NEPAL ELECTRICITY AUTHORITY
Engineering Services

Environmental Management Action Plan
of
Khimti- Dhalkebar 220 kV T/L Project

Submitted to:
Khimti- Dhalkebar 220 kV T/L Project
Ramechhap, Manthali

Prepared and Submitted by:
Environmental and Social Studies Department
Adawait Marg, Kathmandu
Phone: 4-226730, 4-251845
Fax: 4 225248
Email: neaessd @ wlink.com.np

MARCH 2008
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1. BACKGROUND

Environmental Impact Assessment (EIA) report of the Khimti-Dhalkebar 220 kV Transmission Line (KDTL) Project, prepared by the Environmental and Social Studies Department (ESSD) was approved in June 2005 from the Ministry of Environment, Science and Technology. To comply with requirements laid down in the approved EIA report KDTL Project has requested ESSD to submit proposal for the Implementation of construction phase environmental mitigation, enhancement measures and monitoring program. The proposal submitted by the ESSD was approved by the Managing Director of NEA and an agreement was signed between the project and ESSD for the said work. This Environmental Management Action Plan is prepared as per the requirement of the contract agreement signed between ESSD and KDTL Project.

A preliminary Environmental Management Plan (EMP) was prepared as a part of EIA study. This chapter provides a general arrangement regarding the implementation of mitigation measures, monitoring, public concern issues and coordination of the work with different stakeholders. Since KDTL Project is under construction a comprehensive EMP is required by spelling out the responsibility of each stakeholder. As mentioned in EIA this plan is guiding document for proponent (NEA), Consultant, Contractor and line agencies such as Ministry of Environment, Science and Technology (MoEST), Ministry of Water Resources (MoWR), Ministry of Forest and Soil Conservation (MoFSC), Department of Electricity Development (DoED), Department of Forest (DoF) and District Forest Office (DFO).

The plan specifies what parties would be responsible for mitigation and how it will be coordinated with various line agencies, non-project participants and schedule. The monitoring component likewise defines the monitoring mechanism, reporting etc.

2. ENVIRONMENTAL MANAGEMENT APPROACH

The following approach for environmental management will be adopted during different phases of the project.

2.1 Pre Construction Phase

2.1.1 Activities

The pre construction phase activities mainly consist of land acquisition and compensation, relocation of houses, approval for the clearance of forest, public concern issues, and coordination with line agencies and update the baseline condition. Allocation of adequate budget for the implementation of mitigation and monitoring program,
preparation of contract clauses for incorporation in tender documents are the other activities to be conducted during the pre construction phase.

2.1.2 Management Plan

i) Project/NEA

KDTL Project will implement and manage the land acquisition, compensation, relocation of houses, approval of forest clearance, public concerns issues, coordination with line agencies, allocation of adequate budget and incorporation of contract clauses. As per Land Acquisition Act 2034 an officer was appointed by the Ministry of Water Resources and a committee was formed under chairmanship of the Chief District Officer of concerned districts.

ii) Ministry of Forest and Soil Conservation

Ministry of Forest and Soil Conservation will be responsible for the approval of forest clearance required for the project. NEA will make request along with copy of EIA report and details of the forest land required including the number of trees to be removed. After completion of check survey of alignment by the Contractor a detail estimation of trees to be felled will be conducted in coordination with District Forest Office of concerned district.

iii) Environmental and Social Studies Department

ESSD is one of the four departments of Engineering Services of NEA and executes all the activities related to identifying, conducting and coordinating environmental aspects of project developed by NEA in all stages such as studies, design, construction and operation.

Being the responsible department for environmental concerns ESSD assisted KDTL Project as required. As per contract signed with KDTL Project, ESSD will also prepare baseline monitoring report.

2.2 Construction Phase

The construction phase environmental management is rather critical and requires expertise and resources. The activities to be conducted during construction phase and management plan to implement the proposed activities are discussed below.

2.2.1 Activities

The major construction phase environmental activities are as follows:
2.2.1.1 Mitigation and Enhancement Program

The EIA study prepared for the project proposed several mitigation and enhancement program. The followings are the main program to be implemented during construction phase of the project. The mitigation measures mentioned below will be implemented by Nepal Electricity Authority, Contractor and Environmental and Social Studies Department. The detail of implementation mechanism for each program is discussed below.

I. Civil Contractor

The mitigation measures mentioned in section 1 shall be implemented by the Contractor. The contractor may take the services of local consultant for implementation of some of the programs. The mitigation measures and enhancement program mentioned in section -2 will be implemented by ESSD whereas project will be responsible for the mitigation measures falls under category -3.

Table- 1 Environmental Management Plan

<table>
<thead>
<tr>
<th>S.No</th>
<th>Mitigation Measures</th>
<th>Implementing Agency</th>
<th>Monitoring Agency</th>
<th>Agencies to be Consulted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mitigation Measures to be Implemented by Contractor</td>
<td>Contractor</td>
<td>KDTL -EMU</td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Use lower value production land and reclaim used site</td>
<td>Contractor</td>
<td>KDTL -EMU</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>Care should be taken to prevent spill of spoil material, cement slurry in near by water bodies.</td>
<td>Contractor</td>
<td>KDTL -EMU</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Implementation of tower protection works including construction of slope protection structures such as revetment wall, retaining structures and plantation of Napier, Ambio and other grasses.</td>
<td>Contractor</td>
<td>KDTL -EMU</td>
<td>District Soil Conservation Office</td>
</tr>
<tr>
<td>1.4</td>
<td>Separate storage of different type of waste, provision of incineration or safe disposal and sell of the few useful items.</td>
<td>Contractor</td>
<td>KDTL -EMU</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Minimize the forest clearance in gully and valleys</td>
<td>Contractor</td>
<td>KDTL -EMU</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>Cutting of Khair tree shall be avoided until it really hamper the construction work.</td>
<td>Contractor</td>
<td>KDTL -EMU</td>
<td>District Forest Office</td>
</tr>
<tr>
<td>1.7</td>
<td>Project workers must use kerosene oil or LP gas. Use of other material rather than wood shall be encouraged in temporary camps.</td>
<td>Contractor</td>
<td>KDTL -EMU</td>
<td></td>
</tr>
<tr>
<td>1.8</td>
<td>Construction work shall be labour based to the extent possible. Unnecessary disturbances shall be avoided.</td>
<td>Contractor</td>
<td>KDTL -EMU</td>
<td></td>
</tr>
<tr>
<td>1.9</td>
<td>Hunting and trapping by labour force should be prohibited</td>
<td>Contractor</td>
<td>KDTL -EMU</td>
<td></td>
</tr>
<tr>
<td>1.10</td>
<td>Provision of adequate caution and warning sign and safety equipments and device etc. Implement safety awareness program</td>
<td>Contractor</td>
<td>KDTL - EMU</td>
<td></td>
</tr>
<tr>
<td>1.11</td>
<td>Provide equal opportunity to all groups and gender of people</td>
<td>Contractor</td>
<td>KDTL - EMU</td>
<td></td>
</tr>
<tr>
<td>1.12</td>
<td>Temporary camp with adequate facilities shall be provided to labour force</td>
<td>Contractor</td>
<td>KDTL - EMU</td>
<td></td>
</tr>
<tr>
<td>1.13</td>
<td>A strong code of conduct for the labour force shall be enforced</td>
<td>Contractor</td>
<td>KDTL - EMU</td>
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</tr>
<tr>
<td>1.14</td>
<td>Placement of tower at centre of field shall be avoided</td>
<td>Contractor</td>
<td>KDTL - EMU</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Mitigation Measures to be Implemented by ESSD</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2.1</td>
<td>Compensatory Plantation Program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Plantation of 60000 seedlings of native affected species</td>
<td>ESSD/Local Consultant</td>
<td>KDTL EMU</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Non Timber Forest (NTFP) Product</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Implementation of non timber forest and agro forestry program</td>
<td>ESSD/Local Consultant</td>
<td>KDTL EMU</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Environmental and Social Awareness Program</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>a</td>
<td>Forest conservation awareness program (5 places)</td>
<td>ESSD/Local Consultant/ Local NGOs</td>
<td>KDTL EMU</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>Wildlife conservation awareness program (3 places)</td>
<td>ESSD/Local Consultant/ Local NGOs</td>
<td>KDTL EMU</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>Social awareness program (3 places)</td>
<td>ESSD/Local Consultant/ Local NGOs</td>
<td>KDTL - EMU</td>
<td></td>
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<tr>
<td>2.4</td>
<td>Community Support Program</td>
<td></td>
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</tr>
<tr>
<td>a</td>
<td>7 days cash crop training especially vegetable and junar (2 places)</td>
<td>ESSD/Local Consultant/ Local NGOs</td>
<td>KDTL - EMU</td>
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<tr>
<td>b</td>
<td>7 days community forest management training</td>
<td>ESSD/Local Consultant/ Local NGOs</td>
<td>KDTL - EMU</td>
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<tr>
<td>c</td>
<td>3 days Livestock training and program implementation</td>
<td>ESSD/Local Consultant/ Local NGOs</td>
<td>KDTL - EMU</td>
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<tr>
<td>2.5</td>
<td>Small Scale Community Assistance Program (Provisional sum)</td>
<td></td>
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<td></td>
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<tr>
<td>a</td>
<td>1 day improved stove training (5 places)</td>
<td>ESSD/Local Consultant/ Local NGOs</td>
<td>KDTL - EMU</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>1 day Health and sanitation training and improvement program (6 places)</td>
<td>ESSD/Local Consultant/ Local NGOs</td>
<td>KDTL - EMU</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>7 days income generation training</td>
<td>ESSD/Local Consultant/ Local NGOs</td>
<td>KDTL - EMU</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Mitigation Measures to be Implemented by Project/NEA</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3.1</td>
<td>Provide compensation at the rate fixed by the committee. Provision of land registration</td>
<td>Project/NEA</td>
<td>KDTL - EMU</td>
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<tr>
<td>3.2</td>
<td>Compensate the houses and school building at replacement cost. Provision of house rent for 4 months.</td>
<td>Project/NEA</td>
<td>KDTL - EMU</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>District Administration Office, Land Revenue and VDCs</td>
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<tr>
<td>3.3</td>
<td>Compensation cost shall be paid for any such area depending on the crop. People of the concerned land shall be informed in advance.</td>
<td>Project/NEA</td>
<td>KDTL EMU</td>
<td>VDCs</td>
</tr>
<tr>
<td>3.4</td>
<td>Herbicides shall not be used for vegetation clearance</td>
<td>Grid Operation Department</td>
<td>KDTL EMU, ESSD</td>
<td>District Forest Office, Forest Users Group</td>
</tr>
<tr>
<td>3.5</td>
<td>RoW shall be maintain as per electricity regulation</td>
<td>Grid Operation Department</td>
<td>ESSD/NEA</td>
<td>District Forest Office, Forest Users Group</td>
</tr>
<tr>
<td>3.6</td>
<td>Provide 10% compensation of the total land value to affected people for land falls in RoW.</td>
<td>Project/NEA</td>
<td>ESSD/NEA</td>
<td>VDCs/District Land Revenue Office</td>
</tr>
<tr>
<td>3.7</td>
<td>Implementation of awareness program and priority for local hiring in operation phase</td>
<td>Grid Operation Department</td>
<td>ESSD/NEA</td>
<td>VDCs/NGOs</td>
</tr>
<tr>
<td>3.8</td>
<td>Provide construction safety equipment. During maintenance, major area shall be restricted for unauthorized people.</td>
<td>Grid Operation Department</td>
<td>ESSD/NEA</td>
<td></td>
</tr>
</tbody>
</table>

II. Environmental and Social Studies Department

The mitigation measures mentioned below will be implemented by the Environmental and Social Studies Department. The ESSD may mobilize local consultant, relevant government organizations and non-government organization for the implementation of mitigation and enhancement program. ESSD will establish KDTL Environmental Management Unit for day to day environment management, coordination and supervision of the work. The office of the Unit will be located at Manthali of Ramechhap and Sindhuli Bazaar of Sindhuli district. The organization chart of KDTL – EMU is presented below.

**Nursery Establishment and Compensatory Plantation**

Since project cover a 74-km stretch of 5 districts altogether 10 plant nurseries will be established covering different stretch of the transmission line. The proper location of the nursery will be finalized in consultation with the concerned stakeholders. ESSD will operate and maintain all the nurseries throughout the project duration and few nurseries will be maintained during defect liability period.

As per approved EIA, approximately 600,000 trees need to be planted. Assuming mortality of 25% a total of 7,50,000 seedlings will be prepared. These trees will be planted in areas, which will be identified by the ESSD in due consultation with District Forest Office (DFO), Community Forest User Groups (CFUGs) and local people. Due
attention will be paid to plant local species, species affected by the project, preferred by the local communities and those species which contribute to the improvement of habitats for locally available birds and mammals. Plantation designs for each specific sites identified by the related community living in the area will be developed by the ESSD after consultation and interaction with the concerned stakeholders.

The ESSD will manage the plantation site for one year of project operation (Defect liability period). ESSD will develop a management plan for each plantation area with the cooperation of the DFO of the concerned districts and Forest Users Group. This management plan will have very clear description of the roles and responsibility for each stakeholder. After one year of operation a management plan including cost estimate for remaining 4 years operation will be prepared.

**Awareness for Forest Conservation**

This program will be implemented in five (5) places of the project area. Kirne, Manthali, Sindhuli, Gauribash and Dhalkebar are the proposed location for the program. However it will be finalized in due consultation with DFO, the local community and the community forest user groups. A total of 125 people will be covered under this program. The participants will be mostly from the affected households and forest users group of the community forest affected by the project. The duration of the program will be one day and 4 classes of 90 minutes each will be conducted. The trained person will be mobilized to create awareness in their respective community. Besides this video documentary will be shown at public places/local school to aware the local people. Hoarding board, poster and pamphlets will be developed for display at public places especially close to construction areas. The hording board and pamphlets will consist of conservation and informative slogans.
Awareness for Wildlife Conservation

Wildlife Conservation Awareness program will be implemented at Khurkote, Sindhuli and Beghadabar of the project area. A total of 75 people will be covered under this program. The participants will be mostly from the affected households and forest users group of the community forest affected by the project. The duration of the program will be one day and 4 classes of 90 minutes each will be conducted. The trained person will be mobilized to create awareness in their respective community.

Social Awareness Program

The social awareness program will be implemented at Manthali, Sindhuli and Tulashi Bahumara of the project area. A total of 75 people will be covered under this program. The participants will be mostly from the affected households. Lectures, slide shows, video documentary shows, pamphlets and posters distribution and display will be the modalities of the program. The duration of the program will be one day and 4 classes of 90 minutes each will be conducted.

NTFP Training and Agro-Forestry

In total 27 people will be trained from 27-community forest affected by the project. The detail of training program will be developed with due consideration of the needs of the local communities in consultation with DPO. The modalities of the training will be delivery of lecture by experts, visual shows, posters, reading material and discussion. A two days field observation program will also be conducted to give first hand knowledge to the participants. The duration of the program will be 7 days which include 5 days class. A total of 20 classes of 90 minutes each will be conducted in each training.

After implementation of training approximately 50,000 seedlings at the rate of 1500-2000 seedlings of NTF species will be planted in the cleared RoW in the area of each community forest.

Community Support Program

Cash crops Training: Cash crop training will be given to 50 people affected by the project. The training will be implemented at Sindhuli Bazar for the people of Dhanusha, Mahottari and Sindhuli districts and Manthali Bazar for the people of Ramechhap and Dolhka districts. The duration of the training will be of 7 days which include 5 days class and 2 days observation tour. A total of 20 classes of 90 minutes each will be conducted in each training.
Livestock Training: Livestock training will be given to 50 members of poor families especially the Dalit and vulnerable group affected by the project. The training will be implemented at Sindhuli Bazar for the people of Dhanusha, Mahottari and Sindhuli districts and Manthali Bazar for the people of Ramechhap and Dolakha districts. The duration of the training will be 3 days and 12 classes will be conducted.

Delivery of lecture, slide shows, distribution of reading material and group discussion will be the modalities of the program.

Community Forestry Training: Fifty people from the affected community forest will be trained for the record keeping, community forest management and wildlife habitat conservation. The training will be implemented at Sindhuli Bazar for the people of Dhanusha, Mahottari and Sindhuli districts and Manthali Bazar for the people of Ramechhap and Dolakha districts. The duration of the training will be 7 days which include 5 days class and 2 days observation tour. A total of 20 classes of 90 minuets each will be conducted in each training.

Delivery of lecture, slide shows, distribution of reading material and group discussion will be the modalities of the program.

III. KDTL Project/ NEA

As a proponent of this project Nepal Electricity Authority will be responsible for the mitigation measures mentioned in section 3. Compensation for land and house acquisition, room rent for relocated people and hiring priorities are the major program to be implemented by the project during construction phase. The operation phase programs which shall be implemented by NEA are avoidance of use of herbicides for vegetation clearance, RoW maintenance and availability of operation related safety equipments.

KDTL Environmental Management Unit will work for the monitoring of compliance issues and report to the Project Director. The Project Director will have authority to stop work fully or partially; delay in payment or other wise penalize contractors for of non-performance of tender clauses.

Small Scale Community Assistance Program

Health and Sanitation Program: This program will be implemented in city areas and camp locations. The program consist awareness with regards to health and sanitation,
cleanliness program and distribution of waste collection pot in key localities. The health and sanitation awareness program will be of one day and 4 classes of 90 minutes will be conducted. The program will be conducted at 6 sites especially in camp and city areas close to transmission line alignment. Kirne, Manthali, Sindhuli, Dhalkebar are the main locations proposed for the program implementation. A total of 150 people will be given health and sanitation awareness training. Solid waste collection container will be placed at key localities to collect waste. Local level committee will be formed and mobilized for waste management. Lectures, slide shows, video documentary shows, pamphlets and posters distribution and display will be the modalities of the program.

**Improved Stove Training:** Improved stove training will be conducted in 5 places of the project area to aware the local people about the importance of improved stove, saving of fire, impact on health and saving of time and money. A total of 250 people will be trained under this scheme. Improved stove will be given to each participant. The duration of the training will be one day. Manthali, Khurkote, Sindhuli, Bhiman, Dhalkebar are the sites proposed for this training.

**Income Generation Training:** This type of training will be given to 50 people from the project area. The training will be designed based on the best utilization of local resources and manpower. The duration of the training will be 7 days of which 5 days is class room training and 2 days observation tour. Delivery of lecture and reading materials to the participants will be the mode of training.

**IV. Consultant**

Besides construction supervision and management the Consultant will also responsible for the supervision of the contractor non compliances as per Tender Documents. The Consultant will also responsible for monitoring of mitigation program allocated under the contractor scope of work.

**V. Role of Different Stakeholders with Regards to Implementation of Mitigation Program**

**Ministry of Forest and Soil Conservation**

The ministry will play vital role for the marking of the trees to be felled and management of felled trees through its district level offices. The ministry will also be responsible for the technical assistance for the implementation of Reforestation Program.
and NTFP Program through its district level offices. The ministry may monitor the forest related impacts and mitigation measures conducted by the project.

**Central Line Agencies**

Besides the central level line agencies such as Ministry of Water Resources, Department of Electricity Development and Ministry of Environment, Science and Technology shall have responsibility for the monitoring of project activities with regards to Environmental Management, Mitigation and Monitoring Plan. The central level line agencies may coordinate with Environmental and Social Studies Department with regard to implementation of project EMP.

**District Line Agencies**

The district level line agencies such as District Forest Offices and District Soil Conservation Offices will be consulted during implementation of mitigation measures. The cost for the required technical input for the implementation of program will be born by the ESSD. District Development Committee and District Administration Office have vital role for smooth implementation of the project.

2.2.1.2 Environmental monitoring

I. Baseline Monitoring

**Monitoring Parameters**

Baseline monitoring will be conducted to update the baseline condition of the project area prior to implementation of the project. The following parameters will be covered:

- Changes in route alignment
- Changes in land use pattern
- Changes in forest/vegetation pattern
- Changes in number of community forest
- Wildlife habitat and occurrence
- Increase in settlements/infrastructure
- Population structure and migration
- Law and order
- Socioeconomic condition of PAFs
Method of Implementation

Site observation by the expert, discussion with local people & VDC representative and review of progress report submitted by the Contractor and other relevant literature will be used for baseline update. Household survey will be conducted to update the baseline condition of the Project Affected Families (PAFs).

II. Impact Monitoring

Impact monitoring will be conducted to assess actual level of impact. The impact monitoring includes physical, biological and socioeconomic & cultural environment of the area, accuracy of the predicted impacts and effectiveness of mitigation measures. The following parameters are proposed for impact monitoring.

- Degree of slopes, stability of slopes, changes from the baseline
- Unpleasant odor and visual impact
- Number of trees removed
- Occurrence of wildlife species
- Types of disease and incidence of disease in the project workers and local community
- Acquisition of land, lease of land and temporary disturbances in land
- Relocation of house, compensation, use of construction material etc
- Actual damage to standing crop or loss of cropping season for the particular area
- Likely disturbance in traditional cultural ways
- Local employment, rental, sell of consumable goods
- Chemical and bacteriological parameters such as E. Coli
- Occupational safety
- Income and expenditure pattern
- Social and cultural integration

Modus Operandi

Impact monitoring will be conducted by Environmental and Social Studies Department. Household survey using structured questionnaire, key informant survey with the help of checklist, field observation by experts, measurement and counting of tree loss, meeting and discussion with concerned stakeholders and cross checking the list of compensation are the methods proposed for impact monitoring. Monitoring format will be developed for physical, biological and socioeconomic and cultural environment and filled periodically. The experts will visit periodically to collect necessary information and
services of support staff and local enumerator will be taken for impact monitoring. Quarterly visit of professional such as team leader, civil engineer, environmental engineer, electrical engineer and economist will be conducted to collect site specific information.

III. Compliance Monitoring

The compliance monitoring will be conducted to monitor the compliance of the tender clause, implementation of mitigation measures and monitoring activities and allocation of adequate budget for the implementation of environmental management plan. The tender clauses included in tender documents and contract agreement is given in Annex-1.

The compliance monitoring will mainly focus on;

- Integration of the report as a part of project administration
- Allocation of adequate budget for the implementation of the environmental mitigation measures and monitoring works
- Priority of employment
- First Aid
- Loss of life and disability
- Occupational safety

Mode of Implementation

Environmental monitors will be deployed at Sindhuli and Ramechhap site offices for day to day monitoring work. The Sociologist, site in charge of KDTL EMU will be responsible for the implementation of compliance monitoring. Format for compliance monitoring has been developed. The monitor will fill daily environmental log at each site showing the work conducted for each day. The monitor will also fill advisory form for each site showing the area of non compliance referring the contract clauses. If contractor does not improve the non compliances after advisory a non compliance incidence report will be prepared which shall be signed by the KDTL Unit chief, representative of Contractor, and Project for documentary evidences. After preparation of non compliance report the issue of non compliance will be formally send to Contractor by letter of Consultant or Project Manager. The format of compliance monitoring is presented in Annex-2.
2.3 Operation and Maintenance Phase

2.3.1 Activities

The operation and maintenance phase activities include operation of the transmission line, regular maintenance, safety issues, implementation of operational phase biophysical and socioeconomic mitigation programs monitoring and audit. As per the Procedural Guideline for the Use of Forest Land 2063 the plantation site shall be managed by the proponent for five years or required cost for such management must be paid to Department of Forest.

2.3.2 Management

i) Grid Operation Department

Grid Operation Department of NEA will be responsible for this phase management. Director of this department will be responsible for the execution of work with regards to biophysical and socioeconomic and cultural environment.

ii) Environmental and Social Studies Department/Local Consultant

ESSD shall take responsibility for the operation phase environment management for the first one year of project. ESSD will develop a management plan for each plantation area in consultation with concerned DFO and Forest Users Groups. This management plan will have very clear description of the roles and responsibility of each stakeholder. After one year of operation a management plan including cost estimate for remaining 4 years operation will be prepared.

iii) Ministry of Environment, Science and Technology

MoEST will be responsible for the impact audit of the proposed project after two years of project implementation as per EPR 97.

iv) Community Forest Users Group

Community Forest users group of the affected community forest will be made responsible for the management of plantation sites for 4 years. The cost required for such management will be paid by the project.
v) District Forest Office

The compensatory plantation site for government forest will managed by District Forest Office of the concerned district. The cost for such management will be paid by proponent to concerned District Forest Office as per management plan.

3. Procedure For Grievance Redress

The Project will create a Grievance Redress Committee to address complaints and grievances pertaining to resettlement and social development and to pre-empt all disagreements being referred to the court.

The committee will involve administrative officer from the Project, representative of local government bodies and representative of local affected persons nominated by them. Administrative officer will act as member secretary. The committee will adopt an internal working procedure for grievance handling which should be endorsed by Project Manager.

4. Manpower

As mitigation and monitoring work requires different personnel for specific tasks the following interdisciplinary team will be deployed for the proposed work. The experts will be responsible for the implementation of mitigation measures, compliance and impact monitoring. The tasks will be coordination by Team Leader. A Sociologist along with 2 environmental monitor and support staff will be fully stationed at site and other expert will visit periodically. Besides this forest technician and nursery supervisors will be the site based staff responsible for implementation of mitigation program. The following manpower will be involved for the environmental management of the proposed project.

- Project Coordinator
- Team Leader
- Environmental Expert
- Civil/ Environmental Engineer
- Electrical Engineer
- Economist
- Sociologist
- Database Expert
- Forest Specialist
- Wildlife Expert
- Forest Technician
- Nursery Supervisor
- Monitors
- Support Staff
5. ACTION PLAN

The environment management work was started from 13th December 2007 and will be continued for 30 months. The detail work schedule for environmental mitigation and monitoring work to be implemented by ESSD is presented in Fig-2. The mitigation work proposed to be implemented by the Contractor will be implemented as per the Contractor Work Plan for project construction. The pre-construction and construction phase mitigation work proposed to be implemented by NEA are already started.

6. REPORTS AND DELIVERABLE

The project Environment Management Unit will be responsible for the preparation of report. The unit will prepare following reports.

6.1 Baseline Monitoring Report

This report includes the changes in baseline situation and site condition prior to start of major construction work. The major environmental changes due to changes in route alignment will also documented in baseline monitoring report. Two copies of baseline monitoring report will be prepared by ESSD.

6.2 Construction Phase Environmental Report

The construction phase environmental report will be prepared on quarterly basis and annual environmental report will be prepared at the end of each calendar year. A completion report will be prepared after the completion of the construction work. Environmental Unit of the project will be responsible for the preparation of report. The monitoring report will be concise and limited to significant environmental issues. The following number of reports will be prepared and submitted to Project.

- Quarterly monitoring report (1-6 quarter): 30 Copies (5 in each)
- Annual report: 6 Copies (2 each)
- Completion report: 2 Copies
# Khimti- Dhalkebar 220 kV Transmission Line Project
## Environmental Mitigation and Monitoring Program
### Work Schedule

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Activities</th>
<th>Schedule in Months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>1</td>
<td>Site selection and establishment of Plant Nursery</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Social awareness program</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Health and sanitation awareness</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Forest conservation awareness program</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Wildlife conservation awareness program</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>NTEP and agro forestry training</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cash crop training especially vegetable and Junar</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Community forest management training</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Livestock training</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Improved stove training</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Income generation training</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Plantation of saplings</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Environmental Monitoring</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Environmental Report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environmental Management Action Plan Report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Baseline monitoring report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quarterly monitoring report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual report</td>
<td></td>
</tr>
</tbody>
</table>
The report will be distributed to Ministry of Environment, Science and Technology, Ministry of Water Resources, Ministry of Forest and Soil Conservation and World Bank. Project Manager will be responsible for distribution of report to above mentioned organizations.

6. 3 Operation and Maintenance Phase Environmental Report

Operation and maintenance phase environmental report will be prepared for the first one year following the construction. KDTL -EMU will have principle responsibility for the preparation of environmental report. The report will describe mitigation measures, problems and recommend solutions. The report shall clearly identify where operational mitigation measures are not being met or where mitigation efforts are inadequate to protect natural and socioeconomic resources. Unanticipated deleterious impacts of the projects shall be clearly identified. Measures to solve problem shall be proposed and be funded under the project annual operating budget. The environmental audit report will be prepared by MoEST as per EPR 97.

7. ENVIRONMENTAL MANAGEMENT COST

The total estimated environmental management cost for the proposed project is 40.39 million NRs. which is 2.44 % the total project cost. This cost is estimated for the implementation of mitigation program and environmental monitoring during pre -construction, construction and operation phases of the project. An agreement has been made between Project and ESSD for the implementation of mitigation and monitoring program. The Project will pay NRs 36 million for the said work. This cost excludes compensation cost of land and houses and mitigation program to be implemented by the Contractor and Project.
Annex-1: Organization chart of KDTL - EMU
<table>
<thead>
<tr>
<th>Environment Category</th>
<th>Contract Clause</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Environmental Mitigation Measures</td>
<td>1</td>
<td>Discharge of cement slurry, garbage and other solid wastes generated by the construction activities and workforce should be avoided where possible</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Chemical and other hazardous material should be dumped safely far away from the water bodies.</td>
</tr>
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<td></td>
<td>3</td>
<td>Disposal material should be carried out in the appropriate places. The waste materials shall be minimized to avoid for separate land for disposal</td>
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<tr>
<td>2.2 Biological</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>2.3 Socioeconomic and Cultural</td>
<td>a</td>
<td>Control of adverse socio interactions between local communities and construction workforce</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>Awareness program regarding health and safety of transmission line</td>
</tr>
<tr>
<td></td>
<td>c</td>
<td>Awareness program for workforce</td>
</tr>
<tr>
<td></td>
<td>d</td>
<td>Insurance against health and safety</td>
</tr>
<tr>
<td>2.4 Employment</td>
<td>a</td>
<td>The job preference shall be given to local project affected family people.</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>The Contractor shall provide and employ on the site in the installation of the facilities such as skilled, semiskilled and unskilled labour as it necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labour that has necessary skills.</td>
</tr>
<tr>
<td></td>
<td>c</td>
<td>Unless otherwise provided in the Contract, the Contractor shall be responsible for the recruitment, transportation, accommodation and catering of all labour, local or expatriates required for the execution of the Contract and for all payments in connection therewith.</td>
</tr>
<tr>
<td></td>
<td>d</td>
<td>The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, ritually or disorderly conduct or behavior by or amongst its employees and the labour of its Subcontractors.</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td>The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, ritually or disorderly conduct or behavior by or amongst its employees and the labour of its Subcontractors.</td>
</tr>
<tr>
<td></td>
<td>f</td>
<td>The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, ritually or disorderly conduct or behavior by or amongst its employees and the labour of its Subcontractors.</td>
</tr>
<tr>
<td>22.2.2, Contractors Equipment</td>
<td></td>
<td>Unless otherwise specified in the Contract, upon completion of the facilities, the Contractor shall remove from the site all employment brought by the Contractor onto the site and any surplus materials remaining thereon.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Employer and the Contractor shall establish site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The Contractor shall prepare and submit to the Employer with a copy to the Project Manager, proposed site regulations for the Employer approval, which approval shall not be unreasonably withheld.</td>
</tr>
<tr>
<td>22.6 Site Clearance</td>
<td>22.6.1</td>
<td>Site Clearance in Course of Performance: In the course of carrying out the Contract, the Contractor shall keep the site reasonably free from all unnecessary obstruction store or remove any surplus materials, clear away any wreckage, rubbish, or temporary works from the site and remove any Contractors Equipment no longer required for execution of the Contract.</td>
</tr>
<tr>
<td></td>
<td>22.6.2</td>
<td>Cleanliness of Site after Completion: After completion of all parts of the facilities, the Contractor shall clear away and remove all wreckage, rubbish and debris of any kind from the site and shall leave the site and facilities clean and safe.</td>
</tr>
<tr>
<td>22.7 Watching and Lighting</td>
<td></td>
<td>The Contractor shall provide and maintain at its own expenses all lighting, fencing and watching when and where necessary for the proper execution and protection of the facilities or for the safety of the owners and occupiers of adjacent property and for the safety of the public.</td>
</tr>
<tr>
<td>22.8 Work at Night and on Holidays</td>
<td>22.8.1</td>
<td>Unless otherwise provided in the Contract, no work shall be carried out during the night and on public holidays of the country where the site is located without prior written consent of the Employer, except where work is necessary or required to ensure safety of the facilities or for the protection of life or to prevent loss or damage to property when the Contractor shall immediately advise the Project Manager, provided that provisions of this GCC sub-Clause 22.8.1 shall not apply to any work which is customarily carried out by rotary or double shifts.</td>
</tr>
<tr>
<td></td>
<td>22.8.2</td>
<td>Notwithstanding GCC sub-Clauses 22.8.1 or 22.1.3, if and when the Contractor consider it necessary to carry out work at night or on public holidays so as to meet the time for completion and request the Employers consent thereto, the Employer shall not unreasonably withhold such consent.</td>
</tr>
</tbody>
</table>
Annex-2: Schedule for implementation of environmental mitigation and monitoring works
KHIMTI DHALKEBAR 220 kV TL PROJECT
KHIMTI DHALKEBAR ENVIRONMENT MANAGEMENT UNIT
ENVIRONMENTAL MONITORING LOG

<table>
<thead>
<tr>
<th>TIME</th>
<th>ACTIVITY</th>
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<tbody>
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</tbody>
</table>

Signature

Environmental and Social Studies Department, NELA, Kathmandu, Nepal (Phone: 01-4226780, 4-251845 Fax: 01-4232248)
KHIMTI DHALKEBAR 220 kV TL PROJECT
KHIMTI DHALKEBAR ENVIRONMENT MANAGEMENT UNIT
ENVIRONMENTAL COMPLIANCE
ADVISORY

DATE:____________________

LOCATION(s):__________________________________________________________

SPECIFIC SITE:________________________________________________________________

APPLICABLE ENVIRONMENT CLAUSES:


COMPLIANCE MONITOR:
Name____________________ Signature____________________ Date______________

SITE OFFICER OF ENVIRONMENT MANAGEMENT UNIT:
Name____________________ Signature____________________ Date______________

CONSULTANT ENGINEER ACKNOWLEDGEMENT:
Name____________________ Signature____________________ Date______________

Environmental and Social Studies Department, NEA, Kathmandu, Nepal (Phone: 01-4220770, 4237445 Fax: 01-4225988)
KHIMTI DHALKEBAR 220 kV TL PROJECT
KHIMTI DHALKEBAR ENVIRONMENT MANAGEMENT UNIT
ENVIRONMENTAL NON COMPLIANCE INCIDENT REPORT

DATE: ____________________________

LOCATION (s): ____________________________________________________________

SPECIFIC SITE: __________________________________________________________

ACTIVITY CAUSING NON-COMPLIANCE: ______________________________________

DESCRIPTION OF INCIDENT: ________________________________________________

APPLICABLE ENVIRONMENT CLAUSES: _________________________________________

RECOMMENDATION FOR COMPLIANCE AND REMEDIAL ACTION: __________________

PHOTO DOCUMENTATION

COMPLIANCE MONITOR:
Name: ___________________________________________________ Signature: ____________ Date: _______________

SITE OFFICER OF ENVIRONMENT MANAGEMENT UNIT:
Name: ___________________________________________________ Signature: ____________ Date: _______________

NEA REPRESENTATIVE:
Name: ___________________________________________________ Signature: ____________ Date: _______________

CONTRACTOR ENGINEER RECEIPT:
Name: ___________________________________________________ Signature: ____________ Date: _______________

Enviromental and Social Studies Department, NEA, Kathmandu Nepal (Phone: 01-4226750, 4-251843 Fax: 01-425248)