

*Scoping Report and TOR for the Proposed Kisumu-Lessos-Olkaria  
Transmission Line Upgrading Project, July 2009*

project site except Kisumu District and Nandi District. In Kisumu and Nandi Districts, the enrolment rate for the primary school is around 50%, which is quite lower than these of the other districts ranging from 87.3% to 107%.

As for the enrolment rate for the secondary school, Kisumu and Nakuru Districts show higher rate ranging from 41% to 51% while the rest is between 21% and 29%.

**Table 11 Enrolment Rate & Literacy of the Project Site by District**

No.	District Name	Enrolment Rate	Literacy Rate
1	Kisumu District	Primary School: Male 51.0%; Female 49.0% Secondary School: Male 41%; Female 59%	Male 98% Female 75%
2	Nyando District	Primary School: Male 93.8 %; Female 91.3% Secondary School: Male 24%; Female 22.7%	Male 91.3% Female 77%
3	Nandi District	Primary School: Male 49.63 %; Female 50.37% Secondary School: Male 24%; Female 21%	Male 82.4% Female 68.4%
4	Kericho District	Primary School: Male 107 %; Female 104% Secondary School: Male 29%; Female 24%	Male 81% Female 64%
5	Uasin Gishu District	Primary School: Male 88 %; Female 90.5% Secondary School: Both 27.9%	Male 84.0% Female 77.3%
6	Baringo District	Primary School: Male 88.9 %; Female 94% Secondary School: Male 28%; Female 22%	Male 66% Female 55%
7	Nakuru/Naivasha District*	Primary School: Both 87.3% Secondary School: Both 52.0%	Both 71%

Note: \*Naivasha District is covered by the latest DDP of Nakuru District  
Source: District Development Plans 2002-2008

#### 4.0 PROPOSED PROJECT ACTIVITIES

Major activities of the proposed project are listed in the following table.

**Table 12 Project Activities by Stage**

No.	Activities
<b>Planning</b>	
1	Planning and Designing
2	Land Acquisition and Resettlement for the structures/ Wayleave Agreement for the RoW corridor
<b>Construction</b>	
3	Construction of storages & camps
4	Construct access roads
5	Construct transmission lines and transmission line bays
6	Decommissioning access roads
<b>Operation</b>	
7	Maintenance of the transmission lines

*Scoping Report and TOR for the Proposed Kisumu-Lessos-Olkaria  
Transmission Line Upgrading Project, July 2009*

## **5.0 PROJECT DESIGN ISSUES**

### **5.1 Environmental Provisions**

It's expected that the proposed by Kisumu-Lessos-Olkaria transmission line upgrading project will be passing through general ecosystems which need to be conserved. In case if there will be migratory patterns of birds and animals should be taken into consideration. Any solid waste that could be generated from the proposed project should be disposed in an environmentally sound way.

### **5.2 Health and Safety Considerations**

This is one of the crucial aspects of the transmission line design, particularly in regard to operations. The following considerations have been noted:

- The proposed transmission line is adjacent to residential, farming, grazing fields, game parks/reserves and forest areas and hence the transmission lines of 220kV and 132kV will be upgraded and they will not be exposed to the public (way-leave will be required), therefore less risk to public safety,
- The people who will be working or upgrading on the proposed transmission line are expected to wear protective clothing as it's a key requirement of KPLC,
- The generated faecal waste needs proper handling to prevent disease, for example diarrhoea, outbreak on the project site. The developer needs to come up with moveable toilets that could offer a quick solution so that this threat will be minimized,
- There is need for the project materials to be well inspected according to the occupational health and safety standards before being used during the construction of the project, and
- All waste materials will be collected and disposed off in an environmentally sound way.

*Scoping Report and TOR for the Proposed Kisumu-Lessos-Olkaria  
Transmission Line Upgrading Project, July 2009*

## 6.0 PUBLIC VIEWS ON THE PROPOSED PROJECT

The public views on the expected environmental and social impacts were collected by the questionnaire survey along the proposed project site between 17 - 21 July 2009. Fifteen (15) local residents along the proposed alignments responded and identified potential positive/negative impacts on environment and society. Overall, the proposed upgrading project for transmission line was considered to cause positive impacts on employment, landscape and economic development by respondents; however, displacement of structures, soil erosion and public safety were identified as concerned issues. Regarding the impact on natural environment, it was considered both positive and negative by respondents. It seems to be the impact was considered insignificant/problematic rather than positive by 7 respondents and negative by 6 respondents. The summary of the views is provided in the following table, and the questionnaire results are attached in Annex 2.

**Table 13 Summary of Public Views**

Positive Impacts	Positive	Negative	Remarks
Natural Environment	7	6	Not too much damage/loss of forests/trees
Land Acquisition	4	2	It must be consulted/agreed with land owners.
Displacement of Structures for Line Corridors and Service Road	4	10	Appropriate compensation shall be provided.
Employment	15	0	More jobs for young people are welcomed.
Economic Development	12	1	-
Socio-economic Change	10	1	-
Improved Access to Infrastructure	2	0	-
Landscape	13	0	Considered as development
Soil Erosion	6	7	-
Solid Waste Generation	2	0	-
Air Quality	4	0	-
Noise during Construction	10	0	No problem-
Public Safety	10	1	No problem/Climbing up the pylons needs to be prevented. Safety education to children. Provision of lighting arresters can be considered in Kericho
Others – Compensation	-	4	Appropriate compensation should be provided.

Source: Field Data

*Scoping Report and TOR for the Proposed Kisumu-Lessos-Olkaria  
Transmission Line Upgrading Project, July 2009*

## 7.0 POTENTIAL POSITIVE/ADVERSE IMPACTS FROM THE PROPOSED PROJECT

The upgrading of the transmission power line is expected to cause both positive/negative impacts on biophysical and socio-economic environment of the project area. The expected impacts during planning, construction and operation are summarised in the following table.

**Table 14 Summary of Potential Impacts of the Proposed Project**

Potential Positive/Negative Impacts	Remarks
<i>Positive Impacts</i>	
Economic Growth during Operation	The project enables the GoK to meet the increasing demand for power and will contribute to further economic development.
Employment Opportunity during Construction and Operation	The project will create employment opportunities for local residents directly and indirectly such as casual labours and more labour at the local market mainly during construction.
Improved Access to Infrastructure during Construction and Operation	Improved access/maintenance roads will benefit to the local residents and enhance transportation of people and goods during construction and operation.
<i>Negative Impacts</i>	
Impacts of Land Acquisition & Resettlement during Planning	Although the impact of land acquisition/resettlement is likely to minimal due to the feature of a linear project, some land acquisition and resettlement of structures in the transmission corridor is expected only when a small plot with a structure is affected.
Impacts on the Hell's Gate National Park during Construction and Operation	The project is likely to cause adverse impact on wildlife in/around the Hell's Gate National Park to some extent. However, since the geothermal power plants and transmission lines are already developed within the national park and most animal seems to live outside of the National Park according to KWS, it is expected relatively less significant.
Impacts on Forests during Construction and Operation	In the transmission corridors of Alternative 1 & 2, the plant density is relatively lower and scattered in most parts of the forests. However, there are some forests which are considered biodiversity hot spots such as Eastern Mau Forest, Eburru Forest, Mount Londiani Forest and south of Tinderet Forest, which should be studied in details by the full ESIA.
Impact on Soil Erosion during Construction and Operation	During construction and operation, the project is likely to cause soil erosion in the area traversed by the transmission line especially where vegetation cover is little or it is hilly.
Impacts on Landscape during Construction and Operation	During construction and operation, the project would cause adverse impact on landscape in/around the project site. Even though the assessment of landscape tends to depend on individual perception as shown in Section 6.0, the adverse impacts near tourist sites/scenic sites are considered significant (e.g. Hell's Gate National Park and Lake Naivasha in Naivasha District; Lake Nakuru National Park and Lake Elementeita in Nakuru District).
Archaeological, Cultural and Historical Sites during Construction	During construction, some adverse impact on archaeological and historical sites is expected as the project area especially along the Rift Valley Floor is considered rich in archaeological and historical sites.

*Scoping Report and TOR for the Proposed Kisumu-Lessos-Olkaria  
Transmission Line Upgrading Project, July 2009*

Potential Positive/Negative Impacts	Remarks
Noise/Vibration during Construction and Noise during Operation	During construction, noise and vibration are expected from construction vehicles and equipment. During operation, some noise is expected for the older transmission lines or the high-voltage transmission lines during periods of high humidity.
Health and Safety Impact during Construction and Operation	During operation, transmission of electrical energy through high voltage lines is likely cause potential risks/hazards to the workers and the population living next to the lines due to the high level of energized flowing in conductors.
Impact on Birds during Operation	During operation, the transmission line is likely to cause collisions of birds in flight to some extent.
Air Pollution during Construction	During construction, dusts and air pollutant emission is expected by construction vehicles and equipment.
Waste Generation during Construction	During construction, construction waste generation is expected.

*Scoping Report and TOR for the Proposed Kisumu-Lessos-Olkaria  
Transmission Line Upgrading Project, July 2009*

## 8.0 PROPOSED OUTLINE OF MITIGATION MEASURES & ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The development of the transmission power line is expected to cause both positive/negative impacts on biophysical and socio-economic environment of the project area as described in Section 7.0. To mitigate the identified impacts, the proposed outline of mitigation measures and Environmental Management Plan (EMP) are summarised in the following table. The further detailed mitigation measures, EMP and EMoP shall be prepared by the ESIA based on its detailed survey results.

**Table 15 Proposed Outlines of Mitigation Measures & EMP**

<b>Potential Positive/Negative Impacts</b>	<b>Proposed Outline of Mitigation Measures/EMP</b>
Impacts of Land Acquisition & Resettlement during Planning	<ul style="list-style-type: none"> <li>- Alternative consideration of the RoW (Alternative 1 &amp; 2)</li> <li>- Minor diversion of the RoW to minimise the impacts of resettlement</li> <li>- Appropriate compensation for land and resettlement at the replacement cost if any</li> </ul>
Impacts on the Hell's Gate National Park during Construction and Operation	<ul style="list-style-type: none"> <li>- Minor diversion of the RoW to minimise the disturbances in fauna &amp; flora in the National Park.</li> <li>- Appropriate planning to minimise unnecessary vegetation clearance including herbicide management</li> <li>- Provide environmental education to workers to prevent from poaching wildlife or cutting trees</li> </ul>
Impacts on Forests during Construction and Operation	<ul style="list-style-type: none"> <li>- Consideration of alternative alignment (Alternative 1 &amp; 2)</li> <li>- Minor diversion of the RoW to minimise the disturbances in fauna &amp; flora in forests.</li> <li>- Appropriate compensation (e.g. Conservation Fee) for compensation planting in consultation with relevant authorities such as KFS &amp; KWS.</li> <li>- Appropriate planning to minimise unnecessary vegetation clearance including herbicide management</li> <li>- Provide environmental education to workers to prevent from poaching wildlife or cutting trees</li> </ul>
Impact on Soil Erosion during Construction and Operation	<ul style="list-style-type: none"> <li>- Appropriate planning to minimise unnecessary excavations and vegetation clearance</li> <li>- Provision of vegetation (e.g. suitable sediment binding grasses)</li> <li>- Excavation and other earth works to be carried out during the dry season</li> <li>- Excess loose earth to be disposed/stabilised on site before the onset of the rains</li> <li>- Use of appropriately managed quarries and borrow pits</li> </ul>
Impacts on Landscape during Construction and Operation	<ul style="list-style-type: none"> <li>- Minor diversion of the RoW to minimise the impacts of landscape in the tourist/scenic sites by the field investigation.</li> <li>- Provision of fences during construction if necessary</li> </ul>
Archaeological, Cultural and Historical Sites during Construction	<ul style="list-style-type: none"> <li>- Minor diversion of the RoW to minimise the impacts of archaeological, cultural and historical sites by the field investigation.</li> </ul>
Noise/Vibration during Construction and Noise during Operation	<ul style="list-style-type: none"> <li>- Avoid night time construction</li> <li>- Machinery and vehicles will be well maintained to keep noise at minimum.</li> <li>- Appropriate maintenance of the transmission lines</li> </ul>

*Scoping Report and TOR for the Proposed Kisumu-Lessos-Olkaria  
Transmission Line Upgrading Project, July 2009*

Potential Positive/Negative Impacts	Proposed Outline of Mitigation Measures/EMP
Health and Safety Impact during Construction and Operation	<ul style="list-style-type: none"> <li>- Provision of health and safety education to workers and local residents</li> <li>- Provision of health and safety clothes and equipment to workers</li> <li>- Prohibit local residents from living in the transmission line corridor</li> <li>- All towers will be fitted with warning signs and anti-climbing devices.</li> </ul>
Impact on Birds during Operation	<ul style="list-style-type: none"> <li>- Provide a precautionary measure be taken near wetland and lake areas to reduce the risk for bird collision/electrocution, such as a use of reflectors placed at intervals</li> </ul>
Air Pollution during Construction	<ul style="list-style-type: none"> <li>- Sprinkling water during the construction work to minimise dust at construction sites near villages.</li> <li>- Vehicles delivering materials shall be covered to reduce spills and dust</li> </ul>
Waste Generation during Construction	<ul style="list-style-type: none"> <li>- Proper waste management plan shall be prepared.</li> </ul>

### 9.0 INFORMATION GAPS ANALYSIS

The scoping Report was prepared by the existing data and findings obtained during the site visits by environmental experts and relevant KPLC officers between/on 22-24 June, 5 July, 17-19 July and 21 July 2009. Most maps used for scoping were published in 1970's and 1980's, and the actual geographic information including land use shall be identified and updated by the ESIA in the field.

*Scoping Report and TOR for the Proposed Kisumu-Lessos-Olkaria  
Transmission Line Upgrading Project, July 2009*

**10.0 CONCLUSIONS/RECOMMENDATIONS**

This project has many social & economic benefits nationally since it will boost the country's economic growth and more stable access to electricity. However, potential for the project to cause adverse impacts on the local environment and society does exist. In order to realise maximum benefits from the project and safeguard the environment and local communities, careful consideration of the proposed project impacts on the environment and society should be undertaken and mitigation measures put in place. As such, the following recommendations are made:

- i. The significant issues/impacts identified in Section 7.0 should be studied and analysed further to determine their magnitude;
- ii. Appropriate mitigation measures to reduce/prevent impacts identified both for those considered significant and not significant should be identified in the proposed ESIA Study;
- iii. An appropriate monitoring plan for all the adverse impacts identified should be developed. Particularly, special attention shall be paid to the monitoring plan for soil erosion, vegetation clearing, accident & health and social issues such as resettlement if any. For this to be possible, the proposed ESIA Study should establish the existing baseline conditions for the parameters under investigation, frequency, budget and responsible organisations should be clearly indicated;
- iv. The study should also study any cumulative impacts of the project as well as the indirect impacts of project implementation; and
- v. If any resettlement is identified in the ESIA, an appropriate Resettlement Action Plan (RAP) for the project shall be prepared separately in consultation with the Client based on an adequate socio-economic survey as well as public consultation meetings as a part of the ESIA study.



*Scoping Report and TOR for the Proposed Kisumu-Lessos-Olkaria  
Transmission Line Upgrading Project, July 2009*

**REFERENCES**

- Republic of Kenya, 2002. 9<sup>th</sup> National Development Plan
- Republic of Kenya. 2007. Vision 2030
- Republic of Kenya. 1999. Environmental Management and Coordination Act
- Republic of Kenya. 2003. Environmental Management and Coordination Act (No. 8 of 1999): Environmental (Impact Assessment and Audit) Regulations.
- US Trade & Development Agency. 2003. Kenya Power Transmission Project Feasibility Study Preliminary Environmental Impact Assessment.
- Republic of Kenya. 2002. Kisumu District Development Plan 2002 -2008.
- Republic of Kenya. 2002. Nandi District Development Plan 2002 -2008.
- Republic of Kenya. 2002. Nyando District Development Plan 2002 -2008.
- Republic of Kenya. 2002. Kericho District Development Plan 2002 -2008.
- Republic of Kenya. 2002. Uasin Gishu District Development Plan 2002 -2008.
- Republic of Kenya. 2002. Baringo District Development Plan 2002 -2008.
- Republic of Kenya. 2002. Nakuru District Development Plan 2002 -2008.
- Nakuru Municipality. 2009. State of Environment Report, Nakuru.

*Scoping Report and TOR for the Proposed Kisumu-Lessos-Olkaria  
Transmission Line Upgrading Project, July 2009*

**ANNEX 1 – TERMS OF REFERENCE OF ESIA**