeseen accidents.</li> </ul>	<ul style="list-style-type: none"> <li>⊕ Project proponent/contractor</li> <li>⊕ Provincial Public Health Officer</li> <li>⊕ Ministry of Labour</li> <li>⊕ Workers</li> <li>⊕ NEMA inspectors</li> </ul>	Routine Activities	Periodic and surprise checks	50 000 per month

## **CHAPTER 9: THE SOCIO MANAGEMENT AND MONITORING PLAN**

### **9.1 Introduction**

The social monitoring will be a continuous activity and will be managed by the Project Engineer through LTWP. The compliance monitoring and effects monitoring will be carried out regularly by LTWP in coordination with the supervision consultants and discussed in the fortnightly review meetings. The Project Engineer will ensure that the Project functionaries carry out the following activities transparently. Verification of project-affected persons, specifically squatters, on the basis of their national identity card numbers/ photographs, to ensure that only those PAPs recorded before cut-off date are allowed to claim entitlement benefits.

1. Identification of the public facilities and utilities needing relocation.
2. Identifying suitable relocation sites.
3. Signing leases and recording compensation payments in case of delays.
4. Verifying that the amount to be paid as compensation and the schedule of compensation is in conformity with the provisions of the RPF.
5. Recording and addressing the concerns of PAPs during and after resettlement.

The Project Engineer will provide the findings of monitoring activities in the Monthly Progress Report regularly, with details of the issues and the mitigation measures adopted under Grievance Redressal Mechanism (GRM).

The external monitoring will be carried out on quarterly basis. For external monitoring, LTWP will hire the services of independent Consultants for social monitoring. The social monitoring will focus the parameters, as provided in subsequent section. The Monitoring Consultant will present the findings of the study in the Quarterly Monitoring Report to the Client. The LTWP will submit this report to the Donor.

### **9.2 Monitoring Parameters / Indicators**

The following parameters will be considered in carrying out the social monitoring:-

- Number of PAPs to be resettled /relocated /provided livelihood assistance along the road routes.
- Number of owners compensated for land acquisition, amount of compensation and area of land acquired.
- Number of owners compensated for loss of standing crops, amount of compensation, area and type of crops.
- Inventory and valuation of PAPs' affected assets
- Notice period given to PAPs for their shifting from their original locations to new sites
- Number of vulnerable PAPs (if any), compensated under the RPF with details of affected source of livelihood.
- Verification of shifting assistance provided to displaced squatters.
- Number and nature of consultations carried out, as well as targeted stakeholders
- Record of any problems due to power shut downs and mobility of the people during construction, and whether the people of the area were informed about these shut downs when and where required.
- Number of grievances recorded and redressed

- Key issues of conflict between PAPs and the contractors during implementation of resettlement activities.
  - Number of public facilities and utilities to be relocated
  - Number of mosques/shrines/graves relocated (if any) and corresponding contribution of affected communities and LTWP

## **CHAPTER 10: CONCLUSION AND RECOMMENDATIONS**

### **10.1 Overview**

An evaluation of the impacts resulting from implementation of the proposed project indicates that the negative impacts vary from insignificant, through moderate to significant scale. The EMP developed provides for adequate redress to all these impacts. In view of this therefore, the project does not pose any serious and negative environmental impacts.

### **10.2 Recommendations**

Following the impact analysis presented in the previous sections, here below are the recommendations:

- The Proposed project to be implemented in compliance with the relevant legislation and planning requirements. The proponent must ensure that the impacts are kept to a minimum level
- A clear environmental and social management plans have been developed. The proponent should ensure the implement the mitigation guideline provided in the EMP in collaboration with the Contractor. The Resident Engineer for the project need to make progress reports indicating the implementation of the plans.
- Water for use during the project implementation phase is required in large quantities for use by people working for the project as well as in the actual road construction work. The groundwater exploration has indicated limited sources of water with low yields with daily estimate of 130 m<sup>3</sup>. The amount required for construction and use by people on site will be in the region of 450 m<sup>3</sup>/d. Thus there is required investigation of additional water sources to meet the daily demand as well as for the different uses in relation to quality consideration.

### **10.3 Conclusion**

From the foregoing the following conclusions are made:

- No serious and adverse objections were received from the communities occupying the entire corridor. The road will also lead to economic improvement to people living along the road profile. It is therefore considered suitable for the local area.
- The proposed project has actively involved the key stakeholders who did not object the development. Thus the success of the implementation project can be guaranteed.
- The proposed project does not pose adverse socio-economic impacts and is an initiative towards improving accessibility in the area. Therefore, it is a project worth to be supported by donor agencies.

In conclusion, the study recommends timely implementation of the project with strict adherence to the proposed Environmental Management and Social Management Plans. The project benefits have been identified to far outweigh the negative impacts for which a mitigation plan has been prepared. Further, the proponent has carefully considered and applied acceptable local and international standard/regulations at all stage of project planning and would thus qualify for donor funding.

## REFERENCES

1. Agriculture Act (Chapter 318 of the Laws of Kenya)
2. Republic of Kenya, (2002). Marsabit District Development Plan (2002 – 2008). Ministry of Finance and Planning. Government Printers.
3. Kenya Vision 2030. A Globally Competitive and Prosperous Kenya. 2007
4. Physical Planning Act (Cap. 286)
5. Environmental Management and Coordination Act No. 8 of 1999.
6. Legal Notice No. 101: The Environmental (Impact Assessment and Audit) Regulations, 2003.)
7. The Forests Act (Chapter 375 of the Laws of Kenya.)
8. Land (Group Representatives) Act (Chapter 287 of the Laws of Kenya)
9. The Public Health Act (Cap. 242)
10. The Local Government Act (Cap. 265)
11. Occupational Health and Safety Act (2007)
12. Sessional Paper No. 6 of 1999 on Environment and Development
13. The Penal Code (Cap. 63)
14. The National Environmental Action Plan (NEAP)
15. The National Shelter Strategy to the Year 2000
16. The National Poverty Eradication Plan (NPEP)
17. Land Adjudication Act cap 95
18. The Antiquities and Monuments Act 1983 cap 215
19. Public Roads and Roads of Access Act Cap.399
20. The Lake and Rivers Act Cap 409
21. Factories Act, Cap 514
22. The Employment Act, 2007
23. The Limitation of Actions Act Cap 22
24. The Radiation Protection Act (revised 1985)
25. The Environmental Management and Co-Ordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006
26. The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009
27. The Environmental Management and Co-Ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009

28. National Biodiversity Strategy Action Plan
29. Controlled Substances Regulations, 2007 (Legal Notice No.73 of 2007)
30. Waste Management Regulations, 2006 (Legal Notice No.121)
31. Environmental Management and Co-ordination (Waste Management) Regulations, 200
32. The Valuers Act Chapter 532
33. The Environment (Impact Assessment and Audit) Regulations 2003
34. The Poverty Reduction Strategy Paper (PRSP)
35. The Rio Declaration on Environment and Development
36. The World Commission on Environment and Development
37. Wildlife (Conservation and Management) Act Chapter 376 of the Laws of Kenya
38. Wayleaves Act (Chapter 292 of the Laws of Kenya)

## ANNEXURE

**ANNEX 1 LETTER OF AUTHORITY FROM MINISTRY OF ROADS**

*Digital - Certified*



**MINISTRY OF ROADS**

Telephone: Nairobi 723301  
Telegraphic Address "MINWORKS"

Telex: 22174  
Fax: 720044  
If calling or telephoning ask for:

When replying please quote  
R. 5391/M1

**ROADS DEPARTMENT  
TRANSCOM HOUSE  
P.O. BOX 30260  
NAIROBI.**

3<sup>rd</sup> September, 2009

M/S Lake Turkana Wind Power Ltd.  
P.O. Box 63716 - 00619  
NAIROBI.

**GRANTING YOU APPROVAL TO UPGRADE LAISAMIS – SOUTH HERR (D371) ROAD (136 KMS.) AND SOUTH HERR – LOYANGILANI (C77) ROAD – (100 KMS) TO AN ENGINEERED GRAVEL STANDARD ROAD**

Reference is made to your letter dated 1<sup>st</sup> September, 2009 in connection with the above matter.

We have considered your request and hereby grant you approval to proceed with the works on condition that you involve our Regional Managers or their representatives to monitor the design/documentation and implementation of the works.

By copy of this letter the Director General, Kenya Rural Roads Authority (KeRRA) and Kenya National Highways Authority (KENHA) are asked to monitor the design/documentation and implementation of the works.

  
**Eng. P. M. Mwinzi**  
**Chief Engineer (Roads)**

The Director General  
Kenya National Highways Authority  
P.O. Box 49712 - 00100  
NAIROBI.

The Director General  
Kenya Rural Roads Authority  
P.O. Box 48151 - 00100  
NAIROBI.

## ANNEX 2 SAMPLE QUESTIONNAIRE OF PROJECT AFFECTED PERSON

### QUESTIONNAIRE FOR THE PROPOSED REHABILITATION OF 200 KM ACCESS ROAD FROM LAISAMIS TO LOYANGALANI -PROJECT AFFECTED PERSONS

#### Proposed Project

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Marsabit to Loyangalani. This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA/JEA Rules and Regulations (2003).

#### General Information

1. Enumerator's name .....
2. Respondent's name Fatuma Mohamed Yallahow
3. Date of interview 12/04/2010
4. Location Ngurmit Division Korr District Marsabit South

#### Demographic data

1. Head of Household's Name Fatuma Mohamed Yallahow
2. Age of head of household 72 yrs
3. Sex: Male..... Female
4. Tribe: Somali
5. Occupation: Business Woman
6. Religion: Muslim
7. Total Household members: 20
8. For how long have you lived in this area 50 yrs.
9. How did you acquire your parcel land
  - a) Purchasing
  - b) Inheritance (.....)
  - c) Communal land (.....)
  - d) Allotment by government (.....)
  - e) Others please specify .....
10. What is your land Registration number Plot No 2
11. Please state the size of your land 100 x 200 mtrs.
12. What is your main source of income business woman (trading)

#### Education level

- |                        | number of members |
|------------------------|-------------------|
| a. Primary             | <u>6</u>          |
| b. Secondary           | <u>3</u>          |
| c. College/ University | <u>1</u>          |

**How far from your residence is the nearest**

- Kindergarten.....
- Primary school..... 3 km
- Secondary school.....
- Middle level college.....

**Public Health**

State the type of diseases experienced in your household and frequency of occurrence.

Diseases	Monthly	Seasonally	Annually
a) Malaria	.....	<input checked="" type="checkbox"/>	.....
b) Bilharzia	.....	.....	.....
c) Typhoid	.....	.....	.....
d) Cholera	.....	.....	<input checked="" type="checkbox"/>
e) Eye infection	.....	.....	<input checked="" type="checkbox"/>
f) Anaemia	.....	.....	.....
g) Skin Disease	.....	.....	.....
h) AIDS (HIV)	.....	.....	.....
i) Ulcers	.....	.....	.....
j) Measles	.....	.....	<input checked="" type="checkbox"/>
k) Pneumonia	.....	.....	.....
l) Others/specify	.....	.....	.....

Where do you go for health assistance and please indicate why?

- a) Hospital(specify).....
- b) Dispensary(specify)..... It's the nearest health centre.
- c) Clinic(specify).....
- d) Traditional herbs(source).....
- e) Others(specify).....

How far away is the health facility located from your residence 3 km.

What concerns do you have from the rehabilitation of Road from Laisamis to Loiyangalani on community health?

The Community will benefit health service facilities. The government will have great concern due to smooth transportation of resources to uplift livelihood.

**Housing Typology (tick)**

- a) Permanent  (.....)
- b) Semi-permanent (.....)
- c) Temporary (.....)

What concerns have do you have from the rehabilitation of Road from Laisamis to Loiyangalani on housing typology? -----

**Agriculture Production**

Crop type	Subsistence/sale	Acreage	Production	Unit price
a) Maize	.....	.....	.....	.....
b) Millet	.....	.....	.....	.....
c) Cassava	.....	.....	.....	.....
d) Beans	.....	.....	.....	.....
e) Groundnuts	.....	.....	.....	.....
f) Bananas	.....	.....	.....	.....
g) Vegetable	.....	.....	.....	.....
h) Fruits (specify)	.....	.....	.....	.....
i) Potatoes	.....	.....	.....	.....
j) Peas	.....	.....	.....	.....
k) Onions	.....	.....	.....	.....
l) Wheat	.....	.....	.....	.....
m) Sorghum	.....	.....	.....	.....
n) Others (specify)	.....	.....	.....	.....

What concerns do you have from the rehabilitation of Road from Laisamis to Loiyangalani on agricultural production?

More a significant production would be easier to transport to this end.

**Land Tenure System**

Under what type of tenure do you use/hold this land? Please tick below

- a) Freehold (registered) (  )
- b) Freehold (unregistered) (  )
- c) Leasehold (  )
- d) Tenancy (  )
- e) Customary/communal (  )
- f) Do not know (  )

What concerns do you have from the rehabilitation of Road from Laisamis to Loiyangalani on land tenure system and prices?

I hope it will be healthy - PPL will recover their losses due to more business

**Livestock Production and Composition**

Type	Number	Purpose (subsistence/sale)	Income (Kshs/year)
a) Cows	.....	.....	.....
b) Bull	.....	.....	.....
c) Sheep	.....	.....	.....
d) Goats	.....	.....	.....
e) Donkeys	.....	.....	.....
f) Pigs	.....	.....	.....
g) Camels	.....	.....	.....
h) Rabbits	.....	.....	.....
i) Poultry	.....	.....	.....
j) Others (Specify)	.....	.....	.....

What impacts do you anticipate from the rehabilitation of road from Laisamis to Loiyangalani on local livestock production?

It will be easy to transport live stock quickly to Nairobi market for immediate slaughter there

**Compensation**

Some of your land and property may be affected by the proposed roads project. Please list the items that you should be compensated for? List them below

- a) Construction of my Plot
- b) Compensation of my plot sheep & goats that I used to sell
- c) All items - stock still of my sheep business

What is your preferred mode of compensation for your fixed asset such as land?

- a) Cash value (.....)
- b) Land for land (.....)
- c) Partly cash and partly land (.....)
- d) Others please specify .....

If you choose land as a mean of compensation please list the areas where you prefer to be resettled

- a) .....
- b) .....
- c) .....

Are there important relations that are to be affected if you are to be relocated from your land? Please list them below please

- a) .....
- b) .....
- c) .....

Date: 12/04/2010 Signature: FARUWA MOHAMMED

# ANNEX 3 SAMPLE QUESTIONNAIRES OF KEY INFORMANTS

## ANNEX 3.1 Key Informants – Kenya Rural Roads Authority

KEY INFORMANTS INTERVIEW GUIDE

Prof. B.N.K. Njunge  
P.O. Box 12101 - 00200 Nairobi

MILLENNIUM  
ENGINEERING LTD.  
P.O. BOX 64683 - 002  
Nairobi

The Lake Turkana wind Power Project Limited (LTWP) is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the Lead Agency regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA/EA Rules and Regulations (2003).

Lead Agency: KERRA - Regional Manager  
Name: Jannas M. K. Kibuka  
ID No.: 11359952  
Designation: Regional Manager  
Date: 15/06/20  
Signature: [Signature]

- Suggest areas of possible collaboration by the proponent Lake Turkana Wind Power (LTWP) of the proposed Road development project with your institution  
Road improvement especially structures and gravel of the section will be welcomed. The same should however be done to engineering standards.
- Are there policy and legal links of your institution with the proposed project if any  
KERRA has a legal mandate on the road as it is the authority entrusted with all aspects concerning road class D, E and others by the Kenya government
- Do you perceive any conflicts (issues) that could emerge between your institution and the proposed project? If yes, give details  
All structural works must be done to engineering standards and supervision must be by qualified professionals  
+ fine gravel material will not be allowed - there is need to have thorough material investigation
- In your opinion, what benefits does your institution stand to reap from the proposed project?  
We expect a good finished road this means money for maintenance for this road can be used on other links.
- What are the possible impacts from the proposed project that are likely to affect your institution adversely?  
Assuming a well done road, there are no foreseen negative impacts.

6. What would you propose as measures to mitigate the above impacts

N/A

7. Please make any other comments that you feel are relevant in relation to the proposed road development project

- Have a programme to maintain the road until the construction of wind power is completed.

8. I/We approve the proposed project (Reasons)

/

9. I/We do not approve the project (Reasons)

/

**ANNEX 3.2 Key Informants – Kenya Forest Services**

**KEY INFORMANTS INTERVIEW GUIDE**

The Lake Turkana Wind Power Project Limited (LTWP) is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the Lead Agency regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA/EA Rules and Regulations (2003).

Lead Agency: Kenya Forest Service  
 Name: Meslock Choto  
 ID No: 7350857  
 Designation: FORESTER  
 Date: 15/4/2010  
 Signature: [Signature]

1. Suggest areas of possible collaboration by the proponent Lake Turkana Wind Power (LTWP) of the proposed Road development project with your institution \_\_\_\_\_

- ① Conservation
- ② Re-orientation
- ③ Mainstream education on use of alternative energy.

2. Are there policy and legal links of your institution with the proposed project if any \_\_\_\_\_

Yes - Forest Act 2005  
 - Forest Policy - Use of Alternative energy.

3. Do you perceive any conflicts (issues) that could emerge between your institution and the proposed project? If yes, give details \_\_\_\_\_

YES  
 - Clearing of vegetation especially through sacred groves, Conservation areas etc.

4. In your opinion, what benefits does your institution stand to reap from the proposed project? \_\_\_\_\_

Reduction in overdependence on firewood as source of energy hence conserving vegetation in the affected area.

5. What are the possible impacts from the proposed project that are likely to affect your institution adversely? \_\_\_\_\_

Charcoal burning from the cleared material will encourage people to start commercialising the vice.

6. What would you propose as measures to mitigate the above impacts

- (1) Minimise road clearance area.
- (2) Initiate roadside plantings of trees after completion of the road.
- (3) Sensitise communities on the issue of charcoal burning especially when constructing the road.

7. Please make any other comments that you feel are relevant in relation to the proposed road development project

- (1) Involve local communities in conservation efforts and use of alternative source of energy.

8. I/We approve the proposed project (Reasons)

(1) It will open up the Area for Commerce

9. I/We do not approve the project (Reasons)

N/A

**ANNEX 3.3 Key Informants – Kenya Wildlife Services**

**KEY INFORMANTS INTERVIEW GUIDE**

The Lake Turkana Wind Power Project Limited (LTWP) is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Lolyangalani.

This questionnaire is administered to collect and collate views of the Lead Agency regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA/EA Rules and Regulations (2003).

Lead Agency: K.W.S  
Name: ROBERT ORAIN  
ID No: 0288767  
Designation: SENIOR WARDEN  
Date: 15-04-2010  
Signature: 

1. Suggest areas of possible collaboration by the proponent Lake Turkana Wind Power (LTWP) of the proposed Road development project with your institution \_\_\_\_\_

From Laisamis to Mburit and Ilat. We are in the process of starting a grey zebra protection sanctuary.

2. Are there policy and legal links of your institution with the proposed project if any \_\_\_\_\_

Yes all conservationists have been governed by an act of Parliament.

3. Do you perceive any conflicts (issues) that could emerge between your institution and the proposed project? If yes, give details \_\_\_\_\_

NO

4. In your opinion, what benefits does your institution stand to reap from the proposed project? \_\_\_\_\_

Improve on road network and accessibility.

5. What are the possible impacts from the proposed project that are likely to affect your institution adversely? - \_\_\_\_\_

I only hope that tree destruction is minimal.

 15/04/10

6. What would you propose as measures to mitigate the above impacts

Avoid Cutting trees where possible.

7. Please make any other comments that you feel are relevant in relation to the proposed road development project

I propose and suggest that the road goes through Korr to Karpil then follow the road to South Korr rather than take the Nguruit - South Korr road. Obstacles are less.

8. I/We approve the proposed project (Reasons)

we need to open up the north and the LTWP will help us alot. The road will help in developing the area and I also believe that this road will encourage tourism.

9. I/We do not approve the project (Reasons)

 15/4/10

**ANNEX 3.4 Key Informants – Kenya National Highway Authority**

**KEY INFORMANTS INTERVIEW GUIDE**

The Lake Turkana wind Power Project Limited (LTWP) is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the Lead Agency regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA/EA Rules and Regulations (2003).

Lead Agency: Kenya National Highways Authority (KENHA)  
 Name: Julius K. Gitau  
 ID No: 20753836  
 Designation: ENGINEER  
 Date: 22/04/2010  
 Signature: Gitau

1. Suggest areas of possible collaboration by the proponent Lake Turkana Wind Power (LTWP) of the proposed Road development project with your institution \_\_\_\_\_

- Collaboration in establishing the appropriate road corridor and providing linkages to the local community.
- Collaboration in the implementation phase of the project by through involvement in site meetings.
- Collaboration in future Maintenance requirements/needs by our organisation for Sustainability.

2. Are there policy and legal links of your institution with the proposed project if any Yes.

- The Project Managers need to liaise and get approvals (approvals) from the Director General KENHA in respect of the works on E77
- Adherence to general Road Construction Standards applicable to Kenya

3. Do you perceive any conflicts (issues) that could emerge between your institution and the proposed project? If yes, give details \_\_\_\_\_

No Conflict.

4. In your opinion, what benefits does your institution stand to reap from the proposed project? \_\_\_\_\_

- Improved roads (E77, E72) would greatly enhance Mobility of traffic between the sections involved. Hence better linkage for our organisation
- Reduction on the Maintenance/rehabilitation needs on the part of our organisation
- Generated energy/water may be used by the Nation including our self.

5. What are the possible impacts from the proposed project that are likely to affect your institution adversely? \_\_\_\_\_

- The proposed project is unlikely to affect KENHA adversely provided the Siting of the wind power plant is not within the road reserve

- Possible Conflict with locals on the Construction Corridor for the road
  - Possible soil erosion arising from earth works, loose soils and outfalls to Structures
  - Likely occupational, and Health and Safety issues.
6. What would you propose as measures to mitigate the above impacts
- Siting the Power Plant outside of the road reserve.
  - Involvement of all stakeholders during the entire project life.
  - Provide soil erosion control and conservation structures where necessary, controlled earthworks rehabilitate already degraded areas and proper disposal of loose soils.
  - Proper security, Staff & Operability training on safety and health and provision of protective clothing/gear.
7. Please make any other comments that you feel are relevant in relation to the proposed road development project
- There is great need to involve all stakeholders during the life of the project (KARAA, KENHA, Local Administrations and others)
- The need to consider an alternative route to the power plant through Marsabit - North Horr - Wajir/Kisumu, just in case there is a challenge on one route
  - This project will certainly change the wellbeing of the people living along the proposed roads.
8. I/We approve the proposed project (Reasons)
- Improved roads means better mobility, Reduced travel time and less vehicle operating costs.
  - The project will bring about general development in Tourism, Small scale industries, business, fishing in Lake Turkana etc.
  - It brings about the realisation of Public and Private Sector Partnership in development.
9. I/We do not approve the project (Reasons)
- N/A

KENYA NATIONAL HIGHWAYS AUTHORITY  
 REGIONAL MANAGER - UPPER EASTERN  
 P. O. BOX 325 - 60300  
 ISIOLO

James. 22/04/10

**ANNEX 3.5 Key Informants – Ministry of Water and Irrigation**

**KEY INFORMANTS INTERVIEW GUIDE**

The Lake Turkana wind Power Project Limited (LTWP) is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the Lead Agency regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA/EA Rules and Regulations (2003).

Lead Agency: DWO - Marsabit South (Water)  
 Name: Joseph L. Ieparleru  
 ID.No: 0643307  
 Designation: DWO - Marsabit South  
 Date: 09-04-2010  
 Signature: \_\_\_\_\_

1. Suggest areas of possible collaboration by the proponent Lake Turkana Wind Power (LTWP) of the proposed Road development project with your institution \_\_\_\_\_  
Development of water sources along the Laisamis, Seririma Loiyangalani Road.

2. Are there policy and legal links of your institution with the proposed project if any Yes  
On Water Act.

3. Do you perceive any conflicts (issues) that could emerge between your institution and the proposed project? If yes, give details Yes  
(i) on water sources development in regard to Water Act 2002 should be fully complied.

4. In your opinion, what benefits does your institution stand to reap from the proposed project? after the construction of the road, boreholes would be handed over to the communities. Hence releasing of burden of the ministry in water provision.

5. What are the possible impacts from the proposed project that are likely to affect your institution adversely? -  
depletion of ground water aquifer as a result of over-pumping.  
over-utilization of water resources due to over-stocking.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. What would you propose as measures to mitigate the above impacts

1. Replacement of Diesel generator with solar pumps  
and training of community water  
users Association.

7. Please make any other comments that you feel are relevant in relation to the proposed road development project

- The project should be handed over to the communities  
after the road construction.

- The communities to be train on project management  
in order to ensure sustainability.

8. I/We approve the proposed project (Reasons)

We do approve the projects.

9. I/We do not approve the project (Reasons)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**ANNEX 3.6 Key Informants – Provincial Administration**

**KEY INFORMANTS INTERVIEW GUIDE**

The Lake Turkana Wind Power Project Limited (LTWP) is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisemis to Loiyangalani.

This questionnaire is administered to collect and collate views of the Lead Agency regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

Lead Agency: Provincial Administration  
Name: PETER TUNDU  
ID No: 1377055  
Designation: DISTRICT OFFICER  
Date: 17/04/2010  
Signature: [Signature]

1. Suggest areas of possible collaboration by the proponent Lake Turkana Wind Power (LTWP) of the proposed Road development project with your institution \_\_\_\_\_

- Creating awareness and sensitizing the local community along the alignment.  
- tackling security concerns.

2. Are there policy and legal links of your institution with the proposed project if any \_\_\_\_\_

None

3. Do you perceive any conflicts (issues) that could emerge between your institution and the proposed project? If yes, give details \_\_\_\_\_

None

4. In your opinion, what benefits does your institution stand to reap from the proposed project? \_\_\_\_\_

The alignment being one of our security roads, its rehabilitation/strengthening will add value to our security operations. Again supply of relief supplies will be easier.

5. What are the possible impacts from the proposed project that are likely to affect your institution adversely? - \_\_\_\_\_

None

6. What would you propose as measures to mitigate the above impacts

N/A

7. Please make any other comments that you feel are relevant in relation to the proposed road development project

- The project should be designed in such a way that livestock routes are left intact.
- Destruction of natural environment (trees and pasture) should be minimal.
- Local labour must be utilized to enable the community own the project.
- The local community must understand the link between sustainability of the road and Tunisia wind power project. The route for power lines will use the road alignment where possible.

8. We approve the proposed project (Reasons)

1. Rehabilitating the road will make it accessible after being damaged by heavy rain received in the area.
2. Strengthening the alignment and especially drainage line will help maintain and have divisions as the table is always cut off during rainy seasons.
3. The project will enhance our security movements.

9. We do not approve the project (Reasons)

N/A

## **ANNEX 4 MINUTES OF PUBLIC PARTICIPATION**

### **MEETING AT MANYATTA ARNIKH AND NTLIYA 11/04/2010**

- The meeting began at 10.15 am with the area chief Antonino N Kaldalle opening the meeting and welcoming all those present at the meeting and he invited one of the E.I.A representative to explain to the locals present the reason for inviting them to the meeting
- The consultant informed the locals the reason inviting them to the meeting and he explained to them about the proposed road project and the reason for upgrading the road
- One of the local present welcomed the E.I.A team and he said they were happy about the project because it will help them get casual job during construction
- One member present the road development was not a bad idea and he said community have no objection
- Another member contributed that the road when upgraded it will be used to transport people, animals and lorries will pass there that brings foodstuffs to them and he also contributed that if a bridge is build in Margi's area transport problems will be solved in the area
- Another member said that the community have the order and rules to guide them on use of their land ,and their land is used to graze animals and nobody should take their land without involving them even the Government, and the Government knows these rules.
- Another member wanted to know how and who will be maintaining the road after Lake Turkana finished using the road to transport their materials.
- One of the local wanted assurances that the road will be used to transport materials for wind power and that not there land is being taken away illegally for other businesses.
- Another member contributed that the community welcomed the project as long as there animals and peoples especially children will not be affected.
- Another member present said that they were happy to hear about the road project and he thanked the E.I.A team a lot and he said the project to go ahead as it will lead to development of the area.
- Another member said that the communities living along the road have their own rules on how casuals should be employed during construction, i.e. casuals to be employed to work in the sub-locations they come from only and no migration to other sub-locations they don't come from .
- Another member said that because the area is very poor the contractor can pay casuals using means like work for food and any other mode they agree after consultations.
- Another member requested they be made aware when the work on the road will start so that they can prepare themselves, because they are nomad people and they move far looking for pastures for their animals, and also when locals are involved they will be able to solve any problem as it arise during construction of the road, Using Manyatta rules.
- One member requested that the contractor who will upgrade the road to use the local leaders like chiefs to get to them like the E.I.A team has done.
- The meeting ended at 11.10 am with a lot of thanks from the locals present and the area chief Antonino N. Kaldalle

### **Meeting at Manyatta Lorukushu 1 and 2- 11/04/2010**

- The meeting started at 11.30 am with the area chief Antonino N Kaldalle welcoming all those present for the meeting and invited one of the E.I.A representative to introduce themselves and explain to the locals present the reason for inviting them to the meeting.
- The consultant informed the locals the reason for inviting them to the meeting and he explained to them about the proposed road project and the reason for upgrading the road
- One member present requested that they be involved during road construction so that they can own the project and because the project is in their area.
- Another member said they were happy to hear the news about the project and they welcomed the meeting
- The meeting ended at 12.15pm with a lot of thanks from locals and the area chief.

### **Meeting at Manyatta Jales Ndikir I- 11/04/2010**

- The meeting started at 13.40 pm with the area Assistant Chief Gregory Lekuton welcoming all those present for the meeting and he invited one of the E.I.A team representative to introduce themselves to the people present and tell them the reason of calling them for a meeting
- The consultant informed the locals the reason for inviting them to the meeting and he explained to them about the proposed road project and the reason for upgrading the road
- One member contributed that the community was happy to be made aware of the project and they said they accepted the project as it will bring development in their area
- Another member said that the community will assist the contractor fully if they are involved and no problem will arise
- Another member said that they have been experiencing many problems due to lack of good road, he added that food transport to the area is a problem as vehicles don't use the road because it's in poor state and mostly locals repair the road themselves using their hands as they don't have suitable equipment, and during rainy season the road become impassable
- Another member said that the road has made the locals lack food and children usually go hungry because lorries that used to bring food to them don't use the road any more
- Another member present requested that the locals be given casual jobs when the work on road begins and the contractor to use their local leaders to contact them.
- Another member contributed that if the road is upgraded it will ease transport problems in the area, and the locals will access the animal market in Laisamis easily which is about 14 kilometre to the area they leave, he also said that they will be able to access dispensary faster which is about 10 kilometre in Lontorio from the area they leave.
- Another member requested that the community be assisted with water as their local borehole has salty water and when human being use them urinating becomes painful, he also requested that the locals be assisted in educating their children in secondary schools as many children drop out of school after class eight due to lack of school fees, he also requested that they be given fuel that they use in the borehole as it has exhausted their resources.

- Another member said that they were happy to hear about the project and they wished the project well.
- The meeting ended at 14.15pm with a lot of thanks from the locals present and the area assistant chief.

#### **Meeting at Manyatta Lorora Ndikir 2 11/04/2010**

- The meeting started at 14.45 pm with the area assistant chief Gregory Lekuton welcoming locals present at the meeting and he invited one of the E.I.A representative to introduce themselves and tell the locals the reason for inviting them to the meeting.
- The consultant informed the locals the reason for inviting them to the meeting and he explained to them about the proposed road project and the reason for upgrading the road
- One of the member present said that the road Laisamis to Loiyangalani has been their biggest problem and with the news that it will be upgraded they were very happy.
- Another member said that the community have organised themselves on how to repair road because Lorries bringing them foodstuffs usually get stuck.
- Another member asked that if for sure the road will be upgraded because they had been given that promise previously and nothing happened
- Another member said that they were happy because of good interaction with the E.I.A team and they welcomed the project fully.
- Another member said they were happy to hear that the road will be upgraded because many vehicles get stuck and the locals are usually called at night to help those whose vehicles get stuck
- Another member contributed that at rainy seasons the road is impassable, and he said that they appreciate the project a lot as they have faced many problems and locals usually repair the road using their bare hands
- Another member said that if any casual job shall arise locals should be employed in the sub-locations they come from not people to work anywhere as previously done by contractors.
- Another member said that they need assistance on how to get water as the local borehole has salty water not consumable by human being as it leads to painful urination
- Another member contributed that the road project will bring development to the area and they were happy to hear about the project and being involved.
- Another member thanked the E.I.A team for sharing with them about the project and they wished the team well
- The meeting ended at 15.30pm with a word of prayer from Meditian Leteele the community priest.

### **Meeting at Manyatta Lengima , Bayo 11/04/2010**

- The meeting started at 16.40 pm with the area elder Jackson Lengima welcoming those present for the meeting and he invited one of the E.I.A representative to introduce themselves and tell the locals present the reason for inviting them to the meeting
- The consultant informed the locals the reason for inviting them to the meeting and he explained to them about the proposed road project and the reason for upgrading the road
- The locals were told about the project and the reason of constructing the road in the area
- One member present said that they were not aware about the project and were happy to hear about the proposed project
- Another member present said that if the road is upgraded it will help in development of towns in the area and food will be made available because Lorries will use the road.
- Another local member present said that if the proposed road upgrading is done the community will unite themselves and help in the completion of the road project and they will solve any problem that may arise, he also said that they were very happy about the proposed project and they gave a go ahead on the implementation of the proposed project
- Another local member said that to them going to main towns in the area have been a problem as there are no transport as vehicles have abandoned that road due to its poor conditions
- Another local member said that the road usually gets worse at rainy seasons and vehicles usually get stuck and the owners of those stuck vehicles usually request for help from local people at night
- Another local member said that they welcomed the project fully and said construction should start immediately as it will bring benefits to them and he also added that they be told how they can assist the contractor so that the road project can be fully done and done well.
- Another local area member contributed that any casual jobs to be available to be given to locals according to the sub-location they come from
- Another local member said that the community will unite to see that project succeed fully and he said that the local community approves the project fully and they appreciated a lot the E.I.A team for involving them
- The meeting ended at 17.15 pm with a word of prayer from Kakuro Anderi community elder

### **Meeting at Ngurunit chiefs camp 12/04/2010**

- The meeting started at 12.15pm with the area assistant chief Mr Malkash Ltarakino welcoming the people present for the meeting and he invited one of the E.I.A representative to introduce themselves to the locals present and tell them reason for inviting them to the meeting
- The consultant informed the locals about the proposed road project and the reasons behind upgrading of the road.
- One of the local member asked if the road leads to house demolition will those people be compensated.
- Another local member contributed that the road to pass the town centres as there were other two options where the proposed road can pass and he said that compensation will be minimal.

- Another member said if the road pass in the town centre it will lead to many development in town, the town will grow as investor will build good hotels, lodging facilities and vehicles using the road will use NNgurunit town as a stopover for them to refresh themselves
- Another local area member said even if the road will lead to trees destruction the locals will get firewood and they will burn charcoals and he added that they will replace cut trees.
- Another member said that if casual jobs will be available when road upgrading start people to be used should work only on the sub-location they come from, he added that local community don't have any other means of getting money and said they are ready to work and get paid.
- Another local member said that the community will claim anything e.g. trees that are cut using the sub -location the trees are cut and he added that because they cannot charge the contractor a fee for cutting their trees they requested assistance from contractor to assist the plant tree and the contractor should provide seedlings, he also added that the community can organise themselves and form groups for easy compensation.
- Another local member asked where compensation will be based on the producing documents and some don't have the documents as others are poor squatters.
- Another local member asked that if the transmission line will pass on their town for them to get power
- The meeting ended at 13.00pm with a word of prayer from Rantiley Lempuruk

#### **Meeting at Illaut shopping centres 12/04/2010**

- The meeting started at 15.30 pm with the area assistant chief Bernard B. Machan welcoming all those present for the meeting and he invited one of the E.I.A representatives to tell the locals present the reason for inviting them to the meeting
- The consultant informed the locals the reason for inviting them to the meeting and he explained to them about the proposed road project and the reason for upgrading the road
- One of the local member present said that they were happy to hear news about the project and they thanked the E.I.A team a lot, he also said that they heard about the wind power project that has lead to their road be upgraded he added that road construction in the area previously were done badly especially bridges and road culverts
- One of the local present said that they were happy to hear the news about the proposed project and he also added that the local community were only happy and satisfied with only one bridge on NNgurunit that was done well.
- Another local member requested that the road not to be constructed badly like other contractor did previously and he added that some contractors started projects in the area without involving them and the project failed, poor work was done and this resulted to waste of money
- Another member said that the culverts that were built in the area were done badly and vehicles don't use them.
- Another local member said that they could have wanted a tarmac road not murrum road.
- Another local member asked that if the road affects houses what will happen to the affected individuals

- Another member present said that the area that is very bad in the road is Margi's and it was destroyed during El Niño time making the water from area to flow in the road
- The area Sub-chief asked that the access road to their Manyattas not to be destroyed like previous contractors did, as locals use them and mobile clinic use the access road to get to manyattas he even requested that the access road be upgraded and he added that the contractor to co-operate with the locals so that they can be shown the local roads.
- The area sub –chief contributed that they have a very big problem with water and the wells available may be affected by the road, and the location of the well may be only the area with water and he requested that the well be spared and road be re-routed to spare them.
- Another member present said that previously contractors didn't involve the locals on any project and he requested that they be told when the road project will start and they be told of the road program.
- The meeting ended at 16.25 pm with many thanks from the locals and the area assistant chief and a word of prayer from Lkeriyon Lechompira

#### **Meeting at South Horr Shopping centre 13/04/2010**

- The meeting started at 11.35 am with a word of prayer from Pastor Mwereri,
- The area chief Alex Lempirias welcomed all those present at the meeting and he invited one of the E.I.A representative to introduce themselves and tell locals present the reason for inviting them to the meeting.
- The consultant informed the locals the reason for calling them to the meeting and he explained to them about the proposed road project and the reason for upgrading the road
- One of the local said that they heard about the proposed project, he asked what will happen to those people whose Manyattas are on the road as the people who constructed their Manyattas didn't know that the road will pass there and lead to their Manyattas destroyed
- Another local asked what will be the basis for compensation? Will it be done to those with letter of allotment from the Marsabit county council, squatters
- Another local member said that the area has a lot of swamps and lagers and building culverts and drifts may not be enough, he requested that building big bridges be considered.
- The area councillor contributed that the road not to pass the town centre and he recommended that the map be changed and road to use other alternative route so that building in the shopping centre be spared from demolition, he also added that those whose Manyatta will be demolished be helped to rebuild their houses as they are poor people and also those who occupy land in the area without approval from council should also be assisted if affected by road passing in the land they occupy.
- Pastor Mwereri asked that will those people who have build house in the road reserve be compensated? He also asked if local people will be considered for any casual job that may arise during construction?
- Another local member thanked the E.I.A team for involving them and were happy about all proposals made as previously some people started project without letting them know and it's their area and the project was meant for them.

- Another local member recommended that if any casual job will be available the people to be employed should work in the sub-location they come from.
- Another local member asked that they be told when the project will start for them to organise themselves because they are pastoralists and if contractor want anything from locals he should first consult local leaders
- A local woman said that mostly those houses on the road reserve belongs to poor women and she said they be told how far the road will reach for them to organise themselves.
- Pastor Mwereri asked whether those who leave on the road reserve will be notified when to relocate and be given time to relocate?
- The area sub-chief said they were happy to hear about the project and he said any other development is welcome as it will make their area grow.
- Another local member said that the local people own vehicles and they can be hired and he said they be made aware earlier by contractor if he need any vehicles from them.
- The area sub-chief was happy because of them being consulted and he welcomed the E.I.A team
- The meeting ended at 12.25 pm with a lot of thanks from the area chief to all those present at the meeting.

#### **Meeting at Kurungu shopping centre 13/04/2010**

- The meeting started at 15.05 pm with the area chief Alex Lempirias welcoming all those present at the meeting, he welcomed the E.I.A team and he invited the area assistant chief Paul Lepulelei to preside over the meeting, The assistant chief once again welcomed all those present and he invited one of the E.I.A representative to introduce themselves to the locals present and tell the locals the reason for inviting them to the meeting .
- The consultant informed the locals the reason for inviting them to the meeting and he explained to them about the proposed road project and the reason for upgrading the road
- One local member said that they heard about the proposed project but they thought it was just a rumour, he said they are now happy that the E.I.A team talked to them and now they believe the project will materialise
- Another local member said they were happy hearing about the project, he added that all that the E.I.A team said was good and was very thankful that the road will be upgraded
- Another local member said that the road has been in a bad condition for long and upgrading it is a good idea and will not bring any harm to them.
- Another local member said some of the building in Kurungu are near the road and were build by old men who sold their animals to get money to build them and it's their only investment and if demolished they should be assisted to re build them as they don't have money to start all again
- Another local member said that the road upgrading is a good idea but the house near the road the contractor should spare them and if demolished it will heart them a lot
- Another local member said that the road upgrading is a good idea as it will bring development in the area as well as losses on trees and the road may intrude their land that they use to graze their animals.

- Another local member said that the locals have rules that anybody who cut a tree is fined a fee; he added that because they cannot fine the contractor he recommended that the contractor assist them on re planting the cut trees.
- Another local member recommended that the local be given casual jobs to benefit themselves and they should not be denied the opportunity as previous project developers did in the past.
- Another local member said that materials to upgrade the road to be sourced locally and contractor not to buy them from far, he also said that the locals can mine the materials for the contractors
- Another member contributed that when contractor start the job he should involve the community and use local leaders to contact them and not to start job abruptly without involving local people
- Another local member recommended that those casuals to be hired to work in the sub-location they come from only
- The meeting ended at 16.00pm with a lot of thanks from the local people, the area chief and assistant chief.

#### **Meeting at Manyatta Nyatir Sarima 14/04/2010**

- The meeting started at 9.30 am with the area local elder Mr Ekomol Ekitel welcoming E.I.A team and all the local present at the meeting. He invited one of the E.I.A representative to introduce themselves to the locals and tell them the reason for inviting them to the meeting
- The consultant informed the locals the reason for inviting them to the meeting and he explained to them about the proposed road project and the reason for upgrading the road
- One of the local member said that they want to be assisted with water and the area like Sarima there is no water and they go far to fetch the water.
- Another local member said they don't know about the wind turbine machines, he asked how the wind turbine will enter on their land, how it will affect their animals, the wind turbine may fall to their animals and human being and destroy them, he also asked if the wind turbine make noise that may harm them?
- Another local member said that they don't know about the wind power project, the area does not have a chief, KPR, and they don't have water as rain water that they were using was exhausted and walk far to fetch water.
- Another local member asked where the road project and wind power project will get water because in that area there is no water
- Another local member asked whether the wind turbines will affect their animals and their livelihood, he added that the road and wind turbine will take their land and may destroy their animal's food.
- Another local member said since the wind power project started their KPR were taken to guard the wind turbine must and insecurity was high, he recommended that the road contractor to come with his own security as they don't have any KPR for now.
- The local said the road contractor and those building wind turbines should help them build schools, hospitals, water and be assisted with food and he insisted that these four things be taken seriously.
- The meeting ended at 10.20 am with a lot of thanks to the E.I.A team and locals present from Ekomol Ekitel the local elder.

### **Meeting at Manyatta Lorugo Namarey 16/04/2010**

- The meeting started at 14.25 pm with the area assistant chief Francis S Ommarre welcoming the E.I.A team and locals present , he invited one of the E.I.A representative to tell the locals the reason for inviting them to the meeting
- The consultant informed the locals the reason for Inviting them to the meeting and he explained to them about the proposed road project and the reason for upgrading the road
- One of the local said that the road will ease transport problem in the area and will bring development in the area, he said currently when local get sick they don't get vehicles to take them to hospital because of bad state of the road
- Another local member said that when the road is upgraded it will help people move around and it will open up the area
- The area assistant chief asked whether the locals will get electricity after their local road is used to transport wind power turbine that will generate electricity
- The area assistant chief said that if casual jobs will be available the locals should work in the sub-location they come from only because local community had devised way of repairing the road based on sub location they come from.
- The area assistant chief said that the local be assisted with water as the borehole they have don't have enough water, the diesel to power the turbine in the borehole is expensive for them, he also recommended that a local person be trained on how to repair the borehole turbine, he added that some borehole in the area have salty water and cannot be consumed by human being as it leads to painful urination when they consume the water
- The area assistant chief said the area don't have a permanent dispensary because of lack of water and they would like to have one available, he added that the local schools don't have enough water and they go far to fetch water as far as Marsabit town, he added that after water is put in the school tank they face problem removing it as they don't have a pipe
- The area chief also said that if the road is upgraded it will ease transport problems in the area as student suffer a lot when going to school as there are no vehicles on the road because it's in bad condition
- The meeting ended at 15.10pm with a lot of thanks from the locals and the assistant chief Francis S Ommarre to the E.I.A team

**ANNEX 5 LIST OF ATTENDANCE FOR PUBLIC PARTICIPATION**  
**ANNEX 5.1 List of Participants - Manyatta Arnikh and Ntliya**

**LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION**

**List of Members Present**

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Lefar Lekoi kip			
2	Gegele fecha			
3	Lokuko Bargul			
4	Kampi Adigakhiyecha			
5	Cabab Hajufle			
6	Madowo Harao			
7	Hafare Harao			
8	Thimo Harao			
9	Loseya Ntliya			
10	Nandana Lombani			
11	Larapani Arnika			
12	Dobayo Ntliya			
13	Ilo Amtyo			
14	Kurewa Adisono			
15	Lonhule Bargul			
16	Furokora Arnikh			
17	Chulyo Hajufle	0631378		0726531565
18	Nunuko Bulyari			

District: LAISAMIS Division: LAISAMIS Location: LAISAMIS  
 Sub location: LAISAMIS Village: Manyatta Arnikh / Ntliya  
 The meeting ended: 12:15pm  
 Secretary: Thomas Kaman  
 Community Representative: Antonio N. Kaldare - chief Laisamis 0727962228  
 Environmental Consultant Representative: \_\_\_\_\_  
 Date: 11/04/2010

## LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA/EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Lemutan Kumbale			
2	Laven Bafhi			
3	Arapel Arando			
4	Silapau Super			
5	Kiwewa Arnikh			
6	Mjona Kato			
7	Looas Galkena			
8	Lorukwi Bwama			
9	Lhaya Arnikh	0726 704 795		
10	Laraphot Chorodo			
11	Hezela Nihiga	0710 6629 44		
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District: MARSABIT SOUTH Division: LAISAMIS Location: LAISAMIS  
 Sub location: LAISAMIS Village: M/Sayatta Arnikh/Nihiga  
 The meeting ended: 11:00 AM  
 Secretary: Thomas Kamau  
 Community Representative: Chief Antonino N. Kaldalle 0727963028  
 Environmental Consultant Representative: [Signature]  
 Date: 11/04/2010

## LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Sokoyau terapo			
2	lobuk terapo			
3	Leveren Kojan			
4	Kiroro terapo			
5	Wodi lekoyau			
6	Sopu mowu terapo			
7	Malo lekoyau			
8	L Karasiu tekombe			
9	L taya lekoyau			
10	Intertan lengolau			
11	Lamil terapo			
12	L parunai langal			
13	Loboku lengolau			
14	Lerdas koptan			
15	L talasou Lamal			
16	Loku turner kurkuma			
17	Lekuyer Galora			
18	L doropu Eisimakalo			

District: MARSABIT SOUTH Division: LAISAMIS Location: LAISAMIS  
 Sub location: LAISAMIS Village: MENYISSA AREA (AT 1149)  
 The meeting ended 12:15pm LOROKUUKU I and II  
 Secretary: Thomas Kamau  
 Community Representative: Chief Antonino N. Caldalle 0727963028  
 Environmental Consultant Representative: [Signature]  
 Date: 11/04/2010

**ANNEX 5.2 List of Participants - Manyatta Lorokushu**

**LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION**

**List of Members Present**

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Sulo Nkiliya	0721103764		
2	Tiringa Hestoro			
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District: MARSABIT SOUTH Division: LAISAMIS Location: LAISAMIS  
 Sub location: LAISAMIS Village: Manyatta (Kaitik) Nitiya  
 The meeting ended 11/04/2020 12:45pm LOROKUSHU TANDI  
 Secretary: Thomas Kamau  
 Community Representative: Chief Antonino N. Kaldelle 0727963028  
 Environmental Consultant Representative: \_\_\_\_\_  
 Date: 11/04/2020

### ANNEX 5.3 List of Participants - Ndikir 1

#### LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

##### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	LETORO - JALE	8150980		
2	LMOMPASA - ZETALE	12752939		
3	LAPAMU - JALE	0635762		
4	TOTI - JALE	8150959		
5	IREWA - JEBOL	0060157		
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District: LAISAMIS Division: LAISAMIS Location: LONTOLIO  
 Sub location: NDIKIR Village: JALE  
 The meeting ended 14:15 PM  
 Secretary: Thomas Kamau  
 Community Representative: Assistant Gregory Zebulon  
 Environmental Consultant Representative:  
 Date: 11.04.2010

## ANNEX 5.4 List of Participants - Ndirkir 2

### LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

#### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	NYILLIAN - SAKALPO			
2	NAIRUG - LEMOMPE			
3	LEKURANA - IALORA			
4	DRDASHA - KALORA			
5	ITARI - PARIKERI			
6	LOKIRI - GALHAIZE			
7	ROPA - "			
8	KATALO - SAKALPO			
9	ITAAIAN - SAKALPO			
10	NARUNGU - SAKALPO			
11	ZKIRAHICS - LIMIRBAN			
12	LMARANTAN - LEKIASIA			
13	MPORE - HANU			
14	LESALIYA - NAARENTHIWAJI			
15	KASIPO - RAPAYO			
16	MEDETIAN - LETEELE			
17	LETIYOM - SAKALPO			
18	OLETO - ITANYA			

District: Laisamis Division: Laisamis Location: LOIYOLIO  
 Sub location: Ndirkir Village: LOKORA  
 The meeting ended 15:30 PM  
 Secretary: Thomas Kaman  
 Community Representative: Cigora  
 Environmental Consultant Representative: Amkhaton  
 Date: 11/04/2010

## ANNEX 5.5 List of Participants - Manyatta Lengima

### LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

#### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	JACKSON Lengima	12752641	<i>[Signature]</i>	0714738415
2	Lueyolo Lengima			
3	Lokkoti Lengima	26231148		
4	Lorindingai Lengima			
5	Lewria			
6	Ngiro Lengima			
7	Loneki Kbalanga			
8	Abjessa Lepati	9558158		
9	Levitan Lesamana	21433320		
10	Guthalle Anderi			
11	Kakuro Anderi			
12	Lparoi Lesuper			
13	partip Loronyokoe			
14	Muyenger Kesinge			
15	Ltungai Nangaya			
16	Hokoloto Chana			
17	Lkuraon Samana			
18	Lojov Lengima			

District: LAISAMIS Division: KORR Location: Naimareí  
 Sub location: Naimareí Village: Manyatta Lengima  
 The meeting ended 14:15 pm  
 Secretary: Thomas Hamau  
 Community Representative: JACKSON Lengima  
 Environmental Consultant Representative: [Signature]  
 Date: 11/04/2010

## LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Lkipandi Loromyokwe			
2	Kedumu Lengima			
3	Kulmicho Chana			
4	Ltasokuda Kesinge			
5	Sukul Tipo			
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District: LAISAMIS Division: KORR Location: NAMARET  
 Sub location: NAMARET Village: HARAYATA LEALIMA  
 The meeting ended: 17:15 pm.  
 Secretary: Thomas Kamau  
 Community Representative: JACKSON Lengima  
 Environmental Consultant Representative: \_\_\_\_\_  
 Date: 11/04/2010

## ANNEX 5.6 List of Participants - Namarei

### LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

#### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Francis sommarie	0023097		Marsabit south P.O. Box 230
2	Kivale Lau-sovo			
3	Imeliyo sagaram			
4	Epiliwan marro			
5	John Kesidalmaruth			
6	Ntoto komuruth			
7	Leimon Lekarit			
8	Ndwa komuruth			
9	Kavite oyoye			
10	Arabal komuruth			
11	Baragi AWule			
12	Laguu Esimbucha			
13	Muyange Lenguro			
14	Arge EYSIM sachir			
15	Kivinyal Aiboy			
16	Arabal Kesivith			
17	Ketula marro			
18	Imetiki marro			

District: Marsabit south ..... Division: Koy ..... Location: Ngurunt  
 Sub location: Namarey ..... Village: Lavuga .....  
 The meeting ended: 15:10 pm .....  
 Secretary: Thomas Kamau .....  
 Community Representative: Francis Salaha sommarie - Asst chief .....  
 Environmental Consultant Representative: .....  
 Date: 16/04/2010 .....

## LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Kavani Lesivithe			
2	Rasimo Esimuridan			
3	Sakuyen marro			
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District: Marsabit south Division: Koriy Location: Njumanil  
 Sub location: Namaleh Village: Laruga  
 The meeting ended: 15:10pm  
 Secretary: Thomas Kama  
 Community Representative: Francis Salaha Ommare  
 Environmental Consultant Representative: A. Chaf.  
 Date: 16/04/2010

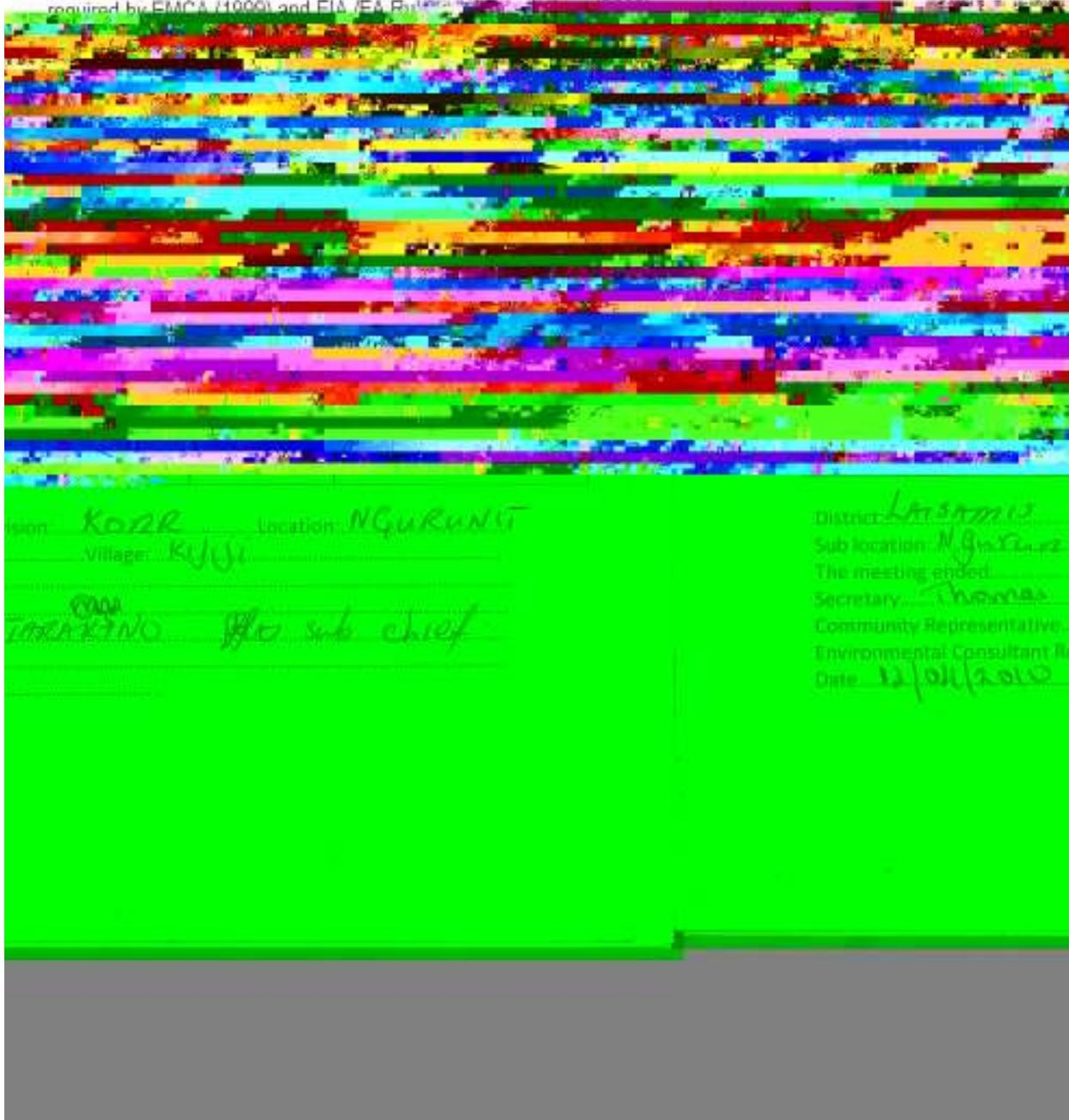
## ANNEX 5.7 List of Participants - Ngurunit chief's camp

### LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

#### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules 2012.



**LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION**

**List of Members Present**

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	SULTANA HALAF.			184 ISOLA
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District: LAISAMIS Division: KORB Location: NGURUNIT  
 Sub location: NGURUNIT Village: KIJJI  
 The meeting ended 13:00 pm  
 Secretary: Thomas Kaman  
 Community Representative: MACKASH LIARAKINO sub chief  
 Environmental Consultant Representative  
 Date: 12/04/2010

## ANNEX 5.8 List of Participants - Illaut trading centre

### LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

#### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Lolyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Charles Leparsanti	11656320		
2	Gedi YALLAW			
3	GEORGE LEPARSANTI	25247374		
4	LKITIANO LEPARSANTI			
5	ALI NOOR MUSA			
6	JOHN LEPARSANTI	24276089		
7	MATHEW LETOLE			
8	NETUNG LENGUSMWA			
9	JULIUS LAMASHIMI			
10	NAOLEI LETSIDO	23343743		
11	MPOKO LKIMIRE			
12	WILLIAM LEMASAYO			
13	PETER LOCHAKUE			
14	LETUNGAN LENGUSMWA			
15	SATOTI LENGUSMWA			
16	WAY WAY			
17	LKERIYON LECHOMPRA			
18	LKATIKIN LEPARSANTI			

District: MARSABIT SOUTH Division: KORB Location: NGURUNIT  
 Sub location: ILLAUT Village: ILLAUT  
 The meeting ended: 16:25 PM.  
 Secretary: Thomas Kuma  
 Community Representative: ASST. CHIEF BENARD B. MACHAN  
 Environmental Consultant Representative:  
 Date: 12/4/10

## LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	LDIDING LEMASAYO			
2	LASA LEMIGOR			
3	IFRA ALI HOOK			
4	NTIRIMAT LESIOLE			
5	FRANCIS LEMAKOPI	9052376		
6	LERATION LEMAGAS			
7	LOTCHERUA LELBAUSHO			
8	SAMUEL LENTOROK			
9	BENARD B. MACHARI.			
10	SARGAL LOBYK	4207436		
11	LEMOROSI LEPASATI	11456319		
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District: MARSABIT SOUTH Division: KORR Location: NGURNIE  
 Sub location: ILLAUT Village: ILLAUT  
 The meeting ended.....  
 Secretary: Thomas Hamau  
 Community Representative: ASSICHEE BENARD B. MACHARI  
 Environmental Consultant Representative.....  
 Date: 12/4/10

## ANNEX 5.9 List of Participants - South Horr trading centre

### LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

#### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Alex Lempirios	4202883	<i>[Signature]</i>	P.O BOX 230 MBT
2	Lhaouci Lekaratu			
3	Hlave Legerber			
4	Charles Gallo			
5	Mkhalim Abdulai			
6	Lhavesin Logipayongi			
7	Pawa Letuke			
8	Lengeli Lekaroto			
9	Postar Mwereri			
10	element Kotol			
11	Lesobo bmarkat			
12	Ndedei Lesikoyo			
13	Loyakin Lolashim			
14	Lkasinga Lemaitranit			
15	Judy Lemerkal			
16	Mungeni Lemerkal			
17	Rumkaiya Lemerkat			
18	Lekaiben Lemungu			

District: Marsabit South Division: Loiyangalani Location: South Horr.  
 Sub location: South Horr Village: South Horr  
 The meeting ended: 12:25pm  
 Secretary: Thomas Kaman  
 Community Representative: Alex Lempirios  
 Environmental Consultant Representative: \_\_\_\_\_  
 Date: 13/04/2010

## LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Masa Lapariya			
2	Mantano Lariakwa			
3	Ntho da Lepile			
4	Onite Lemerkal			
5	Tarata Lokom			
6	Lpalelan Leyamyam			
7	Tarya Lesamachale			
8	Lememes Lemerkat			
9	Kisum Letuke			
10	Lepin Lempisikishoi			
11	Lekinten Lekaldano			
12	Ngashar Leavamu			
13	Rambawan Lepulebi			
14	Sungure Leshamakale			
15	Loitake Leleshap			
16	Rumbaiyan Lepulebi			
17	Lemigan letuke			
18	Leriyon Lekumato			

District: Marsabit South (Laisamis Division: Loiyangalani) Location: S-HORN  
 Sub location: South Horn Village: South Horn  
 The meeting ended: 12:25pm  
 Secretary: Thomas Kaman (M)  
 Community Representative: Alex Lempirias  
 Environmental Consultant Representative: \_\_\_\_\_  
 Date: 13/04/2010

**ANNEX 5.10 List of Participants - Kurungu trading centre**

**LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION**

**List of Members Present**

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	L Kriamba L KENIT	20539483		
2	HIMMI LESOKOYO			
3	BOHTIS L EKATAP			
4	NYIMORU L ENAWALCHINGE			
5	MOHAMMED KERR			
6	KENJOMA L EMANGAS			
7	KARAN TE L EKALAIYO			
8	KUMUKETH L EKEREIP			
9	LERAITA L EKALAIYO			
10	LESWAS L EDAMAY			
11	Lentagan Lemparief	11456733		
12	Lpunkoyo LEMKOYAYO			
13	Salmon L ENGAUR			
14	Lehate L ENGAUR			
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17				
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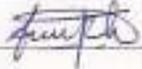
District: Marsabit South Division: Loiyangalani Location: S/UDRR  
 Sub location: Kurungu Village: KURUNGU  
 The meeting ended 16:00P  
 Secretary: Thomas Karan  
 Community Representative: PAULO LEPALEHEI  
 Environmental Consultant Representative: \_\_\_\_\_  
 Date: 18/04/2010

## LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1999) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Lomini Lempiris			
2	TODIN LEPULEBI			
3	LEMONINGA LEDIKANG			
4	RONGYS LEKATAP			
5	LKORO I LEMOLOI			
6	LOMALAN LEMOLOI			
7	JOSEPH S. LENAILE	3019135		P.O. SOUTH-HORR.
8	LDURUMPE LEKEHIT			
9	LOSEMYE LEKALDERO			
10	LEPORIM LEKEREN			
11	LERUNGU LESAMAJA			
12	LKURESIAN LEKEHIT			
13	RITALA LETAMARLE			
14	LPINDISOT LESAMAJA			
15	BEH LEKEHIT			
16	RICHARD LESAMAJA			
17	LPALIM LEMPIRIAS			
18	LOPOPI LEMPIRIAS			

District: MARSABIT SOUTH Division: LOIYANGALANI Location: S/HORR  
 Sub location: KURUNGU Village: KURUNGU  
 The meeting ended: 16:00 PM  
 Secretary: Thomas Kamau  
 Community Representative: PAUL LEPULEBI  
 Environmental Consultant Representative: \_\_\_\_\_  
 Date: 13/04/2010

## LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

### List of Members Present

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1996) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	Lovergo Lepulelei	905237	<i>[Signature]</i>	
2	William Lbulanton	1196235	<i>[Signature]</i>	
3	Isaya LEDAANY		<i>[Signature]</i>	
4	Lkaadja Lesemgo	2112673		
5	LORIMO Lekeren			
6	LTA MONGAN LOKADON			
7	KASUIS LOKADON			
8	LEEPEN Lokatar	4202435		
9	Samuel LENTAJIN	23490836	<i>[Signature]</i>	
10	LTEREMPOS LKENIT			
11	LMANG LEKENIT			
12	Lesolei Lekeren	11643266	<i>[Signature]</i>	
13	Lengria Lekeren			
14	KAMARI Lenasaban			
15	LPERIAN Lekupe			
16	LETUMATO Lemoto			
17	SABEGO Lempiris			
18	LMATIRIN Lempiris			

District: MARCAPI SOUTH Division: LOIYANGANI Location: S/HORN  
 Sub location: KURUNGU Village: KURUNGU  
 The meeting ended: 16:00 PM  
 Secretary: Thomas Kamau DP  
 Community Representative: DAUL LEPULELEI  
 Environmental Consultant Representative: [Signature]  
 Date: 13/04/2010

**ANNEX 5.11 List of Participants - Selima**

**LAISAMIS – LOIYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION**

**List of Members Present**

The Lake Turkana wind Power Project Limited is proposing to construct a wind farm to generate 300MW of power from wind. To access the site, the proponent proposes to rehabilitate/strengthen the access road from Laisamis to Loiyangalani.

This questionnaire is administered to collect and collate views of the project affected persons regarding the proposed project in order to facilitate in the compilation of Environmental Impact Assessment report as required by EMCA (1995) and EIA /EA Rules and Regulations (2003).

SNo.	Name	ID/No.	Signature	Address
1	MAUR KAITIK			
2	Ekomuwa . bogori			
3	LOROI'S Nagola			
4	LAKENI Ekomuwa			
5	<del>ACHUNO</del> MORDU			
6	ADOO NGASIKE			
7	LORAG KINYORI			
8	ESUNYEN Lokadeli			
9	MAMU; LORUBUN			
10	Lokiteha EMASE			
11	JONI; Lonyakal			
12	ADEMUN KERYO			
13	ERUWAN LOSAURA			
14	EKIDORI PUDA			
15	MAWET PUDA			
16	EDUS LOGUSIL			
17	LOGINYONA MOWET			
18	EKATAPAN MAMUKO			

District: LAISAMIS Division: Loiyangalani Location: Loiyangalani  
 Sub location: SERIMA Village: SARIMA  
 The meeting ended: 10:20 AM  
 Secretary: Thomas Kaman  
 Community Representative: Ekomol Ekiel  
 Environmental Consultant Representative:  
 Date: 14/04/2010

## LAISAMIS – LOYANGALANI ROAD UPGRADING – COMMUNITY PUBLIC PARTICIPATION

### List of Members Present

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SNo.	Name	ID/No.	Signature	Address
1	LORUBEN EKOMUWA			
2	LOKODE EKITELA			
3	MAKARIYO AMUN			
4	LOIBACH EKOMUWA			
5	LOKULWAWI LORUBUN			
6	LOMUR. PALDEKUN			
7	MAWOSI PUDA			
8	ESUPYEN ECHAKAN			
9	EKIRU ECHAKAN			
10	LOKIYA KILATEGIRO			
11	LOSOKATIN KAPUA			
12	LOMAYAGOLA NGISEKON			
13	MAWACHA ELOGITA			
14	AYEPIS ETELEF			
15	HIDAKAMYO ETELEF			
16	ESUPYEN PALPITIMOT			
17	PAPOKOTE ETELEF			
18				

District: Laisamis Division: LOYANGALANI Location: SARIMA  
 Sub location: SARIMA Village: SARIMA  
 The meeting ended 10:20 AM  
 Secretary: Thomas Kamau  
 Community Representative: Ekomek EKITELA  
 Environmental Consultant Representative: \_\_\_\_\_  
 Date: 14/04/2010