

Environmental Monitoring Report

Semi-Annual Report

Loan/Grant Number: L2808 NEP/G0270 NEP/G0271 NEP
September 2018

Nepal: Electricity Transmission Expansion & Supply Improvement Project

Prepared by the Government of Nepal for the Asian Development Bank.

This environmental Monitoring Report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the "terms of use" section of this website.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

Nepal Electricity Authority

Environmental Monitoring Report: January-June



NEP: Electricity Transmission Expansion and Supply Improvement Project

ABD Loan: 2808 NEP

ABD Loan: 2808 NEP

ELECTRICITY TRANSMISSION EXPANSION AND SUPPLY IMPROVEMENT PROJECT

Semi Annual Environmental Monitoring Report

Submitted To

ASIAN DEVELOPMENT BANK & NEPAL ELECTRICITY AUTHORITY

August 2018

Notes:

The fiscal year FY of the Government of Nepal (GoN) and its agencies ends on July 16. FY before calendar year denotes the year in which fiscal year ends, e.g., FY July 17, 2018.

Currency Equivalents

30 August 2018

Currency Unit	-	Nepalese Rupees (NPR)
	NPR. 1.00	- \$ 0.009
	US \$ 1.00	- NPR 112.65 ¹

ABBREVIATIONS

ADB	Asian Development Bank
ADF	Asian Development Fund
CFUG	Community Forest User Group
DDR	Due Diligence Report
DFO	District Forest Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESMU	Environmental Safeguards Management Unit
ETESIP	Electricity Transmission Expansion and Supply Improvement Project
GIS	Gas Insulated Substation
GoN	Government of Nepal
GWh	Giga Watt Hour
IEE	Initial Environmental Examination
Km	Kilometer
MOE	Ministry of Energy
MOF	Ministry of Finance
MoFE	Ministry of Forest and Environment
MVA	Mega Volt Ampere
MW	Mega Watt
NEA	Nepal Electricity Authority
PPE	Personal Protective Equipment
RoW	Right of Way
SPS	Safeguard Policy Statement 2009 (SPS)
S/S	Substation
TL	Transmission Line
V	Volt

¹ <http://www.nrb.org.np/>

Note: In this Report \$ refers to US dollars

1. Background	6
2. Overall Progress Status	7
2.1 Compliance Status with Applicable Statutory Requirements	9
3. Reporting Period	10
4. Environmental Safeguards	10
5. Construction Approach	11
6. Compliance Status with Environmental Covenants	11
7. Institutional Arrangement	11
8. Compliance with Environmental Safeguards Measures	11
3.1 Surveys and Approval	12
4.1 Inclusion of Environmental Issues in Contract Documents	12
5.1 Material Storage Yards and Workshop	13
6.1 Spoil Management	13
7.1 Workers Camp Setup	13
8.1 Awareness Training	13
9.1 Landslide Protection and Bioengineering	13
10.1 Drainage Management	14
11.1 Compensatory Plantation	14
12.1 Firewood Use	14
13.1 Safety Gear	14
14.1 Labor Issue (Workers Camp, Health and Sanitary Facilities)	14
15.1 Number of Grievances (documented, resolved and under processing)	14
9. Issues and Way Forward	15
Appendix I	26
Appendix II	29

1. Background

Electricity Transmission Expansion and Supply Improvement Project (ETESIP) is a \$ 128 million project with 44% loan and 34% Grant while a \$ 2 million of capacity development assistance is approved by ADB (Table 1). These figures have been proposed with the objective of improvement of electricity supply capacity. The ETESIP comprises of three major components:

- Transmission Line
- Distribution System
- Rehabilitation of hydropower stations

Table 1: Details on Funds

Fund Provider	Amount in million USD	Fund Type
Asian Development Fund (ADF)	56	loan
ADF	19	grant
Government of Norway	25	grant
NEA and GoN	28	
Capacity Development Assistance	2	

This project was approved on 15th November 2011 with the completion time on 30th June 2017 and loan closing is on 31st December 2017. However, the closing date has been extended to 31st March 2020 with some changes and adjustments on the scope of the TL while the GIS substations have been merged with another project Power Transmission and Distribution Efficiency Enhancement Project (PTDEEP). The project components include a) Tamakoshi Kathmandu 220/400kV TL (sub categorized to New-Khimti Barhabise section and Barhabise Kathmandu section of the TL), b) Rehabilitation of 640kV Sundarijal Hydro Power Project (HPP), Rehabilitation of 1MW Tinau HPP, c) Augmentation of Distribution Services (East) this includes Jare, Gaur, Nijgadh, Chandraghadhi, and Belbari, d) Augmentation of Distribution Services (West) includes Parasi, Amuwa, Taulihawa, Krishnanagar, Gorkha, Mirmi and Gaddachowki, e) Expansion of Chapali Substation, Kohalpur-Mahendranagar 132kV second circuit (sub categorized as second circuit stringing and substations) and f) Upgradation of distribution lines at Kathmandu, Bhaktapur, Kavrepalanchok, Sindhupalchowk, Dolakha, Sindhuli and Ramechhap Districts (Figure 1).

The current assessments indicate the project meeting its targets is entitled for successful implementation. Of the two Power Transmission Line Components, Khimti-Kathmandu Transmission Line construction is in its initial phase. The, Initial Environmental Examination (IEE) has been prepared in abidance with ADB Safeguard Policy Statement 2009. This is in compliance with following its category B designation.

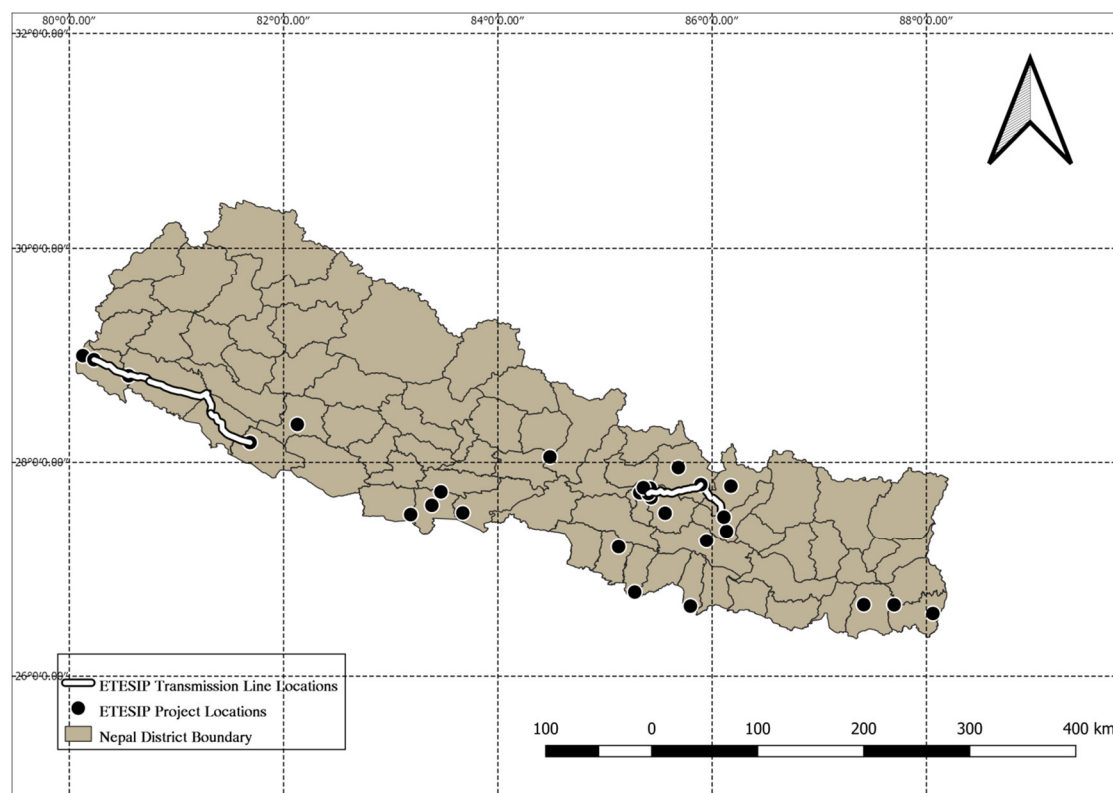


Figure 1: Project Locations

2. Overall Progress Status

The details of project progress are summarized in Table 2.

Table 2: Overall Project Progress, Milestones and Completion Schedules

S N	Name of the Project	Project Details	Progress as of August 18	Completion Schedule
1	Tamakoshi Kathmandu 220/400kV TL			
a	New-Khimti Barhabise section	Construction of double circuit 220/400kV Line from New Khimti of Ramechhap District to Barhabise of Sindhupalchowk District	i. Contract Awarded on Sept 26th 2016 ii. Route Alignment Finalized waiting for check survey	26 May 2019
b	Barhabise Kathmandu section	Construction of double circuit 220/400kV Line from Barhabise to Changuarayan of Bhaktapur District	i. Contract Awarded on June 13th 2017 ii. Check survey under progress iii. Enumeration of Trees to be cut completed in	9 April 2020

S N	Name of the Project	Project Details	Progress as of August 18	Completion Schedule
			Sindhupalchowk District and has been initiated in Kavrepalanchowk, Kathmandu and Bhaktapur Districts	
2	Kohalpur Mahendranagar 132kV TL second circuit stringing	191km of second circuit stringing on existing TL and construction of substations at Bhurigaun, of Bardiya District and Phalmanpur of Kailali District	Project Complete	
3	Rehabilitation of Sundarijal HPP	640kV Hydropower Rehabilitation within the existing area	90m of access road is to be upgraded	6 months Projection ²
4	Rehabilitation of Tinau HPP	1MW HPP rehabilitation	The project has been removed from the ETESIP scope	
5	Chapali Substation	Expansion of Chapali Substation	Project Complete	
6	Augmentation of Distribution Services (East)	Upgradation of 33/11kV substations at Jhapa District for Chadragadhi and Damak (Buluchowk), Morang District for Belbari, Mahottari District for Jalesjwor, Rautahat District for Gaur and Bara District for Nijgad	Project Complete	
7	Augmentation of Distribution Services (West)	Upgradation of 33/11kV at 8 substations	i. Substation at Nawalparasi District for Parasi, Rupandehi District for Amuwa, Kapilvastu District for Taulihawa and Krishnanagar, Gorkha District, Kanchanpur District for Gaddachauki and Salyan District for Jare has been charged since	

² Mentioned time frame is subject to change in case issue with local during upgradation of access road arises or other issues causes delay.

S N	Name of the Project	Project Details	Progress as of August 18	Completion Schedule
			September of 2018. ii. Substation at Syangja District for Mirmi nonperformance of contractor has caused transfer of the project to second package of ADB	
8	Upgradation of Distribution Lines	Upgradation of Distribution Lines in earthquake effected areas of Kathmandu, Bhaktapur, Kavrepalanchowk, Sindhupalchowk, Dolakha, Sindhuli and Ramechaap Districts	Project Complete except some maintenance work on road	

2.1 Compliance Status with Applicable Statutory Requirements

Table 3: Regulatory Compliance Requirements

SN	Legal Requirements	Applicable Attributes	Project's Compliance Status
1	Forest Act 1993	This act is applicable when a project requires a national forest area. Prior Approval has to be received before the construction of the project. In addition to this it provides insights on prohibitive activities	Approval process for uprooting of project affected trees is in initial stage and consultation with CFUG is ongoing.
2	Plant Protection Act 1973	This act lists protected plant species name which needs to be protected during any intervention work in forest areas	Approval process for uprooting of project affected trees is in initial stage and consultation with CFUG is ongoing.
3	Forest Rules 1995	Government has enlisted 13 plant species in protection list of which it has banned felling, transportation and export of three species	Approval process for uprooting of project affected trees is in initial stage and consultation with CFUG is ongoing.
4	Environmental Protection Act 1997	This Act provides details of compensation in section 17 of the act in case of not abiding by the rules of the acts. Also it directs a compensatory ratio of 1:25 for trees to be felled	Approval process in consultation with CFUG for forest clearance permission

3. Reporting Period

The semi-annual environmental safeguard compliance monitoring report is prepared for duration from January to June of 2018.

4. Environmental Safeguards

The environmental assessment with mitigation, corrective and compensatory measures for the proposed development interventions is a chief component in ensuring minimal adverse environmental impacts.

The transmission line projects are screened to be of Category B. However, only Khimti-Kathmandu 220/400kV TL (Transmission Line) has IEE with approval from ADB and GoN through the in line ministry.

Kohalpur Mahendranagar 132kV second stringing: The second stringing of the 191km line with substations is complete.

Khimti Kathmandu TL Line: This transmission line will avoid any environmentally sensitive sites. A section approximately 16km that is to pass through forest areas of Chanrawati Watershed (area set aside for carbon sequestration pilot site) although not a legally protected area has been proposed for offsetting the RoW clearance. The work for the transmission line is in progress where Contractors have been mobilized and Environment and Social Management Unit (ESMU) are already in their respective site office at Charikot as well as Barhabise (for the New Khimti-Barhabise section as Package I and Barhabise-Kathmandu section as Package II. For Package I Social and Environmental Monitoring teams are in site while for the package II recruitment of the team is in process site office has been identified for Charikot and Barhabise. The enumeration of trees for Package I of the transmission line is complete and forest clearance permission from Community Forest User Groups has been complete. While for package II the process has been initiated. Various stages of completion for package I and II are provided in table 6 and 7.

Distribution System: Altogether 9,000 domestic consumers were to be connected within 2017 in the project area. In the eastern part 48.6MVA substations augmentation has ensured completion of distribution services likewise at the western site it is mostly complete. Moreover, 100% of poling and 100% of stringing works have been completed. In both the eastern and western areas NEA land is adequate for rehabilitation works. No major environmental issues are observed for these lines. Similarly, for rebuilding of 11kV feeders, relevant low-voltage networks, and associated facilities in pilot areas all components have been completed except for Mirmire which is behind schedule following earlier nonperformance of the contractor and recently additional scope of work since March 2018. The work in Mirmire is in progress.

Rehabilitation of Hydropower stations: Major environmental issues realized have been community health and safety issues while decommissioning of the equipment as well as materials. These have been assured to be either reused or disposed in compliance with national and international norms. This has resulted in 1.14MW of additional generation capacity providing 4GWh of energy. On one hand Bidding for Tinau Hydro was in progress but the project has

stopped and Government of Nepal has taken the project where its location in Chure Conservation Area (required permission sought by Ministry of Forest and Environment) has triggered an EIA study for the project. On the other hand Sundarijal Hydro Power Contract has been awarded and tender for upgrading access road is under process. The project also supports the used discharge for drinking water supply. Rehabilitation equipment for the Hydropower (includes a store building of 10.2X6.15 m plinth area) has already arrived and is currently stored in NEA Office (Appendix I Figure 3) in Kharipati which will be transferred to the project site once the access road is constructed. A For both the hydro projects NEA premises are adequate for repair and replacements.

Chapali Expansion: All the electrical works including the charging of Chapali-Balaju Transmission Line complete.

5. Construction Approach

ETESIP applies construction approach to reduce adverse environmental effects, cost and promote local jobs. Preventive and corrective measures on Hazardous chemicals, oils occupational health and safety requirements are incorporated as a safeguards requirement.

6. Compliance Status with Environmental Covenants

Environmental safeguard related project activities are in compliance with covenants as regular follow up actions are being taken.

7. Institutional Arrangement

There is a Grievance Management Department headed by director within NEA. Preparation of grievance redress mechanism acceptable to ADB has been complied. Moreover, under Project Management Directorate (PMD) a separate department to overlook the safeguard implementation is being formed.

8. Compliance with Environmental Safeguards Measures

Overall Environmental Compliance will need to be followed as the construction work for the New Khimti-Barhabise (Package I) and Barhabise-Kathmandu section (Package II) of the transmission line begins in accordance to approved IEE's monitoring plan and mitigation measures. Currently Tree Enumeration complete and Soil Testing activities almost complete for Package I while it has been initiated for Package II. Representatives from ESSD under ESMU have set up site offices at Charikot of Dolakha District and Barhabise of Sindhupalchowk District ensuring environmental compliance for both the Packages once the construction work progresses.

3.1 Surveys and Approval

Detail Surveys and tree enumeration process is complete for Package I of the transmission line while along the Package II this is under process. Consultation with CFUG along the alignment has been initiated for forest clearance permission. Other preconstruction activity compliance includes Environmental Health and Safety plan is under review at ESSD for Package II. During the survey process alternative alignment was envisaged avoiding slope instability and forest area with 1,400 trees along AP 29 to 30 of Package I at Bhimeshwor Municipality of Dolakha District. However, after rerouting the alternative route accepted is being used by earthquake reconstruction following 2015 Earthquake. Tentative locations of grievances received are shown in Figure 2.

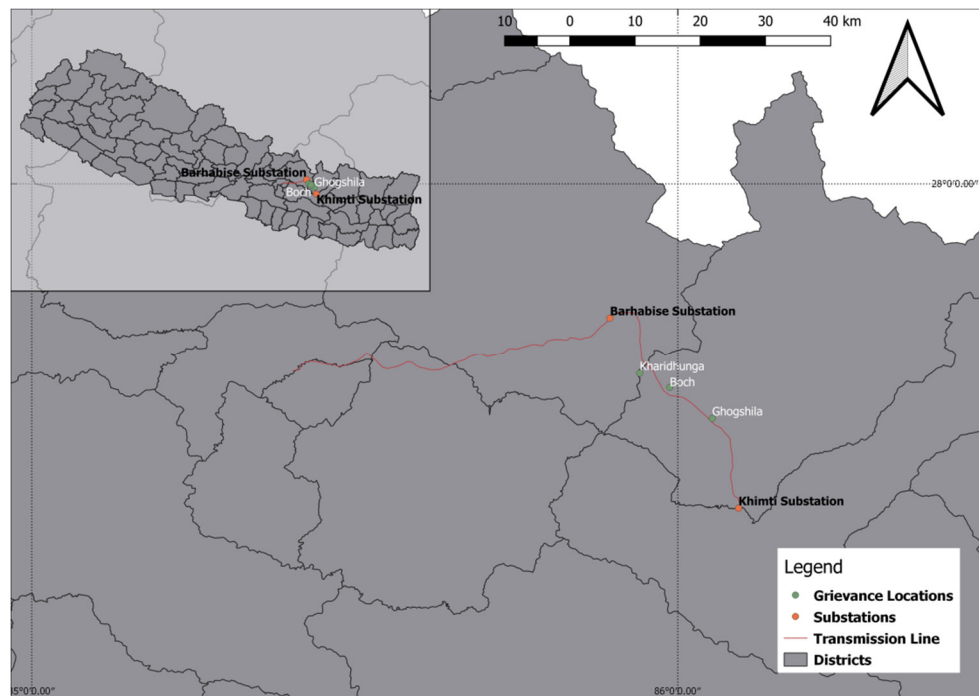


Figure 2: AP 29 to 30 at Ghokshila of Bhimeshwor Municipality in Dolakha District

Likewise, for Sundarijal HPP, the construction will be carried out within existing operational power plant site and budget for upgrading 90m section of the access road to the site has already been set aside and the tender for the upgrading of road is underway. An existing nonfunctional canal along the road will be removed and retention will be used to maintain approximately 4.5m width of road (Appendix I Figure 4).

4.1 Inclusion of Environmental Issues in Contract Documents

For the New Khimti Kathmandu Transmission the contract documents have included existing regulatory requirements of the GoN to be followed and specifically on health and safety issues. The issues' on environmental matters as well as on monitoring that is mentioned in the approved

IEE Report has been documented through MoU with ESSD. A total amount of \$ 1,323,631 has been allocated (details in Appendix II).

5.1 Material Storage Yards and Workshop

Storage Yard and Workshop have been set up by Package of the transmission line at Kuntabesi close to Cha Khola at Mandandeupur Municipality of Kavrepalanchowk District approximately 56km away from Kathmandu and 10km from Zero Kilo on a rented land. Currently, including a security guard there are 5 full time staff in the yard.

6.1 Spoil Management

The work for stringing of the transmission line is complete for Kohalpur Mahendranagar 132kV TL. Likewise for the Khimti Kathmandu TL Line contractors (M/S JV of Guangxi Transmission & Substation Construction Co & Shenzhen Clou Electronics Co. Ltd., China and M/S Larsen & Turbo Limited, India for Package I and II respectively) have been mobilized and under ESMU are stationed for monitoring the environmental compliance status of the project for construction work as the project progresses.

7.1 Workers Camp Setup

Construction work has not begun

8.1 Awareness Training

Environmental compliance as instructed in IEE for trainings will be met with during the construction and operation of the Khimti-Kathmandu 220/400kV (Package I and II) transmission line.

9.1 Landslide Protection and Bioengineering

The land stability issues will be taken into account in full compliance under Environmental Safeguards during the construction of the Khimti Kathmandu 220/400kV Transmission Line, once the mobilized contractors start their construction work. A section between AP 29 to 30 was rerouted following land stability issue (Ghokshila, Bhimeshwor Municipality of Dolakha District Earthquake reconstruction site coincide after rerouting the site). Moreover, for the Distribution system as well as the Rehabilitation of Hydropower station for Sundarijal adequate compliance is observed to the safeguard requirements and the access road and associated stability issue is being dealt with. A 90m length of 4m width access road requiring retention wall from the base with a budget of approximately \$ 44,385 (NPR 5 million) has been secured in the budget. Local communities too have expressed their solidarity towards having a road in the area. A Government Approved IEE has also been sought for the rehabilitation project.

10.1 Drainage Management

The 220/400kV Khimti Kathmandu TL safeguard status can be ensured to comply following the provisions made in IEE report and any other unanticipated impacts through adequate mitigation measures. For Sundarijal HEP rehabilitation a drainage culvert at the beginning of the access road is considered to be incorporated (Appendix I Figure 5).

11.1 Compensatory Plantation

The contractors have been mobilized and the enumeration of trees has been complete for Package I while for Package II enumeration work is being carried out at Janagal of Bhaktapur District and Panchkhal of Sindhupalchowk District. Along with enumeration work forest clearance permission is being sought following meetings with the Community Forest User Groups (CFUG). This will be followed by initiation in approval from Ministry of Forest and Environment for tagging of the affected trees in the forest of the project impact area.

Likewise for the Kohalpur Mahendranagar 132kV Transmission Line number of trees compensated includes 3 for Bhurigaun and 2 for Pahalmanpur SS by 5 households.

12.1 Firewood Use

The construction work has not begun and the ESMU monitoring team is stationed at respective rented site office houses. Furthermore, when the construction work within the existing facility of the power plant will begin the activities will be carried out in compliance with the environmental safeguards requirements.

13.1 Safety Gear

The compliance of safety gear or PPE will be monitored as the construction work progresses once construction begins. Currently, for the Barhabise Kathmandu section Environmental Health and Safety (EHS) plan has been submitted by contractor for review for Package II. The contract document includes health safety as well as PPE requirements.

14.1 Labor Issue (Workers Camp, Health and Sanitary Facilities)

Khimti Kathmandu 220/400kV Transmission Line (Package I and II) preparatory works for construction is in progress and it has been assured to comply with the Safeguards Requirements.

15.1 Number of Grievances (documented, resolved and under processing)

Grievances received on the transmission line are being received and recorded. However, three other issues on AP 0 near New Khimti SS (Ramechap District)³ 1 HH, at Ghoksila of Bhimeshwor

³ Information based on verbal reporting and is subject to change

Municipality (15 HH) of Dolakha District and Kharidhunga of Bhimeshwor Municipality (3 HH) of Sindhupalchok District related to denial of providing land for tower pads and RoW have emerged which are being sorted in coordination with Local and Regional Government bodies. Details elaborated in Table 4.

For Sundarijal HPP locals have asked for maintenance of a culvert under the existing access road.

Table 4: Grievances⁴

Grievance No.	Location ⁵	Issue	Grievance Type	Action
1	Ghoksila (AP 29 to 30), Bhimeshwor Municipality, Dolakha District	Conflict on providing land for the Project as well as Earthquake Reconstruction houses intersect with the alignment	Written	
2	Kharidhunga, Dolakha District between AP 52 to 53	Conflict on providing land for the Project	Written	
3	Manthali Municipality, Ramechaap District AP 0 to 1		Verbal	
4	Shankharapur Municipality, Dolakha District (between AP 61 to 62)		Written	
5	Bhimeshwor Municipality, Dolakha District		Written	
6	Kuntabeshi, Kavrepalanchowk District		Written	

9. Issues and Way Forward

Table: 5 shows the main environmental issues and way forward for the effective implementation of environmental safeguard measures.

Table 5: Corrective Actions and Way Forward

S.N.	Issues	Way Forward
1	Issues of tree felling of trees	Expedite such activities within months permitted for the work in coordination with DFO after receiving permission.
2	Disorientation of work responsibilities	Provision of terms of reference of each individual for respective responsibilities. Initiate with updates for environmental baseline conditions.
3	Selection of Trainers of Capacity Enhancement on environment safeguards	To expedite the process at the earliest

⁴ Several Information based on informal reporting at initial stage when officials and formal office are yet to be setup and is subject to change

⁵ Address have been updated to new administrative boundaries

Table 6: Impact Mitigation Compliance for all project components for different construction stages

S. N	Construction Stage and Impact	Mitigation Measures	Tamakoshi Kathmandu 220/400kV TL		Kohalpur Mahendra nagar 132kV TL second circuit stringing	Rehabilitation of Sundarjal HPP	Rehabilitation of Tinau HPP	Chapali Substation	Augmentation of Distribution Services (East)	Augmentation of Distribution Services (West)	Upgradation of Distribution Lines
			New-Khimti Barhabise section	Barhabise Kathmandu section							
1	Surveys, Alternative Analysis, enumeration of trees.	Better Route Alignment	Complied	In Process	NA	NA		NA	NA	NA	NA
2	Adverse effect on topography from development of Quarry Site and stacking of construction materials	Restoration of exposed areas	Construction not begun	Complied	Complied	Not Begun		Complied	NA	NA	NA
3	Tagging of Trees and clearance causing erosion, effect other utility lines, wildlife habitat and corridors during clearing of Right of Way (RoW)	Compensation, restoration and consultation with forest stakeholders on wildlife habitat and corridors	Construction not begun	Construction not begun	Complied	NA		NA	NA	NA	NA
4	Environmental Investigations	Soil investigations to avoid adverse effects on project	Construction not begun	Complied	Complied	NA		Complied	NA	NA	NA

S. N	Construction Stage and Impact	Mitigation Measures	Tamakoshi Kathmandu 220/400kV TL		Kohalpur Mahendra nagar 132kV TL second circuit stringing	Rehabilitation of Sundarjal HPP	Rehabilitation of Tinau HPP	Chapali Substation	Augmentation of Distribution Services (East)	Augmentation of Distribution Services (West)	Upgradation of Distribution Lines
			New-Khimti Barhabise section	Barhabise Kathmandu section							
5	Pollution of aquatic environment and adverse impact as poaching and felling of tree from temporary workers camp	Adequate cleaning facilities, toilets with soak pits and use of liquefied petroleum gas. Ensure the camp site is cleaned and restored while relocating. Solid waste disposal on pits minimum 500m away from water sources.	Construction not begun	Construction not begun	Complied	Not Begun		NA	NA	NA	NA
6	Soil erosion, wastes and pollution temporarily from unloading of material, storage and workshop in local environment	Avoiding sensitive sites. Recyclable materials such as cement bags, plastics and scrap metals to be segregated and sold for recycling. While decomposable wastes to put in	Construction not begun	Complied	Complied	NA		Complied	NA	NA	NA

S. N	Construction Stage and Impact	Mitigation Measures	Tamakoshi Kathmandu 220/400kV TL		Kohalpur Mahendra nagar 132kV TL second circuit stringing	Rehabilitation of Sundarjal HPP	Rehabilitation of Tinau HPP	Chapali Substation	Augmentation of Distribution Services (East)	Augmentation of Distribution Services (West)	Upgradation of Distribution Lines
			New-Khimti Barhabise section	Barhabise Kathmandu section							
		a pit and covered away from surrounding water sources.									
7	Adverse impact on local aquatic environment, soil erosion and loss of agricultural land while pit marking and digging of foundation	Compensation, restoration of site and proper maintenance of vehicles used	Construction not begun	Construction not begun	NA	NA		Complied	Complied	Complied	NA
8	Contamination of Surface and Ground Water, Soil Erosion while construction of foundation and revetment	Restoration of exposed areas, adequate maintenance of engines to prevent oil leakage. Sensitive Sites include AP 9, 11 and 12	Construction not begun	Construction not begun	Complied	NA		Complied	Complied	Complied	NA
9	Disturbance to existing utilities and population during erection process	Rerouting the utility lines, installation of warning signboards, traffic	Construction not begun	Construction not begun	Complied	NA		NA	Complied	Complied	Complied

S. N	Construction Stage and Impact	Mitigation Measures	Tamakoshi Kathmandu 220/400kV TL		Kohalpur Mahendra nagar 132kV TL second circuit stringing	Rehabilitation of Sundarjal HPP	Rehabilitation of Tinau HPP	Chapali Substation	Augmentation of Distribution Services (East)	Augmentation of Distribution Services (West)	Upgradation of Distribution Lines
			New-Khimti Barhabise section	Barhabise Kathmandu section							
		management and use of safety equipment or Personal Protective Equipment (PPE). Construction activities to be carried out during dry season when farming activities are minimal									
10	Accidents at tower site and soil run off from exposed surface while installing earth wire or optical ground wire	PPE are worn and exposed surface are covered. Safe Distance are maintained from other power lines as well as power is temporarily cut off	Construction not begun	Construction not begun	NA	NA		NA	NA	NA	NA
11	Snapping of stringing blocks or loose hanging	Adequate tension is maintained	Construction not begun	Construction	Complied	NA		NA	Complied	Complied	Complied

S. N	Construction Stage and Impact	Mitigation Measures	Tamakoshi Kathmandu 220/400kV TL		Kohalpur Mahendra nagar 132kV TL second circuit stringing	Rehabilitation of Sundarjal HPP	Rehabilitation of Tinau HPP	Chapali Substation	Augmentation of Distribution Services (East)	Augmentation of Distribution Services (West)	Upgradation of Distribution Lines
			New-Khimti Barhabise section	Barhabise Kathmandu section							
	of wires and excessive lopping of vegetation while stringing, final sagging and tensioning earth wire as well as power conductor	scaffolding is used in areas crossing rivers, roads, telecom lines, overhead power lines and other similar structure. The vegetation to be lopped to be quantified		not begun							

Table 7: Impact Mitigation Compliance on Environmental Issues of Approved IEE for New Khimti-Kathmandu TL

SN	Sensitive Sites ⁶	Impact	Mitigation Measures	Compliance	Remarks
Physical Environment					
1	AP 9, AP 10 and AP 12	Close to streams causing Disruption of Natural Drainage and soil erosion	Tower excavation work are to be carried out and no exposed areas are left		Construction work not begun
2	Throughout the Alignment	Land Use Change	Construction Activities to be confined in seasons of less agro activities		Construction work not begun
3	APs close to Ghumaune, Kharidhunga, Sano Palati, Serabesi,	Air and Noise Pollution	Maintenance of vehicles and construction equipment PPE to be used		Construction work not begun

⁶ The locations and AP are based on IEE study and discussions with NEA Project Staff.

SN	Sensitive Sites ⁶	Impact	Mitigation Measures	Compliance	Remarks
	Barhabise Bazar, Kuntabesi, Nagarkot Bazar, Changuarayan etc. Details in Table 10				
4	Throughout the Alignment Mainly along at the tower pads	Adverse Effects on Aquatic Environment	Construction Wastes to be disposed on barren land minimum 500m away from water sources. Any waste oils and chemicals require adequate storage facilities. Similarly solid wastes to be disposed in pits away from water bodies and covered		Construction work not begun
5	Temporary Workers Camp and Storage Facilities	Waste Management	Recyclable wastes such as cement bags, plastic materials and metal scraps to be segregated and sold for recycling while degradable wastes to be put in a pit and covered minimum 500m away from any water sources over barren land		Construction work not begun
6	AP 14, AP 29 of Package I and AP 10 to 11 along the Package II	River Bank Erosion and Slope Stability Issues	River Training Works		Construction work not begun
7	Close to AP 22, 23, 34, 58 and 59 along the Khimti Barhabise section and AP 20 of the Barhabise Kathmandu Section	Temple close to alignment	Temple Reconstruction Work After 2015 Earthquake Damage.		Construction work not begun
8	Details in Table 11	Schools close to Alignment	Educational Support Program and Fencing		To be expedited after construction work begins
Biological Environment					
9	Community, Government and Leasehold Forests between APs 3-4, 4-5, 10-11, 16-17, 18-19,	Permanent Removal of Trees	Compensation based on Regulatory Requirements and Enhancement through Forest Management Trainings, Training for cultivation of		Construction work not begun

SN	Sensitive Sites ⁶	Impact	Mitigation Measures	Compliance	Remarks
	19-20, 20-25, 24-29, 29-31, 30-31, 31-32, 34-35, 35-36, 36-37, 41-42 and 48-50 for Package I and APs 37-38, 38-39, 21-22, 21-22, 19-20-21, 13-14, 12-13, 13-14, 14-15, 18-19, 18-19-20, 22-23-24, 53-57, 62-63, 63-64, 60-61, 56-57, 60-61-62, 4-5, 4-5, 6-7, 57-59, 26-28, 23-25, 32-33, 36-37, 34-35, 30-31, 33-35, 25-26, 30-31, 40-43, 43-44, 41-42, 47-48, 45-47, 50-51, 52-53, 61-63, 55-56 and 55-56		NTPF. Forest Based Income Generation and Entrepreneurship Training.		
10	Throughout the Forest Area	Disturbance to Wildlife and Poaching	Construction in Forest Area to be coordinated through DFO and CFUG. Use of Screens in tower to discourage monkeys from climbing.		Construction work not begun and Use of screens included in contract Document.
11		Avian/Aviation Hazard	Use of Markers to prevent accidental collisions during the operation phase of the project. Use of optical ground wire and markers will reduce collision of particularly flocking birds and mainly raptors.		Contract Document has listed use of Markers throughout the Transmission Line
Social Environment					
12	Package I 2.39 ha and Package II 2.9 ha	Loss of Private Land	Compensation		Construction work not begun
13		Production Loss of Temporary Land	Compensation		Construction work not begun

SN	Sensitive Sites ⁶	Impact	Mitigation Measures	Compliance	Remarks
14	Package I AP 44-45 and 45-46. 2 houses and 2 cowsheds Package II AP4-5, 12-13, 35 and 57-58. 10 houses and 4 cowsheds	Loss of Structures	Compensation		Construction work not begun
15		Loss of Standing Crops	Compensation		

Table 8: Settlements Close to Alignment Requiring Air and Noise Monitoring based on Approved IEE Report

S.No.	Settlement	New Gaupalika/Municipality/Ward No.⁷	District	Old VDC/Municipality/Ward No
1	Milti bazaar, Sitali	Manthali Municipality-13	Ramechhap	Phulasi-1
2	Sital besi basti	Melung Gaupalika-7	Dolakha	Melung-1
3	Kalleri basti, Thamidada basti	Melung Gaupalika-4	Dolakha	Bhedapu
4	Dihi gaun	Melung Gaupalika-4	Dolakha	Bhedapu
5	Odare gaun	Melung Gaupalika-1	Dolakha	Pawati
6	Gurung gaun	Sailung Gaupalika-7	Dolakha	Fasku
7	Kiratechhap basti	Bhimeshwor Municipality-5	Dolakha	Bhimeshwor
8	Gaudada basti	Bhimeshwor Municipality	Dolakha	Bhimeshwor
9	Syasi	Bhimeshwor Municipality-9	Dolakha	Lakuri dada
10	Okhre	Bhimeshwor Municipality-9	Dolakha	Lakuri dada
11	Tallo pakha gaun	Bhimeshwor Municipality-9	Dolakha	Lakuri dada
12	Phulbarighumti gaun	Bhimeshwor Municipality-9	Dolakha	Lakuri dada
13	Kharidhunga	Bhimeshwor Municipality-9	Dolakha	Lakuridada
14	Dadakharka	Tripurasundari Gaupalika	Sindhupalchowk	Piskar
15	Pokhare basti	Tripurasundari Gaupalika	Sindhupalchowk	Piskar
16	Manichaur	Barhabise Municipality-2	Sindhupalchowk	Karthali
17	Phalate	Barhabise Municipality-4	Sindhupalchowk	Barhabise
18	Sano palate	Barhabise Municipality-3	Sindhupalchowk	Barhabise
19	Beshi Tole	Barhabise Municipality-9	Sindhupalchowk	Ramche-8
20	Badare Tole	Barhabise Municipality-9	Sindhupalchowk	Ramche-6
21	Kotabari gau	Barhabise Municipality-9	Sindhupalchowk	Ramche-3
22	Gairigau	Barhabise Municipality-9	Sindhupalchowk	Ramche-5
23	Thapa basti	Balephi Gaupalika	Sindhupalchowk	Mankha
24	Kanle dada	Balephi Gaupalika-8	Sindhupalchowk	Mankha-1
25	Kamitar Tole	Balephi Gaupalika-7	Sindhupalchowk	Mankha-6
26	Chimlingbeshi gaun	Balephi Gaupalika-7	Sindhupalchowk	Mankha-6
27	Chilaune basti	Chautara Sangachowkgadhi Municipality-8	Sindhupalchowk	Irkhru-6
28	Dada gau basti	Chautara Sangachowkgadhi Municipality-8	Sindhupalchowk	Irkhru-5
29	Sahu tole	Chautara Sangachowkgadhi Municipality-8	Sindhupalchowk	Irkhru

⁷ Updated administrative boundary names included as new municipalities and gaupalika

30	Goth basti	Chautara Sangachowkgadhi Municipality-8	Sindhupalchowk	Irkhu
31	Bhulbhule gaun	Chautara Sangachowkgadhi Municipality-13	Sindhupalchowk	Thulo sirubari
32	Bajini gaun	Chautara Sangachowkgadhi Municipality-13	Sindhupalchowk	Thulo sirubari
33	Jholunge basti	Indrawati Gaupalika-10	Sindhupalchowk	Bhotesipa
34	Majhi gaun	Mandandeupur Municipality-10	Kavrepalanchowk	Chandeni
35	Rayobari	Mandandeupur Municipality-9	Kavrepalanchowk	Mahadevsthan
36	Kunta bazaar	Mandandeupur Municipality-7	Kavrepalanchowk	Mahadevsthan
37	Tallo Haledi	Mandandeupur Municipality	Kavrepalanchowk	Baluwapati
38	Beshi gau	Changunarayan Municipality	Bhaktapur	Mahamanjushreee Nagarkot *
39	Khoriya gau	Changunarayan Municipality	Bhaktapur	Chagunaraya*
40	Ittakhel	Kageshwori Manahara Municipality	Kathmandu	Shankharapur*

Table 9: Schools for Educational Support and Fencing based on Approved IEE Report

S.No.	Name of School	Address Old	Remarks	Address New
1	Kamala devi Lower Sec. School	Karthali-8	within 300m	Barhabise Municipality-2
2	Sunkoshi Higher Sec. School	Karthali		Barhabise Municipality-2
3	Nandala Devi Primary School	Chokati-7	within 500m	Tripurasundari Gaupalika
4	Shree Janata Primary School	Piskar-2		Tripurasundari Gaupalika
5	Shree Shurke Higher Sec. School	Lakuridada	within 100m	Bhimeshwor Municipality-9
6	Shree Shyamtar Primary School	Melung-1	within 40m	Melung Gaupalika-7
7	Shree Saraswati Sec.School	Ramche-6	within 300m	Barhabise Municipality-9
8	Kalidevi Lower Sec. School	Mankha-1	within 80m	Balephi Gaupalika-8
9	Shree Bal Jyoti Primary School	Mankha-6	within 100m	Balephi Gaupalika-7
10	Setidevi Primary School	Irkhu-3	within 20m	Chautara Sangachowkgadhi Municipality-8
11	Suryodaya Primary School	Bhotasipa-9	20m	Indrawati Gaupalika-10
12	Shree Mahakali Higher Sec. School	Nayagau-1	500m	Mandandeupur Municipality-4

Appendix I



Figure 3: Sundarijal Hydropower Equipment at NEA Office, Kharipati, Bhaktapur

Figure 4: Sundarijal HPP Access Road



Figure 5: Culvert of Sewer to be included under the Access Road



Figure 6: Sundaijal HPP Equipment to be Replaced



Figure 7: Museum with 157.8m² of plinth area where the old equipment will be placed



Appendix II

Costs Associated for Environmental Safeguards in MoU with ESSD

S.N	Description	Amounts (NRS)	Remarks
A	Environmental and Social Monitoring	64232490	Including Office Operation
	Sub-total(A)	64232490	
B	Safeguards Implementation		
1	Compensatory Plantation Program	44527775	Table-1.1
2	Placement of informative and warning signs (hoarding boards)	950000	Table-1.2
3	Forest Management and Capacity Building Training	909000	Table-1.3
4	NTFPs Training and Assistant	1474500	Table-1.4
5	Conservation Awareness Raising(Forest, Wildlife and Biodiversity) Program	722750	Table-1.5
6	Forest Based Income Generation program	1168500	Table-1.6
7	Orientation Workshop for DFO Staff	240000	Table-1.7
8	Vegetable Farming Training	982500	Table-1.8
9	Mushroom Farming Training	491250	Table-1.9
10	Livestock Training and Assistance	1927500	Table-1.10
11	Fishery Training	359000	Table-1.11
12	Micro Enterprises Creation Training	802500	Table-1.12
13	Skill Development Training	3315000	Table-1.13
14	Social Awareness Program	900000	Table-1.14
15	Occupational Safety Training	410000	Table-1.15
16	Health and Sanitation Training Program	430000	Table-1.16
17	Community Support Program	15500000	Table-1.17
	Sub-Total(B)	75110275	
	VAT 13%	9764336	
	Total(B)	84874611	
	Grand Total(A+B)	149107101	