



LAKE TURKANA
WIND POWER
LIMITED



**ADDENDUM ON ROAD RE-ALIGNMENT
TO THE
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT FOR THE
PROPOSED STRENGTHENING OF LAISAMIS- SOUTH HERR (D371) AND SOUTH
HERR- LOIYANGALANI (C77) ROAD**



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ABBREVIATIONS AND ACRONYMS

AIDS	-	Acquired Immune Deficiency Syndrome
DC	-	District Commissioner
DO	-	District Officer
ESIA	-	Environmental and Social Impact Assessment
ESMP	-	Environmental and Social Management Plan
HIV	-	Human Immuno-deficiency Virus
Hr	-	Hour
IFC	-	International Finance Corporation
IPP	-	Independent Power Producer
KeNHA	-	Kenya National Highways Authority
KeRRA	-	Kenya Rural Roads Authority
Km	-	Kilometres
KRB	-	Kenya Roads Board
LTWP	-	Lake Turkana Wind Power
MoR	-	Ministry of Roads
NEAP	-	National Environment Action Plan
NEMA	-	National Environmental Management Authority
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.

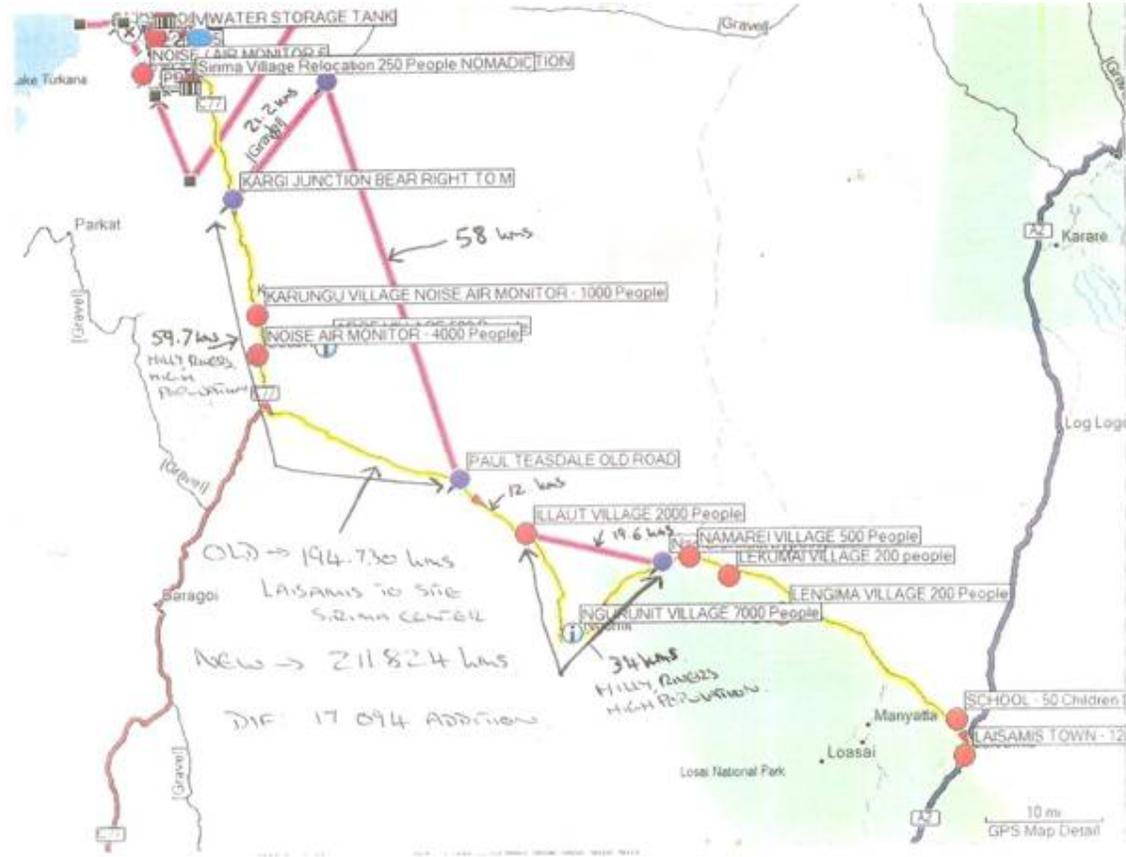
In order to contribute towards sustainable development, an Environmental and Social Impact Assessment (ESIA) was necessary for the proposed road construction. Consequently, Lake Turkana Wind Power Limited (LTWP) contracted Eng. Prof. B. N. K. Njoroge, a registered EIA/EA lead expert to carry out an Environmental and Social Impact Assessment (ESIA) on the proposed strengthening/rehabilitation of Laisamis – South Horr - Loiyangalani road in accordance with NEMA regulation and the IFC guidelines. The report had been prepared, approved by NEMA and License issued (Application No. PR/7445 and Reg. No. 0008064 of 26th Jan, 2011). But then it was felt that re-alignment and re-routing of some sections was necessary to avoid; some heavy settlement areas, rough terrain with sharp bends, steep slopes, rocky terrain among others. Thus, it was important to visit the site between 12th and 19th February, 2011 for route re-alignment identification, confirmation and conduct baseline studies. This was followed by detailed site investigation for social and environmental studies carried out from 27th April to 3rd May, 2011.

Hence this addendum gives details of the re-alignment. However the re-alignment does not alter the course of the initial report and basically avoids some mitigation measures that would have accrued if the original route was followed.

PROJECT ROUTE RE-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 Namarei and Illaut. From Namarei to Illaut the road avoids Ngurunit settlement centre as shown on Figure 1 as a straight through 19.6 km stretch. Twelve (12) km from Illaut centre the proposed re-alignment passes through Arge upto Kargi junction (58 km) as D371. From Kargi junction the route assumes the Kargi – Marsabit 21.2 km as E671 to the original route to Selima – 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 motorable under improvement over the sparsely populated thickets. Again, 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 drains 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.



- Key
- Yellow line shows the original route
- Pink line shows the sections proposed for re-alignment

Figure 1: Laisamis – Loiyangalani road showing the proposed Re-alignment in pink

ANALYSIS OF ALTERNATIVE ROUTE

As indicated in the main report, the alternative to the proposed Laisamis -Ngurunit- 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-Ngurunit-Illaut-South Horr-Loiyangalani was selected for strengthening. However, within this route some variations were thought pertinent to ease equipment transportation, cost of relocation and other environmental considerations.

Hence, there are two sections that require re-alignment namely;

❖ **Namarei to Illaut**

The 19.6 km stretch from Namarei to Illaut has flat and rolling terrain making it a viable route to use. Again one avoids the 34.0 km stretch through Ngurunit hence;

- saving on distance (14.4 km),
- reduce dust, noise and air pollution through Ngurunit market centre
- avoid the Ngurunit settlement area with a population of about 3, 000 persons thus removing need for resettlement and
- avoid transportation over hilly undulating terrain which have bends and rocky terrain

The 19.6 km stretch is an old disused road which will require drainage to be improved and be rehabilitated. There are 2 laggas in the route.

❖ **Illaut –Arge – Kargi junction route**

This route comprising of Illaut to Arge 33 km and Arge to Kargi Junction 25 km has a total of 58 km. Then use a 21.2 km from the Kargi junction through Marsabit road-E671 (which is a fairly good route) back to the originally identified route to Selima - Loiyangalani. The 21.2 km stretch is already in use and has flat and rolling terrain. But the junctions should be curved to allow enough space for long (50 m) turning heavy loaded vehicles.

The 58 km stretch from 'Paul Teasdale' old road (12 km from Illaut) through Argi and Kargi junction has flat and rolling terrain making it a viable route to use. This road was developed in 1970s but later abandoned as the communities moved towards the hills for water and pasture. Again one avoids the 59.7 km stretch through South Horr and Kurungu hence;

- reduce dust, noise and air pollution through South Horr and Kurungu market centres
- avoid the South Horr and Kurungu settlements towns with populations of 1,500 and 1,200 persons respectively hence avoid need for resettlement and
- avoid transportation over hilly undulating terrain which have bends and rocky terrain
- passing through numerous borrow areas
- coming close to the hilly sections which are potential sources of water

The 58 km stretch, will require rehabilitation and drainage be improved. Between the Illaut to Kargi junction, there are 5 laggas namely; Loiya, Moran, Polo, Argae and lagu.

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

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.

However since the re-alignment route did not have human settlement and sensitive receptors or ecosystem there was no need to conduct public meetings and administration of questionnaires. But discussions were held with the key stakeholders where the re-alignment passes through their area of jurisdiction.

The key stakeholders identified in the project were;

1. Area sub chief, chief, District Officer and District Commissioner Laisamis
2. Town clerk Marsabit County Council
3. Regional manager from Kenya Rural Roads Authority (KeRRA)
4. An engineer from Kenya National Highway Authority(KeNHA)
5. Neighbouring communities to the road re-alignment.

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

- 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 consider sinking bore holes which will be handed over to the communities' ones the road construction is over.
- 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.
- During upgrading, clearing of vegetation on borrow pits will be kept to a minimum to avoid interfering with livestock and communal pastoralists way of life.

It is imperative to note that some of these stakeholders had also been consulted earlier and similar concerns had been raised as indicated in the main report.

PROJECT IMPACTS

The impacts (positive and negative) during Construction, Operation and De-commissioning phases of the re-alignment are similar to the ones in the main report except here there is no re-location of communities from Ngurunit, South Horr and Kurungu settlements hence no compensation and avoid transportation over hilly undulating terrain which have bends and rocky terrain.

Again the Proposed Mitigation Measures as also similar to the ones in the main report and again vegetation destruction will be kept to a minimum.

CONCLUSIONS AND RECOMMENDATIONS

The addendum gives details of the re-alignment. However the re-alignment does not alter the course of the initial report and basically avoids some mitigation measures that would have accrued if the original route was followed like re-location of communities and transportation over hilly undulating terrain which have bends and rocky terrain. .

Thus, no objections were received from the communities adjacent to the re-alignment route. The proposed project does not pose adverse socio-economic impacts and is an initiative towards improving accessibility in the area.

Thus, the study recommends timely implementation of the project (under the current re-alignment) 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 was prepared.

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 and Social 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 development 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 195 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 hence requiring strengthening.

1.2 Justification of the re-alignment in the project

The original approved road for strengthening was: Laisamis – Lengima – Namarei – Ngurunit – Illaut – South Horr – Kurungu and Selima (Loiyangalani). As per the proposed re-alignment the route is: Laisamis – Lengima – Namarei – Illaut – Arge – Kargi junctionu and Selima (Loiyangalani).

The 19.6 km Namarei to Illaut stretch has flat and rolling terrain making it a viable route to use. Again one avoid the 34.0 km stretch hence;

- saving on distance (14.4 km),
- Reduce dust, noise and air pollution through Ngurunit market centre
- avoid the Ngurunit settlement area with a population of about 3, 000 persons thus removing need for resettlement and

- avoid transportation over hilly undulating terrain which have bends and rocky terrain

The 58 km stretch from Paul Teasdale old road (12 km from Illaut) through Argi and Kargi junction has flat and rolling terrain with numerous borrow areas making it a viable route to use. Again one avoids the 59.7 km stretch through South Horr and Kurungu hence;

- avoid dust, noise and air pollution generation through South Horr and Kurungu market centres
- avoid the South Horr and Kurungu settlements towns with populations of 1,500 and 1,200 persons respectively hence avoid need for resettlement and
- avoid transportation over hilly undulating terrain which have bends and rocky terrain
- coming close to the hilly sections which are potential sources of water

1.3 Objectives of the ESIA

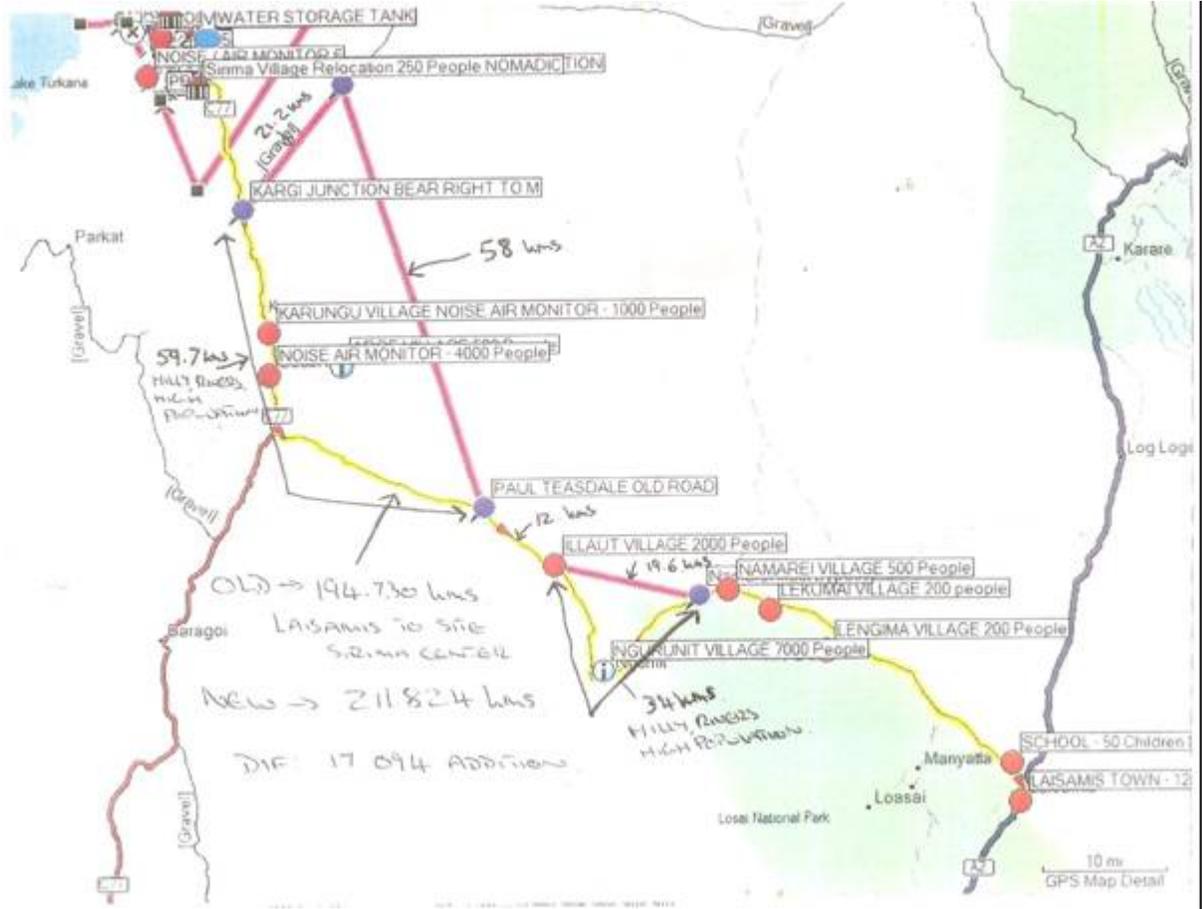
The objectives of the ESIA remains as envisaged in the main report.

1.4 Re-alignment 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 and passes through various centres which include Namarei and Illaut. From Namarei to Illaut the road avoids Ngurunit settlement centre as shown on Figure 1.1 as a straight through 19.6 km stretch. Twelve (12) km from Illaut centre the proposed re-alignment passes through Arge upto Kargi junction (58 km) as D371. From Kargi junction the route assumes the Kargi – Marsabit 21.2 km as E671 to the original route to Selima – Loiyangalani. The entire stretch is a murram road that is marked by low lying terrain lying between numerous hills and dry sand river beds. In general the road is motorable under improvement over the sparsely populated thickets. Again, sections of the road cut across the dry sand river beds and are extensively damaged and are unstable for heavy vehicular loading.

According to the existing road classification and the new institutional arrangement in the road sector, the 171 km Laisamis-Kargi junction (D371) section falls under the jurisdiction of the Kenya Rural Roads Authority (KeRRA) while the 41 km Kargi junction –Selima (Loiyangalani) section falls under the Kenya National Highway Authority (KeNHA). Thus administration and execution of the work is to be carried out in close collaboration with the two statutory bodies and the Ministry of Roads. Figure 1.1 Shows the Laisamis

to Loiyangalani route with re-alignment sections marked in pink. The yellow line indicates the originally approved route.



- Key**
- Yellow line shows the original route
 - Pink line shows the sections proposed for re-alignment

Figure 1.1: Laisamis – Loiyangalani road showing the proposed Re-alignment in pink

1.5 Terms of Reference (TOR)

The ToR remained as per the approved main report

CHAPTER 2: LEGAL AND INSTITUTIONAL FRAMEWORK

The chapter remains as per the main report

CHAPTER 3: PROJECT STUDY METHODOLOGY

3.1 Screening, Scoping and Study Approach

Screening, Scoping and Study Approach followed the procedures as reported in the main report.

3.2 Study tools and techniques

3.2.1 Site visits and Survey

To understand the biophysical nature of the road re-alignment area the field team visited the site. A survey along the road re-alignment was done and observations made of vegetation and existing ecosystems and thickets among others. Thus, it was important to visit the site between 12th and 19th February, 2011 for route re-alignment identification, confirmation and conduct baseline studies. This was followed by detailed site investigation for social and environmental studies carried out from 27th April to 3rd May, 2011. During the site visits, the team was also able to meet the relevant stakeholders.

3.2.2 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 commissioner, district officers, chiefs and assistant chiefs held discussions with affected communities living adjacent to the road alignment. During these meetings, the communities were informed on the road re-alignment and deviations from the originally planned route. Details are as provided in chapter 7.

3.3 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.

3.4 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. Again, this was in line with the contents of the main report.

CHAPTER 4: PROJECT BASELINE INFORMATION

The baseline information did not alter since we are dealing within the same region albeit some re-alignment.

CHAPTER 5: PROPOSED ROAD RE-ALIGNMENT DESCRIPTION

5.1 Project Alternative Routes and Road Re-alignment

Roads

The alternative to the proposed Laisamis -Ngurunit- Ilaut-South Horr - Loiyangalani road was 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 the 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 km, 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 work.

Thus, the Laisamis-Ngurunit-Ilaut-South Horr-Loiyangalani was selected for strengthening. However, within this route some variations were thought pertinent to ease equipment transportation and cost of re-locating people among other environmental considerations.

The two routes requiring re-alignment/re-routing are i.e.

5.1.1 Namarei to Illaut

The 19.6 km stretch from Namarei to Illaut (See plates 5.1 and 5.2) has flat and rolling terrain making it a viable route to use. Again one avoid the 34.0 km stretch through Ngurunit hence;

- saving on distance (14.4 km),
- reduce dust, noise and air pollution through Ngurunit market centre

- avoid the Ngurunit settlement area with a population of about 3, 000 persons thus removing need for resettlement and
- avoid transportation over hilly undulating terrain which have bends and rocky terrain

The 19.6 km stretch is an old disused road which will require drainage to be improved and be rehabilitated. There are 2 laggas in the route.



Plate 5.1 At Illaut end of the 19.6 km re-alignment



Plate 5.2 Namarei shopping centre with a population of 2600, Ngulan primary school at Namarei with a pupil population of 170 located about 100 m from the start of the route re-alignment

5.1.2 Illaut –Arge – Kargi junction route

This route comprising of Illaut to Arge 33 km and Arge to Kargi Junction 25 km has a total of 58 km. Then use a 21.2 km from the Kargi junction through Marsabit road-E671 (which is a fairly good route) back to the originally identified route to selima - Loiyangalani. The 21.2 km stretch is already in use and has flat and rolling terrain. But the junctions should be curved to allow enough space for long (50 m) turning heavy loaded vehicles.

The 58 km stretch from Paul Teasdale old road (12 km from Illaut) through Argi and Kargi junction has flat and rolling terrain making it a viable route to use. Plates 5.3 to 5.9 show some of the key features of the proposed road re-alignment route. Again one avoids the 59.7 km stretch through South Horr and Kurungu hence;

- reduce dust, noise and air pollution through South Horr and Kurungu market centres
- avoid the South Horr and Kurungu settlements towns with populations of 1,500 and 1,200 persons respectively hence avoid need for resettlement and
- avoid transportation over hilly undulating terrain which have bends and rocky terrain
- passing through numerous borrow areas
- coming close to the hilly sections which are potential sources of water

The 58 km stretch, will require rehabilitation and drainage be improved. Between the Illaut to Kargi junction, there are 5 laggas namely; Loiya, Moran, Polo, Argae and lagu.

The road branches off from the main Isiolo -Marsabit at Laisamis town and runs 212 km 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.

Vertical geometrics

The road runs on a flat to gently sloping undulating terrain. There are some laggas. 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 131 from Laisamis. There is also potential of exploitation of ground water at Serima and Khorr as indicated by the presence of productive shallow wells along the dry river beds.

Drainage

The road will be drained by a combination of structures including drifts and single and double culvert lines in addition to box culverts. There are however a total of 6 dry river beds/ deep gullies crossing with no particular drainage structure. The road also traverses numerous low lying laggas.

Environmental aspects

There is no centre along the re-alignment route. The negative environmental impacts likely to arise during implementation of the rehabilitation/strengthening of the road re-alignment 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.

These impacts are similar to the ones reported in the main report except here there is no disruption of livelihood. The proposed road re-alignment follows flat terrain and presents no major geometric challenges compared to the originally selected route. Thus was proposed for strengthening.

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 5.3 At Illaut – South Horr junction (12 km from Illaut) start of the 58 km diversion



Plate 5.4 A section through the Illaut-Arge proposed re-alignment route



Plate 5.5 At Arge lagga on the 58 km diversion



Plate 5.6 Towards Kargi junction from Argi through the thicket



Plate 5.7 At the Kargi Junction



Plate 5.8 Junction that need to be curved between the survey route and the E671 Marsabit route



Plates 5.9 Borrow sites about 7 km from the Arge – Kargi junction re-alignment route

The road between Laisamis and Kargi junction is classified by the Ministry of Roads as D371 and falls under the jurisdiction of Kenya Rural Roads authority (KeRRA). Between Marsabit road junction 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 motorable under improvement. 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.

Note

- For material investigation and testing, excavation, drainage works and equipment the requirements are as detailed in the main report.

CHAPTER 6: PROJECT IMPACTS

The impacts (positive and negative) during Construction, Operation and De-commissioning phases of the re-alignment are similar to the ones in the main report except here there is no re-location of communities at Ngurunit, South Horr and Kurungu settlements hence no compensation and one avoid transportation over hilly undulating terrain which have bends and rocky terrain.

Again the Proposed Mitigation Measures as also similar to the ones in the main report and again vegetation destruction will be kept to a minimum.

CHAPTER 7: PUBLIC CONSULTATION

7.1 Introduction

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.

However since the re-alignment route did not have human settlement there was no need to conduct public meetings and administration of questionnaires. But discussions were held with the key stakeholders where the re-alignment passes through their area of jurisdiction.

The key stakeholders identified in this project were;

1. Area sub chief, chief, District Officer and District Commissioner Laisamis
2. Town clerk Marsabit County Council
3. Regional manager from Kenya Rural Roads Authority (KeRRA)
4. An engineer from Kenya National Highway Authority(KeNHA)
5. Neighbouring communities to the road re-alignment.

Plates 7.1 to 7.5 show the photographic documentation of the public meetings and discussions



Plate 7.1 Discussion with the Ag. DC Laisamis



Plate 7.2: Discussions with the DO Khorr Division



Plate 7.3: Taking facts from an elder at Namarei just about the diversion into the re-alignment



Plate 7.4: Discussions with the a community leader at Namarei



Plate 7.5: Discussion with the Chief Illaut

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 and are similar as reported in the main report.

- ❖ **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 to avoid damage to these sensitive facilities
- ❖ **Cutting down of trees:** Kenya Forest Service expressed concerns on possibility of trees destruction which is used by some community like Rendille as water marker to indicate the presence of water. 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 avoid much destruction and liase with local environmental management committees to rehabilitate unavoidable tree cutting.
- ❖ **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. Also clearing of vegetation should be kept to a minimum at road upgrades and in the borrow pits.

Ultimately, the community support the improvement of the road since it will bring about numerous social economic benefits along the entire road re-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 specifically where the road passes adjacent to their locality considering their pastoralist nature of life. In so doing, this will go a long way in ensuring the smooth implementation of the project.

CHAPTER 8: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

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

The ESMP 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 ESMP below addresses the identified potential negative impact and mitigation measures of the proposed road project.

Note: The ESMP is the same one as in the main document apart from demolition of houses. The alignment has no settlement.

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"> ⊕ All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction. ⊕ 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. ⊕ Careful screening of construction site to contain and arrest construction-related dust. ⊕ Exposed stockpiles of e.g. dust and sand, will be enclosed, covered, and watered daily, or treated with non-toxic soil binders. ⊕ All workers on the site will be required to wear protective clothing while on duty. ⊕ Sprinkle water on the graded road during construction. ⊕ Strict enforcement of speed limits adopted during the construction phase of the project. 	<ul style="list-style-type: none"> ⊕ Project proponent/contractor ⊕ Ministry of Health: provincial public health officer ⊕ Ministry of Roads ⊕ NEMA inspectors ⊕ Ministry of Labour 	Periodic Activities	Periodic and surprise checks	100,000 per Month over the construction period

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

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"> ⊕ Avoidance of unnecessary vegetation clearing and reinstating cleared vegetation ⊕ Replanting of trees where possible ⊕ Avoid clearing culturally, economically and biologically valued trees. ⊕ Design of the road to reduce frequent change of alignment so as to use the existing road alignment. ⊕ Where road realignment is necessary, choose the least vegetated routes 	<ul style="list-style-type: none"> ⊕ Contractor ⊕ Proponent ⊕ Ministry of Roads 	Planting of more trees	Periodic checks	Part of project cost under BoQ
Injuries arising from accidents during the road construction phase.	<ul style="list-style-type: none"> ⊕ All workers will be sensitized before construction begins, on how to control accidents related to road construction works. ⊕ Ensure the machinery, equipments, personnel protective clothing, appliances and hand held tools comply to the set safety and health standards and are maintained accordingly. ⊕ Machines and equipments shall be enclosed or guarded and must always be operated by suitably trained plant or machine operators. ⊕ 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. ⊕ A comprehensive contingency plan will be prepared before construction begins, on accident response. ⊕ Accordingly, adherence to safety procedures will be enforced. ⊕ All workers shall wear protective clothing during construction, including helmets. ⊕ Construction work will be limited to daytime only 	<ul style="list-style-type: none"> ⊕ Project proponent/contractor ⊕ Divisional Public Health Officer ⊕ Ministry of Labour ⊕ Workers ⊕ NEMA inspectors 	Routine Activities	Periodic checks	60 000 per month

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Mushrooming of food kiosks	<ul style="list-style-type: none"> ⊕ Eating places will be provided on site, with adequate wholesome water and waste disposal handling services, during construction process. 	<ul style="list-style-type: none"> ⊕ Divisional Public Health Officers/Ministry of Health ⊕ NEMA inspectors 	Periodic Activities	Periodic and surprise checks	100,000 per annum
Human waste disposal by workers during construction process	<ul style="list-style-type: none"> ⊕ As provided for by the Building Code, temporary latrines will be provided on site to be used by construction workers 	<ul style="list-style-type: none"> ⊕ Project proponent ⊕ Contractor ⊕ Ministry of Health ⊕ Ministry of Roads ⊕ Ministry of Labour ⊕ NEMA inspectors 	Periodic Activities	Periodic checks	50,000 at once
Storm water drainage	<ul style="list-style-type: none"> ⊕ Design and implement adequate hydraulic structures for storm water disposal. ⊕ Use the existing drainage channels adjacent to the existing roads as cut off drainages. 	<ul style="list-style-type: none"> ⊕ Project proponent ⊕ Contractor ⊕ Ministry of Roads ⊕ 	Periodic Activities		Part of project budget
Increase in STI	<ul style="list-style-type: none"> ⊕ Sensitisation of local communities and staff working on the road project on dangers of HIV/AIDS and STI through training and brochures. ⊕ Provision of condoms at strategic places at the work places using condom dispensers. 	<ul style="list-style-type: none"> ⊕ Proponents ⊕ Ministry of Health 	Periodic voluntary 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"> ⊕ Excavated materials will be loaded on trucks and transported to designated disposal sites ⊕ Design and implement an appropriate landscaping program of the road furniture. ⊕ Reuse the excavated top soil in landscaping 	<ul style="list-style-type: none"> ⊕ Project proponent ⊕ Contractor ⊕ Ministry of Roads ⊕ NEMA inspectors 	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"> ⊕ Use of equipment designed with noise control elements will be adopted where necessary. ⊕ Ensure construction machineries are kept in good working condition through regular maintenance. ⊕ Trucks used at construction site shall be routed away from noise sensitive areas where feasible. ⊕ Idling time for pickup trucks and other small equipment will be minimized to limited time. ⊕ All workers operating in noisy areas or operating noisy equipment will be provided with earpieces to protect against extreme noise. 	<ul style="list-style-type: none"> ⊕ Project proponent/contractor ⊕ Divisional Public Health Officer ⊕ Ministry of Labour ⊕ Workers ⊕ NEMA inspectors 	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"> ⊕ Adequate collection and storage of waste will be provided on site, and safe transportation to, and display methods at designated areas. ⊕ All receptacles for storing hazardous wastes shall be adequately covered. ⊕ All employees will be required to wear protective clothing when handling hazardous wastes. ⊕ All workers will be adequately insured against unforeseen accidents. 	<ul style="list-style-type: none"> ⊕ Project proponent/contractor ⊕ Provincial Public Health Officer ⊕ Ministry of Labour ⊕ Workers ⊕ NEMA inspectors 	Routine Activities	Periodic and surprise checks	50 000 per month

CHAPTER 9: SOCIO MANAGEMENT AND MONITORING PLAN

9.1 Introduction

The social management and monitoring plan, processes and procedures will follow the same format as in the main report apart from there being no settlements in the re-alignment areas, hence no issues of compensation.

CHAPTER 10: CONCLUSION AND RECOMMENDATIONS

The addendum gives details of the re-alignment. However the re-alignment does not alter the course of the initial report and basically avoids some mitigation measures that would have accrued if the original route was followed like re-location of communities and transportation over hilly undulating terrain which have bends and rocky terrain. .

Thus, no objections were received from the communities adjacent to the re-alignment route. The proposed project does not pose adverse socio-economic impacts and is an initiative towards improving accessibility in the area.

Thus, the study recommends timely implementation of the project (under the current re-alignment) 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 was prepared.

REFERENCES

Main document references

ANNEXES

Annex 1 Letter of Authority from Marsabit County Council to carry out studies in the Proposed re-alignment Sections

COUNTY COUNCIL OF MARSABIT

Telegram: County Council of Marsabit
 Telephone (069) 2439
 Fax: (069) 2451
 E.mail mcc@africaonline.co.ke



P.o. Box 29, Marsabit.

April 11, 2011.

Eng. Prof. B. N. K. Njoroge,
 Millenium Engineering Services Ltd,
 P.O. Box 64683 – 0602,
 Nairobi.
Kenya.

Our Ref: MCC/LND/5/17/I/86

Dear Sir,

REF: The County Council of Marsabit: Ref Minute No: 100/WTPM/2011 Special Town Planning 7 April 2011. Adopted by Special Full Council Held on 8 April 2011. Minute No. 32/MCC/2011(C)

Thank you for your letter dated March 1, 2011 whereby you seek authorization from the County Council of Marsabit to carry out studies, being survey and materials sampling amongst others on the following road sectors for the Kenyan Government road upgrade being undertaken by Lake Turkana Wind Power Project in order to receive their equipment to site situated in Marsabit district:

- Namarei – Illaut bypassing Ngurunit village on the D 371 (19 Kms)
- Illaut – Kargi/Marsabit via Arge village from the D 371 to E 671 / C 77 (58 Kms)
- Kargi/Marsabit road to the Kargi Junction on the E 671 / C77 (22 Kms)

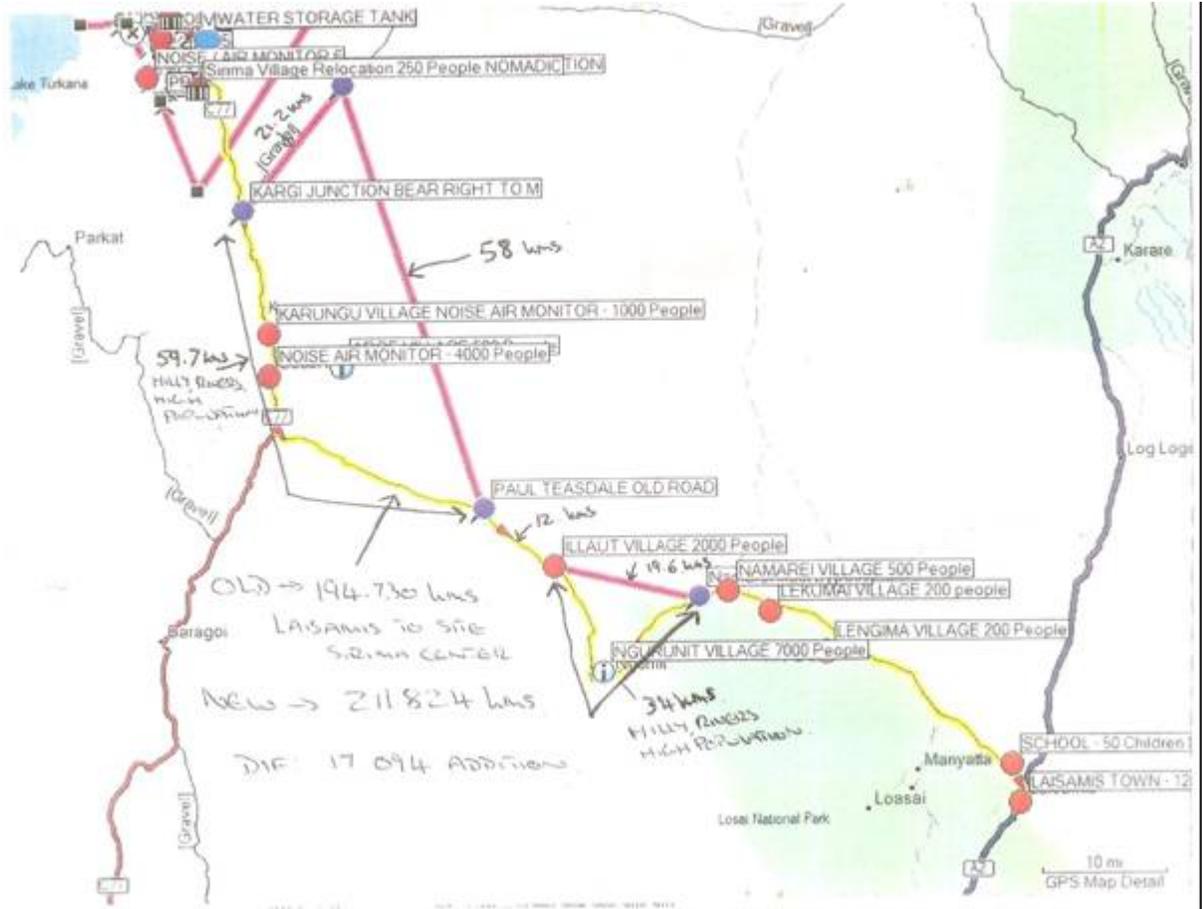
Therefore the County Council of Marsabit has no objection (Ref The County Council of Marsabit Minute Ref above) to your request and hereby grants Millenium Engineering Services Ltd, authorization to proceed on behalf of their client Lake Turkana Wind Power.

Yours faithfully,

Peter Muringi
 Town Clerk

CC: Lake Turkana Wind Power

Annex 2 Map of the Laisamis – Loiyangalani road showing the proposed Re-alignment



Key

- Yellow line shows the original route
- Pink line shows the sections proposed for re-alignment

Annex 3 Community Concerns at Namarei and Illaut Centres

Through the public consultation with communities along the road, community leaders and lead agencies the following were some of the key concerns arising and are similar as reported in the main report.

- ❖ **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 to avoid damage to these sensitive facilities
- ❖ **Cutting down of trees:** Kenya Forest Service expressed concerns on possibility of trees destruction which is used by some community like Rendille as water marker to indicate the presence of water. 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.
- ❖ **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. Also clearing of vegetation should be kept to a minimum at road upgrades and in the borrow pits.

Ultimately, the community support the improvement of the road since it will bring about numerous social economic benefits along the entire road re-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 specifically where the road passes adjacent to their locality considering their pastoralist nature of life. In so doing, this will go a long way in ensuring the smooth implementation of the project.

