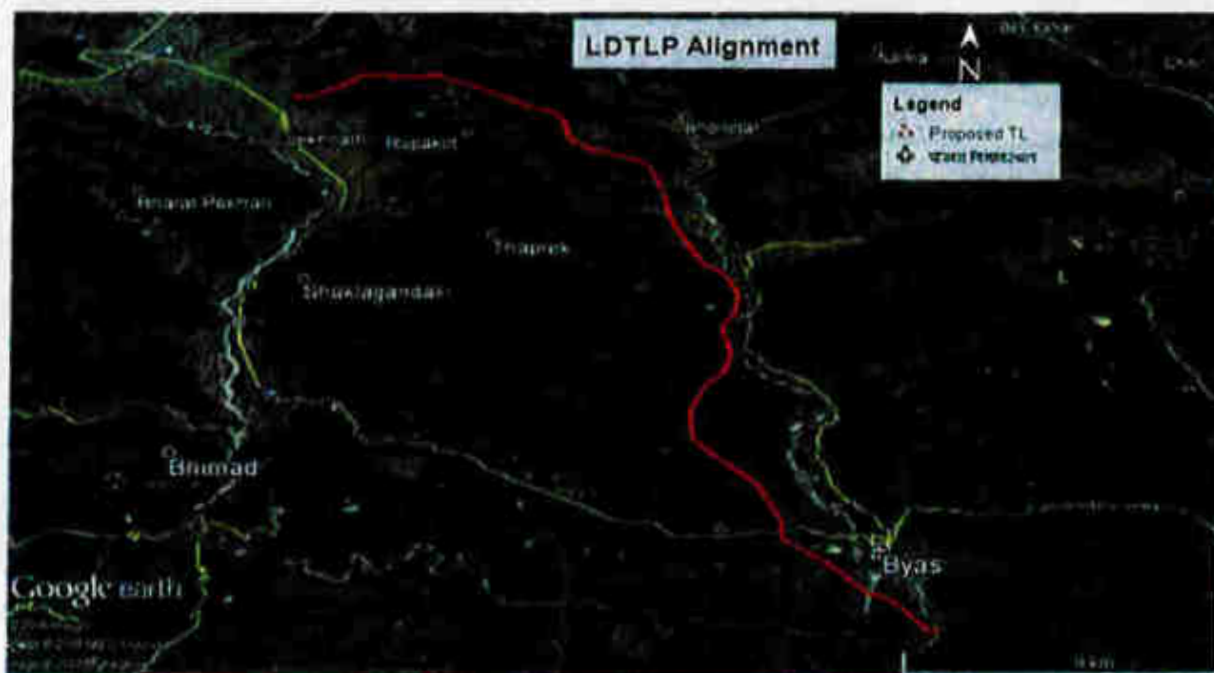




NEPAL ELECTRICITY AUTHORITY

INITIAL ENVIRONMENTAL EXAMINATION (IEE) of Lekhnath-Damauli 220kV Transmission Line Project (Double Circuit)



Submitted to:
Ministry of Energy
Through
Department of Electricity Development



Prepared and Submitted by:
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EXECUTIVE SUMMARY

E.1 Introduction

Nepal Electricity Authority (NEA) is the project proponent of the proposed Lekhnath-Damauli 220kV Transmission Line Project (LDTLP). NEA is an organized institution undertaking of Government of Nepal and was established in August 16, 1985 (Bhadra 1, 2042 BS). Environmental and Social Studies Department (ESSD) is responsible for conducting the IEE of this project. The Ministry of Energy (MoEn) has granted a survey license for the feasibility study including the environmental study of the proposed project. The survey license is valid till 2074/11/01 B.S. This IEE report is prepared as per Terms of Reference (ToR) approved by MoEn on 2073/07/02 BS.

E.2 Project Description

The proposed LDTLP is located in Kaski and Tanahun Districts of Province No. 4. It includes one metropolitan city (MC), one municipality and three rural municipalities (RMs) as its affected area. It starts from existing substation at Lekhnath and traverses through project area viz., Pokhara Lekhnath MC, Rupa RM in Kaski District and Myagde RM, Byas Municipality, Rising RM and ends at proposed Belbas substation, Byas Municipality in Tanahun District.

LDTLP is considered as a power evacuation option for energy generated from Tanahun HEP to the nearest load centre of Pokhara Lekhnath Metropolitan City. The objective of the LDTLP is to improve the supply situation of the whole nation by connecting with the national grid. The project consists of 42.254km long TL (double circuit 220kV TL of 37.401km and four circuit of 220kV and 132kV TL of 4.853km) switching station and one substation at Belbas of Byas Municipality as major components. There shall be switching station near AP 36 in order to switch existing 132kV TL to the Belbas Substation.

E.3 Study Methodology

The IEE process follows the Environment Protection Rules, 2054(1997) and National EIA Guidelines, 2050 (1993). In addition, this IEE is prepared in accordance with the legal requirements of GoN, based on field studies and consultation with local people and officials and approved ToR.

For the physical environment, data on climate, geology and land were collected. Likewise, in biological environment, data on vegetation/forest, fauna were taken and in socio-economic and cultural environment data on population, ethnicity, religion and religious sites, infrastructure, etc. are used for the study. Similarly, methods including HHs survey, market survey and various informal consultations were also used. A public notice was published in national daily newspaper 'Gorkhapatra Daily' in 2074/03/16 B.S and recommendation letters were collected.

E.4 Review of Policy and Legal Provisions

The proponent will be responsible for fulfilling the provisions of all relevant acts, rules/regulations policies, guidelines and conventions while implementing the project. Plan and policy like National Energy Crisis Reduction and Development Decades 2072 (2015) Concept paper, Nepal Environmental Policy and Action Plan 2050 (1993) and 2055 (1998), Forestry Sector Policy 2071 (2015), Hydropower Development Policy 2058 (2001), Climate Change Policy 2067 (2011), National Bio-Diversity Strategy and Action Plan 2014-2020 were studied while preparing this IEE. Similarly, acts like Land Acquisition Act 2034 (1977), Soil and Watershed Conservation Act 2039 (1982), Water Resources Act 2049 (1992), Electricity Act 2049 (1992), Forest Act 2049 (1992), Labor Act 2074 (2017), Environment Protection Act 2058

(1997), Local Government Operation Act 2074 (2017), Child Labor (Prohibition and Regulation) Act 2056 (2000) were intensively studied.

In addition, rules and regulations like Electricity Rules 2050 (1993), Water Resources Rules 2050 (1993), Environment Protection Rules 2054 (1997), Local Self Governance Rules 2056 (1999), and guidelines and conventions like National EIA Guidelines 2050 (1993), EIA Guidelines for Forestry Sector 2052 (1995), Forest Production, Collection and Sales Distribution Guidelines 2057 (1998), Community Forest Inventory Guidelines 2005, Working Procedure for the Use of National Forest Land for National Priority Project, 2074 (राष्ट्रिय प्राथमिकता प्राप्त योजनाको लागि राष्ट्रिय वन क्षेत्र प्रयोग गर्ने सम्बन्धी कार्यविधि, २०७४) and Convention on Biological Diversity (1992); CITES, 1973 were also reviewed while preparing the report.

E.5 Existing Environmental Condition

E.5.1 Physical Environment

The proposed 42.254km long TL project traverses through hilly region of Western Nepal. The alignment runs through several topographic features comprising of rugged hills with mild and steep slope, undulating land forms and flat terrain. The altitudinal variations of the TL points are between 1184m to 327m at Kotbari, Pokhara Lekhnath MC and Byas municipality respectively.

The main land use pattern of the project area is cultivated land, Community Forests (CF), grazing land and barren land. The alignment avoids densely populated areas, major structures, protected areas and dense forests. The other land uses along the alignment consists of road crossings, rivers, rivulets, river beaches and TL. Along the alignment, approximately 68.84% of the TL alignment passes through the cultivated land, 26.01% through forest and 2.68% through barren and 2.47% through others (sand, water bodies, road crossings and river crossings etc.).

E.5.2 Biological Environment

The proposed TL alignment will pass through 13 CFs from Kaski District and 5 CFs from Tanahun District. The TL also passes through 1 national forest in Kaski District. The local people utilize plant resources for different purposes including mainly as timber, firewood, fodder, fruit and medicine. The major timber yielding species of the project area are Sal (*Shorea robusta*), Katus (*Castanopsis indica*), Chilaune (*Schima wallichii*), Sallo (*Pinus sp.*) and Utis (*Alnus nepalensis*).

Similarly the common fruits yielding plants in the project area include Mango (*Mangifera indica*), Banana (*Musa paradisiaca*), Mewa (*Carica papaya*), Naspatti (*Pyrus communis*), Amba (*Psidium guajava*), Kafal (*Myrica eiculenta*) and Katahar (*Arthocarpus sp.*). Citrus species like Orange (*Citrus aurantium*), Nibuwa (*Citrus sp.*), Bhogate (*Citrus maxima*), Kagati (*Citrus auratifolia*) are also common fruit plants in the project area. Chari Amilo (*Oxalis corymbosa*), Abijalo (*Drymaria diandra*), Aduwa (*Zingiber Officinale*) Amala (*Phyllanthus emblica*), Asuro (*Justicia adhatoda*), Ghodtapre (*Centella asiatica*), Aiselu (*Rubus ellipticus*), Lapsi (*Choerospondias axillaris*), Chutro (*Berberis aristata*), Akhe Timur (*Zanthoxylum armatum*) and Paniamala (*Nephrolepsis cordifolia*) are some of the plant species available in the project area having medicinal values.

Some of the wild animals reported from the project areas are Dumsi (*Hystrix indica*), Malsapro (*Martin flavigula*), Common Langur (*Presbytis entellus*) Ratuwa Mriga (*Muntia cusumuntjak*), Leopard (*Panthera pardus*), Jackal (*Canis aureus*), Kharayo (*Lepus nigricollis*), Dhendu (*Macaca assamensis*), Ban Biralo (*Felis chaus*), Rhesus Monkey (*Macaca mulata*), etc. In addition, common bird species reported in the project area are; Crow (*Corvus splendens*),

(*Phylloscopus spp.*), Dhukur (*Streptopelia chinensis*), Koili (*Surniculus lugubris*), House crow (*Corvus splendens*), House sparrow (*Passer domesticus*), Gaunthali (*Hirundo sp.*), Kalij Pheasant (*Lophural eucomelana*), Cuckoo (*Plantative cuckoo*), Baj (*Buteo sp.*), etc.

E.5.3 Socio-economic and Cultural Environment

The total area of Project Affected Districts (PADs) is 3,563 sq.km. (Kaski 2017 sq.km. and Tanahun 1546 sq.km.). The total population is 815,386 with male 379,795 (46.6%) and female 435,591 (53.4%). The total households' (HHs) number is 203982 with average HH size 4.03. The average population density of these PADs is 226.49 person/sq. km and the average population growth from the last decade is 1.41%. The average economically active population (15-59 years) is 55.05% and the average urban population is 72.38%. Similarly the average literacy rate is 79.40% consisting 87.70% male and 72.30% female. The major occupation includes subsistence farming and livestock, tourism and foreign employment. The major caste groups in these PADs are Brahmin-Hill, Magar, Gurung, Chhetri and Dalit which covers 21.49%, 15.90%, 14.58%, 13.44%, 14.66% population respectively. Nepali (71.91%) is the main language followed by Gurung (10.48%), Magar (9.57%) and Newari (2.92%).

The project affects one metropolitan city (Pokhara Lekhnath), one municipality (Byas) and three RMs (Rupa Myagde and Rishing) and are referred as the project affected area (PAA). Total population of PAA is 536,221 with 251,552 (46.91%) male and 284,669 (53.09%) female. Similarly, there are 130,891 HHs and average HH size, sex ratio and population density (person/sq.km) is 4.10, 88.4 and 316 respectively. Major ethnic groups in the project area are Brahmin (24.32%), Chhetri (14.72%), Gurung (14.15%), Kami/Damai/Dholi/ Sarki (12.93%), Magar (13.27%), Newar (6.13%), Tamang (2.31%), Thakuri (1.65%), Musalman (1.13%) and others (10.65%). Major languages spoken in PAA are Nepali (74.60%), Gurung (9.75%), Magar (6.79%), Newari (3.03%), Tamang (1.19%) and others (4.65%). Average literacy rate of population of 5 years and above of project area is 82.7% with male literacy rate 90.4% and female literacy rate 76.1%. Out of 504,738 project population, more than half (61.9%) population is economically active population (age group 15 - 59 years).

Altogether 69 HHs of the project area have been surveyed. The survey reveals the fact that the total population of the surveyed HHs is 433 of which 220 (50.81%) are male and 213 (49.19%) are female and average HH size is 6.3. Hinduism and Buddhism are the two main religions followed by surveyed HHs. The majority of the HHs (78.26%) are Hindu followed by Buddhist (21.74%). Among the surveyed population, 87.9% are literate with male literacy rate 97.55% and female literacy rate 78.11%.

Agriculture is the main occupation of surveyed HHs. About 23.31% of the surveyed HHs have adopted agriculture as a main occupation. HHs occupied other than agriculture are students, labor wage (inside/outside the country), service, business and HHs work. Paddy, maize, wheat and millet are the major product of the surveyed HHs. The total average annual income of the surveyed HHs is NRs. 482,826; where the main source of income is agriculture and livestock. The other sources of income consist of business, remittance, service, daily wage and *Briddha Bhatta*. The average annual expenditure is NRs. 402,382. The figures of income and expenditure pattern indicate that there is annual saving of NRs. 80,444 by the surveyed HHs.

E.6 Impact Assessment

E.6.1 Physical Environment

The main physical impacts on the environment are those associated with land take (permanent and temporary) for stringing of the line, for construction of tower pads and changes in drainage

patterns. No other change in topography is envisaged during this phase. The project will require 134.6125ha land for the placement of tower pads (angle and suspension), substation and RoW of the TL and temporary facilities. Out of this, 9.3675ha land will be permanently acquired and 125.2450ha will be restricted as RoW. There are altogether 43 APs and 79 STs are estimated. AP will typically require an area of 15m x 15m which is equal to 0.0225ha. Altogether 78 Towers (27 APs and 49 STs) are located on cultivated land, 24 (9 APs and 15 STs) on forest and 23 (8 APs and 15 STs) on barren land.

E.6.2 Biological Environment

The total estimated forest area falling under the tower pad and TL alignment is 34.9884ha. Among this, the government forest falling under the TL alignment is 0.7ha and CF area falling under the tower pad and TL alignment is 21.6947ha. Also, 12.5937 ha area falls in private shrub land which consist of sparse trees and bushes specially used for collection of ground fodder.

As far as standing trees are concerned, a total of 14,160 numbers of trees of 23 different species are estimated to be clear felled during project construction period. The contribution of pole sized trees in this data is 79.24% whereas tree sized is 20.76%. Chilaune (*Schima wallichii*) is found to be the dominant tree species throughout the alignment. The total number of Chilaune trees to be felled down is estimated to be 5040 which is 35.59% of the total trees to be felled. This is followed by Sal (*Shorea robusta*), Katus (*Castanopsis indica*), Sallo (*Pinus sp.*), Khirro (*Sapium insigne*), Padke (*Albizia julibrissin*), Botdhairo (*Lagerstroemia parviflora*) and Ramritha (*Mallotus oppositifolius*). Lakuri, Phalat, Kafal and Utis are species which need to be felled in least number.

E.6.3 Socio-economic and Cultural Environment

The likely impacts due to project implementation are associated with land take, production loss, structural loss and other social and cultural problems, health and sanitation etc. Survey of 69 HHs has been carried out. Out of total surveyed HHs, 51 HHs will lose their land only. Similarly, 4 HHs will lose their land and structure, and 14 HHs will lose their structure only. The project will acquire and utilize 106.6042ha of private land along 42.254km route. Out of total, 8.3325ha land will acquire permanently (land require for APs, STs, substation, switching station, camp and storage). The project will acquire only 6.0ha private land permanently for substation. The proposed substation is located in cultivated land. On the basis of this, total annual crop loss of the project affected HHs is estimated to be 33.63MT permanently (cereal crop; paddy 15.75MT, maize 11.98MT and millet 2.06) and about 164.91MT temporarily (paddy 58.74MT, maize 78.25MT, wheat 12.58MT and millet 15.34MT).

E.7 Alternative Analysis

The IEE considered different alternatives for the project ranging from no action alternative to different design alternatives. The final route selection was done on the basis of its minimal impact on forest and settlements as compared to other alternative routes. Attempts were made to select the shortest route, which was economically and environmentally suitable.

E.8 Mitigation and Enhancement Measures

E.8.1 Physical Environment

Proper management of the muck volume will be done. The muck generated during the excavation of tower pads and substation will be used for backfilling and the area will be restored. The stability of the tower locations will be examined before excavation and special foundation design will be selected for the susceptible locations. Erection of tower in the

unstable land and/or in steep slopes will be avoided. Re-vegetation and slope maintenance will be carried out in the disturbed areas to avoid erosion. Bio-engineering with combination of retaining structures will be done as per the requirement. The construction and operation of the TL will not have significant impact on the air quality of the project impact area. Vehicle utilized for construction will be complied with GoN mass emissions standards.

E.8.2 Biological Environment

Plantation program will be carried out as compensation of tree felling along the RoW. The plantation sites will be discovered and determined consulting with the District Forest Office and project affected CFUGs. Special instructional and awareness raising training will be conducted for local people, workers to promote wildlife conservation activities. The project proponent will provide kerosene to the project workers to minimize the loss of forest. The project workers will strictly be prevented from illegal cutting of trees and encroachment on forests.

E.8.3 Socio-economic and Cultural Environment

Compensation for land

The total compensation for the land to be acquired and utilized by the project will be given in accordance with the rate determined by Compensation Determination Committee (CDC). The required land will be acquired according to the Land Acquisition Act, 2034 BS and with mutual understanding between the affected families and the proponent.

Compensation of loss of crops

The total compensation for the loss of 33.63MT for permanent lost and 164.91MT for temporary lost is estimated to be NRs. 5,807,220 only.

Compensation for structures

Compensation for twelve houses, nine cowsheds, one toilet and Structure of Kahare Agriculture and Livestock Co-operative Limited (co-operative commercial structure) will be estimated NRs. 10,583,150/- and short-term employment opportunity will be given to local people to reduce the impact due to influx.

Health, Sanitation and Safety Program

Awareness programs regarding health, sanitation and safety will be conducted in the project area to alert local people to the potential dangers. This program will be targeted to the people residing in and around the vicinity.

Agriculture Farming Training

The directly project affected people and vulnerable HHs will be benefited from mushroom and citrus farming trainings in their own localities.

School Support Program

Financial support will be provided to the schools in vulnerable condition and located in ward of PAA from where TL passes through. Support will be provided for purchase of computer, library establishment, drinking water facility, extension of school play-ground and other activities.

E. 9 Environment Monitoring

In order to implement the project smoothly, the mitigation program, monitoring plan, collection of issues of public concern and other relevant issues and Environmental Monitoring will be done. Under this plan, a Unit will be formed in the project area which will do the day to day monitoring works. The Unit will consist of experts from ESSD and other qualified personnel from the local market if required.

E. 10 Conclusion

The total land requirement will be approximately 134.6125ha for tower foundations, substation, camp, switching station and RoW. Out of that, the project requires 92.693ha of cultivated land

34.9884 ha of forest land (including private shrub land), 3.6074a of barren land and 3.3233ha of other land. There will be loss of 17,360 trees (14,160 from national and community forests and 3,200 from private tree) for the RoW clearance. In terms of the loss of land and assets various mitigation and enhancement measures have been proposed during the construction and operation phase of the project. The total environmental and social cost (mitigation, enhancement, CSR, and monitoring costs) of the proposed project including land cost is estimated to be **NRs 323,158,381/-** which is 4.31% of the total project cost. The IEE concludes that construction of the proposed LDTLP is environmentally and socially feasible if the proposed mitigation measures and monitoring plans are implemented.



कार्यकारी सारांश

१.० परिचय

प्रस्तावित लेखनाथ-दमौली २२०के.भी. प्रसारण लाइन आयोजनाको प्रस्तावक नेपाल विद्युत प्राधिकरण (ने.वि.प्रा.) हो। ने.वि.प्रा. नेपाल सरकारको पूर्ण स्वामित्वमा रहेको एक संगठित संस्था हो र यसको स्थापना वि.स. २०४२ साल भाद्र १ मा भएको हो। प्रस्तावित लेखनाथ-दमौली २२०के.भी. प्रसारण लाइन आयोजनाको प्रारम्भिक वातावरणीय परिक्षण (IEE) प्रतिवेदन वातावरण तथा सामाजिक अध्ययन विभागले तयार गरेको हो। यस आयोजनाको प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन तयार गर्ने सर्वेक्षण अनुमतिपत्र उर्जा मन्त्रालयबाट प्राप्त भएको हो जसको अवधि वि.स. २०७४/११/०१ सम्म रहेको छ। यसप्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन उर्जा मन्त्रालयबाट वि.स. २०७३/०७/०२ मा स्वीकृत भएको कार्यसूचि (ToR) अनुसार तयार गरिएको छ।

२.० आयोजना सम्बन्धी विवरण

प्रस्तावित लेखनाथ-दमौली २२०के.भी. प्रसारण लाइन आयोजना प्रदेश नम्बर चार अन्तरगत कास्की र तनहुँ जिल्लामा अवस्थित रहेको छ। आयोजनाको क्षेत्राङ्गन एक महानगरपालिका, एक नगरपालिका र तीन गाउँपालिका भएर गरिएको छ। यो प्रस्तावित आयोजना अहिलेको लेखनाथ सबस्टेसनबाट शुरु भई पोखरा लेखनाथ महानगरपालिका, रुपा गाउँपालिका, म्याग्दे गाउँपालिका, व्यास नगरपालिका र रिसिङ्ग गाउँपालिका हुँदै पुन व्यास नगरपालिकाको प्रस्तावित बेलवास सबस्टेसनमा आएर टुङ्गिनेछ।

प्रस्तावित आयोजनाले तनहुँ जलविद्युत आयोजना र कास्की तथा तनहुँ जिल्लाका आसपासका क्षेत्रहरुबाट उत्पादित विद्युत आपूर्तिलाई सहज बनाउन महत्वपूर्ण भुमिका निर्वाह गर्ने उद्देश्यले ने.वि.प्रा.द्वारा निर्माणको प्रस्ताव गरिएको हो। यस प्रस्तावित आयोजनाको कार्यक्षेत्र अन्तरगत ४२.२५४ कि.मि. (२२० के.भी. को ३७.४०१ कि.मी. दुई सर्किट, २२० के.भी. र १३२ के.भी.को ४.८५३ कि.मी. चार सर्किट) स्विचिङ्ग स्टेसन र प्रस्तावित सबस्टेसन (बेलवास, व्यास) रहने छन्। एङ्गल टावर ३६ नजिकै स्विचिङ्ग स्टेसन रहनेछ।

३.० अध्ययन विधि

यस प्रारम्भिक वातावरणीय परिक्षणको प्रतिवेदन वातावरण संरक्षण ऐन २०५३ र राष्ट्रिय वातावरणीय प्रभाव मूल्याङ्कन (EIA) निर्देशिका २०५० को अधिनमा रही तयार गरिएको छ। यसका अतिरिक्त, यस प्रतिवेदनमा नेपाल सरकारले विभिन्न समयमा लिएको कानूनी प्रकृया, स्थलगत अध्ययन, स्थानिय जनतासंगको अन्तरक्रिया आदिलाई सन्दर्भ सामाग्रीको रूपमा लिइएको छ। अध्ययनको क्रममा भौतिक वातावरण अध्ययन अन्तर्गत हावापानी, भौगोलिक अवस्था, भू-उपयोग सम्बन्धी तथ्याङ्कको प्रयोग गरिएको छ, भने जैविक वातावरण अन्तरगत वन्यजन्तु र वनस्पति सम्बन्धी तथ्याङ्कहरु प्रयोग गरिएको छ। त्यस्तै सामाजिक आर्थिक तथा सांस्कृतिक वातावरण अन्तर्गत जनसंख्या, धर्म, संस्कृति, जाती, पूर्वाधार आदि जस्ता तथ्याङ्कहरुको सहायता लिइएको छ। यसका साथै घरधुरी सर्वेक्षण, बजार सर्वेक्षण तथा विभिन्न अनौपचारिक छलफल जस्ता विधिहरुको पनि प्रयोग गरिएको छ। त्यसैगरी, प्रस्तावित आयोजनाको जानकारीको लागि वि.स. २०७४।०३।१६ को राष्ट्रिय दैनिक पत्रिका गोरखापत्रमा सार्वजनिक सूचना प्रकाशित गरिएको छ।

४.० वातावरण सम्बन्धी ऐन, नियम तथा कानुनी प्रावधानहरु

यस प्रारम्भिक वातावरण परिक्षण प्रतिवेदन तयार गर्ने क्रममा वातावरण संरक्षणसंग सम्बन्धित विद्यमान नीति, नियम, ऐन, कानून तथा निर्देशिकाहरुको पुनरावलोकन गरिएको छ। यस आयोजना अध्ययनको क्रममा विद्युत तथा जलश्रोत संग सम्बन्धित नीतिहरु जस्तै राष्ट्रिय उर्जा संकट निवारण तथा विद्युत विकास दशकको अवधारणा पत्र (२०७२), नेपाल वातावरण नीति तथा कार्ययोजना (२०५०), वन नीति (२०७१), जल विद्युत विकास नीति (२०५८), जलवायु परिवर्तन नीति (२०६७), राष्ट्रिय जैविक विविधता रणनीति तथा कार्ययोजना (२०७०-२०७६) पुनरावलोकन गरिएको छ। त्यसैगरी, सान्दर्भिक ऐनहरु जस्तै जग्गा प्राप्ति ऐन (२०३४), भु तथा जललधार संरक्षण ऐन (२०३९), जलश्रोत ऐन (२०४९), विद्युत ऐन (२०४९), वन ऐन (२०४९), श्रम ऐन (२०४८), वातावरण संरक्षण ऐन (२०५३) र बालश्रम (निषेध) ऐन (२०५६) अध्ययन प्रतिवेदन तयार गर्ने क्रममा पुनरावलोकन गरिएको छ।

यसका अलावा नियमावलीहरु जस्तै विद्युत नियमावली (२०५०), जलश्रोत नियमावली (२०५०), वातावरण संरक्षण नियमावली (२०५४) र निर्देशिका तथा महासन्धिहरु जस्तै राष्ट्रिय वातावरणीय प्रभाव मूल्याङ्कन निर्देशिका (२०५०), वनक्षेत्रको लागि वातावरणीय प्रभाव मूल्याङ्कन निर्देशिका (२०५२), वन पैदावार संकलन तथा बिक्री वितरण सम्बन्धि निर्देशिका (२०५७), राष्ट्रिय प्राथमिकता प्राप्त योजनाको लागि राष्ट्रिय वन क्षेत्र प्रयोग गर्ने सम्बन्धी कार्यविधि (२०७४) र जैविक विविधता सम्बन्धि महासन्धि (१९९२) आदिको पुनरावलोकन गरिएको छ। यस बाहेक आयोजना कार्यान्वयनको क्रममा माथि उल्लेखित कानुनी प्रावधानका अतिरिक्त अन्य ऐन नियमको आवश्यकता भएको खण्डमा आयोजना प्रवन्धकले सो को पनि पालना गर्ने छ।

५.० आयोजना क्षेत्रको विद्यमान वातावरणीय अवस्था

५.१ भौतिक वातावरण

यस प्रस्तावित प्रसारण लाइन आयोजना पश्चिम नेपालको पहाडी भू-भाग भएर जानेछ। सो क्रममा उक्त प्रसारण लाइन विभिन्न भिरालो तथा समथल भौगोलिक विशेषता भएका डाँडाहरु हुँदै जान्छ। यस प्रसारण लाइन क्षेत्रको उचाई समुद्री सतहबाट ११८४ मि. देखि ३२७ मि. सम्म रहेको छ (पोखरा लेखनाथ महानगरपालिकामा अवस्थित कोटबारी देखि ब्यास नगरपालिकासम्म)।

आयोजना क्षेत्रको जमिनको प्रकार मुख्यतः खेतीयोग्य जमिन, सामुदायिक वन, चरन क्षेत्र तथा बाँझो जमिन रहेको छ। यस प्रसारण लाईनले घना बस्ती, मुख्य संरचनाहरु, संरक्षित क्षेत्रहरु र घना जंगललाई सकेसम्म छुलेको छ। त्यसैगरी प्रसारण लाईन क्षेत्रभित्र पर्ने अन्य जमिनका प्रकारहरुमा खोला तथा खोल्सीहरु, सडकहरु, प्रसारण लाईनहरु आदि पर्दछन्। यस प्रसारण लाईन मार्गमा ६८.८४% खेतीयोग्य जमिन, २६.०१% जंगल, २.६८% बाँझो जमिन तथा बाँकी २.४७% भागमा बालुवा, पानी, सडक तथा खोलानाला रहेका छन्।

५.२ जैविक वातावरण

यस प्रस्तावित प्रसारण लाइन आयोजनाबाट कुल १८ वटा सामुदायिक वन (कास्की जिल्लाको १३ वटा र तनहुँ जिल्लाको ५ वटा) र कास्की जिल्लाको एक राष्ट्रिय वन प्रभावित हुनेछ। स्थानिय जनताहरुले प्रभावित वनजंगलबाट काठपात, घाँस, दाउरा, फलफूल तथा जडिबुटि औषधि संकलन गर्ने गरेको पाइन्छ। प्रभावित वनजंगलबाट प्राप्त हुने प्रमुख काठ दाउराहरुमा साल, कटुस, चिलाउने, सल्लो र उतिस रहेका छन्।

यस आयोजना क्षेत्रमा पाइने प्रमुख फलफूलहरुमा आँप, केरा, मेवा, नास्पाती, अम्बा काफल र कटहर रहेका छन् भने सुन्तला प्रजातिको फलफूलहरुमा सुन्तला, निबुवा, भोगटे, कागती रहेका छन्। त्यसैगरी आयोजना क्षेत्रमा पाइने अन्य वनस्पतिहरुमा चरिअमिलो, अबिजालो, अदुवा, अमला, असुरो, घोडताप्रे, ऐसेलु, लप्सी, चुत्रो, आँखे टिम्बुर र पानीअमला जस्ता वनस्पतिहरु रहेका छन्। आयोजना क्षेत्रमा देखिने प्रमुख वन्यजन्तुहरुमा दुम्सी, मलसाप्रो, लङ्गुर, रतुवा मृग, चितुवा, स्याल, खरायो, ढेंडु, वन विरालो, वाँदरका अतिरिक्त चराचुरुङ्गीहरुमा काग, फिस्टो, दुकुर, कोइली, भंगेरा, गौथली, कालिज, आदि रहेका छन्।

५.३ सामाजिक, आर्थिक तथा सांस्कृतिक वातावरण

आयोजना प्रभावित जिल्लाहरुको कुल क्षेत्रफल ३,५६३ (२०१७ वर्ग कि.मी कास्की र १,५४६ वर्ग कि.मी तनहुँ) वर्ग कि.मी. रहेको छ। यी जिल्लाहरुको कुल जनसंख्या ८१५,३८६ रहेको छ जसमा पुरुष ३७९,७९५ (४६.६%) र महिला ४३५,५९१ (५३.४%) रहेका छन्। यी जिल्लाहरुको औषत घरधुरी संख्या ४.०३ तथा कूल घरधुरी संख्या २०३,९८२ रहेको छ। प्रति वर्ग कि.मी औषत जन घनत्व र साक्षरता दर (५ वर्ष तथा माथिको) क्रमश २२६.४९ र ७९.४०% (पुरुष ८७.७०% र महिला ७२.३०%) रहेको छ। त्यसैगरी आयोजना प्रभावित जिल्लाहरुको औषत जनसंख्या वृद्धिदर १.४१%, आर्थिक रुपमा सक्रिय जनसंख्या ५५.०५% र शहरी जनसंख्या ७२.३८% रहेको छ। यहाँका जनताको मुख्य पेशाको रुपमा निर्वाहमुखि कृषि तथा पशुपालन, पर्यटन र बैदेशिक रोजगार रहेको छ। यहाँ बसोबास गर्ने मुख्य जात/जातिय समुहहरुमा ब्राम्हण-पहाडी, मगर, गुरुङ्ग, क्षेत्री, दलित रहेका छन् जसको उपस्थिति क्रमशः २१.४९%, १५.९०%, १४.५८%, १३.४४% र १४.६६% रहेको छ। यहाँ बोलिने मुख्य भाषामा नेपाली (७१.९१%), गुरुङ्ग (१०.४८%), मगर (९.५१%), नेवार (२.९२%) रहेको छ।



आयोजना प्रभावित क्षेत्र अन्तर्गत कास्की जिल्लामा पोखरा लेखनाथ महानगरपालिका र रुपा गाउँपालिका र तनहुँ जिल्लामा व्यास नगरपालिका, म्याग्दे गाउँपालिका र रिसिङ्ग गाउँपालिका रहेका छन् । उल्लेखित आयोजना प्रभावित गाउँपालिका, नगरपालिका र महानगरपालिकाको कुल क्षेत्रफल १७००.०५ वर्ग कि.मी. र जनसंख्या ५३६,२२१ रहेको छ जसमा पुरुष २५१,५५२ (४६.९१%) र महिला २८४,६६९ (५३.०९%) रहेको छ । त्यसैगरी, आयोजना प्रभावित क्षेत्रमा कुल घरधुरी संख्या १३०,८९१ रहेको छ भने औषत घरधुरी संख्या, लिङ्ग अनुपात र प्रति वर्ग कि.मी. जन घनत्व क्रमशः ४.१०, ८८.४ र ३१६ रहेको छ । यस क्षेत्रमा रहेका मुख्य जात/जातीय समूहहरूमा ब्राम्हण-पहाडी (२४.३२%), क्षेत्री (१४.७२%), गुरुङ्ग (१४.१५%), दलित (१२.९३%), मगर (१३.२७%), नेवार (६.१३%), तामाङ्ग (२.३१%), ठकुरी (१.६५%), मुस्लिम (१.२४%) र अन्य (१०.६५%) रहेका छन् । दलित समूह अन्तर्गत कामी, दमाइ, सार्की समूह रहेको देखिन्छ । त्यसैगरी, आयोजना क्षेत्रमा बोलिने मुख्य भाषाहरूमा नेपाली (७४.६०%), गुरुङ्ग (९.७५%), मगर (६.७९%), नेवार (३.०३%), तामाङ्ग (१.१९%) र अन्य (४.६५%) रहेका छन् । आयोजना क्षेत्रको औषत साक्षरता दर ८२.७४% (९०.४०% पुरुष र ७६.१०% महिला) रहेको छ । आर्थिक रूपमा सक्रिय जनसंख्या (उमेर समूह १५-५९ सम्म) ६१.९% रहेको छ भने प्रमुख पेशा कृषि तथा पशुपालन, नोकरी र वैदेशिक रोजगार रहेको छ ।

आयोजनाबाट प्रत्यक्ष प्रभावित हुने घरधुरीहरू मध्ये कुल ६९ घरधुरीको छनौट गरी उनीहरूको सामाजिक, आर्थिक सर्वेक्षण गरिएको छ । नमुना सर्वेक्षण गरिएका घरधुरीहरूको कूल जनसंख्या (४३३) मध्ये २२० (५०.८१%) पुरुष तथा २१३ (४९.१९%) महिला रहेका छन् भने औषत घरधुरी संख्या ६३ रहेको छ । आयोजनाबाट प्रभावित परिवारहरूको प्रमुख धर्म हिन्दु तथा बौद्ध रहेको छ जसमा हिन्दु धर्म मान्ने घरधुरी ७८.२६%, तथा बौद्ध धर्म मान्ने घरधुरी २१.७४% रहेका छन् । सर्वेक्षण गरिएका जनसंख्याको करिब ८७.९% साक्षर जनसंख्या पाइयो जसमा पुरुष ९७.५५% र महिला ७८.११% रहेका छन् । यी परिवारको मुख्य पेशा कृषि रहेको छ । करिब २३.३१% घर परिवार कृषि तथा कृषिसंग सम्बन्धित कार्यमा नै संलग्न रहेका छन् । त्यसैगरी कृषिका अतिरिक्त श्रमिक (मुलुक भित्र तथा मुलुक बाहिर), साना व्यापार व्यवसाय तथा घरायसी काम विशेष गरेर महिलाहरूद्वारा गरिने नै अध्ययन क्षेत्रको बासिन्दाको प्रमुख पेशा रहेको छ । उनीहरूको जग्गामा उत्पादन हुने प्रमुख उत्पादनमा धान, मकै, गहुँ, तथा कोदो पाइएको छ ।

नमुना घरधुरी सर्वेक्षण अनुसार औषत् वार्षिक आम्दानी रु. ४८२,८२६/- छ र आम्दानीको श्रोतमा कृषि तथा पशुपालन रहेको छ । आम्दानीको अन्य श्रोत अन्तर्गत व्यापार, विप्रेषण, नोकरी, दैनिक ज्याला मजदुरी तथा बृद्ध भत्ता आदि रहेको छ । त्यसैगरी सर्वेक्षण गरिएका घरधुरीहरूको वार्षिक औषत खर्च रु. ४०२,३८२/- रहेको छ । आम्दानी र खर्चको रकम हेर्दा वार्षिक औषत बचत रु. ८०,४४४/- हुने देखिन्छ ।

६.० वातावरणीय प्रभाव

६.१ भौतिक वातावरण

आयोजना निर्माणको चरणमा स्थायी र अस्थायी रूपमा लिइने जग्गालाई नै प्रस्तावित आयोजनाको भौतिक वातावरणमा पर्ने प्रमुख प्रभावको रूपमा लिइएको छ । आयोजनाको टावर निर्माण, सबस्टेशन निर्माण, क्षेत्राधिकार (RoW) तथा अन्य अस्थायी प्रयोजनको लागि कूल १३४.६१२५ हे. जग्गा अधिग्रहण गरिने छ । यसरी अधिग्रहण गरिने जमिन मध्ये ९.३६७५ हे. स्थायी रूपमा सबस्टेशन, तथा टावर प्याड को लागि लिइनेछ भने बाँकी १२५.२४५० हे. प्रसारण लाईनको क्षेत्राधिकार (RoW)को लागि लिइने छ । प्रसारण लाईन अन्तर्गत जम्मा ४३ वटा एंगल टावर तथा ७९ वटा सस्पेन्सन टावरहरू निर्माण हुनेछन् र प्रत्येक टावरले १५ मि.×१५ मि. अर्थात् ०.०२२५ हे. क्षेत्रफल ओगट्ने छ । समग्रमा ७८ वटा टावर (२७ एङ्गल र ४९ सस्पेन्सन) खेतीयोग्य जमिनमा, २४ वटा टावर (९ वटा एङ्गल र १५ वटा सस्पेन्सन) वन क्षेत्रमा तथा बाँकी २३ वटा टावर (८ एङ्गल र १५ सस्पेन्सन) बाँझो जमिनमा रहने छन् ।

६.२ जैविक वातावरण

टावर र प्रसारण लाईन निर्माणको क्रममा जम्मा ३४.९८८४ हे. जग्गा वन क्षेत्रको पर्नेछ । यस मध्ये ०.७ हे. राष्ट्रिय वनमा र २१.६९४७ हे. सामुदायिक वनमा पर्नेछ । यसका अतिरिक्त १२.५९३७ हे. जमिन निजी बुट्यान क्षेत्रमा पर्नेछ जसमा विशेषगरी केही रुखविरुवाहरू र भाडिहरू रहेका छन् जसलाई स्थानीयले भुइँघाँस/डालेघाँस संकलनको लागि प्रयोग गर्छन् ।

आयोजनामा पर्ने बोटविस्वाहरूको सन्दर्भमा, २३ विभिन्न प्रजातीहरूका करिब १४,१६० रुखहरू आयोजना निर्माणको क्रममा कटान गर्नुपर्ने देखिन्छ, जस अन्तर्गत पोल आकारका करिब ७९.२४% र रुख आकारका २०.७६% रहने छन्। यसरी काटिने रुखहरूमा चिलाउने सबैभन्दा बढि ५०४० वटा (३५.५९%) रहेको छ भने अन्यमा साल ४८९० वटा, कटुस १७४० वटा, सल्लो ६०० वटा, खिर्रो ३६० वटा, पङ्के ३६० वटा, बोटघाँरो ३३० वटा रहेको छ। अन्यमा कम संख्यामा लाकुरी, फलात र उत्तिस जातिका रुखहरू रहेका छन्।

६.३ आर्थिक, सामाजिक तथा सांस्कृतिक वातावरण

प्रस्तावित आयोजना निर्माण गर्दा उक्त आयोजनाले जमिन, अन्नवाली, आवासिय घर, अन्य संरचनाहरू र सामाजिक तथा सांस्कृतिक वातावरणमा सामान्य प्रभाव पर्ने देखिन्छ। नमुना सर्वेक्षण गरिएको कुल ६९ घरधुरीहरू मध्ये ५१ घरधुरीहरूको जग्गा, ४ घरधुरीहरूको जग्गा तथा संरचना दुवै र १४ घरधुरीको संरचनाहरू हटाउनु पर्ने हुन्छ। २२.९८१ कि.मी. लामो प्रसारण लाइन आयोजनाले करिब १०६.६०४२हे. निजि जमिनमा प्रभाव पार्नेछ। उक्त जमिन मध्ये ८.३३२५हे. जमिन स्थायी रूपमा (एड्गल टावर, सस्पेन्सन टावर, सबस्टेशन, स्वीचिङ्ग स्टेशन, म्याम्प र स्टोरेज निर्माणको लागि) अधिग्रहण गरिनेछ। प्रस्तावित सबस्टेशन खेतियोग्य जमिनमा रहनेछ जसले करिब ६.०हेक्टर निजि जमिन अधिग्रहण गर्नेछ। यसको आधारमा प्रभावित घरपरिवारको वार्षिक करिब ३३.६३ मे.ट. अन्नवाली (धान १५.७५मे.टन, मकै ११.९८मे.टन र कोदो २.०६ मे.टन) स्थायी अधिग्रहणबाट र १६४.९१मे.टन (धान ५८.७४ मे.टन मकै ७८.२५ मे.टन, गहुँ १२.५८ मे.टन र कोदो १५.३४ मे.टन) अन्नवाली अस्थायी अस्थायी उपभोग गरिने जग्गाबाट नष्ट हुने देखिन्छ।

७.० वैकल्पिक विश्लेषण

अध्ययनको क्रममा आयोजनाको वैकल्पिक विश्लेषण स्थलगत सर्वेक्षण गरिएको छ। आयोजनाको प्रसारण मार्गको छनौट गर्दा खोला, नदी, राष्ट्रिय राजमार्ग, राष्ट्रिय प्रसारण लाइन, टेलिफोन लाइन, घना वस्तीहरू, वन क्षेत्र, ऐतिहासिक तथा सांस्कृतिक सम्पदाहरू तथा अन्य संवेदनशील क्षेत्रहरूलाई सकेसम्म न्यून प्रभाव पर्ने गरी उत्तम विकल्पको रूपमा यस प्रसारण मार्गलाई प्रस्ताव गरिएको छ।

८.० प्रभाव न्यूनीकरणका उपायहरू

८.१ भौतिक वातावरण

भौतिक वातावरणमा पर्ने प्रभावलाई न्यूनीकरण गर्नको लागि सकेसम्म कम जमिन तथा मानव वस्तीहरूमा क्षति पुग्ने गरी आयोजनाको निर्माण गरिने छ। टावर तथा सबस्टेशन निर्माणको क्रममा निस्किएको माटोलाई निर्माण पश्चात पूर्ववत रूपमा राख्नुका साथै टावर निर्माणपूर्व सो स्थानको स्थिरताको लागि अति संवेदनशील स्थानहरूको परिक्षण गरी छुट्टै बनावट (design)को टावरहरूको निर्माण गरिनेछ। त्यसैगरी अस्थिर जमिनमा टावर निर्माण प्रतिबन्ध गर्नुका साथै आवश्यकतानुसार बायो ईन्जिनियरिङ कार्य पनि गरिनेछ।

८.२ जैविक वातावरण

प्रभाव न्यूनीकरणको लागि कटान गर्नुपर्ने रुखहरूको क्षतिपूर्ति स्वरूप वृक्षारोपण कार्य गरिनेछ। वृक्षारोपण गरिने क्षेत्र सम्बन्धित जिल्ला वन कार्यालयहरू र सामुदायिक वन उपभोक्ता समूहहरूसँग समन्वय गरी सम्बन्धित निकायबाट निर्धारण गरिनेछ। आयोजनाका कामदारहरू तथा स्थानियवासीहरूलाई वनजंगल तथा वन्यजन्तु संरक्षण सम्बन्धी जानकारी दिन विशेष निर्देशन तथा सचेतनामुलक तालिम कार्यक्रम संचालन गरिनेछ। आयोजनाका कामदारहरूलाई अवैधानिक रूपमा रुखहरू कटान गर्न तथा जंगल अधिग्रहण गर्न रोक लगाईने छ। वनको विनास रोक्नको लागि ठेकेदारले कामदारहरूलाई मृष्टीतेलको व्यवस्था गर्ने छ। यसका साथै कामदारहरूलाई वन क्षेत्रमा गैरकानूनी गतिविधि गर्न रोक लगाइनेछ।

८.३ आर्थिक सामाजिक तथा सांस्कृतिक वातावरण

जग्गाको क्षतिपूर्ति

स्थायी रूपमा अधिग्रहण वा उपयोग गरिने जमिनको क्षतिपूर्ति मुआब्जा निर्धारण समितिले निर्धारण गरे बमोजिम आयोजनाले प्रदान गर्नेछ। 'जग्गा प्राप्ती ऐन २०३४' अनुसार आयोजना र प्रभावित परिवार बिचको आपसी समझदारीमा आवश्यक जग्गा अधिग्रहण गरिने छ।

उत्पादन क्षतिपूर्ति

आयोजना निर्माणको क्रममा अन्नवालीमा क्षति पुग्ने देखिन्छ । स्थायी रुपमा अधिग्रहण गर्ने जमिनबाट कुल ३३.६३मे. टन खाद्यान्न नष्ट हुने देखिन्छ भने १६४.९१मे.टन खाद्यान्न अस्थायीरुपमा निर्माण अवधिभर नष्ट हुने देखिन्छ । उक्त खाद्यान्न क्षतिपूर्तिको लागि जम्मा रु ५,८०७,२२०।-खर्च हुने देखिन्छ ।

संरचनाहरूको क्षतिपूर्ति

आयोजनाबाट प्रभावित हुने बाह्र वटा घर, नौ वटा गोठ, एक शौचालय र एक पोल्टी फार्म (व्यवसायिक संरचनाहरू) को क्षतिपूर्ति रु १०,५८३,१५०।- हुने देखिन्छ । प्रभावित परिवारहरूमा पर्ने असरलाई न्यूनिकरण गर्न अस्थाई रोजगारी प्रदान गरिनेछ ।

स्वास्थ्य, सरसफाई तथा सुरक्षाका कार्यक्रमहरू

स्थानिय जनताहरूलाई स्वास्थ्य, सरसफाई र सुरक्षा सम्बन्धि हुनसक्ने संभावित खतराबाट सचेत गराउनको लागि आयोजना प्रभावित क्षेत्रमा सचेतनामुलक कार्यक्रमहरू संचालन गरिनेछ । यस्ता कार्यक्रममा आयोजना क्षेत्रभित्र र वरिपरि बसोबास गर्ने जनतालाई लक्षित गरिने छ ।

कृषिजन्य तालिम कार्यक्रम

आयोजनाबाट प्रत्यक्ष प्रभावित जनता तथा न्युन आय भएका घरपरिवारको क्षमता अभिवृद्धी गर्न उनीहरू बसोबास गरेकै स्थानमा च्याउ खेती र सुन्तला प्रजाति (*Citrus species*)को खेती सम्बन्धि तालिम संचालन गरिने छ ।

विद्यालय सहयोग कार्यक्रम

प्रसारण लाईन मार्गमा पर्ने गाउँपालिका, नगरपालिका तथा महानगरपालिकाका सम्बन्धित वार्डहरूमा पर्ने कमजोर अवस्थामा रहेका विद्यालयहरूलाई आवश्यकता अनुसार वित्तिय सहयोग प्रदान गरिनेछ । यस्तो सहयोग कम्प्युटर खरिद, पुस्तकालय स्थापना, खानेपानीको व्यवस्थापन, स्कूल खेल मैदानको विकास तथा अतिरिक्त क्रियाकलापहरू जस्ता कार्यहरूमा प्रदान गरिनेछ।

९.० वातावरणीय अनुगमन

आयोजनाको प्रभावकारी निर्माण गर्नको लागि वातावरण न्यूनिकरणका कार्यक्रमहरू, अनुगमन योजना, सरोकारवालाले उठाएका विभिन्न समस्याहरू आदि समाधान गर्नको लागि आयोजनास्थलमा एउटा वातावरणीय अनुगमन इकाई (EMU) को गठन गरिने छ । यस इकाईमा वातावरण तथा सामाजिक अध्ययन विभागका विभिन्न क्षेत्रका विशेषज्ञहरूको साथै आवश्यकता अनुसार स्थानिय स्तरमा रहेका व्यक्तिहरूलाई समेत संलग्न गरिने छ ।

१०.० निष्कर्ष

यस प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदनमा उल्लेख भए अनुसार आयोजनाको कार्यान्वयनको लागि कुल १३४.६१२५हे. जमिनको आवश्यकता पर्ने देखिन्छ । आयोजनाले अधिग्रहण गर्ने कुल १३४.६१२५हे. जमिन मध्ये खेतियोग्य जमिन ९२.६९३हे., वनक्षेत्र ३४.९८८४हे., बाँझो ३.६०७४हे. र अन्य जमिन ३.३२३३हे. रहनेछ । करिव १७,३६० रुखहरू (राष्ट्रिय वन तथा सामुदायिक वन क्षेत्रको १,४१६० वटा र निजी क्षेत्रको ३,२०० वटा) कटान गर्नु पर्नेछ । यस आयोजनाको कुल वातावरणीय तथा सामाजिक लागत (न्यूनिकरण, अभिवृद्धि र सामाजिक उत्तरदायित्व) रु ३२३,१५८,३८१।- लाग्ने अनुमान गरिएको छ जसमा प्रभाव न्यूनिकरणका कार्यक्रमहरूको साथसाथै अनुगमन कार्य पनि समावेश गरिएको छ । उक्त लागत आयोजनाको कूल लागतको ४.३१%ले हुन आउँछ ।

प्रस्तुत प्रस्तावको कार्यान्वयन गर्दा माथि प्रस्तुत गरिएको न्यूनिकरणका उपायहरू र अनुगमन योजना अनुसार गरिएको खण्डमा यो आयोजना सामाजिक र वातावरणीय दृष्टिकोणले उपयुक्त देखिन्छ ।

ABBREVIATIONS AND ACRONYMS

ACSR	:	Aluminum Conductor Steel Reinforced
AGTB	:	Above Ground Tree Biomass
AM	:	Amplitude Modulation
AP	:	Angle Point
CAAN	:	Civil Aviation Authority of Nepal
CBO	:	Community Based Organization
CBS	:	Central Bureau of Statistics
CDO	:	Chief District Officer
CF	:	Community Forest
CFUG	:	Community Forest Users' Group
CFC	:	Compensation Fixation Committee
CSR	:	Corporate Social Responsibility
DBH	:	Diameter at Breast Height
DCC	:	District Coordination Committee
DDC	:	District Development Committee
DFO	:	District Forest Office
DHM	:	Department of Hydrology and Meteorology
DoED	:	Department of Electricity Development
DSO	:	District Statistics Office
EIA	:	Environmental Impact Assessment
EMF	:	Electromagnetic Field
EMU	:	Environment Monitoring Unit
EPR	:	Environment Protection Rules
ESSD	:	Environment and Social Studies Department
FM	:	Frequency Modulation
FY	:	Fiscal Year
GoN	:	Government of Nepal
GIS	:	Geographical Information System
GPS	:	Global Positioning System
HHs	:	Households
IEE	:	Initial Environmental Examination
LCF	:	Local Consultative Forum
LDTLP	:	Lekhnath-Damauli 220kV Transmission Line Project
KII	:	Key Informant Interview
MC	:	Metropolitan City
MoEn	:	Ministry of Energy
MoFSC	:	Ministry of Forests and Soil Conservation
NEA	:	Nepal Electricity Authority
NEPAP	:	Nepal Environmental Policy and Action Plan
NGO	:	Non-Governmental Organization
NTFP	:	Non-Timber Forest Products
PAA	:	Project Affected Area
PADs	:	Project Affected Districts
PAF	:	Project Affected Family
PAP	:	Project Affected Person
PRA	:	Participatory Rural Appraisal
RM	:	Rural Municipality



RoW	:	Right of Way
RRP	:	Resettlement and Rehabilitation Plan
SPAF	:	Seriously Project Affected Family
ST	:	Suspension Tower
SWCA	:	Soil and Watershed Conservation Act
TL	:	Transmission Line
ToR	:	Terms of Reference
VDC	:	Village Development Committee

Units

AD	:	Anno Domini
BS	:	Bikram Sambat
⁰ C	:	Degree Centigrade
ha	:	Hectare
km	:	Kilometer
kV	:	Kilo Volt
mm	:	Millimeter
m ²	:	Square meter
MW	:	Megawatt
sq. km.	:	Square Kilometer



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1 INTRODUCTION

1.1 Proponent

Nepal Electricity Authority (NEA), the major electricity generator and sole agency responsible for transmission and distribution of electricity, is the proponent of the proposed **Lekhnath-Damauli 220kV Transmission Line Project (LDTLP)**. The Ministry of Energy (MoEn) has granted a survey license on BS 2072/11/02 to NEA for feasibility and Initial Environmental Examination (IEE) which is valid up to BS 2074/11/01. A copy of survey license is attached in Appendix-A.

The contact address of the project proponent is as follows:

Nepal Electricity Authority,
Durbarmarg, Kathmandu
Phone No. : 01-4220449
Fax No. : 01-4447969

1.2 Organization Responsible for Preparation of IEE

Environment and Social Studies Department (ESSD) of NEA executes all activities related to the environmental aspects of projects studied, designed, and constructed or operated by NEA. Being the concerned department, ESSD has prepared the IEE report of this project. The IEE report is prepared as per Terms of Reference (ToR) approved by MoEn on 2073/07/02 (Appendix J). The contact address of the organization responsible for the preparation of ToR and IEE is:

Environment and Social Studies Department,
Engineering Services Directorate,
Nepal Electricity Authority,
Kharipati, Bhaktapur
Phone No. : 01-6611580; Fax No.: 01-6611590
Email : essdnea@gmail.com

1.3 Rationality for Conducting IEE

As per the Environment Protection Rules (EPR), 2054 and the amendment (published in BS 2065/11/26 on Nepal Gazette) made in EPR, 2054, Rule-3, Schedule-1, Clause-E, Sub-clause 1(c); for any TL of voltage level 132kV or above, an IEE is mandatory. Similarly, for any projects requiring forest area more than 5ha, an EIA is prescribed by EPR, 2054 (Rule-3, Schedule-2, Clause-A, Sub-clause 12). The government forest area (government forest and community forest) required by this project is about 22.3947ha. Though the requirement of forest area (more than 5ha) for the project mandates for EIA, the amendment in the EPR (2066/10/13 BS) states IEE is sufficient irrespective of forest area requirement for TL projects (Rule-3, Schedule-1, Clause-F, Sub-clause 1-a).

Similarly, as per Rule-3, Schedule-2, Clause-K (3) of EPR, 2054; for any project located in environmentally sensitive areas such as National Parks, Wild life Reserves, Wetlands and Conservation Areas, an EIA is required. Since the project area does not lie in the national park, wildlife reserve, buffer zone, conservation Area, wetlands, historically and archaeologically important sites and or environmentally sensitive/fragile areas, IEE is sufficient for the environmental study.

1.4 Scope of IEE

The major components of this project include one substation (Belbas), one switching station, 42.254km TL (37.401km double circuit and 4.853km four circuit), 123 towers (44 APs and 79 STs) and its Right of Way (RoW) of 30m with 15m on either side of TL. This IEE includes the



environmental examination of impacts of all the components mentioned above and proposed ways to mitigate the negative impacts.

1.5 Objective of IEE

The aim and objective of the IEE is to assess and inform decision makers by identifying the potentially significant environmental effects and risks of the proposed project and to suggest appropriate mitigation measures to mitigate and/or minimize the adverse impacts so that the project is implemented in an environmentally sound manner. The specific objective of the study is to prepare an IEE report. The other general objectives of the study are to:

- Document physical, biological, socio-economic and cultural baseline conditions of project area;
- Analyze alternative TL routes;
- Identify, predict and assess the adverse and beneficial environmental impacts of the TL in project affected areas in terms of magnitude, extent and duration during project construction and operation phases;
- Suggest appropriate and pragmatic mitigation and enhancement measures for potential adverse impacts;
- Familiarize various stakeholders with the IEE outcomes through public consultation and participation programs and to incorporate their relevant concerns and issues;
- Prepare an environment monitoring plan; and
- Facilitate informed decision making including setting the environmental terms and conditions for implementing the proposed project.

1.6 Structure of the Report

The IEE report is divided into ten chapters. Chapter-2 contains a brief description of the project, including the TL and substation, construction planning and project area delineation. Chapter-3 discusses about the data requirement and the methodology adopted for the collection of data on physical, biological, socioeconomic and cultural environment of the area. This chapter also highlights the techniques used for data analysis and impact assessment. Chapter-4 deals with the national acts, policies, rules and guidelines referred while preparing the report.

The existing environmental conditions of the project area with respect to physical, biological and socioeconomic and cultural environment is given in Chapter-5. Chapter-6 highlights the positive and adverse impacts likely to occur due to implementation of the project. Chapter 7 analyses the different alternatives of the project. The mitigation and enhancement measures are presented in Chapter-8. Chapter-9 deals with the environmental monitoring plan and Chapter-10 conclusion of the study.



2 PROJECT DESCRIPTION

The under construction Tanahun Hydroelectric Project (HEP) of Tanahun district has proposed its 220kV transmission line to Bharatpur substation as a major evacuation plan. In addition, LDTLP is considered as a power evacuation option for energy generated from Tanahun HEP to the nearest load centre of Pokhara Lekhnath Metropolitan City (MC). The objective of the LDTLP is to improve the supply situation of the whole nation by connecting with the national grid. LDTLP is proposed to be constructed by NEA. It consists of 220kV TL, 132kV TL, Switching Station and one proposed substation at Belbas of Byas Municipality as project major components. Expanding some foot trail and feeder road shall be the minor components of the project in order to ease the transportation work and placement of towers. It starts from existing substation at Lekhnath, traverse through project affected area (PAA) such as three rural municipalities (RMs), one municipality and one MC of Kaski and Tanahun District and ends at proposed Belbas substation. It is 42.254km in length and double circuit to carry 600MW power. In addition, there is a four circuit line from angle point (AP) 36 to AP 43. This four circuit consists of 220kV line above 132kV line. It is of 4.853km in length. There shall be a switching station near AP 36 in order to switch existing 132kV TL to the Belbas Substation.

2.1 Project Location

The proposed project is located in Gandaki zone, Province No. 4 of the Central part of Nepal (Figure 2-1). The TL passes through two districts namely: Kaski and Tanahun. These are termed as project affected districts (PADs). In total three RMs (one of Kaski and 2 of Tanahun), one municipality in Tanahun and one MC in Kaski District will be affected by the project. These affected RMs (गाउँपालिका) are Rupa (रूपा) of Kaski, Myagde (म्याग्दे) and Rishing (रिशिंग) of Tanahun. Similarly Byas (ब्यास) Municipality and Pokhara Lekhnath MC (पोखरा लेखनाथ) also lies along the alignment. The project location map has been presented in Figure 2-1. The PAA along the TL are listed in salient features (Table 2-2) below and TL map has been presented in Figure 2-3.

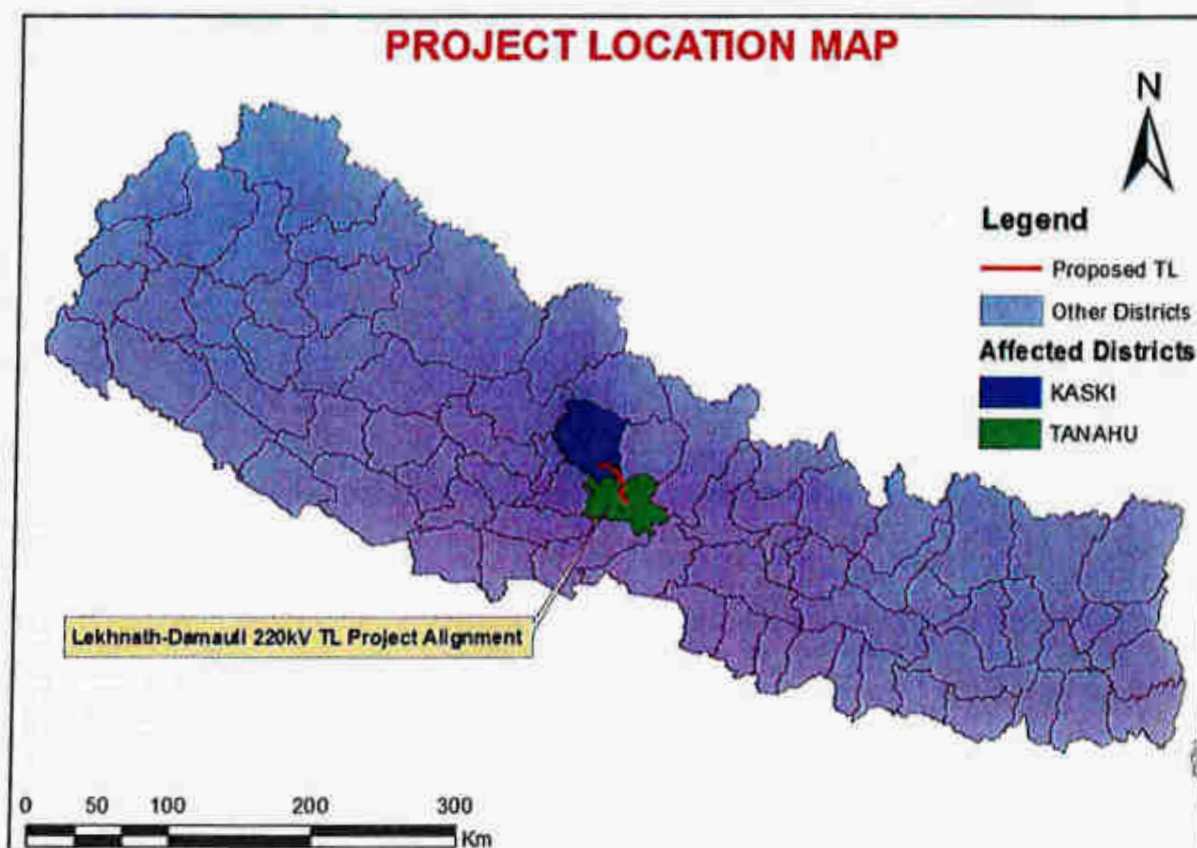
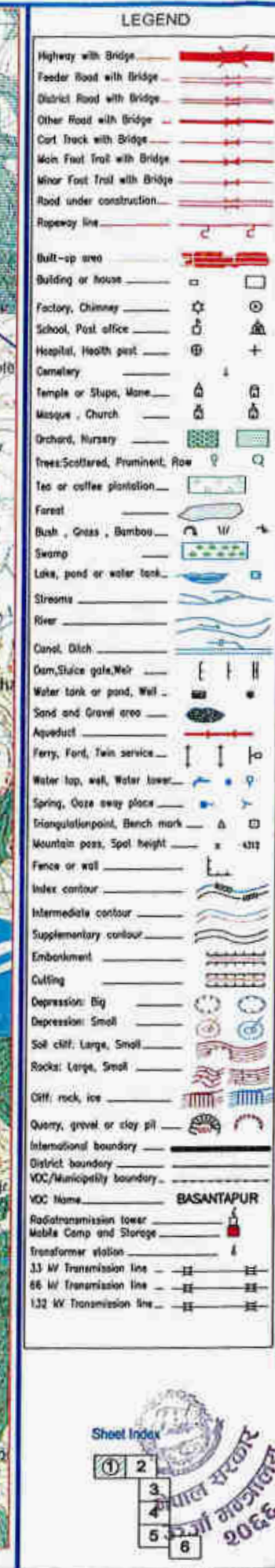
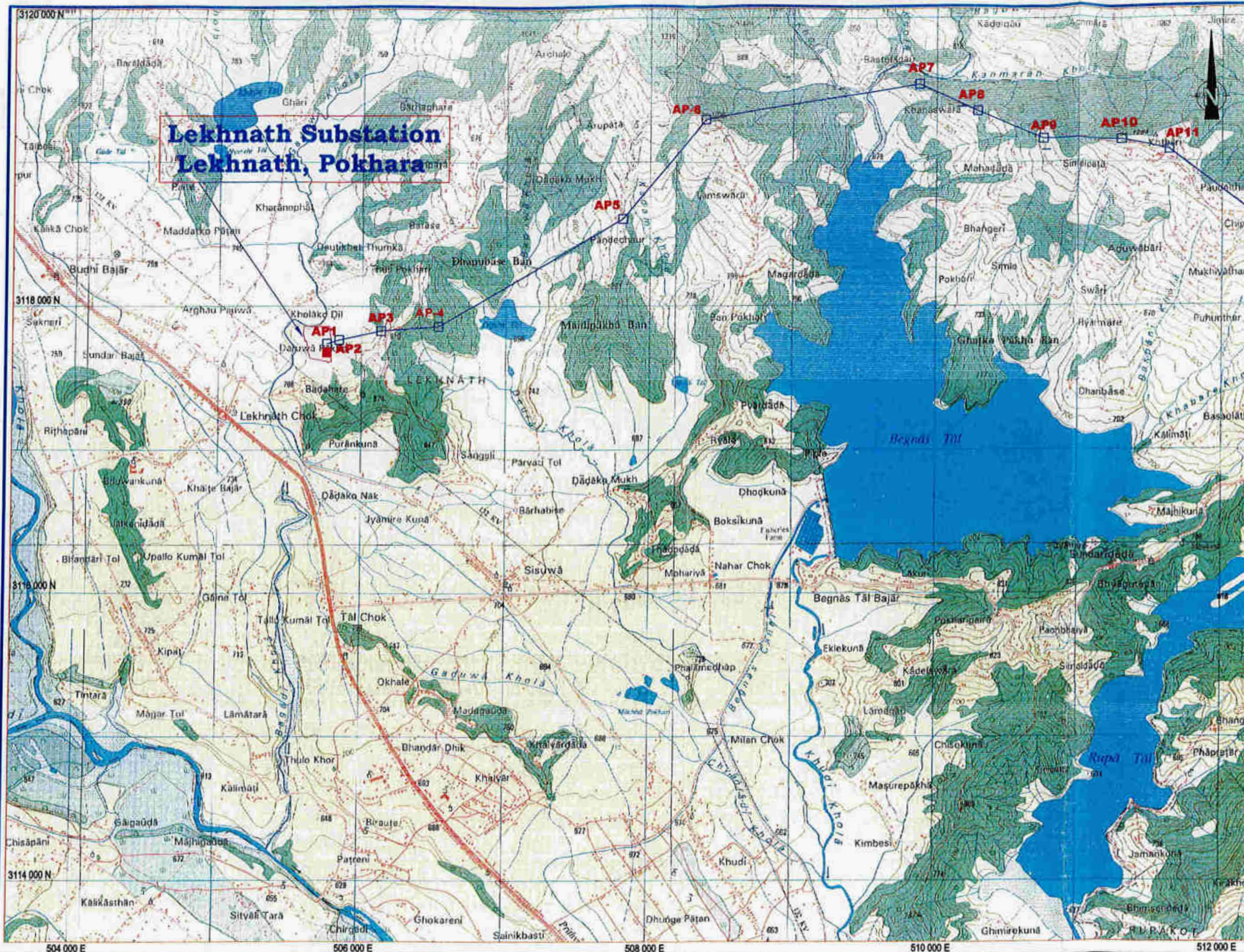
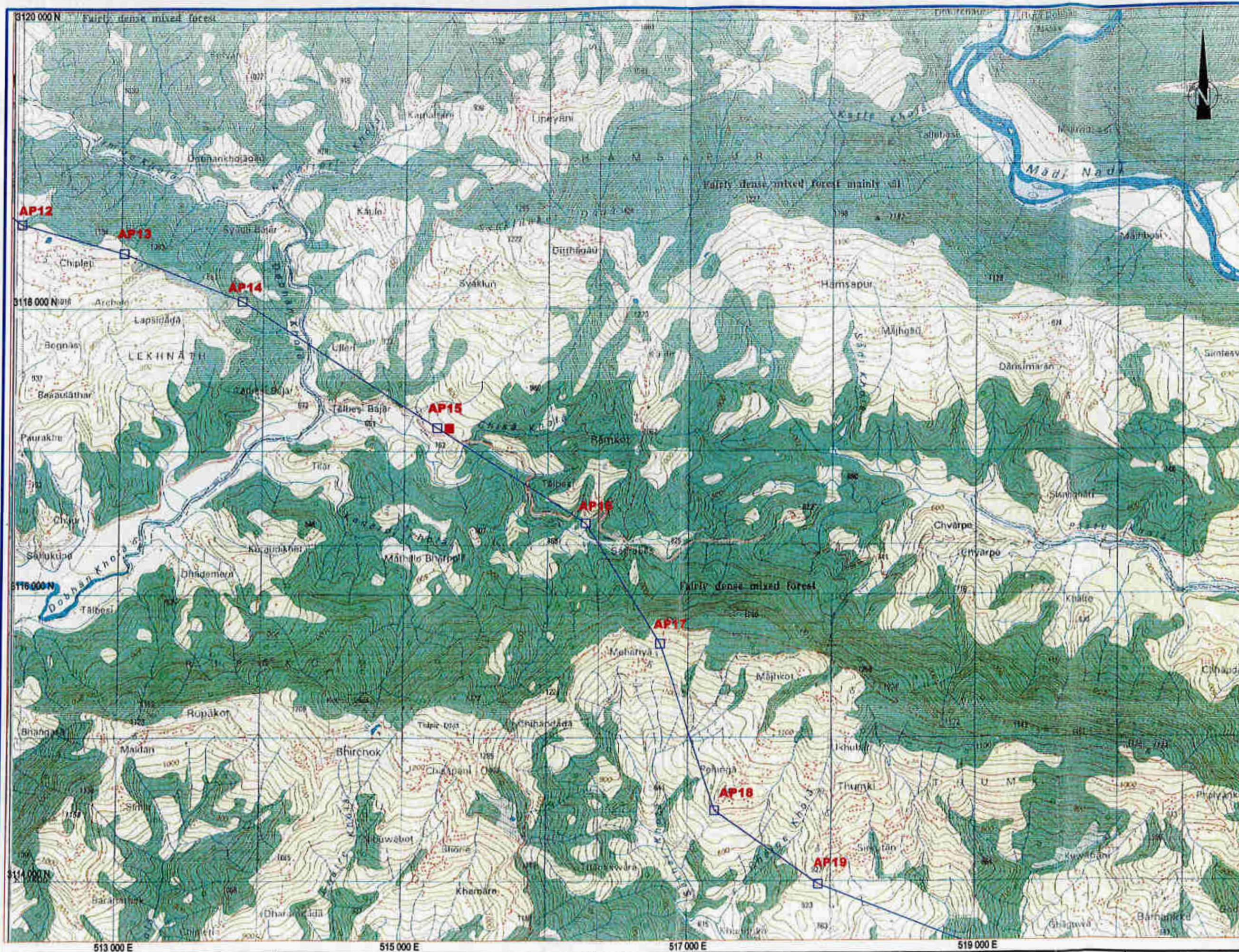


Figure 2-1: Project Location Map

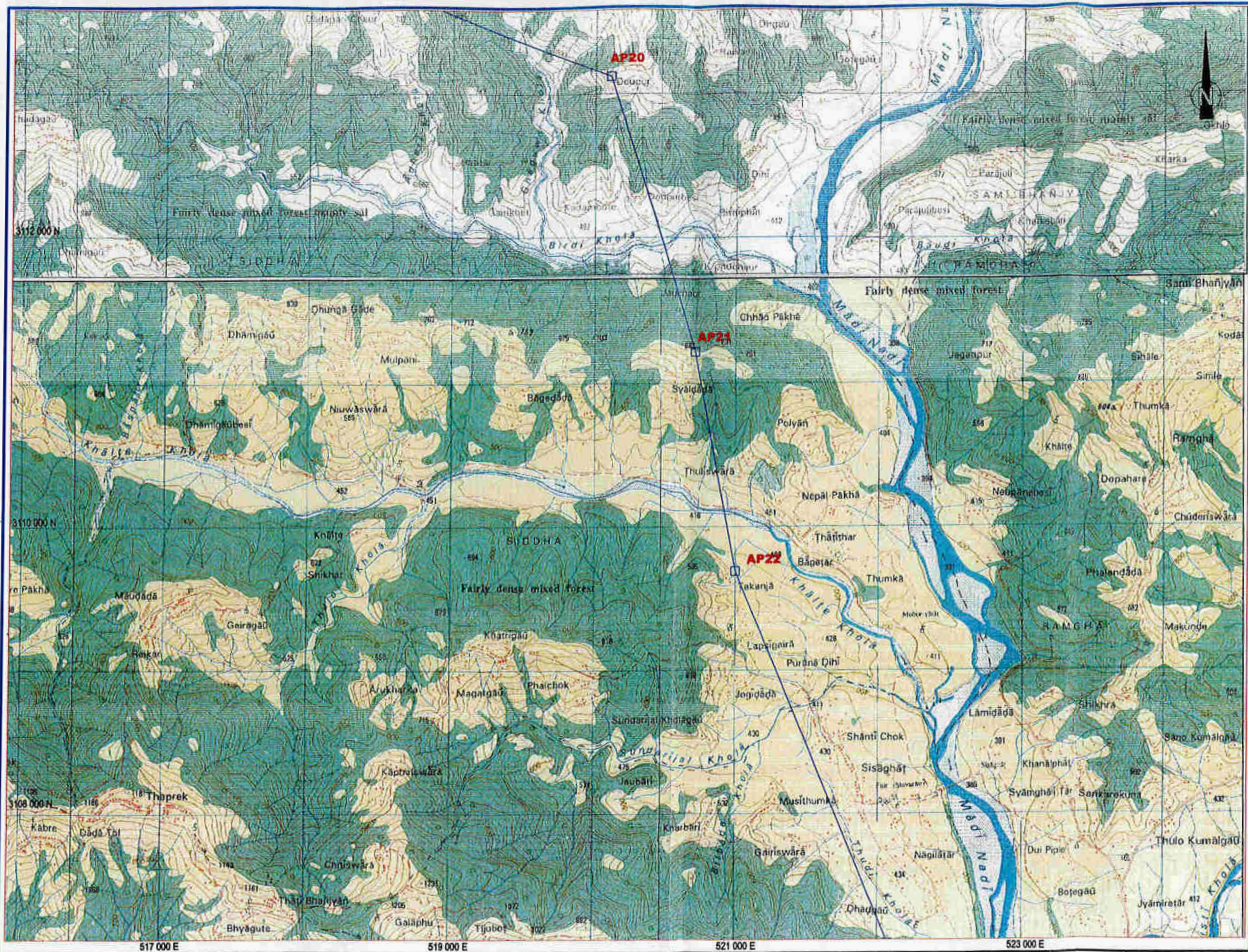
Source: GIS Analysis





LEGEND	
Highway with Bridge	
Feeder Road with Bridge	
District Road with Bridge	
Other Road with Bridge	
Cort Track with Bridge	
Main Foot Trail with Bridge	
Minor Foot Trail with Bridge	
Road under construction	
Roadway line	
Built-up area	
Building or house	
Factory, Chimney	
School, Post office	
Hospital, Health post	
Cemetery	
Temple or Stupa, Wane	
Mosque, Church	
Orchard, Nursery	
Trees: Scattered, Prominent, Row	
Tee or coffee plantation	
Forest	
Bush, Grass, Bamboo	
Swamp	
Lake, pond or water tank	
Stream	
River	
Canal, Ditch	
Dam, Sluice gate, Weir	
Water tank or pond, Well	
Sand and Gravel area	
Aqueduct	
Ferry, Ford, Twin service	
Water tap, well, Water tower	
Spring, Oase way place	
Triangulation point, Bench mark	
Mountain pass, Spot height	
Fence or wall	
Index contour	
Intermediate contour	
Supplementary contour	
Embankment	
Cutting	
Depression: Big	
Depression: Small	
Soil cliff: Large, Small	
Rocks: Large, Small	
Cliff: rock, ice	
Quarry, gravel or clay pit	
International boundary	
District boundary	
VDC/Municipality boundary	
VDC Name	BASANTAPUR
Radiotransmission tower	
Mobile Camp and Storage	
Transformer station	
33 kV Transmission line	
66 kV Transmission line	
132 kV Transmission line	

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LEGEND

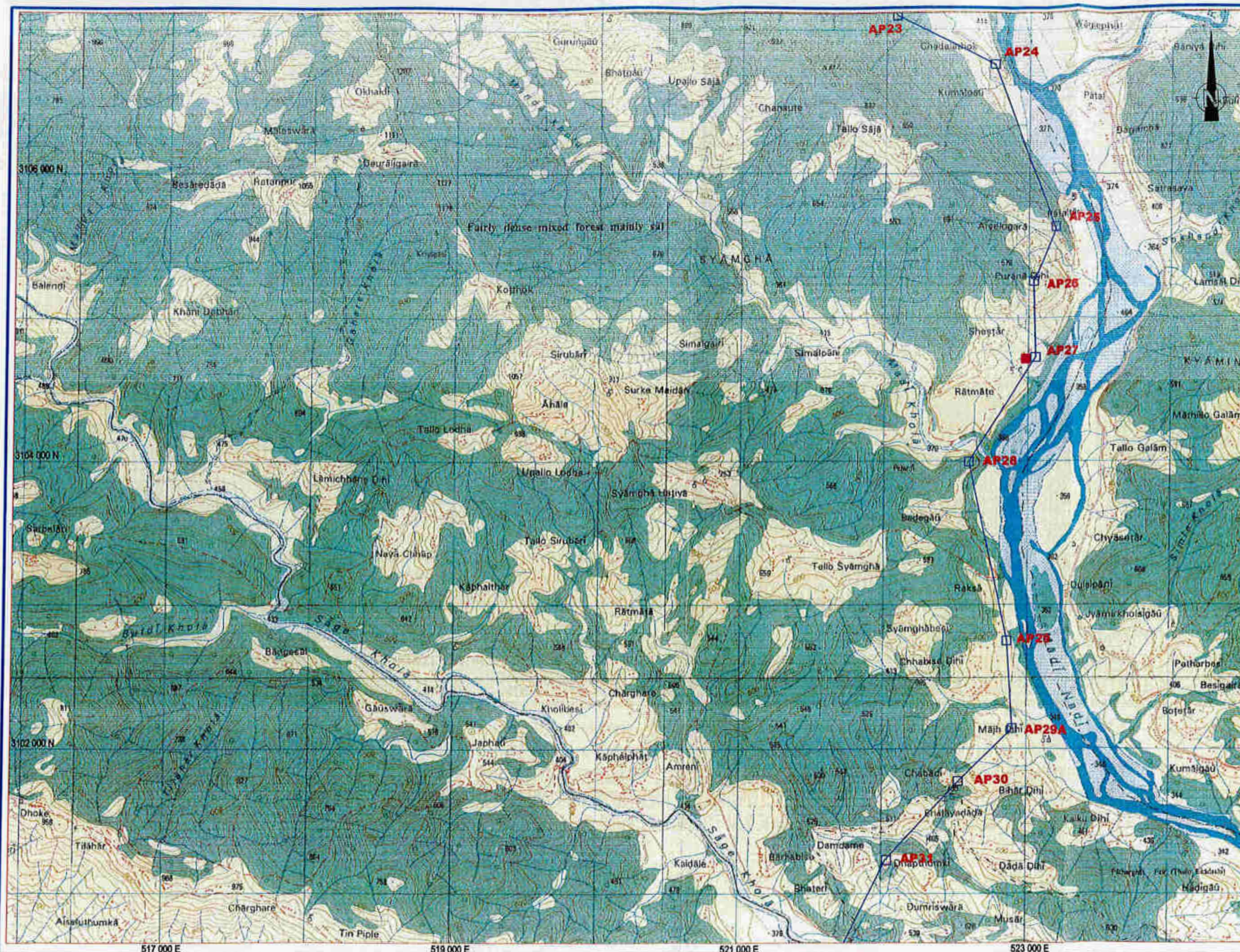
Highway with Bridge	
Feeder Road with Bridge	
District Road with Bridge	
Other Road with Bridge	
Cart Track with Bridge	
Main Foot Trail with Bridge	
Minor Foot Trail with Bridge	
Road under construction	
Railway line	
Built-up area	
Building or house	
Factory, Chimney	
School, Post office	
Hospital, Health post	
Cemetery	
Temple or Shiva, Mon	
Mosque, Church	
Orchard, Nursery	
Trees/Groffered, Prominent, Row	
Tee or coffee plantation	
Forest	
Bush, Grass, Bamboo	
Swamp	
Lake, pond or water tank	
Streams	
River	
Canal, Ditch	
Dam, Sluice gate, Weir	
Water tank or pond, Well	
Sand and Gravel area	
Aqueduct	
Ferry, Ford, Twin service	
Water tap, well, Water tower	
Spring, Oxen way place	
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Mountain pass, Spot height	
Fence or wall	
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Intermediate contour	
Supplementary contour	
Embankment	
Cutting	
Depression: Big	
Depression: Small	
Soil cliff: Large, Small	
Rock: Large, Small	
Cliff: rock, ice	
Quarry, gravel or clay pit	
International boundary	
District boundary	
VDC/Municipality boundary	
VDC Name	
Radio transmission tower	
Mobile Camp and Storage	
Transformer station	
33 kV Transmission line	
66 kV Transmission line	
132 kV Transmission line	

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Date: February - 2011



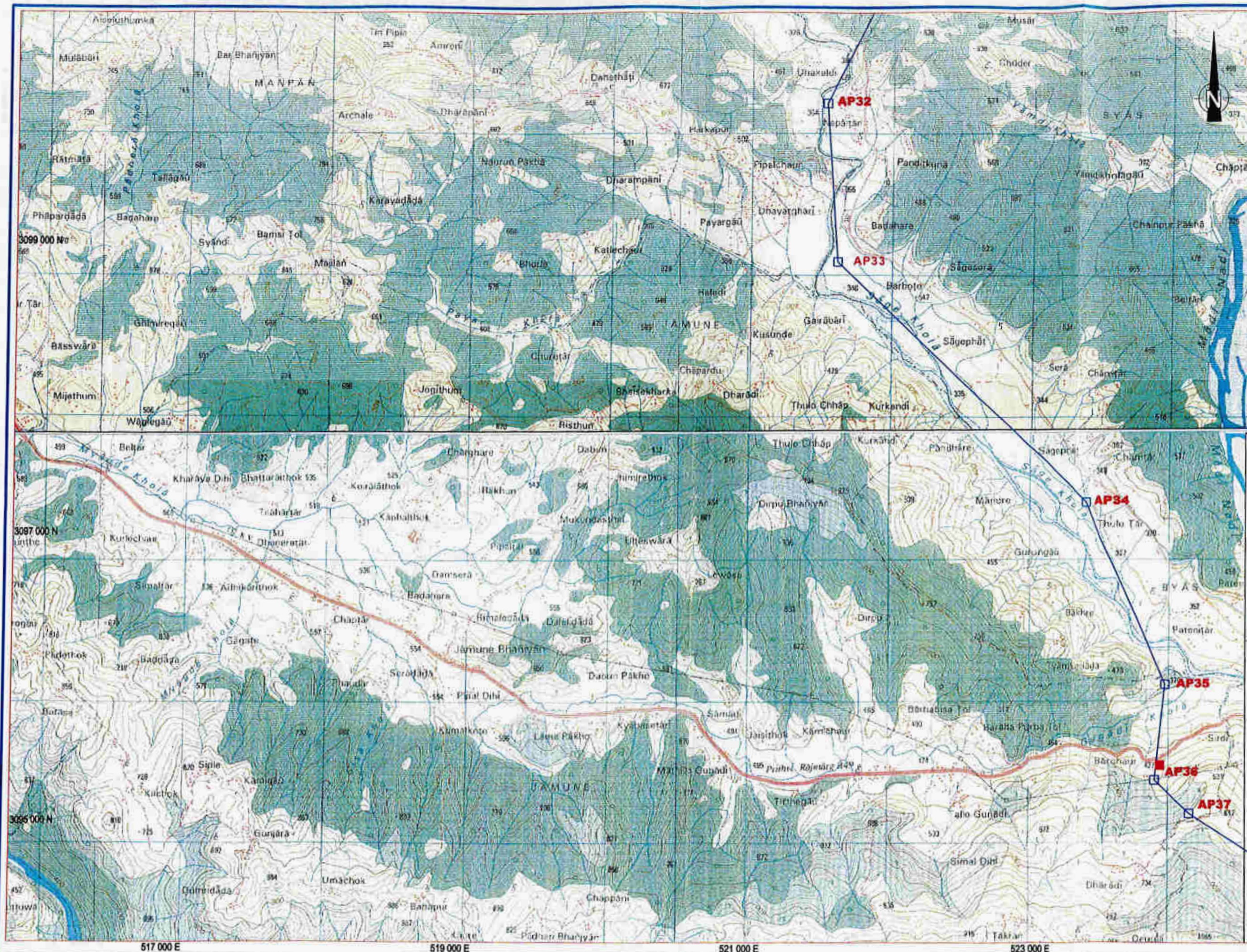
LEGEND

Highway with Bridge	
Feeder Road with Bridge	
District Road with Bridge	
Other Road with Bridge	
Cart Track with Bridge	
Main Foot Trail with Bridge	
Minor Foot Trail with Bridge	
Road under construction	
Proposed line	
Built-up area	
Building or house	
Factory, Chimney	
School, Post office	
Hospital, Health post	
Cemetery	
Temple or Stupa, Monastery	
Mosque, Church	
Orchard, Nursery	
Trees: Scattered, Prominent, Row	
Tea or coffee plantation	
Forest	
Bush, Grass, Bamboo	
Swamp	
Lake, pond or water tank	
Streams	
River	
Canal, Ditch	
Dam, Sluice gate, Weir	
Water tank or pond, Well	
Sand and Gravel area	
Aqueduct	
Ferry, Ford, Twin service	
Water tap, well, Water tower	
Spring, Ooze away place	
Triangulation point, Bench mark	
Mountain pass, Spot height	
Fence or wall	
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Supplementary contour	
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Depression: Big	
Depression: Small	
Soil cliff: Large, Small	
Rocks: Large, Small	
Cliff: rock, ice	
Quarry, gravel or clay pit	
International boundary	
District boundary	
VDC/Municipality boundary	
VDC Name	
Radiotransmission tower	
Mobile Camp and Storage	
Transformer station	
33 kV Transmission line	
66 kV Transmission line	
132 kV Transmission line	

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Scale
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SCALE 1:25,000
Date : February, 2011



LEGEND	
Highway with Bridge	
Feeder Road with Bridge	
District Road with Bridge	
Other Road with Bridge	
Cart Track with Bridge	
Main Foot Trail with Bridge	
Minor Foot Trail with Bridge	
Road under construction	
Ropeway line	
Built-up area	
Building or house	
Factory, Chimney	
School, Post office	
Hospital, Health post	
Cemetery	
Temple or Stupa, Monastery	
Mosque, Church	
Orchard, Nursery	
Trees: Scattered, Prominent, Row	
Tea or coffee plantation	
Forest	
Bush, Grass, Bamboo	
Swamp	
Lake, pond or water tank	
Streams	
River	
Canal, Ditch	
Dam, Sluice gate, Weir	
Water tank or pond, Well	
Sand and Gravel area	
Aqueduct	
Ferry, Ferry, Twin service	
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Spring, Gaze away place	
Triangulation point, Bench mark	
Mountain pass, Spot height	
Fence or wall	
Index contour	
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Supplementary contour	
Embankment	
Cutting	
Depression: Big	
Depression: Small	
Sail cliff: Large, Small	
Rocks: Large, Small	
Cliff: rock, ice	
Quarry, gravel or clay pit	
International boundary	
District boundary	
VDC/Municipality boundary	
VDC Name	BASANTAPUR
Radiotransmission tower	
Mobile Camp and Storage	
Transformer station	
33 kV Transmission line	
66 kV Transmission line	
132 kV Transmission line	

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NEPAL ELECTRICITY AUTHORITY
Durbar Marg, Kathmandu (Nepal)

ENGINEERING SERVICES
PROJECT DEVELOPMENT DEPARTMENT

ROUTE ALIGNMENT MAP

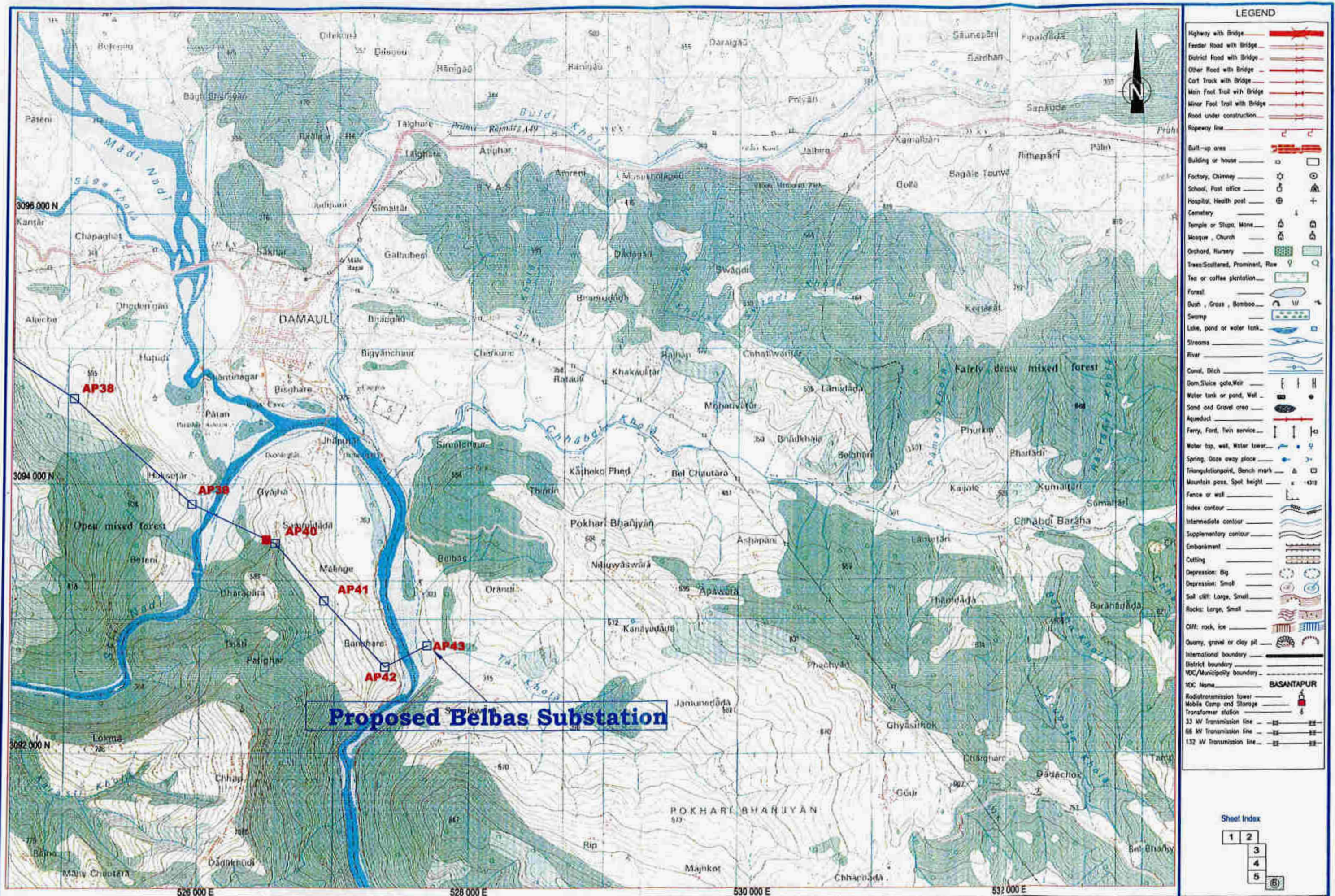
LEKHNATH-UPPER SETI 220KV
TRANSMISSION LINE

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Date : February, 2011

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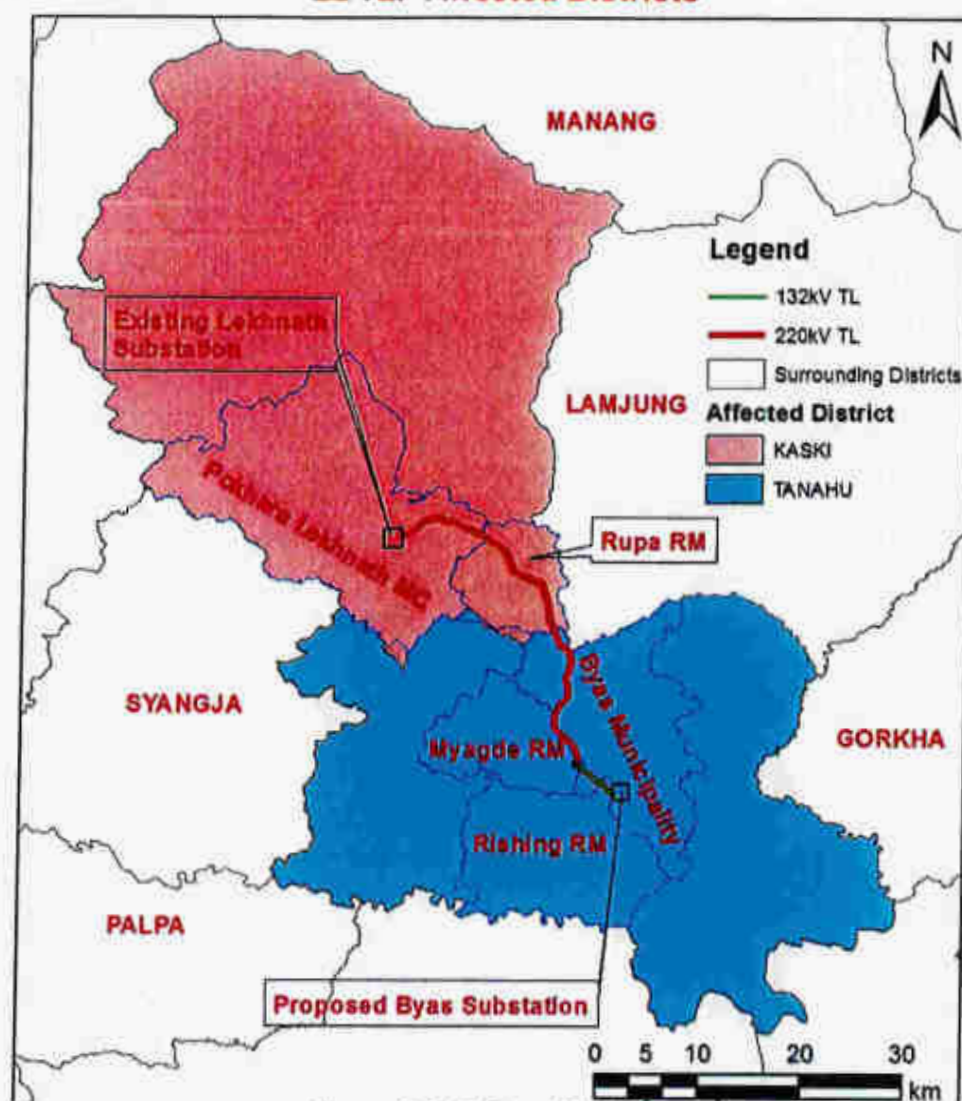
LDTLP Affected Districts

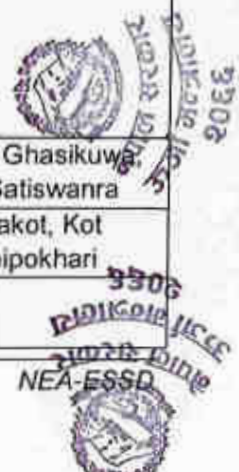
Figure 2-2: PADs of LDTLP

Source: GIS Analysis

The VDCs during ToR phase have been declared to form RRM/ Municipality/ MC and presented in table below.

Table 2-1: Project Affected Area

S. N.	Project Affected Current Administrative Units		Previous Administrative Units	
	RM/ Municipality/ MC	Ward	Project Affected VDCs/Municipality*	Other Merged VDCs (not affected by project)
1	Pokhara Lekhnath MC	27, 29, 31	Lekhnath*	Pokhara SMC, Puranchaur, Mauja, Chapakot, Badaure Tagami, Kaskikot
		28	Majhthana	
			Kalika	
2	Rupa RM	1,2	Thumki	
		3,4	Siddha	
		5	Deurali	
		6	Rupakot	
		7	Hansapur	
3	Byas Municipality	6	Shyamgha	Keshabtar, Kyamin, Ghasikuwa, Tanahunsur, Risti, Satiswanra
		5	Byas*	
4	Rishing RM	1,2	Kahun Shivapur	Bhirkot, Baidi, Ramjakot, Kot Darbar, Rishing Ranipokhari
5	Myagde RM	1-3	Jamune	Chhang
		6,7	Manpang	



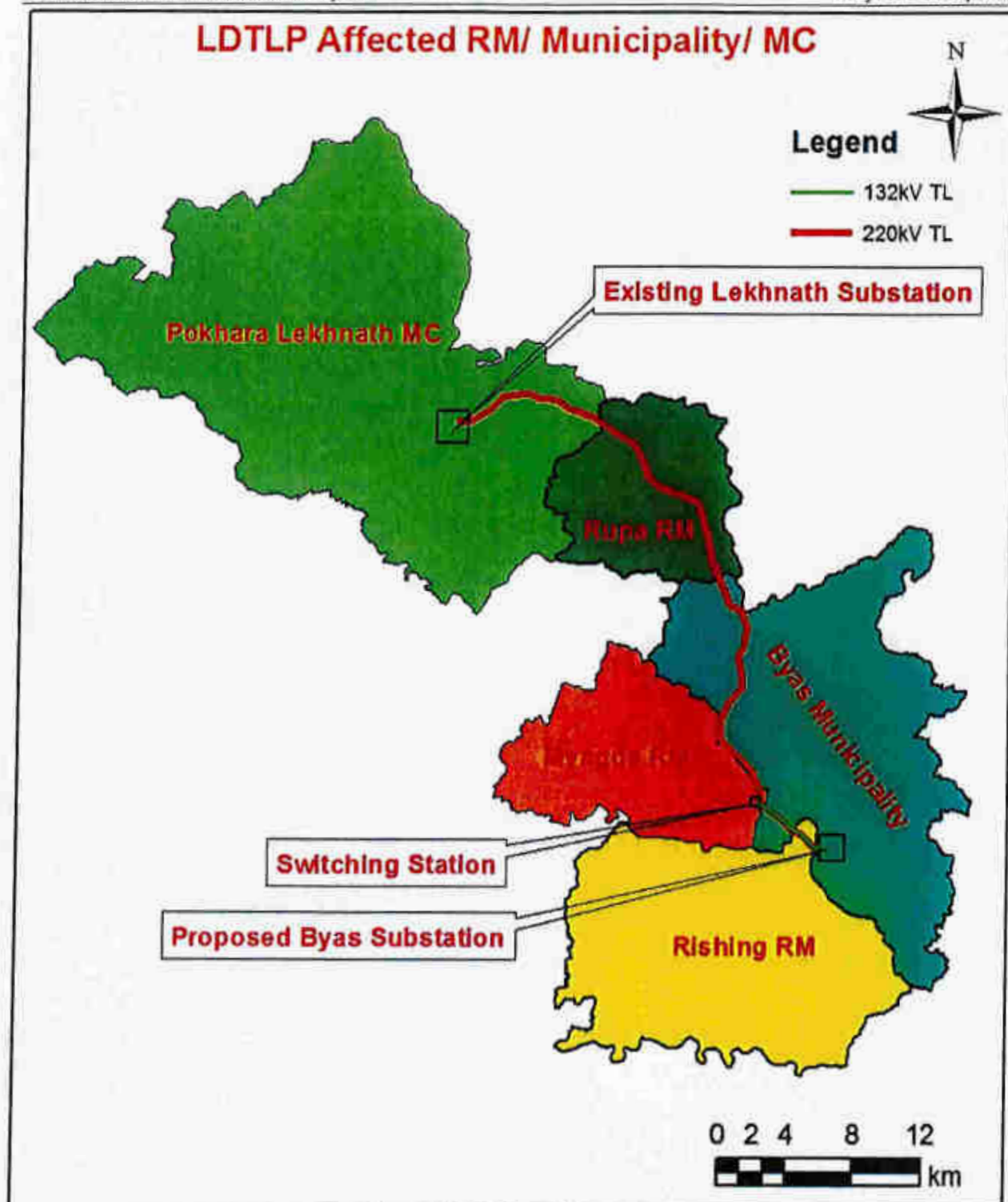


Figure2-3: PAAs of LDTLP

Source: GIS Analysis

2.2 Salient Features

The total length of the proposed TL is about approximately 42.254km. Out of which 4.853km is four circuit of 132kV and 220kV. Remaining 37.401km is double circuit of 220kV. The voltage level will be 220kV. The proposed TL will be double/four circuit comprising with two separate aluminum conductor steel reinforced (ACSR) per phase. There is slight change in salient features of ToR like terminal point, TL crossings, tower span, etc. this is due to shift in alignment and technical reports provided by the project. The project description and components listed in table below confirms with the design and technical reports. The TL design features are given in Table 2-2 below.

Table 2-2: Salient Features of LDTLP

Features	Description
General	
Name of the Project	Lekhnath-Damauli 220kV Transmission Line
Project Boundary	Longitude: 84°02'30" E to 84°20'00"E Latitude: 27°57'00" N to 28°13'45" N
Impact Area	Province No.
	District
	Rural Municipality/ Municipality*/ MC**
	4
	Kaski
	Pokhara Lekhnath** (पोखरा लेखनाथ), Rupa (रुपा)
	Tanahun
	Myagde (म्याग्दे), Byas* (ब्यास), Rishing (रिशिङ्ग)
Initial Point	AP 1 lies at existing Substation at Kharene of Pokhara Lekhnath MC, Kaski District
Terminal Point	AP 43 lies at Belbas of Byas Municipality, Tanahun District
Highway crossings	1 (Prithvi highway)
River crossings	27
132kV line crossings	2
11kV line crossings	12
Design Features	
Line Length	42.254km
Conductor Configuration	Double circuit of 37.401km length; Four circuit of 4.853km length
Conductor	ACSR Moose Conductor
Conductor bundling	Bundled (Number of cables in each bundled-2)
Nominal System Voltage	220kV and 132kV
Voltage at maximum condition	245kV
Current at normal operating condition	731Amp
Current at Maximum Condition	874A
Tower details	Type
	Deviation Angle
	Typical Use
	DA
	0 to 2 degree
	To be used as tangent/ suspension tower with suspension insulator string
	DB
	2 to 15 degree
	a. Angle towers with tension insulator string. b. Also to be used for uplift force resulting from an uplift span up to 360m under broken wire conditions c. Also to be used for Anti Cascading Condition.
	DB
	0 degree
	To be used as section tower
	DC
	15 to 30 degree
	a. Angle towers with tension insulator string. b. Also to be used for uplift force resulting from an uplift span up to 360m under broken wire conditions c. Also to be used for Anti Cascading Condition.
	DC
	0 degree
	To be used as section tower
	DD
	30 to 60 degree
	a. Angle towers with tension insulator string. b. Also to be used for uplift force resulting from an uplift span up to 600m under broken wire conditions c. Dead end with 0 degree to 15 degree deviation. Both on line side and substation side (slack span)
	DDE
	0 degree
	a. Complete dead end. b. For river crossing anchoring with longer wind span and 0 degree deviation on crossing span side and 0 degree to 30 degree deviation on other side.
Capacity	600MW

Circuit	Double and Four Circuit
Tower average nominal Span	330m
No. of Tower	123 (44 APs and 79 STs)
Tower Height	Around 29m for double circuit and 44m for four circuit
Ground Clearance	<ul style="list-style-type: none"> Minimum 7.1m at the maximum sag condition National highway 9.8m
Right of Way (RoW)	30m (15m on either side) for 220kV TL 18m (9m on either side) for 132kV TL
Foundation Area	15mx15m (225m ²)
Land Requirement	134.6125ha
Substation	
No. of Substation	1
Location of Substation	Belbas of Byas Municipality
Area of Substation	6.0ha
Switching Station	1
Cost of the Project	NRs 7,500,000,000

2.3 Project Accessibility

Existing substation at Kharene village of Kaski can be accessed through earthen road from black-topped motorable road of Prithvi Highway at Lekhnath chowk (about 800m). Similarly, Belbas substation (about 3km) can be reached through earthen road from Prithvi Highway at bridge site before entering Damauli bazaar. Switching station lies near Prithvi Highway. Some section of the TL is accessible by feeder road and Prithvi highway and some section by rural local road. Some stretches in between are located at higher altitudes and are not easily accessible. Hence, the study was carried out through walk over approach and the project will be implemented by upgrading existing trails, wherever necessary so as to transport construction materials.

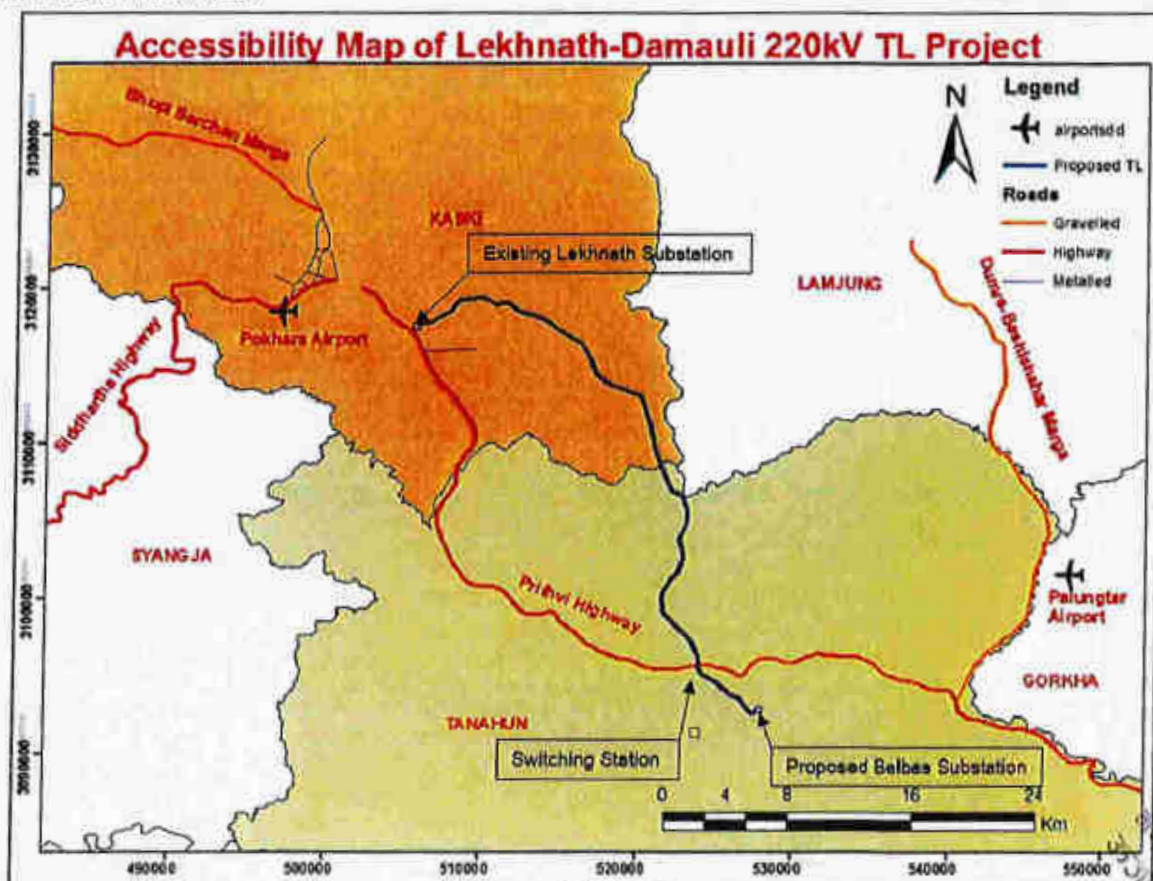


Figure2-4: Accessibility Map of LDTLP

Source: GIS Analysis

2.4 Project Components

The LDTLP consists of four major project components - TL, substation, switching station and towers. The total length of the route is 42.254km. The project comprises of one substation which is to be constructed at Belbas, Byas Municipality of Tanahun. During the field study, it has been verified that due to the construction and operation of this proposed project, there shall be no obstruction in planned/proposed/operated hydropower, TL, reservoir area or other development projects in the vicinity. These project components are discussed in the following sections in detail.

2.4.1 Transmission Line

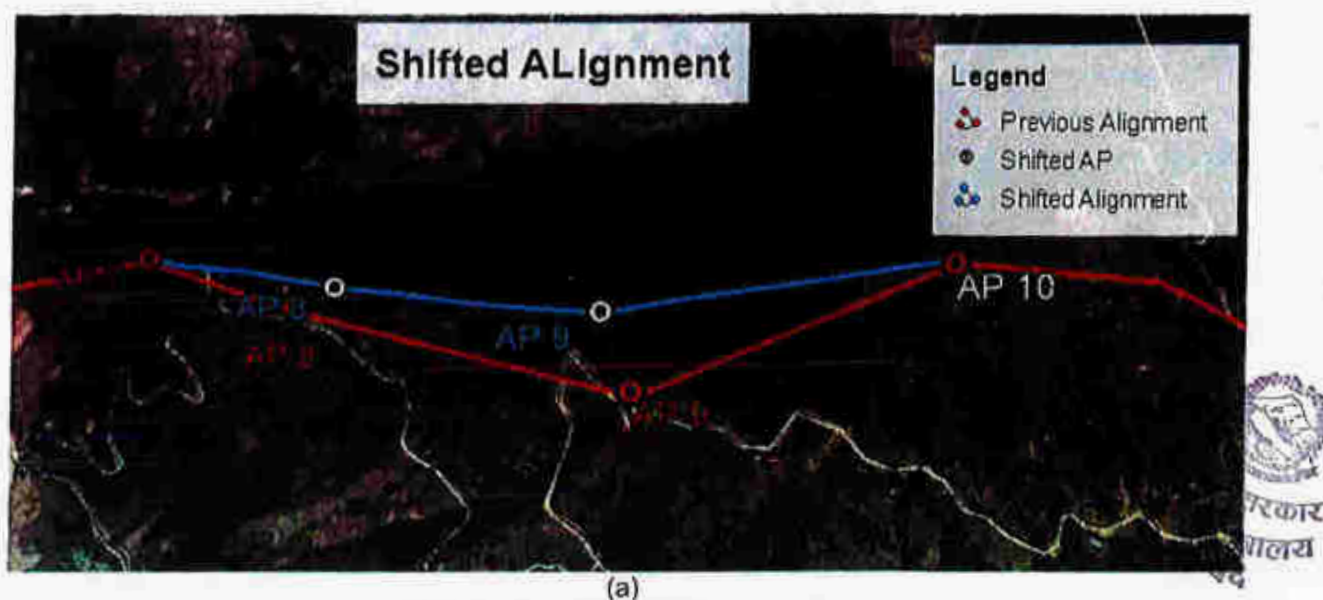
The proposed route will commence from the existing substation of Lekhnath, Pokhara Lekhnath MC and terminate at proposed Belbas substation at Byas Municipality of Tanahun district. It consist of 220kV and 132kV line. The alignment of LDTLP has been selected avoiding the settlement areas, inbuilt structures, religious places, schools and other community infrastructures wherever possible. It mostly traverse through cultivated land and at some stretch barren land, forest land and other (sand, water bodies, roads, etc.) lands. The description of the proposed route has been discussed in Table 2-3 below.

Table 2-3: Details of TL route

S.N.	RM/ Municipality/ MC	From AP to AP	No. of AP In Section	Land Use along the section	Remarks
1	Pokhara Lekhnath MC	AP 1 to AP 14	14	CL, BL, FL and Others	Only 220kV TL
2	Rupa RM	AP 15 to AP 22	8	CL, FL and Others	Only 220kV TL
3	Rishing RM	AP 40 to AP 42	3	CL and FL	Both 220kV and 132kV TL
4	Byas Municipality	AP 23 to AP 39 AP 43	18 1	CL, FL and Others CL	Both 220kV and 132kV TL
Total			44		

Note: CL: Cultivated Land, BL: Barren Land, FL: Forest Land and Others: Water Bodies, Sand, Road etc.

In Myagde Rural Municipality, project will require RoW and no AP will be erected. The TL has been shifted slightly at AP 8, AP 9 and AP 26. Similarly, AP 29A has been inserted in between AP 29 and AP 30. There is 12 house crossing along the aforementioned alignment. In order to avoid social conflict, AP 8, AP 9 and AP 26 has been shifted and an additional AP 29A has been introduced between AP 29 and AP 30. AP 43 has been introduced as the substation is shifted to Belbas. This shift in alignment cause the increase in length of the TL from 41.85km to 42.254km. Figure below shows how the alignment has been shifted.



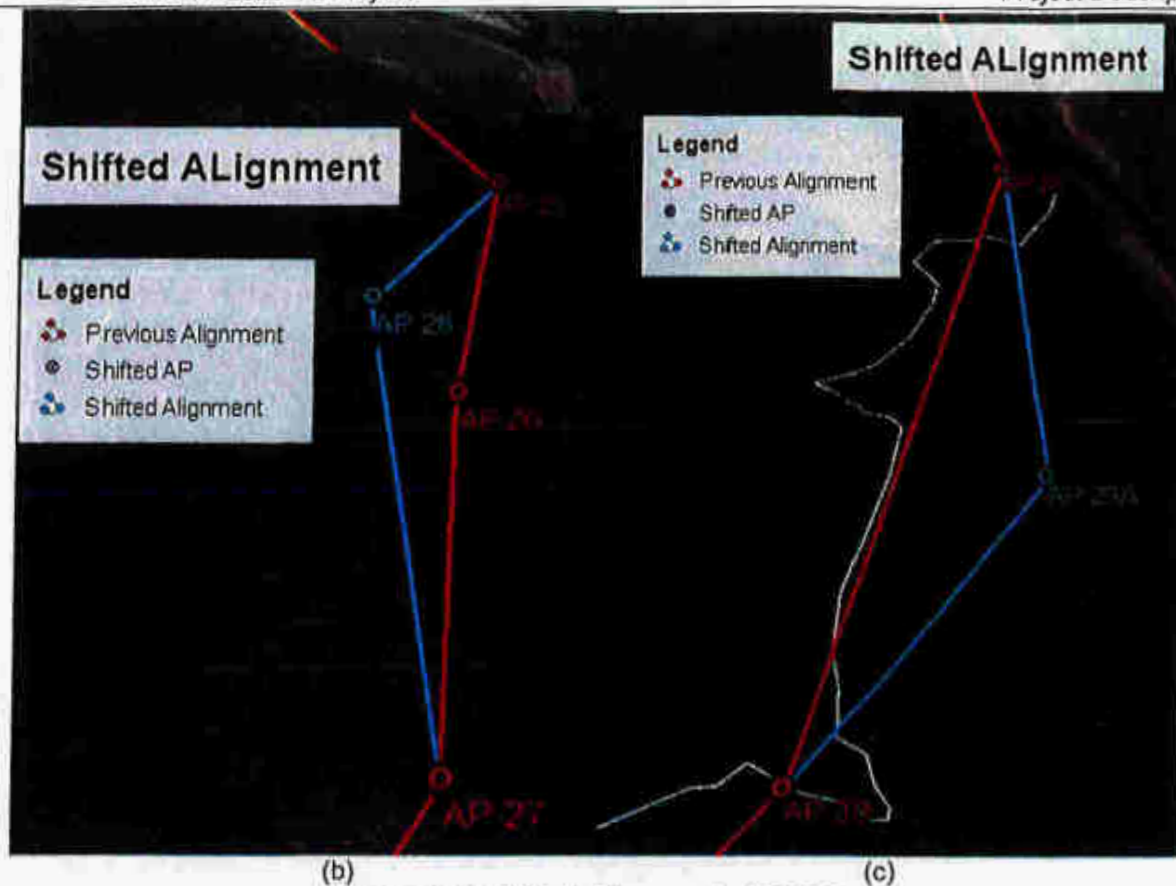


Figure 2-5: Shifted Alignment of LDTLP

2.4.2 Substation

Substation was proposed earlier in Kahun Shivapur VDC. However, due to the construction of access road for the power house of Tanahun Hydropower project, land erosion was observed near the proposed site so substation has been shifted to Belbas of Byas Municipality. Belbas substation can be accessed through earthen road. It shall acquire 6.0ha of cultivated land.



Picture 2-1: Proposed Belbas Substation

2.4.3 Switching Station

The other major component of the project is switching station proposed at Jamune, Myagde RM of Tanahun district. The station is proposed near Prithvi Highway at left side while traversing from Kathmandu to Pokhara. It is about 50m left from the highway. It shall acquire 0.1ha of cultivated land. The main purpose of switching station is to switch the existing 132kV line along the alignment as per necessary.



2.5 Project Area Delineation

For the IEE of the proposed project, the project area is defined as the area for the construction of 220kV TL, 132kV TL, switching station and substation as well as the area that will be impacted due to the construction and operation of the project. This area mainly includes three RMs, one municipality and one MCoF Kaski and Tanahun districts. The project area does not lie in the national park, wildlife reserve, buffer zone, conservation area, historically and archaeologically important sites and/or environmentally sensitive/fragile areas. The study area is divided into two parts on the basis of the proximity and magnitude of impacts.

2.5.1 Direct Impact Area

The National EIA Guidelines 1993 defines the direct impact as a direct alteration in the existing environmental conditions as a consequence of project activity. So, the direct impact area (DIA) includes all the components of the LDTLP which mainly consists of 30m RoW comprising 15m on each side of the center line of the TL of 42.254km length. Since the RoW of 132kV TL is 18m which lie within 220kV TL RoW, there is no need of additional assessment for 132kV line. In addition, the DIA also includes the substation area and switching station area. Thus, the settlement area, forests or other vegetation and places having built-up infrastructures or facilities that fall within the project components constitute the DIA of the project. On the basis of spatial coverage, this area is also termed as High Impact Area.

2.5.2 Indirect Impact Area

This consists of the surrounding area. Any built-up community infrastructures and facilities, forests, surrounding the DIA shall be studied in this impact area. The area outside DIA extending up to RM/Municipality/MC boundary is considered as IIA. This area is also termed as Moderate Impact Area.

The term "project" indicates the LDTLP and "Area" refers to the core project area and the surrounding area. The term "project area" is also referred to as the study area for the IEE.

2.6 Construction Planning

The implementation of the proposed project comprises construction of 132kV and 220kV TL. It includes foundation and erection of towers, wire stringing, testing and commissioning of it. The estimated periods of project completion is two years.

2.6.1 Preliminary Works

Preliminary works for the proposed TL consist of contract award, the detail design study and mobilization of the contractors. The detail design study will carry out the detailed route survey, spotting the tower locations, preparation of longitudinal profiles, geological field test and laboratory testing, tower design etc. To achieve effective tower footing resistance, earth resistance will also be measured at each tower site.

2.6.2 Land Acquisition and Forest Clearance

After finalization of the substation site and tower location, the required land will be acquired by NEA as per Land Acquisition Act, 2034 in the coordination with Compensation Determination Committee (CDC). As well, the trees will be felled for the tower foundation and under the RoW in coordination with District Forest Office (DFO) and other stakeholders. The table below shows the land requirement details.



Table 2-4: Land Requirement for LDTLP

S. N.	Project Component	Land Types (ha)					Total Land Take (ha)		
		Cultivation		Forest		Others	Land Restriction	Permanent	Total (ha)
		Private	Govt.	CF	Govt.	Private	Public		
1	Land to be required under RoW (excluding tower pads)	84.3834	-	21.1547	0.7	12.5937	1.7949	-	123.995
2	Land to be acquired for tower pad including ST	1.7100	-	0.5400	-	-	0.4950	2.7675	2.7675
3	Substation	6.00	-	-	-	-	-	6.00	6.00
4	Camp and Storage	0.50	-	-	-	-	-	0.50	0.50
5	Switching Station	0.10	-	-	-	-	-	0.10	0.10
6	Mobile Camp	-	-	-	-	1.25	-	-	1.25
Sub Total		92.693	-	21.6947	0.7	12.5937	2.2899	125.2450	134.6125
Total		92.693	-	21.6947	0.7	12.5937	2.2899	125.2450	134.6125
Percentage, %		68.86	-	21.6947	0.7	12.5937	2.2899	125.2450	134.6125
					34.9884		3.6074		
					25.99		2.68		
								93.04	100.00
								6.96	

Table 2-5: Land Use of APs and STs

S.N	Land Use	No. of APs	No. of STs	Area, ha		Total Area (ha)
				APs	STs	
1	Cultivation	27	49	0.6075	1.1025	1.710
2	Forest	9	15	0.2025	0.3375	0.540
3	Barren	8	15	0.18	0.3375	0.5175
Sub Total		44	79	0.99	1.7775	2.7675
Total		123		2.7675		

2.6.3 Substation and Switching station Construction

At first, civil works for ground leveling, boundary wall, control building, office cum staff quarter buildings, switching station, line bay foundation etc. will be done. Transformers and equipment will be transported to the sites and installed.

2.6.4 Tower Foundation

The construction of tower foundation will be undertaken by manual labor assisted by the mechanical plant wherever possible. The mechanical plant will be limited to small demountable steel skid framed concrete mixers, air compressors, air drills/chisels and tamping/compaction tools. Excavation and the concreting of the tower foundations will be carried out as per the design requirements and after necessary curing, the foundations will be backfilled with suitable material. Average area required for each tower foundation is 15m x 15m (0.0225ha).

2.6.5 Erection of Tower

Galvanized steel lattice towers manufactured in the factory will be transported to the individual tower locations and are erected manually by employing pulleys, wenchers, etc. into the tower foundations.

2.6.6 Insulator Fittings, Conductor and Ground Wire Stringing

Conductors, Optical Ground Wire (OPGW), ground wires, insulators and necessary accessories will be transported manually to the tower locations. The fitting of insulators on the tower will be carried out manually. Stringing of conductors, OPGW and Extra High Strength (EHS) wire will be carried out with the help of tension machine and other pulling devices as per the design requirements.

2.6.7 Transportation

Primary site access for the substation construction will be gained from Byas through Belbas road. TL and its foundation construction can be accessed from Prithvi highway and its various feeder road that passes near the settlements along the alignment. No permanent access roads will be constructed to tower sites from existing road. Existing feeder roads and tracks will be used for construction and maintenance where available. The construction material up to the nearest road head will be carried out through vehicle and later it will be transported manually up to the individual tower foundation location.

2.6.8 Spoil Dumping Site

Since the construction of TL towers requires clearing and excavation of fairly small areas at tower locations, construction work will not require spoil dumping sites. The spoil will be filled up and compacted in the tower base area. Similarly, spoil generated from the substation and switching station during construction will be used for the river protection work near substation and for leveling of access road to substation.

2.6.9 Construction Materials

The materials required for civil construction works related to the TL, switching station and substation will be:

- Steel reinforcement
- Cement
- Coarse aggregate
- Fine aggregates (sand)
- Batteries
- Admixtures, etc.

Steel reinforcing bars and cement can be acquired from local manufacturers or can also be imported. Coarse aggregates will be produced at site from excavated materials or purchased



from the nearby market. Likewise, fine aggregates will be collected from major quarries along riverbanks (Seti River, Madi Khola, Thudi Khola, Sage Khola, etc.), the excavated foundation material can be used as a backfill material required for the foundation construction.

Table 2-6: Requirement of the Construction Materials to the Project

S.N	Description	Unit	Quantity
1	Coarse aggregates	m ³	4588
2	Total Reinforcement Steel Quantity	Tons	460
3	Total Cement quantity	Bags	47120
4	Total Fine aggregates	m ³	2356

2.6.10 Requirement of Workforce

During the stages of the construction period of the project, altogether approximately 350 people will be employed including 265 unskilled, 60 semi-skilled and 25 skilled human resources. The requirement of the workforce will be from start to end of the construction stage. Most of the unskilled manpower will be hired locally as per available skill and experiences. Semi-Skilled and skilled manpower will be managed by Contractor and Employer (NEA). A list of human resources required to the project for the project construction is given in Table 2-7.

Table 2-7: List of Human Resources Required to the Project

Qualification	Expertise	No./month	Availability in local area
Skilled	Electrical engineer	5	-
	Civil engineer	3	-
	Electrical supervisor	3	-
	Civil Overseer	4	-
	Others	10	-
Semi-skilled	Foreman	8	-
	Fitter	22	-
	Mason	15	Few people
	Others	15	
Unskilled	Labor/porter	265	Some people
Total		350	

Source: LDTLP

2.7 Project Schedule

The estimated completion period of the project including both section is 24 months includes 6 months pre-construction phase and 18 months construction and commissioning phase. The construction work of TL will primarily be carried out during the dry season when ground conditions are essentially dry and river flows low to allow easy movement of materials and placement of tower. Construction activities during the monsoon season will primarily be restricted to stringing of conductors, although this activity may also be restricted by the weather. However, the construction work of the switching station and substation will be conducted throughout the year.



Table 2-8: Construction Schedule

S.N	Task Name	Duration (month)	Month Number																							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	Conduct of Detail survey	4																								
2	Conduct of IEE	6																								
3	Preparation of Estimate and approval	3																								
4	Tendering	3																								
5	Contract sign	3																								
6	Cadastral survey	3																								
7	Land acquisition	2																								
8	Soil investigation	3																								
9	Design related works	6																								
10	Construction of tower foundation	11																								
11	Supply of tower accessories and conductor, hardware, OPGW etc.	6																								
12	Erection of towers	5																								
13	Stringing of conductor and OPGW	2																								
14	Testing and commissioning	1																								

नेपाल सरकार
ऊर्जा मन्त्रालय
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3 STUDY METHODOLOGY

The IEE process follows the EPR,2054 (1997) and National EIA Guidelines, 2050 (1993). This IEE report is prepared in accordance with the legal requirements of Government of Nepal (GoN), based on approved ToR (Appendix-J), field study, consultation with local people/stakeholders and officials. The study methodology for each environment (physical, biological and socio-economic and cultural) is discussed in the following section.

3.1 Physical Environment

3.1.1 Data Requirement

The following data were collected during the IEE:

- Meteorological data: maximum/minimum temperature and rainfall of the project area;
- Topographical data: Altitude and landscape;
- Air, water and noise quality of the project area;
- Physical setting: Physiographic location, river system etc. of the project area;
- Geological data: Rock type, soil type, slope stability, erosion, landslides, flood area, etc. of the project area;
- Spoil materials: Total volume, volume to be used for construction, disposal volume, etc.;
- Significant crossings along the alignment; and
- Land use pattern of the project area.

3.1.2 Data Collection Methods

3.1.2.1 Desk Study and Literature Review

Review of IEE reports of similar types of TL projects, district level annual reports and other pertinent literatures was done. Topographical and land use maps of the area including the Google Earth map were studied for field study. The major reports consulted are: District Profile reports of Kaski and Tanahun published by District Statistics Office (DSO), Pokhara; Feasibility and Survey Reports of LDTLP. On the basis of the reviewed information regarding the project areas, data gaps were identified and the methodology described in this chapter was developed to collect other relevant information required for the IEE. All the issues highlighted in ToR document were given emphasis during the IEE.

Documents and other relevant literature were collected and reviewed. The data on climate (temperature and rainfall) was collected through secondary source; the published data of Department of Meteorology and Hydrology (DHM). The data on air, noise and water quality of the area has been collected through observation by subject expert during site visit. Geographic and geological data, such as topography, rock type and soil type, stability of the APs locations, soil erosion and other key environmental features were investigated and obtained from the geological maps and previous geological reports of the Nepal and by general observation. Physical settings, land use pattern and significant crossings were adopted from topographical maps, site observation and detail plan and profile of the TL. The different topographical maps used during the study period are given in following table.

Table 3-1: Details of Topographic Maps of Project Area

S.N	Name of Topographic Sheet	Sheet No.	Scale
1	Pokhara	2884 13A	1:25000
2	Bhorletar	2884 13B	1:25000
3	Sisaghat	2884 13D	1:25000
4	Naya Risin	2784 01B	1:25000
5	Damauli	2784 02A	1:25000



Following documents were reviewed to collect relevant information on physical environment;

- 1:25000 scale topographical maps prepared by the Department of Survey, GoN;
- 1:100000 scale district map of Kaski and Tanahun districts;
- Detail Survey Report of LDTLP prepared by Engineering Service Directorate, Project Development Department, NEA;
- Approved ToR of LDTLP;
- Geological Maps and previous geological reports of the Nepal;
- District profile of affected district, district information centre; and
- Google Earth, the online software for verifying the TL.

3.1.2.2 Field Observation

An intensive field investigation along the proposed alignment was conducted to collect information on existing physical environment. During the field visit, inspection of site condition of the APs and other critical areas along the TL were done. The obtained data of land use pattern, river system and significant crossings along the alignment from the review of the topographical maps and plan and profile of the alignment has further been verified at site. The geology around the project area has been covered in the IEE report, as per the available information in the feasibility report and site visit. The stability of slopes and the presence of landslides, fan deposits and rock fall within the project area were evaluated mainly by site observations and from topographical maps.

3.1.3 Data Analysis

The type of land use and area calculation has been prepared with reference to the topographical maps, survey report, digital maps provided by the Department of Survey with field verifications. Similarly, the numbers of structures under RoW, at substation area and near APs were determined with the help of the plan and profile of the Final Survey Report with verifications at site. The collected data from the field visit was analyzed using different software like ArcGIS 10.2.1, AutoCAD, Google Earth, MS Office by the study team in coordination with the project engineers and experts. Necessary maps and information thus generated were presented in the report. The beneficial and adverse impacts have been predicted and appropriate mitigation measures proposed to reduce the impacts.

3.2 Biological Environment

3.2.1 Data Requirement

The following data were collected during the IEE:

- Types of forest and its area;
- Diversity of tree species (density, frequency, basal area, IVI);
- Types of herbs, shrub and protected plant species;
- Type of ethnobotanical plants and NTFPs observed;
- Types of fauna (mammals, birds, protected species and others) observed and reported in the project site;
- Loss of trees from government forest, Community Forest (CF) and private forest;
- Loss of trees and regeneration in terms of species from CF and government forest;
- Loss of types of NTFPs; and
- Observation of migratory bird species.

3.2.2 Data Collection Methods

a) Desk Review

Secondary information was reviewed from the Community Forestry Monitoring and Annual Progress Reports of Kaski and Tanahun DFO, Forest and Vegetation Types of Nepal published by Tree Improvement and Silviculture Component of DoF, Forest Resource Inventory



Guidelines, 2061, Forest Act and Rules, Government Tree Cutting Procedures, 2071. Meeting was also held with concerned officials in the Ministry of Forest and Soil Conservation (MoFSC), DFO of Kaski and Tanahun.

b) Walk through Survey

Walk through survey was conducted at each project site to make general observation of the vegetation type and forest area delineation in different project components. Based on the field observation the sample plots were fixed covering different type of vegetation. Information on wildlife and birds were collected through observation and consultation with local resource persons. During the field visit, indirect evidence such as droppings, pug marks, foot prints and scales of the animals were collected for identification purposes.

c) Quadrant Sampling

Altogether twenty (20) sampling plots, each of 400 sq. m, were taken for quantitative analysis of vegetation in CF. This represents 3.57% of total CF and government forest area (0.80ha out of 22.3947ha) along the entire TL. In each plot, tree species were identified, and all trees equals or exceeding a diameter of 10 cm at breast height (dbh) were counted with their height and dbh. For enumeration of seedlings and saplings, a plot of 10 m x 10 m was made within the 20 m x 20 m. plot and their number were noted down species wise. Similarly occurrence and distribution pattern of shrubs and herbs species available in and around the sample plots and along the alignment were recorded.



Picture 3-1: Delineation of Sample Plot

Picture 3-2: Measurement of dbh of tree

Based on this information, loss of regeneration (saplings and seedlings), loss of vegetation (pole and tree class), species wise standing wood volume and biomass is calculated. In this report, trees having more than 30cm dbh are referred as tree sized, trees having 10 to 29.9cm dbh are referred as pole sized, trees having 4.0 to 9.9cm dbh are considered as saplings and having less than 4.0cm dbh are considered as seedlings (Forest Rules, 1995). Diameter at breast height was measured at 1.3m from the ground level.

d) Group Discussion

Consultation were carried out with all affected CFUGs and officers of DFO to collect ethno-botanical information as well as user group's dependency on the forest resources. A checklist was developed and introduced in the field to collect the primary information about the dependency of local people on CF and non-timber forest product (NTFP), etc.

During the group meetings and discussions, participants were introduced about the project features, potential impact on the environment, various mitigation and enhancement measures likely to be adopted during construction and operation phase of the project. The issues raised during meetings were discussed and recorded. Similarly, meetings, interviews and discussions

were held with the members of CFUGs, local peoples and officials of concerned DFO and Area/Ilaka Forest Office to collect information on the availability of flora and fauna, dependency of local people on forest resources, availability of NTFPs, etc.

3.2.3 Data Analysis

The data from forest sampling were quantitatively analyzed for density, basal area, crown coverage and wood volume. These parameters were calculated using the following formulae:

$$\text{Density (D)/hectare} = \frac{\text{No. of individuals of a species}}{\text{Size of the plot} \times \text{Total no. of plots sampled}} \times 10,000$$

$$\text{Relative Density (RD)} = \frac{\text{No. of individual species}}{\text{Total number of all species}} \times 100$$

$$\text{Frequency (F) \%} = \frac{\text{Total no. of plots in which the sp. occurred}}{\text{Total no. of plots sampled}} \times 100$$

$$\text{Relative Frequency (RF)} = \frac{\text{Frequency of individual species}}{\text{Frequency of all species}} \times 100$$

$$\text{Relative dominance (RDom)} = \frac{\text{Total basal area of particular species}}{\text{Total basal area of all species}} \times 100$$

Basal Area is the trunk cross-sectional area. The basal area of each of trees was calculated on the basis of diameter at breast height.

$$\text{Basal Area (BA)} = \pi (\text{dbh}/2)^2$$

$$\text{Importance Value Index (IVI)} = \text{RD} + \text{RF} + \text{RDom}$$

$$\text{Wood volume of standing tree} = 1/2 \times \text{BA} \times \text{Height}$$

The wood volume of all the species of the trees of to be felled was calculated using the standard norms developed by Sharma and Pukala (1990) and Department of Forests, 2005. In addition, for biomass calculation, the allometric equation (models) in estimating above ground tree biomass (AGTB) developed by Chave et al., (2005) was followed.

$$\text{AGTB} = 0.0509 \times \rho D^2 H$$

Where,

AGTB = above-ground tree biomass (kg);

ρ = wood specific gravity (g/cm^3) was used from guideline prepared by (MoFSC, 2011)

D = tree diameter at breast height measured [cm]; and

H = tree height (m).

To determine the above ground sapling biomass (AGSB) (dbh less than 5cm), national allometric biomass tables was used. These tables were developed by the Department of Forest Research and Survey (DFRS) and the Department of Forest, Tree Improvement, and Silviculture Component (TISC). Since the national allometric biomass table did not contain all species present in Nepal, values for related or similar species were used. The biomass values of saplings include foliage, branch, and stem compartments. The following regression model was used to calculate biomass.

$$\ln(\text{AGSB}) = a + b \ln(D)$$

Where,

\ln = natural log [dimensionless];

AGSB = above-ground sapling biomass (kg);

a = intercept of allometric relationship for saplings [dimensionless];

b = slope allometric relationship for saplings [dimensionless]; and

D = over bark diameter at breast height (measured at 1.3 m above ground)

3.3 Socio-economic and Cultural Environment

3.3.1 Data Requirement

The following types of data are acquired for IEE:

Table 3-2: Requirement of data

S.N	Parameter	Area of Study	PAD	PAAs	DIA/PAF
Social Features					
1	Demography	Population distribution, age group distribution	√	√	
2.	Settlements	Settlement pattern-scattered or aggregated, in uphill or lowland, name and numbers of major settlements, structures, growing settlements, types of settlement.		√	√
3	Ethnicity	Ethnic groups, dominance/minority, ethnic composition.	√	√	√
4	Language	Major languages, number of people speaking, literature and media of local language	√	√	√
5	Religion	Major religion, number of religion followers.	√		√
6	Festivals	Major festivals, festive seasons, their importance	√		√
7	Migration	Migration pattern-in/out, Seasonal/permanent, causes of migration, impact of migration in population dynamics of local area.	√	√	√
8	Gender Aspect	Women's right-property and participation, violence, disparity, child marriage, human trafficking and any other social evils	√	√	√
9	Law and Order Situation	Crime and violence, major types of crime, local conflict for resources, honor etc., traditional conflict resolution system, police post, legal access etc.		√	√
10	Education and Literacy	Educational institutions; literacy rate.	√	√	√
11	Health and Sanitation	Health institutions, health facilities, common disease, drinking water supply, use of latrine.	√	√	√
12	Road and Transportation	Road network in the project area, public transportation, road access to surrounding project area, means of transportation.	√	√	
13	Energy	Electrification in the project area, means of electrification, fuel sources for household use, access to fuel wood etc.	√	√	√
14	Communication and Other Facilities	Telephone (landline/wireless) network in the project area, accessibility to internet and other means of modern communication (television, radio, newspaper).	√	√	√
15	Development Initiative/ Activities	Development projects of local level (district/ municipality), regional and national level in the project area, nature and size of the projects, its future impact in the project area, development issues/ initiatives / activities in the local area	√	√	
16	Tourism activities	Places of touristic attraction.	√	√	
17	Community infrastructures and service	Drinking Water, Supply, Irrigation, Foot Trails, Transportation, Electricity, Telecommunication, etc.;	√	√	√



S.N	Parameter	Area of Study	PAD	PAAs	DIA/PAF
18	Local institution and activities	government and non-government agencies, cooperatives, community based organizations;	√		
Economic Features					
19	Local price information	Land, agriculture and forest products, wage rate, etc.		√	√
20	Economy	occupation, employment, agriculture and livestock production, trade and commerce, etc.	√	√	√
21	Land and Assets	Land holding size and ownership; measurement and valuation of houses, cowsheds and other structures to be acquired; compensation rates for land, etc.			√
22	Economic status	Income and expenditure			√
23	Crops and Livestock	Cropping pattern, practices and production; livestock raising; loss of standing crops			√
Cultural Features					
24	Archeological, Historical and Religious Sites	Existing such site, their location, their importance, fame of area-local/regional, conservation status.	√	√	√
25	Places of cultural importance	cultural sites and the special occasions of celebrations/ gathering, including the relative importance of these sites; cultural practices		√	√
26	Aesthetic value	Aesthetic value of the affected landscape		√	√
27	Attitude of the local people	Attitude towards the development of this project			√

3.3.2 Data Collection Methods

a) Literature Review

Based on previous experiences and the review of relevant literature associated with IEE of various TL projects, demographic tables were developed. To fill these tables, a desk study was conducted in the office. All the relevant information associated with socio-economic and cultural environment was reviewed. On the basis of the reviewed information, data gaps were identified and the following techniques were used to generate the remaining data. The following documents were reviewed to collect relevant information on socio-economic and cultural environment;

- Population Census, Central Bureau of Statistics (CBS), GoN/ Nepal, 2011;
- Demographic profile of Nepal 2013/14;

b) Field Observation

Observation of the project site was made to obtain information on different socio-economic and cultural activities of the impact area. Religious sites of the project area were identified and analyzed the impact on these sites within the range of high impact area (HIA) or moderate impact area (MIA). At the end of each day, notes were written about the observations and a field diary was maintained.

c) Households' Survey

The land owners of the APs/substation and the land owners/structure owners of the high impact zone have been identified. These identified families were considered as PAFs. In addition, the families losing their residence irrespective of their land holding size and other off farm income and the families losing more than 50% of their total landholding were identified as Seriously Project Affected Families (SPAFA). List of PAFs/SPAFA is given in Appendix D. Land/structure owners were identified, through consultation with the local people, owners, GPS and Toposheet.



Pre-tested questionnaires were designed and applied by a trained team of enumerators to solicit information from PAFs. HH survey was conducted only for PAFs belonging to APs and structures falling in RoW. The questionnaire has been designed especially to cover the sectors like demographic characteristics, basic health conditions, income and expenditure, availability of infrastructure facilities, water and energy related issues, information about project, attitude towards resettlement and expectations from the project. Project will affect 84 HHs, a census of 69 HHs (55 PAFs and 14 SPAFs) was carried out, and remaining HHs were missing during the time of HHs survey. The owners of land belonging to tower points, substation area and structures located under RoW were identified through walkover survey and survey report and hence socio-economic status of them has been studied using questionnaires. HH survey of landowners belonging to RoW was not conducted in this stage.

d) Market Survey

Market survey was conducted in the PAA to get the prevailing price of agricultural commodity, major construction materials, and wage rate. The market survey was conducted with the help of a checklist. Finding of market survey has been attached in Appendix D.

e) Participatory Rural Appraisal (PRA)

As key stakeholders in development, the citizens have right to know and to be involved in information exchange and decision-making that affects their lives, resources and properties from implementation of a development project. This citizen right is protected by the Right to Information Act 2064 BS (2007), Right to Information Rules, 2065 BS (2009) and EPR, 2054 BS (1997). Public consultation and information disclosure from the beginning is also important to reduce misunderstandings and successful implementation of a project. It is a process of both information giving and listening issues and concerns of public for planning and successful implementation of project with full support of the stakeholders.

PRA is an intensive systematic and semi-structured learning experience carried out in the project area by a multidisciplinary team which includes community members. Altogether, 11 PRAs were conducted in the former VDC affected by the project to collect socio-economic information, views, concerns and expectations of local people from the project. Similarly, the participants were also informed regarding the project and its activities during PRA. The details of PRA is given in Table 3-2. The key issues raised during PRA are presented in Table 5-48.

Informal meetings/consultations were conducted with relevant district level government officials at districts headquarters, and at local levels with key stakeholders. The purpose of the meeting/consultation was to inform them about the project, collect their concerns/ expectations regarding the project such as project purpose, project type, impact area, likely impacts and potential opportunities due to project implementation and required information for the IEE.

The major consultations were carried out in November, 2016. In addition, a second round of consultations were carried out in January, 2017. A total of 13PRA consultations in the form of formal discussions, meetings and group discussions were conducted in the affected area. The key issues and concerns raised by the local people are related to compensation, employment, implementation of mitigation and enhancement measures and community participation in the project activities. The key issues/concern raised by the local people during community consultations were summarized.



Picture 3-3: Public Consultation Program at Byas



Picture 3-4: HH Survey at Shyamgha

Table 3-3: Date, Location and Number of Participants in PRA

S.N.	Date	RM/Municipality/MC	Male	Female	Total
1.	2073/07/26	Byas (Shyamgha-2), Tanahun	4	4	8
2.	2073/07/29	Byas-6, Tanahun	8	2	10
3.	2073/07/29	Rising (Kahun Shivapur-1), Tanahun	8	4	12
4.	2073/07/25	Rupa (Rupakot, Kaski	10	0	10
5.	2073/07/22	Lekhanath-9, Kaski	8	2	10
6.	2073/07/21	Lekhanath-7, Kaski	6	4	10
7.	2073/07/30	Byas-8, Tanahun	8	0	8
8.	2073/07/24	Hansapur-9, Kaski	8	1	9
9.	2073/07/25	Majhthana-6, Kaski	8	0	8
10.	2073/07/25	Thumki-9, Kaski	10	2	12
11.	2073/07/14	Byas-13, Belbas, Tanahun	8	2	10
12.	2073/10/14	Byas-12, Belbas, Tanahun	3	3	6
13.	2073/10/15	Byas-13, Katan Tol, Tanahun	11	0	11
Total			100	24	124

f) Key Informant Interview (KII)

KII was employed with elderly people, CFUG members, social workers, businessmen and teachers, representatives of political parties and intellectuals of the project area. The main objective of KIIs was to assess their views, concerns and expectation from the project and collect relevant information of the project area. The main objective of KIIs was to assess their views, concerns and expectation from the project and collect relevant information of the project area. Altogether 12 KIIs were conducted in the PAA. The respondents of the KIIs were purposively selected.

3.3.2.1 Distribution of Sample

The distribution of sample included socio-economic survey of all the 69 project affected HHs, 11VDC level PRAs, 12 KIIs and 14 market survey in the PAA.

Table 3-4: Distribution of Sample

Table 3-4: Distribution of Sample						
S.N.	District	PAA	Sample			
			HHs Survey	VDC level PRA	KIIs	Market Survey
1	Kaski	Pokhara Lekhnath MC	11	3	3	3
		Rupa RM	8	3	4	4
2	Tanahun	Byas Municipality	44	6	2	4
		Rishing RM	5	1	1	1
		Myagde RM	1	-	2	2
Total			69	13	12	14

Source: Field Survey, 2016



3.3.3 Data Analysis

The field data collected from the PAA were compiled edited and analyzed in Kathmandu using windows software like MS office software (Word, Excel). The analyzed data were then interpreted and discussed in appropriate sections of the IEE report.

3.4 Impact Identification, Evaluation and Prediction

A logical, simple and systematic approach has been adopted for impact identification, evaluation and prediction. The impact has been identified for physical, biological and, socio-economic and cultural environment of the project area. The following tools have been used for impact identification:

- VDC Checklist, KII
- HHs Questionnaire
- Table format for loss of land, crop production and property (PAFs and SPAFs)
- Expert's judgment

Topographic map of the alignment has been used in predicting the impacts of the proposed TL by analyzing the effect of project activities on the resources like existing infrastructures, rivers/rivulets, settlements, private land, forest etc. present in the location. The expert's judgment using past experiences of similar type of projects have been used to predict impacts. Wherever possible, impact predictions have been done quantitatively.

Field inventories before project implementation provide the baseline condition of resources. The assessment of impacts is based on the baseline environmental conditions of the affected area with the project activities in relation to spatial and temporal aspects in terms of magnitude, extent and duration using various environmental prediction methods. The impact has been predicted over a specified period and within defined area. Consequences of environmental impacts were interpreted in terms of local, regional and national contexts. The significant positive and adverse environmental impacts associated with the project components have been identified considering the impact zone. The magnitude, extent and duration of the impacts which were categorized according to the National EIA Guidelines, 1993 are given below:

Magnitude of Impacts

- Low Impact (L): If the value of the resources could be used with no or minimum inconvenience to the public
- Medium/Moderate Impact (M): If the value of the resources could be used with inconvenience to the public.
- High Impact(H): If the value of the resources reduced far below publicly acceptable level

Extent of Impacts

- Site Specific (SS): The impact is limited within RoW or within any project component then it is site specific one.
- Local (L): If the impact of the work extends to the adjoining wards and or within 100m up 300m from the TL or tower then it is termed as local.
- Regional (R): If the impact of the work extends to the entire district or further then it is termed regional.

Duration of Impacts

- Short Term (ST): If the impacts last for 3 years after project initiation it is classified as short term. Construction phase impacts are mostly categorized under this category.



- Medium Term (MT): An impact that continues for more than 3 years but less than 20 years is considered as medium-term. The construction phase impacts which carry over for few years of operation falls under this category.
- Long Term (LT): An impact that lasts beyond 20 years is considered to be long term. The operation phase impacts are mostly categorized under this category.

The National EIA Guidelines 2050 has provide the numeric value for each type of impact as follows;

<u>Extent (E)</u>	SS= Site Specific (10)	L= Local (20)	R= Regional (60)
<u>Magnitude (M)</u>	L= Low (10)	M= Medium (20)	H= High (60)
<u>Duration (Du)</u>	ST= Short Term (05)	MT= Medium Term (10)	LT= Long Term (20)

The number in the bracket refers to Impact value as per National EIA Guidelines, 1993. The sum of impact values provides a maximum of 140 and minimum of 25.

Significance of impact was evaluated based on the sum of the impact values in the following manner;

S.N	Sum of Impact Values	Significance Level
1	more than 75	Highly Significant
2	50-75	Significant
3	less than 50	Less Significant

3.5 Public Notice and Recommendation Letters

As per EPR 1997, a 15 days public notice was published in Gorkhapatra National Daily on 16-03-2074 BS (Appendix E). The notice consisted of a statement regarding brief project information and request to provide comments and suggestions within 15 days to the project office or ESSD. A team was mobilized in the field with copy of public notice along with cover letters to the concerned RM/Municipality/MC, district level line agencies and other local stakeholders. Copy of the notice was displayed in the project sites and proof of deed (*Muchulkas*) will be collected (Appendix H). Similarly, recommendation letters were collected from the affected RM/Municipality/MC (Appendix G). Summary of the draft IEE report was distributed to the concerned RM/Municipality/MC and a copy of IEE report was provided to District Co-ordination Committees (DCCs) and DFOs.

3.6 Limitations of the Study

The assessment of the site conditions was based mainly upon visual observations, literature and interviews with the local people. Since no updated topographic maps are available, the GIS analysis was based topo-maps mainly of mid-1990s. The GIS-generated information, mainly land-use, does not coincide with the actual field data. Field verifications were done to minimize the error but still some conflicts are encountered in mapping. The lack of site-specific location of suspension tower and ancillary facilities (construction camps, stores, etc.) during the field study created some difficulties in assessing the impact of the project.

Some information, particularly on physical and biological environment, reflects the characteristic only of that particular season and time of investigation. This resulted in generalization of impacts for such tower and facilities. Difficulties were also encountered during the socio-economic data collection as some of the land/structure owners of the affected area were not available during the questionnaire survey. Furthermore, some information mainly on land holding, agricultural production, income and expenditure are approximate value based on HH survey. Since the exact location and ownership of land required for STs and RoW was not available during IEE period (only to be determined in final check survey of the TL project), the survey of those HH was not carried out.

According to the recent change on the structure of local government (2073-11-27), new RM/municipality/MC are formed by merging and separating the existing VDCs/wards. So, total population is only the actual population of RM/municipality included all VDCs/wards whereas the data of other details do not match with demographic table. This is because the initial VDC structure is not completely merged into a single RM/Municipality. Some wards of the VDC are merged into other RM/Municipality, creating the mismatch in demographic and other details as no ward level data are available except for demography.

3.7 The Study Team

The following personnel were involved in the preparation of IEE of the proposed TL:

Table 3-5: List of Expertsinvolved in IEE

S.N.	Name	Designation	Specialization	Address	Phone No.
1	Rabindra Pd. Chaudhary	Chief	Zoology	NEA- ESSD	01- 6611580
2	Krishna Pd. Joshi	Asst. Director	Statistics		
3	Prakash Gaudel	Asst. Manager	Environment		
4	Anup KC	Environmentalst	Environment		
5	Ramesh Gautam	Sociologist	Sociology		
6	Sulav Shrestha	Civil Engineer	Civil Engineering		

Beside the aforementioned study team, the experts from the project were also involved in providing the project's technical data/facts and figures and suggestions for the preparation of this IEE Report. As well as enumerators and field helpers were hired at the local level to assist the study team in collecting baseline on each environmental domain and other necessary field data.

4 REVIEW OF POLICY AND LEGAL PROVISIONS

4.1 Introduction

The prevailing Acts, Policies, Regulations and Guidelines, which are required for the construction and operation of TL projects in Nepal, have been reviewed as per the followings while preparing the present IEE report. The proponent will abide by any other laws besides those already mentioned in the documents that are attracted due to different activities that will be undertaken during project implementation.

4.2 Constitution of Nepal

In the Article 30 of Part 3 of the Constitution of Nepal states about the Right to Clean Environment: According to this article all citizens shall have the right to live in clean environment, and in case if there is injury caused from environmental pollution or degradation, the victim have the right to obtain compensation. In the same way, Article 51(g) explains Policies relating to Protection, Promotion and use of Natural resources under the Policies of the State as follows;

- to protect, promote, and make environmental friendly and sustainable use of, natural resources available in the country, in consonance with national interest and adopting the concept of intergenerational equity, and make equitable distribution of fruits, according priority and preferential right to the local communities,
- to make multi-purpose development of water resources, while according priority to domestic investment based on public participation,
- to ensure reliable supply of energy in an affordable and easy manner, and make proper use of energy for the fulfilment of the basic needs of citizens by generating and developing renewable energy,
- to develop sustainable and reliable irrigation by making control of water-induced disasters, and river management,
- to conserve, promote, and make sustainable use of forests, wildlife, birds, vegetation and bio-diversity, by mitigating possible risks to environment from industrial and physical development, while raising awareness of general public about environment cleanliness,
- to adopt appropriate measures to abolish or mitigate existing or possible adverse environmental impacts on the nature, environment or biological diversity,
- to pursue the principles of environmentally sustainable development such as the principles of polluter pays, of precaution in environmental protection and of prior informed consent,
- to make advance warning, preparedness, rescue, relief and rehabilitation in order to mitigate risks from natural disasters.

4.3 Plan and Policy

4.3.1 National Energy Crisis Reduction and Development Decades, 2072 (2015) Concept paper

The MoEn has declared the decade 2016-2026 as the National Energy Crisis Reduction and Electricity Development Decade (Energy Emergency Decade). In this regard, the MoEn has issued a Concept Paper on Elimination of Energy Emergency and Electricity Development Decade, 2015 (2072) "Concept Paper" on February 18, 2016, with the objective to substantially end the power outage within the next one year, completely end power outage (even in the dry season) within the next two years, and to ensure energy security within the next decade. The concept paper also contains the provision that hydropower projects with a capacity of more than 10MW should be awarded only through competitive bidding. The proposed law is expected to facilitate the implementation of the 10-year National Energy Emergency Decade.



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4.3.2 Nepal Environmental Policy and Action Plan, 2050 (1993) and 2055 (1998)

Nepal Environmental Policy and Action Plan (NEPAP) were endorsed to further institutionalize environment protection in the development processes. The NEPAP recognize that a growing number of people are exposed to pollute from industrial enterprises. The NEPAP identifies the following factors as contributing to this process:

- Industrial plan inappropriately cited close to population centers
- Insufficient emphasis on fuel efficiency
- Little, if any pollution abatement equipment used for reducing emission, and
- A total lack of industry pollution standards

Hence, NEPAP emphasizes the need for mitigating adverse environmental impacts to address urban and industrial development, air and water pollution and infrastructure development.

4.3.3 Fourteenth Three Year Plan (2073/74-2075/76 BS), 2016

The GoN implemented the 14th periodic plan which will remain effective for three years. The plan focuses on reducing absolute poverty, sharing economic prosperity, post-earthquake reconstruction and rehabilitation, development of physical infrastructure and good governance. The new periodic plan also complements efforts being made by the government to put the country in the league of developing nations by 2022 and transform Nepal into a middle-income country by 2030.

4.3.4 Forestry Sector Policy, 2071 (2015)

The long term vision of Forest Policy, 2071 (2015) is to contribute towards local and national welfare through sustainable management of forest, biological diversity and watershed. The main goal of the policy is to conserve, promote and utilize forest, flora, fauna, conservation area, biological diversity and watershed and generate job employment, increase income, improve livelihood of vulnerable people and balance the ecosystem. The objectives of the policy is to conserve and manage forest, flora, fauna, conservation area and watershed to bring environmental balance, increase the forest productivity and production of forest products for fulfilling local and national needs and enhance exports to contribute towards national economy, develop and promote CF and other community based forest management options, involve private sector in forest area conservation, promotion and management for income generation and generate job employment and enhance the forest governance. To achieve above vision, goals and objectives, policies for increasing productivity and forest products through sustainable forest management, increasing benefits from biological diversity, resource conservation and environmental services and fair distribution of these resources, increasing productivity of water and land conservation through united conservation and management of watershed, enhancing CFs, leasehold forests, religious forests, protected forests and buffer zone CF for ecological, economic and social benefits and fair distribution, involving private sector in forest area conservation, promotion and management for income generation, applying climate change mitigation and adaptation measures and strengthen management for forest sector governance, inclusion and social law promotion. MoFSC is responsible for monitoring the implementation of its policy.

4.3.5 Hydropower Development Policy, 2058 (2001)

The Hydropower Development Policy was promulgated in 2001. The main objectives of the policy include producing clean energy through the development of hydroelectric projects which helps to conserve the environment. It is stipulated that one of the policies is to extend the use of electricity for achieving a reduction in the utilization of fuel wood and to render necessary assistance in the conservation of forest and environment.



4.3.6 Climate Change Policy, 2067 (2011)

The Climate Change Policy was approved by the GoN on January 2011. Main objectives of the policy include the promotion of the use of clean energy such as hydroelectricity, renewable and alternative energies and thereby increasing energy efficiency and encouraging use of green technology. Some of the major objectives of the policy are as follows:

- To establish a Climate Change Center as an effective technical institution to address issues of climate change and also strengthen existing institutions;
- To implement climate adaptation-related programs and maximize the benefits by enhancing positive impacts and mitigating the adverse impacts;
- To reduce GHG emissions by promoting the use of clean energy, such as hydro-electricity, renewable and alternative energies, and by increasing energy efficiency and encouraging the use of green technology;
- To enhance the climate adaptation and resilience capacity of local communities for optimum utilization of natural resources and their efficient management;
- To adopt a low-carbon development path by pursuing climate-resilient socio-economic development;
- To develop capacity for identifying and quantifying present and future impacts of climate change, adapting to climate risks and adverse impacts of climate change; and
- To improve the living standard of people by maximum utilization of the opportunities created from the climate change-related conventions, protocols and agreements.

4.3.7 National Bio-Diversity Strategy and Action Plan 2014-2020

The GoN prepared and implemented Nepal Biodiversity Strategy in 2002 and Nepal Biodiversity Strategy Implementation Plan in 2006. Useful experience and lessons have been learnt from the implementation of the strategy and the plan. Moreover, substantial changes have taken place in the socio-political and environmental contexts of the country over the last decade. Several new themes and issues have emerged or gained prominence since 2002. In light of these changes, MoFSC has prepared this revised 'National Biodiversity Strategy and Action Plan (NBSAP) 2014-2020'. It has been prepared to meet the national needs for managing biodiversity on a sustainable basis for the benefit of present and future generations, and also to fulfill the country's international obligations. It has a long-term (i.e. 35 years) vision, and includes specific short-term (up to 2020) strategies and priorities for action.

4.3.8 National Policy on Land Acquisition, Compensation and Resettlement, 2015

The National Policy on Land Acquisition, Compensation and Resettlement in Development Projects in Nepal was prepared by the National Planning Commission (NPC) with ADB assistance. The Policy has the following guiding principles:

- "Appropriate and adequate compensation for the loss of assets or income is a fundamental right of all project affected persons. Physically displaced people must be relocated with basic amenities such as school, health posts and other facilities.
- All affected persons should be assisted to restore at least their pre-project income and livelihood sources.
- The absence of legal title to land should not be a bar for compensation, resettlement and rehabilitation assistance.
- Vulnerable groups such as *Janajati/Adivasi*, Dalits, landless, women, especially women-headed households, differently-abled, poverty groups and senior citizens are entitled to special benefit and assistance packages in addition to compensation and resettlement.



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4.4 Acts

4.4.1 Land Acquisition Act, 2034 (1977)

One of the important acts that have a bearing on the implementation mechanisms and mitigation of adverse impacts of power projects is the Land Acquisition Act, 2034. This Act covers all aspects of land acquisition and compensation of land and other assets. It authorizes the government to acquire land for public purpose by providing compensation to the private landowners. The compensation paid under this Act will be given in cash. To decide the amount of the compensation, the Land Acquisition Act (1977) has made provisions for the constitution of a Compensation Fixation Committee (CFC). That committee consists of the chief district officer (CDO), Chief of District Land Administration and Revenue Office, Project Chief or an officer designated by the CDO and the Representative of the DCC.

The proposed project will permanently acquire 9.3675ha of land. As per the Act, it is mandatory to acquire land prior to the implementation of the project. The provisions made in the Act will be applied during acquisition of land. Cultivated land required for the project will be acquired by as per the rates fixed by CFC while forest land will be acquired by taking approval from GoN.

4.4.2 Soil and Watershed Conservation Act, 2039 (1982)

In order to manage watersheds of Nepal, the Soil and Watershed Conservation Act (SWCA), 1982 was enacted. The act is devoted to the protection of watersheds. Under Section 10 of SWCA, power is extended to the Watershed Conservation Officer to grant permission to construct dams, drainage ditches and canals, cut privately owned trees, excavate sand, boulders and soil, discharge solid waste and establish industry or residential areas within any protected watersheds. The Act outlines the essential parameters necessary for proper watershed management. The Act is relevant to the proposed project as the project will utilize the soil for tower foundation in different location. There is likely to impact on soil and watershed condition of the project area. Hence, the project is obliged to follow the SWCA, 2039 during project implementation.

4.4.3 Water Resources Act, 2049 (1992)

The objective of the Water Resources Act, 2049 is to make legal arrangements for determining beneficial uses of water resources, preventing environmental and other hazardous effects thereof and also for keeping water resources free from pollution. The Act strives to minimize environmental damage to water bodies, especially lakes and rivers through environmental impact assessment studies and the proponents who wish to use water resources for various purposes should prepare IEE report before a license can be granted. The Act stipulates that soil erosion, flooding, landslides or any significant impact on the environment should be avoided in all uses of a water resource. The provisions made in Water Resources Act, 2049 are mandatory in case of the implementation of the proposed project. As per the provision, the environmental impact mitigation and enhancement measures have been proposed in view of environment conservation.

4.4.4 Electricity Act, 2049 (1992)

Electricity Act, 2049 is related to survey, generation, transmission and distribution of electricity. Electricity includes electric power generated from water, mineral oil, coal, gas, solar energy, wind energy etc. Under Section 3 of the Act, it is stated that survey, generation, transmission or distribution of electricity without obtaining a license is prohibited. The Electricity Act, 2049 also contains provisions to minimize soil erosion, flood, air pollution and damage on environment while producing electricity and transmission of the power (Article 24). NEA is responsible for electricity transmission and distribution.

4.4.5 Forest Act, 2049 (1992)

The Forest Act, 2049 (Amendment 2055) recognizes the importance of forests in maintaining a healthy environment. One of the major objectives of the enhancement and enforcement of the Forest Act is the promotion of a healthy environment. The Act requires decision-makers to take account of all forest values, including environmental services and bio-diversity. It emphasizes the development and implementation of an approved work plan for different categories of forest, i.e. CF, Leasehold Forests, Private Forests and religious forests.

This Act is relevant in case of the project that will acquire 21.6947ha of forest land belonging to community and 0.7ha from government forest. It is mandatory to follow the Forest Act, 2049 while proposing the mitigation measures and also in implementation phase.

4.4.6 Labor Act, 2074 (2017)

New Labour Act has been passed by the Parliament on August 11, 2017 (Shrawan 27, 2074) and accorded the assent by the President on Sept. 04, 2017 (2074-05-19). The New Labor Act is now effective from the date of assent by the President by virtue of Section 3 (f) of the Interpretation of Statute Act, 1953 (2010). The New Labor Act has repealed the Labor Act 1992 (2048) (the "Previous Act"). The New Labor Act has brought complete change in employment regime in Nepal.

The Act clearly mentions that the appointment letter should be issued for all the employees which include their working hours, working time, wages and other benefits. The Act allows for the time bond contract for the manpower required for development work. The Act specifies that working hours for the Anabolic and women must be within 6 AM to 6 PM which clearly restrict to deploy women in night works. The Act also state that equal opportunity shall be given to women as men. Similarly Working Hours continue to be 8 hours a day and 48 hours a week, overtime has been increased to 24 hours per week from 20 hours a week. New Labor Act provides that the minimum remuneration of workers, public and weekly holidays should be as prescribed. The employer can deduct the expenses incurred in providing food and lodging from the remuneration if such is provided. Domestic workers should be allowed to celebrate festivals as per their culture, religion, tradition.

4.4.7 Environment Protection Act, 2053 (1997)

Nepal has enacted a comprehensive and umbrella type Act, the Environment Protection Act, (EPA), 2053 which is now enforced through appropriate regulatory measures. The EPA provides a legal basis for the concerned authorities for regulation of IEE or EIA. Section 3 of the Act requires the proponent to conduct an IEE or EIA in relation to the prescribed proposals. The Act uses the word proposal instead of Projects which makes the scope of the Act much broader in relation to environmental studies. Proponent includes any government, semi government or non-government agency or organization submitting an application for approval of a proposal and possessing the responsibility to work according to such a proposal or implementing the proposal.

According to the provision in Section 6 (1) of the Act, the relevant agency is empowered to grant approval for the IEE and EIA report, only if it finds that no significant adverse effects will be caused to the environment by the implementation of the proposal. Implementation of any proposal without the approval of the relevant agency is prohibited by the Act. As per EPA, 2054; the proposed project has obligation to carry out IEE prior its implementation.

4.4.8 Local Government Operation Act, 2074 (2015)

As the Local Self-Governance Act, 2055 (1999) was scrapped after the implementation of new constitution, this act is enforced by GoN in 2074/06/29 accordingly. This act has paved a strong legal foundation towards institutionalizing executives, legislative and quasi-judiciary practice of the newly formed local government. The legal mechanism was enacted as per the Article 296 (1) of the Constitution of Nepal so as to leverage local leadership and governance system. It was introduced by upholding the spirit of local autonomy and full decentralization with the motive to distribute fruits of democracy in a proportional, inclusive and just manner. The act has stipulated several arrangements related to authorities, duties and responsibilities of local government.

4.4.9 Child Labor (Prohibition and Regulation) Act, 2056 (2000)

The Child Labor (Prohibition and Regulation) Act, 2056 is enacted and enforced adopting International Labor Organization (ILO) Convention concerning Elimination of Worst Forms of Child Labor and Minimum Age Convention. This Act has defined the 'Child' as a person who has not achieved the age of 16 year. Article 3 bans the employing a child below the age of 14 to work as a laborer and engaging a child in the hazardous and risky works listed in the Schedule of the Act. It is mandatory for the proponent to follow the Child Labor (Prohibition and Regulation) Act, 2056 (2000) during the project implementation phase.

4.4.10 CITES Act, 2073 (2017)

This Act is enacted and enforced adopting Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973 to which GoN is a signatory state. The main objective of this Act is to implement CITES through protection of endangered species and controlling and regulating the wildlife trade. The Act has strictly prohibited the trade, use, farming, breeding or transport (export or import) of endangered species of fauna or flora or their samples. However the Act has provided some flexibility in the above provision by obtaining license.

4.4.11 Solid Waste Management Act, 2068 (2011)

Article 4 rests the responsibility of the solid waste management under the prescribed standards with the persons or institution that has generated the waste whereas Article 5 mandates reduction of the waste at source. Article 9 make the institution responsible to transport the solid waste to the waste disposal facility. The local body is made responsible for the monitoring of solid waste management by Article 21. Article 38 stipulates discharge of solid waste without the consent of the local body as an offence and Article 39 provisions for the punishment /penalty in case of offense.

4.5 Rules and Regulations

4.5.1 Electricity Rules, 2050 (1993)

Regulations on electricity sectors have been formulated for the implementation of the provisions made in the Electricity Act, 2049. The Electricity Rules, 2050 emphasizes environmental analysis, which should include environmental mitigation measures to minimize adverse impacts likely to occur while developing hydro-electricity (Rule 12 and 13). Rule 12 (f) and Rule 12 (g) are related to the EIA/IEE process which emphasize that the IEE report should include measures to be taken to minimize the adverse effects of the project on social, biological and physical environments and should also elaborate utilization of local labor, source of materials, benefits to the local people after the completion of the project, training to local people in relation to construction, maintenance and operation, facilities required for construction site and safety arrangements.

4.5.2 Water Resources Rules, 2050 (1993)

It is mandatory under Rule 17(e) of the Rule that any person or corporate body, who desires to obtain a license for utilization of water resources must state in his application that appropriate measures will be taken to lessen the adverse effects due to the project on the overall environment. Rule 19 stipulates that the water resources committee shall publish a notice giving detail information about the project to the people.

4.5.3 Environment Protection Rules, 2054 (1997)

EPR was endorsed in June 1997 and was made under the provisions of the EPA. The EPR has been amended several times and the recent was done in 2065/11/26. The recent amendment states that TL projects of capacity above 132kV voltage level requires only IEE unless it traverses through protected area, buffer zone or national parks. The EPR adopts the environmental assessment criteria mentioned in the EIA guidelines. However, the EPR establishes the administrative framework for assessing, exhibition and determination of the EIA/IEE, in terms of issues needing to be addressed and the format/layout of the EIA/IEE document.

Under section (18) of EPA, any person who contravenes any of the provisions of the Act, or the Regulations or the guidelines issued under the Act, shall be punishable with a fine up to NRs. 50,000. If a proposal is implemented without the approval of the Ministry of Population and Environment (in case of IEE, MoEn) or relevant government agency, or the person implementing the proposal is not complying with the conditions of the approval or license, the authorized official is empowered to close down that activity and may impose fine of up to NRs. 100,000 on such person or organization. This Act is relevant to the proposed project. Under this Rules, the IEE of the proposed project has to be carried out by the proponent and get approval from the MoEn prior to the project implementation.

4.6 Guidelines and Conventions

4.6.1 National EIA Guidelines, 2050 (1993)

The National EIA Guidelines, 2050 set out the process for the environmental review and management of infrastructure projects in all sectors and the respective roles of certain GoN agencies and project proponents. The guideline is part of a comprehensive program to develop the national and sectorial guidelines for establishing a national system for EIA which is part of GoN's National Conservation Strategy. The schedules attached to the Guidelines include:

Schedule 1	:	Projects requiring an IEE Report
Schedule 2	:	Projects requiring an EIA
Schedule 3	:	EIA based on project sites
Schedule 4	:	Projects requiring an IEE Report
Schedule 5	:	Format for ToR
Schedule 6	:	Environmental Impact Report Format

It is mandatory to follow the National EIA Guidelines, 2050 during the IEE. Following the Guidelines, the environmental impact prediction and evaluation of the proposed project has been done on physical, biological and socio-economic and cultural environment of the project area. The guideline is used for analysis of significant issues.

4.6.2 EIA Guidelines for Forestry Sector, 2052 (1995)

The GoN in keeping with the spirit of the National EIA Guidelines, 2050 framed EIA Guidelines for the forestry sector in 2052 (1995). The Guideline aims to facilitate the sustainable use of forest resources for socio-economic development and meeting basic need to the community.



regarding the forest products, to make proposals socio culturally acceptable, economically feasible, and environmental friendly to conserve genetic resources and biodiversity and minimize environmental damage in forest areas and facilitate in identification of positive and negative impacts of programs to be implemented by other agencies in forest areas. The guideline emphasizes the need of carrying out an EIA/IEE of development projects and programs proposed for implementation in forest areas.

4.6.3 Forest Production, Collection & Sales Distribution Guidelines, 2057 (1998)

The Clauses 3 to 10 of the Guidelines have specified various procedure and formats for getting approval for vegetation clearance, delineation of lands for vegetation clearance, evaluation of wood volume etc. and government offices and officials responsible for the approval, delineation and evaluation. These provisions have a direct relevance to the development of the project and need compliance to these provisions. It is obligation to the project for getting approval in view of vegetation clearance and evaluation of wood volume from district forest office prior to the construction phase.

4.6.4 Community Forest Guidelines, 2058 (2001)

This guideline has been prepared by including amendments of acts, rules by officials of GoN and related experts. Through these guidelines, persons involved in the development and management of CF like facilitators, User Groups, forester and managers etc. will get help to understand about the processes and stages of development of CF. Forest Users Group, forest officials, NGOs and INGOs are getting benefit by this guideline. Till date, more than 15000 CFs have been handed over to the CFUGs.

4.6.5 Community Forest Inventory Guidelines, 2005

The guideline for inventory of CFs advice to classify the forest into timber trees, pole size trees and regeneration on the basis of diameter. It has recommended using 20m x 20m size of quadrant for timber trees, 10m x 10m for shrub and 5m x 5m for regeneration plots in the CF. Plants having dbh (1.3m above ground) greater than 30cm are considered as trees. Trees having dbh between 10cm to 30cm are categorized as pole and plants having less than 10cm dbh belong to regeneration species.

4.6.6 Working Procedure for the Use of National Forest Land for National Priority Project, 2074

(राष्ट्रिय प्राथमिकता प्राप्त योजनाको लागि राष्ट्रिय वन क्षेत्र प्रयोग गर्ने सम्बन्धी कार्यविधि, २०७४)

This Procedure sets ways for the use of the forest area land for National Priority Projects (NPPs). In regard to the Ministry's approval of IEE/EIA of the NPPs requiring national forest, this Procedure makes it mandatory for such ministry to take consent from the MoFSC prior to such approval. Apart from this it also sets guidelines for the mitigation measures for compensatory afforestation for the loss of forest resources in the project occupied land areas.

4.7 Conventions

4.7.1 Convention on Biological Diversity, 1992

The convention contains a series of far reaching obligations related to the conservation of biological diversity and sustainable uses of its components. One of these obligations is the requirement for environmental study. The purpose of an environmental study in relation to biodiversity conservation is to identify in advance:

- The aspects of the project which is likely to have significant adverse effects on biological diversity at genetic, species and ecosystem level, and



- The steps to be taken to avoid or minimize significant adverse effects to ensure that the proposed project comply with existing environmental legislation.

The GoN has included 17 species of plants and 39 species of wild animals in the protection list. If the project area is in the core habitat of these species and project activity will likely to affect them, mitigation measures shall be proposed and be implemented to avoid and/ or mitigate the adverse impacts. Nepal is a party to the convention of Biological diversity and in accordance to the article 14, adequate attention should be given to minimize and or avoid the impacts.

4.7.2 CITES, 1973

Nepal became a contracting party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) on June 18, 1975. That aims to control the trade of certain wildlife species to prevent further endangered species of their survival. CITES classified species according to the following criteria:- (i) Species threatened with extinction; (ii) Species which could become endangered and (iii) Species that are protected.

As Nepal is a signatory member to the convention related to species conservation, attention should be given to evaluate the impacts of the project activities on meeting their obligation. It is relevant to IEE that species protection list could also be used to evaluate the significance of the identified and predicted impacts.



5 EXISTING ENVIRONMENTAL CONDITION

5.1 Physical Environment

The proposed alignment passes through different terrain affecting variety of land use pattern. The topography, land use, climatic condition, geomorphology and geology, seismology, air, water and noise condition, watershed and drainage pattern, crossing of other utilities and air traffic that shall be influenced due to the construction of this project has been discussed in each topic ahead.

5.1.1 Topography

The proposed alignment of length 42.254km traverses through hilly region of western Nepal. The alignment runs through several topographic features comprising of rugged hills with mild and steep slope, undulating land forms and flat terrain. The altitudinal variation of the TL points are between 1184m to 327m at Kotbari, Pokhara Lekhnath MC and Byas municipality respectively. The altitudinal variation of the APs along the alignment is given in Figure5-1. Altitudinal variation along the alignment including location and land use is presented in Appendix B.

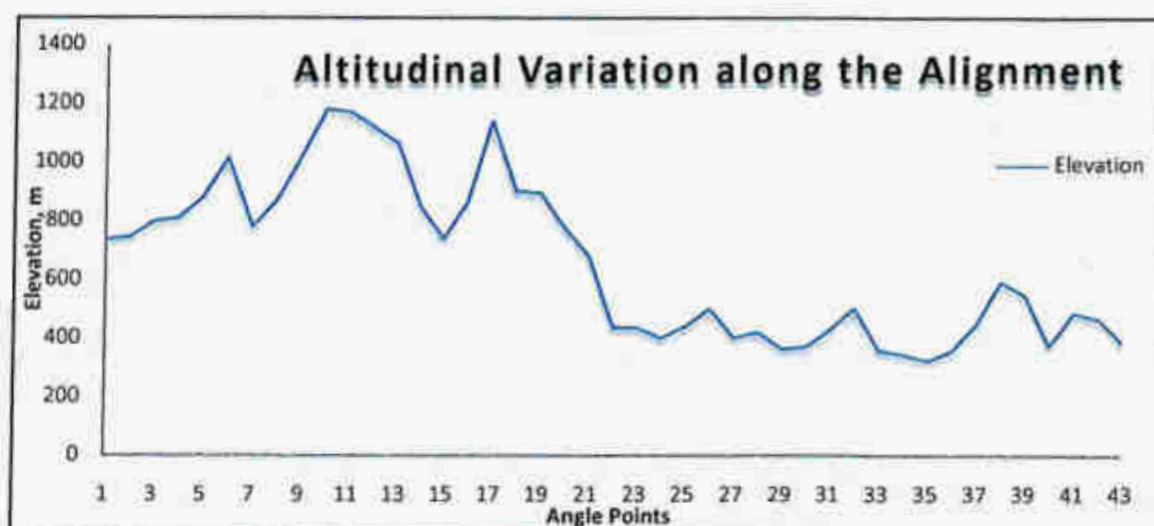


Figure5-1: Altitudinal Variation along the Alignment



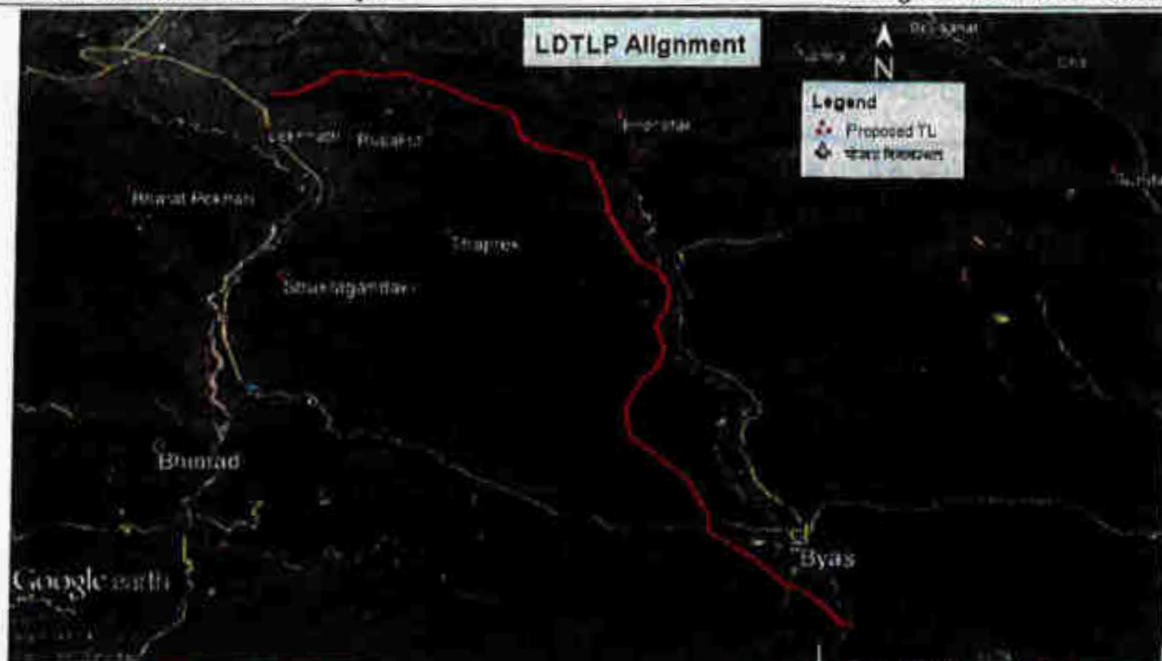


Figure 5-2: Google Image with Longitudinal Profile of LDTLP

Source: Google Earth Image

5.1.2 Land Use

The main land use pattern of the project area is cultivated land, CF, grazing land and barren land. The alignment avoids densely populated areas, major structures, protected areas and dense forests. The other land uses along the alignment consists of road crossings, rivers, rivulets, river beaches and TL. Along the alignment, approximately 68.84% of the TL passes through the cultivated land, 26.01% through forest and 2.68% through barren and 2.47% through others (Sand, Water Bodies, road crossings and river crossings etc.). The land use detail is presented in Table 2-4. The change in land use data with reference to ToR is due to shift of alignment in some portion (AP 8, AP 9 and addition of AP 29A). Figure 5-3 is land use Map of the PAA along the TL. The land use details along the alignment AP wise has been presented in Appendix B.



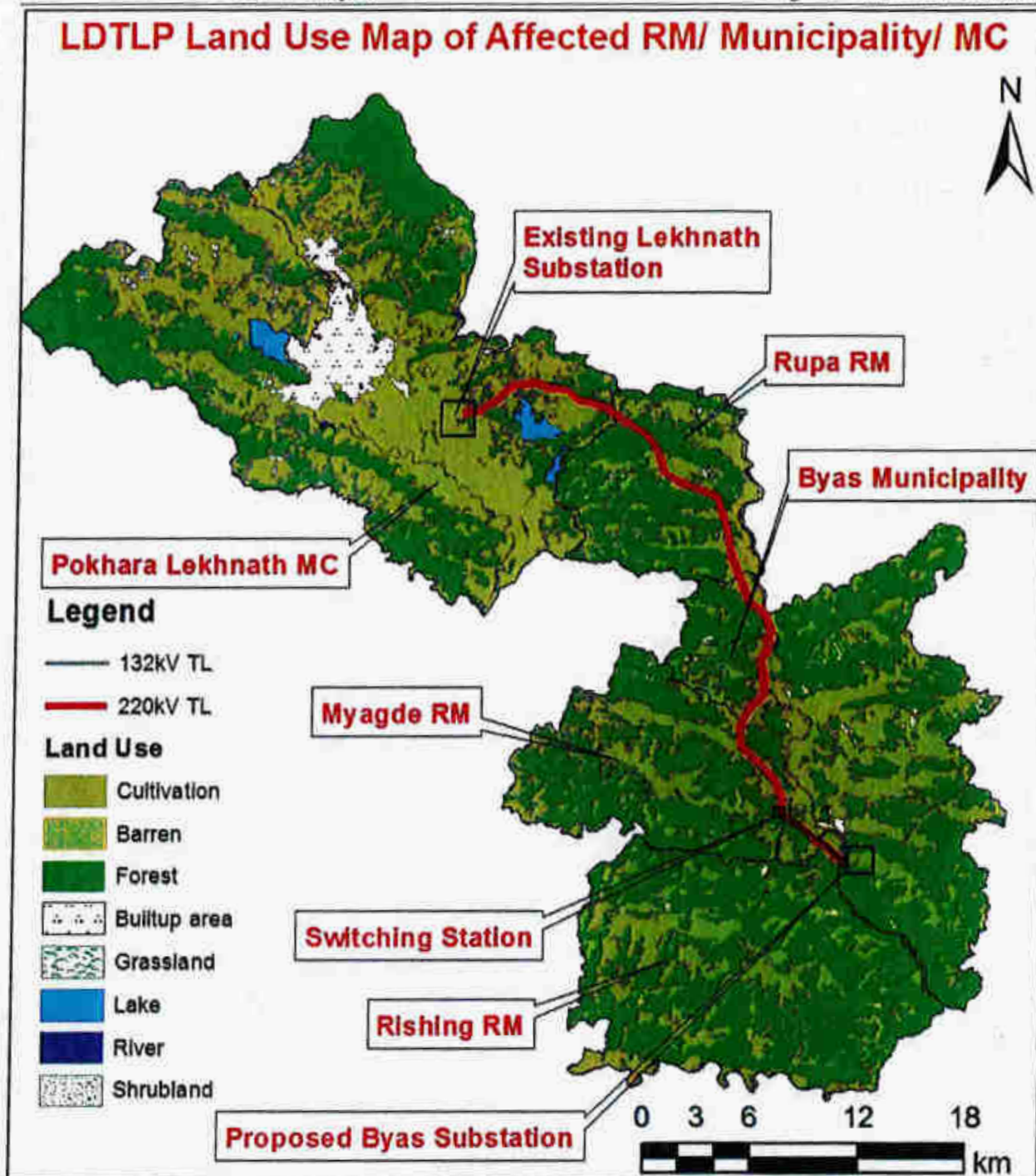
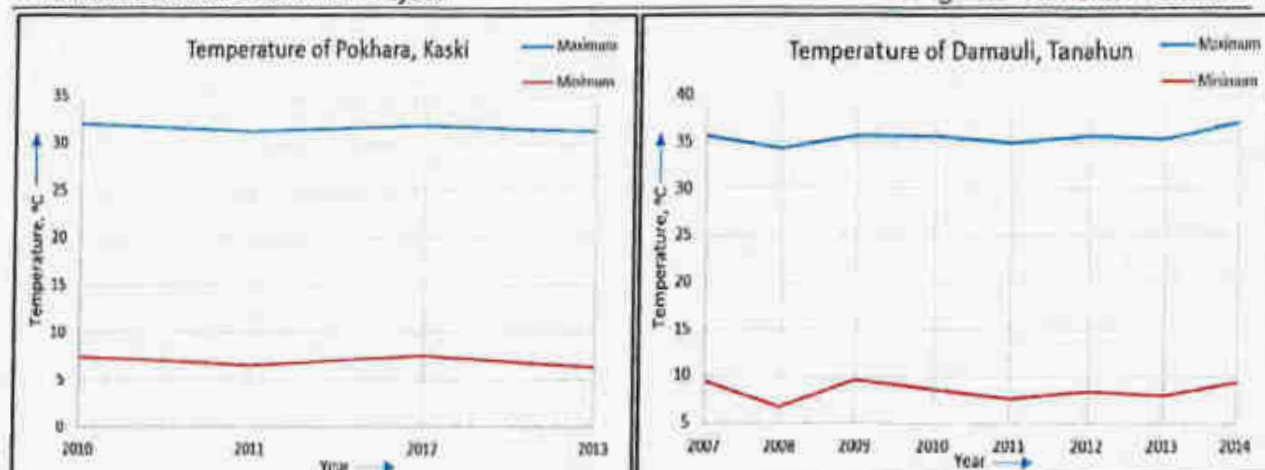


Figure5-3: Land Use Map of PAAs

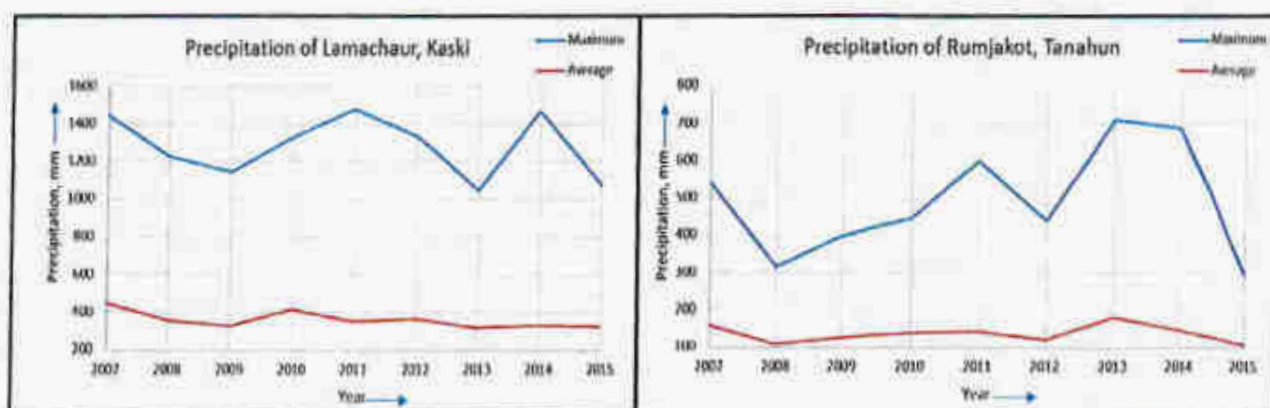
Source: GIS Analysis

5.1.3 Climate

Subtropical and upper tropical climates prevail in the project area. The project area experiences strong seasonal variations, with wet monsoons from June to September and dry weather from October to May. Temperature and precipitation along the PADs is presented in following charts. The temperature and precipitation data along the TL in tabular form is presented in Appendix B.



(a)



(b)

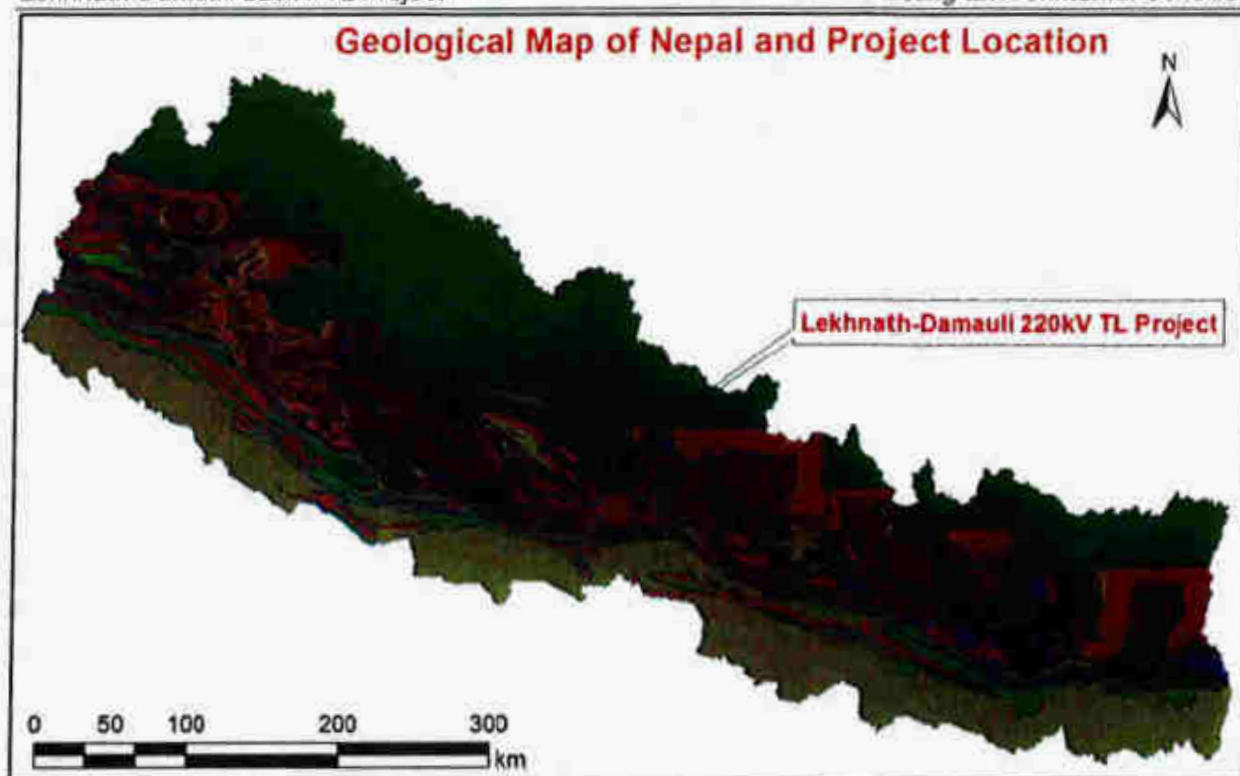
Table 5-1: (a) Temperature and (b) Precipitation Data of PADs

Source: DHM

5.1.4 Geomorphology and Geology

The proposed alignment of TL passes through the Hill (Figure 5-5) represented by low grade metamorphic rocks such as phyllite, quartzite and slate. During the field visit it was observed that APs of the TL are located at relatively flat and stable areas covered by colluvial and alluvial deposit. The AP that are prone to risk has been mentioned in Table 5-3. The geology along the alignment has been presented in Figure 5-6.



**Legend****Geology**

Ba	Gn	Middle Siwalik2	Shipin Khola Formation
Basic Rocks	Granites	Naudanda Formation	Siuri Formation
Bb	Himal Gneiss	No Data	Sopyang Formation
Bu	Himal Group	Pa	Suntar Formation
Chandragiri Formation	Kaikot Formation	Panglima Quartzite	Surbang Formation
Chitlang Formation	Kushma Formation	Phulchowki Formation	Swat Formation
Ci	Lakherpata Formation	Quaternary	Syanga Formation
Cs	Lower Siwalik	Ranimatta Formation	Takure Formation
Damgad Formation	Maksang Formation	Rb	Tawa Khola Formation
Du	Markhu Formation	Recent	Tistung Formation
Dware kharka Schist	Melmura Formation	Sallyani Gad Formation	Udayapur Formation
Galyang Formation	Melpani Formation	Sangram Formation	Ulleri Formation
Gh	Middle Siwalik	Serung Khola Formation	Upper Siwalik
	Middle Siwalik1	Seli Formation	
		Sh	

Figure 5-4: Geological Map of Nepal and Project Location

Source: GIS Analysis



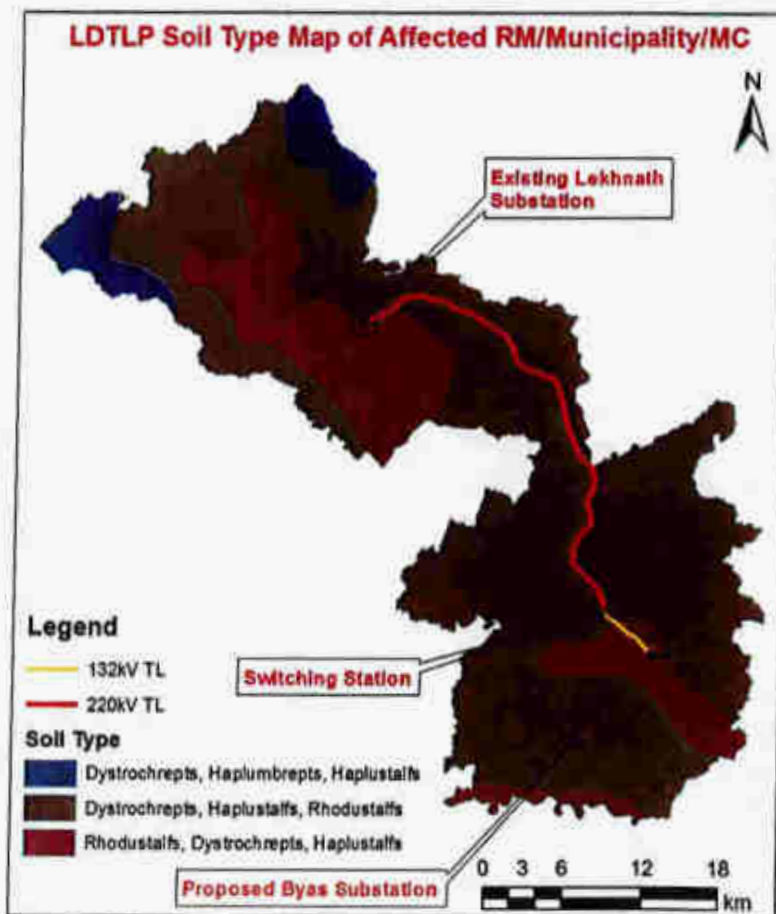
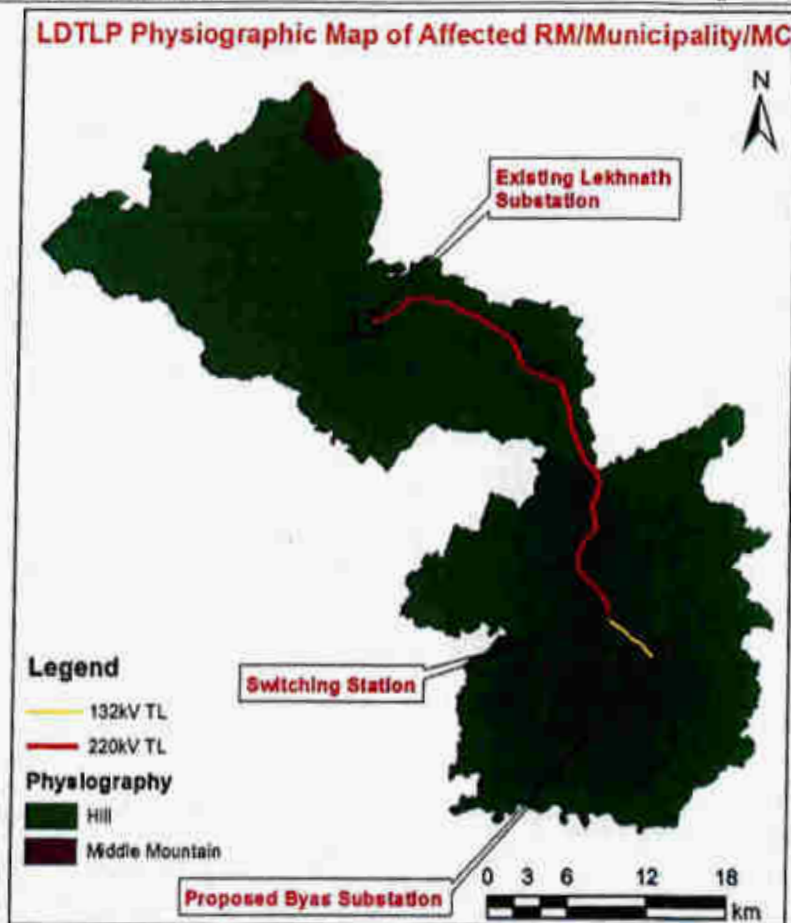


Figure 5-5: Physiographical and Soil Type Map along the Alignment

Source: GIS Analysis



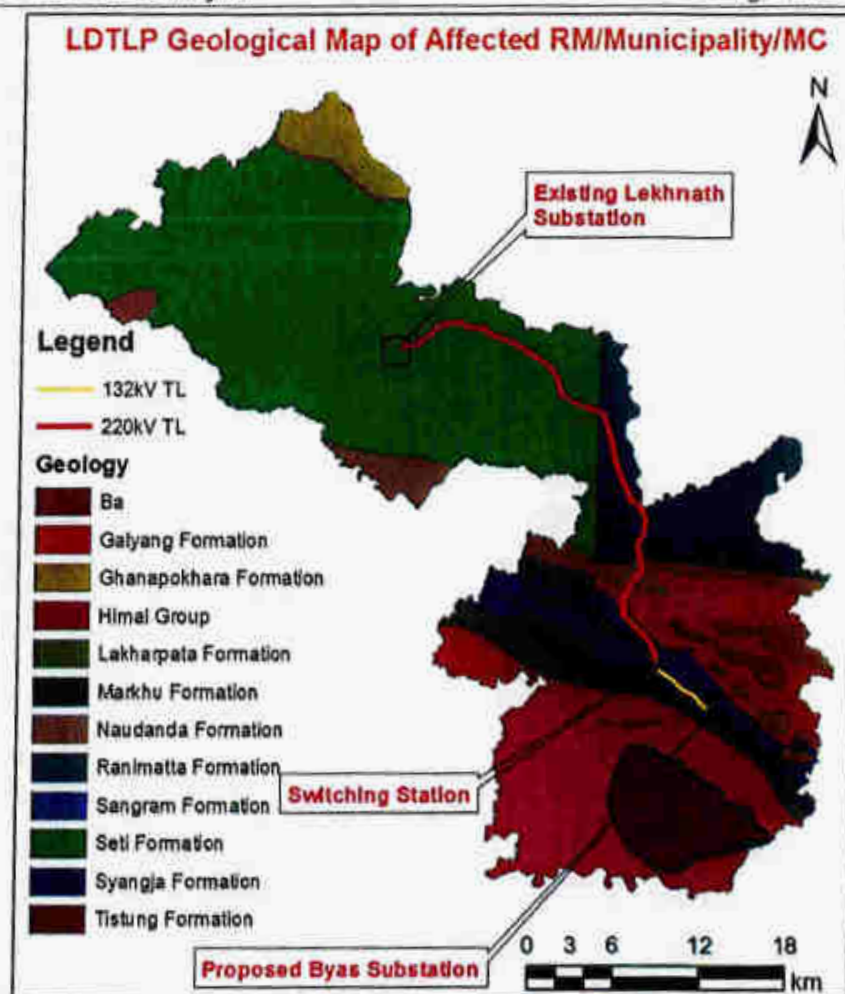


Figure5-6: Geological Map along the Alignment

Source: GIS Analysis

Geological map of Nepal in Figure 5-4 shows the project location lies along boundary of western central and mid western Nepal of regional geological map. Initial part of alignment start from mid western region and end part to the western central region.

Similarly, figure 5-6 above of geological map of PAA with alignment shows that the 220kV line mostly traverse through Seti formation. This alignment follows Ranimatta formation, Naudada formation, Galyang formation, Syangja formation, Lakharpata formation and terminate at Sangram formation. Likewise, same figure above shows 132kV line starts on Syangja formation and terminate on Sangram formation. These formation comprise of followings:

- Seti Formation: Grey to greenish grey phyllites, gritty and quartzites with minor conglomeratic layer. Basic intrusions are also noted.
- Ranimatta Formation: Grey to greenish grey shally phyllites slates garnetiferous phyllites greyish white quartzites with carbonate beds and amphibolites.
- Naudada Formation: Fine to medium grained white quartzites with ripple marks and thin intercalations of green chloritic phyllites.
- Galyang Formation: Dark grey shales with black limestones, thin calcareous slates and grey dolomitic limestones, black carbonaceous slates with fine grained dull calcareous sandstones beds. Grey to black siliceous limestones with thin marble bands.
- Syangja Formation: White milky white, pale orange, pinkish or purplish calcareous quartzites and quartzitic limestones with dark grey and purple shales pinkish calcareous quartzitic beds grey arkosic sandstones, grey and pale green shales.

- f. Lakharpata Formation: Fine grained gray pink limestones and dolomitic limestones with thin intercalation of purple and green shale, algal structure and stromatolites are present.
- g. Sangram Formation: Grey to greenish grey carbonaceous shales with highly silicified grey to grayish white dolomites.

5.1.5 Seismology

Nepal is the 11th most earthquake-prone country in the world (NPC, 2015). Ever since the first recorded earthquake of 1225 AD that killed one-third of the population of Kathmandu Valley, Nepal has experienced a major earthquake every few generations. Earthquake of Baisakh 12, 2072 is evident of such incidents. This project is situated in seismic zone factor of 1.0 which is critical from the seismic point of view. Although, it is good that this alignment does not pass through the dangerous seismic zone.

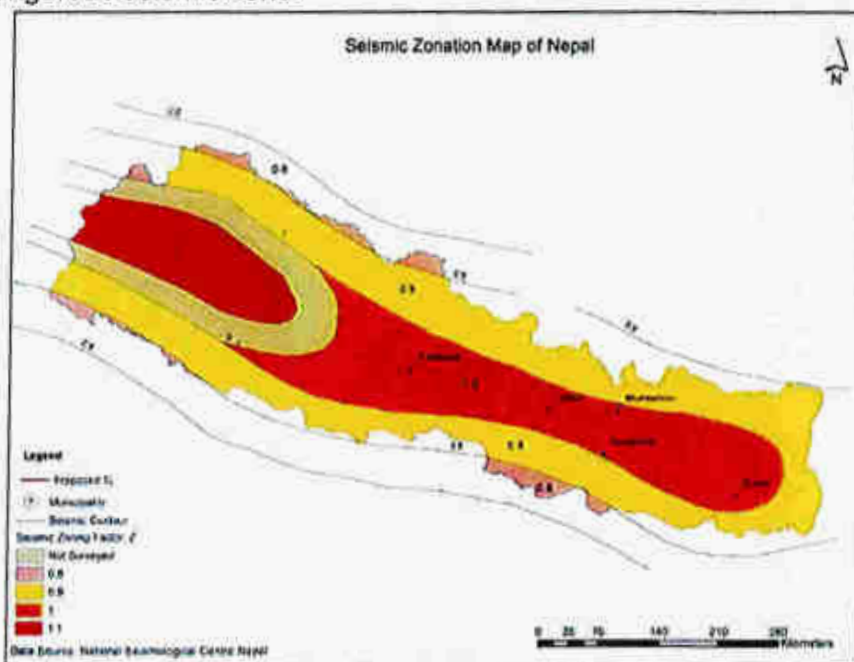


Figure5-7: Seismic Map of Nepal

The above figure shows the seismic zone factor in Nepal and where this project alignment lies in the map. As the seismic zoning factor increases the level of seismicity increases. So from above map, the LDTLP alignment passes through the zone which has seismic zone factor 1.0.

5.1.6 Air and Noise Quality

The proposed TL passes mainly through the rugged hills with mild and steep slope, undulating land forms and flat terrain avoiding settlements and market centers. However, at some stretches, it traverses along the RoW of motorable gravel and earthen roads and even the highway. During the field visit, it was observed that the major stretch of the project stretch traverses through rural setting with some industrial activities within 500-1000m from alignment. The main source of air pollution along the alignment is due to the vehicular movement along the earthen road and construction activities like road, canal, buildings etc. Other sources of air pollution along the alignment are HH fire, fugitive dust particles created by the movement of public vehicles along the roads to the settlements and vehicular emissions. However, the transportation density and frequency of the vehicles along the road is not high. Therefore, the overall status of air quality at the project area can be considered to be satisfactory and within the range of acceptable limits.

Noise pollution may be felt by the local people of market places residing in market areas like Khareni village, Bastola gau, Talbesi, Mauriya, Sishaghat, Barhabise, Malingagau and Belbas. The overall noise levels along the TL can be considered to be within the acceptable limits.

5.1.7 Water Quality

The overall water quality of river and other water bodies along the TL appears to be unpolluted. However, dumping of solid wastes into the river was observed at some stretches as of AP5 - AP6, AP13-AP14 and AP30-AP35. But, the water quality of the streams close to the settlement areas has a high potential of microbiological contamination as the banks are used for open defecation and other HH purposes by the local people.

5.1.8 Watershed Conditions and Drainage Patterns

Drainage system also known as river system are the patterns formed by the streams, rivers and lakes in a particular drainage basin. They are governed by the topography of the land, whether a particular region is dominated by hard or soft rocks, and the gradient of the land. As per configuration of the channels, drainage system found in this area is accordant drainage pattern. In accordant drainage pattern, dendritic drainage pattern (pertaining to a tree) is the most common form of drainage system in the project area. There are many contributing streams which are then joined together into the tributaries of the main river as in figure below. They develop where the river channel follows the slope of the terrain. Dendritic systems form in V-shaped valleys; as a result, the rock types are impervious and non-porous. The alignment traverse through hilly region of Nepal. The watershed of the proposed TL including the substation proposed is observed to be fairly intact and stable.

The rivers which cross the alignment of this section include Seti River and Madi Khola. The watershed is fed by mostly Machhapuchhre Mountains' snow and its Kawache Glacier, and Annapurna I and II Mountains' snow and its glacier. The river crossing along the alignment are presented in Table 5-2 below. Drainage can be easily provided for each and every tower pads except for the tower pads which are situated in flat lands (AP 27, AP 32, AP 33 and AP 34). In this case, foundation of tower should be laid during dry season.

Table 5-2: River Crossing along LDTLP

S.N	Stretch between		Major River Crossing		No. of small Rivulets
	From	to	Name	No.	
1	AP 3	AP 4	-	-	1
2	AP 4	AP 5	Baguwa Khola	1	1
3	AP 5	AP 6	-	-	1
4	AP 6	AP 7	Chandi Khola Kanmaran Khola	1 1	-
5	AP 14	AP 15	Dhovan Khola	1	2
6	AP 15	AP 16	Chaisa Khola	1	2
7	AP 16	AP 17	-	-	3
8	AP 17	AP 18	-	-	2
9	AP 18	AP 19	Chalne Khola	1	-
10	AP 19	AP 20	Ghaguwa Khola	1	-
11	AP 20	AP 21	Birdi Khola	1	5
12	AP 21	AP 22	Khalte Khola	1	1
13	AP 22	AP 23	Bilmghe Khola Mulpani Khola Thudi Khola	1 1 3	2
14	AP 23	AP 24	Thudi Khola	1	1
15	AP 24	AP 25	Thudi Khola	1	

S.N	Stretch between		Major River Crossing		No. of small Rivulets
	From	to	Name	No.	
16	AP 26	AP 27	-	-	1
17	AP 27	AP 28	Madi Khola	1	1
18	AP 28	AP 29	-	-	2
19	AP 29	AP 30	-	-	1
20	AP 30	AP 31	-	-	2
21	AP 31	AP 32	Sage Khola	2	2
22	AP 32	AP 33	Sage Khola	2	-
23	AP 33	AP 34	Sage Khola	2	1
24	AP 34	AP 35	Sage Khola	2	-
25	AP 35	AP 36	Gunadi Khola	1	1
26	AP 37	AP 38	-	-	1
27	AP 38	AP 39	-	-	2
28	AP 39	AP 40	Seti River	1	1
29	AP 42	AP 43	Seti River	1	-
Total				28	36

5.1.9 Land Stability/ Erosion

Almost all the location of APs are on stable land except AP 40 which is on steep slope. Construction of foundation will be difficult in this case. Since the tower pad is located near the local road, the construction may disturb the flow of vehicle and the original landscape of the area. Some APs are located on sites susceptible to erosion and instabilities like some near the feeder road. Likewise, due to construction of rural road, some landslide was observed during the field visit along the RoW of the alignment (AP 5 to AP 6).

Settlements and steep slopes have been avoided which may trigger landslide and cause instability problems. Likelihood of triggering existing slides, formation of new slides and soil erosion near existing settlements has been studied and no such issues are found. Hill slope shall be maintained as far as possible but in some cases if it is difficult to maintain, appropriate measures shall be provided accordingly. In case if any unstability occur due to the construction and operation of the project components, such issues shall be addressed by the project.

Table 5-3: List of Critical APs

S. N.	APs/ Stretch	Type of Problem	Remarks
1	AP 2, AP3 and AP4	Coincide with APs of New Modi Lekhnath 132kV TL Project	APs need to be shifted.
2	AP3 to AP4	Cross Madi 132kV TL	Clearance between the conductors shall be maintained.
3	AP 34 to AP35	Cross 132kV line	
4	AP38	Water tank near AP	AP need to be shifted slightly
5	AP 40	Located on steep slope above earthen road	Protection work is needed.
6	AP 43	Located near Site River bank	River protection work is needed.

5.1.10 Crossings of Other Utilities

The proposed LDTLP crosses 28 times the major rivers like Seti River and Madi Khola and other rivulets, 12 times by existing 11kV TL and twice by 132kV. Similarly, it crosses Prithvi Highway once and 45 times feeder road and other inter-connected gravel/earthen/trails/feeder roads numerous times. These crossings shall have required clearance (vertical and horizontal) from the proposed TL. For this, the standards referred by the Electricity Regulation, 1993 (Rule 48, 49, 50 and 55) shall be followed. Since these crossings follow the standards of clearance proposed by electricity regulation and these has been discussed in project area with stakeholders, these crossings does not create any kind of social or physical problems in future.

The field verification for other crossings like houses, huts and shed and other infrastructure of religious and archaeological significance was also done during the site visit. Altogether 23 built-up infrastructures are found under the RoW of the TL which includes tin roofed and thatched houses, cowsheds, toilet, hut, etc. From the alternative analysis, it is the most safe, easy, short and economic alignment. Hence such crossings neither be minimized nor be avoided. The summary of the crossings is given in the table below.

Table 5-4: Crossing along the TL Alignment

S.N	Stretch		Highway		Crossings				TLs	
	From	to	Name	No.	Feeder Road	Foot Track	House	Physical Structure	Voltage level	No.
1	AP 1	AP 2	-	-	1	1	-	-	400V	2
2	AP 2	AP 3	-	-	-	-	-	-	400V	1
3	AP 3	AP 4	-	-	1	-	-	-	400V 132kV	1 1
4	AP 4	AP 5	-	-	3	-	1	-	220V	1
5	AP 5	AP 6	-	-	4	1	1	-	220V	1
6	AP 6	AP 7	-	-	1	1	-	Hut-1	220V	2
7	AP 7	AP 8	-	-	1	1	-	-	220V	1
8	AP 8	AP 9	-	-	1	-	-	-	220V	1
9	AP 10	AP 11	-	-	-	1	-	-	-	-
10	AP 11	AP 12	-	-	-	1	-	-	220V	1
11	AP 12	AP 13	-	-	2	-	-	-	-	-
12	AP 13	AP 14	-	-	1	-	1	-	-	-
13	AP 14	AP 15	-	-	1	-	-	-	-	-
14	AP 15	AP 16	-	-	2	-	1	-	220V	1
15	AP 16	AP 17	-	-	1	-	-	-	-	-
16	AP 17	AP 18	-	-	1	2	-	-	11kV	1
17	AP 20	AP 21	-	-	-	1	-	-	400V	1
18	AP 21	AP 22	-	-	2	-	-	-	-	-
19	AP 22	AP 23	-	-	2	1	-	-	220V 400V 11kV	2 1 1
20	AP 23	AP 24	-	-	1	-	1	Cowshed-1	400V	1
21	AP 24	AP 25	-	-	2	-	-	-	-	-
22	AP 25	AP 26	-	-	-	-	1	Cowshed-1	220V	1
23	AP 26	AP 27	-	-	1	-	2	Toilet-1	400V 11kV	1 2
24	AP 27	AP 28	-	-	1	-	-	-	-	-
25	AP 28	AP 29	-	-	2	2	-	Cowshed-1	-	-
26	AP 29	AP 29A	-	-	1	-	-	-	220V 400V 11kV	1 1 1
27	AP 29A	AP 30	-	-	1	-	1	-	-	-
28	AP 30	AP 31	-	-	2	-	-	-	220V	1
29	AP 31	AP 32	-	-	1	1	-	-	11kV	1
30	AP 32	AP 33	-	-	1	1	1	-	220V 11kV	1 1
31	AP 33	AP 34	-	-	1	-	-	-	11kV	2
32	AP 34	AP 35	-	-	1	-	-	-	-	-
33	AP 35	AP 36	Prithvi Highway	1	1	-	1	-	220V 132kV	2 1
34	AP 36	AP 37	-	-	-	-	-	-	220V	1
35	AP 37	AP 38	-	-	2	-	-	-	220V	2
36	AP 38	AP 39	-	-	1	1	1	-	220V	2
37	AP 39	AP 40	-	-	1	1	1	Cowshed-1	220V	1
38	AP 40	AP 41	-	-	1	1	1	Cowshed-2	220V 11kV	1 1
39	AP 41	AP 42	-	-	-	-	-	Cowshed-1	220V	1

S.N	Stretch		Highway		Crossings				TLs	
	From	to	Name	No.	Feeder Road	Foot Track	House	Physical Structure	Voltage level	No.
40	AP 42	AP 43	-	-	1	-	-	-	11kV	1
41	AP 43	AP 44	-	-	1	-	-	-	11kV	1
Total				1	45	17	14	9		

Source: Field Survey

5.1.11 Air Traffic

A domestic airport exists in Pokhara which is located approximately 7.74km north west from the existing Lekhnath substation. The airport and substation area can be seen in the Google image in Figure 5-2. Moreover, project officials consulted with Civil Aviation Authority of Nepal (CAAN) at Kathmandu regarding probable disturbance of the proposed TL to the flying route of air plane. And it was concluded that the proposed LDTLP will not disturb to the air traffic of Pokhara airport. A letter from CAAN has been attached in Appendix A.

5.2 Biological Environment

The proposed TL passes through two districts namely Kaski and Tanahun. It starts from substation of Pokhara Lekhnath MC of Kaski District and runs along mid-hill area of Kaski and Tanahun District and finally terminates at proposed substation of Byas Municipality-13, Belbas of Tanahun District.

Based on the diverse climate due to changes in elevation, the PADs have four types of forest which include (i) Sub-Tropical Broad Leaf Forest (below 1500m elevation) characterized by Chilaune (*Schima wallichii*), Katus (*Castanopsis indica*), Uttis (*Alnus nepalensis*) and Hill saal (*Shorea robusta*); (ii) Temperate Forest (1500m to 3000m) characterized by mixed broad leaved species of Khasru (*Quercus* sp.), Gurans (*Rhododendron* sp.), etc.; (iii) Sub-Alpine Forest (3000m to 4430m) consisting of Bhojpatra (*Betula* sp.), Dhupi (*Thusa* sp.), Guran (*Rhododendron* sp.), etc. and (iv) Alpine Forest (4430m to 4800m) with dwarf varieties of *Rhododendron* and *Thusa* species (DFO-Kaski, 2072). However, the altitude variation of the proposed LDTLP alignment varies from 327m to 1184m (Figure 5-1), the project area is characterized by Sub-Tropical Broad Leaf Forest according to the above classification. Out of 44APs, 9 are located in the forest area.

Nine Lakes of Pokhara Lekhnath MC were declared as a Ramsar Site in February 2, 2016. The Lake Cluster of Pokhara Valley Ramsar Site comprises of 261.1sq. km. of area and is rich in biodiversity. The following sections describes the baseline of the biological environment of the project area.

5.2.1 Vegetation and Forest Resources

The density measurement of plants showed that Sal (*Shorea robusta*) had the highest density of 3008 per ha. It is followed by Chilaune (*Schima wallichii*) (2336/ha), Katus (*Castanopsis indica*) (1168/ha), Angeri (*Osbeckia nepalensis*) (750/ha), Tiju (*Diospyros malabarica*) (333/ha), Botdhairo (*Lagerstroemia parviflora*) (204/ha), Dhurseli (*Colebrookea oppositifolia*) (140/ha), Ramritha (*Mallotus oppositifolius*) (71/ha), Khirro (*Sapium insigne*) (70/ha), Sallo (*Pinus* sp.) (68/ha), Mauwa (*Engelhardtia spicata*) (63/ha), Padke (*Albizia julibrissin*) (46/ha). Other species are found in fewer amounts as shown in Table 5-6.

Overall, frequency measurement of plants in TL showed 90% of Chilaune (*Schima wallichii*), 55% of Angeri (*Osbeckia nepalensis*), 40% of Sal (*Shorea robusta*), 35% of Katus (*Castanopsis indica*), 25% each of Botdhairo (*Lagerstroemia parviflora*) and Khirro (*Sapium insigne*), 20% of Dhurseli (*Colebrookea oppositifolia*) and 15% each of Mauwa (*Engelhardtia spicata*), Sallo

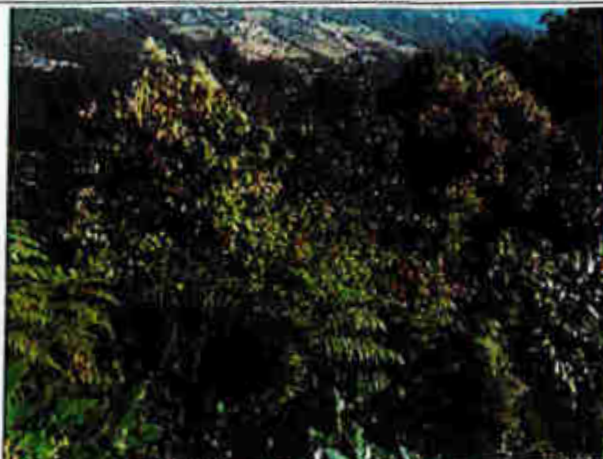
(*Pinus sp.*) and Tiju (*Diospyros malabarica*). There is sparse presence of other species as shown in Table 5-6.

The basal area of Sal (*Shorea robusta*) is highest with 26.505m² per hectare. It is followed by Chilaune (*Schima wallichii*) (14.826 m²/ha), Katus (*Castanopsis indica*) (6.013 m²/ha), Swami (*Ficus benjamina*) (2.310 m²/ha), Sallo (*Pinus sp.*) (1.650m²/ha), Angeri (*Osbeckia nepalensis*) (1.335m²/ha), Padke (*Albizia julibrissin*) (0.951m²/ha), Botdhairo (*Lagerstroemia parviflora*) (0.668m²/ha), Tiju (*Diospyros malabarica*) (0.599m²/ha), Khirro (*Sapium insigne*) (0.585 m²/ha) and Ramritha (*Mallotus oppositifolius*) (0.585m²/ha). Basal area of other species is shown in Table 5-6. Importance Value Index (IVI) of Sal (*Shorea robusta*) was 91.73. It is followed by Chilaune (*Schima wallichii*) (75.79), Katus (*Castanopsis indica*) (32.99), Angeri (*Osbeckia nepalensis*) (24.83), Botdhairo (*Lagerstroemia parviflora*) (9.76), Tiju (*Diospyros malabarica*) (8.70), Khirro (*Sapium insigne*) (8.02), Sallo (*Pinus sp.*) (7.37), Dhurseli (*Colebrookea oppositifolia*) (7.10), Swami (*Ficus benjamina*) (5.28) and Mauwa (*Engelhardtia spicata*) (4.71). IVI of other species is shown in Table 5-6.

The forest type available along the entire project alignment of LDTLP is of sub-tropical and temperate categories. The vegetation study along the TL revealed that the major forest in the project area comprises of mixed type with dominance of Sal (*Shorea robusta*), Chilaune (*Schima wallichii*), Katus (*Castanopsis indica*) and Sallo (*Pinus sp.*). The forest area in lower stretch is dominated by Sal (*Shorea robusta*) while forest in upper stretch is dominated by Chilaune (*Schima wallichii*). The crown cover of forest in the project area varies from 40% to 80% depending upon the degradation of forest, vegetation types, altitude, etc. The forest area consists of natural endemic plant species. Few planted species of Sallo (*Pinus sp.*) were also observed in natural forest area inside the CF in the upper stretch of the route. Most of the forest area fall inside CF providing habitat for faunal species. Most of the forest was human influenced forest being utilized and conserved by local people.

The major shrub species available in the area are Angeri (*Osbeckia nepalensis*), Dhurseli (*Colebrokia oppositifolia*), Asuro (*Justicia adhatoda*), Aiselu (*Rubus ellipticus*), Sisnu (*Urtica dioca*), Banmara (*Eupatorium odoratum*), Sajiwon (*Jatropha curcas*), Amriso (*Thysanolaena maxima*), Datiwon (*Achyranthes aspera*), Nigalo (*Arundo donax*), Titepati (*Artemisia vulgaris*), Bilaune (*Maesia chisla*), Chutro (*Berberis aristata*), Aiselu (*Rubus paniculatus*), Hade Unyo (*Dicranopterus linearis*), Bans (*Bambusa spp.*), and others. Many herb (ground vegetation) species were identified during the field visit. Some of the important herbs observed during the field visit were Dubo (*Cynodon dactylon*), Gande (*Ageratum conyzoides*), Banmara (*Eupatorium odoratum*), Chari Amilo (*Oxalis corymbosa*), Abijalo (*Drymaria diandra*), Asthma weed (*Euphorbia hirta*), Babiyo (*Eulaliopsis binata*), Congress grass (*Parthenium hysterophorus*), Siru (*Imperata spp.*), Sisnu (*Urtica dioca*), Ghodtapre (*Centella asiatica*), Khar (*Typha spp.*), Kuro (*Bidens biternata*), Lajabati (*Mimosa pudica*), Paniamala (*Nephrolepis cordifolia*) and Tinpate (*Trifolium repens*). Major climber species observed during the field visit were Kubindo (*Kydia calycina*), Bantarul (*Dioscorea sp.*), Tito Karela (*Momordica charantia*) and Githa (*Dioscorea sp.*). The list of plant species available in and around the project area are given in Appendix C.





Picture 5-1: Schima-Castanopsis forest in RoW



Picture 5-2: Shorea robusta forest in RoW

The district wise total land area, total forest area and number of CFs along the TL in the PADs are as follows:

Table 5-5: Forest Status in PADs

S. N.	District	Total Area (ha)	Forest Area (ha)	Forest Area (%)	No. of CF in the PAD	No. of CF Affected by the Project
1.	Kaski	201700	93923	46.56	489	13
2.	Tanahun	154600	78111	50.52	593	5
	Total	356300	172034	48.28	1082	18

Source: Data from Field Survey (2016) and Respective DFOs



Table 5-6: Species diversity of plants along the TL in CFs

S.N.	Common Name	Botanical Name	Density (No. of ind./ha)	Frequency (%)	Basal Area (m ² /ha)	Relative Frequency	Relative density	Relative dominance	IVI
1	Amala	<i>Phyllanthus emblica</i>	15	5	0.073	1.23	0.18	0.13	1.54
2	Amba	<i>Psidium guajava</i>	24	5	0.050	1.23	0.28	0.09	1.60
3	Angeri	<i>Osbeckia nepalensis</i>	750	55	1.335	13.58	8.93	2.32	24.83
4	Botdhairo	<i>Lagerstroemia parviflora</i>	204	25	0.668	6.17	2.43	1.16	9.76
5	Chilaune	<i>Schima wallichii</i>	2336	90	14.826	22.22	27.81	25.76	75.79
6	Dhurseli	<i>Colebrookea oppositifolia</i>	140	20	0.285	4.94	1.67	0.50	7.10
7	Epil Epil	<i>Leucaena diversifolia</i>	3	5	0.026	1.23	0.03	0.05	1.31
8	Kafal	<i>Myrica eiculenta</i>	5	5	0.145	1.23	0.06	0.25	1.55
9	Katus	<i>Castanopsis</i> sps.	1168	35	6.013	8.64	13.90	10.45	32.99
10	Khirro	<i>Sapium insigne</i>	70	25	0.585	6.17	0.83	1.02	8.02
11	Lankuri	<i>Fraxinus floribundu</i>	15	10	0.093	2.47	0.18	0.16	2.81
12	Mango	<i>Magnifera indica</i>	15	5	0.031	1.23	0.18	0.05	1.47
13	Mauwa	<i>Engelhardtia spicata</i>	63	15	0.149	3.70	0.74	0.26	4.71
14	Padke	<i>Albizia julibrissin</i>	46	5	0.951	1.23	0.55	1.65	3.44
15	Phalat	<i>Quercus lamellosa</i>	23	5	0.083	1.23	0.27	0.14	1.65
16	Ramrittha	<i>Mallotus oppositifolius</i>	71	5	0.585	1.23	0.85	1.02	3.10
17	Rato pate	<i>Ajuga bracteosa</i>	1	5	0.238	1.23	0.01	0.41	1.66
18	Sal	<i>Shorea robusta</i>	3008	40	26.505	9.88	35.80	46.05	91.73
19	Sallo	<i>Pinus</i> sp.	68	15	1.650	3.70	0.80	2.87	7.37
20	Simal	<i>Bombax ceiba</i>	10	5	0.195	1.23	0.12	0.34	1.69
21	Swami	<i>Ficus benjamina</i>	3	5	2.310	1.23	0.03	4.01	5.28
22	Tiju	<i>Diospyros malabarica</i>	333	15	0.599	3.70	3.96	1.04	8.70
23	Utis	<i>Alnus nepalensis</i>	33	5	0.169	1.23	0.39	0.29	1.91
Total			8400	405	57.561	100	100	100	300

Source: Field Survey, 2016



5.2.2 Community and National Forest

The proposed TL will pass through 13 CFs from Kaski district and 5 CFs from Tanahun district. The TL also passes through 1 national forest in Kaski district (Table 5-8). The Table 5-7 shows the list of CFs along the TL.

Table 5-7: CF along the TL in Kaski District

S. N.	Name of CF	MC/Municipality*/RM- Ward	TL location (AP to AP)	Area (ha)	Beneficiaries HHs
Kaski District					
1.	Sahelipakho Badhare	Pokhara Lekhnath MC-27,29 (Lekhnath-1,6)	3-4	35.02	249
2.	Pakhura	Pokhara Lekhnath MC-27,29 (Lekhnath-6)	3-4-5	18.50	62
3.	Bhaltari Bhiteri		4-5	37.00	80
4.	Bhurtel Gaon	Pokhara Lekhnath MC-28 (Majhthana-6)	6-7	104.00	85
5.	Shaakhudi Simle		6-7	19.75	57
6.	Bilaune Ghari Puranthar	Pokhara Lekhnath MC-31 (Lekhnath-9)	7-8-9	10.06	27
7.	Bhir Pani	Pokhara Lekhnath MC-31 (Lekhnath-10)	11-12-13	115.14	135
8.	Odar Thumki Sirani Danda Thuli Dhunge Sinkauli Swar Maru Ghairo & Lapsibot		12-13-14	28.49	179
9.	Jimire Bishauna Pakho	Rupa RM-7 (Hansapur-9)	14-15	20.66	92
10.	Ramkrishna	Rupa RM-7 (Hasapur-6)	15-16	75.54	94
11.	Mohariya	Rupa RM-6 (Rupakot-9)	16-17	198.47	91
12.	Jimire	Rupa RM-1 (Thumki-4)	19-20-21	69.50	83
13.	Ghewapani Kusunde	Rupa RM-2 (Siddha-8,9)	20-21-22	106	216
Tanahun District					
14.	Thulobhanjyang	Byas*-6 (Syamgha-3)	22-23-24-25-26	174	180
15.	Sapankot	Byas*-6 (Syamgha-6)	27-28-29-30	180	148
16.	Phoksing	Byas*-5	30-31-32	214.47	177
17.	Ripa Shikhar Thumki	Myagde RM -6 (Manpang-1)	33-34	183.71	152
18.	Manung	Byas*-5	38-39-40	184.17	160

Note: names within the brackets refer to the former VDC/Municipality prior to new re-structuring of local administrative units.

Source: Field Survey, (2016) and Respective DFOs

Table 5-8: National Forest along the TL in Kaski District

S. N.	National Forest	MC- Wards	TL location(AP to AP)
1	Nursery	Pokhara Lekhnath MC-31 (Lekhnath-9)	8-9-10

Source: Field Survey, (2016)

Cutting of trees for firewood and timber by locals, illegal felling of trees by smugglers, occasional forest fires, encroachment are the disturbing factors of the existing vegetation of the project vicinity. However, local people are making efforts to protect the forest by the formation of CFUGs and enhance natural regeneration.

5.2.3 Ethno - botany

The local people utilize plant resources for different purposes including mainly as timber, firewood, fodder, fruit and medicine. The major timber yielding species of the project area are Sal (*Shorea robusta*), Katus (*Castanopsis indica*), Chilaune (*Schima wallichii*), Sallo (*Pinus sp.*) and Utis (*Alnus nepalensis*). Almost all types of trees are being used as firewood depending upon their availability.

Similarly the common fruits yielding plants in the project area include mango (*Mangifera indica*), banana (*Musa paradisiaca*), papaya (*Carica papaya*), Naspoti (*Pyrus communis*), guava (*Psidium guajava*), Kafal (*Myrica eiculenta*) and jack fruit (*Artocarpus sp.*). Citrus species like Orange (*Citrus aurantium*), Nibuwa (*Citrus sp.*)

Bhogate (*Citrus maxima*), Kagati (*Citrus aurantifolia*) are also common fruit plants in the project area. Orange garden was observed in and around AP37.

Chari Amilo (*Oxalis corymbosa*), Abijalo (*Drymaria diandra*), Aduwa (*Zingiber Officinale*) Amala (*Phyllanthus emblica*), Asuro (*Justicia adhatoda*), Ghodtapre (*Centella asiatica*), Aiselu (*Rubus ellipticus*), Lapsi (*Choerospondias axillaris*), Chutro (*Berberis aristata*), Akhe Timur (*Zanthoxylum armatum*) and Paniamala (*Nephrolepsis cordifolia*) are some of the plant species available in the project area having medicinal values. Lapsi (*Choerospondias axillaris*) and Amala (*Phyllanthus emblica*) have commercial value and are being used for making pickle.



Picture 5.3 Agroforestry in Phoksing CF Picture 5.4 Orange garden in RoW (AP-37)

Tree and shrub species used as fodder are Badahar (*Artocarpus lakoocha*), Bans (*Bambusa spp.*), Berula (*Ficus sarmentosa*), Bilaune (*Maesia chisla*), Chuletro (*Brassaopsis glomeulata*), Daar (*Boehmeria rugulosa*), Dudhilo (*Ficus nemoralis*), Kabhro (*Ficus lacor*), Khanyu (*Ficus semicordata*), Kimbu (*Morus alba*), Koiralo (*Bauhinia variegata*), Kursimlo (*Schefflera venulosa*), Kutmero (*Litsea monopelata*), Nibaro (*Ficus carica*), Nigalo (*Arundo donax*), Pakhri (*Ficus glaberrima*), Phaledo (*Erythrina strica*) and Ambriso (*Thysanolaena maxima*). Herb species used as fodder are Babiyo (*Eulaliopsis binate*), Dubo (*Cynodon dactylon*), Kans (*Saccharum spontaneum*), Khar (*Typha spp.*), Siru (*Imperata spp.*), etc.

5.2.4 Protected Species of Flora

GoN has imposed restriction on the export of a number of plant species in unprocessed condition. Simal (*Bombax ceiba*) and Sal (*Shorea robusta*) are the species available in the project area banned for commercial felling, transportation and export as per the Forest Rules, 1995. Simal (*Bombax ceiba*) is found in few number near the river and Kholsi while Sal (*Shorea robusta*) is the dominant species in the forest of lower stretch of the project site.

5.2.5 Wildlife

The TL and adjoining areas have various ecological and vegetation characteristics which has provided a natural habitat for different types of wildlife species along the route. As the TL passes through the forest near the settlement area, the habitat near the route is not suitable for wildlife due to the human disturbances. It is not the specific corridor for movement of wildlife. But, some of the major wildlife reported from the project area are categorized as follows.

5.2.5.1 Mammals

Some of the wild animals reported from the project areas are Dumsi (*Hystrix indica*), Malsapro (*Martin flavigula*), Common Langur (*Presbytis entellus*) Ratuwa Mriga (*Muntiacus muntjak*), Leopard (*Panthera pardus*), Jackal (*Canis aureus*), Kharayo (*Lepus*

nigricollis), Dhendu (*Macaca assamensis*), Ban Biralo (*Felis chaus*), Rhesus Monkey (*Macaca mulata*), etc. Based on the field observation and interaction with the local communities/forest user group, altogether 15 species of mammals were reported in the project area. Interaction with local people and member of forest user groups in the vicinity of the forest revealed that the frequency of encounter with the wild mammals is very low.

5.2.5.2 Birds

Gardens, agricultural fields, villages, forest, rivers, streams, gorges, and cliffs provide variety of habitat for different species of birds. Common bird species reported in the project area are; Crow (*Corvus splendens*), Fisto (*Phylloscopus spp.*), Dhukur (*Streptopelia chinensis*), Koili (*Surniculus lugubris*), House crow (*Corvus splendens*), House sparrow (*Passer domesticus*), Gaunthali (*Hirundo sp.*), Kalij Pheasant (*Lophural eucomelana*), Cuckoo (*Plantative cuckoo*), Baj (*Buteo sp.*), etc. During literature reviews, field visits and local stakeholder consultations, no any specific migratory route of bird is observed in TL.

5.2.5.3 Protected Species of Fauna

As per the National Park and Wildlife Conservation Act (1973) of Nepal, 27 mammal species and 9 bird species of Nepal have been enlisted into the protected categories. In the project area, no any protected species of mammal is reported under this protected categories. Among the 15 species of mammals reported in project area, 1 species is listed in CITIES Appendix I and 2 species are listed in CITIES Appendix II. The detail about these species is given in Appendix C of this report. Similarly, none of the bird species reported in the project area during the field study is under protected categories as per the National Parks and Wildlife Conservation Act, 1973. Among the 19 species of birds reported in project area, 4 species are listed in CITIES Appendix II. The detail of these species is given in Appendix C.

5.3 Socio-economic and Cultural Environment

5.3.1 General Introduction of the PADs

The 42.254km long proposed LDTLP locates in Kaski and Tanahun District, Province no 4, Nepal. The total area of these PADs is 3563 sq. km (Kaski 2017 sq.km. and Tanahun 1546 sq.km.) that comprises about 2.42 percent of total national area. There are, as per the current local level restructure, 10 RMs, 4 municipalities and one MC in these PADs(4 RMs and 1 MC in Kaski District and 6 RMs and 4 municipalities in Tanahun District).

According to CBS(2011), total population of these PADs is 815,386 with male 379,795 (46.6%) and female 435,591 (53.4%) which covers 3.08% population of Nepal. The total households' (HHs) number is 203982 with average HH size 4.03 which is lower than average national HH size (4.89). The average population density is 226.49 person/sq.km which is higher than the average national density(180). Average population growth from the last decade is 1.41 which is higher than the national growth rate (1.35%). The average economically active population (15-59 years) is 55.05% which is lower than the national average aconomically active population (57%). The average urban population is 72.38%. The number of the urban population has highly increased in these PADs when the GoN has recently restructured local level structure merging some exiting VDCs into municipality and MC (Table 5-9).



Table 5-9 : Demographic Characteristics of PADs

S.N	Demographic Characteristics	PADs		Total	Average
		Kaski	Tanahun		
1	Total Population	492,098	323,288	815,386	-
2	Male	236,385	143,410	379,795	-
3	Female	255,713	179,878	435,591	-
4	Total Number of HHs	125,673	78,309	203,982	-
5	Average HHs size	3.92	4.13	-	4.03
6	Population Density (persons/ sq.km)	243.98	209	-	226.49
7	Sex Ratio (Male per 100 Females)	92.44	79.73	-	86.09
8	Population growth rate	2.57	0.25	-	1.41
9	Urban Population (%)	84.16	60.61	-	72.38
10	Population below 15 years (%)	28.9	33.62	-	31.26
11	Economically Active Population 15 to 59 year (%)	62.38	55.72	-	55.05
12	Elderly Population 60+years (%)	8.73	10.66	-	9.70
13	Total Area of the Districts (sq. km)	2017	1546	3563	-
14	District Population in Total Population of Nepal (%)	1.86	1.22	3.08	-

Source: CBS, 2011

5.3.1.1 Caste and Ethnicity

PADs are polyglot society with multilingual and diversified cultural groups inhabiting with co-existence and mutual harmony. The major ethnic composition of these PADs includes Brahmin-Hill (21.49%), Magar (15.90%), Gurung (14.58%), Chhetri (13.44%) and Dalit (14.66%). Here Dalit refers to Kami, Damai/Dholi and Sarki.

Table 5-10: Major Caste/Ethnic Group of PADs

S.N.	Major Caste/Ethnic Group	PADs		Total Population	Percent
		Kaski	Tanahun		
1	Brahmin-Hill	136834	38382	175,216	21.49
2	Magar	42547	87078	129,625	15.90
3	Chhetri	71808	37809	109,617	13.44
4	Gurung	81597	37325	118,922	14.58
5	Dalit (Kami, Damai/Dholi, Sarki)	69331	50216	119,547	14.66
6	Others	89981	72478	162,459	19.92
Total		492,098	323,288	815,386	100.00

Source: CBS, 2011

5.3.1.2 Religion

Out of the total population, 684,802 (83.99%) follow Hindu religion which is higher than the national average (81.3%). Similarly, 96,798 (11.87%) follow Buddhism, 16,005 (1.96%) follow Christianity, 8,594 (1.05%) Islam and 4,496 (0.55%) Bon (Table 5-11). Here, others refers to Jainism, Bahai, prakriti and unidentified.

Table 5-11: Major Religion of PADs

S.N.	Major Religion	Population		Total	Percent (%)
		Kaski	Tanahun		
1	Hindu	405141	279661	684802	83.99
2	Buddhism	66266	30532	96798	11.87
3	Christianity	10538	5467	16005	1.96
4	Islam	4437	4157	8594	1.05
5	Bon	2908	1588	4496	0.55
6	Others	2808	1883	4691	0.58
Total		492,098	323,288	815,386	100.00

Source: DSO (2071) and DSO (2072)

5.3.1.3 Education and Literacy Status

There are, including community and institutional schools, altogether 1,775 schools (628 in Kaski and 1,147 in Tanahun) in these PADs.

Table 5-12: Number Schools of PADs

S.N.	Description	Number		Total	Percent
		Kaski	Tanahun		
1	Community	425	861	1286	72.45
2	Institutional	203	286	489	27.55
Total		628	1,147	1,775	100.00

Source: DSO (2071) and DSO (2072)

CBS (2011) shows the average literacy rate of population of 5 years and above of these PADs is 79.40% with male literacy rate 87.70% and female literacy rate 72.30%. This figure is higher as compared to the national literacy rate 65.9% (Table 5-13).

Table 5-13: Literacy Status of PADs

S. N	PADs	5 years & above Population			Can Read and Write			Literacy Status		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
1	Kaski	454992	216624	238368	374802	195181	179621	82.38	90.10	75.35
2	Tanahun	295611	129445	166166	221194	108317	112877	74.83	83.68	67.93
Total/Average		750,603	346,069	404,534	595,996	303,498	292,498	79.40	87.70	72.30

Source: CBS, 2011

5.3.1.4 Language

CBS 2011 shows that there are all together 123 mother tongues in Nepal. Out of which Nepali, Magar, Gurung and Magar are four major languages use by the people of the PADs where majority of the population (71.91%) speak Nepali language. This is followed by Magar (9.57%), Gurung (10.48%) and Newari (2.92%) and others (5.13%).

Table 5-14: Major Languages Spoken in PADs

S.N.	Languages	Speakers		Total	Percent
		Kaski	Tanahun		
1	Nepali	386083	200236	586319	71.91
2	Magar	10782	67252	78034	9.57
3	Gurung	58589	26829	85418	10.48
4	Newari	10659	13127	23786	2.92
5	Others	25985	15844	41829	5.13
Total		49,2098	323,288	815,386	100.00

Source: CBS, 2011

5.3.1.5 Migration

Migration has become a prominent phenomenon in the population dynamics of Nepal. A large volume of youth population has been consistently moving abroad for the purpose of employment. The absent population of Nepal has been a major issue in demographic, social and economic aspect. Figure 5-8 shows the increasing and decreasing trend of foreign migrants in the PADs. The Annual Report (FY 2067/68, 2068/69, 2069/70) of Department of Foreign Employment (DoFE) shows the increasing trend of foreign employment from the fiscal year 2067/68 to 2069/70; however the number of foreign migrants has decreased in the fiscal year 2070/71 in the PADs. It shows that there are 10,273, 10,635, 15,005 and 14,401 migrants had departed into abroad employment in the FY 2067/68, 2068/69, 2069/70 and 2070/71 respectively. These reports also show that male participation in foreign

employment were more than female that reveals access of female in abroad employment in PADs is very low.

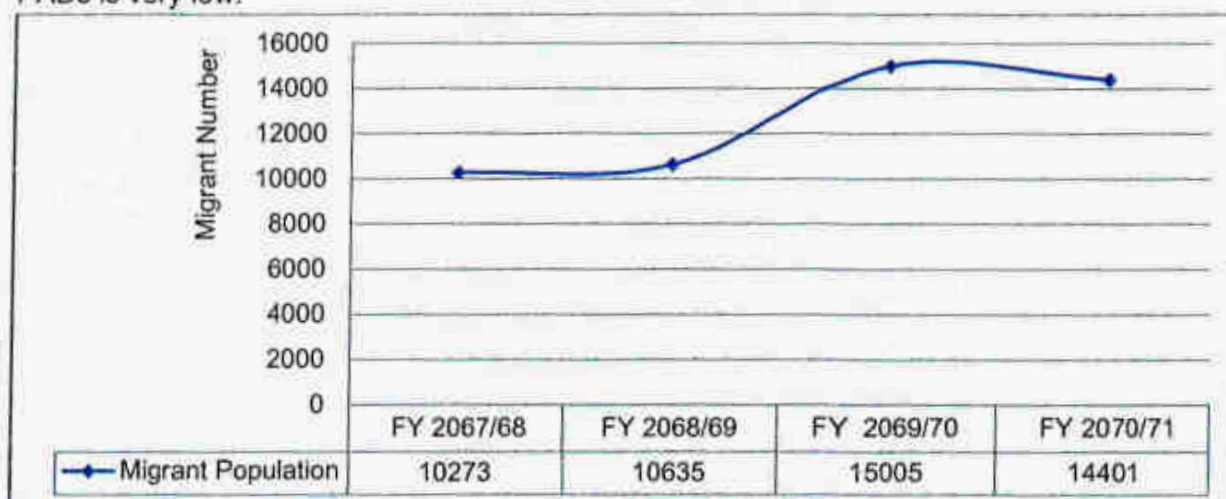


Figure 5-8: Comparative Trend of Foreign Labor Migration in the PADs

Source: DoFE (www.dofe.gov.np)

5.3.1.6 Occupation and Employment

The major occupation of families in PADs is subsistence farming and livestock and tourism for their livelihood. The PADs are also known as tourist area of the country. Thus, many people are engaged as skilled, semi-skilled and unskilled labor force in tourism sector. Rest of the people are engaged in business, government service, wage labor, agro-based industries, etc. Major occupation of the people of PADs is given in Table 5-15.

Table 5-15: Occupational Distribution of PADs

S. N.	Description	Kaski		Tanahun		Total		Total	Percent
		Male	Female	Male	Female	Male	Female		
1	Agriculture, forestry & fishery workers	24959	39646	34734	56470	59693	96116	155809	52.86
2	Service & sale workers	17730	11412	4323	3769	22053	15181	37234	12.63
3	Craft and related trades workers	16353	4925	5716	1480	22069	6405	28474	9.66
4	Elementary occupations	7961	6632	3360	2582	11321	9214	20536	6.97
5	Professionals	6899	4415	2979	2051	9878	6466	16344	5.54
6	Plant & machine operators & assemblers	6992	438	2221	111	9213	549	9762	3.31
7	Technicians & associate professionals	4564	1710	1178	415	5742	2125	7867	2.67
8	Managers	4167	2164	836	630	5003	2794	7797	2.65
9	Office assistant	2360	1434	560	294	2920	1728	4648	1.58
10	Security Workers	484	49	191	24	675	73	748	0.25
11	Others and unmentioned	1892	875	1850	929	3742	1804	5546	1.88
Total		94,361	73,700	57,948	68,755	152,309	142,455	294,764	100.00
Percentage (%)		56.15	43.85	45.74	54.26	51.67	48.33	100.00	

Source: DSO (2071) and DSO (2072)

DSO (2071) and DSO (2072) show still 52.86% population of PADs has involved in agriculture, forestry and fishery works is the main occupation. This is followed by service and sales workers (12.63%), craft and related trades workers (9.66%), elementary occupations (6.97%), professionals (5.54%), plant and machine operators and assemblers (3.31%), technicians and associate professionals (2.67%), managers (2.65%), office assistant (1.58%) and security workers (0.25%).

5.3.1.7 Agriculture

Agriculture is the prime economic activity which has given 36.21% contribution (23% in Kaski and 49.42% in Tanahun) in gross domestic production. The total area of the PADs is 356,300ha. Out of which, 52,460.9ha (14.72%) land is cultivated land. Out of 52460ha cultivated land, 20,392.8ha (38.87%) is irrigated. About 112,501 HHs (55.15%) of total HHs of PADs are engaged in agriculture and its related activities (livestock and forestry). Paddy, maize, wheat and millet are the major agricultural productions. Besides, oilseeds, fruits, vegetables are also produced in a large scale (DSO, 2071 and DSO, 2072). The detail of the land type of these PADs is given in Table 5-16.

Table 5-16: Detail of the Agricultural Land of the PADs

S.N	Description	Tanahun(ha)	Kaski(ha)	Total(ha)	Percentage(%)
1.	Total area of the district (ha)	154,600	201,700	356,300	100.00
2.	Total cultivated land	29,022.3	23,438.6	52,460.9	14.72
3.	Total irrigated land	8,022.8	12,370	20,392.8	38.88

Source: DSO (2071) and DSO (2072)

5.3.1.8 Trade and Industries

Major economic centers in the PADs are Pokhara, Lekhnath in Kaski District and Damauli, Aanbukhareni, Dumre, Khairanitar, Bhansar and Dulegaida in Tanahun District. Some industries established in the PADs has provided numbers of employment to the people. The detail of the industries number and employment according to their category of these PADs is given in Table 5-17.

Table 5-17: Industries in PAD

S.N.	Category	Kaski		Tanahun	
		No of Industry	Employment	No of Industry	Employment
1.	Production oriented	138	522	74	222
2.	Commerce (baniya Farm)	-	-	374	1122
3.	Agriculture and Forestry	92	347	181	483
4.	Tourism	236	1069	116	348
5.	Service	176	524	127	381
Total		642	2,462	872	2,556

Source: DSO (2071) and DSO (2072)

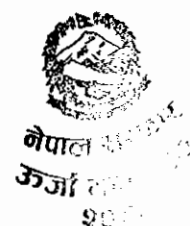
5.3.1.9 Tourism Activities

The PADs are one of the major tourist destinations in Nepal. The main tourist destinations are Mahendra Cave, Patale Chhago, Gupteshwar Mahadev Cave, Seti River, Sarankot, Machhapuchchhre, Annapurna-I, Panchase Area and so on in Kaski District and Byas Cave, Siddha Cave, Bandipur Area, Bhanu Birth Place Area, Tanahunsur Area, Seti Gandaki Area, Kali Gandaki Corridor Area, DhorBarahi Area, Highway Tourism area and so on in Tanahun District.

Table 5-18: Major Touristic Places of PADs

S. N.	Touristic Places	
	Kaski District	Tanahun District
1	Mahendra Cave	Bhanu Birth Place Area
2	Patale Chhago	Siddha Cave
3	Gupteshwar Mahadev Cave	Bandipur
4	Seti River	Tanahunsur Area
5	Sarankot	Seti Gandaki Area
6	Machhapuchchhre	Kali Gandaki Corridor Area
7	Annapurna-I	DhorBarahi Area
8	Panchase Area	Highway Tourism Area

Source: DSO (2071) and DSO (2072)



5.3.1.10 Religious, Historical and Archeological Sites

The PADs are also famous for religious and historical aspect too. Some religious places like Bindhyabasini Temple, Ram Temple, Dharmashila Buddha Bihar, Bhadrakali Temple, Shova Bhagawati Temple, Siddha Barah, Kotdanda, Yanjikot Gurung Basti in Kaski District and Devghat Dhaam, Chhabdi Barahi Temple, Dhorbarahi Temple, Chhimkeshwari Temple, Jame Masjid, Bauddha Gumba in Tanahun District are very popular.

5.3.1.11 Gender

Gender equality is a key component of human development. Overall Nepal still has a gender gap, so is found in these PADs. The female population exceed the male population, as a result the sex ratio is low (86.09). The female literacy has remarkably increased in the past decades however it is still low (72.30%) than the male literacy (87.70%). There has been a rise in female-headed HHs due to the increase of male into foreign employment. However, economic empowerment of women is still a challenge in these PADs. In addition, women's economic activity is still low in non-agriculture sector possibly due to a lack of education and a tradition of working in agriculture. DSO (2071) and DSO (2072) show that about 45.33% women of Kaski and about 31.5% women of Tanahun are engaged in agriculture sector.

5.3.1.12 Public Health, Drinking Water and Sanitation

DSO (2071) shows that there are one regional hospital, two teaching hospitals, two community hospitals, one eye hospital, one leprosy disease hospital and fourteen health posts, three primary health centers, eleven DOT centers, twenty six NGOs/INGOs working in Health Sectors and some other private health institutions/nursing homes in Kaski District. Similarly, two district hospitals, five primary health centers, fifty five health posts, twenty three birthing centers, two dental service providers, ten Ayurveda hospitals, seven NGOs/INGOs working in health sectors and some other private institutions are in Tanahun District (DSO, 2072). The health situation of these PADs is satisfactory. The health service in these PADs is delivered through the existing district government hospital, zonal hospital, medical college, other private hospitals, sub-health post, and clinics which provide local level health services. These health centers provide the health facilities not to the people within the district but outside of the districts.

Table 5-19: Health Institutions of PADs

S.N.	Types of Health Institutions	Kaski	Tanahun	Total
1.	Regional Hospital	1	-	1
2.	District Hospital	-	2	2
3.	Primary Health Centre	3	2	5
4.	Health post	14	45	59
5.	Sub-Health Post	20	-	20
6.	Birthing Centre	-	23	23
7.	Urban Health Centre	-	1	1
8.	Community Health Unit	-	1	1
9.	Village Clinic	-	167	167
10.	Vaccine Clinic	-	219	219
11.	Private Hospital	8	8	16
12.	Eye Hospital	1	-	1
13.	Regional Tuberculosis Centre	1	-	1
14.	Leprosy Hospital	1	-	1
15.	Teaching Hospital	2	-	2

source: DSO, 2071 and DSO, 2072

CBS (2011) shows that main sources of drinking water in the PADs are tap/piped water (85.65%), uncovered well/kuwa (5.41%), spout water (4.16%), covered well/kuwa (2.74%), river/stream (0.45%), others (0.99%). Awareness level towards health and sanitation



(particularly towards safe drinking water, use of toilets, etc.) is satisfactory in the PADs. DSO (2071) and DSO (2072) show 84% HHs of Tanahun and 99.2% HHs of Kaski have toilet facilities. Both districts are declared as 'Open Defecation Free Districts'. Thus, sanitation condition is found satisfactory in the PADs.

5.3.2 Project Affected Area (RMs/Municipality/MC/Settlement)

Due to the recent restructuring of local level in Nepal, the earlier structures of VDC have either been merged to RM or Municipality or MC. In case of PADs, Pokhara Lekhnath MC is formed by merging the Pokhara Sub-Metropolitan City, Lekhnath Municipality, Chapakot, Kaskikot, Puranchaur, ward no. 3 to 9 of Bhadaure Tagami, ward no. 1 to 5 of Kalika and Ward no. 1 and 4 to 9 of Majhthana VDCs. In the same way, Thumki, Siddha, Deurali, Rupakot and ward no. 1 to 4, 6, 7 and 9 of Hansapur VDCs were restructured as Rupa RM. Similarly, former Byas Municipality, Kyamin, Shyamgha, ward no. 2 to 8 of Ghansikuwa, Ward no. 4 to 9 of Tanahunsur, ward no. 2 to 7 of Keshabtar, ward no. 1 to 5 and 7 to 9 of Risti and ward no. 6 to 9 of Satiswara VDCs have restructured as Byas Municipality. Kahun Shivapur, Bhirkot, Kotdarbar, Ward no. 1 to 3 of Baidi, Ward no. 1 to 8 of Ramjakot and Ward no. 1 to 8 of Rising Ranipokhari VDCs have restructured as Rising RM and Jamune Bhanjyang, Chhang and Manpang VDCs have restructured as Myagde RM. So, the proposed LDTLP passes through one MC (Pokhara Lekhnath) and one RM (Rupa) in Kaski District, and one municipality (Byas) and two RMs (Rising and Myagde) in Tanahun District (Table 2-1). Major settlements and their locations by RMs/Municipality/MC and districts are given in Table 5-20.

Table 5-20: List of Near-by Settlements of LDTLP

Kaski District			Tanahun District		
S.N.	Settlement	RM/MC	S.N.	Settlement	RMs/Municipality
1	Dharmasala Village	Pokhara Lekhnath MC	1	Sekhatar	Byas Municipality
2	Kaligandaki Tole		2	Tallo Dhad Village	
3	Kotbari Village		3	Pokhare Danda	
4	Kahere		4	Sekhapur Village	
5	Archal Tar		5	Sapan Kot Village	
6	Syankhudi Tol		6	Madi Besi Village	
7	Labsi Danda Village		7	Rani Tar Village	
8	Thuldhunga Village		8	Bhanungkot Saura Village	
9	Khana Swara		9	Belbas Village	
10	Aarupata		10	Bajhari Villige	
11	Ulleri Talbesi	Rupa RM	11	Sami Danda	Rishing RM
12	Tilkhoriya		12	Manpang	Magde RM
13	Sirkutan				
14	Deupur Besi				
15	Katuje				

Except for Byas Municipality and Pokhara Lekhnath MC, the population of project affected RMs is predominantly rural and settlement is mostly scattered near the TL route. However, this rural characteristic of the area is gradually changing into the urban and semi-urban due to the development of infrastructures; such as transportation, communication, education and others. Along the TL route, settlements are clustered in market areas.

5.3.2.1 Demographic Characteristic of the PAA

Total population of one MC, one municipality and three RMs in the PAAs has 536,221 with 251,552 (46.91%) male and 284,669 (53.09%) female. Similarly, there are 130,891 HHs

PAA and average HH size, sex ratio and population density (person/sq.km) is gradually 4.10, 88.4 and 316 (Table 5-21).

Table 5-21: Demographic Characteristics of the PAA

S. N.	PAA	Population			HHs	Sex Ratio	Average HH size	Area (sq.km.)	Pop. Density (person/sq.km)
		Total	Male	Female					
	Kaski								
1	Pokhara Lekhnath MC	402995	192977	210018	103707	91.9	3.89	464.24	868
2	Rupa RM	14519	6289	8230	3018	76.4	4.81	94.81	153
	Tanahun								
3	Byas Municipality	70335	31260	39075	14940	79.9	4.71	248	284
4	Rishing RM	25870	11140	14730	3598	75.6	7.19	215	120
5	Myagde RM	22502	9886	12616	5628	78.4	4.00	115	196
Total/Average		536,221	251,552	284,669	130,891	88.4	4.10	1,700.05	316

Source: CBS, 2011

5.3.2.2 Caste/Ethnic Composition and Religion

The PAA is populated by heterogeneous caste/ethnic communities. Major caste/ethnic groups in the PAA are Brahmin-Hill (24.32%), Chhetri (14.72%), Gurung (14.15%), Dalit (Magar (13.27%), 12.93%), Newar (6.13%), Tamang (2.31%), Thakuri (1.65%) and others (10.65%). Here, Dalit includes Kami, Sarki, Damai, Dholi and other dalit too. Similarly, other includes Darai, Kumal, Gharti/Bhujel, Badi, Sanyasi/Dashnami and other castes settle in the PAA. In addition, remarkable number of Musalman (1.13%) has been settling in the PAA.

Table 5-22: Population in the PAA by Caste/Ethnic Group

S.N.	Caste/ethnicity	Population	Percentage (%)
1	Brahmin-Hill	122759	24.32
2	Chhetri	74276	14.72
3	Gurung	71423	14.15
4	Magar	66977	13.27
5	Kami/Damai/Dholi/Sarki	65256	12.93
6	Newar	30931	6.13
7	Tamang	11649	2.31
8	Thakuri	8315	1.65
9	Gharti/Bhujel	6772	1.34
10	Musalman	6231	1.13
11	Sanyasi/Dasnami	4605	0.91
12	Badi	3988	0.79
13	Others	31556	6.25
Total		504,738	100.00

Source: CBS, 2011

During the field visit, it was observed that Brahmin-Hill, Chhetri, Magar, Gurung, Dalit and Musalman are the major caste/ethnic groups found in the settlements near to the TL. In the same way, Hinduism and Buddhism are the major religions followed by the people in the PAA. Muslim also found in the settlement between AP25 to AP26 in Pokhara Danda, Byas (former Shyamgha), Tanahun, Dashain, Tihar, Lhosar, Janaipurnima, Gaijatra, Tij, Makar Sankranti, Krishnashtami, Baishak Purnima, Matatirtha Ausi, Shreepanchami, Falgu Purnima, Udhauri, Uvauli are the major festivals celebrated by Hindus, Buddhists and Eid by Muslims in the PAA.

5.3.2.3 Mother Tongue

Nepali is widely spoken language in the PAA. Out of 504738 population, more than two third 376538 (74.60%) speak Nepali language. Other major languages spoken in the PAAs are Gurung 49191 (9.75%), Magar 34267 (6.79%), Newari 15283 (3.03%), Tamang 5988 (1.19%) and others 23471 (4.65%). Here, other languages include Urdu, Maitheli, Bhojpuri, Tharu, Limbu, Chepang, Sunuwar, Bangla, Darai, Dura, Bote, Kumal, Thakali, Chhantyal, Hyolmo/Yholmo, Ghale, Rai, Kham and Hindi etc. However, it has been observed during the field survey that the main language spoken along the TL is Nepali. Some indigenous people use their own ethnic language to speak; however, the medium of conversation among the people is found Nepali. Details of languages in the PAA have been presented in Figure 5-9.

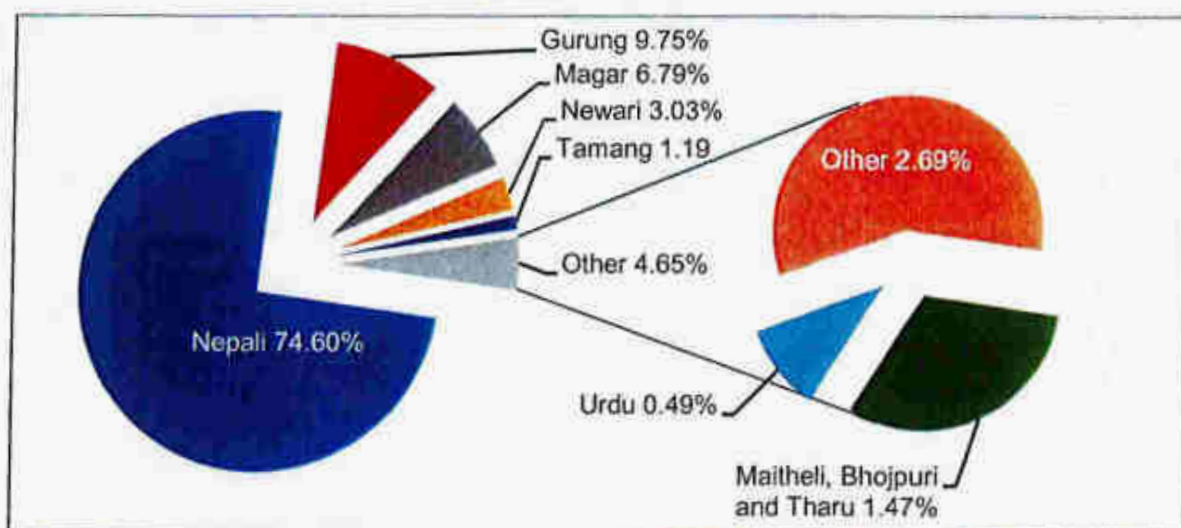


Figure 5-9: Population of PAA by Mother Tongue

Source: CBS, 2011

5.3.2.4 Literacy Status and Educational Facilities

CBS(2011) shows average literacy rate of population of 5 years and above of PAA is 82.74% with male literacy rate 90.4% and female literacy rate 76.1%. This figure is higher as compared to the district literacy rate 79.40%. This is because the literacy rate of Pokhara Lekhnath MC and Byas Municipality is comparatively higher than project affected RMs. Pokhara Lekhnath MC of Kaski has higher literacy rate (84.4%) whereas Rishing RM of Tanahun has lower literacy rate (64.1%) (Table 5-23).

Table 5-23: Literacy Status of the PAA

S. N.	PAA	5 yrs & above Population			Can Read and Write			Literacy Status		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
	Kaski									
1	Pokhara Lekhnath MC	366095	173855	192240	308982	159478	149504	84.4	91.7	77.7
2	Rupa RM	10758	4601	6157	8149	4008	4141	75.7	87.1	67.3
	Tanahun									
3	Byas Municipality	52305	23037	29268	42399	20295	22104	81.1	88.1	72.5
4	Rising RM	15857	6663	9194	10156	4961	5195	64.1	74.5	56.5
5	Myagde RM	20657	8943	11714	15614	7590	8024	75.6	84.9	68.5
	Total/Average	465,672	217,099	217,099	248,573	385,300	196,332	82.7	90.4	76.1

Source: CBS, 2011

There are higher secondary schools at every project affected RMs/Municipality/MC. Schools of all levels (primary, lower secondary, secondary, higher secondary) are found in villages along the proposed TL route. During the field study, it was found that school attainment of female and male student is almost the same. However, the majority of the schools nearby TL alignment in the PAA lack physical facilities such as building/class room, toilet, drinking water, sports ground, furniture, athletics materials and library. The physical condition of almost all the schools is in poor condition. During the field visit, local people stated that almost all schools of the PAA require external support for physical facility improvement.

DDC-Kaski (2067) and DSO (2072) show that the education facility in the PAA is supported by 328 numbers of community schools and higher secondary schools; out of which number of primary level, lower secondary level, secondary level and higher secondary level schools are 218, 42, 41 and 27 respectively. Besides, there are also some schools too like Institutional Schools, Gurukul Schools, Madarsaa, Gumba, Dristibihin (Blindness/Low-vision) Schools, Sustashrawan (Deaf/Hard to Hearing) Schools, Susta Manasthiti (Mentally Disable) Schools and colleges in different academic areas that have been provided education facility in the PAA.

Table 5-24: Number of Schools in PAA

S. N.	PAA	Primary	Lower Secondary	Secondary	Higher Secondary	Total
Kaski						
1	Pokhara Lekhnath MC	120	15	22	13	170
2	Rupa RM	23	4	4	1	32
Tanahun						
3	Byas Municipality	32	10	8	10	60
4	Rishing RM	19	9	3	1	32
5	Myagde RM	24	4	4	2	34
Total		218	42	41	27	328

Source: DDC-Kaski, 2067 and DSO, 2072

5.3.2.5 Economically Active Population

Out of 504,738 population of PAA, more than half (61.9%) population is economically active population (age group 15-59 years). The remaining 38.1% (29.7% below 15 years and 8.4% above 60 years) population is economically in-active. The dependency ratio in the project area is 1:1.6 (Table 5-25).

Table 5-25: Economically Active Population

S. N.	PAA	Total Population			Economically Active Population (Age group 15-59)			Economically Inactive Population (Age below 15 and above 60)		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
1	Pokhara Lekhnath MC	395988	189885	206103	251810	117149	134661	144178	72736	71442
2	Rupa RM	11641	5047	6594	6343	2462	3881	5298	2585	2713
3	Rishing RM	17624	7530	10094	9006	3363	5643	8618	4167	4451
4	Myagde RM	22502	9886	12616	12605	4972	7633	9897	4914	4983
5	Byas Municipality	56983	25485	31498	32844	13226	19618	24139	12259	11880
Total		504,738	237,833	266,905	312,608	141,172	171,436	192,130	96,661	95,469
Percentage (%)		100.00	47.1	52.9	61.9	45.2	54.8	38.1	50.3	49.7

Source: CBS, 2011

5.3.2.6 Migration Patterns

In the PAA, people are generally found to be migrated from hill to Terrain and rural to urban area for better opportunity of their life. According to CBS (2011), there are 61071 absent population (both inside and outside migration) of 43413 HHs where 85.3% are male and only 14.7% are female (Table 5-26).

Table 5-26: Absent HHs and Population of Project Area

S. N.	PADs	PAA	Total HHs	Absent HHs	Absent Population		
					Total	Male	Female
1	Kaski	Pokhara Lekhnath MC	103507	31653	45403	37474	7929
		Rupa RM	3018	1314	1857	1693	164
2	Tanahun	Byas Municipality	14940	5894	7354	6870	484
		Rishing RM	3598	1892	2857	2669	188
		Myagde RM	5628	2660	3600	3361	239
Total			130,891	43,413	61,071	52,067	9,004
Percentage (%)			100.00	33.2	100.0	85.3	14.7

Source: CBS, 2011

Similarly, the young generation migrating to abroad seeking employment opportunities is common from the project area. The abroad countries like Saudi Arabia, Qatar, UAE (Dubai), Kuwait, Malaysia, Oman, Afghanistan, Israel, Macau, Korea, Hong Kong and even Libya too are the main destination countries of the migrants. Local people reported, during the field visit, that the push factors (social factors, economic factors, political factors, personal factors) and pull factors (easily available of unskilled work, easy entry and exit, high rate of wage, pressure of relatives and friends) have predominantly played significant role leading to abroad migration in the project area.

5.3.2.7 Health and Sanitation Condition

The finding of the HHs surveys as well as meetings, held in different places, reveals that the quality of service provided by health institutions is satisfactory. Since the project area has good road network in Byas and Pokhara Lekhnath MC, most of the people of these municipality/MC have easy access to hospitals and health centres. However, the participants of the meetings also suggested for providing support for infrastructure development, medicine supply to improve their services in the RMs level health posts as well as sub-health posts.

CBS (2011) shows out of total HHs (130,891), majority of the HHs 77,758 (58.85%) use covered well/kuwa for drinking water followed by tap/piped water by 41285 HHs (31.17%), spout water by 6096 HHs (5.19%), uncovered well/kuwa by 2933 HHs (2.55%), tube-well/hand pump by 1713 HHs (1.32%), river/stream by 300 HHs (0.25%), others by 316 HHs (0.25%) and not stated by 490 HHs (0.42%). Similarly, 83284 HHs (63.63%) use liquefied Petroleum Gas (LPG) as cooking fuel followed by wood/firewood by 38454 HHs (29.38%), bio-gas by 6360 HHs (4.86%), kerosene by 1748 HHs (1.34%), electricity by 148 HHs (0.11%), cow dung by 87 HHs (0.07%) and others by 320 HHs (0.24%) are the major sources of cooking fuel of people in the PAA.

5.3.2.8 Religious, Archeological and Historical Site

PAA has a number of popular historical, cultural and natural sites like Bindhya Basini Temple, Taal Barahi Temple, Shova Bhagawati Temple, Namu Baudhdha Gumba, Siddha Barah Temple, Kalika Temple, Kotbhairab Temple, Bishwa Santi Stupa (World Peace Stupa), Harihar Cave, Laxmi Narayan Temple, Gorakhnath Temple in Pokhara Lekhnath MC and Syaklung Kot, Lipyani, Ramkot, Bhumesthan, Deurali, Indra Cave, Jateshwar Temple, Chandisthan Temple in Rupa RM. Similarly, Kalika Temple, Thulakot Bhairabsthan,

Gorakhnath Temple, Juma Masjid, Bauda Sadan, Parasar Aashram, Nuri Jame Masjid etc. in Byas Municipality and Akala Temple, Chhabdi Barahi Temple, etc. in Myagde RM and Chhamdi Bhueyar Temple and Mai Temple in Rishing RM are popular as religious and historical site (DSO, 2071 and DSO, 2072)

5.3.2.9 Agricultural Farming and Production

a. Agricultural Land and Cropping Patterns

The PAA is the hill land, so farmers have more upland (*Bari and Pakho*) than the low lands (*Khet*) where rice is grown in monsoon season only. The agricultural land in the PAA is irrigated by some irrigation systems. There are about 19 major irrigation systems irrigating a total of 2443ha of land (DSO, 2071 and DSO, 2072). Out of these 19 projects, one project (Shaja Tar)* irrigates a total land of 65ha in both Rupa RM of Kaski and Byas Municipality of Tanahun (Table 5-27).

Table 5-27: Major Irrigation Systems in the PAA

S.N.	Name of Irrigation System	Place (RM/Municipality*/MC)	Irrigated Area (ha.)
Kaski District			
1	Bijayapur Irrigation System	Pokhara Lekhnath MC	1280
2	Begnas Irrigation System	Pokhara Lekhnath MC	580
3	Shishuwa Irrigation System	Pokhara Lekhnath MC	50
4	Kimbesi Irrigation System	Pokhara Lekhnath MC	20
5	Shaja Tar Irrigation System	Rupa RM (Siddha-1, 2,3)	65*
Tanahun District			
6	Kalesti Khola Irrigation System	Byas*	31
7	Sanghe Khola Kaphle Paani Irrigation System	Byas* (Shyamgha)	23
8	Shaja Tar Irrigation System	Byas (Shyamgha-3,4)	65*
9	Sange Pateni Irrigation System	Byas*	200
10	Parewa Rah Lift Irrigation System	Byas*	28
11	Sheshtar Irrigation System	Byas* (Shyamgha-2)	40
12	Bhattako Dihi Irrigation System	Byas*	15
13	Kaendale Kulo Irrigation System	Byas* (Shyamgha-8),	25
14	Pokheral Phant Irrigation System	Byas*	35
15	Kaphle Amreni Phat Irrigation System	Byas* (Shyamgha-8,9)	34
17	Pokharel Phant Irrigation System	Byas*	30
18	Sheshtar Irrigation System	Byas* (Shyamgha-2)	40
19	Kul Bandha Irrigation System	Byas* (Kyamin)	10
20	Myade Khola Irrigation System	Myagde RM (Chhang)	2

Source: DSO (2071) and DSO (2072)

The cropping patterns and selection of crops depend on the land quality and availability of irrigation facilities. During the field survey, local people informed more fertile and irrigated lands are cultivated thrice (rarely) or twice a year whereas non-irrigated lands are cultivated once in a year. The major agriculture cultivation practices in the PAA depend upon monsoon. The cropping pattern is mostly dominated by two cropping systems comprising of paddy and wheat, paddy and vegetable, paddy and potato, paddy and oilseeds, paddy and red lentil in irrigated area and in non-irrigated area the cropping pattern is maize and millet, potato and wheat, maize and oilseeds, maize and soya bean/black gram, maize and vegetable or other appropriate combination of leguminous plants.

b. Crop Productions and Horticulture Farming

DSO (2071) and DSO(2072) show the major crops grown in the PAA are paddy, maize, millet and so on. The major cash crops are oilseeds, potato, pulse etc. Similarly, banana, lemon, guava, orange and so on are the major fruits production PAA. Black gram, kidney bean and masyam are the pulses production in the project area. However, it has been seen

during the field visit that some fertile cultivated lands near by the TL have been seen barren due to foreign employment. According to the local people foreign employment has seriously affected the agriculture sectors in PAA.

Citrus species farming may play a significant role in cash income generation for the people of the PAA. During the field visit, it was observed that citrus species farming has decreased in the PAA due to the various diseases in its tree, cluster of buds and flowers. However, still local people were found to be interested to involve in citrus species farming applied improved new techniques and methods.



Picture 5-5: Banana Orchard inPAA

5.3.2.10 Economy

The major occupation of families in PAA is subsistence farming and livestock for their livelihood. Some of the HHs practice off-season vegetables, fruit farming and fish farming for livelihood. Small scale businesses like tea stall, small groceries and hotels have also existed in the PAA. Seasonal migration to Pokhara, Kathmandu and abroad (especially in India) in search of employment is common in project area.

The major local business trade centers near to TL route are Lekhnath, Pokhara and Damauli. There are some manufacturing industries, tourism industries (trekking and travel agencies and hotels) in Pokhara that provide employment opportunities to the locals and help to boost the local economy. Orange farming(Picture 5-4) and banana farming (Picture 5-5) was observed in the project area. Professional poultry farming, goat farming, buffalo farming and fish farming were also reported in Byas Municipality and Pokhara Lekhnath MC during the field study. Many HHs were found to be involved in subsistence livestock.

5.3.2.11 Income Sources and Expenditure Patterns

a. Income Source

During the field visit it was found that main income source of the people of the PAA is agriculture. Farmers are being gradually involved in professional agriculture production from traditional agriculture system. In the professional agriculture, farmers are involved in livestock, poultry farming and vegetable farming. Besides, tourism, trade and industry, wage labor, construction, service, foreign employment are other sources of income in the PAA.

b. Expenditure Patterns

As far as the PAA is concerned, the level and structures of consumption are more or less similar to the other part of the country. Most of the expenditure is for the consumption of food items following education, health, energy and other non-food items.

5.3.2.12 Infrastructure and Service Facilities

The project area is accessible by black-topped and gravel road and facilitated through market centers, telecommunication, electricity and postal services. The municipality/MC have direct road link to Kathmandu and all the affected RMs have road network to district headquarters through gravel and earthen motorable road and some higher stretch through foot trail. The bus service to Kathmandu is also available from the Damauli Bazar, Lekhnath, Pokhara and other market centers. There is also the air service from Pokhara to Kathmandu on daily basis.

Communication services through mobile and Code Division Multiple Access (CDMA) are available in the PAA. Similarly, postal and modern communication facilities like email/internet and fax are available in major market centers. Cable network is accessible in most part of the project area. Radio and Local Frequency Modulation (FM) network is accessible to public people. Local and national newspapers are available regularly in Byas, Pokhara Lekhnath, Myagde and other major markets area in the PAA.

Most of the PAA is electrified through national grid system, however Kanhunshivapur, Rising RM and Bharat Pokhari of Pokhara Lekhnath MC is partially electrified. There are some hydropower projects too in PAA like Seti Hydropower Station (1.5MW), Fewa Hydropower Station (1MW), Seti-II Hydropower Station (0.979MW) in Pokhara Lekhnath MC, Kaski and Deulikhola Micro Hydropower Project (22kW) in Kahun Shivapur, Bodikhola Micro Hydropower Pradasani Project (10kW) in Bhirkot, Rising RM. Solar panels and bio-gas plants are other alternative sources of energy for the people of the project area. There are 303 bio-gas plants and 4490 solar panels in the PAA for lighting (DSO, 2071 and DSO, 2072).

CBS (2011) shows that majority of the HHs in the PAA use electricity as the source of lighting. This is followed by 3.06% Kerosene, 1.41% solar, 0.23% bio gas and 0.84% use other sources for lighting. Similarly, 63.63% HHs use LP gas as the source of cooking however only 0.11% HHs use electricity. This is followed by 29.38% use wood/firewood, 4.86% use bio-gas, 1.34% use kerosene, 0.07% use cow dung and 0.24% use other sources of cooking fuel.

The local governmental organizations are located in all PAA. The agriculture, livestock and public health services centers are also located in the PAA. In the field of finance and banking sector, various commercial banks, development banks, micro finance, saving and credit cooperation are working in the major market area of PAA.

5.3.2.13 Gender Status

In the PAA, population of female is higher than male attendance. Even the economically active populations of female in PAA are higher than male. On the other hand, male literate population, absent population and foreign migrant worker are higher than female population (Figure 5-10).

However, during the field visit it was observed the fact that land and property holding is dominated by male where collection and management of fuel wood and ownership of animal husbandry is female dominant. Due to the foreign labour migration of male, most of the

women were found to be involved as natural resource manager in terms of wide range of job description from collecting fodder grass, water, animal grazing and agricultural activities to kitchen work, cleaning the house and nursing the children in one side. On the other hand, it was also observed during the field visit that decision making process about economic activities and other areas was found to be changed from male into female. Due to the change of time, female were found to be engaged in other activities like teaching, industry, business, tourism and to some extent foreign labor migration and it is interesting to note that male was also observed, during field visit, to be involved in collecting water in the PAA.

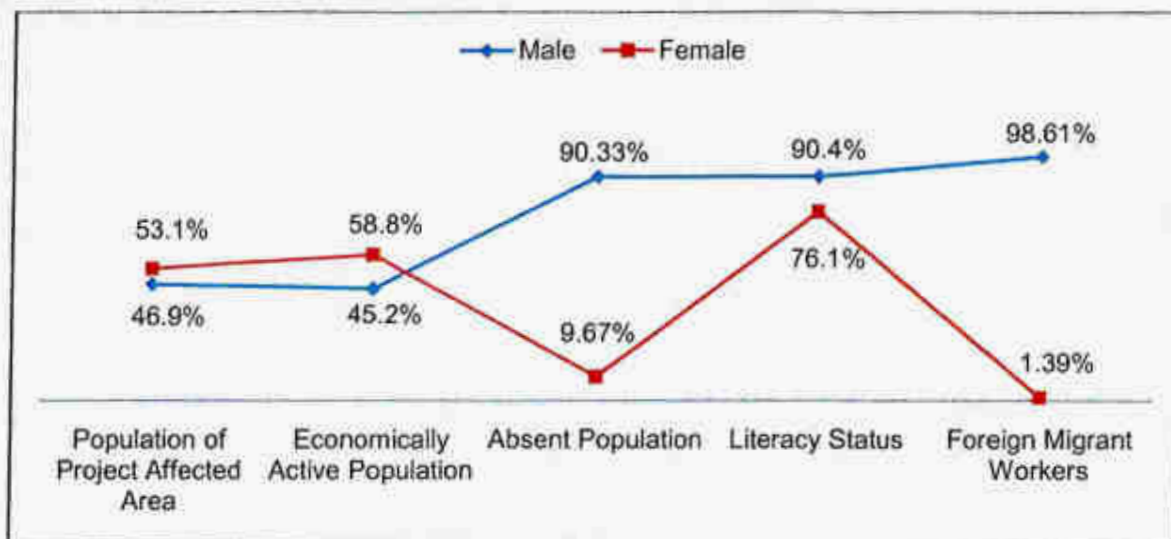


Figure 5-10: Comparative Status of Male and Female in the PAA

Source: CBS, 2011

5.3.2.14 Law and Order Situation

The existing law and order situation of the PAA was observed to be normal. The District Administration Office and police office have maintained the law and order in the area.

5.3.2.15 NGO's Activity

There are many NGOs, youth clubs, co-operatives, mother groups, *Tole Sudar Samitee* etc. are working in the field of water supply, sanitation, sports, women awareness, transportation, child sector, human rights, saving mobilization and income generating activities in the PAA. Rural Empowerment Society, Nepal Redcross Society, Environment Conservation Women Group, Rural Empowerment Society, Society Service Group are the NGOs that have been working in various sectors in the PAA.

5.3.2.16 Tourism Activities

The PAA has lots of potential of tourism due to some popular historical, religious place and natural beauty. Almost all tourists who come to visit Nepal definitely visit the area to take pleasure in trekking, paragliding, rafting, zip-flying and so on. Some major tourism attraction areas in the PAA are Syaklung Kot, Lipyani, Ramkot, Bhumessthan, Deurali, Indra Cave, Barah Temple, Chisapani Temple, Jaleshwar Temple, Chandisthan Temple, Phalyankot Darbar in Rupa RM. Similarly, Kalika Temple, Thulakot Bhairabsthan, Gorakhnath Temple, seven lakes like Begnas Lake, Rupa Lake, Dipang Lake, Sundari Danda, Sarangkot, etc. in Pokhara Lekhnath MC, Juma Masjid, Bauda Sadan in Byas Municipality (DSO, 2071 and DSO, 2072).

5.3.2.17 Cultural Environment

Since the PAA is dominantly inhabited by Hindu people. So, Hindu festivals like Dashain, Tihar, Teej, Janai Purnima, Chaite Dashain and Maghe Sankranti etc. are widely celebrated.

in the PAA. In the same way, a large number of indigenous people (IPs) are also inhabited in the PAA who celebrate Buddha Jayanti and Lhosar (New Year festival according to Tibetan calendar), Chasok Tannaam, Udhauli, Ubhauli, Gaijatra etc. Similarly, popular cultural activities in the PAA are Bhallo and Deushi (singing and dancing activities) in Tihar, Holi, Bhajan/Kirtan (praying by singing) in Ram Nawami and Kirshna Janmastami, cultural programs in Shripanchami, Dhami and Jhankri Naach (dance performed during various religious activities and festivals). Other religious activities in the PAA are Paasni (rice feeding ceremony for newly born babies), Bratabanda (thread wearing ceremony of teenage boys), marriage, Shraadha (worship for the soul of the dead people) etc. In addition, there is presence of Muslim Community in the PAA. So, Eid is also celebrated by this Community.

5.3.3 Profile of the Project Affected Households

5.3.3.1 Population and Households

Sample survey of 69 HHs was conducted to collect socio-economic status of PAFs that are directly affected by the project. The total population of surveyed HHs is 433 including 220 males and 213 females. The sex ratio and average HHs size is 1.03 and 6.3 respectively. According to the broad age group classification, 74.36% of the surveyed population is categorized as economically active population. Similarly, the dependent population (population below age group 0-10 years and senior citizen 60 years and above) is 25.64%.

Table 5-28: Demographic Features of PAFs

S. N.	PAD	PAA	Population				Household	
			Male	Female	Total	Sex Ratio	Total	Average HH Size
1	Kaski	Pokhara Lekhnath MC	37	35	72	1.06	11	6.5
		Rupa RM	30	23	53	1.30	8	6.6
2	Tanahun	Byas Municipality	130	132	262	0.98	44	6.0
		Rising RM	14	18	32	0.78	5	6.4
		Myagde RM	9	5	14	1.80	1	14.0
Total			220	213	433	1.03	69	6.3

Source: HH Survey, 2016

Table 5-29: Distribution of Population by Broad Age Group

S. N.	Age Group (years)	Population	Percentage
1	0-14	59	13.63
2	15-59	322	74.36
3	60 and above	52	12.01
Total		433	100.0

Source: HH Survey, 2016

Type of family

Nuclear type of family is dominant in the project affected HHs. Of the total 69 HHs, 41 (59.42%) HHs are categorized as joint type and the rest 28 (40.58%) are nuclear type.

Marital status

Of the total 433 population, 235 (54.27%) are married and 174 (40.18%) unmarried. Similarly, the population of widow/widower are 24 (5.54%).

5.3.3.2 Religion

Out of the surveyed HHs, 54(78.26%) HHs follow Hinduism whereas the remaining 15 (21.74%) HHs follow Buddhism as their main religion.

5.3.3.3 Mother Tongue

Nepali is the major language (56.52%) spoken by the surveyed HHs. This is followed by Magar (39.13%) and Gurung (4.35%) language is spoken by the affected HHs.

Table 5-30: Distribution of Surveyed HHs by Mother Tongue

S. No.	Spoken Language	HHs	Percentage
1	Nepali	39	56.52
2	Magar	27	39.13
3	Gurung	3	4.35
Total		69	100.00

Source: HHs Survey, 2016

5.3.3.4 Occupation

Majority of the surveyed people are students. About 29.14% of the surveyed HHs are students. The percentage of HHs occupied other than agriculture is student (23.31%); HHs work (14.72%), 13.80% outside the country, 7.98% service, labor wage inside the country (5.52%) and business (5.52%). Table 5-31 depicts the detail of the occupational distribution of the surveyed HHs.

Table 5-31: Occupational Composition of Surveyed Population (10-59 years) by Sex

S. N.	Major Occupation	Gender					
		Male		Female		Total	
		No.	%	No.	%	No.	%
1	Student	48	29.63	47	28.66	95	29.14
2	Agriculture	21	12.96	55	33.54	76	23.31
3	HH Work	-	-	48	29.27	48	14.72
4	Labor wage(Outside country)	42	25.93	3	1.83	45	13.80
5	Service(Inside country)	18	11.11	8	4.88	26	7.98
6	Labor wage(In country)	18	11.11	-	-	18	5.52
7	Business /Small Industry	15	9.26	3	1.83	18	5.52
Total		162	100.00	164	100.00	326	100.00

Source: HHs Survey, 2016

5.3.3.5 Literacy

From the HHs survey, it is revealed that 87.9% population are literate with male literacy rate 97.55% and female literacy rate 78.11%.

Table 5-32: Literacy Status (5 years and above) of Surveyed HHs

S. N.	Literacy Status	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Illiterate	5	2.45	44	21.89	49	12.10
2	Literate	199	97.55	157	78.11	356	87.90
Total		204	100.00	201	100.00	405	100.00

Source: HHs Survey, 2016

Of the literate population, percentage of having basic level education, secondary level, and Bachelor and above is 41.29%, 38.20% and 9.55% respectively. Literate population is 10.96% only. Table 5-33 describes the educational attainment among the literate population of the surveyed HHs.



Table 5-33: Educational Attainment among the Literate Population of the Surveyed HHs

S. N.	Educational Attainment	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Literate only	15	7.54	24	15.29	39	10.96
2	Basic level education	78	39.20	69	43.95	147	41.29
3	Secondary Level	85	42.71	51	32.48	136	38.20
4	Bachelor & above	21	10.55	13	8.28	34	9.55
Total (Literate)		199	100.00	157	100.00	356	100.00

Source: HHs Survey, 2016

5.3.3.5 Land Holding Size by Land Type

The HHs survey shows all of the affected HHs have their own land for cultivation. These HHs have been classified on the basis of different landholding categories such as marginal, small, medium, and large. Majority of the HHs i.e. 53.62% are categorized as small type families having land 0.5ha to 2.0ha whereas 40.58% are classified as marginal HH with land holding size of below 0.5ha. Similarly, 5.80% of HHs as medium type families having land 2.0ha to 4ha. Table 5-34 and Table 5-35 shows HHs having land based on holding size and category.

Table 5-34: Distribution of Surveyed HHs by Landholding Size

S.N.	Landholding Categories		HHs		Total Area	
	Category	Size of holding(ha)	No.	%	Area(ha)	%
1	Marginal	Up to 0.5	28	40.58	8.028	14.14
2	Small	0.5 - 1.0	21	30.43	14.243	25.09
		1.0 - 1.5	11	15.94	13.024	22.94
		1.5 - 2.0	5	7.25	9.49	16.72
3	Medium	2.0- 4.0	4	5.80	11.98	21.10
Total		-	69	100.00	56.765	100.00

Source: HH Survey, 2016

Table 5-35: Landholdings of the Surveyed HHs by Type of Land

S. N.	Type of Land	Total Holdings(ha)	Percentage (%)
1	Khet	15.127	26.65
2	Bari	33.634	59.25
3	Pakho Bari	7.449	13.12
4	Ghaderi	0.555	0.98
Total		56.765	100.00

Source: HHs Survey, 2016

5.3.3.6 Agriculture and Livestock

Paddy, wheat, maize and millet are the main crops grown by the project affected surveyed families. The total production of crops with different varieties are 62.04MT of paddy, 7.66MT of wheat, 33.96MT of maize and 7.92MT of millet. Similarly, the productivity of the different crops are 3.25MT/ha of paddy, 2.11MT/ha of wheat, 2.28MT/ha of maize and 1.09MT/ha of millet. The distribution of crops, production and yield is shown in Table 5-36.

Table 5-36: Major Crop Area Coverage, Production and Yield for the Surveyed HHs

S.N.	Description	Major Crops			
		Paddy	Wheat	Maize	Millet
1	Total Cropped Area (ha)	19.089	3.630	14.895	7.266
2	Total Production (MT)	62.04	7.66	33.96	7.92
3	Yield(MT/ha)	3.25	2.11	2.28	1.09

Source: HHs Survey, 2016



Cow, buffalo, goat and pig are main domesticated animals by the surveyed HHs. Of the total, 78.26% of HHs have the livestock of their own while 21.74% don't have any livestock.

5.3.3.7 Food Sufficiency

Since, the project area has the less fertile irrigated land, majority of the surveyed HHs have deficit food for them to survive. About 37.68% of the surveyed HHs have sufficient food throughout the year. Among the surveyed HHs, 16.28% have food deficiency only for less than 3 months whereas there are 20.93% families who have food deficiency for more than 9 months.

Table 5-37: Food Deficient Months for the Surveyed HHs

S. N.	Months	HHs	Percentage
1	<3	7	16.28
2	3-5	13	30.23
3	6-9	14	32.56
4	>9	9	20.93
Total		43	100.00

Source: HHs Survey, 2016

5.3.3.8 Debt Status

One major component to see the socio-economic condition of the surveyed HHs is their debt status. From the HHs survey, it is revealed that 22(31.88%) of surveyed HHs have the burden of debt whereas 47(68.12%) HHs have no debt burden. The survey also reveals that these people take loans for different purpose (foreign employment, house repair, education, health treatment, marriage/ritual, and food/clothing). Among the surveyed HHs who have the burden of debt, majority of them take loans for foreign employment (31.82%).

Table 5-38: Cause of Debt of the Surveyed HHs

S. N.	Description	HHs	Percentage
1	Food and clothes	5	22.73
2	Foreign employment	7	31.82
3	Education	3	13.64
4	Health treatment	2	9.09
5	Land Purchase	1	4.55
6	House Maintenance	2	9.09
7	Marriage/rituals	2	9.09
Total		22	100.00

Source: HHs Survey, 2016

5.3.3.9 Business/Cottage Industry

From the HHs survey, it is revealed 17.39% of total HHs have their own business. These HHs either depends upon agriculture or other sources such as foreign employment, service or labor wage.

5.3.3.10 Income and Expenditure Patterns

The average annual income of the surveyed HHs is calculated NRs. 482,826; where the source of income of the surveyed HH is agriculture as well as non-agriculture. Non-agriculture sector consists of service, business, daily wage, remittance, and *briddha bhatta*. Among the different sources of income, non-agriculture contributes about 90.57%. Income from agriculture and animal husbandry contribute 9.43%. The average annual income from different sources is given in Table 5-39.



Table 5-39: Average Income of Surveyed HHs

S.N.	Income Source	Average (NRs.)	Percentage (%)
1	Remittance	181043	37.50
2	Service	87826	18.19
3	Business	86667	17.95
4	Agriculture and animal husbandry Income	45522	9.43
5	Pension and Briddha Bhatta	37043	7.67
6	Daily Wages/Porter	23855	4.94
7	Rent	20870	4.32
Total Average Income		482,826	100.00

Source: HH Survey, 2016

Similarly, the average annual expenditure of 69 surveyed HHs is estimated to be NRs. 402,382. Food items, clothing, education, medicine, festival, fuel, communication/electricity, transportation are the main expenditure items of the surveyed HHs. The proportion of expenditure on food items is higher (51.74%) followed by festival (10.08), education (9.93%), clothing (9.52%), medicine (5.93%), transportation (4.83%), communication/electricity (4.82%), and fuel (3.15%).

5.3.3.11 Drinking Water and the Source of Lighting

Of the surveyed 69 HHs, 71.01% use piped water supply for their drinking water, followed by public tap (26.09%) and tube well (2.90). Electricity is the main sources of lighting for the surveyed HHs. Since the project area is connected with the national grid of electricity, all the surveyed HHs use electricity for lighting.

5.3.3.12 Source of Cooking Energy

Fuel wood, LP gas and bio-gas are the main sources of energy for cooking food among the surveyed HHs. Majority of the surveyed HHs use fuel-wood (44.93%) only. Source of cooking energy and fuelwood are given in Table 5-40 and Table 5-41.

Table 5-40: Sources of Cooking Energy of the Surveyed HHs

S. N.	Energy Type	HHs	Percentage (%)
1	Fuelwood	31	44.93
2	Fuelwood and LPG	16	23.19
3	LPG	15	21.74
4	LPG and bio-gas	4	5.80
5	Fuelwood and bio-gas	3	4.35
Total		69	100.00

Source: HH Survey, 2016

Table 5-41: Sources of Fuel wood Used by Surveyed HHs

S. N.	Source of Fuel wood	HHs	Percentage (%)
1	Community Forest	31	62.00
2	Private	14	28.00
3	Purchase	5	10.00
Total		50	100.00

Source: HH Survey, 2016



5.3.3.13 Health and Sanitation Condition

Out of the surveyed HHs, 39.1% suffered from disease since last year. The sanitation condition of the PAA is satisfactory. Though both the PADs are declared as ODF districts, the HHs survey revealed that only 97.1% (67HHs) have their own toilet for defecation and the remaining 2.9% (2 HHs) use open field and canal side. In regards to the solid waste

management, among the surveyed HHs, 53.62% dump their solid waste at the safe location, where 27.54% burn and 18.84% bury the waste. Table 5-42 shows the solid waste management practiced by the surveyed HHs.

Table 5-42: Solid Waste Management Practice by Surveyed HHs

S. N.	Solid Waste Management Practice	HHs	Percentage (%)
1	Dump at safe location	37	53.62
2	Burn	19	27.54
3	Bury	13	18.84
Total		69	100.00

Source: HH Survey, 2016

5.3.3.14 Knowledge and Attitude Regarding the Project

Knowledge

Out of total 69 surveyed HHs, only 26.09% HHs have knowledge about the proposed project and its activities. According to the surveyed HHs, the main sources of information about the project activity are through the NEA employee, neighbors and newspapers. About 72.22% of the HHs got information from NEA employers, 16.67% got information through neighbors and 11.11% have knowledge through newspapers.

Table 5-43: Source of Knowledge about the Project

S. N.	Sources of Knowledge	HHs	Percentage (%)
1	NEA/Surveyors	13	72.22
2	Neighbors	3	16.67
3	Newspapers	2	11.11
Total		18	100.00

Source: HHs Survey, 2016

Attitude

About 60.87% of the HHs have shown their positive attitude towards the proposed project while 26.09% of the HHs are against the project activities (due to the alignment) and remaining 13.04% are neutral.

Table 5-44: Attitude towards the project of the surveyed HHs

S. N.	Perception	HHs	Percentage (%)
1	Positive	42	60.87
2	Negative	18	26.09
3	Neutral	9	13.04
Total		69	100.00

Source: HHs Survey, 2016

5.3.3.15 Expectation from the Project

The expectations of the project affected HHs are mainly for good compensation for the land and property, employment, and local development. However, majority (63.77%) of the HHs have shown their interest for good compensation. Similarly, 27.54% of the HHs have shown their expectation for employment and 8.70% for local development.

Table 5-45: Expectation from the Project

S. N.	Expectation	HHs	Percentage (%)
1	Good Compensation	44	63.77
2	Employment	19	27.54
3	Local Area Development	6	8.70
Total		69	100.00

Source: HHs Survey, 2016



5.3.3.16 Description of the house of the Surveyed HHs**a. House****By wall type**

Hundred percent of the surveyed HHs have their own house for residence. Out of the surveyed HHs, wall of 36 HHs (52.17%) is made up of cement/stone/brick whereas the remaining 33 HHs (47.83%) have mud/stone/brick used in their walls.

By roof type

Zinc plates, RCC and stone roof are prevalent in the surveyed HHs. Majority of the HHs (62.32%) have their house with galvanized zinc sheet followed by RCC (34.78%) and thatched (2.90%).

Table 5-46: Houses by Roof Type

S.N.	Type of Roof	HHs	Percentage
1	Zinc Plates	43	62.32
2	RCC	24	34.78
3	Thatched	2	2.90
Total		69	100.00

Source: HH Survey, 2016

By floor type

Mud and Cement are used on floor by the surveyed HHs. Out of the surveyed HHs, 37 (53.62%) have mud floor and the remaining 32 HHs (46.38%) have cemented floor.

By no. of Storey

One storey houses are common among the surveyed HHs. About 57.97% of the HHs have their house with two storey where 33.33% of HHs have one storeys and remaining 8.70% have three and more storey houses.

Table 5-47: Houses by Number of Storey

S.N.	No of Storey's	No. of HHs	Percentage
1	One	23	33.33
2	Two	40	57.97
3	Three and more	6	8.70
Total		69	100.00

Source: HH Survey, 2016

5.3.4 Key Issues/Concerns Raised in KII and Informal Meeting

During the community consultation several issues and concerns were raised by the people. All the local people of the PAA have positive attitude regarding the construction of project. However some of the people in project area suggested that the TL should be constructed with less impact on valuable land and go through riverside/barren land. The major issues/concerns are related to good compensation of assets on time, local development, shifting the route alignment from the emerging city, employment, livelihood support, transparency in project activities and environment protection. The issues, which considered for IEE are included in Table 5-48 and addressed in relevant section of Chapter 8.

Table 5-48: Summary of Key Issues/Concerns of Local People

S. N.	Key Issues /concerns	Issues considered for IEE
1	Alignment	<ul style="list-style-type: none"> • Re-align the TL (AP26-AP27 and AP29-AP30) to avoid settlements in Byas Municipality (former Syamgha VDC.)
2	Livelihood	<ul style="list-style-type: none"> • Employment to local people as per their skill • Skill development training
3	Infrastructure development/ community support	<ul style="list-style-type: none"> • Support for educational institution (library, laboratory equipment, toilet, furniture, teaching and sports materials) • Support for drinking water (intake, source improvement) • Protect/conservate cultural and religious places. • Support for upgrading the exiting Ama Samuha, CFUGs offices
4	Compensation	<ul style="list-style-type: none"> • Compensation should be given on the basis of prevailing market price • Construction of the project should be started after completion of compensation process
5	Others	<ul style="list-style-type: none"> • Maintain transparency in project activities • Create trust among the local people • TL should go by minimizing the environmental effect as well as damaging agricultural land. • Involved local people in project activities. • Consideration should be given for safety of towers.



6 IMPACT ASSESSMENT

This chapter assesses the likely adverse impacts during the construction and operation of the LDTLP, which will result in perturbations in the existing baseline conditions. The general discussions are organized in three categories namely; physical, biological and socio-economic and cultural environment, and divided into construction and operation phases.

6.1 Physical Environment

The main physical impacts on the environment are those associated with land take for stringing of the line, construction of tower foundation and changes in drainage patterns. The major impacts anticipated during the construction and operation phase are discussed in the sections below.

6.1.1 Watershed and Drainage Condition

a. Construction Phase

The TL traverses through flat and mild slope landscape in the hilly region. Most of the tower foundations are located at the top soil and on agricultural land. The interference with drainage patterns due to the construction of the foundation will be minimal. However, the activities like site clearing, stringing of the line, excavation for tower foundation, trail construction for material transportation and access road construction may disturb the watershed and increase erosion due to vegetation removal.

Though the area required for tower foundation construction may vary depending on location and weight of tower, approximately 225m² of land will be disturbed for each tower foundation. The earthwork associated with tower construction will be confined to the tower foundation base area with low impact on the adjoining areas. Nevertheless, the cultivated area around the tower foundation may be affected due to compaction during the construction and transportation of materials.

Disruption of natural drainage system and soil erosion while stringing the line across the river can be anticipated during the construction phase. However, the APs are not located near the river or streams, the probability of the disruption of natural drainage will be none. Since the requirement of land for the construction of tower foundation is limited, the impact on drainage and soil erosion is envisaged to be low. Therefore, the impact is expected to be site specific, low in magnitude and for a short duration.

b. Operation Phase

No significant impact on the watershed and natural drainage is expected during the operation and maintenance period.

6.1.2 Topography

a. Construction Phase

The land interference during construction of the TL is related to the tower foundation, substation and lack of restraint of the RoW. This may result in the change in landscape. No other change in topography is envisaged during this phase. The visualized impact on topographic changes is considered to be low in magnitude, site specific and for long term.

b. Operation Phase

No impact on topography is expected during the operation phase except for the impact on natural scenery. The impact is low in magnitude, local and for long term.

6.1.3 Land Use and Land Take

a. Construction Phase

The land use changes involved in the implementation of the project will be basically due to the permanent and temporary land acquisition under the RoW and for the construction of tower foundation. The project will require 134.6125ha land for the placement of tower foundations (angle and suspension), substation and RoW of the TL and temporary facilities. The summary of the land take and land use are given in the Table 2-4 and Table 2-5. The alignment passes through different type of land use and CF. It has been fragmented while alignment passes and is presented in the Table 6-1 below. The impact can be classified as high in magnitude, local in terms of extent and of long term in terms of duration.

Table 6-1: Fragmentation of Forest due to TL

S. N.	AP to AP	MC/Municipality/RM-wards	Fragmented CF
Kaski District			
1	3-4	Pokhara Lekhnath MC -27,29	Sahelipakho Badhare
2	3-4-5	Pokhara Lekhnath MC-27	Pakhura
3	4-5		Bhaltari Bhiteri
4	6-7	Pokhara Lekhnath MC-28	Bhurtel Gaon
5	6-7		Shaakhudi Simle
6	7-8-9	Pokhara Lekhnath MC-31	Bilaune Ghari Puranthar
7	11-12-13		Bhir Pani
8	12-13-14		Odar Thumki Sirani Danda Thuli Dhunge Sinkauli Swar Maru Ghairo & Lapsibot
9	14-15	Rupa RM-7	Jimire Bishauna Pakho
10	15-16		Ramkrishna
11	16-17	Rupa RM-6	Mohariya
12	19-20-21	Rupa RM-1	Jimire
13	20-21-22	Rupa RM-2	Ghewapani Kusunde
Jarapur District			
14	22-23-24-25-26	Byas Municipality-6	Thulobhanjyang
15	27-28-29-30		Sapankot
16	30-31-32	Byas Municipality -5	Phoksing
17	33-34	Myagde RM-6	Ripa Shikhar Thumki
18	38-39-40	Byas Municipality -5	Manung

b. Operation Phase

The impact on the land use changes of the permanent land take for the towers and substation is expected to be high. The land under the RoW will be restricted for the erection of any type of public and private structures except for plantation of dwarf trees species. However, cultivation will be allowed. All temporary land acquired will be converted to its original use or agreed new uses towards the end of the construction period and handed over to their owners. The impact can be classified as high in magnitude, local in extent and of long-term in duration.

6.1.4 Air and Noise Quality

a. Construction Phase

The construction activities consist of site clearance, excavation for the tower foundation, concreting and stringing of the line. These activities will generate dust in the surrounding area. Apart from these activities, movement of transporting vehicles carrying the construction materials along the gravel roads will generate fugitive as well as combustion emissions and will cause temporary impact on air quality. Since the construction activities are limited to small area, the impact on the ambient air quality will be low in magnitude, site specific in terms of extent and of short duration.

The emission of noise and vibrations are inevitable during construction though only insignificant interruption in noise quality has been expected for TL projects. The location of the APs are relatively far from the settlements except for APs which are close to Khareni village, Bastola gau, Talbesi, Mauriya, Sishaghat, Barhabise, Malingagau and Belbas will feel the noise disturbances due to vehicular movement and construction activities. Noise pollution will be temporary and will not be different from the prevailing conditions due to low traffic movement along the roadside. The impact is expected to be low in magnitude, site specific and for a short duration.

b. Operation Phase

No major impact on air quality is envisaged during the operation phase. However, a kind of humming sound may be created at the substation area. The transmission overhead lines do create some noise in certain circumstances; for example during minor surface damage, dirt or change in weather conditions can cause the lines to crackle or hum slightly. This is due to a phenomenon called Corona effect. The effect of corona is conspicuous during rain. However, noise due to the corona effect of the proposed TL with voltage level of 220kV will not be significant since the alignment does not pass very close to the settlements. The impact is expected to be low in magnitude, long termed and site specific.

6.1.5 Water Quality

a. Construction Phase

During the construction period, water will be used from nearby river and streams. Therefore, there is possibility of water pollution especially in sectors where the line crosses the rivers and streams. Soil disturbances associated with construction activities of tower foundations, the improper disposal of solid wastes and chemicals such as cement slurry, construction materials, and human wastes into the river or streams may deteriorate the river water quality and other existing water bodies around the construction area. This may lead to water borne diseases and other problems especially in the adjacent villages where people use the flow from these streams for HH chores. The impact is expected to be moderate in magnitude, site specific and for a short duration.

b. Operation Phase

The operation and maintenance activities of the TL will not have impact on the water quality in the project impact area.

6.1.6 Waste and Spoil Generation

a. Construction Phase

The improper disposal of solid waste like cement bags, iron bar and other leftover construction materials, kitchen waste and waste generated by the temporary labour camp might cause adverse impact to the environment. The spoil generated due to the excavation of foundation is also detrimental to land and water quality of the area. There will be no muck from tower pad since the excavated volume will be used for compaction and restoration of natural ground level. Muck volume of 16,550 cubic meter will be generated at substation area. However, more than 90% of the volume of muck will be used for back filling and compaction and remaining 10% of the volume of muck will be deposited near foundation site and also will be used for feeder road gravelling and retaining wall. The magnitude of impact is considered to be low, extent is site specific and duration is short term.

b. Operation Phase

The operation and maintenance activities of the TL will not have impact on the waste and Spoil generation in the project impact area.

6.1.7 Crossing of Other Utilities and Interferences

a. Construction Phase

No impacts on crossing of other utilities and interferences is likely to happen during the construction phase.

b. Operation Phase

The proposed TL alignment crosses roads, rivers, TLoF of different voltages and structures. Crossings of communication utilities and transmission and distribution lines will result in the interferences to the communication system. Radio interference can disrupt television and AM (amplitude modulation) radio reception close to a line. Interference can sometime be noticed at a distance of 150m away. By contrast, FM (frequency modulation) system is affected very little by interference. Interference varies according to the position of the TL between transmitter and receiver. In some cases, receiving conditions can be improved due to the reflections caused by a TL. Since the TL mostly passes more than 500m distance from most of the settlement areas the magnitude of the impact is considered to be insignificant. The impact will be low in magnitude, site specific and for short duration.

6.1.8 Storage of Construction Material and Camps

a. Construction Phase

Storage of construction materials will result to the land degradation of the particular area. Likewise, the area designated for the camps will also damage the leased or rented area. Both temporary mobile camps and storage sites are located nearby. The locations for temporary camps and storage sites of construction materials are listed below. The impact will be low in magnitude, site specific and for short duration.

Table 6-2: Location and Area of Storage and Camp sites

S. N.	PAD	PAA	Area (ha)
1	Kaski	Pokhara Lekhnath MC	0.3
		Rupa RM	0.3
2	Tanahun	Myagde RM	0.3
		Rishing RM	0.3
		Byas Municipality	0.3
Total			1.5

b. Operation Phase

No impact is expected during the operation and maintenance period.

6.1.9 Air Traffic

a. Construction Phase

No impact is envisaged on the existing airport at Pokhara as the closest distance from the airport to the proposed line is approximately 7.74km North West.

b. Operation Phase

Since the entry path of the aeroplane towards the runway is in the perpendicular direction of the proposed line, no impact is envisaged on the route of the existing air traffic.



Table 6-3: Physical Environment Impact Assessment Matrix

Table 3.6.1: Physical Environment Impact Assessment matrix										
S.N.	Issues	Impacts	Identification and Evaluation of Impact							
			D	IND	M	E	Du	Sum of Impact Values	Significance of Impact	
Construction Phase										
1	Watershed and Drainage	No APs are located near the river or streams, the probability of the disruption of natural drainage does not appear.	D		L	SS	ST	35		Less Significant
2	Topography	Topography of the tower site will be changed due to excavation, fill and cut for leveling the foundation area leading to the change in landscape.	D		L	SS	LT	50		Significant
3	Land Use & Land Take	The project will require 134.6125ha of land for placement of foundation, substation and RoW of TL.	D		H	L	LT	90		Highly Significant
4	Air Quality	Different construction activities and vehicular movements will generate dust/ smoke and affect air quality in the surrounding area	D		L	SS	ST	25		Less Significant
5	Noise Level	Use of Construction equipment and vehicles will increase noise level.	D		L	SS	ST	25		Less Significant
6	Water Quality	There is possibility of water pollution especially in sectors where the line crosses the rivers and streams leading to deterioration of river water quality and other existing water bodies around the construction area.	D		M	SS	ST	35		Less Significant
7	Waste generation	The improper disposal of solid waste like cement bags, iron bar and other leftover construction materials, kitchen waste and waste generated by the temporary labour camp might cause adverse impact to the environment.	D		L	SS	ST	25		Less Significant
8	Storage of Construction Material	Lead to land degradation and damage of the particular area	D		L	SS	ST	25		Less Significant
Operation Phase										
1	Topography	Impacts on natural scenery	D		L	L	LT	50		Significant
2	Noise Level	A kind of humming sound may be created at the substation area and corona effect might cause.	D		L	SS	ST	25		Less Significant
3	Crossing of other utilities & interference	interferences to the communication system	D		L	SS	ST	25		Less Significant

Note: D: Direct, IND: Indirect

Extent (E)

Magnitude (M)

Duration (Du)

SS= Site Specific (10)

L= Low (10)

ST= Short Term (05)

L= Local (20)

M= Medium (20)

MT= Medium Term (10)

R= Regional (60)

H= High (60)

LT= Long Term (20)



IEE Report

6-5

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6.2 Biological Environment

The implementation of the project will affect the existing ecosystems in the project impact area multi-dimensionally and the effects may be both adverse and positive. The major impacts on the biological environment will include the loss of individual trees and loss of vegetation cover due to site clearance; increased demand of fuel wood and timber; impact on NTFPs; habitat loss of mammals, bird and reptiles because of change of vegetation cover and site disturbances.

6.2.1 Forest/Vegetation Loss

a. Construction Phase

The total estimated forest area falling under the tower pad and TL is 34.9884ha. Along this, the government forest falling under the TL alignment is 0.7ha and CF area falling under the tower pad and TL is 21.6947ha. Also, 12.5937ha area falls in private shrub land which consist of sparse trees and bushes specially used for collection of ground fodder.

Based on the available detailed route survey report of the proposed TL and field study, out of 42 APs, 9 are located in the forestland. Since large trees in this area are removed, it will leave shrubs, short trees as vegetation cover which will reduce the crown cover of the forest along the TL. The impact due to the loss of vegetation during project implementation is expected to be medium in magnitude, direct and long-term in duration.

Table 6-4: Total Affected Forest (by Types)

S. N.	Forest Type	Forest Area (ha)
1	Government Forest	0.7
2	Community Forest	21.6947
3	Private Shrubland	12.5937
Total		34.9884

As far as standing trees are concerned, based on the field study and sample taken during IEE, a total of 14160 numbers of trees of 23 different species are estimated to be clear felled during project construction period. The contribution of pole sized trees in this data is 79.24% whereas tree sized is 20.76%. Chilaune (*Schima wallichii*) is found to be the dominant tree species throughout the line alignment. The total number of Chilaune trees to be felled down is estimated to be 5040 which is 35.59% of the total trees to be clear felled. This is followed by Sal (*Shorea robusta*) (4890), Katus (*Castanopsis indica*) (1740), Sallo (*Pinus sp.*) (600), Khirro (*Sapium insigne*) (360), Padke (*Albizia julibrissin*) (360), Botdhairo (*Lagerstroemia parviflora*) (330) and Ramritha (*Mallotus oppositifolius*). Lakuri, Phalat, Kafal and Utis are the species which need to be clear felled in least number.

Approximately 8772.33 cubic meter of wood volume may potentially be removed during the project construction period. In addition, total of 7959.28 ton of dry biomass will be lost from the ecological system. This estimate is based on the forest samplings that represent the forest types and conditions of the project area.

The impact on forest and vegetation cover will be moderate in magnitude, local in extent and long term in duration. This loss of forest and vegetation cover might create indirect impacts resulting in the degradation of the mid hill environment for a long duration but is of little or no significance. Table 6-6 to Table 6-7 provide the details of forest clearance.



Table 6-5: Forest Loss in different components

S. N.	Project Component	Type of Forest	Forest Area (ha.)	Loss of Vegetation	Crown Cover (%)	Forest Type
				No of trees >10 cm DBH		
1	Substation	Govt. Managed	-	-	-	-
		Community	-	-	-	-
		Leasehold	-	-	-	-
		Religious	-	-	-	-
		Private	-	-	-	-
2.	Tower Pads and TL	Govt. Managed	0.7	14160	40-80	Mixed Forest (Sal, Chilaune, Katus, Mauwa and Pine)
		Community	21.6947			
		Leasehold	-	-	-	-
		Religious	-	-	-	-
		Private Shrubland	12.5937	3200	30-60	Sal, Chilaune, Katus
Total			34.9884	17360	30-80	

Source: Field Survey, 2016

Above table reveals that construction of the proposed line affect 0.7ha government forest and 21.6947ha CF. The detail of the species wise tree loss in terms of number, wood volume and biomass is given in the Table 6-6. It also shows species wise loss of regeneration in terms of seedlings per ha and saplings per ha.

Table 6-7 shows that the average regeneration rate of seedlings and saplings in the CFs along the TL are 4981 and 2428 per hectare, respectively. The crown cover of the vegetation is found to be varied from 30-80%.

Loss of Trees from Private land

In addition to the loss of 14,160 number of trees from the government and CFs, about 3200 number of trees comprising of Sal, Chilaune, Katus, Botdhairo, Padke, Uttis, Mauwa, and others are expected to be clear felled from the private shrubland during the project construction period. Other species of private trees includes, Jack fruit (*Artocarpus heterophyllus*), Kabhro (*Ficus lacor*), Pakhri (*Ficus glaberrima*), Orange (*Citrus aurantium*), Simal (*Bombax ceiba*), Berula (*Ficus sarmentosa*), Khanyu (*Ficus semicordata*), Banana (*Musa paradisiaca*), etc.



Table 6-6: Tree Loss in Terms of Plant Species from Government Forest and CF

S.N.	Local Name	Botanical Name	Loss of Vegetation						Standing Wood Volume, m ³	Biomass (ton)
			Loss of Regeneration		Loss of Tree (No.)					
			Seedlings/ha	Saplings/ha	Pole Class	Tree Class	Total	%		
1.	Amala	Phyllanthus emblica	0	15	0	0	0	0.00	2.07	1.89
2.	Amba	Psidium guajava	14	10	0	0	0	0.00	1.41	1.27
3.	Angeri	Osbeckia nepalensis	483	268	0	0	0	0.00	37.53	33.77
4.	Botdhairo	Lagerstroemia parviflora	124	66	300	30	0	0.00	36.87	33.45
5.	Chilaune	Schima wallichii	1448	679	4230	810	0	0.00	1790.31	1624.42
6.	Dhurseli	Colebrookea oppositifolia	83	58	0	0	330	2.33	8.04	7.30
7.	Epil Epil	Leucaena diversifolia	0	0	60	0	5040	35.59	1.71	1.55
8.	Kafal	Myrica eiculenta	0	0	120	0	0	0.00	9.18	8.33
9.	Katus	Castanopsis sps.	688	408	1530	210	60	0.42	567.36	514.80
10.	Khirro	Sapium insigne	25	30	330	30	120	0.85	41.37	37.54
11.	Lankuri	Fraxinus floribundu	0	13	60	0	1740	12.29	4.08	3.71
12.	Mango	Magnifera indica	9	6	0	0	360	2.54	0.87	0.79
13.	Mauwa	Engelhardtia spicata	39	21	60	0	60	0.42	6.90	6.26
14.	Padke	Albizia julibrissin	19	13	270	90	0	0.00	132.66	120.38
15.	Phalat	Quercus lamellose	13	8	60	0	60	0.42	4.35	3.95
16.	Ramritha	Mallotus oppositifolius	38	25	180	30	360	2.54	66.09	59.98
17.	Rato pate	Ajuga bracteosa	0	0	0	30	60	0.42	43.32	39.32
18.	Sal	Shorea robusta	1763	1041	3360	1530	210	1.48	5114.34	4640.44
19.	Sallo	Pinus sp.	6	36	480	120	30	0.21	159.57	144.79
20.	Simal	Bombax ceiba	5	4	0	30	4890	34.53	20.94	19.00
21.	Swami	Ficus benjamina	0	0	30	30	600	4.24	696.93	632.36
22.	Tiju	Diospyros malabarica	214	118	30	0	30	0.21	17.31	15.70
23.	Uttis	Alnus nepalensis	15	13	120	0	60	0.42	9.12	8.29
Total			4981	2428	11220	2940	14160	100.00	8772.33	7959.28

Note: Seedling 0-4 cm DBH; Sapling 4-10 cm DBH; Pole Class 10-30 cm DBH; Tree Class >30cm DBH; NA: Not Applicable Source: Field Survey, 2016



Table 6-7: Total Forest Loss

S.N.	Type of forest	Area (ha.)	Loss of Vegetation				Crown Cover (%)	Standing Wood Volume (m ³)	Biomass of Standing Tree (Ton)	Biomass Usages*
			Seedlings per ha	Saplings per ha	Pole class	Tree class				
1.	Government	0.7	4981	2428	11220	2940	40-80	8772.33	7959.28	Timber, Firewood, Fodder, NTFP
2.	Community	21.6947	-	-	-	-	-	-	-	
3.	Religious	-	-	-	-	-	-	-	-	
4.	Leasehold	-	-	-	-	-	-	-	-	
5.	Private Shrubland	12.5937	-	-	2200	1000	30-60	-	-	
	Total	34.9884	4981	2428	13420	3940	30-80	8772.33	7959.28	

Note: Seedling 0-4 cm DBH; Sapling 4-10 cm DBH; Pole Class 10-30 cm DBH; Tree Class >30cm DBH; * Possible usages are- Timber, fire wood, fodder etc.,
Source: Field Survey, 2016



b. Operation Phase

During the operation phase of the project, only trees which grow under the RoW after some years might need to be cleared. Regular trimming of tall trees and growing shrubs and short trees will change the vegetation cover. This impact is low, site specific (local), and long-termed.

In terms of the biological environment, the project area will reap beneficial impacts from the project's afforestation program that will be implemented to replenish the loss of forest and vegetation especially in the project affected CFs.

6.2.2 Changes of Demand for Fuel Wood and Timber**a. Construction Phase**

The existing CF cover is found to be large enough to support the demand of forest resources such as firewood and timber to the dependent HHs. Therefore, cutting down of 14,160 number of standing trees from CF is of significance to the livelihood of local people but direct and long-termed. The economic impact will be significant because timber and firewood obtained from the felled trees can be sold in local markets.

It is assumed that most of the labor force will be from local areas. There will be a few people from outside the project area for a short period of time. Due to this, the increase in demand of fuel wood and timber during the construction period is expected to be low. Moreover, there will not be any permanent settlements that may lead to encroachment on forest land. This impact will be low in magnitude, site specific and short-termed.

b. Operation phase

During the operation phase, site-specific and short-term effects such as increase in pressure on forest resources will settle down. Patrolling and maintenance activities along the TL will involve only a few people occasionally. This activity will not have a noticeable adverse impact on the forest and vegetation.

6.2.3 Increased Access to Forest**a. Construction Phase**

The fragmentation of forest area for RoW, erection of tower and stringing of conductors during the construction phase can increase the access to forest. The impact is expected to be low in magnitude, site specific and short-termed.

b. Operation Phase

During the operation phase, site-specific and short-term effects such as increase in pressure on forest resources due to increased access will decrease. RoW management will involve patrolling and maintenance activities along the TL with very few people from the project. The re-growth of ground vegetation and short height plants will reduce the access to the forest. The overall impact is expected to be low in magnitude, site specific and long-termed.

6.2.4 Exploitation of Non-Timber Forest Products (NTFPs)

The term 'non-timber forest product' encompasses all biological materials other than timber which are extracted from forests for human use. NTFPs include edible plants (food, edible oils, spices, fodder etc.) and non-edible plant products such as medicines, ornamental plants, etc.

a. Construction Phase

Since there will be a small number of work force involved in the project construction, collection and sale of NTFPs by workers will be negligible. CFUGs have imposed strict rules regarding the collection of NTFPs in their forests. However, even the collection of tiny volumes of NTFPs might result in social conflicts. Therefore, these impacts are considered as low in magnitude, site-specific and of a short duration.



Table 6-8: Total Loss of NTFP

S.N.	Commercially Important Species (other than trees) NTFP	Government Managed	CF	Religious Forest	Leasehold Forest	Private Forest
1	Aduwa (<i>Zingiber Officinale</i>)	-	Rare	-	-	-
2	Aiselu (<i>Rubus ellipticus</i>)	-	Frequent	-	-	-
3	Akhe Timur (<i>Zanthoxylum armatum</i>)	-	Rare	-	-	-
4	Alaichi (<i>Amomum subulatum</i>)	-	Rare	-	-	-
5	Amala (<i>Phyllanthus emblica</i>)	-	Frequent	-	-	-
6	Bel (<i>Aegle marmelos</i>)	-	Rare	-	-	-
7	Chutro (<i>Berberis asiatica</i>)	-	Frequent	-	-	-
8	Kafal (<i>Myrica eiculenta</i>)	-	Frequent	-	-	-
9	Kera-Banana (<i>Musa paradisiaca</i>)	-	Rare	-	-	-
10	Lapsi (<i>Choerospondias axillaris</i>)	-	Frequent	-	-	-
11	Tejpat (<i>Cinnamomum tamala</i>)	-	Frequent	-	-	-

(Note: Estimation of NTFPs in number could not be made. Rather it is estimated as Rare, Frequent, Abundant and Dominant) Source: Field Survey, 2016

b. Operation Phase

During the operation phase, there will be an occasional intervention of just a few people maintaining the TL. This will have an insignificant effect on the forest and NTFPs along the TL.

6.2.5 Impact on Wildlife and Avifauna

a. Construction Phase

The possible adverse impacts on wildlife and avifauna population during the project construction phase are loss of physical habitat and food habitat, possibility of hunting and poaching by labor force and disturbance in the migratory movement of mammals and birds.

• Loss of Habitat

The construction of TL which will require site clearance and other construction related disturbances will cause loss of vegetation and will affect wildlife habitat to some extent. Since the area to be cleared is large (22.3947ha of forest area), the overall magnitude of impact is considered to be high, extent is site specific and duration is long termed.

• Disturbances from Construction Activities

Construction disturbances and other related activities will interrupt normal movement, feeding and other activities of wildlife. The construction disturbances resulting from excavation of foundation, vehicle movement, transportation of materials, and other related activities would interrupt normal movements, feeding and other activities of animals available in the surrounding areas. Construction activities may affect movement of birds resulting in the temporary disturbance to their normal route. These activities will affect less mobile, frequently smaller species such as frogs, lizards and small mammals. This is short-term localized impacts and will subside gradually as the construction work is completed. Hence the magnitude of impact is considered to be low, extent is local and the duration is short term.

• Hunting and Poaching by Labor Force

Hunting and poaching will be one of the likely impacts on the wildlife due to the presence of construction workers. The local hunters or hunters among the workforce might be attracted to hunt birds and other wild animals. The possibilities of hunting and trapping by workers during construction period will have some impact on local wild fauna. However, such pressure on wildlife will be site specific and will decrease once the work is completed. The magnitude of impact is considered to be low, extent is local and duration is short term.



b. Operation Phase

During operations, there will be some adverse impact on wildlife which are discussed in the following sub-sections.

- **Habitat Changes**

The vegetation of the RoW will maintain a conductor clearance compatible with safe operation. This will result in loss of some habitat. The vegetation clearance will be carried out manually and will have a minor disturbance on the wildlife during operation. In addition, the RoW will create the barrier for the movement of some wildlife. Pylons might attract population of Primates like Langur (*Macaca assamensis*) and Rato Bandar (*Macaca mulata*) in the project area as they are climbers and high voltage TL could pose a danger for such animals. The impact will be low in magnitude, site specific and long term.

- **Avian Hazards**

The existence of 220 kV line may affect bird mobility to some extent. The conductor wires, being suspended at the height and being thin, are difficult for birds to detect and avoid them. The inability of birds to notice the wires can cause fatal injuries from collisions. This type of impact is predicted to be high in low visibility conditions such as bad weather and foggy days and during nights. Since the TL route does not pass through any identified bird migration route, the impact is of low magnitude, site specific and will remain for long duration.

6.2.6 Impacts on Protected Species of Flora and Fauna**a. Construction Phase**

Because of different construction activities and influx of outsiders, pressure on the vegetation and the forest will increase. Physical habitats, feeding habits, reproductive behaviors and movement of wild animals and birds might be disturbed due to construction activities and increased human presence in and around the PAA. This might change the existing ecosystem diversity altering natural communities of plants and animals. Ultimately protected plant and animal species will be more prone to such adverse impacts. This impact is of high in magnitude, site specific and long-termed. The effect will be adverse on the local biological resources and on the biodiversity of the PAA.

b. Operation Phase

During the operation phase, clearance of trees along the RoW will create open linear stretches in the forest. That would further divide small patches of forest into smaller fragments. Fragmentation of the forest would also fragment the existing habitat, which in turn, affects flora and fauna in a number of ways. For example, some wild animals like Chitwa (*Panthera pardus*) are reluctant to pass through open stretches in the forest. Likewise, an open stretch in the forest may be barrier for propagation of plants. Thus, bio-diversity of the PAA and the status of rare, endangered and threatened plants might be adversely affected. This impact is expected to be low in magnitude, site-specific and for a long duration.



Table 6.2.6: Biological Environment Impact Assessment Matrix

S. N. Issues			Impacts		Identification and Evaluation of Impact						
Construction Phase					D	IND	M	E	Du	Sum of Impact Values	Significance of Impact
1	Loss of forest land	The total estimated forest area falling under the tower pad and TL alignment is 34.9884 ha. Government forest area falling under TL alignment is 0.7ha and CF area falling under the tower pad and TL alignment is 21.6947ha. Also, 12.5937ha area falls in private shrub land.	D		D		M	SS	LT	50	Significant
2	Loss of tree	14160 numbers of trees from CF of 23 different varieties will be clear felled. 8772.33 cubic meter of wood volume with 7959.28 ton of dry biomass will be lost.	D		D		M	SS	LT	50	Significant
3	Demand for Fuel Wood and Timber	Cutting down of standing trees is significant to the livelihood of local people. Demand of fuel wood and timber during the construction period will be low.		IND		L	SS	SS	ST	25	Less Significant
4	Increased Access to Forest	Fragmentation of forest area for RoW, erection of tower and stringing of conductors during the construction phase can increase the access to forest.	D		D		L	SS	ST	25	Less Significant
5	NTFPs	Collection of small volumes of NTFPs might result in social conflicts.	D		D		L	SS	ST	25	Less Significant
6	Loss of Habitat	Reduction in available forest habitat due to loss of 34.9884ha forest.	D		D		L	SS	LT	40	Less Significant
7	Hunting and poaching	Likely increase in hunting and poaching.		IND		L	L	L	LT	50	Significant
8	Protected, Species of Flora and Fauna	Pressure on the vegetation and forest will increase. Physical habitats, feeding habits, reproductive behaviors and movement of wild animals and birds might be disturbed.	D		D		M	SS	LT	50	Significant
Operation Phase											
1	RoW Clearance/ Bush Cutting	Trees will be trimmed and cut down to make conductor clearance. Regular trimming of tall trees will change vegetation cover. Afforestation program will replenish loss of forest and vegetation.	D				L	SS	LT	40	Less Significant
2	Access to forest	RoW management can increase access to forest		IND		L	SS	SS	LT	40	Less Significant
3	NTFPs	Occasional intervention of NTFPs as few people maintain TL	D		D		L	SS	LT	40	Less Significant
4	Impact on wildlife	Pylons might attract Primates. Bird mobility may affect and cause fatal injuries from collisions. Fragmentation and destruction of habitat will reduce movement of wild animals, availability of their food and shelter.	D				L	SS	LT	40	Less Significant
5	Change in Habitat	Permanent change in 2.1472ha forest area in shrub land and grass lands.	D		D		L	SS	LT	40	Less Significant
6	Protected Species of Flora and Fauna	Fragmentation of forest would fragment the existing habitat and affects flora and fauna.	D		D		L	SS	ST	40	Less Significant

Note: D: Direct, IND: Indirect

Extent (E)

Magnitude (M)

Duration (Du)

SS= Site Specific (10)

L= Low (10)

ST= Long Term (05)

L= Local (20)

M= Medium (20)

MT= Medium Term (10)

R= Regional (60)

H= High (60)

LT= Short Term (20)

The number in the bracket refers to impact value as per National EIA Guidelines, 1993. The sum of impact values provides a maximum of 140 and minimum of 25.

Significance of impact: sum of impact values: more than 75 → Highly Significant, 50-75 → Significant and less than 50 → Less Significant.

EE Report

6-13

NEA-ESSD

6.3 Socio-economic and Cultural Environment

6.3.1 Acquisition of Land and Structures

a. Construction Phase

• Land Requirement

The total land requirement for the project is 134.6125ha land for the erection of tower pads (angle and suspension), substation, switching station, mobile camp and RoW of the TL and temporary facilities. Out of the total, the project will acquire and utilize 106.6042ha of private land. Out of total private land, 8.3325ha is permanent land (land required for APs, STs, substation, switching station, camp and storage), 97.0221ha for RoW and 1.25ha for mobile camp. The project will acquire only 6.0ha private land permanently for substation. Detail of the land use is given in Table 2-5 and Appendix B. The land occupies by single tower is 0.0225ha. The land under the RoW of TL will be restricted permanently for the construction of houses, cowsheds and plantation of timber size big trees, etc. However, there will be no restriction on agricultural farming after the construction work is over. Appendix D shows affected land for surveyed HHs, however project will acquire the land as mentioned in the Table 2-4.

• Households Losing Land and Structure

The implementation of the proposed project will affect 84 HHs (excluding those HHs who will be affected due to the suspension tower foundation). Sample survey of 69 HHs have been carried out. Table 6-9 shows the details of HHs losing land and structures.

Table 6-9: HHs Losing Land and Structures

S. N.	Project Components	Type of losing Land and Structure	Affected HHs	Surveyed HHs
1	AP	Land Only	31	28
2	Substation and switching station	Land Only	35	23
3	Substation and switching station	Land and structure	2	2
4	RoW	Structure Only	14	14
5	AP and RoW	Land and structure	2	2
Total			84	69

Source: HHs Survey, 2016

• Household Losing Land

Proposed project will affect 84 HHs out of which 70 will lose their land. They are likely to be affected due to the implementation of project. Among 70 HHs who will lose their land, percentage of land loss is calculated for 55 surveyed HHs. Table 6-10 shows the detail of the HHs who lose their land.

Table 6-10: Affected HHs by Land Loss (Surveyed HHs)

S.N.	Loss of land	No of HHs	Percentage
1	< 10%	32	58.18
2	10-25%	15	27.27
3	25 -50%	4	7.27
4	>50%	4	7.27
Total		55	100.00

Source: HH Survey, 2016

• Households Losing Structures

Private Structures

Out of total project affected HHs, 18 HHs will lose their 22 structures (12 houses, 9 cowsheds and one toilet). Out of the 18 HHs who will lose their structures 9 HHs shall be relocated. They will lose their place of residence. Detail of the HHs who loses their structures is given in Appendix D.



Table 6-11: List of Project Affected Surveyed HHs by Area and Type of Structures

Area	No. of Affected Structures	Affected Area (Sq.ft.)									
		Houses				Cowsheds				Toilet	
		Kachchi	Semi Pakki	Pakki	Avg.	No.	Area	Avg.	No.	Area	
<u>Single Floor</u>											
<100 sq.ft.									1	40	
100-150 sq.ft.						5	619				
150-200 sq.ft.											
> 200 sq.ft.	5	1157	238		279	3	842				
<u>Double Floor</u>											
> 200 sq.ft.	7		3334		476.29	1	416	416			
Total	12	1157	3572	-	394.08	9	1800	180	1	40	

Note: Kachchi: Mud/Wood/Bamboo wall with Thatch or Bamboo Roof; Semi-Pakki: Cement/Brick/Stone wall with Zinc plate Roof; Pakki: Cement/Brick wall with RCC Roof.

Public/Commercial Infrastructures

One water tank located in AP5 and another one in AP38 will be affected due to the tower foundation. Proposed project will also affect the structures of Kahare Agriculture and Livestock Co-operative Limited located in AP13-AP15 (near AP-14).

The overall magnitude of impact is considered to be high, site specific and long termed. The level of impact may vary with the proportion of land acquired.

b. Operation Phase

Land acquisition will not be required during operation and no significant impacts are expected during this phase. Due to safety reason, houses and other permanent structures are not allowed to be constructed within the RoW as per the Electricity Regulation, 2050. The land price under the RoW and in the vicinity of RoW, especially near to the highway and built up areas will be reduced significantly. It is difficult to quantify the level of impact on the pricing of the land because there are other factors too that would play the significant role. The land used for camp will be returned to the respective land owners as in the previous condition. Thus, the magnitude of impact is moderate, extent is site specific and duration is long term.

6.3.2 Loss of Crops

a. Construction Phase

• Permanent Loss of Crops

The major parts of the TL alignment go through less fertile cultivated land. The major crops cultivated in the PAA are paddy, maize, wheat and millet. Total annual crop loss of the project affected HHs is estimated to be 33.63MT (cereal crop; paddy 15.75MT, maize 11.98MT and millet 2.06. Table 6-12 shows the details.

Table 6-12: Permanent Loss of Agricultural Production (Due to Land Acquisition)

S.N.	Crop types	Surveyed HHs			Production Loss (MT) of total project affected HHs
		Production area loss (ha)	Production Loss (MT)	Productivity (MT/ha)	
1	Paddy	3.942	12.81	3.25	15.75
2	Wheat	1.630	3.44	2.11	3.84
3	Maize	3.741	8.53	2.28	11.98
4	Millet	1.734	1.89	1.09	2.06
Total			26.67		33.63

Source: HH Survey, 2016

- **Temporary Loss of Crops**

There will be loss of standing crops along TL RoW during the construction phase. The impact will depend upon the timing of the construction and cropping in the impacted area. Preferably the construction of TL will be carried out during clean season so that standing crops are not damaged or minimum damaged. However, the adjoining of RoW may be disturbed due to the movement of vehicles and stringing of line.

About 164.91MT of crops (paddy 58.74MT, maize 78.25MT, wheat 12.58MT and millet 15.34MT) will be lost due to the construction of TL. This loss is calculated considering that stringing of the line will be completed in one year and compensation will be paid for one seasonal cropping. The magnitude of this impact is considered to be high, extent is site specific and duration is long termed.

Table 6-13: Loss of Agriculture Production due to Land Utilization

S. N.	Crop type	Actual production loss area (ha)	Production Loss (MT)	Productivity (MT/ha)
1	Paddy	18.07	58.74	3.25
2	Wheat	5.96	12.58	2.11
3	Maize	34.32	78.25	2.28
4	Millet	14.07	15.34	1.09
		Total	164.91	

b. Operation Phase

Tower constructed in cultivated area, especially those erected in the middle of land parcels will pose hindrance while tilling agricultural field. The field may be cultivated by using human labor that will increase the cost of agriculture production. The overall magnitude of impact is considered to be low, extent is site specific and duration is long term for loss of crops in permanent land. Whereas, there is no such impact on temporary land.

6.3.3 Impact on Livelihood

a. Construction Phase

The HHs survey shows that people of the PAFs do not rely on only single income source; instead they maintain their daily life involving on various occupations like the foreign employment, service, subsistence farming and livestock, tourism, pension and so on. Similarly, the proposed TL alignment will acquire less fertile land and the proposed substation will acquire some hectares of fertile cultivated land so some HHs will lose their cultivated land permanently which causes, to some extent, scarcity of food permanently on their daily living; however they do not fully depend on their agricultural incomes so, the overall magnitude of impacts on livelihood is considered to be moderate, extent is site specific and duration is long term.

b. Operation Phase

The impact on livelihood will remain same in this period.

6.3.4 Health, Water Supply and Sanitation

a. Construction Phase

- **Health and Sanitation**

The local people may come regular undesirable contact with the outsiders so, the likely increase of the outsiders' influence during this phase may add further stress on the local health and sanitation situation. The concentration of labor force may encourage prostitution, which could lead to the spread of HIV/AIDS and other sexually transmitted disease. There could lead the spread of other communicable diseases such as diarrhea, worm, and respiratory diseases and so on too. However, the impact is considered to be low, site specific and for short term considering the small number of manpower and their short-term mobility at one site.

Besides, the increase in the noise level due to vehicular movement in the project area is likely to influence the physical and mental health of the local community. Discharge of wastes of various types including metals, paper, kitchen wastes etc. is potential to degrade the sanitary hygienic conditions particularly around the construction sites and camp sites. The lack of proper sanitary measures and increase wastes and water pollution may lead to the outbreak of epidemic diseases. However, the impact is considered to be low, site specific and for short term considering the small number of manpower and their short-term mobility at one site.

- **Drinking Water**

With the increase in population along with the construction activities of substation, a potential decline of the access to the drinking water and existing sanitation condition will occur in the project area. The overall impact on water supply and sanitary situation will be: shortage of drinking water, increase pressure on the existing water supply system, increase distance to the safe drinking water, increase in disease vectors, and reduced water quality due to increased sanitation problems etc. However, the impact on water supply and sanitation shall be low, short term and site specific but the pressure on water supply and sanitation will be long term in substation.

b. Operation Phase: The same impact is anticipated during the operation phase.

6.3.5 Occupational Hazards and Safety

a. Construction Phase

During construction of the 42.254km long 220kV TL approximately 123 towers of 29m height for double circuit and 44m for four circuit would be constructed. This job involves moderate risks mainly in the form of falling from height or being pulled by the cable and vehicle accidents. If careless, there will be possibility of injury or even deaths of the workers become a reality. Inadequate provision of health safety equipment such as hard hats, boots etc. may create health hazard. The magnitude of impacts is considered to be moderate, extent is local and duration is long term.

b. Operation Phase

During the operation phase, the people residing in the vicinity of the TL will be vulnerable to electrical hazards such as fire, electrical shocks or even electrocution. Similarly, lack of operation and maintenance skill and unavailability of the essential safety equipment may add further risk with safety regards. The public can be affected principally through their own activities, such as tendency of climbing towers by children; high vehicles attempt to pass beneath the TL, surveyors using metal leveling staffs under the conductors, etc. These risks have low probability of occurrences, but a great significance to individuals involved. The overall magnitude of impacts is considered to be moderate, extent is local and duration is long term.

6.3.6 Impact on House, Settlements and Social Infrastructure

a. Construction Phase

There are 31 settlements which are close (within 300m) to the TL. All together 12 residential houses, 9 cowsheds, one toilet, structures of a cooperative farm and two water tanks fall under the RoW as already discussed in section 6.3.1. A school Shree Bhanung Primary School is very close (approximately 70m) to the TL alignment in Saura, Byas. Similarly, Some schools like Shree Shiva Shakti Primary School in Pokhara Lekhnath MC, Byas and Jana Jukta Saahi Higher Secondary School in Byas are close (within 300m) to the TL alignment. The Damauli-Sukhaura gravel road lies within the premises of proposed Damauli Substation. So, the proposed Damauli Substation (Belbas) will permanently impact the Damauli-Sukhaura gravel road. The list of such structure/property is presented in Appendix D. The magnitude of impact on above mentioned private and social infrastructures are high, extent is local and duration is long term.

b. Operation Phase

The impact on settlements and community structures remain same in this period also. The magnitude of impact is high, extent is local and duration is long term.

6.3.7 Impact due to Crossings**a. Construction Phase**

The baseline study shows the proposed TL alignment crosses highway, some roads/trails, residential/non-residential homes, physical structures of agriculture farm, drinking water tanks, irrigation canals, pond and distribution lines.

The proposed alignment crosses the Prithvi Highway in Byas, Damauli to Ranipokhari gravel/earthen road, Damauli to Shyamgha gravel/earthen road and some other inter-connected gravel/earthen/trails. The alignment crosses 132kV TL two times and 11kV line 12 times. Similarly the LDTLP crosses the 400/200V distribution lines 33 times. The LDTLP also crosses physical structures like residential homes/non-residential homes in Shyamgha, Byas, some structures of Kahare Agriculture and Animal Husbandry Co-operative Ltd. farm in Labsi Danda, Pokhara Lekhnath MC, some irrigation canals like *Chhar Hajar* Irrigation canal and Sanghepateni Irrigation Canal in Byas, Saura drinking water tank in Saura, Byas and another drinking water tank in Aarupata Village and buffalo ponds in Pokhara Lekhnath MC. The detail of the crossings is given in Appendix D. Hence, there will be impact due to crossing over of power cables, foot trails and roads on local infrastructures and facilities. The impact is expected to be low, local and long term.

b. Operation Phase: The same impact is observed during operation phase.

6.3.8 Impact on Communal Resources

a. Construction Phase: No impact on the communal resources during the construction phase.

b. Operation Phase: There is no impact on communal resources during operation phase of the TL.

6.3.9 Impact on PAF due to Alteration of Land and Property Values**a. Construction Phase**

The aforementioned TL alignment had crossed some residential houses of nearby settlement, so AP-8, AP-9 and AP-26 have been slightly shifted and AP-29A has been inserted in between AP-29 to AP-30 in order to avoid impact on dense settlement and likely social conflict (see figure in Chapter-2). The land and property values under RoW and close to house and settlement will be devalued due to construction of TL. The nature of impact is expected to be high, local and long term.

b. Operation Phase: The same impact is anticipated during the operation phase.

6.3.10 Restriction of Future Land Use Development near to Settlement**a. Construction Phase:**

No impact is anticipated during this phase.

b. Operation Phase

The proposed TL mostly passes through rural and semi urban sections. The metropolitan area and municipality area from where the alignment passes through is rural and semi urban types too. Due to implementation of TL, land nearby settlement and road will be affected. It restricts the multipurpose land use potentiality of the area mostly in Shyamgha, Byas where the area may spread as market area in future. Plan and programs proposed by concern RMs/Municipality/MC and DCC will be affected. Hence, impact is expected on future land use development. The nature of impact is high, local and long term.



6.3.11 Disturbance to Radio, Television and Mobile/Cell Phone Reception

a. Construction Phase

During construction period, there will be no impact on radio, television, telephone or cell phone.

b. Operation Phase

There will be some interference with the radio, television and cell phone waves with the Electromagnetic Field (EMF) of the TL within the RoW; however, there are no findings of impact due to high voltage TL outside RoW. Hence, the nature of impact is expected to be low, site specific and long term.

6.3.12 Electric and Magnetic Field Effect

a. Construction Phase: No impact is anticipated during construction phase.

b. Operation Phase

Electric powered TL creates electric and magnetic field together is known as EMF. Electric field is created by the presence of voltage and is expressed in volt per meter (V/m). Magnetic field is produced by the present of current in the line and is expressed in terms of ampere per meter (A/m). Power lines EMFs are strongest beneath the lines and diminish rapidly with distance. Numerous researches have been done abroad to investigate the effect of EMF associated with TL but none has proved and quantify about the health risks. Scientific research on the effects of EMFs on public health has not demonstrated clearly the existence of a significant risk, nor has it proven the complete absence of risk.

Electric field of high voltage line gives rise to corona effect causing ionization leading to the generation of ozone and oxides of nitrogen, possible radio and television interference and audible noise at high levels. Such noise will increase under rain and smog conditions. Similarly, there will be impact on pacemaker users. The magnitude of overall impact is considered to be low, extent is site specific and duration is long term.

6.3.13 Gender and Vulnerable Groups

a. Construction Phase

People will be, during the project construction, employed as unskilled, semi-skilled and skilled manpower on daily wages for excavation, transportation of construction materials and other construction related works. In equal value of work, the contractor, especially the sub-contractors, may discriminate the women and vulnerable group while hiring the worker. Despite, the GoN ban on child labor, it remains a potential temptation in an economically poor region such as the proposed project area for children to be exploited to pursue menial jobs. It is assumed that most of the labor force required for the construction of the TL will be farmers and landless people from the vicinity of the actual work place moving around the alignment as the construction proceeds. Considering the nature of construction work and manpower employed the magnitude of impact is considered to be low, extent is local and the duration is short term.

b. Operation Phase

Most of the population involved directly or indirectly in the project work will be deprived from the job after the completion of the project which will make the female population to look for alternative source of income. This may add extra burden to their normal daily activities. This impact is expected to be medium in magnitude, local in extent and long term in duration.

6.3.14 Economic Activities

• Construction Phase

Some section of the TL passes very near to market area like Lekhnath, Nepaltar, Seshtar, etc. where economic activities are high in comparison to other section of project area. Similarly, most of the section of the TL passes close to the rural roads which are considered as the semi-urban area. The interaction among different people/stakeholders and ethnic group may attract rural people towards more advance society. However, the experience with other project has revealed fact that sudden cash flow may cause unproductive spending earned by the workers. The availability of cash may divert some workers towards gambling and other awful habits like alcohol consumption. The magnitude of impact is low, extent is local and duration is short term.

• Operation Phase

Project induced economic opportunities will be beneficial for the local people. However, these opportunities will be closed and the workers will lose their job after the project completion. Demand for local agricultural production and local commodity transactions will be reduced. The decrease or withdrawal in economic activity during operation phase may affect the habitual life of local people of spending more like the construction phase. They will face difficulty in managing the lifestyle. However, due to the linear nature of the project, the local labors will be hired at the different locations only for the short duration of time. Thus, the magnitude of the impact is considered to be low because the economic activities are limited and are spread throughout the settlements of the alignment. The extent is local and duration is of long term.

6.3.15 Religious, Historical and Archeological Site

a. Construction Phase

Though there are numbers of temples, religious and cultural sites in the project area, none of the religious, historical and archaeological sites fall under the RoW.

b. Operation Phase: No impact is expected during the operation phase.

6.3.16 Infrastructure and Service Facility

a. Construction Phase

• Infrastructure

Damauli and Lekhnath are the main markets/trade centers of the project area. The average distance of these market centers from the proposed TL is ranged from 1km to 3km. The implementation of project will likely to affect these market centers. The magnitude of the impact is moderate, extent is local and duration is long term.

• Service Facility

The construction work and related influx of population in the project area will make the existing institutions regarding health, water supply, telecommunication, electricity, etc. unable to deliver the required service. Besides, existing market and hotels will come under pressure. However, privately operated service is expected to cope-up with this situation considering the nature of job and limited workers staying with their families in the project area. The impact is expected to be low in magnitude, local in extent and short duration.

b. Operation Phase: No impact is anticipated during the operation phase.

6.3.17 Social and Cultural Practices

a. Construction Phase

There might be some possible effects that are most likely to occur on the social structures, norms and cultural practices of the communities located close to the construction area. During the project construction, the influence of the outside workforce on the local way of life and traditional cultural

practice may result into cultural erosion, undesired social practices, disputes, conflicts and possible dilution of social bonds among the local people. However, the social and cultural life style of the local people will hardly be affected by the influx of workers due to nature of project. This is because of the linear type of the PAA, low number of the construction workers from outside and their fast mobility. These impacts are expected to low in magnitude, local and short term in duration.

b. Operation Phase

After completion of the construction work, the impact on culture by the construction work force will subside and will slowly return to its normal social condition.

6.3.18 Law and Order

a. Construction Phase

The contractor will, during the construction period, employ labor from different places with different religion and faiths, so there will be possibilities of conflict of interest that may affects the law and order situation. The past experience reveals the fact that local people have misunderstanding with the employers and contractor's staff. Since the project is of linear type and the number of local labor for construction activities will be less, the likely impact on law and order situation due to project is expected to be low in magnitude, local and short term.

b. Operation Phase

No impact is anticipated during operation phase.

6.3.19 Impacts of Aesthetics

a. Construction Phase

No impact is anticipated during construction phase.

b. Operation Phase

Impacts to visual resources are examined in terms of changes between the existing landscape character and proposed actions, sensitivity of viewing points available to the general public, their viewing distances and visibility of proposed changes. The existence of towers and TL will likely to create aesthetic impact on natural and manmade resources by hindering the mountain. Hence, the magnitude of impact on aesthetic will be moderate, local and long term in nature.

6.4 Beneficial Impacts

a. Construction Phase

• Local Employment

During the construction phase, one of the major beneficial impacts of the project is the creation of employment opportunities that, to some extent, may check out migration of the project area and promote in-migration. In this regard, this contributes to poverty alleviation to some extent. The availability of reliable power in the western part of the country will assist in establishing new industries which will generate employment for the local people. The magnitude of impact is considered to be moderate, extent is local and duration is short term.

• Local Economy

During construction period, the area of income of local people will be employment opportunity, income from house rental, rental/lease of land, shops, increased demand for fresh vegetables, fruits and meat. Furthermore, local contractor and local people will also be engaged for some construction work, which is considered as beneficial impacts for the local economy. As a result of increased trade and business, significant amount of cash will be introduced into local economy. This short term economic boom will contribute to the development of local economy. The growth in business will enhance the economic status of local people. The magnitude of impact is considered to be moderate, extent is local and duration is medium term. The people of project area will have

opportunity to sell their products to construction workforce and project farmers in terms of cash economy. With the start of proposed project construction, visible and significant impact will be realized in the local economy of the area as whole and economic activities of the urban, semi-urban area like Byas, Lekhnath and Shyamgha.

b. Operation Phase

• **Regional Economy**

The reliability in power distribution will enhance the production of the industries and boost the economic activity in the western Nepal.

• **Living Standard**

Beneficial impacts of the development project are development of urban and semi urban area with better facilities and amenities, which avail short-term economic benefits to the local community. Given the opportunity of job to the locals in the project, the unemployed people of the area and HHs depend upon labor will benefit immensely. Their purchasing power is expected to improve the living standard. People thriving in subsistent agriculture will have cash flow, then exposed to the direct cash earning economic activities will certainly lead to positive changes in the existing social relationships and socio-economic value. Similarly, local people will be benefitted through acquiring training on different sectors related to agriculture, vegetable farming, education, environment awareness program, health, etc. The magnitude of impact is considered to be moderate, extent is regional and duration is long term.



Table 6-14: Socio-economic and Cultural Environment Impact Assessment Matrix

S. N.	Issues	Impacts	Identification and Evaluation of Impacts						
Construction Phase			D	IND	M	E	Du	Sum of Impact Values	Significance of Impact
1.	Acquisition of Land and Structure	Project will require 106.6042ha private land of which 5.71ha private cultivated land is acquired. Total 22 structures will be affected.	D		H	SS	LT	90	Highly Significant
2.	Loss of Crops	Loss of 198.54MT food crops from permanent land acquisition and RoW.	D		H	SS	LT	90	Highly Significant
3.	Impact on Livelihood	Likely impact on livelihood to the PAFs.	D		M	SS	LT	50	Significant
4.	Health, Water Supply and sanitation	Likely impact on physical and mental health of local community	D		L	SS	ST	25	Less Significant
5.	Occupational Hazards and safety	Likely increase in construction related accidents.	D		M	L	LT	45	Less Significant
6.	Impact on house, settlement and social infrastructure	Likely impacts on house, settlements and social infrastructures.	D		H	L	LT	100	Highly Significant
7.	Impact due to crossings	Likely impact due to crossings (Power cables/Communication lines/ roads etc.)	D		L	L	LT	50	Significant
8.	Impact on PAF due to alteration of land and property values	Likely impact on PAF due to Alteration of Land and Property Values	D		H	L	LT	45	Less Significant
9.	Gender and Vulnerable group	Likely discrimination while hiring workers, compensation or other project related benefits.	D		L	L	ST	100	Highly Significant
10.	Economic Activities	Likely increase in economic activities as well as unproductive spending.	D		L	L	ST	35	Less Significant
11.	Infrastructure and Service Facility	Likely impact on infrastructures and service facilities.		IND	M	L	LT	50	Significant
12.	Social and Cultural Practices	Likely impact on social and cultural practices		IND	L	L	ST	60	Significant
13.	Law and Order	Likely increase in pressure to maintain the law and order		IND	L	L	ST	35	Less Significant
Operation Phase									
1.	Acquisition of Land and Structures	No significant impacts are expected on Land acquisition. Houses and other structures are not allowed to be constructed within RoW.	D		M	SS	LT	50	Significant
2.	Loss of Crops	Placement of tower at center of field pose difficulty for the cultivation which further increase production cost	D		L	SS	LT	40	Less Significant
3.	Impact on Livelihood	Likely impact on livelihood to the PAFs.	D		M	SS	LT		
4.	Occupational health and safety	Likely increase risks with safety regards.	D		M	L	LT	60	Significant
5.	Impact on House,	Likely impacts on house, settlements and social infrastructures.	D		H	L	LT	100	Highly Significant

S. N.	Issues	Impacts	Identification and Evaluation of Impacts						
	Settlements and Social Infrastructures								
6.	Impacts due to crossings	The project will cross Prithvi highway one time, feeder road, foot track, 220/400V, 11kV line, 132kV TL.	D						
7.	Impact on PAF due to alteration of land and property values	Land and property values under RoW will be devalued.	D						
8.	Impact due to restriction of future land use development	Restriction on the multipurpose land use potentiality for the growing up market area.		IND	H	L	LT	100	Highly Significant
9.	Disturbances to radio, television and cell phone reception	Likely disturbances to radio, television and mobile/ cell phone reception		IND	L	SS	LT	40	Less Significant
10.	Electric and magnetic field	Electromagnetic impact due to long term exposure		IND	L	SS	LT	40	Less Significant
11.	Gender and Vulnerable group	Male population become jobless; this will compel extra burden to female population.	D		M	L	LT	60	Significant
12.	Economic Activities	Withdrawal of economic activities. Negative impacts on locals.	D		L	L	LT	50	Significant
13.	Impact on Aesthetics	Likely impacts on Aesthetic values	D		M	L	LT	60	Significant

Note: D: Direct, IND: Indirect

Extent (E)

Magnitude (M)

Duration (Du)

SS= Site Specific

L= Low

ST= Short Term

L= Local

M= Medium

MT= Medium Term

R= Regional

H= High

LT= Long Term

The number in the bracket refers to impact value as per National EIA Guidelines, 1993. The sum of impact values provides a maximum of 140 and minimum of 25. Significance of impact: sum of impact values: more than 75 → Highly Significant, 50-75 → Significant and less than 50 → Less Significant.



7 ALTERNATIVE ANALYSIS

7.1 Introduction

A key aspect of good environmental practice is the evaluation of potential alternatives. In order to achieve this goal, the environmental and social considerations need to be brought into the planning from the very early stages. In case of this project, a range of route alternatives was investigated and the lowest and highest impacts on engineering, environmental and land use of these routes were determined to select the best route.

A number of alternatives were considered from the Desk study for the selection of TL. The alternative alignments of the proposed TL were selected taking into consideration the following criteria:

- RoW which have minimal environmental impact
- Improvement of reliability of the power system
- Provide the shortest straight route as far as possible with minimum number of APs.
- Minimum number of structure crossings
- Avoid build up swampy and unstable areas
- Provide easy access for construction and maintenance works
- Avoid settlements as far as possible
- Proximity of road etc.

7.2 Alternatives Considered

Some of the major alternatives considered during the feasibility and IEE studies were:

1. Route alternatives;
2. Design alternative;
3. Construction alternatives in terms of technology, procedures, schedule and raw materials to be used and
4. No forest Option
5. No project Option

7.2.1 Route Alternatives

Three alternative routes for this alignment were considered for this project, out of which the alignment with 42.254km was selected. Comparative studies for the feasibility of the different routes were done on the basis of the following guidelines:

- Access facility
- Located on geologically stable ground
- Total length of the line
- Minimum number of APs
- Avoid highly productive land or expensive RoW
- Minimum number of river crossing, national highways and overhead power line and telecommunication lines
- Avoid settlements areas or densely populated area; Minimum number of affected HHs
- Avoid forest crossing, protected area and wildlife sanctuaries



A comparison has been made among the possible routes as set forth below:

Table 7-1: Alternative Analysis

S. N.	Items	Route-I	Route-II	Route-III
1	Total length in km	42.254km	42.254km	63.590km
2	Number of angle points	51	43	60
3	Access Facility	Near to Prithivi Rajmarg	Village road	Village road
4	Crossing of existing lines (132 kV TL)	4 Times	3 Times	4 Times
5	Number of river/khola /kholi crossings	2/11/75	4/12/75	2/16/123
6	Crossing of existing lines (33 kV TL)	1	0	1
7	Number of village nearby	21	7	26
8	Marshy and unstable area	Not seen	Not seen	Not seen
9	Number of road/highway crossings	6/2	1/2	6/2
10	Forest area(in length km)	20.84km	19.5km	41.16
11	Any other permanent structures	Not seen	Not seen	Not seen
12	Any other impacts	None	None	None
13	Advantages	Easily accessible, easy construction, easy maintenance, length less than Route- II and Route -III	APs, settlements and forest area less than other two alternatives Route I & III	Easily accessible from village road
14	Disadvantages	Angle point and forest area more than Route-II. Settlement is also high.	Medium access, Difficulty in Construction and supervision will be also medium	Difficult access, construction, supervision will be difficult, route is longest and more settlements
15	Order of priority	2	1	3

Based on the desk study and comparison made among the identified three alternatives, it has been obvious that Route II has longer distance as compared to Route I and less angle towers as compared to Route III; but due to simple topography, minimum settlements, easily accessible from the foot tracks and this alignment is considered to be the best route. However, this needs to be verified and confirmed during the field reconnaissance survey.

7.2.2 Design Alternatives

Different design alternatives for tower structure, tower foundation and its protection, ruling span and voltage level have been also carried out during the feasibility and the IEE. In order to simplify the erection procedures and make the project cost-effective Lattice type of tower has been selected. Lattice type of tower is appropriate for the terrain and conditions of Nepal since they do not require large flat surface. In the rocky area along the alignment, rock bolt foundation is preferred to normal concrete foundation due to its less excavation, drilling advantage and low environmental impact. Conventional pad and chimney type concrete foundation will be constructed.

The design of the tower and foundation design are very much dependent on the selection of ruling span. The number of tower will be minimized by increasing the ruling span but it leads to heavier and higher tower structures to maintain the necessary ground clearances whereas shorter ruling span means increased number of tower which will further lead to increase land acquisition. Therefore, optimum standard ruling span of 330m has been adopted.



7.2.3 Construction Alternatives

Manual excavation will be adopted since it provides opportunity for the local employment and will have less impact on topography, low disturbance to surrounding areas and does not require wider access road. Mechanical excavation requires motorable access roads and cause more impact to environment including air and noise pollution. However, concreting will be done using mixer and vibrator in order to maintain the quality.

Erection will be done manually. Helicopter stringing is an alternative but such method would be costly. Moreover, use of helicopter will create noise pollution. Internationally accepted standard technology will be applied for the installation and procurement of the goods and equipment.

7.2.4 No Forest Option

Although practically it is not possible to avoid forest, no forest option was also studied. The proposed alignment has been routed nose to nose, valleys and at ridges so as to avoid forest clearance to the extent possibility. Furthermore, the locations for the APs have been also selected at elevated spots to avoid felling of the trees and trimming. Efforts to avoid the dense forest area have been made.

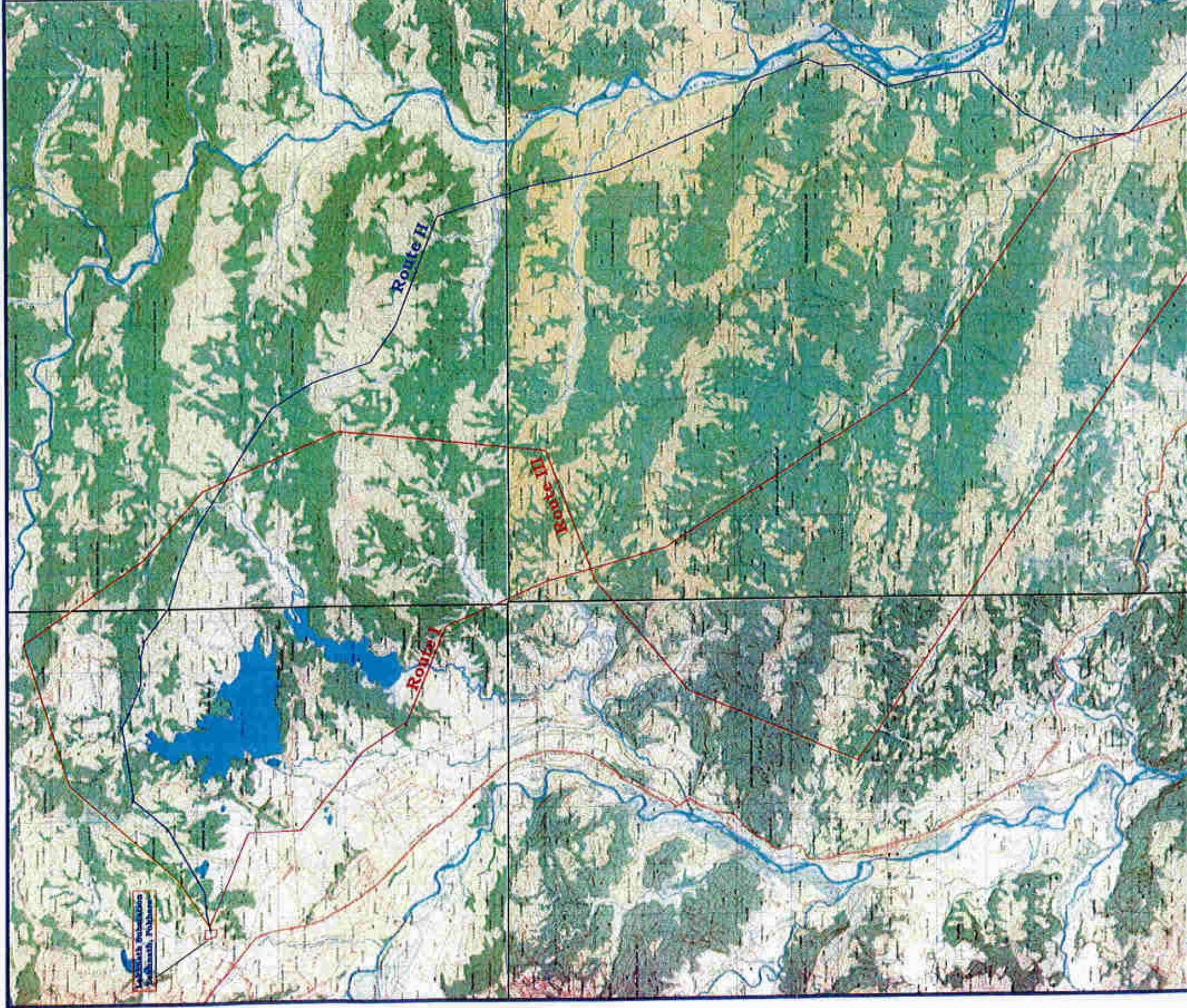
The compensatory plantation in the ratio 1:25 trees will be carried out in the project areas to mitigate the loss of trees with due consideration with DFO and the CFUGs of PADs. The implementation of the project will be done by following the existing forest acts, rules and regulations.

7.2.5 No Project Option

The unprecedented growth in power consumption has led to severe imbalance in demand and supply of electricity power in the country which has resulted in load shedding in Nepal since last few years. If the proposed project is not implemented then there will be no project induced loss/effect on vegetation, cultivated area and other environmental and socio-economic impacts. But such 'No Action' alternative would result in heavy deficit of power and energy in western part of the country. Besides, the construction of the proposed project will also reduce system loss and provide reliable power to the load centers of Nepal. This project will also be helpful for the expansion of rural electrification program. The likely increase in electricity supply to local people will help to switch energy consumption trend and pressure on local vegetation will be minimum. Socio-economic conditions of the local people are likely to be increased through employment opportunities and income generation activities.

Since, the construction of this TL will play a major role not only solving the power crisis in the country but also in improving the socio-economic status of the people, the construction of LDTLP is essential.





LEGEND

- Highway with Bridge
- Feeder Road with Bridge
- District Road with Bridge
- Other Road with Bridge
- Cart Track with Bridge
- Main Foot Trail with Bridge
- Minor Foot Trail with Bridge
- Road under construction
- Roadway line
- Built-up area
- Building or house
- Factory, Chimney
- School, Post office
- Hospital, Health post
- Cemetery
- Temple or Shiva, Mon
- Mosque, Church
- Orchard, Nursery
- Tea/Scattered, Prominent, Row
- Tea or coffee plantation
- Soil and gravel area
- Forest
- Bush, Grass, Fertilizer service
- Swamp
- Water top, well, Water tower
- Lake, pond, spring, water, vegetation
- Triangulation point, Bench mark
- Streams
- River
- Canal, Ditch
- Dam, Sluice, gate, Weir, culvert
- Water tank, reservoir, Well
- Sand and gravel area
- Aqueduct
- Ferry, Ford, win service
- Water top, well, Light, Shelter
- Spring, Ocean, range, place
- Triangulation point, Bench mark
- Mountain peak, spot height
- Fence or wall
- Indian contour line
- Intermediate contour
- Transformer station
- Supplementary W Transmission line
- Embankment, W Transmission line
- Cutting
- Depression: Big
- Depression: Small
- Soil cliff: Large, Small
- Rocks: Large, Small
- Cliff, rock, ice
- Quarry, gravel or clay pit
- International boundary
- District boundary
- VDC/Municipality boundary
- VDC Name: BASANTAPUR
- Radio transmission tower
- Mobile Camp and Storage

NEPAL ELECTRICITY AUTHORITY
Durbār Marg, Kathmandu (Nepal)

ENGINEERING SERVICES
PROJECT DEVELOPMENT DEPARTMENT

Title
ALTERNATE ROUTE

LEKHNATH-DAMAULI 220KV
TRANSMISSION LINE

Sheet No. 1/1

Date : February, 201



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8 MITIGATION AND ENHANCEMENT MEASURES

The mitigation and enhancement measures outlined in this chapter have been proposed to curtail potential adverse impacts and enhance beneficial impacts identified during the study. Those adverse and beneficial impacts not identified or predetermined during the study if later discovered during the construction phases will be explicitly mitigated or enhanced by the project. The discussion is organized into three categories of physical, biological, and socio-economic and cultural aspects, and has been split into construction and operation phases in an equivalent manner as for Chapter 6-Impact Assessment.

NEA as the project proponent will implement all the proposed mitigation measures and enhancement measures, monitoring plans described in the respective chapters as NEA's prime responsibility. In addition, the project will take responsibility of compensating as per the prevailing law for any losses or damage caused to lives and property during construction and operation phases. The impacts/issues which are not seen now, and if seen/encountered later will be mitigated/addressed by project on its own cost.

8.1 Physical Environment

Minimization of landtake and soil disturbances wherever feasible will be the primary mitigation measures of the project.

8.1.1 Watershed and Drainage Condition

a. Construction Phase

Proper management of the muck volume will be done. The muck generated during the excavation of foundation and substation will be used for backfilling and the area will be restored. The following mitigation measures will be anticipated during the construction phase:

- Vegetation clearing and ground disturbances will be confined within the foundation and required RoW.
- Proper compaction of the excavated soil will be done. After compaction 10% volume of muck will be deposited near foundation site and also will be used for feeder road gravelling and retaining wall.
- Adequate surface and subsurface drainage will be provided at all the APs area and at substation area to drain away the excess water and prevent water logging.
- Excavation will be done in phases with higher number of laborers so that the required target stretch is completed on time.
- Restoration of the area around the tower foundation for cultivation and regeneration of vegetation will be done.
- If quarry site found to be vulnerable for landslide/erosion of bank, bank protection work need to be carried out by contractor.
- Erection of tower and stringing of line will be carried out in dry season if possible.

b. Operation Phase

Proper inspection and maintenance of foundation areas will be done to reduce the risk of soil erosion. The annual costs for such site verifications will be borne by the project developer and thus included in operation and maintenance budget. If the amount of this title is included in the main project cost, this amount can be reduced from the cost of environmental mitigation measures. No mitigation measures on the watershed and natural drainage is needed during the operation and maintenance period.



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8.1.2 Topography, Land Use and Land Take

a. Construction Phase

- The natural slope disturbances will be minimized during the construction of foundation.
- Erection of foundation in the unstable land and/or in steep slopes will be avoided.
- Proper landscaping will be done at each tower site.
- The stability of the tower locations will be examined before excavation and special foundation design will be selected for the susceptible locations.
- Re-vegetation and slope maintenance will be carried out in the disturbed areas to avoid erosion. Bio-engineering with combination of retaining structures will be done if necessary.

The permanent land use changes due to foundation construction cannot be mitigated. However, the land under the RoW will not be restricted for the current use except that the construction of any structure will be prohibited. The construction area will be reinstated to the present condition after the construction is over. Land for temporary facilities will be rehabilitated to original status to minimize the land use impacts. The camp sites are proposed mostly in barren land to minimize the impact on land use pattern of cultivated land. The private land required for the project will be compensated through rental in agreement with the land and property owners.

b. Operation Phase

The impact on the land use changes under the RoW and permanent landtake for the tower will remain forever. The restriction for the erection of any type of structure of land under the RoW and plantation of trees of tall species cannot be mitigated. However, cultivation will be allowed. All temporary land acquired will be converted to its original use or agreed new uses towards the end of the construction period and handed over to their owners.

8.1.3 Air Quality

a. Construction Phase

The project will not lead to a significant deterioration in air quality except in much localized instances and localized areas during the construction phase. Vehicle utilized for construction will be complied with GoN mass emissions standards. Regular checkup; up keeping and maintenance of the equipment will be carried out as per the Manufacturer's Specifications to meet the emission standards. Proper maintenance of all vehicles and construction machinery will be done regularly. Helmets and air mask will be provided to labor force working in areas susceptible to dust pollution. The working hours will be limited near the settlements and temporary relocation of particularly vulnerable people (old/sick, etc.) to acceptable locations will be done if required.

b. Operation Phase

There is no significant impact on air quality during the operation and maintenance period.

8.1.4 Noise and Vibrations

a. Construction Phase

No construction work will be carried out during the night time so as to minimize the noise and vibrations. Ear mufflers will be provided to labor force working in the areas susceptible to noise pollution.

b. Operation Phase: The impacts due to corona effect cannot be mitigated.

8.1.5 Water Quality

a. Construction Phase

The waste generated from the mixing concrete will be disposed in pits and filled with soil. Such pits will be made in barren land at approximately 500m distance from the water bodies. Dykes



are proposed around the storage tanks to avoid water pollution. Toilets will be provided to the workforce. Care will be taken to locate the temporary construction worker sheds away from the water bodies. Garbage and solid wastes generated by the workforce will be dumped safely away from water bodies. All waste oils and chemicals will be collected and stored in suitable storage tanks and disposed through incineration.

b. Operation Phase

Since the impact on water quality during the operation period is expected to be minimal, no mitigation measure is proposed.

8.1.6 Waste and Spoil Disposal

a. Construction Phase

The domestic waste will primarily consist of organic food waste because this is easily biodegradable and non-hazardous. It will be managed by burying in pits at reasonable distance from water bodies and subsequently covering with soil.

Waste generated from construction activities are usually inert material which are non-biodegradable e.g. empty cement bags and containers, rejected material, plastic, wooden planks. These waste materials will be stored out and kept separated instead of throwing haphazardly elsewhere. Some of these items (cement bag, plastic drum etc.) can be sold in the markets in order to be re-used or recycled. The contractor will be responsible for the establishment of the waste management system at the construction and camp areas.

b. Operation Phase

There is no impacts on waste and spoil disposal on operation phase, hence no mitigation measures is proposed.

8.1.7 Storage of Construction material

a. Construction Phase

The area for the substation will be used as the storage of construction materials in order to mitigate the land degradation. The locations for the temporary camps will be selected at degraded or the lower value lands. The area proposed for storage will be taken on lease at the prevailing market price based on the production loss. The temporary yards will be fenced properly. Cement will be stored in private storage facilities taken on rent. The other materials will be stored properly at the designated storage site. The detail of storage of construction material has been presented in section 6.1.8.

b. Operation Phase

There is no impacts on storage of construction material on operation phase, hence no mitigation measures is proposed.

8.1.8 Crossing of Other Utilities and Interference

a. Construction Phase

There is no impacts on crossing of other utilities and interference on construction phase, hence no mitigation measures is proposed.

b. Operation Phase

All crossings of existing transmission and distribution lines will be designed with standard safe vertical and horizontal clearances for 220kV lines. Design clearances for communication lines will be maintained. For this, the standards referred by the Electricity Regulation 1993 (Rule 48, 49, 50 and 55) shall be followed.



8.1.9 Air Traffic

a. Construction Phase

There is no impacts on air traffic on construction phase, hence no mitigation is proposed.

b. Operation Phase

As per the recommendation of CAAN, pylon should be colored red and white painted below the air route. Similarly, obstacle light should be placed at the top of pylon and in between adjacent pylon cable at top should be placed with marker ball of alternate color of red and white. The maximum height of tower should be limited to 40m from ground except pylon from AP 1 to AP 4 height should be limited to 35m. The recommendation letter is attached in Appendix A.

8.1.10 Summary of Mitigation Cost for Physical Environment

A total of NRs. 5,000,000/- is estimated for the mitigation works in physical environment. The detail of cost of physical environment along the different headings has been discussed below:

a. River Training Structures:

As a river training structure, bank protection for tower near Seti River is proposed. AP 43 and Belbas substation need the protection work. Gabion work and flood retaining structure at these sites are proposed.

b. Retaining Structure:

Some of the APs which are located below or above the existing rural road are vulnerable to landslide due to excavation of tower foundation. These APs are AP 5, AP 30, AP 35 and AP 40. Retaining structure of gabion and concrete whichever is best suited shall be constructed for the stability of land above and below the rural road.

Table 8-1: Detail of Cost Break Down of Physical Environment

S.N	Description	Cost (NRs)
1	River Training Structures	4,000,000
2	Retaining Structure	1,000,000
Total		5,000,000

8.2 Biological Environment

8.2.1 Mitigation Measures

The mitigation measures that will be adopted for the impact on floral and faunal resources during the project construction and operation phases are as follows:

8.2.1.1 Minimizing the Forest Clearance

a. Construction Phase

Selective felling of trees in the RoW of the TL will be done to minimize the forest loss. Similarly, the trees in the gully and valley will be avoided from felling as far as possible. In such area, it is proposed that the minimum forest clearance that are needed for the laying and stringing of conductor will be maintained and remaining trees of the RoW will be kept intact. This will not only minimize the forest loss but also indirectly contribute to conserve the biodiversity of the project area. RoW vegetation clearance will be carried out manually. As far as practicable, towers will be placed in ridges to avoid the forest clearance to the extent possible.

Trees that are likely to be removed will be counted, marked and harvested with the proper forest techniques by involving technical staffs from the respective DFOs. For the RoW clearance in CF, the preference will be given to the users of concerned CFUGs rather than outside labors which will help for the conservation of forestland indirectly and will provide work opportunity to locals as well. The project proponent will adopt methodology to minimize loss of



saplings during construction to the extent possible. Wood and other forest products extracted as part of the site clearance from the forest will be utilized as per the Forestry Regulations, 1995. The project proponent will prohibit project workers for the collection of NTFPs. Informative and warning sign at each construction sites located in and around the forest area will also be placed.

b. Operation Phase

All type of growing trees within the RoW will be trimmed regularly in every alternate year. The project will use Electricity Regulation, 1993 for the minimum clearance required for the TL, which is 30 meter (15 meter on either side of the centre line) for 220kV capacity.

8.2.1.2 Compensatory Plantation

a. Construction Phase

As a compensatory measure for the loss of trees due to the site clearance, plantation in 1:25 ratio will be carried out in the area provided by the concerned CFUGs and DFOs, as per the new provision made in Working Procedure for the Use of National Forest Land for National Priority Project, 2074 (राष्ट्रिय प्राथमिकता प्राप्त योजनाको लागि राष्ट्रिय वन क्षेत्र प्रयोग गर्ने सम्बन्धी कार्यविधि, २०७४) against the earlier provision of plantation in the ratio of 1:2.

The compensatory plantation will be conducted for 14,160 trees (pole and tree sized) which are estimated to be fallen down from the project affected CFs during project construction. A total of 354,000 seedlings (@ 25 seedlings per tree cut down) of different species of plants will be planted. In addition, the plantation of 35,832 number of seedlings will be done in 22.3947ha of government forest and CF area (at the standard ratio of 1600 seedlings per ha (followed from MoFSC guideline) which is equivalent to the total CF area occupied by the project components. The total government forest and CF area having vegetation that need to be clear felled along the project alignment is estimated to be 22.3947ha. Therefore, in totality 389,832 number of seedlings will be planted as a compensatory plantation. The estimated cost for compensatory plantation is kept in Table 8-5. Due attention will be paid to plant local species suitable to the area, species cut down by the project as far as possible, species preferred by the local communities and species which contribute to improvement of habitats for available wildlife. NEA will take care of planted site for the period of 5 years and handover to the respective CFUG and DFOs. Also, land area equal to 0.540ha will be bought by the project and handled to respective DFOs in replacement to the permanently acquired forest land for construction of tower pads. The estimated cost for buying 0.540ha land area is kept in Table 8-5.

The sites for compensatory plantation will be finalized after discussion with the members of concerned CFUGs and officials of respective DFOs. The proponent will request to DFOs and CFUGs to locate the land for plantation. Plantation designs for each specific sites identified will be developed after consultation and interaction with the concerned stakeholders. The initial discussion made with DFOs and concerned CFUGs reveals that the plantation area is available in the affected CFs and its vicinity for compensatory plantation. For the purpose of plantation work, the seedlings required may be purchased from the plant nurseries / DFO or there may need to establish a nursery in the project site. If it is determined to establish a nursery, the appropriate location for the nursery will be finalized in consultation with the concerned stakeholders. There shall also be the provision of replacement plantation after one year of tree plantation based on the mortality rate of seedlings.

b. Operation Phase

As per the Working Procedure for the Use of National Forest Land for National Priority Project, 2074, the plantation site shall be managed by the proponent for five years or required cost for such management must be paid to DFOs. In order to comply with this requirement, the proponent will either manage the plantation site for five years or the estimated cost for the



entire management work will be provided to the respective DFOs, and/or concerned forest user groups.

8.2.1.3 Harvesting Costs

a. Construction Phase

The cost of harvesting, logging and transporting of the trees and other forest products in CFs will be provided as per the district norms to the concerned agency following the provision made in Article 65 of Forest Regulations, 2051. The harvesting costs for each CF will be provided by the project proponent. The compensation cost for the harvesting, logging and transportation of forest is part of project construction work and will be included in construction cost hence it is not estimated separately in this IEE Report.

b. Operation Phase

During operation phase, there will not be the issue of harvesting of trees. However, the growing trees within RoW will be trimmed regularly in every alternate year at the cost of the proponent.

8.2.1.4 Compensation Cost for Private Trees

a. Construction Phase

The trees removed from the private land will be compensated as per prevailing rates. Due consultation will be made with the concerned DFOs and stakeholders while determining the rate. The estimated cost for compensation of private tree is kept in Table 8-5.

b. Operation Phase: This issue will not exist. Hence no mitigation measure will be adopted.

8.2.1.5 Supply of Fuel to Workers

a. Construction Phase

If practically feasible, construction workers will be prevented from the use of fuel wood for cooking their food items. The project proponent will provide kerosene/LPG to the extent possible to project workers staying at temporary/permanent labour camps to minimize forest loss in order to meet their fuel wood demand. If the use of alternative fuel is not possible, haphazard collection of fuel wood from the nearby forest will be controlled in coordination with the Forest User Groups, Area Forest Office and DFOs.

b. Operation Phase: There will not be the issue of fuel wood management to workers.

8.2.1.6 Habitat Loss/Change of Wild Animals and Birds

a. Construction Phase

The impact of forest clearance on habitat loss/change is a permanent phenomenon. However, the compensatory plantation of trees and awareness for forest management and wildlife conservation is considered to help for minimizing the impact to some extent. The clearing of trees will be done manually causing less impact on adjoining vegetation. As far as possible construction work will be labour based. The project proponent will be responsible to avoid unnecessary machinery disturbances and lighting.

b. Operation Phase

During operation phase, no mitigation measures will be adopted regarding habitat loss/change of wild animals and birds. However, the growth of planted tree species is expected to reap some benefit to the available species of animals and birds.

8.2.1.7 Restriction on Hunting and Poaching

a. Construction Phase

The project workers will strictly be prevented from hunting and poaching and any other kind of illegal activities related to hunting and poaching. The construction work within CF area will be



coordinated through DFO and CFUGs. Informative and warning sign will be placed at relevant construction sites. The contractor who is liable to control his labor in this regard will be instructed strictly for application of specification regarding hunting and poaching control.

b. Operation Phase: During operation phase, no mitigation measures will be adopted.

8.2.1.8 Avian Hazards

Measures to minimize bird injury and death associated with the TL will be considered in line design. Markers such as color balls will be attached to conductors to improve line visibility for bird wherever it is necessary and technically feasible.

8.2.2 Enhancement Measures

In addition to the above mentioned mitigation measures, following biological enhancement measures will be adopted in order to provide project benefit to the affected CFUGs and their members.

8.2.2.1 Awareness on Forest Management and Wildlife Conservation

The project proponent will implement awareness program to aware local people and member of forest users group of the project area about the forest management, techniques and methods of forest management, forest conservation, tree plantation, economic importance of forest, its role in rural society and other relevant forest management matters.

Similarly, awareness for wildlife conservation will be implemented to minimize the adverse impacts on local wild fauna. This will include the importance of wildlife conservation, existing rules and regulation with respect to wildlife, benefits associated with the wildlife conservation and other relevant topics. The awareness program will be provided to the selected executive members and users of CFUG. The awareness program will be provided to the selected executive members and users of CFUGs. Such programs will be implemented at 4 different places of the PAA (two in each PAD). The program will be implemented in close coordination with DFOs, local NGOs, CBOs and other concerned agencies. Organization of lectures, field visits, documentary shows, distribution of informative materials will be the methods to be utilized for awareness program.

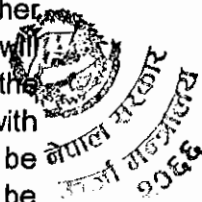
Table 8-2: Cost for Awareness on Forest Management and Wildlife Conservation

S. N	Description	Unit	Day	Quantity	Rate (NRs)	Amount (NRs)
1	Participant allowances (including lunch)	Day	4	25	700	70,000
2	Expert	Class	4	4	2500	40,000
3	Materials and logistics	LS				140,000
Total Cost for conducting one program						250,000
Grand Total for conducting 4 program						1,000,000

8.2.2.2 Non Timber Forest Products (NTFPs)

Training for cultivation of NTFPs especially medicinal aromatic plants and other herbs and/or agro forestry will be given to selected members and users of affected CFUGs. Appropriate agro-forestry models using suitable NTFP species will be developed for different land types in consultation with the concerned communities.

The members from affected CFUGs will be encouraged for the plantation of NTFPs and other vegetation having economic values along the RoW of the line falling under CFs. This will provide them with the opportunities of long term income source as well as maintaining the vegetation cover under RoW. The species to be planted will be selected in consultation with concerned DFOs and project affected CFUGs. Three such training programmes will be conducted in the PAA (1 in Tanahun and 2 in Kaski). The detail of training program will be developed with due consideration of the needs of the local communities in consultation with



DFOs. The modalities of the training will be delivery of lecture by experts, visual shows, posters, reading material and discussion. The communities after receiving the training will be aware about various NTFPs, their cultivation practices, harvesting techniques, storage method, processing and marketing.

Table 8-3: Estimated Cost for NTFPs Training

S. N	Description	Unit	Day	Quantity	Rate (NRs)	Total Amount (NRs)
1	Participant allowances (including lunch)	Day	7	25	700	1,22,500
2	Training Expert	Class	7	4	2500	70,000
3	Training material and logistics	LS				2,45,000
Total Cost for conducting one program						4,37,500
Grand Total for conducting 3 training program						1,312,500

8.2.2.3 Awareness Program for DFO/Area Forest Office Staffs

To provide general information about the project, the type of mitigation and enhancement measures on biological environment, one day awareness program will be given to staffs of DFOs and Area Forest Office staffs of both districts (1 in Tanahun and 1 in Kaski). The detail of orientation program will be developed with due consideration of the needs in consultation with DFOs and area forest offices. The modalities of the training will be delivery of lecture by experts, visual shows, posters, reading material and discussion.

Table 8-4: Cost for Awareness Program

S. N.	Description	Unit	Day	Quantity	Rate (NRs)	Total Amount (NRs)
1	Participants allowances (including lunch)	Day	1	25	700	17,500
2	Expert	Class	1	4	2500	10,000
3	Material and logistics	LS				47,500
Total Cost for conducting one program						75,000
Grand Total for conducting 2 program						150,000

8.2.3 Biological Mitigation and Enhancement Cost

The total biological mitigation and enhancement cost (including land cost) is estimated to be NRs. 62,512,340 (Mitigation cost NRs 60,049,840 and Enhancement cost NRs 2,462,500) and excluding land cost is NRs. 60,442,340.

Table 8-5: Mitigation Measures Cost

S. N	Mitigation Program	Unit/Rate	Total Amount (NRs)
1	Compensatory plantation of 389,832 seedlings (including seedling purchase/preparation, site preparation, pitting, transplanting, composting, mulching and replacement plantation based on mortality of seedlings).	120	46,779,840
2	Management/ take care of planted site for 5 years	Rs 30,000/month	1,800,000
3	Support for fencing at specific planted sites	LS	1,200,000
4	Compensation cost for the loss of private trees (estimated no.=3200)	2500	8,000,000
5	Placement of informative and warning signs regarding forest management and wildlife conservation	LS	200,000
6	Cost of buying land in place of permanently acquired tower pad area of CF (0.540ha) for handing to DoF	LS	2,070,000
Sub Total-1 (Including land cost)			60,049,840
Sub Total-1 (Excluding land cost)			57,979,840



Table 8-6: Enhancement Measures Cost

S. N.	Enhancement Program	Refer	Total Amount (NRs)
1	Awareness program on Forest Management and Wildlife Conservation	Table 8-2	1,000,000
2	Awareness/Training program on NTFPs	Table 8-3	1,312,500
3	Awareness Program for DFO/Area Forest Office Staffs	Table 8-4	150,000
Sub-total-2			2,462,500
Total (Including land cost)			62,512,340
Total (Excluding land cost)			60,442,340

The title of the training programs as mentioned above could be changed as per the demand from DFOs and CFUGs. The training will be provided to the selected users and members of the affected CFUGs. The number of training programs to be conducted will be determined depending upon the number of participants, demand from communities and availability of resource persons. Technical resource persons and experts shall be deployed for the training programs from DFOs and other relevant offices.

8.3 Socio-economic and Cultural Environment

Mitigation as well as enhancement measures for all identified significant impacts on socio-economic and cultural environment have been considered in this section of IEE report. In the same way, corporate responsibility of the project for different social sector has been identified and discussed briefly here.

8.3.1 Mitigation Measures

Each of the identified impacts during construction as well as operation phase has been evaluated in detail and cost effective mitigation measures are suggested to minimize the impacts. The cost of mitigation measures is calculated and mentioned in different titles below.

8.3.1.1 Acquisition of Land and Structure

a. Construction Phase

i) Land

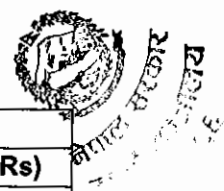
• Compensation for Permanently Acquired Land

The proponent will provide appropriate compensation to all of the PAFs. The compensation rate will be fixed by Compensation Determination Committee (CDC). Based on the discussions with the local people, cash compensation will be provided for affected land. According to the GoN laws and regulations, it is mandatory to provide cash compensation for the acquired land and property. Compensations paid and settled immediately after acquisition are administratively much simpler and economically cheaper than those that last over a long period. Direct cash compensation is appropriate for HHs that lose only a small portion of their land holdings, or to HHs that have other forms of income generation schemes they wish to invest in.

Project will acquire and utilize 106.6042ha of private land. Out of total private land, 8.3325ha is permanent land (land required for APs, STs, substation, switching station, camp and storage), 97.0221ha for RoW and 1.25ha for mobile camp. Land will be acquired to Land Acquisition Act 2034. Total land acquisition cost is estimated to be NRs. 138,500,950.

Table 8-7: Estimated Cost for Land Acquisition

S. N.	Project Component	Description		
		Area (ha)	Rate (NRs/ha)	Amount (NRs)
1.	APs and Suspension Tower	1.7325	6860000	11884950
2.	Substation and switching station	6.1	11760000	71736000
3.	Camp and storage	0.5	109760000	54880000
Total		2.9276	-	138,500,950



The land price varies from place to place, parcel to parcel and according to proximity of road and market centers. The average land price in the area is considered for the estimate of compensation. Landless (tenants), Guthi holders etc. affected by the project will also be compensated as per the recommendation of the CDC.

- **Compensation for Restricted Land (RoW)**

The land used for TL (RoW) is considered as permanently utilized land. This land is also known as restricted land. The total of 97.02221ha private land falls under the RoW. The total amount for the land requirement of 97.0221ha of private land is NRs. 665571606 (NRs. 6,860,000/ha). As per NEA practice, project will provide only 10% of the total land value for land of RoW. Therefore compensation cost for RoW land is NRs. 66,557,161. However, in recent practice, project will provide maximum amount to the land in accordance with their use and local market price. Total compensation amount for land to be acquired and RoW is estimated NRs.205,058,111.

- ii) **Compensation for Private Structures**

Based on the discussions with the local people, cash compensation will be provided for private structures. Compensation will be provided for 22 structures (12 houses, 9 cowsheds and one toilet) to the PAFs. Compensation cost for structures has been calculated classifying into two categories i.e. cost for plinth area of the structures and construction cost of the structures. The total compensation cost for the structures is NRs. 9,783,150 (Table 8-8).

- **Compensation Cost for Structures based on Plinth Area**

Compensation on the basis of plinth area will be provided for three houses. The total compensation for three structures i.e. 5,425sq. ft. is estimated to be NRs. 2,006,150.

- **Compensation of Structures based on Construction Cost**

The total compensation of 22 structures based on construction cost is estimated to be NRs. 7,777,000.



Table 8-8: Compensation Cost for Structure Loss

Type of structure	Project component	Name of Owner	Plinth Area (sq. ft.)	No. of storey	Total area (sq.ft.)	Cost for land occupied by structure based on plinth area		Construction Cost of Structure based on total area		Total Compensation Cost (NRs)
						Rate (NRs/ sq.ft.)	Amount (NRs)	Rate (NRs./sq.ft.)	Amount (NRs)	
1. House	AP4-AP5	Jit Bahadur Gurung	247	1	247	400	98800	900	222300	321100
	AP5-AP6	Khem Raj Bajgai	320	2	640	400	128000	900	576000	704000
	AP13-AP14	Hari Prasad Tiwari	286	1	286	300	85800	900	257400	343200
	AP15-AP16	Raj Kumar Subedi	280	2	560	300	84000	1300	728000	812000
	AP23-AP24	Bishnu Gurung	374	2	748	400	149600	1300	972400	1122000
	AP25-AP26	Som Bahadur Nepali	308	2	616	400	123200	900	554400	677600
	AP26-AP27	Kopila Dawadi	238	1	238	400	95200	1300	309400	404600
	AP26-AP27	Krishna Bdr. Thapamagar	352	2	704	400	140800	900	633600	774400
	AP32-AP33	Hari Maya Wagle	345	2	690	350	120750	900	621000	741750
	AP38-AP39	Iman Singh Ale	294	1	294	350	102900	900	264600	367500
	AP40-AP41	Kesh Bahadur Saru	330	1	330	350	115500	900	297000	412500
	AP29A-AP30	Bir Bahadur Gurung	342	2	684	400	136800	900	615600	752400
	Total(1)						1381350		6051700	7433050
2. Cowshed	AP6-AP7	Nrayan Pd Lamichhane	208	2	416	300	62400	900	374400	436800
	AP23-AP24	Bishnu Gurung	242	1	242	400	96800	900	217800	314600
	AP25-AP26	Purnima Nepali	228	1	228	400	91200	900	205200	296400
	AP32-AP33	Hari Maya Wagle	372	1	372	350	130200	900	334800	465000
	AP40-AP41	Kesh Bahadur Saru	143	1	143	350	50050	900	128700	178750
	AP40-AP41	Durga Bahadur Thapa	135	1	135	350	47250	900	121500	168750
	AP41-AP42	Khim Bahadur Ale	110	1	110	350	38500	900	99000	137500
	Substation	Gam Bahadur Ale	121	1	121	400	48400	900	108900	157300
3. Toilet	Substation	Suk Bd Rana	110	1	110	400	44000	900	99000	143000
	Total (2)						608800		1689300	2298100
	AP26-AP27	Krishna Bd Thapamagar	40	1	40	400	16000	900	36000	52000
Total (1+2+3)					7954		2,006,150		7,777,000	9,783,150

(Note: construction cost for the structures is calculated on the basis of the consultation with public in different project affected areas.)

Source: HH Survey, 2016



iii) Compensation for Commercial Structure

Structures of Kahare Agriculture and Livestock Cooperative Limited located between AP13-AP15 will be relocated and compensated. The amount of compensation is estimated NRs. 800,000.

iv) Other Structures

Water tanks likely to be affected by AP5 and AP38 will be avoided and shifted.

8.3.1.2 Compensation for Loss of Standing Crops**a. Construction Phase****• Production Loss in Permanently Acquired Land**

The total production loss of different crops of the project affected HHs is calculated as 33.63MT and the total compensation for the loss is estimated to be NRs. 977,400. The value of total loss of crops is estimated based on their yield, production, and local market rate. The crop wise value with area is shown in Table 8-9.

Table 8-9: Value of Total Loss of Agricultural Production due to Land Acquisition

S.N.	Crop type	Production Loss (MT)	Productivity (MT/ha)	Rate/MT	Amount(NRs)
1	Paddy	15.75	3.25	28000	441,000
2	Wheat	3.84	2.11	30000	115,200
3	Maize	11.98	2.28	30000	359,400
4	Millet	2.06	1.09	30000	61,800
Total		33.63			977,400

Source: HHs Survey, 2016

• Production Loss in Permanently Utilized Land (RoW)

The total loss of cereal crops produced in land restricted area is estimated as 164.91MT (Paddy: 58.74MT, Wheat: 12.58MT, Maize: 78.25MT and Millet: 15.34MT) which value is estimated to be NRs. 4,829,820 for one year. The crop wise area allocation, production and value is shown in Table 8-10.

Table 8-10: Value of Total Loss of Agriculture Production due to Land Utilization (RoW)

S.N.	Crop type	Actual production loss area (ha)	Production Loss (MT)	Productivity (MT/ha)	Rate/MT	Amount (NRs)
1	Paddy	18.07	58.74	3.25	28000	1,644,720
2	Wheat	5.96	12.58	2.11	30000	377,400
3	Maize	34.32	78.25	2.28	30000	2,347,500
4	Millet	14.07	15.34	1.09	30000	460,200
Total			164.91			4,829,820

Source: HH Survey, 2016

Total compensation for crop loss is estimated NRs. 5,807,220.

8.3.1.3 Health, Water Supply and Sanitation**a. Construction Phase****• Health and Sanitation**

The project proponent will keep the project area clean and hygienic to ensure the project activities will not cause the spread of communicable diseases. The labor camp will be provided with simple dry pit toilet constructed on hard ground and far from water sources. Toilets will be made in temporary camps First aid kits will be maintained for preliminary treatment in emergencies. The domestic solid waste generated in the PAA will be either buried in designed landfill areas or converted in to compost. A joint awareness program on health and sanitation will be launched in association with the existing NGOs and other local communities during the construction phase. Health check-up of workers and documentation of health status will be



made periodically. Priority will be given to the local people in project works to minimize the impacts on health and sanitation. The project must ensure adequate safety gears for workers (Personal Protective Equipment, accommodation, First Aid box, etc.). It must arrange the training for contractors and workers. It should provide temporary security fencing surrounding the construction site and safety signboard at all sites in Nepali languages should be put.

- **Drinking Water**

To minimize the impact on water supply at least one drinking water supply system will be installed at each camp site to cope the demand of the drinking water supply for the labors and technicians. The water supply of the project area will be strengthened by installation of new pipe lines, keeping taps at a regular interval, and by improving storage of water at the source.

b. **Operation Phase:** No mitigation measures are required during this phase.

8.3.1.4 Occupational Hazards

a. Construction Phase

The construction area will be cleared up and all the necessary precaution and warning signs will be placed at construction site. This area will be restricted for the entry of unauthorized people. The project proponent will provide safety helmet, eye glass, safety boot, safety belt, fire-fighting accessories, caution signals and other safety equipment as required at particular site and work area. Safety training will be implemented and any loss of life or injury will also be compensated as per prevailing rules. The safety training for the project workers will be conducted prior to the construction work. Community safety awareness program about the TL and potential risks associated with TL construction will also be implemented. The project workers involved in construction work will also be trained for health and occupational measures. Total cost for such trainings will be NRs. 500,000.

b. Operation Phase

Safety equipment required for the operation of the TL will be provided. During the maintenance, the construction area will be restricted for entry of unauthorized person to avoid disturbances and risk. Safety helmet and glass, safety boot, ear plugs, good electric light system, good earthing devices, fire-fighting accessories, caution signals, safety belt and other safety equipment as required at particular site and working area will be provided. The RoW of close settlements shall be strictly maintained to minimize the likely risks of conductor breakage, induced voltages, etc. Appropriate protection system and equipment will be installed at the substation to ensure the automatic isolation of the line in case of abnormal conditions.

8.3.1.5 House, Settlements and Social Infrastructures

a. **Construction Phase:** No mitigation measures are required during this phase.

b. Operation Phase

About 31 APs are proposed to be constructed within the range of 30m to 300m from the existing house, settlements and social infrastructures (Appendix D). Protection measures will be applied in around the tower pads and construction area after the consultation with local people/stakeholders. Fencing, sign and other appropriate tools of public awareness will be adopted to reduce the likely impact on people, their property and public infrastructures. Furthermore, following points will be considered: Design criteria; RoW maintenance and Fencing of tower area in critical location.



8.3.1.6 Crossing of Power Cables, Communication lines, Foot Trails, Roads

a. **Construction Phase:** No mitigation measures are required during this phase.

b. Operation Phase

The proposed TL crosses inter-connected gravel road /earthen road /foot trails number of times (Table 5-4). Similarly, the alignment crosses distribution lines. The TL also crosses irrigation canals and communication lines. Hence, there will be impact due to crossing over of power cables, communication lines, foot trails and road/highways on local infrastructures and facilities.

As mitigation measures, following points will be considered:

- Maintenance of ground clearance;
- Avoidance of infrastructures as far as possible;
- Placement of signboard where necessary
- Public awareness program at critical location.

8.3.1.7 Communal Resources

a. **Construction Phase:** No mitigation measures shall be required during this phase.

b. **Operation Phase:** No mitigation measures are required during this phase.

8.3.1.8 Impact on PAFs due to Alteration of Land and Property Value**a. Construction Phase**

Land fragmentation will be minimized as far as possible. Remaining portion of land that will not be significant for agriculture purpose will be acquired for tower foundation. Compensation for permanently acquired and temporarily used lands will be provided. The temporarily used land will be returned to respective land owner as in the previous condition.

b. **Operation Phase:** No mitigation measures are required.

8.3.1.9 Impact due to Restriction of Future Land use Development close to Settlement**a. Construction Phase**

Coordination with the project affected HHs, RMs/DCC/municipality/MC authority and concern stakeholders will be done during the construction phase. Land Use Policy-2072 will be followed while designing the project to the extent possible.

b. **Operation Phase:** No mitigation measures are required.

8.3.1.10 Electric and Magnetic Field (EMF) Effect**a. Construction Phase**

No mitigation measure is required during the construction phase since the TL will not be charged until the completion of the stringing.

b. Operation Phase

In order to reduce the impact of the EMF effect, phase split in either of the circuit will be considered during the Detail Design Stage. Market centers are far from the TL, will itself reduce the impact of EMF to certain extent. However, for the safeguard of the local people, an awareness program about the concept EMF and risk of neglecting maintenance of RoW will be conducted.

8.3.1.11 Gender and Vulnerable Group**a. Construction Phase**

The project will ensure not to discriminate the local people based on their gender, caste, color and place of origin. Similarly, priority for jobs will be given to the vulnerable group as per their ability and skills and willingness to work in the project area. Child labor will be prohibited in the project area. The project proponent will consult and assist the local NGO working for the



welfare of the women and children to monitor and control. Child Labor Act, 2049 will be effectively implemented during construction period.

b. Operation Phase: No mitigation measures required during operation phase.

8.3.1.12 Economic Activities

a. Construction Phase

To minimize the adverse impacts on local economy and enhance the living standards of the affected HHs, following measures will be implemented:

- Compensation for the hindrance due to use of land for the TL has been done through private negotiation route. Replacement value has been added to the average value of the land to bring it closer to or at par with the prevailing market rate. The disturbance allowances will be provided to the affected HHs;
- To minimize the impacts of loss of agricultural products due to the land acquisition, and any effect on the occupation will be compensated through appropriate agricultural extension program, livelihood skill training programs, etc.
- Maximum job opportunities will be provided to the local people in prudential order and assistance to local communities into the planning through coordination with district level and local government office of the respective district.

b. Operation Phase: No mitigation measures required during operation phase.

8.3.1.13 Religious, Historical and Archeological Sites

a. Construction Phase

None of religious, historical and archeological structures are affected and need to be relocated due to the proposed pylon and TL construction. However, some temples are found within the distance of 300m from TL.

b. Operation Phase: No mitigation measures are required.

8.3.1.14 Infrastructure and Service Facility

a. Construction Phase

To minimize the impacts on the existing institutions and service facilities, following measures will be implemented:

- Separate communication facilities other than the existing facilities through extension
- Provision of health and support program;
- Provision of additional support police force (if required) through coordination with the District Administration Office, and District Police Office, etc.

b. Operation Phase: No mitigation measures are required during this phase.

8.3.1.15 Social and Cultural Practice

a. Construction Phase

The impacts on social structures and practices in the project area are related mostly with the influx of construction workforce and their number. Besides, to minimize the impacts on local communities, following code of conduct will be enforced to the outside construction workers:

- The labor force will be instructed about the conducts and manners to be maintained while working along the TL. No discrimination in terms of salary or nature of job among local and migrant workers will be allowed.
- Respecting the rights, properties and practices of local people;
- Prohibiting all the outside labors to live outside construction camps.

- Prohibiting the use of alcohol in the project site, camp and nearby villages.
- No child labour or forced labour would be engaged by the project proponent.
- The project proponent will demonstrate its concerns about health and safety of the workers as well as the community through awareness programmes and grievance redressed.
- The workers will be briefed about the health risk of communicable diseases due to unhygienic environment as well as sexually transmitted diseases.
- Management of the short term influx of labors during construction and stringing phases will include communication about technical aspect of construction and operation, and to allay fears about any apprehensions of perceived accidents during operational phase.

b. Operation Phase

Employment in the substations and RoW maintenance will be given to the local people in accordance with their qualification to reduce tension and potential conflicts with local residents.

8.3.1.16 Law and Order

• Construction Phase

During the construction of the TL, labor from different places with different religions and faiths with their own norms and values will be employed by the project contractor and there may conflict of interest between locals and the outsiders affecting law and order situation in the project area. Local employment, wage/ labor rate, working hours, use of local resources by the project workers, etc. are the major factors that may create conflict in the project area which may pose threat to law and order situation. The proponent will implement a strict code of conduct for the workforces. In case any worker is found as a drunkard or soliciting prostitution and gambling etc. will be penalized and terminated too. The existing facilities of GoN from affected district will be used to maintain the law and order situation as when required basis. The proposed awareness program will also minimize this impact to some extent.

- **Operation Phase:** No mitigation measures are required at this phase.

8.3.1.17 Aesthetic Value

a. Construction Phase: No mitigation is required at this phase.

b. Operation Phase

The significant impact of TL and towers on aesthetic value cannot be mitigated completely. The stringing of the 220kV TL will cause minor visual change to the existing landscape and scenery.

8.3.1.18 Resettlement and Rehabilitation Plan (RRP)

The objective of this plan is to ensure that the effects of acquiring land and property and its impact on the livelihood of the affected parties and individuals will be addressed adequately and in time prior to the start of the project construction in an amicable and conducive environment with mutual consensus and agreement. Any grievances of the affected parties will be handled to the satisfaction of the affected parties or individuals through proper information sharing

a. Relocation of House

Nine HHs will be relocated as these HHs do not have any other houses. They lose their place of residence and are categorized as SPAFs. Kahare Agriculture and Livestock Co-operative Limited will lose business.



b. Applicable Policy and Legislation

Land Acquisition Act 2034 (1977) will be the main legislative system for land and other physical asset acquisition. The procedure defined in the Act will be followed for the acquisition; Compensation Determination Committee (CDC) will determine the compensation rates of each unit at replacement cost. Project proponent is the responsible for the implementation of RRP.

c. Entitlement Framework

The entitlement framework accordingly specifies compensation and /or rehabilitation measures for two units of entitlement individuals including affected individuals and their HHs, and groups. Loss of private assets will be valued and compensated based on entitlement policy

d. Government Property

Government infrastructures and facilities affected by the project will be repaired or replaced in consultation with the relevant department authorities. Government forest land will be acquired by getting approval from MoFSC.

e. Displacement Allowance

In addition to the compensation for asset losses, HHs who are losing houses will be entitled for the displacement allowances. HHs, which required to be relocated, will receive a housing displacement allowance for six month. Displacement allowance for 9HHs who will lose their place of residence is estimated to be NRs. 2,700,000 (NRs. 50,000/month for 6 months). Kahare Agriculture and Livestock Co-operative Limited will lose its commercial structures so NRs. 50,000 for 3 months will be provided for displacement allowance. Total displacement allowance is estimated NRs. 2,850,000. Titleholders, tenants in own accommodation and squatters will be entitled to this allowance, to be paid at the time of compensation payment.

f. Transportation Allowance

Eighteen HHs of PAFs who will get transportation allowance. A total of NRs. 540,000 (@ NRs 30,000 per HH) has been allocated as transportation allowances. Hence, total displacement and transportation allowance is calculated NRs 3,390,000.

Table 8-11: Resettlement and Rehabilitation Plan

S. N.	Actions	Timing of Action	Responsibility
1	Re verification of the owners of the land to be acquired permanently including their affected land areas, land plot numbers and landownership.	Pre-construction (6 months before construction)	Project / LARU
2	Identification of the HH or parties traditionally using land without land certificates in case of acquisition /lease of such land	Pre-construction (6 months before construction)	Project/ LARU
3	Verify and publish the list of land owners affected by the project	Pre-construction (6 months before construction)	Project/CDC
4	Meeting of CDC to discuss on the land acquisition and compensation issues	Pre-construction	Project/CDC
5	Compensation Determination Committee decides the rates of land to be acquired	Pre-construction	Project/CDC
6	Payment of compensation to PAFs	Pre-construction at least one month before mobilization of Contractor to construction site	Project/ LARU
7	Implementation of resettlement and rehabilitation (R&R) packages as per approved EIA documents.	Pre-construction and construction (initial phase)	Project/ LARU

S. N.	Actions	Timing of Action	Responsibility
8	Evacuation of the owners from the structures affected by the project.	Pre-construction (At least 2 months will be given to the affected parties to remove their belongings if any)	Project/ LARU
9	Handling of grievances of the affected parties and individuals (formalities of Grievance Redress Mechanism)	Pre-construction and construction	Project/ LARU
10	Monitoring of the implementation of R&R	Pre-construction and construction	EMU/Central Line Agencies/ Panel of Expert (PoE)

Note: EMU-Environment Monitoring Unit

Summary of Social Mitigation Cost

The total socio-economic mitigation and rehabilitation cost including land cost is calculated to be NRs. 225,338,481 and excluding land cost is NRs.20,280,370. The detailed cost analysis is shown

Table 8-12.

Table 8-12: Mitigation and Rehabilitation Cost

S.N.	Mitigation Measures	Unit	Quantity	Amount (NRs)
1	Compensation for Land	Ha	106.6042	205,058,111
2	Compensation for structures	No.	23 (22-private and Structures of Kahare Agriculture and Co-operative Limited.)	10,583,150
3	Compensation for loss of crops	MT	198.54	5,807,220
4	Safety training		LS	500,000
5	Displacement & Transportation Cost		LS	3,390,000
Total Mitigation and Rehabilitation Cost (including land cost)				225,338,481
Total Mitigation and Rehabilitation (excluding land cost)				20,280,370

8.3.2 Enhancement Measures

8.3.2.1 Agriculture Farming

• Mushroom Farming Training

The mushroom farming plays the significant role in cash for income generation for the people of the PAA. To increase the production of the mushroom in the area, improved techniques and methods will be introduced. A special mushroom farming program will be conducted in the PAA. A total of 15 PAFs will be trained under this training program. The duration of the training will be of 5 days.

Table 8-13: Mushroom Farming Training

S. N.	Particulars	No. of persons	No. of days	Unit cost (daily allowance) NRs	Total Cost (NRs)
1	Program Coordinator	1	7	4000	28,000
2	Allowance including Lunch	20	5	800	80,000
3	Resource Persons	4	5	2500	50,000
4	Improved Seeds distribution		LS		200,000
5	Training material and Logistics		LS		300,000
Total					658,000

• Citrus Farming Training

During the field visit, it was observed that citrus species farming can play significant role in cash income generation for the people of the PAA mainly in Rupa RM (former Siddha and Thumki VDC), Byas Municipality and Myagde RM (former Manpang VDC). Now a day, the production of citrus species farming has decreased in this area due to the various diseases in its tree, cluster of buds and flowers. However, during the field visit, local people revealed their eagerness to involve in citrus farming applying improved new techniques and methods. So, improved new techniques and methods need to be introduced to increase citrus species production in the area. Training program on improved citrus farming will be conducted for the local farmers, which will provide opportunities for increasing production in their farmlands. This program is especially focused in the assumption that they can improve production and productivity by applying new methods and techniques. A total of 20 PAFs will be trained under this training program and the duration of this will be for 5 days. The total cost allocated for training programs is NRs 658,000 (including cost for trainee's allowance, expert hiring, training materials and logistics).

Table 8-14: Cost of Citrus Farming Training

S.N.	Particular	No. of person	No. of days	Unit cost (daily allowance)	Total Cost (NRs)
1.	Program Coordinator	1	7	4000	28,000
2.	Local Farmers /participants	20	5	800	80,000
3.	Training Experts	4	5	2500	50,000
4.	Distribution of seed/improved materials	LS			200,000
5.	Training Materials and Logistics	LS			300,000
Total					658,000

8.3.2.2 Micro Enterprise Creation Training

Micro Enterprise Creation Training program will be provided to the PAFs particularly for women (Women-headed HHs, Dalits, and Indigenous People). One program covering 20 participants in each and 5 days duration will be conducted. The main objectives of training are:

- To motivate the women group of PAF create/start their own business
- To develop entrepreneurship competency
- To identify and select viable business of their own
- To help for preparation of their own business plan

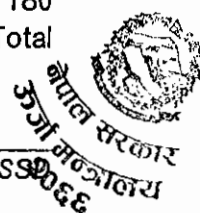
Table 8-15: Cost of Micro Enterprise Training

S.N.	Particular	No. of person	No. of days	Unit cost (daily allowance)	Total Cost (NRs)
1.	Program Coordinator	1	7	4000	28,000
2.	Participants	20	5	800	80,000
3.	Resource Persons	4	5	2500	50,000
5.	Training Materials and Logistics	LS			300,000
Total					458,000

* Note: Training cost will include participant's allowance for accommodation, food and others. The topics of skill training and number of participants may change than specified above depending upon demands from PAFs.

8.3.2.3 Skill Development Training

Skill development related training programs such as driving and automobile (special focus for those households who lose land more than 50% and HHs who lose their residential structure) will be conducted to tackle the adverse impact of the project. Duration of training will be 180 hours as per the CTEVT standard. A total of 20 SPAFs will be trained under this program. Total cost for driving training is estimated NRs. 1,000,000 (NRs. 50,000/person).



8.3.2.4 Social Awareness (Health, Sanitation and Safety) Program

An awareness program will be conducted in the PAA to alert local people to the potential dangers related to health, sanitation and safety. This program will be targeted to the people residing in and around the vicinity of the substation. Awareness program on construction related safety issues and electrocution will also be given to the local residents. Community safety awareness program about the TL will be implemented. Hoarding board will be placed in the sensitive area. The cost for social awareness program including hoarding board is NRs. 800,000.

8.3.2.5 Summary of Enhancement Measures

The total enhancement cost for socio-economic and cultural environment is NRs. 3,574,000.

Table 8-16: Summary of Enhancement Measure Cost

S. N.	Description	Amount (NRs)	Remarks
1	Mushroom farming	658,000	Refer Table 8-13
2	Citrus farming training	658,000	Refer Table 8-14
3	Micro-enterprise training	458,000	Refer Table 8-15
4	Skill development training	1,000,000	
5	Social awareness program	800,000	
Total		3,574,000	

8.3.3 Corporate Social Responsibility (CSR)

As a corporate responsibility, the proponent has allocated some money for the betterment of local people. Money on different programs sectors like education, health, infrastructure, service facility and religious sites has been allocated. Following are the sectors covering as CSR:

- Drinking Water**

It was observed during the field visit that some area like Byas (former Shyamgha and Saura Village), Pokhara Lekhnath MC (former Lekhnath Municipality), Rupa RM (former Siddha and Thumki VDC) from where the proposed TL alignment passes through have scarcity of drinking water due to the lack of sources of water, storage tank and proper management of water stream. The water supply of the project area will be strengthened by installation of new pipe lines, keeping taps at a regular interval and by improving the storage of water at the source. The project will do further consultation with the community to finalize such schemes in close coordination with NEA-ESSD. After the completion, the scheme will be handed over to the Consumer User Groups. The total cost of NRs. 2,500,000 is estimated for improving drinking water supply in the PAA.

- Education Support Program**

During the field visit, some schools nearby TL alignment viz. Shree Manung Primary School in Saura, Byas and Bhawani Primary School in Shyamgha, Janajukta Saahi Secondary School in Byas, Suryadaya Lower Secondary School in Pokhara Lekhnath MC were observed as weak condition with lack of proper infrastructures like drinking water facility, extra curriculum goods and library facility etc. These schools and other schools which are in vulnerable condition and located nearer from the TL alignment will be supported through educational support program. Support will be provided for establishment of library, purchase of computer, support for drinking water facility and extra curriculum activities. The total amount for this provision will be NRs. 3,000,000.

- Infrastructure and Service Facility**

Project also aims to support to people/stakeholders of PAA in the infrastructures and service facility sector. Support will be provided for renovation of community building centers, renovation



of the temples near to the TL alignment, renovation of the play-ground for the community, strengthening public meeting place, etc. The project will do further consultation with the community to finalize such schemes in close coordination with NEA-ESSD. For this NRs. 10,000,000 will be allocated.

Summary of CSR Cost

The total CSR cost for the socio-economic and cultural environment is NRs. 15,500,000.

Table 8-17: Summary of CSR Cost

S.N.	Description	Amount (NRs)
1	Drinking Water	2,500,000
2	Education Support Program	3,000,000
3	Infrastructure and Service facility	10,000,000
Total		15,500,000

8.3.4 Summary of Socio-economic Mitigation, Enhancement and CSR Cost

The socio-economic mitigation and enhancement cost including CSR cost for implementing various mitigation and enhancement measures (including land cost) mentioned above is estimated to be NRs 244,412,481 and excluding the land the cost is NRs. 39,354,370. The cost breakdown is given below in Table 8-18.

Table 8-18: Cost Estimate for Social Mitigation and Enhancement

S.N.	Description	Amount (NRs)
1	Mitigation Measures	225,338,481
2	Enhancement Measures	3,574,000
3	Corporate Social Responsibility (CSR) Cost	15,500,000
Total (including land cost)		244,412,481
Total excluding land cost)		39,354,370

8.4 Summary of Environmental Mitigation, Enhancement & CSR Cost

The total environmental mitigation including land cost, enhancement cost and CSR cost for implementing various mitigation and enhancement measures mentioned above for physical, biological and socio-economic and cultural environment is estimated to be NRs 307,724,821. The cost breakdown is given below in the following table.

Table 8-19: Cost Estimate for Environmental Mitigation, Enhancement and CSR

S. N.	Environment	Description	Amount (NRs)	Remarks
1	Physical	Mitigation	5,000,000	Table 8-1
2	Biological	Mitigation	60,049,840	Table 8-5(including land cost of NRs. 2,070,000/-)
		Enhancement	2,462,500	Table 8-6
3	Socio-economic	Mitigation	225,338,481	Table 8-11(including land compensation cost of NRs. 205,058,111/-)
		Enhancement	3,374,000	Table 8-15
		CSR	15,500,000	Table 8-16
Total (including land cost)			307,724,821	
Total (excluding landcost)			100,596,710	



Table 8-20: Entitlement Policy Matrix

Nature of Loss	Application	Definition of AP	Entitlements	Actions	Responsibility
Permanent acquisition of agricultural/Residential/commercial and other private lands by landowners	Land and other assets permanently acquired for the Project	Owners with legal or legalizable right (8.3325ha land for permanently acquisition; and for RoW)	Cash compensation at replacement cost determined by CDC. All fees, taxes and other charges as applicable under the relevant laws and regulations.	CDC to compensate the owner (preferably in joint account of husband and wife, if married and with the consent of the title holder)	NEA and CDO
Permanent acquisition or restriction to use of agricultural/Residential/other private commercial and private lands by Tenants	Land and other assets permanently acquired or restricted use to maintain RoW	Registered tenant(s)	Fifty percent or as provisioned in applicable acts compensation to the tenants out of the total compensation fixed for the permanently acquired land or land restricted to maintain the RoW. The remaining fifty percent compensation amount will be given to the titleholders of the affected land as provisioned in the prevailing Acts of Nepal.	Compensation for the tenants of affected land	NEA and CDO
Temporary effects on land due to use by the contractors during construction phase	Land temporarily acquired by the contractors during the implementation phase	Person(s) owning land	Contract will be signed between the DPs and property owner for temporary use/acquisition of land/assets. The contract to confirm rental rate/compensation and mode of payment. Project Office and the Contractor to ensure compensation for the land/assets temporarily acquired during the construction phase.	Compensation for the temporarily acquired land/assets by the contractors	NEA and Contractor



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Loss of residential and non-residential structures	Residential and non-residential structures (e.g. cattle shed, toilet.) on land permanently acquired for the project.	Owners of structures regardless of ownership of land on which the structure stands (22 HHs)	Cash compensation for structures at replacement cost based on current market price without considering depreciation. DPs will be allowed to take/reuse their salvageable materials. DPs will be provided one time shifting allowances (@ LS NRs 30,000) to move the household effects and materials. DPs losing residential structures will also be provided transitional allowance to meet to cost of renting accommodation and other management cost for a period of 3 months (estimated time to rebuild the house) @ NRs 50,000 per month (Total NRs 150,000 per affected household).	Compensation for the residential/commercial structures	CDO/NEA
Loss of residential / commercial structures by squatters	Structures on RoW / Govt. land either permanently or temporarily affected.	Squatters/ informal dwellers (defined as a person who occupy vacant government land/ ROW)	Cash compensation for the loss of built-up structures at replacement costs without considering depreciation. Owners of affected structures will be allowed to take/reuse their salvageable materials The DPs will be provided one time shifting allowances to move the effects and materials. The allowance will be paid @ NRs 30,000 per affected households as estimated based on consultation with the DPs on current market price. The DPs will also be provided transitional allowance to meet to cost of renting accommodation and other management cost for a period of 3 months (estimated time to rebuild the house) @ NRs 50,000 per month (Total NRs 150,000 per affected household)	The NEA/ CDO will ensure payment prior to physical displacement.	NEA, CDO



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Loss of residential / commercial structures by encroachers	Structures on RoW / Govt. land either permanently or temporarily affected	Encroachers (defined as a person who has legal title holding to land but illegally extends his occupation onto the contiguous, vacant government land)	Cash compensation for non-land assets at replacement costs without considering depreciation for vulnerable households. Owners of affected structures will be notified and allowed to take/reuse their salvageable assets.	Encroachers who are vulnerable/ below poverty line are to be assisted on a case by case basis considering their household income and assets.	NEA, CDO
Loss of fruit and timber trees	- Trees on Land permanently acquired for tower foundation and RoW.	Owners of trees including encroachers, squatters, sharecroppers or tenants.	<ul style="list-style-type: none"> - One time compensation for loss of fruit trees for average fruit production for next 5 years will be computed at current market value. - One time compensation for loss of wood-trees at current market value of wood (timber or firewood, as the case may be). 	Cash compensation for loss of trees	CDO, NEA, District Forest Office, District Agriculture Office and Contractor
Loss of crops	<ul style="list-style-type: none"> - Loss of crops from the land permanently acquired for the project. - Loss of crops either temporarily or within the ROW corridor. 	Owners of crops regardless of legal status	<ul style="list-style-type: none"> - One time cash compensation for the loss of agricultural crops at current market price based on average production of the affected area. 	Cash compensation for loss of crops as per rates from the Department of agriculture	CDO, NEA, District Agriculture Office and Contractor
Temporary Loss of Livelihood	Temporary loss of livelihood/ source of income.	Business owner (s), tenant (s), leaseholder(s), employee(s), agricultural worker(s)/Mobile vendors(s).	<p>30 days advance notice regarding construction activities, including duration and type of disruption.</p> <p>Contractor's actions to ensure there is no income/access loss through provision of access etc.</p> <p>For business, affected by construction activities involving unavoidable livelihood disruption, compensation for lost income or a transitional allowance for the period of disruption whichever is greater.</p> <p>Restoration of affected land, structure.</p> <p>For employees, assistance equivalent to 30 days wages will be computed at local wage rates.</p>	In the absence of tax receipts, compensation for income loss of affected business/shops will be calculated using the prevailing legislated minimum daily wage.	NEA

Vulnerability Allowance	Vulnerable households	Female headed house, households having senior members, disabled family members, ethnic minority households.	Enrolment of the family members in income generation or skill training activities for the improvement of household income. Priority employment via contractors during project construction.	Involvement of vulnerable households on livelihood improvement programs	NEA
Unanticipated adverse impact due to Project intervention or associated activities (re-cabling of overhead distribution line, under grounding of distribution cables, collaboration with the local users groups and other agencies will occur.			The NEA will ensure adequate fund to meet the need of such unexpected costs and the project implementation authorities will deal with any unanticipated consequence of the Project during and after the implementation- shall be documented and mitigated.		


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9 ENVIRONMENTAL MONITORING PLAN

9.1 Introduction

This section discusses and outlines the environmental monitoring program of LDTLP. It also assists to ensure compliance with environmental laws and in ameliorating and eliminating adverse impacts. This chapter on monitoring is formulated in accordance with EPR, 1997 and its amendment.

9.2 Requirements for Environmental Monitoring in Nepal

An Environmental Monitoring Plan will be required to define the responsibilities for the monitoring, the parameters that will be monitored, where the monitoring will take place and its frequency. Effective monitoring of the whole project cycle, particularly the resettlement related aspects, will assist in the identification of unexpected problems/outcomes, and facilitate the correction of these. Monitoring of socio-economic impact indicators should wherever possible be participatory, involving local groups assessing their own situations as part of the process. This will assist local communities raise their awareness about their situations and the chain of causality bringing about their situations of relative gain or loss.

Social monitoring will also be incorporated in the scope of work for construction management, so that the local labor recruitment norms and requirements, their operating conditions, rights and penalties can be closely observed in order to avoid inequities and conflicts. Social monitoring is the most effective if local community leadership and administration structures are involved in a process that is participatory, and provides recourse to recognized authority structures. Involving community leaders and local authorities often provides the means to resolve social problems identified in a direct, efficient and effective manner. Project proponent will primarily be responsible for the implementation of monitoring program. MoEn, DoED and local bodies will also be involved during the monitoring.

The environmental monitoring will be carried out at all the project impact areas in a regular or intermittent schedule. Compliance monitoring will be carried out regularly whereas the impact monitoring will be done at the middle and at the end of construction phase or as prescribed in the monitoring plan and schedule. (In general, observation, inspection, review of official records, interview, counting and/or measurements will be used for monitoring. Furthermore, scientific methods will be used for the monitoring requirements, where and whenever necessary.

9.3 Environmental Monitoring Unit

An Environment Monitoring Unit (EMU) will be formed which will consist of experts from ESSD and other qualified personnel from the local market. Two site offices will be established in proper place for conducting monitoring and mitigation activities. EMU will be responsible for day-to-day Environment monitoring works. This Unit will consist of experts including the following;

- Environmentalist
- Sociologist
- Civil Engineer
- Field Assistant

This unit will have two principal functions. The first is to conduct community related mitigation measures on behalf of the project (which are not specifically related to the activities of the construction contractors); while the second is the implementation of mitigation measures. The



Unit, in addition of foreseeing mitigation and monitoring will also take care of the community problems arising during project construction. Furthermore, the Unit will use EMP as the guideline for implementing the mitigation specified in IEE, Tender Documents and Technical Specifications such that the deleterious environmental impacts were minimized.

The co-ordination of the compliance monitoring and mitigation program allocated under the contractor will be the responsibility of the project proponent. As already stated, the Environmental Unit will work for the monitoring of compliance issues of construction contractors. The Unit will be responsible for the approval of contractors Environmental Protection Plan (EPP) and Environmental Safety Plans. In addition, the Unit in coordination of Project Manager will have the authority to penalize contractors for violation of environmental tender clauses and non-performances.

9.4 Environmental Monitoring Plan

A monitoring program required for the project to evaluate the application and effectiveness of mitigation measures is formulated in three phases.

a) Baseline Monitoring

The primary concern during this phase will be to implement field data collection programs needed to enhance the knowledge of baseline conditions. Focus will be on the gathering of scientific and sociological information needed to verify and update the data provided by this IEE process.

b) Compliance Monitoring

In this monitoring, the GoN licensing entity (MoEn/DoED) oversees and ensures the implementation of the required mitigation measures according to GoN guidelines and approved mitigation plan. The Unit will be delegated the day-to day responsibilities in this respect.

c) Impact Monitoring

Impact monitoring will focus on key indicators to assess whether the impacts have been accurately predicted, and whether the mitigation measures are sufficient and effective. The monitoring of the proposed 220kV TL Project will include:

Physical Environment

- Watershed monitoring /Land use
- Stability of the area around the tower foundations

Biological Environment

- Vegetation Clearing
- Plantation
- Casualty replacement/ re-vegetation
- Tree management
- Stability along the river crossings

Socio-economic and Cultural Environment

- Employment monitoring
- Land-use along the RoW
- Economic status of the affected people and relocated people
- Adaptation of resettlement households to their new homes and communities
- Public safety and security monitoring
- Health and sanitation monitoring
- Compensation



9.5 Grievance Redress Mechanism (GRM)

Grievance redress mechanism will be established to allow project affected persons (PAPs)/HHs to appeal any disagreeable decisions, practices and activities arising from compensation for land and assets. The PAPs will be made fully aware of their rights and the procedures. There is a possibility of two types of grievances: grievances related to land acquisition and resettlement requirements, and grievances related to compensation or entitlement. The PAPs will have access to both locally constructed grievances redress committees i.e. Local Consultative Forums (LCFs), CDC and the Ministry, and formal courts of appeal system. Under the latter system every AP can appeal to the court if they feel that they are not compensated or entitlements are not provided for appropriately. They may appeal to court within 35 days of the public notice given to them.

A grievance recording register will be maintained at the Environment and Social Management Unit (ESMU) established at site and at Project Manager Office. Project affected people as well as local people can lodge their complaints at the Unit related to compensation, entitlement and construction related activities. Special project grievance mechanisms such as on site provision of complain hearings allow project affected persons and communities to interface and get fair treatment on time. The project authority will ensure that funds are delivered on time to CDC and the implementing partners for timely preparation and implementation of social activities, as applicable. The compensation issues and rehabilitation measures will be completed before civil work starts. Civil works contracts will not be awarded unless required compensation payment has been completed. PAPs and community will be exempted from all administrative fees incurred, pursuant to the grievance redress procedures except for cases filed in court. Proposed mechanism for grievance resolution will be as follows:

Stage -I

Complaints of PAPs and community on any aspect of compensation, relocation, or unaddressed losses of private and community property shall in first instance be settled verbally or in written form in field based project office at sites. The complaint can be discussed in an informal meeting with the PAPs and Environment and Social Management Unit. This Unit will be created within the Project Director/ Manager Office at NEA. The Unit will be solely responsible to be in close contact with all affected people and public and hear record and formally file their complaints in the registers on a regular basis. The Unit will carry out necessary inquiry and verification regarding redressal of issue within 7 days of complains registered. If the issue is settled, the process ends.

Stage -II

If issue is not addressed within 7 days of written application to the satisfaction of PAPs they can file formal type-written complain to Environment and Social Management Unit. While lodging the complaint, the PAP and community must produce documents to support their claim. The Social Development Expert of the Unit will carry out field observation and discuss the issue with Project Director/Manager through the Coordinator. If issue is still not resolved to the satisfaction of both the parties, the issue will be discussed in LCFs. The LCF will be established in each district to handle initial grievances of the project affected people and community and will be based in appropriate project site/ location of the district to provide easy access to the people. Although formed at district level, the LCF will be led by RMs/municipality/MC Chair or a locally respected person with other members being the RMs/municipality/MC representatives and AP representative and will be inclusive in nature i.e., with adequate representatives of female Dalits, Janajatis, etc.

The ESMU will coordinate the meetings with LCF and come up with amicable solutions acceptable to all parties. The LCF will play key roles in public consultations, grievance handling/



managing at local level, participate proactively in planning and implementation process and key decision making matters that contribute to better outcomes and performances, especially in IEE implementation. The issue thus brought to LCF will be resolved within 15 days from the date of the complaint received. If the issue is settled, the process ends.

Stage -III

If no understanding or amicable solution is reached or no response from the project office, the PAPs or community can appeal to the CDC, particularly if the issue is related with loss of private assets and compensation. As a formal body with legal standing, all other relevant complaints/ grievances not resolved at earlier stages may also be registered with CDCs for timely resolution. While lodging the complaint, the PAP and community must produce documents to support their claim. The CDC will come up with acceptable decision within 15 days of registering the appeal. For other unresolved social and environmental issues PAPs or community can appeal to MoEn or Ministry of Home in case of compensation. The Ministry may address the issues as per the current practices Rules and Regulations of the GoN. If the issue is settled, the process ends.

Stage -IV

If the PAPs and local community are not satisfied with the decision of CDC and the MoEn/Home or in absence of any response of its representatives within 35 days of the complaint, the PAPs and community may submit their case to the District Court. The decision of the court will be acceptable to both parties.

Table 9-1: Monitoring Plan and Schedule

SN	Parameter	Indicators	Method	Location	Schedule
A Baseline Monitoring					
Physical Environment					
1	Land Use	Changes in land use pattern	Site observation	RoW and nearby areas	Once during the construction phase and operation phase
2	Stability	Stability at tower foundations	Site observation	Near tower foundations	Before and after rainy season prior to construction
Biological Environment					
3	Vegetation/ Forest cover	Observation of Vegetation and maintenance of RoW	Discussions with Users Group, observation, local people and District Forest Office	Under the RoW and in the vicinity of the corridor	Once each during preconstruction, construction and operational phase
4	Wildlife	Wildlife habitat and clearance	Observation, discussion with local people	RoW and near project area	Once each during preconstruction, construction and operational phase
Socio-economic and Cultural Environment					
5	Settlement/ infrastructure	Increase in settlements/infrastructure, migration	Discussion with local people, VDCs, observation	PAA	Once each prior to construction and operation
6	Socioeconomic cultural baseline	Update socio-economic/cultural baseline	Discussion with local people, observation, review	PAA	Once prior to construction
B Impact Monitoring					
Physical Environment					
1	Land use	Stability/ landuse changes from the baseline	Observation	Around the tower foundation area	Continuous observation during construction, annually during operation



SN	Parameter	Indicators	Method	Location	Schedule
2	Waste disposal	Unpleasant odour and visual impact	Observation	Temporary camps/ construction sites	Weekly during construction
3	Air Quality/ water quality		Observation	Project area	Weekly during construction
Biological Environment					
4	Vegetation Clearance	No. of trees felled, ground cover	Observation of the area, discussion, counting	Under the RoW	During construction
5	Pressure on Forest	Forest Cover	Observation and survey of forest area before and after construction, discussion with local people and CFUGs.	Along TL	Regular basis during construction and annually during operation
6	Wildlife	No. of wildlife seen	Observation, keeping records on wildlife, birds and reptiles killed	In the vicinity of the corridor	Regular basis during construction and annually during operation
Socio-economic and Cultural Environment					
7	Compensation	Socio-economic parameters like economic status, living conditions etc. of the affected people.	Housing assets, living conditions, income etc.	Affected local people	Regularly for at least three years following land acquisition
8	Land Loss	Acquisition of land, lease of land and temporary disturbances in land	Cross checking the compensation list	Tower foundation, RoW and the leased area	Quarterly during construction and once during operation
9	Health issues	Types of Diseases and record of outbreak of diseases	Inspection of camps, Record of diseases	Project area and camps	Continuous during construction period
10	Safety	No. of casualties	Records of accidents	Project area	Continuous during construction period/operation phase
11	Employment	No. of local people employed by project	Records kept by management	Project area	Continuous during construction and annually during operation
12	Impact on Women/ Children	Status of women children	Record of women employment; children education; inspection on child labor	Project area	Continuous during construction period
13	Indirect economic benefits	Economic activities in the area	Trade and business revenues	PAA	Once a year during construction and once during operation
C Compliance Monitoring					
1	Incorporation of recommendations of IEE into project documents	Yes/No	Review/cross checking of tender and design documents	Kathmandu Office	During and after the project design stage completion of tender documents
2	Incorporation of Environmental considerations mentioned in	Yes/No	Review of proposed work plan submitted by the contractor	Kathmandu Office/site office	During contract negotiations



SN	Parameter	Indicators	Method	Location	Schedule
	tender documents in the contractors proposed work plans				
3	Integration of mitigation measures in the detail design and contract document	Yes/No	Review process	Kathmandu office	During project approval
4	Allocation of adequate budget for implementation of environmental mitigation measures and monitoring works		Review, inquiry and consultation	Kathmandu office	During detail design and contract agreement
5	Clean-up and reinstatement of the project area	Muck disposal, drainage around the tower	Site observation, and inspection	Around tower area, substation area	At the end of construction period
6	Compensatory plantation of native species and conservation of planted seedlings for 5 years	Type of planted Species, survival of seedlings	Site observation/sampling	Corridor inspection, tower area, plantation areas	Periodically during construction and operation
7	Land/property acquisition procedures	Compliance with national legal requirements	Discussions with local people	Affected area/site office	At the time of acquisition
8	Trainings and trainees	No. of trainings and trainees	Survey/observation	PAA	Periodic during construction and operation

9.6 Monitoring Cost

The monitoring costs have been estimated in table below. The total cost for monitoring activities (for pre-construction and construction phase) has been estimated as NRs. 16,233,560/-.

Table 9-2: Monitoring Cost of the Proposed LDTLP

S.N.	Item	No. of Persons	Man-month	Rate/Month (NRs.)	Amount (NRs.)
A. Pre-construction Phase					
1	Manpower				
	Senior Environmental Expert	1	1	40,688	40,688
	Team Leader	1	2	34,220	68,440
	Environmental Expert	1	1	34,220	34,220
	Socio-economist	1	1	34,220	34,220
	Civil Engineer	1	1	34,220	34,220
	Support Staff	2	2	30,500	61,000
	Sub-total	7	7		272,788
2	Out of Pocket Expenses				
	TA/DA		LS		80,000
	Field Assistant		LS		30,000

S.N.	Item	No. of Persons	Man-month	Rate/Month (NRs.)	Amount (NRs.)
	Transportation		LS		100,000
	Report Production		LS		20,000
	Miscellaneous		LS		10,000
	Sub -total				240,000
	Total of Pre-construction Phase				512,788
B. Construction Phase					
1	Manpower				
	Senior Environmental Expert	1	4	40,688	162,752
	Co-ordinator	1	12	34,220	410,640
	Civil Engineer	1	6	34,220	205,320
	Environmentalist	1	6	34,220	205,320
	Socio-economist	1	6	34,220	205,320
	Electrical Engineer	1	6	34,220	205,320
	Liasion Officer	1	2	30,550	61,100
	Support Staff	5	30	30,500	915,000
	Sub -total	12	72		2,370,772
	From Outsourcing				
	Environmental Safeguard Officer	1	24	80,000	1920,000
	Social Safeguard Officer	1	24	80,000	1920,000
	Support Staff Site Office-1	1	24	35,000	840,000
	Database Expert	1	2	80,000	160,000
	Sub-total	4	74		4,840,000
2	Out of Pocket Expenses				
	TA/DA		LS		500,000
	Fuel and maintenance		LS		1,000,000
	Vehicle hire/ purchase/ Maintenance		LS		4,000,000
	Fuel for Vehicle		LS		600,000
	Report Production		LS		100,000
	Office Rent (Site Office)	24		15000	360,000
	Computer and Printer		LS		100,000
	Electricity, Drinking Water and Communication		LS		100000
	Community Consultation		LS		80,000
	Site office Furnishing		LS		150,000
	Computer and Printer		LS		120,000
	Office Accessories and Operation Cost		LS		200,000
	Institutional Strenghtening		LS		1,000,000
	Community Consultation		LS		100,000
	Miscellaneous		LS		100,000
	Sub-Total				8,510,000
	Total of Construction Phase Monitoring				15720772
	Grand Total (Pre-construction and construction monitoring)				16233560

9.7 Agencies Responsible for Environmental Monitoring

As per the EPR, MoEn will be responsible for monitoring. However, the project proponent NEA will have the prime responsibility for carrying out the monitoring activities. ESSD of NEA will be the organization responsible for pre-construction and construction phase monitoring of the proposed project. EMU comprising the staff from ESSD will be established for the construction phase of monitoring of the project. The Unit will be responsible for compliance and impact monitoring works.



9.8 Summary of Environmental Cost Assessment

The total environmental cost (mitigation including land cost, enhancement, CSR, and monitoring costs) of the proposed project including land cost is estimated to be NRs323,158,381/- which is 4.31% of the total project cost. The summary of environmental cost benefit analysis is shown in Table 9-3. The proponent has obligation to carry out the mitigation, enhancement and monitoring activities of the project.

Table 9-3: Environmental Cost Benefit Analysis (including land cost)

S. N.	Description of Cost	Amount (NRs.)
1	Cost for environmental mitigation measures	
	including land cost	285,388,321
	excluding land cost	78,260,210
2	Cost for enhancement measures	6,036,500
3	Cost for other social support program and CSR cost	15,500,000
4	Cost for environmental monitoring	16,233,560
Total environmental mitigation (including land cost) and monitoring cost		323,158,381
Total environmental mitigation (excluding land cost) and monitoring cost		116,030,270
Total Project cost		7,500,000,000
Percentage of total environmental cost (including land cost) to total project cost		4.31%
Percentage of total environmental cost (excluding land cost) to total project cost		1.55%

Implementation of Mitigation/Enhancement Measures, CSR and Monitoring Activity

The proponent has prime responsible for implementing the proposed mitigation/enhancement measures, CSR and the monitoring activities. Proponent has an obligation to carry out all these activities along with cost.



Table 9-4: Environmental Impact, Mitigation and Monitoring Matrix

S.N	Impact	Mitigation Measure	Mitigation/Enhancement Cost (NRs.)	Responsible	Monitoring Plan	Responsible
A. Physical Environment						
1	Topography of the tower site will be changed due to excavation, fill and cut for leveling the foundation area leading to the change in landscape.	Re-vegetation and slope maintenance will be carried out in the disturbed areas to avoid erosion. Bio-engineering with combination of retaining structures will be done as per the requirement. Proper landscaping will be done at each tower site.	Included in Project Cost	Contractor, LDTLP	Weekly field observation during construction	LDTLP-EMU
2	Different construction activities and vehicular movements will generate dust/ smoke and affect air quality in the surrounding area	Vehicle utilized for construction will be complied with GoN mass emissions standards. Regular checkup; up keeping and maintenance of the equipment will be carried out as per the Manufacturer's Specifications to meet the emission standards.	Included in Project Cost	Contractor, LDTLP	Weekly field observation during construction	LDTLP-EMU
3	Use of Construction equipment and vehicles will increase noise level.	Ear mufflers will be provided to labor force working in the areas susceptible to noise pollution.	Included in Project Cost	Contractor, LDTLP	Weekly field observation during construction	LDTLP-EMU
4	There is possibility of water pollution especially in sectors where the line crosses the rivers and streams leading to deterioration of river water quality and other existing water bodies around the construction area.	Waste disposed in pits and filled with soil. Such pits will be made in barren land at approximately 500m distance from the water bodies. Dykes are proposed around the storage tanks to avoid water pollution. Toilets will be provided to the workforce	Included in Project Cost	Contractor, LDTLP	Weekly field observation during construction	LDTLP-EMU
5	The improper disposal of solid waste like cement bags, iron bar and other leftover construction materials, kitchen waste and waste generated by the temporary labour camp might cause adverse impact to the environment.	Waste materials will be stored out and kept separated instead of throwing haphazardly elsewhere. Some of these items (cement bag, plastic drum etc.) can be sold in the markets in order to be re-used or recycled.	Included in Project Cost	Contractor	Weekly field observation during construction	LDTLP-EMU



S.N	Impact	Mitigation Measure	Mitigation/Enhancement Cost (NRs.)	Responsible	Monitoring Plan	Responsible
6	Lead to land degradation and damage of the particular area	Re-vegetation, slope maintenance will be carried out in the disturbed areas to avoid erosion. Bio-engineering with combination of retaining structures will be done as per the requirement. Proper landscaping will be done at each tower site.	Included in Project Cost	Contractor	Continuous observation during construction, annually during operation	Contractor, LDTLP-EMU
B. Biological Environment						
1	Government forest area falling under TL alignment is 0.7ha and CF area falling under the tower pad and TL alignment is 21.6947ha.	Purchase of 0.54ha of land as replacement of permanently acquired forest land	2,070,000/-	NEA, MoFSC	During construction	Contractor, LDTLP-EMU
2	14160 numbers of trees from CF of 23 different varieties will be clear felled. 8772.33 cubic meter of wood volume with 7959.28 ton of dry biomass will be lost	389,832 number of seedlings will be planted as a compensatory plantation	46,779,840/-	NEA, MoFSC	During construction	Contractor, LDTLP-EMU
3	Removal of 3200 private trees (ToF).	Cash compensation	800,000/-	NEA, MoFSC	During construction	Contractor, LDTLP-EMU
4	Increase in pressure on local vegetation with increasing demand for firewood and timber	Provide kerosene/LPG to the extent possible to project workers staying at temporary/permanent labor camps	Included in Project Cost	Contractor, NEA	Regular basis during construction and annually during operation	Contractor, LDTLP-EMU
5	Likely increase in hunting and poaching	Prohibit project workers for the collection of NTFPs, hunting and poaching	-	Contractor, NEA	During construction	CFUG
6	Avian Hazards (LDTLP in operation phase may affect bird mobility to some extent. The inability of birds to notice the wires can cause fatal injuries from collisions).	Markers such as color balls will be attached to conductors to improve line visibility for bird wherever it is necessary and technically feasible	Included in Project Cost	Contractor, NEA	Observation/keeping records on birds killed in the vicinity of TL annually during operation	NEA, MoEn

S.N	Impact	Mitigation Measure	Mitigation/Enhancement Cost (NRs.)	Responsible	Monitoring Plan	Responsible
C. Socioeconomic and Cultural Environment						
1.	Acquisition of Land and Structure (require 106.6042ha private land out of which 8.3325ha acquired permanently, total 23 structures will be affected.)	Compensation will be provided to affected land and structure (full compensation for permanent land and 10% of land utilization)	NRs 205,058,111 for land and NRs 10,583,150 for structures)	CDC, NEA (LDTLP)	Cross checking the compensation list, Quarterly during construction, once during operation.	LDTLP-EMU
2.	Crops Loss (33.63MT crops from permanent land and 164.91 crops from land utilization)	Compensation will be provide to PAFs.	NRs 977,400 for crop loss from land acquisition and NRs 4,829,820 from land utilization	CDC, NEA(LDTLP)	Discussions with, PAFs, site observation and market survey	LDTLP-EMU
3.	Livelihood	Skill development training will be provided		NEA (LDTLP)		LDTLP-EMU
4.	Occupational Hazards and safety (Likely increase in construction related accidents)	Construction area will be cleared up and warning signs/hoarding boards will be placed.	NRs. 500,000 for awareness program and hoarding board	NEA (LDTLP), Contractor	Records of accidents.	LDTLP-EMU
5	Impact due to crossings (Likely impact due to Crossings on power cables/communication lines/ roads etc.)	Maintenance of ground clearance, Avoidance of infrastructures as far as possible, Placement of signboard where necessary, Public awareness program at critical location	Included in project cost	NEA (LDTLP), Contractor	Cross checking during the operation phase.	LDTLP-EMU
6.	Economic Activities (Likely increase in economic activities)	Compensation for the hindrance due to use of land, agricultural extension program, livelihood skill training programs, Maximum job opportunities.	Nrs. 658,000 for mushroom farming and NRs. 658,000 for training on citrus species.	NEA(LDTLP)	Economic activities in the area, Trade and business revenues	LDTLP-EMU
7.	Social and Cultural Practices (Likely impact on Social and Cultural Practices)	Appropriate code of conduct will be enforced to the outside construction workers	Included in project cost	NEA (LDTLP), Contractor	Records of such incidents.	LDTLP-EMU
8.	Law and Order (Likely increase in pressure to maintain the law and order)	The proponent will implement a strict code of conduct for the workforces.	Included in project cost	NEA (LDTLP), Contractor	Ensure that appropriate code of conduct will be adopted.	LDTLP-EMU



10 CONCLUSION

This chapter sums up the findings and conclusions of the environmental team responsible for carrying out the IEE report of LDTLP 220kV TL project. An overall assessment is provided first, followed by sections giving specific conclusions and recommendations.

The total land requirement will be approximately 134.6125ha for tower foundations, substation, camp, switching station and RoW. Out of that, the project requires 92.693ha of cultivated land, 34.9884 ha of forest land, 3.6074ha of barren land and 3.3233ha of other land. There will be loss of 17360 trees (14160 from CF/government forest and 3200 private tree) for the RoW clearance.

The environmental issues/impacts identified during the IEE can be mitigated and manageable. The finding of IEE shows that the adverse impacts on physical, biological, socio economic and cultural environment due to the implementation of the proposed project low/medium, local and short term. Wherever possible, efforts have been made by the project planning team to limit adverse impacts on the environment by selecting environmentally benign design options and otherwise suggesting appropriate mitigation measures. Mitigation measures has been proposed for all identified/predicted adverse impacts and enhancement measures are developed for maximize the project benefits. However, those impacts/issues now not predicted/documented in this IEE report but might appear later; will also be undertaken by Environmental Management Unit during the construction phase.

The proponent NEA will have obligation to carry out the mitigation, enhancement and monitoring activities of the project. The environmental impact mitigation measures will be incorporated in detail design of the substation and so on, contract documents. The project proponent will be primarily responsible for following acts, rules, regulations (legislation and other relevant directive of GoN) while implementing the project.

The total environmental and social cost (mitigation, enhancement, CSR, and monitoring costs) of the proposed project including land cost is estimated to be NRs 323,158,381/- which is 4.31% of the total project cost.

In overall, this IEE concludes that the proposed LDTLP 220kV TL project will not have significant impacts on physical, biological, socio-economic and cultural environment of the project area. Therefore, the proposed project is environmentally and socially feasible, with adoption of suggested mitigation and enhancement measures. The IEE is adequate and no further study is supposed to be required regarding environmental assessment of the proposed project.



REFERENCES

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- DDC-Kaski, 2067. *District Profile of Kaski*, District Development Committee, Kaski (In Nepali Version)
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- DSO, 2072. *District Profile of Tanahun*, District Statistics Office, Pokhara (In Nepali Version).
- NEA, 2011. *Final Survey Report of Lekhnath-Upper Seti 220kV Transmission Line Project*, prepared by Engineering Services, Project Development Department, Nepal Electricity Authority, Kathmandu.



DECLARATION FROM IEE STUDY TEAM MEMBERS

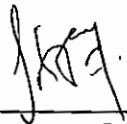
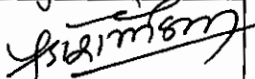
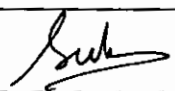

Title of the IEE Report: IEE of Lekhnath Damauli 220kV Transmission Line Project

Name/Address of the Project Proponent: Nepal Electricity Authority, Durbar Marg, Kathmandu

We declare the following:

- We have read and checked the content of this IEE report;
- We have conducted the study professionally using acceptable methodologies;
- The study findings are correct to the best of our knowledge; and have not been altered in any manner;
- The mitigating measures proposed are, to the best of our knowledge, reliable, practical and adequate to comply with the relevant legal requirements; and
- We shall be accountable for any misleading information in any part of this report

LIST OF IEE STUDY TEAM MEMBERS

S.N.	Name	Qualification	Area(s) of study in IEE	Signature
1	Rabindra Prasad Chaudhary	M.Sc. Zoology	Biological Environment	
2	Krishna Prasad Joshi	M.Sc. Statistics	Socio-economic and Cultural Environment	
3	Prakash Gaudel	M.Sc. Env. Science	Biological Environment	
4	Anup K.C.	M.Sc. Env. Science	Biological Environment	
5	Sulav Shrestha	B.E. Civil	Physical Environment	
6	Ramesh Gautam	M.A. Sociology	Socio-economic and Cultural Environment	

Date:

Official stamp:



Appendix A

Survey License and Concerned Letters



[illegible]

अनुमतिपत्र महाशाखा

अनुमतिपत्र २०७२ ७३

२०७२/११/२३

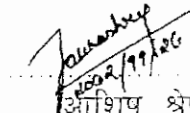
चलानी नम्बर २६१

लेखनाथ-दमौली २२० के.भी. विद्युत प्रसारण लाईन आयोजनाको सर्वेक्षण अनुमतिपत्र वारे ।

✓ श्री नेपाल विद्युत प्राधिकरण
पो.ब.न. १००२०, प्रधान कार्यालय
दरबारमार्ग, काठमाडौं
फोन: ०१-४१५३०५४ ।

प्रस्तुत विषयमा तर्हाले लेखनाथ - दमौली २२० के.भी. विद्युत प्रसारण लाईन आयोजना को सर्वेक्षण अनुमतिपत्र पाउन दिएको दरखास्त उपर कारवाही हुँदा विद्युत ऐन, २०४९को दफा ४ को उपदफा २ र विद्युत नियमावली, २०५० को नियम ८ बमोजिम नेपाल सरकार, ऊर्जा मन्त्रालय (सचिवस्तर)को मिति २०७२/११/०२को निर्णयानुसार मिति २०७४/११/०१ सम्म दुई वर्ष) बहाल रहने गरी जारी भएको २२० के.भी. प्रसारण लाईनको सर्वेक्षण अनुमतिपत्र संख्या: वि.वि.वि. ०७२/७३ वि.प्र.स. २३६ यसै पत्र साथ संलग्न गरी पठाइएको व्यहोरा अनुरोध छ ।

संलग्न: विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र संख्या वि.वि.वि. ०७२/७३ वि.प्र.स. २३६ ।


आशिष श्रेष्ठ
ईन्जिनियर

ध्यायः

श्री ऊर्जा मन्त्रालय, सिंहदरवार

श्री विद्युत विकास विभाग

➤ आयोजना अध्ययन महाशाखा

➤ निरीक्षण महाशाखा

➤ आर्थिक प्रशासन शाखा : मिति २०७२ ०६ १९ मा आ.र.नं. ४५६७ ने.रा.वै.क.ध.भौ.न.०२८९३७ बाट अनुमतिपत्र दस्तुर बापत राखेको धरौटी रकम रु १,००,०००/०० (अक्षरेपी रु.एक लाख मात्र) र मिति २०७२*०८ १६ मा आ.र.नं. ४५९७ ने.रा.वै.क.ध.भौ.न.०२९९९७ बाट अनुमतिपत्र दस्तुर बापत राखेको धरौटी रकम रु १,००,०००/०० (अक्षरेपी रु.एक लाख मात्र) गरी जम्मा भएको रु २,००,०००/०० (अक्षरेपी रु.दुई लाख मात्र) राजश्व खातामा जम्मा हुन ।





नेपाल सरकार

ऊर्जा मन्त्रालय

विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र

(लेखनाथ-दमौली २२० के.भि. विद्युत प्रसारण लाईन आयोजना)

अनुमतिपत्र संख्या : वि. वि. वि. ०७२/७३, वि.प्र.स. २३६

नेपाल विद्युत प्राधिकरण
प्रधान कार्यालय, काठमाडौं ।

हाशय

विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र पाउन मिति २०७२/०८/२१ मा दिनु भएको दस्तावेज अनुसार देहायको विवरण खोली विद्युत ऐन, २०४९ को दफा ४ को उपदफा (२) र विद्युत नियमावली, २०५० को नियम ८ बमोजिम यो अनुमतिपत्र प्रदान गरिएको छ ।

विद्युत प्रसारणको सर्वेक्षण गर्न चाहने व्यक्ति वा संगठित संस्थाको पूरा नाम र ठेगाना :

श्री नेपाल विद्युत प्राधिकरण
पो.ब.नं. १००२०, प्रधान कार्यालय,
दरबारमार्ग, काठमाडौं
फोन: ०१-४१५३०५४ ।

प्रसारण गरिने विद्युत उपलब्ध गराउने परियोजना /स्थानको विवरण :-
नेपाल विद्युत प्राधिकरणको केन्द्रीय प्रसारण प्रणाली ।

विद्युत प्रसारण कहाँबाट कहाँ गर्ने हो सो को विवरण :-

गण्डकी अञ्चल कास्की जिल्लाको लेखनाथ नगरपालिकामा नेपाल विद्युत प्राधिकरणको सवस्टेसन देखि सोहि जिल्लाको कालिका, माभथाना, हंसपुर हुँदै गण्डकी अञ्चल तनहुँ जिल्लाको रुपाकोट, देउराली, पेलुङ्गा, सल्यानडाँडा, थुम्की, सिद्ध, स्याम्घा, ब्यास नगरपालिका, मनपन, जामुने गा.वि.स.हुँदै कुशु शिवपुरमा प्रस्तावित नेपाल विद्युत प्राधिकरणको सवस्टेसन सम्म र ब्यास नगरपालिकाको दमौली सवस्टेसन सम्म ।

सर्वेक्षण गर्ने क्षेत्र :

(क) अञ्चल	: गण्डकी ।
(ख) जिल्ला	: कास्की र तनहुँ ।
(ग) गा.वि.स.र नगरपालिका	: प्रकरण ३ मा उल्लेख भएको प्रसारण लाईनको रूटमा पर्ने गा.वि.स. तथा न.पा हरू।
(घ) पूर्व:	८४° २०' ००" पू
उत्तर:	२८° १३' ४५" ऊ
पश्चिम:	८४° ०२' ३०" पू
दक्षिण:	२७° ५७' ००" ऊ

विद्युत प्रसारणको भोल्टेज र परिमाणहरू :-

भोल्टेज : २२०,००० भोल्ट (डबल सर्किट) ।
परिमाण : ६०० मेगावाट ।

सर्वेक्षण प्रकृति :- संभाव्यता अध्ययन तथा वातावरणीय अध्ययन ।

अनुमतिपत्र बहाल रहने अवधि :-

मिति : २०७२/११/०२ देखि २०७४/११/०१ सम्म ।



ATM विभाग

1936 2 72

संघात विद्युत प्राधिकरण
समाचारण सभा सांघातिका अध्यक्षता विभाग
दस्तावेज १२५
मिति २०६५.१२.१५

(मुकेश रंज दाहाल)
प्रबन्धक
ATM Department

श्रीमान् उपसहानिदेशकज्य. ANSनिदेशनाम्न, नं सा डू प्रा. प्रधान कार्यालय ।

Appendix B


Documents Related to Physical Environment



Appendix B: Documents related to Physical Environment

Appendix B-I (a): Types of Land Falling under TL

Line Components	Stretch		Land Type, ha										Total Area, ha	
			Forest Area (ha)			Cultivated		Barren		Others				
	From AP	To AP	Gvt.	CF	LHF	Rel.	Pvt.	Gvt.	Pvt.	Gvt.	Pvt.	Public		Pvt.
Under TL conductor (including Tower Pads area)	1	2	-	-	-	-	-	-	-	-	-	-	-	0.2684
	2	3	-	-	-	-	0.1143	-	-	-	-	-	-	0.9344
	3	4	-	0.8313	-	-	-	-	-	-	-	-	-	1.1619
	4	5	-	2.1599	-	-	-	-	-	-	-	-	-	4.4448
	5	6	-	-	-	-	0.2501	-	-	-	-	-	-	2.6846
	6	7	-	2.6773	-	-	1.2	-	-	-	-	0.16674	-	4.5659
	7	8	-	0.78	-	-	0.5647	-	-	-	-	-	-	1.3447
	8	9	0.2	0.4954	-	-	0.2	-	-	-	-	-	-	1.4509
	9	10	0.5	-	-	-	0.7876	-	-	-	-	-	-	1.6706
	10	11	-	-	-	-	0.0333	-	-	-	-	-	-	0.9847
	11	12	-	0.2961	-	-	0.17	-	-	-	-	-	-	2.5087
	12	13	-	0.5663	-	-	0.19	-	-	-	-	-	-	2.2366
	13	14	-	0.476	-	-	0.1	-	-	-	1.69578	-	-	2.6908
	14	15	-	1.21	-	-	1.1333	-	-	-	-	0.16533	-	4.8951
	15	16	-	1.3017	-	-	1.4802	-	-	-	-	-	-	3.7051
	16	17	-	1.9085	-	-	0.5	-	-	-	-	-	-	2.9764
	17	18	-	-	-	-	-	-	-	-	-	-	-	3.6852
	18	19	-	-	-	-	0.5043	-	-	-	-	-	-	2.6534
	19	20	-	1.6019	-	-	1.0223	-	-	-	-	-	-	7.0928
	20	21	-	2.0171	-	-	1.4019	-	-	-	-	0.26823	-	6.0248
	21	22	-	0.8899	-	-	0.42	-	-	-	-	0.16569	-	4.6731
	22	23	-	0.0625	-	-	-	-	-	-	-	-	-	8.4017
	23	24	-	0.4869	-	-	0.28	-	-	-	-	-	-	2.2850
	24	25	-	1.4218	-	-	0.45	-	-	-	-	-	-	3.6249
	25	26	-	0.0782	-	-	0.03	-	-	-	-	-	-	1.2229
	26	27	-	-	-	-	0.006	-	-	-	-	-	-	1.5863
	27	28	-	0.1173	-	-	0.11	-	-	-	-	0.15363	-	2.5635
	28	29	-	0.7049	-	-	0.3	-	-	-	-	-	-	3.8230



भारत सरकार
महाराष्ट्र

IEE Report

NEA-ESSD



Line Components	Stretch		Land Type, ha										Total Area, ha	
			Forest Area (ha)				Cultivated		Barren		Others			
	From AP	To AP	Gvt.	CF	LHF	Rel.	Pvt.	Govt.	Pvt.	Gvt.	Pvt.	Public		Pvt.
Under TL conductor (including Tower Pads area)	29	29A	-	-	-	-	0.121	-	-	1.7083	-	-	-	1.8293
	29A	30	-	0.1226	-	-	-	-	-	1.4329	-	-	-	1.5555
	30	31	-	0.3492	-	-	0.2	-	-	1.6568	-	-	-	2.2060
	31	32	-	0.5311	-	-	0.4	-	-	1.9463	-	0.52572	-	3.4031
	32	33	-	-	-	-	-	-	-	2.6917	-	0.68079	-	3.3725
	33	34	-	-	-	-	-	-	-	7.1909	-	0.22086	-	7.4117
	34	35	-	-	-	-	-	-	-	3.9200	-	0.06984	0.22566	4.2155
	35	36	-	-	-	-	-	-	-	1.8709	-	0.16815	-	2.0390
	36	37	-	-	-	-	-	-	-	0.6474	-	0.3756	-	1.0230
	37	38	-	-	-	-	-	-	-	3.1928	-	0.03	-	3.2228
	38	39	-	0.3988	-	-	0.22	-	-	2.8961	-	0.018	-	3.5329
	39	40	-	0.21	-	-	0.144	-	-	1.4304	-	0.28506	-	2.0694
	40	41	-	-	-	-	0.2609	-	-	1.4193	-	-	-	1.6802
	41	42	-	-	-	-	-	-	-	2.0054	-	-	-	2.0054
	42	43	-	-	-	-	-	-	-	0.5604	-	0.46563	-	1.0260
	Tower Pads	Total number of tower pads/area		-	24/0.54	-	-	-	-	-	76/1.71	22/0.495	1/0.0225	-
Substation	Near powerhouse		-	-	-	-	-	-	-	6.0000	-	-	-	6.0
Camp and Storage	Along the stretch		-	-	-	-	-	-	-	0.50	-	-	-	0.5
Switching station	Near AP 35		-	-	-	-	-	-	-	0.10	-	-	-	0.1
Mobile Camp	Along the stretch		-	-	-	-	-	-	-	-	-	1.25	-	1.25
	Total Area		0.7	21.6947	-	-	-	12.5939	-	92.6937	-	3.60737	3.3233	134.6125

Appendix B-I (b): Types of Land acquired under TL

Line Components	Particulars	Land Type, ha											Total Area, ha
		Forest Area (ha)				Cultivated			Barren		Others		
		Gvt.	CF	LHF	Rel.	Pvt.	Govt.	Pvt.	Gvt.	Pvt.	Public	Pvt.	
Tower Pads	Total number of tower pads/area	-	24/0.54	-	-	-	-	76/1.71	22/0.495	1/0.0225	-	-	2.7675
	Substation	-	-	-	-	-	-	6.0000	-	-	-	-	6.0
Switching station	Near AP 35	-	-	-	-	-	-	0.10	-	-	-	-	0.1
	Total Area	-	0.54	-	-	-	-	7.81	0.495	0.0225	-	-	8.8675

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Appendix B-II: Altitudinal Variation along the Alignment

S.N	APs	Elevation	Address			Land Use
			Village	Rural Municipality/ Municipality*/ MC**	District	
1	AP 1	740.643	Kharene	Pokhara Lekhnath**	Kaski	BL
2	AP 2	749.639	Badaare Danda			CL
3	AP 3	798.241	Dharmashala			CL
4	AP 4	814.073	Pakhuridada			FL
5	AP 5	887.064	Aarupata			BL
6	AP 6	1019.689				FL
7	AP 7	783.912				BL
8	AP 8	874.952				FL
9	AP 9	1025.128	Simalpata			BL
10	AP 10	1184.699	Kotpari			CL
11	AP 11	1176.165	Kotbari			CL
12	AP 12	1123.658	Chipleti Bhangere dada			FL
13	AP 13	1070.282	Begnasgau			FL
14	AP 14	853.429	Lapsidada Kahare			CL
15	AP 15	744.497	Ulleri-Talbesi	Rupa	Kaski	CL
16	AP 16	868.245				CL
17	AP 17	1144.203	Pakhagau-Mauriya			BL
18	AP 18	905.923	Pelungthumki			CL
19	AP 19	900.133	Sirkutanidada			CL
20	AP 20	780.225	Bhurung Deupur			CL
21	AP 21	682.464				FL
22	AP 22	441.54				CL
23	AP 23	1014.942	Dandagau Sisaghat	Byas*	Tanahun	FL
24	AP 24	786.514	Chaudal thok			CL
25	AP 25	443.839	Pokharedada			FL
26	AP 26	503.7	Shekhatar			CL
27	AP 27	405.633	Shekhatar			CL
28	AP 28	424.157				FL
29	AP 29	368.25				CL
30	AP 29A	375.395				
31	AP 30	851.038	Pakhure bhangyang			CL
32	AP 31	505.354	Ratadada			BL
33	AP 32	364.175				CL
34	AP 33	347.675				CL
35	AP 34	327.508				CL
36	AP 35	361.241				CL
37	AP 36	454.031	Panamdigau			CL
38	AP 37	595.069				CL
39	AP 38	550.858	Saurahagau			CL
40	AP 39	379.292	Beteni gau			FL
41	AP 40	489.495	Swamidada Gyaja	Kahun Shivapur	BL	
42	AP 41	469.528	Ghyansingdada		CL	
43	AP 42	389.226	Malingagau		CL	
44	AP 43	360.00	Belbas	Byas*		CL



Appendix B-III: Temperature Data**Table 1: Temperature Data of Pokhara Regional Office, Kaski**

S.N	Year	Tmax		Tmin	
		°C	Month	°C	Month
1	2010	32.1	April	7.4	January
2	2011	31.3	June	6.5	January
3	2012	31.9	June	7.5	January
4	2013	31.3	August	6.3	January

Table 2: Temperature Data of Damauli, Tanahun

S.N	Year	Tmax		Tmin	
		°C	Month	°C	Month
1	2007	35.6	May	9.4	December
2	2008	34.3	July	6.7	December
3	2009	35.6	April	9.5	January
4	2010	35.7	April	8.5	February
5	2011	34.9	May	7.5	January
6	2012	35.6	May	8.3	January
7	2013	35.3	September	7.9	January
8	2014	37.1	May	9.3	January



Appendix B-IV: Precipitation Data

Table 3: Precipitation Data of Lamachaur, Kaski

S.N	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Max	Avg
1	2007	0	221	46.6	199.4	404.6	803.4	1100.4	799.6	1444.8	249	92.4	4	1444.8	447.1
2	2008	11.4	0	36.6	65	402.2	1030	722.6	1225.6	704.6	41.4	8.8	0	1225.6	354.0167
3	2009	4	0	16.4	65.6	275.4	474.4	1142.4	966.2	752	180.2	2	4.8	1142.4	323.6167
4	2010	0	80.8	97.8	114.4	392.8	813	1328.6	1304.2	734.6	92.5	2	0	1328.6	413.3917
5	2011	10	22.2	30	160.4	212.6	584.3	1476.6	860.8	711.8	55.2	49.2	0	1476.6	347.7583
6	2012	6	36.6	30.8	176	174.8	697	1333.2	1004	722.4	181.4	0	0	1333.2	363.5167
7	2013	10	32.2	39	113.6	275.9	921.1	1045.6	727.1	318.6	299.6	2.2	2	1045.6	315.575
8	2014	12.8	14.8	61.6	58	110.7	463.8	1031.6	1469.4	638.8	96.2	0	21.2	1469.4	331.575
9	2015	56.4	44.8	134	92.8	143.2	461.2	1075.4	1063	629.4	112.8	52.6	0	1075.4	322.1333

Table 4: Precipitation Data of Rumjakot, Tanahun

S.N	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Max	Avg
1	2007	0	172.3	52.6	75.2	70	305.2	311.9	296.8	542.4	65.3	0	0	542.4	157.64
2	2008	8.7	0	48.3	28.2	194.4	274.8	316.1	219.4	130.5	62.4	0	0	316.1	106.90
3	2009	0	0	0	2.1	241.8	334.6	399.1	307.7	50.6	146.7	0	0	399.1	123.55
4	2010	0	32.4	4.1	19.4	181	213.9	446.5	443.3	288.7	29.4	0	0	446.5	138.23
5	2011	5.1	25.7	16.7	46.7	181.5	324.6	598.6	307.1	149.9	9.2	43.5	0.5	598.6	142.43
6	2012	23.4	64.2	15.5	108.6	112.6	183.5	440.6	229.6	253.5	0	0	0	440.6	119.29
7	2013	14.8	65.5	23.4	110.9	251.4	617.2	709.8	199.3	28.5	132.5	0	0	709.8	179.44
8	2014	14.2	5.2	16.6	9.1	77	186.8	355.4	687.7	153.1	188.5	0	22.1	687.7	142.98
9	2015	0	61.7	5.2	130.2	196.6	297.3	234	296.4	28.6	12.3	0	0	297.3	105.19

Appendix C

Documents Related to Biological Environment



Appendix C: Document related to Biological Environment

Appendix C-I: List of Plant Species

S.N.	Botanical Name	Local Name	Growth Form	S.N.	Botanical Name	Local Name	Growth Form
1	<i>Zingiber officinale</i>	Aduwa	H	27	<i>Lagerstroemia</i> spp.	Bot Dhayaro	T
2	<i>Magnifera indica</i>	Aanp	T	28	<i>Sambucus</i> sp.	Buki	H
3	<i>Drymaria diandra</i>	Abijalo	H	29	<i>Oxalis corymbosa</i>	Chari Amilo	H
4	<i>Rubus ellipticus</i>	Ainselu	S	30	<i>Schima wallichii</i>	Chilaune	T
5	<i>Walsura triguga</i>	Akhataruwa	T	31	<i>Madhuca butyraceae</i>	Chiuri	T
6	<i>Phyllanthus emblica</i>	Amala	T	32	<i>Brassapopsis glomeulata</i>	Chuletro	T
7	<i>Psidium guajava</i>	Amba	T	33	<i>Berberis asiatica</i>	Chutro	S
8	<i>Thysanolaena maxima</i>	Amriso	S	34	<i>Parthenium hysterophorus</i>	Congress grass	H
9	<i>Osbeckia nepalensis</i>	Angeri	S	35	<i>Boehmeria rugulosa</i>	Daar	T
10	<i>Mimosa rubicaulis</i>	Areli Kanda	S	36	<i>Lannea coromandellica</i>	Dabdabe	T
11	<i>Euphorbia hirta</i>	Asthma weed	H	37	<i>Truimfetta rhomboides</i>	Dallekuro	S
12	<i>Justicia adhatoda</i>	Asuro	S	38	<i>Achyranthes spora</i>	Datiwan	S
13	<i>Eulaliopsis binata</i>	Babiyo	H	39	<i>Woodfordia fruticosa</i>	Dhanyero	S
14	<i>Artocarpus lakoocha</i>	Badahar	T	40	<i>Ficus nemoralis</i>	Dudhilo	T
15	<i>Melia azedarach</i>	Bakaino	T	41	<i>Juniperus indica</i>	Dhupi	T
16	<i>Quercus lanata</i>	Banjh	T	42	<i>Colebrookia oppositifolia</i>	Dhurseli	S
17	<i>Eupatorium odoratum</i>	Banmara	H	43	<i>Cynodon dactylon</i>	Dubo	H
18	<i>Bambusa</i> spp.	Bans	S	44	<i>Ficus neriifolia</i>	Dudhilo	T
19	<i>Dioscorea</i> sp.	Bantarul	C	45	<i>Cirsium arvense</i>	Gaidakade	S
20	<i>Ficus bengalensis</i>	Bar	T	46	<i>Ageratum conyzoides</i>	Gande	H
21	<i>Ficus sarmentosa</i>	Berula	T	47	<i>Campanula pallida</i>	Ghantejhar	H
22	<i>Aegle marmelos</i>	Bel	T	48	<i>Centella asiatica</i>	Ghodtapre	H
23	<i>Chenopodium album</i>	Bethe	H	49	<i>Dioscorea</i> sp.	Githa	C
24	<i>Rhus wallichii</i>	Bhalayo	T	50	<i>Rhododendron arboreum</i>	Gurans	T
25	<i>Buddleja asiatica</i>	Bhimensepati	T	51	<i>Ziziphu incurva</i>	Hade bayar	T
26	<i>Maesia chisla</i>	Bilaune	S	52	<i>Dicranopteris linearis</i>	Hade Unyu	S
53	<i>Eurya acuminata</i>	Jhingane	T	82	<i>Pyrus communis</i>	Naspati	T
54	<i>Ficus lacor</i>	Kabhro	T	83	<i>Ficus carica</i>	Nibaro (Nebharo)	T
55	<i>Tectaria macrodonta</i>	Kali neuro	H	84	<i>Arundo donax</i>	Nigalo	S

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S.N.	Botanical Name	Local Name	Growth Form	S.N.	Botanical Name	Local Name	Growth Form
56	<i>Saccharum spontaneum</i>	Kans	H	85	<i>Ficus glaberrima</i>	Pakhri	T
57	<i>Myrica eiculenta</i>	Kafal	T	86	<i>Prunus cerasoides</i>	Paiyu	T
58	<i>Artocarpus heterophyllus</i>	Katahar (Jack fruit)	T	87	<i>Nephrolepis cordifolia</i>	Paniamala	H
59	<i>Castanopsis indica</i>	Katus	T	88	<i>Erythrina strica</i>	Phaledo	T
60	<i>Machilus gambiei</i>	Kaulo	T	89	<i>Ficus religiosa</i>	Pipal	T
61	<i>Musa paradisiaca</i>	Kera (Banana)	T	90	<i>Mallotus oppositifolius</i>	Ramnitha	T
62	<i>Diospyros malabarica</i>	Khallu (Tiju)	T	91	<i>Ajuga bracteosa</i>	Rato pate	H
63	<i>Ficus semicordata</i>	Khanyu	T	92	<i>Jatropha curcas</i>	Sajiwon	S
64	<i>Typha spp.</i>	Khar	H	93	<i>Terminalia elliptica</i>	Saj	T
65	<i>Pogonatherum crinitum</i>	Khari banso	H	94	<i>Shorea robusta</i>	Sal	T
66	<i>Ficus hispida</i>	Khasreto	T	95	<i>Pinus spp.</i>	Saila	T
67	<i>Sapium insigne</i>	Khirro	T	96	<i>Lindera neesiana</i>	Siltimur	T
68	<i>Morus alba</i>	Kimbu	T	97	<i>Bombax ceiba</i>	Simal	T
69	<i>Bauhinia variegata</i>	Koiralo	T	98	<i>Albizia spp.</i>	Siris	T
70	<i>Kydia calycina</i>	Kubindo	C	99	<i>Imperata spp.</i>	Siru	H
71	<i>Asparagus spp.</i>	Kunilo	H	100	<i>Urtica dioica</i>	Sisnu	S
72	<i>Bidens biternata</i>	Kuro	H	101	<i>Citrus aurantium</i>	Suntala (Orange)	T
73	<i>Schefflera venulosa</i>	Kursimlo	C	102	<i>Ficus benjamina</i>	Swami	T
74	<i>Litsea monopetala</i>	Kutmero	T	103	<i>Bauhinia purpurea</i>	Tanki	T
75	<i>Mimosa pudica</i>	Lajabati	H	104	<i>Cinnamomum tamala</i>	Tejpat	T
76	<i>Euphorbia pulcherrima</i>	Lalupate	S	105	<i>Zanthoxylum armatum</i>	Timur	T
77	<i>Fraxinus floribunda</i>	Lankure	T	106	<i>Trifolium repens</i>	Tinpate	H
78	<i>Choerospondias axillaris</i>	Lapsi	T	107	<i>Artemisia vulgaris</i>	Titepati	S
79	<i>Macaranga indica</i>	Malato	T	108	<i>Momordica charantia</i>	Tito karela	C
80	<i>Engelhardtia spicata</i>	Mauwa	T	109	<i>Cedrella toona</i>	Tuni	T
81	<i>Carica papaya</i>	Mewa	T	110	<i>Saccharum officinarum</i>	Ukhu	S
111	<i>Alnus nepalensis</i>	Utis	T	Growth Forms: H: Herbs, S: Shrubs, T: Tree, C: Climbers			

Total Loss of Vegetation in Terms of Plant Species in Community Forest

SN	Local Name	Botanical Name	DBH range (cm)	Seedling /ha	Saplings/ ha	No		Standing Wood Volume (m³)	Dry Biomass (ton)	Biomass Usages
						Pole	Tree			
1	Amala	Phyllanthus emblica	6 to 9	0	15	0	0	2.07	1.89	Fuel wood, Timber, Fodder
2	Amba	Psidium guajava	2 to 9	14	10	0	0	1.41	1.27	
3	Angeri	Osbeckia nepalensis	2 to 9	483	268	0	0	37.53	33.77	
4	Botdhairo	Lagerstroemia parviflora	2 to 35	124	66	300	30	36.87	33.45	
5	Chilaune	Schima wallichii	2 to 72	1448	679	4230	810	1790.31	1624.42	
6	Dhurseli	Colebrookea oppositifolia	2 to 9	83	58	0	0	8.04	7.30	
7	Epil Epil	Leucaena diversifolia	10 to 11	0	0	60	0	1.71	1.55	
8	Kafal	Mynca eiculenta	13 to 21	0	0	120	0	9.18	8.33	
9	Katus	Castanopsis sps.	2 to 57	688	408	1530	210	567.36	514.80	
10	Khirro	Sapium insigne	2 to 36	25	30	330	30	41.37	37.54	
11	Lankuri	Fraxinus floribunda	2 to 12	0	13	60	0	4.08	3.71	
12	Mango	Magnifera indica	2 to 9	9	6	0	0	0.87	0.79	
13	Mauwa	Engelhardtia spicata	2 to 15	39	21	60	0	6.90	6.26	
14	Padke	Albizia julibrissin	2 to 34	19	13	270	90	132.66	120.38	
15	Phalat	Quercus lamellosa	2 to 15	13	8	60	0	4.35	3.95	
16	Ramritha	Mallotus oppositifolius	2 to 32	38	25	180	30	66.09	59.98	
17	Rato pate	Ajuga bracteosa	44	0	0	0	30	43.32	39.32	
18	Sal	Shorea robusta	2 to 76	1763	1041	3360	1530	5114.34	4640.44	
19	Sallo	Pinus sp.	2 to 38	6	36	480	120	159.57	144.79	
20	Simal	Bombax ceiba	2 to 38	5	4	0	30	20.94	19.00	
21	Swami	Ficus benjamina	25 to 35	0	0	30	30	696.93	632.36	
22	Tiju	Diospyros malabarica	2 to 10	214	118	30	0	17.31	15.70	
23	Utis	Alnus nepalensis	2 to 21	15	13	120	0	9.12	8.29	
Total				4981	2428	11220	2940	8772.33	7959.28	

Total forest Loss

S. No.	Type of forest	Area (ha.)	Loss of Vegetation				Crown Cover (%)	Standing Wood Volume (m³)	Dry Biomass of Standing Tree (Ton)	Biomass Usages*
			Loss of Regeneration		Loss of Tree (no.)					
			Seedlings per ha.	Saplings per ha.	Pole class	Tree class				
1.	Government	0.7	4981	2428	11220	2940	40-80	8772.33	7959.28	Timber, Firewood, Fodder, NTFP
2.	Community	21.6947								NA
3.	Religious	NA	NA	NA	NA	NA	NA	NA	NA	NA
4.	Leasehold	NA	NA	NA	NA	NA	NA	NA	NA	NA
5.	Private Shrubland	12.5937	NA	NA	NA	2200	1000	30-60	NA	Timber, Firewood, Fodder, NTFP
	Total	34.9884	4981	2428	13420	3940	30-80	8772.33	7959.28	

Forest Sampling Data

SN	Common name	Botanical Name	No of individual spp in 20 plots	Density (No. of ind./ ha	No of plot species occurred	Frequency (%)	Basal Area (m ² /ha)	Relative Frequency	Relative Density	Relative Dominance	IVI
1	Amala	Phyllanthus emblica	12	15	1	5	0.073	1.23	0.18	0.13	1.54
2	Amba	Psidium guajava	19	24	1	5	0.050	1.23	0.28	0.09	1.60
3	Angeri	Osbeckia nepalensis	600	750	11	55	1.335	13.58	8.93	2.32	24.83
4	Botdhairo	Lagerstroemia parviflora	163	204	5	25	0.668	6.17	2.43	1.16	9.76
5	Chilaune	Schima wallichii	1869	2336	18	90	14.826	22.22	27.81	25.76	75.79
6	Dhurseli	Colebrookea oppositifolia	112	140	4	20	0.285	4.94	1.67	0.50	7.10
7	Epil Epil	Leucaena diversifolia	2	3	1	5	0.026	1.23	0.03	0.05	1.31
8	Kafal	Myrica eculenta	4	5	1	5	0.145	1.23	0.06	0.25	1.55
9	Katus	Castanopsis sps.	934	1168	7	35	6.013	8.64	13.90	10.45	32.99
10	Khirro	Sapium insigne	56	70	5	25	0.585	6.17	0.83	1.02	8.02
11	Lankuri	Fraxinus floribunda	12	15	2	10	0.093	2.47	0.18	0.16	2.81
12	Mango	Magnifera indica	12	15	1	5	0.031	1.23	0.18	0.05	1.47
13	Mauwa	Engelhardtia spicata	50	63	3	15	0.149	3.70	0.74	0.26	4.71
14	Padke	Albizia julibrissin	37	46	1	5	0.951	1.23	0.55	1.65	3.44

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SN	Common name	Botanical Name	No of individual spp in 20 plots	Density (No. of ind./ ha	No of plot species occurred	Frequency (%)	Basal Area (m ² /ha)	Relative Frequency	Relative Density	Relative Dominance	IVI
15	Phalat	<i>Quercus lamellosa</i>	18	23	1	5	0.083	1.23	0.27	0.14	1.65
16	Ramritha	<i>Mallotus oppositifolius</i>	57	71	1	5	0.585	1.23	0.85	1.02	3.10
17	Rato pate	<i>Ajuga bracteosa</i>	1	1	1	5	0.238	1.23	0.01	0.41	1.66
18	Sal	<i>Shorea robusta</i>	2406	3008	8	40	26.505	9.88	35.80	46.05	91.73
19	Sallo	<i>Pinus sp.</i>	54	68	3	15	1.650	3.70	0.80	2.87	7.37
20	Simal	<i>Bombax ceiba</i>	8	10	1	5	0.195	1.23	0.12	0.34	1.69
21	Swami	<i>Ficus benjamina</i>	2	3	1	5	2.310	1.23	0.03	4.01	5.28
22	Tiju	<i>Diospyros malabarica</i>	266	333	3	15	0.599	3.70	3.96	1.04	8.70
23	Utis	<i>Alnus nepalensis</i>	26	33	1	5	0.169	1.23	0.39	0.29	1.91
Total			6720	8400	81	405	57.561	100	100	100	300



Appendix C-III: List of Mammals

S.N.	Scientific Name	Common Name	Local Name	CITIES Appendix	Global IUCN Status
1.	<i>Canis aerus</i>	Jackal	Syal	-	-
2.	<i>Felis chaus</i>	Jungle cat	Ban Biralo	II	LC
3.	<i>Funaribus sp.</i>	Squirrel	Lokharke	-	-
4.	<i>Herpestis edwardsi</i>	Common Mongoose	Nyauri Musa	-	-
5.	<i>Hystrix indica</i>	Porcupine	Dumsi	-	LC
6.	<i>Lepus nigricolis</i>	Rabbit	Kharayo	-	-
7.	<i>Macaca assamensis</i>	Langur	Dhendu	-	-
8.	<i>Macaca mulata</i>	Rhesus Macaque	Rato Bandar	II	LC
9.	<i>Martes flavigula</i>	Yellow throated marten	Mal sapro	-	-
10.	<i>Muntiacus muntjak</i>	Barking deer	Mriga	-	LC
11.	<i>Mus musculus</i>	House mouse	Musa	-	-
12.	<i>Panthera pardus</i>	Common Leopard	Chituwa	I	NT
13.	<i>Pteropus sp.</i>	Bat	Chamero	-	-
14.	<i>Presbytis entellus</i>	Common Langur	Langur	-	-
15.	<i>Rattus rattus</i>	House rat	Musa	-	LC

NT= Near Threatened, LC= Least Concern

No any protected mammal is reported as per the National Parks and Wildlife Conservation Act, 1973.

Appendix C-IV: List of Birds

S.N.	Scientific Name	Local Name	Habitat	CITIES Appendix	Global IUCN Status
1.	<i>Apus affinis</i>	Gaunthali	O	-	-
2.	<i>Bubulcus ibis</i>	Bakulla	O	-	-
3.	<i>Buteo sp.</i>	Baj	O	II	-
4.	<i>Chrysocolaptes lucidus</i>	Kath Phoruwa	F	-	-
5.	<i>Cissa erythrorhyncha</i>	Lampuchchhre	F	-	-
6.	<i>Corvus splendens</i>	Kag	O	-	-
7.	<i>Cuculus canorus</i>	Koili	F	-	-
8.	<i>Dicrurus spp.</i>	Chibe	O, F	-	-
9.	<i>Falco tinnunculus</i>	Baudai	O	II	-
10.	<i>Gyps bengalensis</i>	Giddha (White Rumped Vulture)	O	II	CR
11.	<i>Sarcogyps calvus</i>	Giddha (Red Headed Vulture)	O	-	CR
12.	<i>Lophura leucomelana</i>	Kalij	F	-	-
13.	<i>Megalaima virens</i>	Nyauli	O	-	-
14.	<i>Milvus migrans</i>	Chil	O	II	-
15.	<i>Myophonus caeruleus</i>	Kalchaudo	F, R	-	-
16.	<i>Passer domesticus</i>	Bhangera (House sparrow)	O	-	-
17.	<i>Phylloscopus spp.</i>	Fisto	F	-	-
18.	<i>Pycnonotus cafer</i>	Jureli	O	-	-
19.	<i>Streptopelia chinensis</i>	Dhukur	O	-	-
20.	<i>Surniculus lugubris</i>	Koili	O	-	-

Habitat Code: O = Open or mixed country, F = Forest, R = on or nearby river

CR= Critically Endangered,

No any protected bird species is reported as per the National Parks and Wildlife Conservation Act, 1973.

Appendix D
Documents Related to Socio-Economic and
Cultural Environment



Appendix D: Documents related to Socio-economic Environment**Appendix D-I: Percentage of Loss of Land of Project Affected Surveyed Households**

S. N.	RM/Municipality*/MC	Project Component	Name	Affected Land	Total Land	Percentage of Land Loss
1	Byas*	Substation	Jit Bd Thapa	0.0351	0.753	4.66
2	Byas*	Substation	Tara Maya Thapa	0.0510	0.523	9.76
3	Byas*	Substation	Sanari Thapa	0.0510	0.357	14.29
4	Byas*	Substation	Rupa Thapa	0.0510	0.676	7.55
5	Byas*	Substation	Sita Ram Bagale	0.0893	0.357	25.00
6	Byas*	Substation	Ratna Maya Neupane	0.1020	0.153	66.67
7	Byas*	Substation	Bharat Mani Bagale	0.0670	0.587	11.41
8	Byas*	Substation	Ram Krishna Neupane	0.1531	0.204	75.00
9	Byas*	Substation	Dipak Thapa Magar	0.0510	1.071	4.76
10	Byas*	Substation	Keshav Thapa	0.1626	0.816	19.92
11	Byas*	Substation	Kumari Thapa	0.0510	0.918	5.56
12	Byas*	Substation	Man Kumar Ale	0.1276	3.954	3.23
13	Byas*	Substation	Prem Bd Ale	0.2041	1.990	10.26
14	Byas*	Substation	Indra Bd Thapa	0.3061	2.857	10.71
15	Byas*	Substation	Amar Bd Ale	0.1531	0.714	21.43
16	Byas*	Substation	Bhim Bd Ale	0.1531	1.276	12.00
17	Byas*	Substation	Suk BD Rana	0.7653	1.939	39.47
18	Byas*	Substation	Bhakta BD Rana	0.8163	0.867	94.12
19	Byas*	Substation	Tek Bd Rana	0.2041	1.020	20.00
20	Byas*	Substation	Chet Bd Rana	0.3571	2.551	14.00
21	Byas*	Substation	Bel Bd Rana	0.1020	0.255	40.00
22	Byas*	Substation	Yam Bd Ale	0.3061	1.327	23.08
23	Byas*	Substation	Narayan Bd Rana	0.6122	1.224	50.00
24	Byas*	Substation	Gan Bd Rana	0.1020	0.765	13.33
25	Byas*	Substation	Purna Bd Rana	0.1531	0.561	27.27
26	Pokhara-Lekhnath MC	AP2	Bindu Thapamagar	0.0225	0.102	22.05
27	Pokhara-Lekhnath MC	AP3	Mitra Lamichhane	0.0225	2.618	0.86
28	Pokhara-Lekhnath MC	AP5	Bodh Raj Tripathi	0.0225	0.867	2.59
29	Pokhara-Lekhnath MC	AP10	Hari Bd Sapkota	0.0225	0.204	11.03
30	Pokhara-Lekhnath MC	AP11	Ramesh	0.0225	0.521	4.32
31	Pokhara-Lekhnath MC	AP14	Dilmaya Tiwari	0.0113	0.306	3.68
32	Pokhara-Lekhnath MC	AP14	Rajendra Tiwari	0.0113	0.561	2.00
33	Rupa RM	AP15	Bhim Bd Gurung	0.0225	0.510	4.41
34	Rupa RM	AP16	Yam Bd Gurung	0.0225	1.122	2.00
35	Rupa RM	AP18	Bhagwan Subedi	0.0225	1.888	1.19
36	Rupa RM	AP19	Mahadev Subedi	0.0225	0.459	4.90
37	Rupa RM	AP20	Hem Raj Koirala	0.0113	0.255	4.41
38	Rupa RM	AP20	Narayan Krishna Koirala	0.0113	1.122	1.00
39	Rupa RM	AP22	Pun Narayan Shrestha	0.0225	0.786	2.86
40	Byas*	AP24	Hema Dura	0.0225	0.255	8.82
41	Byas*	AP27	Jas Narayan Shrestha	0.0225	0.459	4.90
42	Byas*	AP29 & 29A	Bishnu Pd Neupane	0.0338	0.375	8.99
43	Byas*	AP29	Laxmi Shrestha	0.0225	1.341	1.68
44	Byas*	AP30	Bir Bd Gurung	0.0225	0.306	7.35
45	Byas*	AP32	Nanu Maya Subedi	0.0225	0.306	7.35

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S. N.	RM/Municipality*/MC	Project Component	Name	Affected Land	Total Land	Percentage of Land Loss
46	Byas*	AP33	Narayan Giri	0.0225	0.281	8.02
47	Byas*	AP33	Surendra Pandit	0.0225	0.306	7.35
48	Byas*	AP34	Jhilke Kumal	0.0225	0.515	4.37
49	Byas*	AP35	Purna Chandra Khanal	0.0225	0.357	6.30
50	Byas*	AP36	Hari Bd Thapa	0.0225	0.408	5.51
51	Byas*	AP37	Tek Bd Rana	0.0225	0.515	4.37
52	Byas*	AP38	Padam BD Ale	0.0225	1.735	1.30
53	Rising RM	AP40	Lok Bd BK	0.0225	0.179	12.60
54	Rising RM	AP41	Lal Bd Bk	0.0225	0.153	14.70
55	Rising RM	AP42	Khim Bd Ale	0.0225	1.939	1.16
Total				5.8676	48.45	12.11



Appendix D-II: Production Loss of PAFs

S. N.	RM/ Municipality* /MC	Project Component	Owners name	Loss of Crop due to Land Acquisition				Total Crop Production of the Families							
				Paddy MT	Wheat MT	Maize MT	Millet MT	Paddy		Wheat		Maize		Millet	
								MT	%	MT	%	MT	%	MT	%
1	Byas*	Substation	Jit Bd Thapa	0.11		0.08		0.24	43.99		0.00	0.90	8.89		0.00
2	Byas*	Substation	Tara Maya Thapa	0.16		0.12		0.48	33.33		0.00	0.60	19.39	0.12	0.00
3	Byas*	Substation	Sanari Thapa	0.18		0.12		0.36	50.00		0.00	0.60	19.39	0.36	0.00
4	Byas*	Substation	Rupa Thapa	0.15		0.12		0.36	42.66		0.00	0.60	19.39	0.36	0.00
5	Byas*	Substation	Sita Ram Bagale	0.29		0.20		0.78	37.18		0.00	0.30	67.86	0.24	0.00
6	Byas*	Substation	Ratna Maya Neupane	0.31	0.22	0.23		1.20	25.60	0.54	39.87	0.30	77.55	0.12	0.00
7	Byas*	Substation	Bharat Mani Bagale	0.20		0.15		0.42	47.99		0.00	0.24	63.62	0.30	0.00
8	Byas*	Substation	Ram Krishna Neupane					-	0.00		0.00	0.00	0.00	0.12	0.00
9	Byas*	Substation	Dipak Thapa Magar	0.15		0.12	-	0.48	31.99		0.00	0.90	12.93	0.06	0.00
10	Byas*	Substation	Keshav Thapa	0.49		0.37	-	0.60	81.58		0.00	0.48	77.25	0.18	0.00
11	Byas*	Substation	Kumari Thapa	0.15	0.11	0.12	0.06	0.48	31.99	0.21	51.26	1.32	8.81	0.12	46.3
12	Byas*	Substation	Man Kumar Ale	0.38	0.24	0.29	0.14	0.90	42.66	0.24	100.00	1.20	24.23	0.30	46.3
13	Byas*	Substation	Prem Bd Ale	0.28		0.1	0.15	0.30	94.3		0.00	0.12	95.32	0.18	82.3
14	Byas*	Substation	Indra Bd Thapa	0.87	0.30	0.70	0.2	2.70	32.22	0.30	100.00	1.20	58.16	0.30	66.7
15	Byas*	Substation	Amar Bd Ale	0.46		0.35	0.17	0.90	51.19		0.00	0.72	48.47	0.60	27.8
16	Byas*	Substation	Bhim Bd Ale	0.42	0.32	0.35	0.17	2.52	16.67	0.48	67.28	1.08	32.31	0.48	34.8
17	Byas*	Substation	Suk BD Rana	2.30	0.24	1.18		3.60	63.99	0.30	80.00	1.44	81.94		0.00
18	Byas*	Substation	Bhakta BD Rana	1.18	0.20	0.2		1.20	98.6	0.24	83.33	0.24	96.0		0.00
19	Byas*	Substation	Tek Bd Rana	0.58	0.30	0.3		1.32	43.94	0.30	100.00	0.36	72.3		0.00
20	Byas*	Substation	Chet Bd Rana	1.07	0.4	0.3		2.40	44.79	0.42	96.38	0.36	72.3		0.00
21	Byas*	Substation	Bel Bd Rana	0.31		0.18	0.11	0.60	51.19		0.00	0.24	75.00	0.36	30.9
22	Byas*	Substation	Yam Bd Ale	0.89	0.28	0.70		2.10	42.38	0.30	95.28	1.08	64.63	0.06	0.00
23	Byas*	Substation	Narayan Bd Rana	0.87	0.32	0.2		0.96	90.63	0.48	66.67	0.24	96.0		0.00
24	Byas*	Substation	Gan Bd Rana			0.23		2.10	0.00		0.00	0.30	77.55		0.00
25	Byas*	Substation	Purna Bd Rana			0.32	0.17	1.50	0.00		0.00	0.36	88.89	0.24	69.5
26	Pokhara-Lekhnath MC	AP2	Bindu Thapamagar			0.05			0.00		0.00	0.18	28.50	0.18	0.00
27	Pokhara-Lekhnath MC	AP3	Mitra Lamichhane			0.06		4.5	0.00	0.72	0.00	1.08	5.56		0.00

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S. N.	RM/ Municipality* /MC	Project Component	Owners name	Loss of Crop due to Land Acquisition				Total Crop Production of the Families																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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S. N.	RM/ Municipality* /MC	Project Component	Owners name	Loss of Crop due to Land Acquisition				Total Crop Production of the Families							
				Paddy MT	Wheat MT	Maize MT	Millet MT	Paddy MT	Wheat MT	Maize MT	Millet MT	%	%	%	%
51	Byas*	AP37	Tek Bd Rana			0.05	0.02			0.24	0.12	20.4			
52	Byas*	AP38	Padam BD Ale			0.05	0.02			0.72	0.48	5.11			
53	Rising RM	AP40	Lok Bd BK			0.05	0.02			0.12	0.12	20.4			
54	Rising RM	AP41	Lal Bd Bk			0.05	0.02			0.3	0.24	10.2			
55	Rising RM	AP42	Khim Bd Ale			0.05	0.02	0.36	0.00	1.2	0.6	4.09			
Total				12.81	3.44	8.53	1.89	51.1	25.09	28.3	9.9	40.90	30.12	9.9	19.1



Appendix D-III: List of Affected Structures

S. N.	RM/Municipality/ MC	Project Components	Name of Owners	House (sq.ft.)					Cowshed (sq.ft.)				
				Type of Structures	Length	Width	Plinth Area	Floor	Area	Length	Width	Floor	Area
1	Pokhara-Lekhnath	AP4-AP5	Jit Bd Gurung	Kachchi	19	13	247	1	247	-	-	-	-
2	Pokhara-Lekhnath	AP5-AP6	Khem Raj Bajgai	Kachchi	20	16	320	2	640	-	-	-	-
3	Pokhara-Lekhnath	AP6-AP7	Narayan Pd Lamichhane	-	-	-	-	-	-	16	13	2	208
4	Pokhara-Lekhnath	AP13-AP14	Hari Pd Tiwari	Kachchi	22	13	286	1	286	-	-	-	-
5	Rupa RM	AP15-AP16	Raj Kumar Subedi	Semi-Pakki	20	14	280	2	560	-	-	-	0
6	Byas*	AP23-AP24	Bishnu Gurung	Semi-Pakki	22	17	374	2	748	22	11	1	242
7	Byas*	AP25-AP26	Som Bd Nepali	Kachchi	22	14	308	2	616	-	-	-	-
8	Byas*	AP25-AP26	Purnima Nepali	-	-	-	0	-	0	19	12	1	228
9	Byas*	AP26-AP27	Kopila Dawadi	Semi-Pakki	17	14	238	1	238	-	-	-	0
10	Byas*	AP26-AP27	Krishna Bd Thapamagar	Kachchi	22	16	352	2	704	-	-	-	-
11	Byas*	AP29A-AP30	Bishnu Bd Gurung	Kachchi	19	18	342	2	684	-	-	-	-
12	Myagde RM	AP32-AP33	Hari Maya Wagle	Kachchi	23	15	345	2	690	31	12	1	372
13	Byas*	AP38-AP39	Iman Singh Ale	Kachchi	21	14	294	1	294	-	-	-	0
14	Rising RM	AP40-AP41	Kesh Bd Saru	Kachchi	22	15	330	1	330	13	11	1	143
15	Rising RM	AP40-AP41	Durga Bd Thapa	-	-	-	-	-	-	13.5	10	1	135
16	Rising RM	AP41-AP42	Khim Bd Ale	-	-	-	-	-	-	10	11	1	110
17	Byas*	Substation	Gan bd Ale	-	-	-	-	-	-	11	11	1	121
18	Byas*	Substation	Suk Bd Rana	-	-	-	-	-	-	11	10	1	110
Total									6037				1669



S.N.	RM/Municipality*/MC	Project Components	Name of Owners	PA/SPAF
1	Byas*	Substation	Jit Bd Thapa	PAF
2	Byas*	Substation	Tara Maya Thapa	PAF
3	Byas*	Substation	Sanari Thapa	PAF
4	Byas*	Substation	Rupa Thapa	PAF
5	Byas*	Substation	Sita Ram Bagale	PAF
6	Byas*	Substation	Ratna Maya Neupane	SPAF
7	Byas*	Substation	Bharat Mani Bagale	PAF
8	Byas*	Substation	Ram Krishna Neupane	SPAF
9	Byas*	Substation	Dipak Thapa Magar	PAF
10	Byas*	Substation	Keshav Thapa	PAF
11	Byas*	Substation	Kumari Thapa	PAF
12	Byas*	Substation	Man Kumar Ale	PAF
13	Byas*	Substation	Prem Bd Ale	PAF
14	Byas*	Substation	Indra Bd Thapa	PAF
15	Byas*	Substation	Amar Bd Ale	PAF
16	Byas*	Substation	Bhim Bd Ale	PAF
17	Byas*	Substation	Suk BD Rana	PAF
18	Byas*	Substation	Bhakta BD Rana	SPAF
19	Byas*	Substation	Tek Bd Rana	PAF
20	Byas*	Substation	Chet Bd Rana	PAF
21	Byas*	Substation	Bel Bd Rana	PAF
22	Byas*	Substation	Yam Bd Ale	PAF
23	Byas*	Substaton	Narayan Bd Rana	SPAF
24	Byas*	Substation	Gan Bd Rana	PAF
25	Byas*	Substation	Purna Bd Rana	PAF
26	Pokhara-Lekhnath MC	AP2	Bindu Thapamagar	PAF
27	Pokhara-Lekhnath MC	AP3	Mitra Lamichhane	PAF
28	Pokhara-Lekhnath MC	AP5	Bodh Raj Tripathi	PAF
29	Pokhara-Lekhnath MC	AP10	Hari Bd Sapkota	PAF
30	Pokhara-Lekhnath MC	AP11	Ramesh	PAF
31	Pokhara-Lekhnath MC	AP14	Dilmaya Tiwari	PAF
32	Pokhara-Lekhnath MC	AP14	Rajendra Tiwari	PAF
33	Rupa RM	AP15	Bhim Bd Gurung	PAF
34	Rupa RM	AP16	Yam Bd Gurung	PAF
35	Rupa RM	AP18	Bhagwan Subedi	PAF
36	Rupa RM	AP19	Mahadev Subedi	PAF
37	Rupa RM	AP20	Hem Raj Koirala	PAF
38	Rupa RM	AP20	Narayan Krishna Koirala	PAF
39	Rupa RM	AP22	Pun Narayan Shrestha	PAF
40	Byas*	AP24	Hema Dura	PAF
41	Byas*	AP27	Jas Narayan Shrestha	PAF
42	Byas*	AP29 & 29A	Bishnu Pd Neupane	PAF
43	Byas*	AP29	Laxmi Shrestha	PAF
44	Byas*	AP30	Bir Bd Gurung	PAF
45	Byas*	AP32	Nanu Maya Subedi	PAF
46	Byas*	AP33	Narayan Giri	PAF
47	Byas*	AP33	Surendra Pandit	PAF
48	Byas*	AP34	Jhilke Kumal	PAF
49	Byas*	AP35	Purna Chandra Khanal	PAF
50	Byas*	AP36	Hari Bd Thapa	PAF
51	Byas*	AP37	Tek Bd Rana	PAF
52	Byas*	AP38	Padam BD Ale	PAF
53	Rising RM	AP40	Lok Bd BK	PAF
54	Rising RM	AP41	Lal Bd Bk	PAF
55	Rising RM	AP42	Khim Bd Ale	PAF
56	Pokhara-Lekhnath MC	AP4-AP5	Jit Bd Gurung	SPAF

S.N.	RM/Municipality*/MC	Project Components	Name of Owners	PA/SPAF
57	Pokhara-Lekhnath MC	AP5-AP6	Khern Raj Bajgai	PAF
58	Pokhara-Lekhnath MC	AP6-AP7	Narayan Pd Lamichhane	PAF
59	Pokhara-Lekhnath MC	AP13-AP14	Hari Pd Tiwari	SPAF
60	Rupa RM	AP15-AP16	Raj Kumar Subedi	SPAF
61	Byas*	AP23-AP24	Bishnu Gurung	SPAF
62	Byas*	AP25-AP26	Som Bd Nepali	SPAF
63	Byas*	AP25-AP26	Purnima Nepali	PAF
64	Byas*	AP26-AP27	Kopila Dawadi	PAF
65	Byas*	AP26-AP27	Krishna Bd Thapamagar	SPAF
66	Myagde RM	AP32-AP33	Hari Maya Wagle	SPAF
67	Byas*	AP38-AP39	Iman Singh Ale	SPAF
68	Rising RM	AP40-AP41	Kesh Bd Saru	PAF
69	Rising RM	AP40-AP41	Durga Bd Thapa	SPAF



Appendix D

NEA-ESSD

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S.N.	Transmission Line Section (From AP to AP)	Location (VDC, Ward)	Settlements/Infrastructures/houses/Schools /temples /Hat-Bazaars etc. within 100 m from TL conductor	Distance From the Conductor Approx (M)	Settlements/Major structures within a distance greater than 100 m to 300 m from TL conductor	Distance From the Conductor Approx (M)
16.	AP 16 to AP 17		- A Home	- 100 m North		
17.	AP 17 to AP 18	Rupa-7/2			- A settlement	- 300 m
18.	AP 18 to AP 19	Rupa-2	- Drinking Water Tank	- 20 m North	- Siwalaya Temple	- 300 m East
19.	AP 19 to AP 20	Rupa-2			- Sirkutan Village	- 300 m East
20.	AP 20 to AP 21	Rupa-1/4	- Chautaro	- 15 m West		
21.	AP 21 to AP 22	Rupa-3/4				
22.	AP 22 to AP 23	Rupa-3, Byas-6				
23.	AP 23 to AP 24	Byas-6	- A home - Tallohad Village	- 50 East - 100 m East		
24.	AP 24 to AP 25	Byas-6	- Paanal Tar Village	- 100 m East		
25.	AP 25 to AP 26	Byas-6	- Pokhare Danda Village - A home - Cow Shed - Home	- 100 m East - RoW - RoW - 5 m E		
26.	AP 26 to AP 27	Byas-6	- Sekhatar Village - Two Home - Toilet and bathroom - A Home	- 100 M - RoW - RoW - 5 M West	- Shiva Temple	- 200 m South
27.	AP 27 to AP 28	Byas-6			- Amar Jyoti Primary School - Brick Factory	- 200 m West - 250 m West
28.	AP 28 to AP 29	Byas-6	- Sapan Kot Village - Suspension Bridge	- 50 m West - 50 m East	- Drinking Water Kuwa - Kul Deuta Than	- 200 m West - 200 m West
29.	AP 29 to AP 29A	Byas-6			- Madi Besi Village	
30.	AP 29A to AP 30	Byas-6	- A Home	- RoW	- A Home	- 200 m West
31.	AP 30 to AP 31	Byas-6/5			- Pakhure Bhanjyang Village	- 200 m West
32.	AP 31 to AP 32	Byas-5			- Nepal Tar Village	- 300 m East
33.	AP 32 to AP 33	Byas-5	- A home - Suspension Bridge - Pratikshalaya - Raanitar Village	- RoW - 100 m East - 100 m East - 100 m East	- Jana Jukta Saahi Higher S. School - Nepali Tar Village - Chaar Hajar Canal	- 200 m East - 300 m East - 200 m

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S.N.	Transmission Line Section (From AP to AP)	Location (VDC, Ward)	Settlements/Infrastructures/houses/Schools /temples /Hat-Bazaars etc. within 100 m from TL conductor	Distance From the Conductor Approx (M)	Settlements/Major structures within a distance greater than 100 m to 300 m from TL conductor	Distance From the Conductor Approx (M)
34.	AP 33 to AP 34	Byas-5	-	-	- ThuloTar Simal Gaira Tole	- 300 m East
35.	AP 34 to AP 35	Byas-5	-	-	- Pig Farm	- 150 m West
36.	AP 35 to AP 36	Byas-5	-	-	- Sanggi Pateni Village	- 300 m East
37.	AP 36 to AP 37	Byas-5	- Prithbi Highway	- RoW	- Settlement	- 300 m
38.	AP 37 to AP 38	Byas-5	- Saura Village - Shree Bhanung Primary School	- 100 m Around - 70 m North	- Water Tank	- 300 m
39.	AP 38 to AP 39	Byas-5	- Beteni Village	- 100 m North	- Beni Patan Village	- 300 m East
40.	AP 39 to AP 40	Byas-5, Rising-1	- A Settlement	- 100 M North and South	- Chandi Bhueyar Temple	- 200 m East
41.	AP 40 to AP 41	Rising-1	- Bajhan Village	- 100 m West	- Kuwa - Mai Temple - Chandi Bhueyar Temple	- 200 m West - 300 m - 300 m West
42.	AP 41 to AP 42	Rising-1	-	-	-	-
	AP 42 to AP 43	Rising 1/Byas-13	-	-	-	-



APPENDIX D-VI: Price of the different Commodities collected through Market Survey

S. N.	Type of Commodity	Commodity	(per) Unit	Market Price (NRs)													
				Syamgha	Byas-13	Belbas	Belbas	Thumki	Syang khudi	Tal Besi	Malinga Tole	Nepal Tar	Thulo Tar	Kalka	Mauriya Rupa	Shisa ghat	
1	Grains	Paddy	quintal	2700	2900	2900	2900	2800	2800	2800	2750	2800	2850	2800	2800	2750	
		Maize	quintal	2900	2900	3000	3000	3200	2900	2900	2900	3000	2900	3000	3100	2800	3000
		Millet	quintal	3000	3200	3200	3200	2800	2900	3100	3150	3000	3100	3200	2900	2900	2900
		Dal (average)	quintal	180	180	180	190	170	170	180	185	165	160	180	180	175	
2	Vegetable	Potato	Quintal	3000	3000	2800	2800	3200	3000	3000	3000	3100	3000	2800	2800	3000	
3	Meat	Chicken	kg	275	275	275	275	250	250	260	260	260	275	275	250	250	
Mutton		kg	650	750	700	700	650	650	700	700	650	700	650	650	650	650	
4	Fruits	Banana	Dozen	50	60	60	60	45	50	50	50	50	50	55	50	50	
		Orange	kg	60	60	-	-	60	60	60	55	-	-	60	55	60	60
5	Dairy Items	Milk	liter	75	80	70	70	70	75	75	75	75	80	80	75	75	
		Yogurt	liter	90	80	80	80	80	85	85	85	85	90	90	90	85	85
		Ghee	kg	800	900	900	900	800	800	800	800	800	900	900	800	750	800
6	Oil	Oil	liter	200	200	220	200	200	200	200	200	200	200	200	200	200	
7	Wage Rate	Male	Day	800	850	850	850	800	800	800	800	800	800	800	800	800	
		Female	Day	600	700	700	700	650	600	600	700	600	600	650	600	600	600

Source: Market Survey, 2016



APPENDIX D-VII: Distribution of Settlements/Infrastructures/etc. within 100 m from Tower APs

S.N.	Angle Points	Location	Land Types under tower pad and its ownership	Settlements/Infrastructures/houses/Schools/temples /Hat-Bazaars etc. within 100 m	Distance from the edge of Tower Points Approx. (M)
1.	AP 1	Kharene, Pokhara Lekhnath-27	Sub-Station	-	-
2.	AP 2	Badare Danda, Pokhara Lekhnath-27	Cultivated Barren Land Bindu Thapa Magar	- A Home - Badare Settlement	- 50 m North West - 100 m North and West
3.	AP 3	Dharmashala, Pokhara Lekhnath-27	Cultivated Land (Mass Farming) Ram Bdr Lamichhane	- Dharmashala Village	- 30 m North
4.	AP 4	Pakhuri Danda, Pokhara Lekhnath-27	Barren Forest Land Government	-	-
5.	AP 5	Aarupata, Pokhara Lekhnath-28	Bush (Private Tree) Bodh Raj Tripathi	- Water Tank - A road to Sisuwa Kalika - Aarupata Village	- 8 m West - 8 m West - 100 m North and South - 8 m West
6.	AP 6	Sami Danda, Pokhara Lekhnath-31,	Forest land Government Land	- Small Canal	-
7.	AP 7	Pokhara Lekhnath-31,	Private Tree	- Food Track to KhanaSwara	- 2 m North
8.	AP 8	Pokhara Lekhnath-31,	Forest land Government	-	-
9.	AP 9	Simalpata Pokhara Lekhnath-31	Forest Land (Barren) Government	-	-
10.	AP 10	Kotbaari, Pokhara Lekhnath-31	Kharbari Hari Bdr. Sapkota	- Historical Pond	- 50 m
11.	AP 11	Kotbaari, Pokhara Lekhnath-31	Cultivated Land (Millet) Tilak Bdr. Sapkota	- Water Tank	- 30 m North
12.	AP 12	Bhangere Danda, Pokhara Lekhnath-31	Forest Land (Barren) Government	- Deurali Temple - Shiwalaya Temple - Kot Temple - Kot Village	- 100 m South - 100 m South - 100 m South - 100 m South
13.	AP 13	Begnas Gau Pokhara Lekhnath-31	Forest land (Plantation) Government Land	-	-
14.	AP 14	Lapsidanda Kahare, Pokhara Lekhnath-31	Cultivated Land (Barren) Basanta and Rajendra Tiwari	- 5 Infrastructures of Kahare Agriculture and Animal Husbandry Co-operative Institution (Pvt.)	- 10 m to 100 m around

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S.N.	Angle Points	Location	Land Types under tower pad and its ownership	Settlements/Infrastructures/houses/Schools/Temples /Hat-Bazaars etc. within 100 m	Distance from the edge of Tower Points Approx. (M)
15.	AP 15	Rupa-7, Ulleri Talbesi	Cultivated Land (Paddy) Bhim Bdr. Gurung	- Ulleri Village	- 60 m North
16.	AP 16	Rupa-6	Cultivated Land (Barren) Yam Bahadur Gurung	-	-
17.	AP 17	Rupa-6, Pakhagau-Mauriya	Barren Land	-	-
18.	AP 18	Rupa-2, Salindanda	Cultivated Land (Barren) Bhagwan Subedi	- Drinking Water Tank	- 20 m North
19.	AP 19	Rupa-2, Sirkutani Danda	Cultivated Land (Barren) Mahadev Subedi	-	-
20.	AP 20	Rupa-1, Bhurung Deupur	Cultivated Land (Barren) Khem Raj and Krishna Koirala	- Chautaro	- 55 m South
21.	AP 21	Rupa-4	Forest Land Government	-	-
22.	AP 22	Rupa-3, Kaduje	Cultivated Land (Barren) Pun Narayan Shreshtha	-	-
23.	AP 23	Byas-6, Dandagau Sisaghat	Forest Land Government	-	-
24.	AP 24	Byas-6, Chaudal Thok	Cultivated Land Hema Dura	-	-
25.	AP 25	Byas-6, Pokhare Danda	Forest Land Government	-	-
26.	AP 26	Byas-6, Shekhar Danda	Cultivated Land Sukh Bahadur Nepal	- A home	- 100 m West
27.	AP 27	Byas-6, Shekhatar	Cultivated Land (Mass Farming) Sailo Miyal/Jas Narayan Shreshtha	- Settlement Around	- 100 m
28.	AP 28	Byas-6	Forest Land Government	-	-
29.	AP 29	Byas-6	Cultivated Land Paddy Farming Bishnu P. Neupane and Laxmi Shreshtha	- Sapan Kot Village - Suspension Bridge	- 50 m West - 80 m East
	AP 29	Byas-6	Cultivated Land Bishnu Prasad Neupane		
30.	AP 30	Byas-6	Cultivated Land	- A home	- 60 m South

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S.N.	Angle Points	Location	Land Types under tower pad and its ownership	Settlements/Infrastructures/houses/Schools/temples /Hat-Bazaars etc. within 100 m	Distance from the edge of Tower Points Approx. (M)
31.	AP 31	Byas-5	(Mass Farming) Bir Bahadur Gurung	- A Home	- 30 m East
32.	AP 32	Byas-5	Cultivated Land (Paddy Farming) Shankar Pandit Nanu Maya Subedi	- A home - Canal to Nepalatar	- 100 m East - 60 m East
33.	AP 33	Byas-5	Cultivated Land (Paddy Farming) Sankar Pandit, Narayan Giri and Surendra Pandit	-	-
34.	AP 34	Byas-5	Cultivated Land (Paddy Farming) Kumal	- Small Canal	- 5 m West
35.	AP 35	Byas-5	Cultivated Land (Barren) Purna Chandra Khanal	-	-
36.	AP 36	Byas-5	Cultivated Land (Barren) Hari Bdr. Thapa	-	-
37.	AP 37	Byas-5	Cultivated Land (Orange Orchard) Tek Bdr. Rana	-	-
38.	AP 38	Byas -5	Cultivated Land (Barren) Padan Bdr. Aale	- Drinking Water Tank - Food Track - Home	- 10 m West - 7 m West - 100 m North
39.	AP 39	Byas-5	Forest Land Government	- Gravel Road to Rising Rani Pokhari	- 15 m South
40.	AP 40	Rising-1	Cultivated Land (Private Tree) Lok Bahadur B.K	- Sami Danda Village - A home	- 100 m East - 35 m East
41.	AP 41	Rising-1	Cultivated Land (Bamboo Trees)	- Malinga Tole	- 100 m Around
42.	AP42	Rising-1	Cultivated Land	-	-
43.	AP43	Belbas, Byas-13	Cultivated Land	- Belbas Village - Poultry Form	- 100m North and South - 100 m North



Appendix E

Public Notice



गोरखापत्र

२०७४ साल असार १६ गते शुक्रवार
2017 June 30 Friday



नेपाल विद्युत् प्राधिकरण

लेखनाथ-दमौली २२० के.भी. प्रसारण लाईन आयोजनाको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन तयारीको सिलसिलामा राय सुझावको लागि जारी गरिएको सार्वजनिक सूचना

(प्रकाशित मिति : २०७४।०३।१६ गते)

- प्रस्तावकको नाम : नेपाल विद्युत् प्राधिकरण
प्रस्तावको नाम : लेखनाथ-दमौली २२० के.भी. प्रसारण लाईन आयोजना
प्रभाव पर्ने सक्ने जिल्ला/ गाउँपालिका / (साविक नगरपालिका / महानगरपालिका) : कास्की जिल्ला अन्तर्गत पोखरा-लेखनाथ महानगरपालिका, लेखनाथ नगरपालिका, माभठाना र कालिका गा.वि.स.हरू) र रूपागाउँपालिका (साविक थुम्की, सिद्ध, रूपाकोट, देउराली र हंशपुर गा.वि.स.हरू)
तनहुँ जिल्ला अन्तर्गत व्यास नगरपालिका (साविक व्यास नगरपालिका र श्याम्पा गा.वि.स.), ऋसिङ गाउँपालिका (साविक काहँशिवपुर गा.वि.स.) र म्याग्दे गाउँपालिका (साविक मनपाङ र जामुने भञ्ज्याङ गा.वि.स. हरू)
प्रसारण लाईनको क्षेत्राधिकार (RoW) : केन्द्रीय रेखावाट दायौँदायाँ १५-१५ मिटर (जम्मा ३० मिटर)
प्रसारण लाईनको लम्बाई : पोखरा-लेखनाथ महानगरपालिकास्थित लेखनाथ सवस्टेशनदेखि व्यास नगरपालिका-१३ स्थित प्रस्तावित वेलबास सवस्टेशनसम्म कुल ४२.२५४ कि.मी.

नेपाल सरकार, ऊर्जा मन्त्रालयबाट वातावरण संरक्षण नियमावली, २०५४ को नियम ५ बमोजिम स्वीकृत भएको कार्यसूचीको आधारमा अनुसूची ५ बमोजिमको ढाँचामा तयार हुने प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी प्रतिवेदन तयारीको सिलसिलामा नियम ७ को उपनियम २ बमोजिम प्रस्तावको कार्यान्वयनबाट वातावरणमा पर्ने सक्ने प्रभावको सम्बन्धमा पन्ध्र (१५) दिनभित्र सम्बन्धित गाउँपालिका, नगरपालिका, महानगरपालिका, जिल्ला समन्वय समिति वा सरोकारवाला व्यक्ति वा संस्थाले तल उल्लेखित ठेगानामा लिखित रायसुझाव उपलब्ध गराई दिनु हुन यो सूचना प्रकाशित गरिएको छ। साथै रायसुझावको प्रतिलिपि श्री ऊर्जा मन्त्रालय तथा विद्युत् विकास विभागमा समेत पठाउन सकिनेछ।

रायसुझाव पठाउने ठेगाना

नेपाल विद्युत् प्राधिकरण लेखनाथ -दमौली २२० के.भी. प्रसारण लाईन आयोजना खरीपाटी, भक्तपुर, नेपाल फोन नं. : ०१-६६९०३५४ ईमेल : ld220kvtlp@gmail.com	नेपाल विद्युत् प्राधिकरण वातावरण तथा सामाजिक अध्ययन विभाग खरीपाटी, भक्तपुर, नेपाल फोन नं. : ०१-६६९९५८० फ्याक्स नं. : ०१-६६९९५९० ईमेल : neaessd@wlink.com.np
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Appendix F

Public Meeting



नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना कार्यान्वयन गर्दा आयोजना प्रभावित गा.वि.स./न.पा मा पर्नेसक्ने वातावरणीय प्रभावहरुका बारेमा ने.वि.प्रा., वातावरण तथा सामाजिक अध्ययन विभाग, भक्तपुरबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरुबीच निम्न मिति, समय र स्थानमा छलफल गरी निम्न लिखित राय सुभावहरु संकलन गरियो ।

मिति : २०७३/०६/२६

समय:

स्थान : स्याम्छा - २, तनहु

क्र.सं.	नामथर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन.नम्बर
१.	गंगा ब. डे.ली	ड.बि	स्याम्छा-२	गंगाब.डे.ली	९८४९२९००२
२.	खगे ब. डे.ली	ड.बि	स्याम्छा-२	खगे	९८४६४९८२०३
३.	दिपेन्द्र ब्योपाई	कृषि	स्याम्छा-६	दिपेन्द्र	९८४४६६८२८
४.	शर्मिला ब्योपाई	कृषि	स्याम्छा-६	शर्मिला	९८०५८३८३८८
५.	पुष्पमाया मोक्तव	ड.बि	स्याम्छा-६	पुष्पमाया	-
६.	समिन्द्र मिश्रा	ड.बि	स्याम्छा-२	समिन्द्र	९८९६९५९९९९
७.	सविता मिश्रा	ड.बि	स्याम्छा-२	सविता	९८२३६६६६९६
८.	वीर ब. गुम्बा	ड.बि	स्याम्छा-६	वीर	९८०९९०६९४२
९.	प्रकाश शर्मा	नोकरी	ने.वि.प्रा.	प्रकाश	
१०.	बालकृष्ण शर्मा	नोकरी		बालकृष्ण	
११.	सुभाष शर्मा			सुभाष	

राय सुभाव : १. वस्तीलाई अझर तपनेगरी आउनेलाइन लाइन आयोजना त्रिभि गरिनुपर्ने

२. प्रभावित घरपरिवारका सदस्यलाई प्रसारण लाइन वरिपरि राखिनु पर्ने।

३. मुआवजा- निर्यात उचित रूपमा हुनुपर्ने ।



नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग

नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना कार्यान्वयन गर्दा आयोजना प्रभावित गा.वि.स./न.पा. मा पर्नेसम्बन्धित वातावरणीय प्रभावहरूका बारेमा ने.वि.प्रा., वातावरण तथा सामाजिक अध्ययन विभाग, भक्तपुरबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरूबीच निम्न मिति, समय र स्थानमा छलफल गरी निम्न लिखित राय सुझावहरू संकलन गरियो।

मिति : २०७३/१०/१५
समय : बिहान १०.०० बजे
स्थान : क्याम्प-१३, काँडा टोल, तनहुँ

क्र.सं.	नामधर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन.नम्बर
१.	दिल व. परिवार	कृषि	क्याम्प-१४		९८०६५३८१९१
२.	पशुपति कुमाल	कृषि	क्याम्प-१३		
३.	आशिष थापा	कृषि	क्याम्प-१३		९८२२१४०८४४
४.	दिपक थापा	कृषि	क्याम्प-१३		९८१३०९६५९५
५.	सरोज थापा	विद्यार्थी	क्याम्प-१३		९८१४२२३०६१
६.	मित व. थापा	कृषि	क्याम्प-१३		९८१५१०३८९२
७.	उम्वरी प. खिल	कृषि	क्याम्प-१३		९८१४१९३६४४
८.	देव व. मगर	कृषि	क्याम्प-१३		९८०३६००३०८
९.	रवि व. गिर्जाणी	कृषि/पेन्सन	क्याम्प-१३		९८०६६६२८५२
१०.	निर्धन थापा	विद्यार्थी	क्याम्प-१३		९८४०१०८५६५
११.	बिनी व. खाले	कृषि	क्याम्प-१३		
१२.	अनुप के. ही	कृषि/पेन्सन	क्याम्प-१३		

१३. मिया गौतम, क्याम्प-१३, काँडा टोल, तनहुँ, ९८११९८०८२५

१४. सुन्दर श्रेष्ठ, क्याम्प-१३, काँडा टोल, तनहुँ, ९८११९८०८२५

राय सुझाव :

१. लडेराम गाउँपालीलाई जानकारी गराउन तथा नयाँ निर्माण गरिनुपर्ने।
२. लडेराम गाउँपालीलाई जानकारी गराउन तथा नयाँ निर्माण गरिनुपर्ने।
३. मिया गौतम निर्माणको लागि जानकारी गराउन तथा नयाँ निर्माण गरिनुपर्ने।



नेपाल विद्युत प्राधिकरण
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लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना कार्यान्वयन गर्दा आयोजना प्रभावित गा.वि.स./न.पा. मा पर्नेसबने वातावरणीय प्रभावहरूका बारेमा ने.वि.प्रा., वातावरण तथा सामाजिक अध्ययन विभाग, भक्तपुरबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सराकारवालाहरूबीच निम्न मिति, समय र स्थानमा छलफल गरी निम्न लिखित राय सुझावहरु संकलन गरियो ।

मिति : २०७३/१०/१४

समय : बिहान ८ बजे

स्थान : बैलवाङ (नेचरी रोड)

क्र.सं.	नामधर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन.नम्बर
१.	वसुध व. वि. उ	हृषि	व्याप-१२		९८४६९३४००५
२.	वसुध व. आले	हेन्डा	व्याप-१२		९८४९२६९०९९
३.	बिलम्बर थापा	हृषि	व्याप-१२		
४.	शिव व. आले	हृषि	व्याप-१२		
५.	शिव व. राना	व्यवसाय	व्याप-१२		९८०९२६३९९
६.	जेष्ठ व. आले	हृषि	व्याप-१२		९८४६९३४३६६
७.	बैज व. राना	हृषि	व्याप-१२		९८२६९९६४४०
८.	गंगा भन्ज आले	उद्दीवी	व्याप-१२	गंगा	९८०४९०३०२४
९.	पायल भन्ज आले	उद्दीवी	व्याप-१२		
१०.	शिव व. आले	हृषि	व्याप-१२		
११.	अनुप के. श्री	व्यवसाय	त्रे वि. प्र.		
१२.	रमेश श्रेष्ठ	व्यवसाय	त्रे वि. प्र.		९८१९९८०८२५

*३ सुनम श्रेष्ठ

वि. प्र. वि. प्र.

त्रे वि. प्र.

९८१६९८६२५

१४ अनिल श्रेष्ठ

वि. प्र. वि. प्र.

त्रे वि. प्र.

९८५१०३४९९

राय सुझाव :




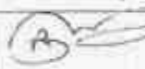

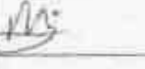
१. प्रसारण लाईन आयोजनाको निर्माण गर्दा हरेकसँग वातावरणको क्षति प्रभाव हुनेगरी लाग्ने गर्दछ ।
२. आयोजना प्रभावितलाई उचित मुआवजाको व्यवस्था गर्नुपर्ने ।

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उर्जा विभाग
२०७३

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नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना कार्यान्वयन गर्दा आयोजना प्रभावित गा.वि.स./न.पा. मा पर्नेसक्ने वातावरणीय प्रभावहरूका बारेमा ने.वि.प्रा., वातावरण तथा सामाजिक अध्ययन विभाग, भक्तपुरबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयबासी, सरोकारवालाहरूबीच निम्न मिति, समय र स्थानमा छलफल गरी निम्न लिखित राय सुझावहरू संकलन गरियो।

मिति : २०७३/१०/१४
 समय : बिहान ४.२० बजे
 स्थान : बेलकला, नम्रुङ

क्र.सं.	नामधर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन.नम्बर
१.	कु.व. र. राना	होमि	बेलकला-१३		९९५८५८२५५५
२.	राम ब. विक	कृषि	बेलकला-१२		
३.	श्रीमान श्रीमान	कृषि	बेलकला-१२	श्रीमान	९८०५८८६११७
४.	श्रीमान श्रीमान	कृषि	बेलकला-१२	श्रीमान श्रीमान	
५.	चैत व. राना	गुरुकुल	बेलकला-१२, नम्रुङ		९८०५१२८१५८
६.	श्रीमान राना	कृषि	बेलकला-१२		
७.	कु.व. के. सी	बेलकला-१२	बेलकला-१२		
८.	श्रीमान श्रीमान	बेलकला-१२	बेलकला-१२	श्रीमान श्रीमान	९८०५८८२५५५
९.	कु.व. के. सी	बेलकला-१२	बेलकला-१२		९९५८५८२५५५
१०.	श्रीमान श्रीमान	बेलकला-१२	बेलकला-१२		९९५८५८२५५५

राय सुझावः बेलकला-१२, नम्रुङ, दमौली २२० के.भी. प्रसारण लाईन आयोजना
 (१) कु.व. के. सी, बेलकला-१२, नम्रुङ, दमौली २२० के.भी. प्रसारण लाईन आयोजना



नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना कार्यान्वयन गर्दा आयोजना प्रभावित गा.वि.स./न.पा. मा पर्नेसक्ने वातावरणीय प्रभावहरुका बारेमा ने.वि.प्रा., वातावरण तथा सामाजिक अध्ययन विभाग, भक्तपुरबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरुबीच निम्न मिति, समय र स्थानमा छलफल गरी निम्न लिखित राय सुझावहरु संकलन गरियो ।

मिति : २०७३/०६/२५

समय :

स्थान : जुम्ली - ५

क्र.सं.	नामथर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन.नम्बर
१.	होम व. धर्मेल		जुम्ली. ल. गाउँ	होम	
२.	प्रेम व. वि. क.	मार्केटिङ		प्रेम वि. क.	
३.	डिल व. दत्तार्	के. क. गा. वि. स. जुम्ली		डिल	९८००७९५१२२
४.	चन्द्र व. वि. क.	जय	—	चन्द्र	९८१८५९६९३६
५.	अमृत दत्तार्		—	अमृत	९८०६५६०४६०
६.	पुरन परियार	किशन	—	पुरन	९८१८५९६९३६
७.	धन व. वि. क.		—	धन	९८१४२३९६५
८.	विमल पौड्याल		—	विमल	९८२६१३१६१५
९.	प्रविण सुबाद		—	प्रविण	९८२५१२१५१५
१०.	मैदा वि. क.	गृहीणी	—	मैदा	९८१३२२५८२५
११.	राम व. खपाङ्गरी			राम	९८१२१२२०१६
१२.	जेविला परियार			कापला	—

१३. सुलभ ढाँचा नैतिक र शिष्टता

राय सुझाव : १. नियमित विद्युत आपूर्ति हुनुपर्ने ।

२. घर तथा सगगाडी उचित छुल्नुपर्ने हुनुपर्ने ।

३. तार खुट्टी सगगाडी उचित छुल्नुपर्ने हुनुपर्ने ।

४. सगगाडीको आवरण दिनुपर्ने ।

५. नखि सम्बन्धी तथा निषेधित तालिम प्रदान गरिनुपर्ने ।

६. सुरक्षा सम्बन्धी जनचेतना कार्यक्रमहरू प्रदान गरिनुपर्ने ।



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नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना कार्यान्वयन गर्दा आयोजना प्रभावित गा.वि.स. न.पा. मा पर्नेसक्ने वातावरणीय प्रभावहरुका बारेमा ने.वि.प्रा., वातावरण तथा सामाजिक अध्ययन विभाग, भक्तपुरबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) तयार गर्ने सिलसिलामा खर्टाआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरुबीच निम्न मिति, समय र स्थानमा छलफल गरी निम्न लिखित राय सुझावहरु संकलन गरियो।

मिति : २०७३/०६/२८

समय:

स्थान : माझठोला - ६, खप्तडपुर

क्र.सं.	नामथर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन.नम्बर
१.	त्रुलीदास श्रेष्ठ	कृषि	माझठोला-६		९८६१५३९५२
२.	सुर्देव मोहन बाग्ले	कृषि	माझठोला-६		९८४६३२३४४४
३.	दिनाश्वर श्रेष्ठ	"	माझठोला-६		९८११३१८३५
४.	वेदश्वर बाग्ले	"	माझठोला-६		९६४६०१४८६
५.	लेखनाथ बाग्ले	"	"		९
६.	सम्भर ब. मगर	"	लेखनाथ-६		९८४६२८४२८
७.	नारायण प्र. लामिछाने	"	माझठोला-६		९८१६६०६८६८
८.	शुक्ल प्र. पौडेल	"	माझठोला-६		९८१४१३०४३२
९.	कल्याण श्रेष्ठ	नोकरी	माझठोला-६		
१०.	राम श्रेष्ठ	"	"		
११.	शुक्ल प्र. श्रेष्ठ	"	"		

राय सुझाव : १. उचित क्षतिपूर्ति दिई व्यवस्था हुनुपर्ने।

२. सबै सम्पत्ति अन्तर्गत हुने क्षतिपूर्ति गर्दा आयोजना तुरुन्तै निष्कासित हुनुपर्ने।

३.

नेपाल
उर्जा
२०७३

नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना कार्यान्वयन गर्दा आयोजना प्रभावित गा.वि.स./न.पा मा पर्नेसक्ने वातावरणीय प्रभावहरुका बारेमा ने.वि.प्रा., वातावरण तथा सामाजिक अध्ययन विभाग, भक्तपुरबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) तयार गर्ने सिलसिलामा छटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, हरोकारवालाहरुबीच निम्न मिति, समय र स्थानमा छलफल गरी निम्न लिखित राय सुझावहरु संकलन गरियो ।

मिति : २०७३/०७/२४

समय :

स्थान : हंसपुर-९, ताल्लेखी, काठ्की

क्र.सं.	नामथर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन.नम्बर
१.	तालेनाथ सुवेदी	समाजसेवि	हंसपुर-९, काठ्की		९८४६७९०५५६
२	शंका बहादुर सुवेदी	समाजसेवि	हंसपुर-९ "		९८४६१३७९८५
३.	कृष्ण प्रसाद सुवेदी	"	हंसपुर-९ "		९८४६००६१७५
४	चन्द्र प्रसाद सुवेदी	"	हंसपुर-९ "		९८४६६०२५६१
५	पुष्पराज सुवेदी	"	हंसपुर-९ "		९७४६०१४२८४
६	पुष्प सुवेदी	हृदि	हंसपुर-९ "		९८४६१७५५६३
७	बुद्ध व. सुवेदी	"	" "		९८२५११६०३८
८	लक्ष्मी सुवेदी	शिक्षक	हंसपुर-९ "		९८४६६४०२९५
९	धानराज सुवेदी	कृषि	हंसपुर-९		९८०६८६७२००
१०.	प्रकाश गौरी	नायक	ने.वि.प्रा.		
११.	रमेश गौरी	"	"		

राय सुझाव :

- १) जनतालाई हरेकसँग कम हुने गरी प्रसारण लाईन बिस्तार गर्नुपर्ने।
- २) स्थानीय समुदायलाई आवश्यक परामर्श र सहकार्य गर्नुपर्ने।
- ३) सरकारले प्रसारण लाईनको तल पर्ने जग्गाको बैडकीड, प्रक्रियाको बारेमा जानकारी दिनुपर्ने।
- ४) प्रसारण लाईन हरेकसँग सार्वजनिक जग्गामा पर्ने गरी जानुपर्ने।



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नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना कार्यान्वयन गर्दा आयोजना प्रभावित गा.वि.स./न.पा. मा पर्नेसक्ने वातावरणीय प्रभावहरूका बारेमा ने.वि.प्रा., वातावरण तथा सामाजिक अध्ययन विभाग, भक्तपुरबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरूबीच निम्न मिति, समय र स्थानमा छलफल गरी निम्न लिखित राय सुझावहरू संकलन गरियो ।

मिति : २०७३/०६/२९

समय :

स्थान : काहुडिबिपुर-१, काठमाडौँ टोल

क्र.सं.	नामधर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन.नम्बर
१.	प्रेम व. वि. ड.	कृषि	काहुडिबिपुर	प्रेम व. वि. ड.	
२.	खेल दावा वि. ड.	मार्केटिंग/रिसेन्स	"	खेल दावा	
३.	दुर्गा व. थापा	सिक्कि	काहुडिबिपुर	दुर्गा व. थापा	९८२५११०६९१
४.	अकर व. वि. ड.	पेन्सनर	काहुडिबिपुर	अकर व. वि. ड.	९८६६३६१२०१
५.	विष्णु वि. ड.	शहीदी	काहुडिबिपुर-१	विष्णु	
६.	दुर्गा व. थापा	कृषि	काहुडिबिपुर-१	दुर्गा	
७.	सिरज ड. साह	कृषि	"		
८.	दुर्गा व. थापा	कृषि	"		९८२५११११६७
९.	जविगा साह	कृषि		जविगा साह	
१०.	मुल्लमाया वि. ड.	कृषि	काहुडिबिपुर	मुल्लमाया	९८४६०४३४५६
११.	पातुज वि. ड.	कृषि	काहुडिबिपुर		९८१६१३३६९१
१२.	प्रति वि. ड.	"	काहुडिबिपुर		९८०६५५६६११

१३. रमेश जोशी सेक्रेटरी ने.वि.प्रा. काठमाडौँ ९८४१९८०८२५

१४.

राय सुझाव : १. घर भित्र तथा बाह्यीत भित्रको अतिरिक्त अन्य सुझावहरू
२. सडकमा गाडवाली तथा ट्रफि सम्बन्धित गर्नुपर्ने ।
३. प्रभावितहरूलाई सेवागार प्रदान गर्नुपर्ने ।
४. सुरक्षा तथा जनचेतना तथ्यांक सँगसँगै सडकमा गाडवाली गर्नुपर्ने ।
५. कृषि तथा सिपबलहरू तालिमहरू प्रदान गर्नुपर्ने ।




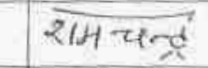

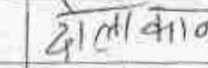

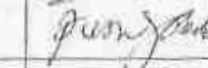
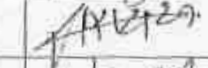
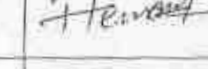

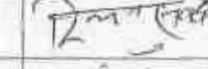


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मिति : २०७३/०६/२५

समय :

स्थान : क्याम्प-६, प्रहिसतकुना (नेपालगढ)

क्र.सं.	नामथर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन.नम्बर
१.	अन्तर प्रहिसत	लेखनी	क्याम्प-६		९८४६५३८८३३
२.	शमचन्द्र कुमाल	कृषि	क्याम्प-६		
३.	लाल बज्रेश्वर	कृषि	"		९८०५८८३०४८
४.	दोल गुरुङ कुतेस	कृषि	"		९८४८९८०८९८६५
५.	सुन्दर राम खड्का	"	"		
६.	पुण्यवती पडौत	"	"		९८९३८२४८८८
७.	नारायण गिरी	"	"		९८८५६४६३२३
८.	हेमन्त थापा	वि.प्रा.मी.	"		
९.	सुमन थापा	"	"		
१०.	रिना सुब्बा	"	"		९८८९३८९४६३८
११.	सुभाष थापा	गा.वि.स.	न.वि.प्रा.		
१२.	रमण थापा	"	"		



राय सुझाव : १. निर्माण - लक्षणमा लक्षणीयताको निम्न अनुपातको बाधमा निर्माण गर्नु पर्ने।
२. लक्षणीयताको आधार तय गर्ने गरी निर्माण गर्नु पर्ने।
३. आवासीयताको आधारमा निर्माण गर्नु पर्ने।
४. निर्माण गर्नु पर्ने।
५. निर्माण गर्नु पर्ने।

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नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ - दमौली २२० के.भी. प्रसारण लाईन आयोजना कार्यान्वयन गर्दा आयोजना प्रभावित गा.वि.स न.पा.मा पनसुके वातावरणीय प्रभावहरूका कारणमा नै.वि.प्रा. वातावरण तथा सामाजिक अध्ययन विभाग, भक्तपुरबाट प्राथमिक वातावरणीय परिक्षण (IEE) तयार गर्ने सिर्जनामा खाँदबाराका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरकारीवातावरणीय तिम्र मिति, समय र स्थानमा छलफल गरी निम्न लिखित गरी सुझावहरू मकलन गरियो ।

मिति : २०७३/०६/२२

समय :

स्थान : लेखनाथ - ९

क्र.सं.	नामथर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन,नावर
१.	लेखनाथ पाले	१०	लेखनाथ - ९	लेखनाथ	
२.	तल्लिवा गा.वि.स.		"	लेखनाथ	
३.	उमर गा.वि.स.	हलामुखी	"	लेखनाथ	
४.	उमर गा.वि.स.	१०	"	लेखनाथ	९८५५९०८९६
५.	लेखनाथ गा.वि.स.		"	लेखनाथ	९८५८७५६६
६.	उमर गा.वि.स.		"	लेखनाथ	
७.	लेखनाथ पाले		"	लेखनाथ	
८.	शरद गा.वि.स.	१०	"	लेखनाथ	
९.	लेखनाथ गा.वि.स.	१०	"	लेखनाथ	
१०.	लेखनाथ गा.वि.स.		"	लेखनाथ	
११.	लेखनाथ गा.वि.स.	१०	"	लेखनाथ	
१२.	पुल्खी गा.वि.स.		"	पुल्खी	

- गरी सुझाव : १. पार २२० वा.प्र.को उचित पुर्वाधार हुनुपर्ने
 २. तारखतीको तालाको उचित पुर्वाधार हुनुपर्ने
 ३. तालाको तालाको उचित पुर्वाधार हुनुपर्ने
 ४. उमर गा.वि.स.को तालाको तालाको उचित पुर्वाधार हुनुपर्ने
 ५. तालाको तालाको उचित पुर्वाधार हुनुपर्ने



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मिति : २०६३/०६/३०

समय :

स्थान : व्यास न.पा-८ झुल्लोटाँर

क्र.सं.	नामधर	पद/पेशा	ठेगाना/संस्था	हस्ताक्षर	फोन.नम्बर
१.	कृष्ण प्रसाद आचार्य	कृषि	व्यास न.पा-८		९८४६१९९९५६
२.	महेन्द्र आचार्य	व्यापार	"		९८४६३३०८४४
३.	शरत् खनाल	व्यापार	व्यास न.पा-८		९८४६०४४६८३
४.	शरत् खनाल		व्यास-८		
५.	दत्त खनाल		व्यास-६		९८४९८६९४४८
६.	वीर न. खाले		व्यास-६		९८४६०५६६६५
७.	रविन्द्र खाले		"		
८.	सुरेन्द्र खाले		"		
९.	रमेश खाले	मेकरी	ने.वि.प्रा.		९८४९५८८८२
१०.	नरेश खाले	"	"		९८४९९९८८५
११.	प्रकाश खाले	"	"		९८४९९२६३३३
१२.	सुभाष खाले	"	"		९८४९९८६४

राय सुझाव : १. वातावरणीय निवेदनमा तर्जिएर प्रसारण लाईन निर्माण गरिनुपर्ने।

२. निर्माण-कार्यमा वातावरणीय न्यून अनुसरणको जोखिमबाट दिनु पर्ने।

३. निषेधकृत तथा सुझाव लेखनको तालीमहरू प्रकाशित गरी दिनु पर्ने।

४. प्रकाशित पत्र तथा प्रसारणको उचित छलफलबाट उचित निर्णय सुझाव दिनुपर्ने।



Appendix G

Recommendation and Consent Letters



२०७४/०३/२७

श्री नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
खर्पाटी, भक्तपुर ।

विषय : सिफारिस गरिएको सम्बन्धमा ।

उपरोक्त सम्बन्धमा तहाँ कार्यालयको प.सं २०७३/७४, च.नं ९२९, मिति : २०७४/०३/२२ को पत्र साध लेखनाथ-दमौली २२० के. भी. प्रसारण लाइन आयोजनाको प्रारम्भिक वातावरणीय परिक्षण मस्यौदा प्रतिवेदनको सारण प्राप्त भई व्यहोरा अवगत भयो । उक्त प्रतिवेदनमा उल्लेख भएका वातावरणीय प्रभाव न्यूनिकरणका कार्यक्रमहरु कार्यान्वयन हुने गरी वातावरण संरक्षण नियमावलीका २०५४ को नियम १० बमोजिम उक्त प्रस्ताव कार्यान्वयन हुनको लागि सिफारिस गरिन्छ ।

निर्मल मान सिंह भण्डारी
वातावरण अधिकृत
वातावरण अधिकृत



पत्र संख्या- २०७४/०७५

चलानी नम्बर- २८६

मिति-२०७४/०४/२४

विषय- सिफारिस गरिएको बारे ।

श्री नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग,

प्रस्तुत विषयमा व्यास नगरपालिका ६ नं वडा कार्यालय तनहुँको आ.व. २०७४/०७५ चलानी नं ७१ मिति २०७४/०४/२३ गतेको पत्र अनुसार नेपाल विद्युत प्राधिकरण द्वारा प्रस्तावित लेखनाथ दर्माली २२० के.भी प्रशारणा लाइन आयोजनाको आई.ई.ई. प्रतिवेदन उर्जा मन्त्रालयबाट स्विकृत गराउने सम्बन्धमा वातावरण संरक्षण नियमावली २०५४ को नियम १० बमोजिम आयोजना सँग सम्बन्धित यस व्यास नगरपालिकाको सिफारिस माग भै आएको सन्दर्भमा व्यास नगरपालिका वडा नं ६ बाट समेत वडाको हाल वसोबास भएको क्षेत्र र सम्भावित बस्ती विस्तार हुने क्षेत्रलाई असर नपर्ने गरी उक्त योजना संचालन गर्नको लागि सिफारिस गरिएको हुदाँ सोही अनुसार गर्नुहुन अनुरोध गरिन्छ ।


०२४
विद्युत तथा न्यायापाले
प्रमुख



सर्गादि साङ्ख्योपाख्यानम्

112

○ 이차방정식 2차함수의 그래프

4014 WANG ET AL.

 $\frac{1}{4}, \frac{1}{3}, \frac{1}{2} \in$

956

12014 12015 12016 12017 12018 12019 12020 12021 12022 12023 12024 12025 12026 12027 12028 12029 12030 12031 12032 12033 12034 12035 12036 12037 12038 12039 12040 12041 12042 12043 12044 12045 12046 12047 12048 12049 12050 12051 12052 12053 12054 12055 12056 12057 12058 12059 12060 12061 12062 12063 12064 12065 12066 12067 12068 12069 12070 12071 12072 12073 12074 12075 12076 12077 12078 12079 12080 12081 12082 12083 12084 12085 12086 12087 12088 12089 12090 12091 12092 12093 12094 12095 12096 12097 12098 12099 12100 12101 12102 12103 12104 12105 12106 12107 12108 12109 12110 12111 12112 12113 12114 12115 12116 12117 12118 12119 12120 12121 12122 12123 12124 12125 12126 12127 12128 12129 12130 12131 12132 12133 12134 12135 12136 12137 12138 12139 12140 12141 12142 12143 12144 12145 12146 12147 12148 12149 12150 12151 12152 12153 12154 12155 12156 12157 12158 12159 12160 12161 12162 12163 12164 12165 12166 12167 12168 12169 12170 12171 12172 12173 12174 12175 12176 12177 12178 12179 12180 12181 12182 12183 12184 12185 12186 12187 12188 12189 12190 12191 12192 12193 12194 12195 12196 12197 12198 12199 12200 12201 12202 12203 12204 12205 12206 12207 12208 12209 12210 12211 12212 12213 12214 12215 12216 12217 12218 12219 12220 12221 12222 12223 12224 12225 12226 12227 12228 12229 12230 12231 12232 12233 12234 12235 12236 12237 12238 12239 12240 12241 12242 12243 12244 12245 12246 12247 12248 12249 12250 12251 12252 12253 12254 12255 12256 12257 12258 12259 12260 12261 12262 12263 12264 12265 12266 12267 12268 12269 12270 12271 12272 12273 12274 12275 12276 12277 12278 12279 12280 12281 12282 12283 12284 12285 12286 12287 12288 12289 12290 12291 12292 12293 12294 12295 12296 12297 12298 12299 12300 12301 12302 12303 12304 12305 12306 12307 12308 12309 12310 12311 12312 12313 12314 12315 12316 12317 12318 12319 12320 12321 12322 12323 12324 12325 12326 12327 12328 12329 12330 12331 12332 12333 12334 12335 12336 12337 12338 12339 12340 12341 12342 12343 12344 12345 12346 12347 12348 12349 12350 12351 12352 12353 12354 12355 12356 12357 12358 12359 12360 12361 12362 12363 12364 12365 12366 12367 12368 12369 12370 12371 12372 12373 12374 12375 12376 12377 12378 12379 12380 12381 12382 12383 12384 12385 12386 12387 12388 12389 12390 12391 12392 12393 12394 12395 12396 12397 12398 12399 12400 12401 12402 12403 12404 12405 12406 12407 12408 12409 12410 12411 12412 12413 12414 12415 12416 12417 12418 12419 12420 12421 12422 12423 12424 12425 12426 12427 12428 12429 12430 12431 12432 12433 12434 12435 12436 12437 12438 12439 12440 12441 12442 12443 12444 12445 12446 12447 12448 12449 12450 12451 12452 12453 12454 12455 12456 12457 12458 12459 12460 12461 12462 12463 12464 12465 12466 12467 12468 12469 12470 12471 12472 12473 12474 12475 12476 12477 12478 12479 12480 12481 12482 12483 12484 12485 12486 12487 12488 12489 12490 12491 12492 12493 12494 12495 12496 12497 12498 12499 12500 12501 12502 12503 12504 12505 12506 12507 12508 12509 12510 12511 12512 12513 12514 12515 12516 12517 12518 12519 12520 12521 12522 12523 12524 12525 12526 12527 12528 12529 12530 12531 12532 12533 12534 12535 12536 12537 12538 12539 12540 12541 12542 12543 12544 12545 12546 12547 12548 12549 12550 12551 12552 12553 12554 12555 12556 12557 12558 12559 12560 12561 12562 12563 12564 12565 12566 12567 12568 12569 12570 12571 12572 12573 12574 12575 12576 12577 12578 12579 12580 12581 12582 12583 12584 12585 12586 12587 12588 12589 12590 12591 12592 12593 12594 12595 12596 12597 12598 12599 12600 12601 12602 12603 12604 12605 12606 12607 12608 12609 12610 12611 12612 12613 12614 12615 12616 12617 12618 12619 12620 12621 12622 12623 12624 12625 12626 12627 12628 12629 12630 12631 12632 12633 12634 12635 12636 12637 12638 12639 12640 12641 12642 12643 12644 12645 12646 12647 12648 12649 12650 12651 12652 12653 12654 12655 12656 12657 12658 12659 12660 12661 12662 12663 12664 12665 12666 12667 12668 12669 12670 12671 12672 12673 12674 12675 12676 12677 12678 12679 12680 12681 12682 12683 12684 12685 12686 12687 12688 12689 12690 12691 12692 12693 12694 12695 12

DOI: 10.1002/for

11146-11147 = 11146 (11147) 11146-11147

2007-08-15 14:06:14

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24/9/2015

राजेन्द्रकृष्ण श्रेष्ठ
अध्यापक





म्याग्दी गाउँपालिका

गाउँ कार्यपालिकाको कार्यालय

२०७३/७४

पत्र संख्या

चलानी नं. ३५

खाफा, तम्घास

४ नं. प्रदेश, नेपाल


२०७३/०४/२०

मिति

विषय : सिफारिस गरिएको सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण
(वातावरण तथा सामाजिक अध्ययन विभाग),
खार्पाटी, भक्तपुर ।

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ-दमौली २२० के.भी प्रसारण लाइन आयोजनाको प्रारम्भिक वातावरणीय परीक्षण (IEE) मस्यौदा प्रतिवेदनको माराशमा उल्लेख भएका वातावरणीय प्रभाव न्यूनीकरणका कार्यक्रमहरु कार्यान्वयन हुनेगरी वातावरण संरक्षण नियमावली, २०१४ को नियम १० बमोजिम उक्त प्रस्ताव कार्यान्वयन हुनको लागि सिफारिस गर्दछु ।


(माया देवी राना आलं)

अध्यक्ष

माया देवी राना आलं
गाउँपालिका अध्यक्ष



-0.71- 69

दिनांक: २०७८.०६.२३

विषयः सिफारिश गारिहकीं ।

श्री नेपाल विद्युत प्राधिकरण,
धनकुटा तथा सप्तगरीक कार्यालय विभागा

प्रस्तुत विषयमा तथै कार्यलयमा तार मिति २०७३.०८.२१ नं. ३२५ को दश। कार्यलयलाई प्राप्त तै. वि. प्रा. दुम। प्रस्तावित लेखापत्र. दूबौली. २२ तै. गी. प्रकरण लाइन आयोजनाको आर्. ई. ई. प्रतिकेन दर्जा मन्त्रालयबाट स्वी कृत गराउने सम्बन्धमा वातावरण सुरक्षण नियमावली २०३४ को नियम ५० अगोजिम आयोजना सँग सम्बन्धित यस यस्य नया तह। नुहुको सिफारिश माग गरको सम्बन्धमा यस तहको हाल बसोबास गरको क्षेत्र २ सम्मानित यसको तहबाट हुने क्षेत्रलाई अरु तहने कपी माथ उक्त तहको सम्बन्धमा यो को तहको सिफारिशमा अनुमति गरिह।

1344





रुपा गाउँपालिका

Rupa Rural Municipality

गाउँ कार्यकारी कार्यालय

Village Executive Office

पत्र संख्या (Letter No.) २०७३/१३

४ नं प्रदेश नेपाल (No. 4 Province Nepal)

संदर्भ नं (Ref No.) १६१

मिति (Date) २०७३/०३/१३

श्री नेपाल विद्युत प्राधिकरण
सामाजिक तथा सामाजिक अध्ययन विभाग
खारिपारी भक्तपुर ।

विषय (Subject) : जानकारी गराइएको सम्बन्धमा ।

उत्तराक्त सम्बन्धमा नेपाल विद्युत प्राधिकरण, सामाजिक तथा सामाजिक अध्ययन विभागले मिति २०७३/०३/१३ को पत्र साध विज्ञान-वर्माती २२७ के सी प्रसारण लाइन आयोजनाको प्रारम्भिक सामाजिक परीक्षण मूल्यांकन प्रतिवेदनको सारसंगै पठाएर नई व्यक्तित्व प्रयोगत नयाँ । सो सम्बन्धमा साधनात्मक रूपमा सम्बन्धित क्षेत्रमा सम्बन्धित नयाँ छलफल गर्दा उक्त प्रस्तावमा सहमत भईने तथ्यको आधारमा जानकारी गराइन्छ ।

२०७३/०३/१३
सचिव
नरेश्वर जोशी

नेपाल सरकार
ऊर्जा सचिवालय
२०७३



विद्युत

सर्वप्रथम सामुदायिक व अन्य उपयोगिता-समिति समूह

अध्याय-६, भाग-१



दिनांक 20/05/08/24

विद्युत ग्राम विकास समिति के लोडिंग लाइटों के रखरखाव

कार्यालय प्रमुख को

अप्रैल 2008 में ग्राम स्थापन के समुदायिक
उपभोक्ता समूह द्वारा ह. तनहुँ सा. मिति 20/05/08। एवं
को जिला लेखन विद्युत प्राधिकरण कातावरण प्रभाव
तथा सामाजिक अध्ययन विभाग के पत्र 06/05/08
को-नं. 526 को प्राप्त लाई गैलरी प्रस्तुत की गई उक्त
कार्यका लागी 220 K.V. लाइन प्रसारण की लागी
करती भन्दा बाहीर रहेको गाली बढिको छिनार छिनार
सात विद्युत लाईन विस्तार गर्न अनुमति दिने र कुक्क
विस्तारमा कुनै पनि उपभोक्ताको रोकथाम गोज्य अभिन र
सार जग्गा लाई नोकसान गर्ने बढिने भनि जिला
विभाग करिको अनुरोध गर्दछु

अहमद



गोपनीय

भ्यांजन - भुज

વસ્તુનો નં. : 062/088

दिनांक 20/06/2021

विषय : सहकारी समूह / १

Q11. $\frac{1}{2}$ litre of water is added to 1 litre of milk. Find the ratio of milk to water.

सं. १०० नमन गिरावले दिनी २०८१०३४
 नमन ५३६ को पत्र साध लेखनाथ - दारौली व २० के नमन
 उलारन लाइन कागजनाको उम्मील उरमनीक वातावरणी
 परिश्रम (IEE) गसपौडा उलिवेदन को लारशिं जाले -
 लारोरा उरमना भयो। उल उलिवेदनका उललेख गसका
 वातावरणीय उपाय लुनीकरका कार्यकाहुन कार्यालय
 हुने गरी उल उलिवे कार्यालय हुने लानी सहमति
 गरिन्छ।

H. H. F.

(रहित बहादुर थापा)

अद्वैत ए

मालिक लामुद्दारी बग

उपरोक्त सविनी सं. 14-2



मेपात शर
ऊर्जा शर

Appendix H

Public Deeds





सदरूप माहिती आ. स. संकेतमा विकास मन्त्रालय
जिल्ला शिक्षा अधिकारीको कार्यालय
सुनसरी

सुनसरी, ०६/०२/२६
०६/०२/२६
०६/०२/२६

सं. ०६३/०६८
०६३/०६८
०६३/०६८

०६३/०६८

०६३/०६८

०६३/०६८

विषय : सूचना टाँसको जानकारी

श्री नेपाल विद्युत् प्राधिकरण
पाटीगाउँ तथा खामाप्के अद्वान पेभल
शकरीपाथी अरुणपुर

उपयुक्त विषयमा त्यहाँबाट पठाउनु भएको प.सं. ०६३/०६८
च.नं. ५२३ मिति ०६३/०२/२२ को पत्र साथ प्राप्त सूचना यस कार्यालयको
सूचना पाटीमा टाँस भएको व्यहोरा जानकारीको लागि अनुरोध छ ।

०६३/०२/२६



जिल्ला समाजिक सवितिको कार्यालय

तल, धरौली

बागेश्वर, कैलाल

फोन : ०३१-४४००४४

०३१-४४००४४

फैक्स : ०३१-४४००४४

डा. २०७३/०६०४

प्रमाणित तथ्याङ्क : १०६३

दिनांक :

२०७४/३/२६

विषय:- सूचना टाँसको जानकारी ।

श्री नेपाल विद्युत प्राधिकरण,

वातावरण तथा सामाजिक अध्ययन विभाग, खरिपाटी भक्तपुर ।

प्रस्तुत विषयमा तहाँको प.सं. २०७३/०६०४ च.नं. ९२३ मिति २०७४/३/२२ को पत्रसाथ प्राप्त हुन आएको गोर्खा पत्रमा प्रकाशित मिति २०७४/३/१६ गतेको सार्वजनिक सूचना यस कार्यालयको सूचना पाटीमा टाँस भएको व्यहोरा जानकारीको लागि अनुरोध छ ।

नेपाल सरकार
ऊर्जा नवनीकरण
२०७६

नेपाल सरकार

वन तथा भू-संरक्षण मन्त्रालय

वन विभाग

जिल्ला वन कार्यालय, कास्की



प.स.०३३ ०७४

च.नं.

१०५१

मिति २०७४/०३/२३

विषय: सूचना टाँसको जानकारी सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण

वातावरण तथा सामाजिक अध्ययन विभाग ।

प्रस्तुत विषयमा नेपाल विद्युत प्राधिकरण वातावरण तथा सामाजिक अध्ययन विभागको च.नं. ९२३ को पत्रानुसार मिति २०७४/३/१६, गते गोरखापत्र राष्ट्रिय दैनिकमा प्रकाशित सूचना यस कार्यालयको सूचना पाटीमा टाँस गरिएको व्यहोरा जानकारीको लागि अनुरोध छ ।

केदार बराल

जिल्ला वन अधिकृत

जिल्ला वन कार्यालय, कास्की

नेपाल सरकार
अर्जा कार्यालय
२०६६

2068/03425

सुविधा विभाग सुविधा विभाग

01/09/07 र म, लखनऊ में, रहरिपाली मठ 1

3-6/10/1111 11/11 0. & 202/068 - 2. 9. 22 11/11

068/312-2 जलिका वन्यपक्षी मिति 06/03/95 जलिकारेकायन प्रकल्पको
जलिका लारेकायन-डोली 100 रु. दि प्रमाण लाने भन्ने कुराको
प्रमाणित प्रमाणित वन्यपक्षी मिति 06/03/95 जलिकारेकायन प्रकल्पको
जलिका लारेकायन-डोली 100 रु. दि प्रमाण लाने भन्ने कुराको
प्रमाणित प्रमाणित वन्यपक्षी मिति 06/03/95 जलिकारेकायन प्रकल्पको

2005/2/25
(2005. 2. 25)



१८४/१८४/१२०

१२०२१



२०७४, ०३, २३

श्री नेपाल विद्युत प्राधिकरण
भक्तपुर।

विषय :- जानकारी।

उपरोक्त सम्बन्धमा तहाँ कार्यालयको २०७३, ७४ च.नं. ९२३ मिति : २०७४, ०३, २२ को पत्रमाथि प्राप्त सूचना पत्र प्राप्त भएको मितिमा यस कार्यालयको सूचना पाटीमा टाँस भएको व्यहोरा जानकारीको लागि अनुरोध छ।

(कल्याण बराल)

प्रशासकिय अधिकृत

प्रशासकिय अधिकृत



१२२४

२०७४/०३/२७

श्री नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
खारपाटी, भक्तपुर ।

विषय :- राय/सुझाव पेश गरिएको बारे ।

उपरोक्त सम्बन्धमा यां आयोजना कार्यान्वयन गर्ने समयमा प्रभावित क्षेत्रका घरधुरी, समाज, सामुदायिक वन वा प्रभावित हुन सक्ने अन्य क्षेत्रहरूलाई उचित क्षतिपूर्ति तथा मुआब्जा, स्थानीयहरूलाई रोजगार, आयमुलक/सिपमुलक तालिम तथा पारदर्शिता गरी आयोजना निर्माण हुन मनासिव देखीदा सोहि समोजिमको राय यस कार्यालयबाट दिइएको व्यहोरा निर्देशनानुसार अनुरोध छ ।


निर्मल मान सिंह भण्डारी
वातावरण अधिकृत


कोषाया सरकार
अर्जा कक्षा
२०६६

प.स. ०६३/०६४

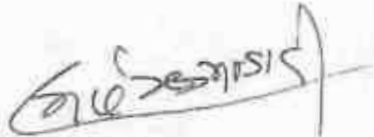
च.नं. ४९६

मिति: २०६४/०३/२८

विषय: सूचना टैक्सको जानकारी सम्बन्धमा ।

क्षी नेपाल विद्युत प्राधिकरण,
वातावरण तथा सामाजिक अध्ययन विभाग,
ब्यारिपाटी भक्तपुर, नेपाल ।

उपर्युक्त विषयमा तथर्हीबाट पठाउनु भएछो प.स. ०६३/०६४-च.नं.
३२३ मिति २०६४/३/२१ को पत्राचार प्राप्त सूचना वरु कार्यालयको
सूचना पाटीमा मिति २०६४/३/२८ मा टैक्स भएछो तथर्ही जानकारी
लागी अग्रशोध छ ।


सूर्यमल्ल गण्डारी
अध्यक्ष



पत्र ०६३१०६४


च-त ४९६

मिति: २०६४०३।२८

विषय: राय/सुझाव पेश गरिएको छरे ।

श्री नेपाल विद्युत प्राधिकरण,
कातावरण राया सामाजिक अध्ययन विभाग,
बपरिपारी, मकपुर ।

उपर्युक्त सम्बन्धमा यी आयोजना कार्यान्वयन गर्ने समग्रमा प्रभावित क्षेत्रका धारदुरी, समान र सामुदायिक वनलाई कम प्रभावित हुने गरी र प्रभावित क्षेत्रलाई उचित क्षतिपूर्ति, मुआवजा र स्थानीय बासिन्दाहरूलाई रोजगार प्रदान गर्ने गरी आयोजना निर्माण हुन मनासिन्छ देखिने स्रोतहरूको आधारमा राय राख्न कार्यान्वयन गरिएको व्यहोरा अनुरोध छ ।


सुर्यगत भण्डारी
अध्यक्ष



प. २१ ०६२१०६४

पृ. ३१-६९

दिनांक: २०६४०६२३

विषय: शिफारिश गरिएको।

श्री नेपाल विद्युत प्राधिकरण,

काठमाडौं तथा सप्तगञ्ज अख्तियार विभाग

प्रस्तुत विषयमा तथी तथ्यांक तथा दिनांक २०६४०६२३-२४ गी ३२९
को यस तथ्यांकलाई प्राप्त री १४ प्रा. द्वारा प्रस्तावित तथ्यांक. ४००००२२
ले. श्री. प्रसाद लामा आयोजनाको आई. ई. ई. प्रावेलेन कर्जा प्रस्तावलाई स्वी
कृत गराउने सम्बन्धमा काठमाडौं अख्तियार नियमावली २०२४ को नियम १०
अनुसार आयोजना री १४ सम्बन्धित यस व्यक्त जता तथी नुद्धो शिफारिश
गर्ने गरेको सम्बन्धमा यस तथ्यांकबाट बसोवाला गरेको री २३०३०३०३
तथ्यांकलेबारे हुने सोधताई यस तथ्यांकको री १४ तथ्यांक सम्बन्धमा री
को तथ्यांक शिफारिशको अग्रिम गरिएको।

स. १४ १४ १४
अ. १४ १४ १४



पत्र संख्या- २०७४/०७५

चलानी नम्बर- २६८

मिति-२०७८/०८/२४

विषय- सिफारिस गरिएको बारे ।

श्री नेपाल विद्युत प्राधिकरण

वातावरण तथा सामाजिक अध्ययन विभाग,

प्रस्तुत विषयमा व्यास नगरपालिका ६ नं वडा कार्यालय तनहुँको आ.च. २०७४/०७५ चलानी नं ७१ मिति २०७४/०४/२३ गतेको पत्र अनुसार नेपाल विद्युत प्राधिकरण द्वारा प्रस्तावित लेखनाथ दमौली २२० के.भी प्रणारणा लाइन आयोजनाको आई.ई.ई. प्रतिवेदन उर्जा मन्त्रालयबाट निवृत्त गराउने सम्बन्धमा वातावरण संरक्षण नियमावली २०५४ को नियम १० बमोजिम आयोजना सँग सम्बन्धित यस व्यास नगरपालिकाको सिफारिस माग भै आएको सन्दर्भमा व्यास नगरपालिका वडा नं ६ बाट समेत वडाको हाल बसोबास भएको क्षेत्र र सम्भावित वन्ती विस्तार हुने क्षेत्रलाई असर नपने गरी उक्त योजना संचालन गर्नको लागि सिफारिस गरिएको हुदा सोही अनुसार गर्नुहुन अनुरोध गरिन्छ ।


०२४
लेखनाथ दमौली
प्रमुख





म्याग्दे गाउँपालिका

गाउँ कार्यपालिकाको कार्यालय

पत्र संख्या: २०७३/७४

चलानी नं. ३५

झाङ्ग, तनहुँ

४ नं. प्रदेश, नेपाल

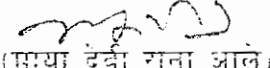
२०७४/०४/२०

मिति:

विषय : सिफारिस गरिएको सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण
(वातावरण तथा सामाजिक अध्ययन विभाग),
खर्पाटी, भक्तपुर ।

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ-दमौली २२० के.भी. प्रसारण लाइन आयोजनाको प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्वन्धित प्रतिवेदनको सांगणमा उल्लेख भएका वातावरणीय प्रभाव न्यूनीकरणका कार्यक्रमहरु कार्यान्वयन हुनेगरी वातावरण संरक्षण नियमावली, २०५४ को नियम १० बमोजिम उक्त प्रस्ताव कार्यान्वयन हुनको लागि सिफारिस गर्दछु ।


(माया देवी राना आले)

अध्यक्ष

त. माया देवी राना आले
गाउँपालिका अध्यक्ष



क्रांति गाउँपालिका
गाउँ कार्यपालिकाको कार्यालय

काठ
४ नम्वर पट्टा नेपाल

मिति : २०७३.०२.२०

प.सं. ५३२/३०

ख.सं. १९६

विषय : शिक्षात्मक मागको सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण

नवसंस्था तथा सामाजिक उत्प्रेरक विभाग

सुदूरपश्चिम प्रदेश

दुपयोजन सम्बन्धमा नेपाल विद्युत प्राधिकरण वा प्रा.प्रा.स.बाट सामाजिक उत्प्रेरक विभागबाट पठाई २०७३.०२.१९ को प्रत्यक्ष लेखवाज (दमोली ३२२४) कृ.म. प्रसारण बाटुने प्रयोगकर्ता प्रा.प्रा.स.को वातावरणमा परिचय IEE मेस्येजिङ पोलिटेक्निकी समितिबाट प्राप्त गर्नु आदेशित प्रयोगकर्ता संगी । दुई पोलिटेक्निकी दुवैसँग समीक्षा वातावरणमा प्रसारण पोलिटेक्निकीको वातावरणमा प्रयोगकर्ता संगी संगी वातावरणमा प्रसारण निम्नमावली २०७३.०२.१९ को तथ्याङ्क १०० प्रसारण दुई. पर प्राप्त प्रयोगकर्ता संगी संगी शिक्षात्मक सम्बन्ध ।

राजेन्द्रकृष्ण श्रेष्ठ
अध्यक्ष

नेपाल सरकार
ऊर्जा मन्त्रालय
२०७३



समाचार सामुदायिक स्वास्थ्य सेवा - २०७३
२०७३/०५/२२



विद्युत ग्रामीण स्वास्थ्य सेवा को लाईन लाईन सेवाको बारेमा

कार्यालय प्रमुख को -

उपरोक्त स्वास्थ्य सेवाको यस रूपको स्वास्थ्य सेवाको
उपभोक्ताहरूलाई यसको बारेमा मिति २०७३/१५/०१
को फैसला नेपाल विद्युत प्राधिकरणबाट प्राप्त
तथा स्वास्थ्य सेवा अर्थोपचार विभागको सन् ०६२/०६४
को-०००६२६ को पत्रलाई भौतिक प्रस्तुत गर्दा उक्त
कार्यका लागि २२० K.V लाईन प्रसारणको लागि
तरती भन्दा बाहिर रहेको भन्ने तथ्यांकले कित्ता कित्ता
सात विद्युत लाईन विस्तार गर्ने अनुमति दिने र कुनै
विरतारमा कुनै पनि उपभोक्ताको सेवाको रोक जागी न
घर जागी लाई लोकमान गर्ने तथ्यांकले भन्ने फैसला
निर्णय गरिएको अनुरोध गर्दछु

अहमद

गाउँपालिका अध्यक्ष

गाउँपालिका



पत्र संख्या

संख्या २ - ०६३/०६४

दिनांक २०६४/४/२२

विषय: सहकारी समितिका लागि ।

सिद्धिचन्द्र शर्मा

सिद्धिचन्द्र शर्मा जिल्ला प्रशासकीय कार्यालय, धनकुटा जिल्ला, २०६४/०३/२२
संख्या ५२६ को पत्र प्राप्त भएको छ। यो पत्रमा २२० के.मी.
उत्तरतर्फको भूखण्डको सम्बन्धमा सहकारीको नाममा
परिचय (IEE) गराइएको उल्लेख गरिएको छ। यो पत्रमा
सहकारीको नाममा भूखण्डको उल्लेख गरिएको छ।
सहकारीको नाममा भूखण्डको उल्लेख गरिएको छ।
सहकारीको नाममा भूखण्डको उल्लेख गरिएको छ।
सहकारीको नाममा भूखण्डको उल्लेख गरिएको छ।
सहकारीको नाममा भूखण्डको उल्लेख गरिएको छ।



(सिद्धिचन्द्र शर्मा)
अध्यक्ष
सहकारी समिति, धनकुटा
उपमहानगरपालिका, धनकुटा-२



Appendix I

Photographs



Photograph of Houses and other Structures Fall under RoW and Nearby TL Alignment



House Under RoW (AP23 to AP24)



Manung Primary School, at Saura, Byas



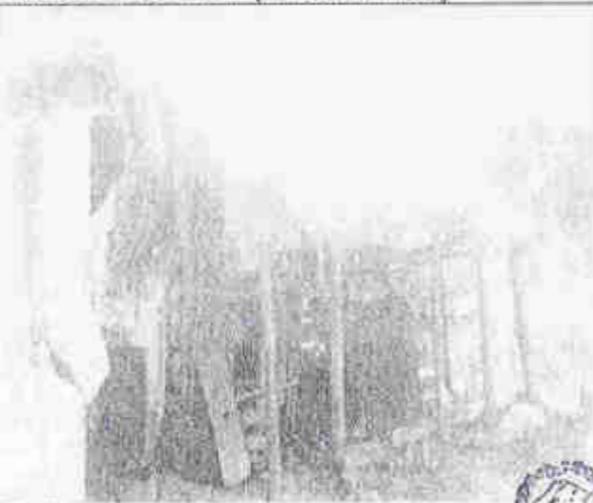
Drinking Water Tank under RoW (AP37-AP38)



House under RoW (AP25 to AP26)



House under RoW (AP25-AP26)



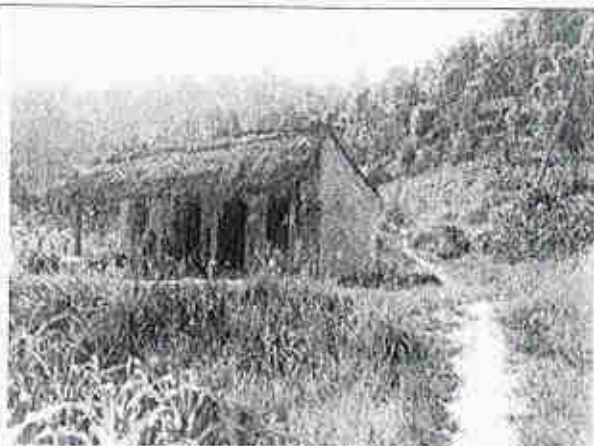
Buffaloshed under RoW (AP25-AP26)



नेपाल सरकार
ऊर्जा मन्त्रालय
२०६६



Toilet under RoW (AP26-AP27)



House under RoW (Ap26-Ap27)



HH survey at Shyamgha



Home under RoW (Ap29A-Ap30)



HH Survey



Meeting with Local People

Appendix J

Approved ToR




$$E_{\text{tot}} = \begin{cases} 0.577076 \\ 0.579900 \end{cases}$$

विद्युत्-चुम्बकत्व

U. R. 062168
D. R. 2.22

मिति: २०७३।०७।७

विषय: लेखनाथ - दमौली २२० के.भि विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परीक्षणको कार्यसूची (TOR) स्वीकृत भएको सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण,
दरबारमार्ग, काठमाण्डौ ।

तह्नीवाट पेश भएको लेखनाथ - दर्मीली २२० के.भि विद्युत प्रसारण लाइनको प्रारम्भिक वातावरणीय परीक्षणको कार्यसूची (TOR) प्रतिवेदन वातावरण संरक्षण ऐन, २०५३ तथा वातावरण संरक्षण नियमावली, २०५४ बमोजिम निम्न शर्तहरू सहित संलग्न अनुसारको विषयहरू अध्ययनमा समेटेने गरि मन्त्रालयको मिति ०७३१०७१०२ को निर्णय (सचिवस्तर) अनुसार स्वीकृत भएको व्यहोरा अनुरोध गरिन्छ । (स्वीकृत प्रतिवेदनको एकप्रति संलग्न छ ।)

शततन्त्र

१. आयोजनाले प्रारम्भिक वातावरणीय परीक्षणको अध्ययन गर्दा सरोकारवाला निकाय सँग आवश्यक समन्वय गरी गर्नु पर्नेछ।
२. प्रारम्भिक वातावरणीय परीक्षणमा उल्लिखित गा.वि.स तथा जिल्ला अनुमतिपत्रमा उल्लेख भए अनुसार हुनुपर्नेछ।
३. स्वीकृत प्रारम्भिक वातावरणीय परीक्षणको कार्यसूचीमा उल्लेखित आयोजनाको संरचना तथा क्रियाकलापको स्थल, डिजाइन, आकार वा प्रकारमा परिवर्तन गर्नुपर्ने सोको जानकारी यस मन्त्रालयमा गराई थप अध्ययन गर्न आवश्यक विषयहरूका बारेमा अनुमति लिनु पर्नेछ।


कल्याण मोहन सोती
सि.डि.ई.

बोधार्थ

श्री विद्युत विकास विभाग,
अनामनगर, काठमाण्डौ ।





NEPAL ELECTRICITY AUTHORITY

TERMS OF REFERENCE
FOR
INITIAL ENVIRONMENTAL EXAMINATION
OF
LEKHNATH-DAMAULI 220KV TRANSMISSION LINE PROJECT



Submitted to:
Ministry of Energy
Through
Department of Electricity Development



Prepared and Submitted by:
Environment and Social Studies Department
Kharipati, Bhaktapur
Phone No.: 01-6611580, Fax: 01-6611590
Email: neaessd@wlink.com.np



May, 2016

ACRONYMS AND ABBREVIATIONS

ACSR	:	Aluminum Conductor Steel Reinforced
AP	:	Angle Point
CBOs	:	Community Based Organization
CBS	:	Central Bureau of Statistics
CFUG	:	Community Forest Users' Group
CSR	:	Corporate Social Responsibility
DDC	:	District Development Committee
DIA	:	Direct Impact Area
DoED	:	Department of Electricity Development
EIA	:	Environmental Impact Assessment
EMF	:	Electromagnetic Field
EPA	:	Environmental Protection Act
EPR	:	Environment Protection Rules
ESSD	:	Environment and Social Studies Department
FGD	:	Focused Group Discussion
GIS	:	Geographic Information System
GoN	:	Government of Nepal
GPS	:	Global Positioning System
HHs	:	Households
HIA	:	High Impact Area
IEE	:	Initial Environmental Examination
IIA	:	Indirect Impact Area
ILO	:	International Labor Organization
LPG	:	Liquefied Petroleum Gas
MoEn	:	Ministry of Energy
MoFSC	:	Ministry of Forest and Soil Conservation
MIA	:	Moderate Impact Area
NEA	:	Nepal Electricity Authority
NGOs	:	Non-Governmental Organizations
NTFPs	:	Non-Timber Forest Products
RoW	:	Right of Way
ST	:	Suspension Tower
TL	:	Transmission Line
ToR	:	Terms of Reference
VDC	:	Village Development Committee

Units

BS	:	Bikram Sambat
°C	:	Degree Centigrade
ha	:	Hectare
km	:	Kilometer
kV	:	Kilo Volt
mm	:	Millimeter
m ²	:	Square meter
MW	:	Megawatt
sq. km.	:	Square Kilometer
USD	:	United States Dollar

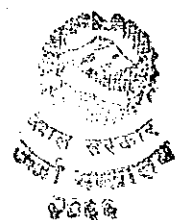


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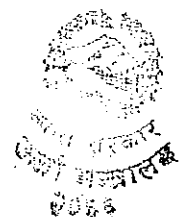
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1 INTRODUCTION

1.1 Background

Nepal possesses immense hydropower potential which has yet not be realized. However, the present situation is that Nepal has developed only approximately 750 MW of hydropower. The demand of power has been increasing with an average of 9% annually. At present, the generation capacity is not sufficient to feed the electricity demand of the country. It has triggered the severe load shedding in the country. Nepal Electricity Authority (NEA), the only public utility in Nepal responsible for generation, transmission, and distribution of electricity, is finding difficulty to cope with the increasing demand due to poor investment in generation and transmission.

Recently, System Planning Department of NEA has completed Power Evacuation Study for Lekhnath-Damauli 220kV TL. The hydropower projects namely Tanahun hydropower project (140MW), Upper madi (25MW), Namarjun Madi (12MW) and Bajra Madi (24.8MW) are in vicinity of the Lekhnath-Damauli; some of them are in construction and remaining others in study phase. It is essential to develop the 220kV transmission line to evacuate the power from these above mentioned projects. The current project **Lekhnath-Damauli 220kV Transmission Line Project** is a major step for evacuating the power generated from the Seti-Madi River basin and the vicinity area.

1.2 Proponent

Nepal Electricity Authority (NEA), the major electricity generator and sole agency responsible for transmission and distribution of electricity, is the proponent of the proposed Lekhnath-Damauli 220kV TL Project. The Ministry of Energy (MoEn) has granted a survey license on B.S. 2072/11/02 to NEA for feasibility and Initial Environmental Examination (IEE) study which is valid up to 2074/11/01 B.S. A copy of survey license is attached in Annex-I.

Address of the Project Proponent:

Nepal Electricity Authority
Durbar Marg, Kathmandu, Nepal
Phone No. : 01-4220449
Fax No. : 01-4447969

1.3 Organization Responsibility for Conducting IEE Study

Environment and Social Studies Department (ESSD) of NEA is responsible for the preparation of the ToR for the IEE study of the proposed project

Environment and Social Studies Department

Engineering Service Directorate

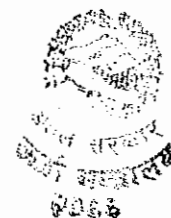
Nepal Electricity Authority

Kharipati, Bhaktapur, Nepal

Phone No. : 01-6611580

Fax No.: 01-6611590

Email : neaessd@wlink.com.np



1.4 Objectives of the ToR

The primary objective of the ToR for IEE is to inform the stakeholders about the project, receive their comments and feedback on relevant environmental impacts/ issues and identify the priority based components on social and environmental parameters for assessment.

The other objectives of ToR are to:

- To Collect brief information on physical, biological and socio-economic and cultural environment of the project area;
- To Identify all the beneficial and adverse impacts likely to arise as a result of the implementation of the proposed project;
- To Collect issues from the local community and summarize the significant issues
- To Describe the study methodology and provide guidance for the IEE study;
- To identify data requirement and describe methodology to collect these data;
- To identify the acts, rules, policies that needs to be reviewed and consulted;
- To develop the alternative study plan and monitoring plan
- To Clarify of the responsibilities of the different institutions involved in the IEE procedures;
- To Set out a time frame, with required expert manpower for carrying out the IEE study, together with estimated budget required; and
- Technical guidance relating to the main aspects of the environment that will require delineation during the courses of the IEE study.

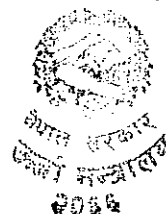
1.5 Objectives of IEE Study

The aim and objective of the IEE is to assess and inform decision makers by identifying the potentially significant environmental effects and risks of the proposed project and to suggest appropriate mitigation measures to mitigate and/or minimize the adverse impacts so that the project is implemented in an environmentally sound manner. The specific objective of the study is to prepare and IEE report. The other general objectives of the study are to:

- Document physical, biological, socio-economic and cultural baseline conditions of project area;
- Analyze alternative TL routes;
- Identify, predict and assess adverse and beneficial environmental impacts of the project in affected areas in terms of magnitude, extent and duration during project construction and operation phases;
- Purpose mitigation measures for adverse impact and enhancement measures for positive impact;
- Familiarize various stakeholders with IEE outcomes through public consultation and participation programs and to incorporate their relevant concerns and issues in environmental mitigation plan;
- Prepare an environment monitoring plan; and
- Facilitate informed decision making including setting the environmental terms and conditions for implementing the proposed project.

1.6 Rationality for Conducting IEE Study

As per the Schedule 2 of Environment Protection Rules (EPR), 1997 and the subsequent amendment (published in 2066/10/13 BS on Nepal Gazette) an IEE study is mandatory for TL of voltage level of 132kV or above. Thus, this project having a voltage level of 220kV requires an IEE study. All the project components along with substation fall within the boundary of survey license. The proposed project does not lie in any National Parks, Conservation Areas, Wildlife Sanctuary Areas, Buffer Zone, Wetlands or any other environmentally sensitive and fragile zones and the proposed alignment does not cross any settlement in its entire length.



2 PROJECT DESCRIPTION

2.1 Project Location

The proposed project is located in Gandaki zone of the Western Development Region of Nepal (Figure 2-1). The TL alignment passes through two districts namely: Kaski and Tanahun. In total 11 VDCs (7 VDCs of Kaski and 4 VDCs of Tanahun) and two municipalities (one in each District) will be affected by the project. These affected VDCs include Kalika (कालिका), Majhthana (माकठाना), Rupakot (रुपाकोट), Hansapur (हंसपुर), Thumki (थुम्की), Deurali (देउराली), Shidha (शिद्ध), Syamgha (श्याम्घा), Manpang (मनपाङ्ग), Jamune Bhanjyang (जामुने भञ्ज्याङ्ग), and Kahu Shivapur (काहुशिवपुर). The two municipalities, namely, Lekhnath (लेखनाथ) of Kaski and Byas (ब्यास) of Tanahun also lies along the alignment. It starts from the existing Lekhnath substation at Kharene village, Lekhnath Municipality and end at the proposed substation at Malingagau, Kahu Shivapur VDC. The project location map has been presented in Figure 2-1.

2.2 Project Accessibility

Existing Lekhnath substation at Kharene village of Kaski (already in operation) can be accessed through earthen road from black-topped motorable road of Prithvi Highway at Lekhnath chowk (about 800m). Proposed Substation at Malingagau, Kahu Shivapur VDC shall be constructed by the project and it can be accessed through the earthen road which is under-construction via Tanahu Hydro Limited. Access road to the proposed substation need to be constructed and its detail shall be presented in IEE report. Some section of the TL is accessible by feeder road and Prithvi highway and some section by rural local road. Some stretches in between are located at higher altitudes and are not easily accessible. Hence, the study was carried out through walk over approach and the project will be implemented by upgrading existing trails, wherever necessary so as to transport construction materials.

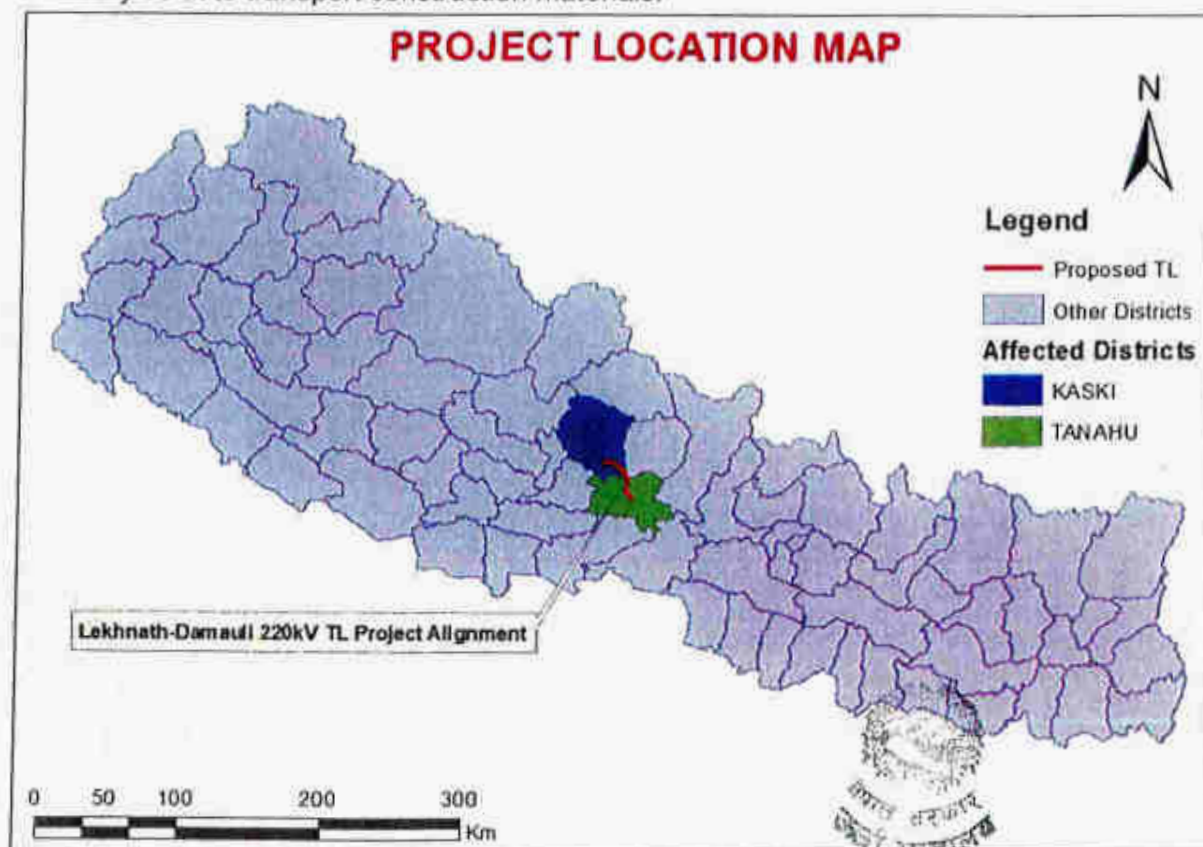


Figure 2-1: Project Location Map

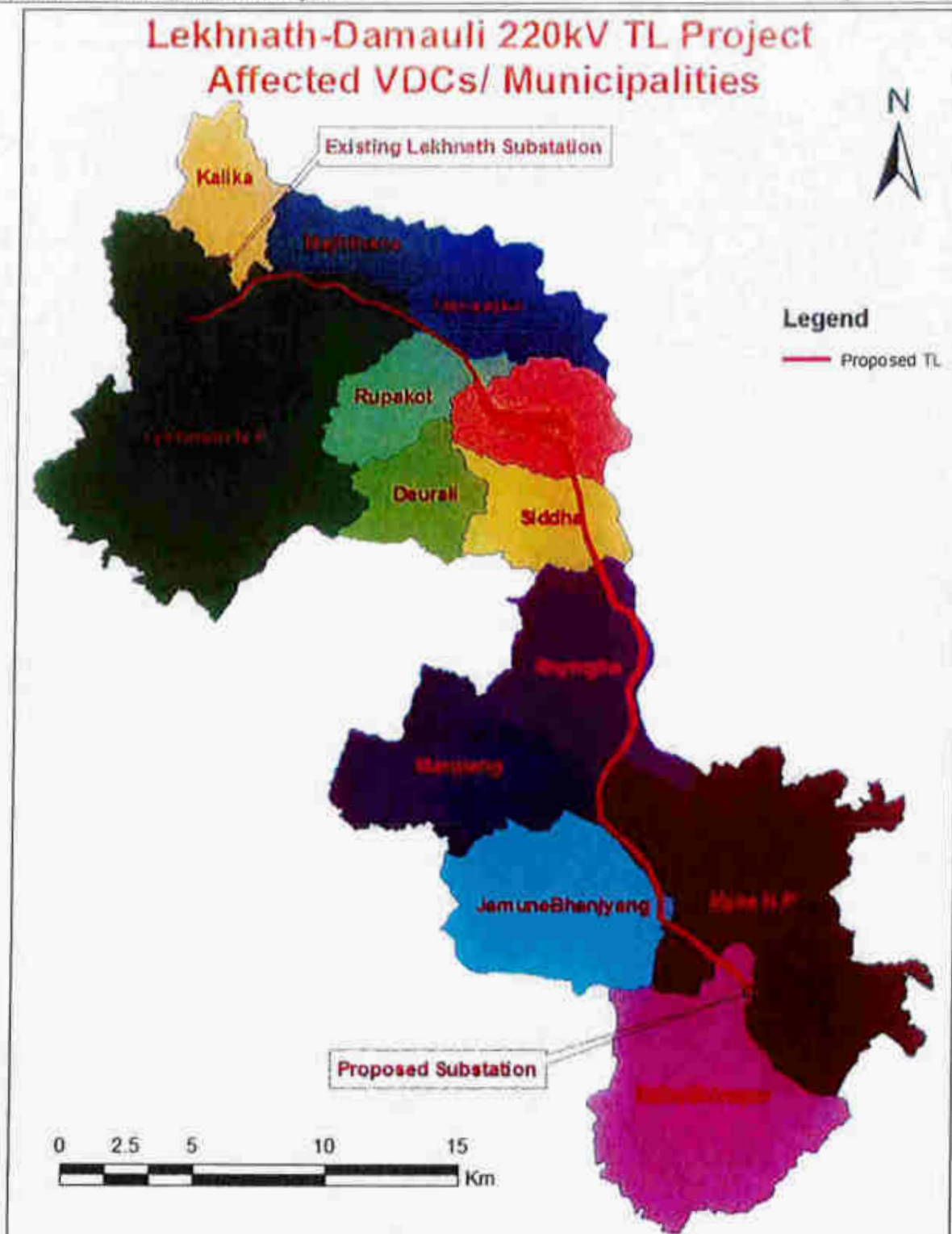
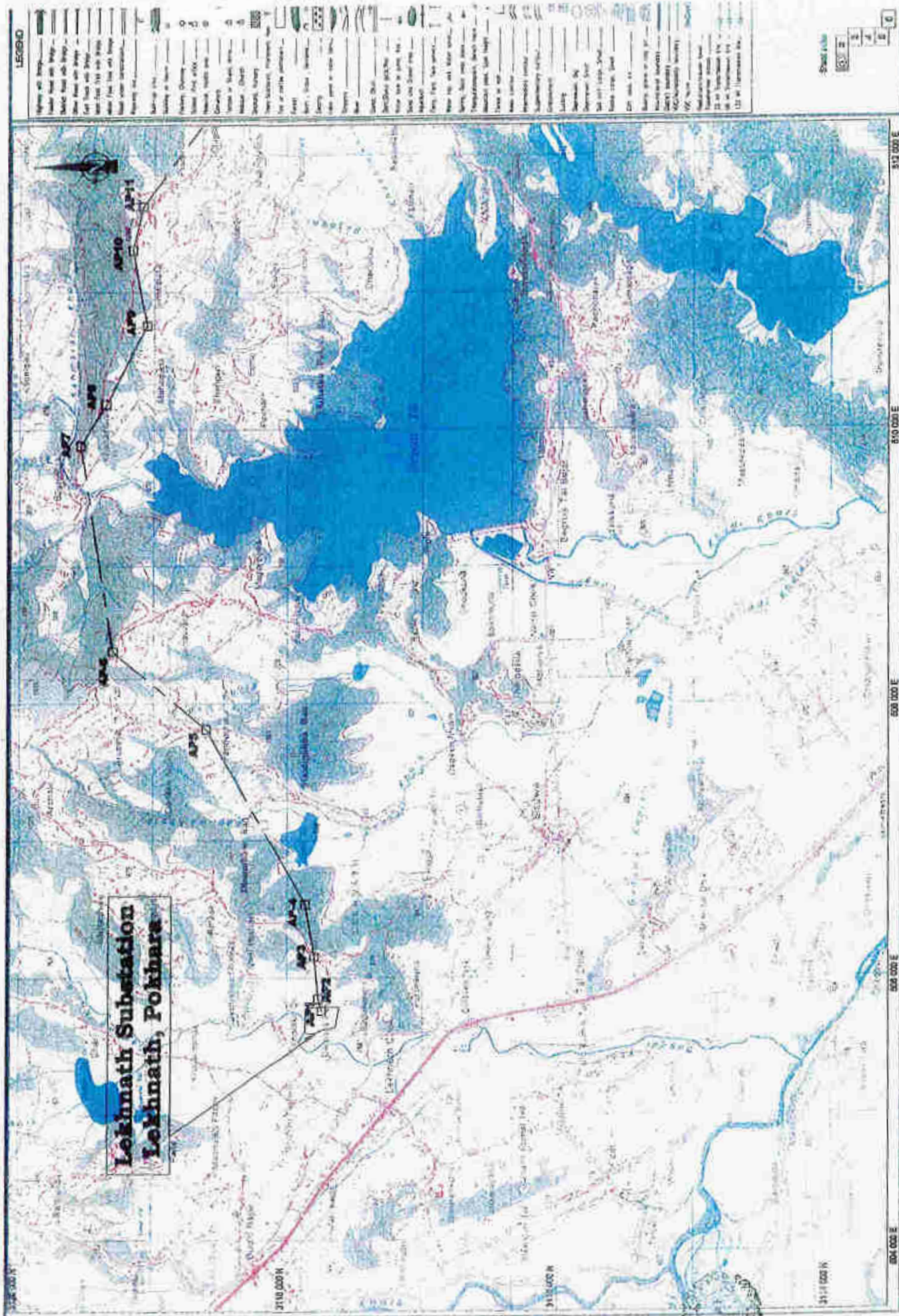


Figure 2-2: Project Affected VDCs/ Municipalities

2.3 Project Technical Features

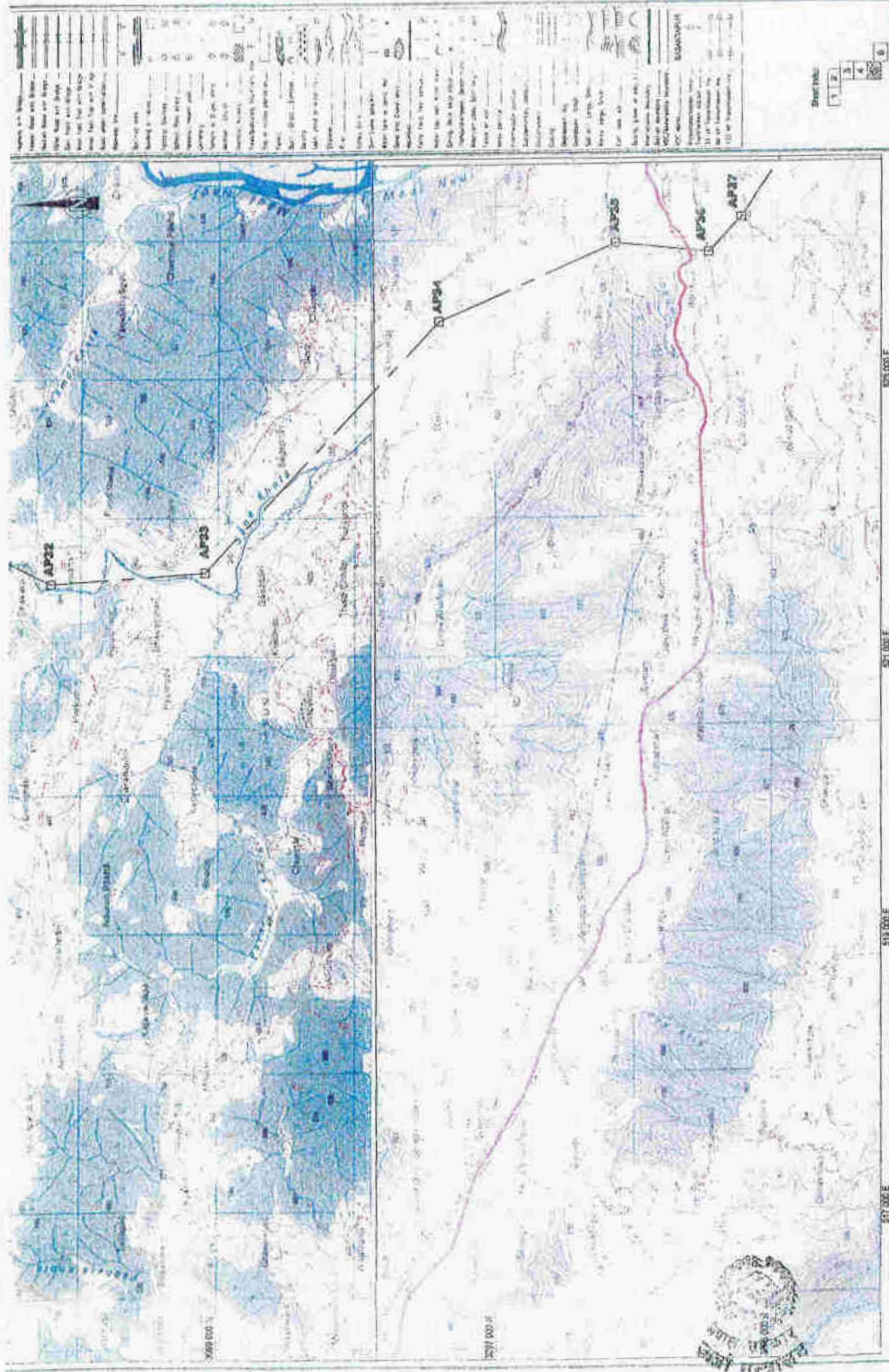
The study area of the route alignment starts from existing Lekhnath Substation, Lekhnath Municipality of Kaski District to proposed substation at Malinga gau, Kahun Shivapur VDC of Tanahun. This proposed substation shall be built by the project and the detail about area requirement and other facilities shall be mentioned in IEE study. The alignment lies within coordinates $84^{\circ} 20' 00''$ E to $84^{\circ} 02' 30''$ E and $28^{\circ} 13' 45''$ N to $27^{\circ} 57' 00''$ N. The alignment has been presented in in Figure 2-2.





**Lekhnath Substation
Lekhnath, Pokhara**

नेपाल सरकार
जल विभाग
२०७३



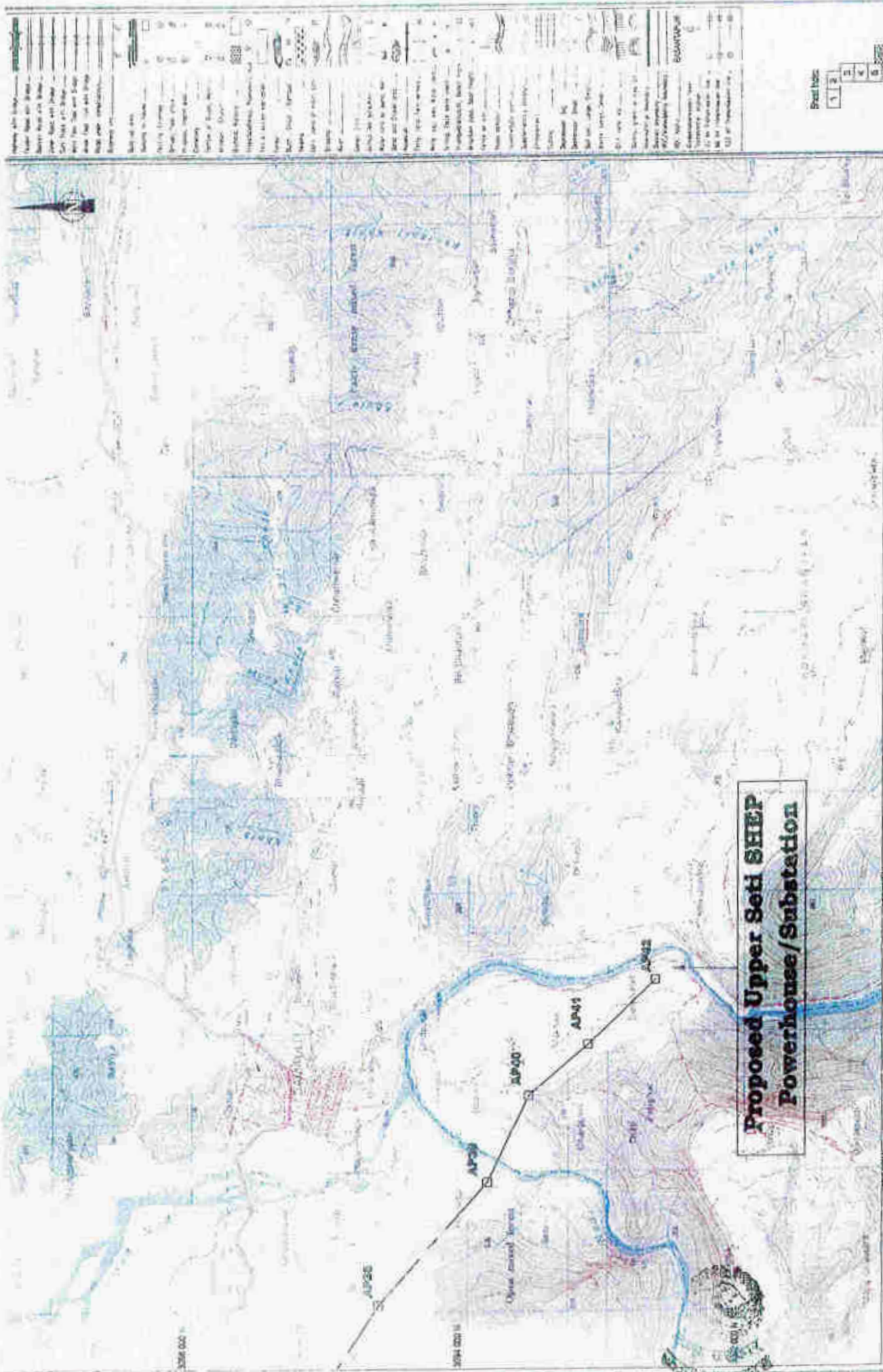


Table 2-1: Details of Angle Points

S.N.	Angle Points	Coordinates			Address			District	Land Use
		Easting	Northing	Elevation	Village	VDC			
1	AP 1	505758.73	3117746.29	740.643	Kharene	Lekhnath-7	Kaski	Substation	
2	AP 2	505844.57	3117771.50	749.639	BadaareDanda			Cultivated Land	
3	AP 3	506137.37	3117834.35	798.241	Dharmashala	Lekhnath (Archale-6)		Cultivated Land	
4	AP 4	506536.58	3117865.41	814.073	Pakhuridada	Lekhnath-6		Barren Land	
5	AP 5	507818.06	3118608.97	887.064	Aarupata	Kalika-1		Public Land	
6	AP 6	508406.12	3119301.55	1019.689				Barren Land	
7	AP 7	509887.43	3119543.25	783.912				Public Land	
8	AP 8	510186.61	3119356.21	860.611				Cultivated Land	
9	AP 9	510763.23	3119057.41	1021.1	Simalpata	Lekhnath-9		Public Land	
10	AP 10	511310.09	3119162.33	1184.699	Kotpari			Cultivated Land	
11	AP 11	511629.64	3119087.28	1176.165	Kotbari			Cultivated Land	
12	AP 12	512299.32	3118586.49	1123.658	Chipleti Bhangere dada			Barren Land	
13	AP 13	513017.42	3118386.10	1070.282	Begnasgau	Lekhnath-10		Barren Land	
14	AP 14	513850.36	3118051.87	853.429	LapsidadaKahare			Cultivated Land	
15	AP 15	515223.42	3117170.29	744.497	Ulleri- Talbesi	Hansapur-3		Cultivated Land	
16	AP 16	516263.28	3116504.00	868.245		Rupakot-9		Cultivated Land	
17	AP 17	516788.29	3115662.15	1144.203	Pakhagau-Mauriya			Barren Land	
18	AP 18	517185.83	3114499.86	905.923	Pelungthumki	Pelunga Salyandada-6		Cultivated Land	
19	AP 19	517907.86	3113989.02	900.133	Sirkutanidada	Thumki-8		Cultivated Land	
20	AP 20	520110.94	3113131.02	780.225	BhurungDeupur	Thumki-4		Cultivated Land	
21	AP 21	520717.04	3111216.39	682.464		Siddha-7		Forest Land	
22	AP 22	521004.27	3109685.38	441.54		Siddha-1		Cultivated Land	
23	AP 23	508369.03	3119310.03	1014.942	Dandagau Sisaghat	Syamgha-3		Forest Land	
24	AP 24	509938.02	3119505.09	786.514	Chaudalthok	Syamgha-3		Cultivated Land	
25	AP 25	523194.14	3105610.72	443.839	Pokhare-dada	Syamgha-3		Forest Land	
26	AP 26	523105.57	3105152.61	484.534	Shekhatar	Syamgha-2		Cultivated Land	
27	AP 27	523053.12	3104725.42	405.633	Shekhatar	Syamgha-2		Cultivated Land	
28	AP 28	522600.45	3104000.66	424.157		Syamgha-6		Forest Land	

S.N.	Angle Points	Coordinates			Address			District	Land Use
		Easting	Northing	Elevation	Village	VDC			
29	AP 29	522866.66	3102754.46	368.25		Syamgha-6	Tanahun	Cultivated Land	
30	AP 30	510176.43	3119335.57	851.038	Pakhure-bhangyang	Syamgha-6		Cultivated Land	
31	AP 31	522033.42	3101238.47	505.354	Ratadada	Byas M-6		Public Land	
32	AP 32	521531.92	3100225.99	364.175		Byas M-6		Cultivated Land	
33	AP 33	521613.73	3099104.80	347.675		Byas M-6		Cultivated Land	
34	AP 34	523407.09	3097405.51	327.508		Byas M-6		Cultivated Land	
35	AP 35	523966.26	3096117.26	361.241		Byas M-8		Cultivated Land	
36	AP 36	523898.59	3095441.15	454.031	Panamdigau	Byas M-8		Cultivated Land	
37	AP 37	524145.20	3095205.65	595.069		Byas M-6		Cultivated Land	
38	AP 38	525050.61	3094627.47	550.858	Saurahagau	Byas M-7		Cultivated Land	
39	AP 39	525932.30	3093846.83	379.292	Betenigau	Byas M-7		Forest Land	
40	AP 40	526556.25	3093552.64	489.495	Swamidada Gyaja	Kahun Shivapur-1		Cultivated Land	
41	AP 41	526921.38	3093128.00	469.528	Ghyansingdada	Kahun Shivapur-1		Cultivated Land	
42	AP 42	527380.03	3092641.69	389.226	Malingagau	Kahun Shivapur-1		Cultivated Land	



The proposed TL alignment was selected on the basis of following details:

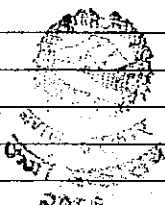
- Provide the shortest possible length and straight route as far as possible;
- Minimize or avoidance the crossing through forest areas;
- Minimize the number of structures or assets crossings;
- Avoid built-up, swampy and unstable areas;
- Provide easy access for construction and maintenance works;
- Minimize adverse impacts on the environment, and
- Proximity to the road.

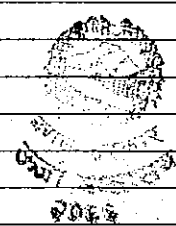
2.4 Salient Features of the Project

The total length of the proposed TL is about approximately 41.851km. The voltage level will be 220kV. The proposed transmission line will be double circuit comprising with two separate aluminum conductor steel reinforced (ACSR) per phase. The vertical double circuit configuration tower will have an average height of 40m and the standard tower base dimensions will be 15m x 15m (for 220kV) from center to center of each tower leg foundation/ footing. Steel tower leg and body extensions will be utilized to reduce foundation excavation on slopes and provide greater tower foundation structural security. The ruling span between tower structures is 350m. The right of way (RoW) of the proposed TL is 15m on each side from the centerline from 220kV as per the Electricity Regulation, 2050 (1993). The TL design features are given in Table 2-2 below:

Table 2-2: Salient Features

Features		Description	
General			
Project	Lekhnath-Damauli 220kV Transmission Line		
Impact Area	Zone	Districts	VDCs/ Municipalities*
	Gandaki	Kaski	Lekhnath* (लेखनाथ), Kalika (कालिका), Majhthana (माझठाना), Rupakot (रुपाकोट), Hansapur (हंशपुर), Thumki (थुम्की), Deurali (देउराली), Shidha (शिद्ध),
		Tanahun	Syamgha (श्याम्घा), Manpang (मनपाङ्ग), Byas* (ब्यास), Jamune Bhanjyang (जामुने भञ्ज्याङ्ग), and Kahun Shivapur (काहुँशिवपुर).
Initial Point	AP 1 lies at existing Substation at Kharene, ward no 7 of Lekhnath Municipality, Kaski District		
Terminal Point	AP 42 lies at Malingagau, ward no 1 of Kahun Shivapur VDC, Tanahun District		
No. of Major Highways crossings	1 (Prithvi Highway)		
No. of major River crossings	27		
No. of 132kV line crossings	1		
No. of 11kV line crossings	9		
No. of 400V line crossings	8		
No. of 220V line crossings	26		
Design Features			
Line Length	41.851km		
Nominal System Voltage	220kV		
Capacity	600 MW		
Circuit	Double Circuit		





Nominal Span	300m
No. of Angle Tower	42
Foundation Area	15m x 15m (225m ²)
Ground Clearance	Minimum 8.84 m at the maximum sag condition
Min. clearance between power line to power line	4.58m
Right of Way	30m
Project Cost	USD 25 Million

2.5 Delineation of Project Impact Area

The study area is defined as the project area consisting of the alignment as well as the area that will be impacted due to the construction and operation of the project. The project impact area that will be considered during IEE study has been defined as follows:

2.5.1 Direct Impact Area (DIA)

This consists of 30m Right of Way (RoW) comprising 15m on each side of the center line of the TL alignment of 41.851km. Thus, the settlement area, forests or other vegetation and places having built up infrastructures or facilities that fall within the RoW constitute the 'Direct Impact Area' of the project. The detail of defragmented land use due to the TL shall be covered in IEE report. On the basis of spatial coverage this area is also termed as High Impact Area (HIA).

2.5.2 Indirect Impact Area (IIA)

This consists of the surrounding area. Any built-up community infrastructures and facilities, forests, surrounding the DIA shall be studied in this impact area. This area is also termed as Moderate Impact Area (MIA).

2.6 Construction Planning

The implementation of the proposed project comprises construction of a 220 kV TL. It included foundation and erection of transmission towers, wire stringing, testing and commissioning of 220kV TL. The estimated years of project completion is two years.

2.6.1 Requirement of Workforce

During the stages of the construction period of the project, altogether approximately 300 people will be employed including 150 unskilled, 100 semi-skilled and 50 skilled human resources. Most of the unskilled manpower will be hired locally as per available skill and experiences.

2.6.2 Material

The construction materials required for substation and towers shall be acquired from river bank of Madi and through local availability. The details of source, quantity and material shall be included in IEE report. The main construction material related with substation and Tower will be as follows;

- Cement, sand and aggregates;
- Steel reinforcement.

2.6.3 Investment

The project proponent and the project contractors' office will be established in rental buildings at appropriate locations of Tanahun and Kaski districts. Site office will be established as per the requirement. The project contractor will also establish its office at the suitable places for its staff and camps for its workers at suitable sites. Due to the linear nature of the construction works,



smaller warehouse and construction yard facilities will be built at appropriate locations along the alignment. The details shall be worked out during the IEE. The estimated total cost for the project is USD 25 Million.

2.6.4 Land

The project shall permanently acquire approximately 7.208 ha of land for tower pads and substation, whereas 122.472ha of land will be restricted as RoW (excluding tower pads). The detail and exact requirement of land for the project shall be covered in IEE report.

Table 2.2. Land Requirement for the Project

S. N.	Project Features	Land required (approx.)	Remarks
1.	Tower Pads	3.128 ha	Including 42 AP and approximately 97 ST
2.	Substation	4.08 ha	
3.	RoW including tower pads (land restriction)	125.6 ha	

Source: Field Survey 2016

The detail of land requirement for tower pads as permanent requirement right of way as temporary land requirement, substation land as permanent requirement and other land requirement like camp site, storage facilities and access road for substation shall be studied and presented in IEE. The table to be filled in IEE for the land loss is attached in Annex II.

2.6.5 Construction/Operation Strategy

The implementation of the proposed project comprises construction of a new 220 kV transmission line. It comprised of foundation and erection of transmission towers, wire stringing, testing and commissioning of 220 kV TL Project. The estimated years of project completion is two years.

Due to the linear nature of the construction works, smaller storage facilities shall be built at appropriate locations along the transmission line alignment. These details shall be worked out during the IEE. The linear nature of the transmission line construction suggests that the construction work will be carried out by manually, where possible, for each location in various works such as land clearing, excavation, and concreting, transporting tower and other materials, etc. No permanent access road shall be constructed to tower site from the existing road head. Only the existing roads and tracks will be used for the construction and maintenance where available.

2.6.6 Project Schedule (Construction and Operation)

The estimated completion period of the project is 24 months which includes 6 months pre construction phase and 18 months construction and commissioning phase. The construction work of the transmission line will be carried out during the month October to May when ground conditions are essentially conducive to allow easy movement of materials and construction towers. Construction activities during rainy season (June–September) will be restricted to the stringing of conductor. However, construction of the substation can be carried out throughout the year. The construction schedule of the project shall be presented in IEE.



2.6.7 Work Schedule and Budget

It has been planned to complete the IEE study for the proposed Lekhnath-Damauli 220kV TL project within sixteen month. The total estimated budget for the IEE study of the project is NRs. 2.49million. The following experts will be involved in the IEE study

- Team Leader
- Environmentalist
- Sociologist/Socio-economist
- Statistician
- Civil engineer
- Electrical Engineer
- Forester
- Senior Surveyor
- Liaison Officer



3 STUDY METHODOLOGY

The IEE process follows the Environment Protection Rules, 1997, and its amendments 2009 (2065/11/26) and National EIA Guidelines, 1993. This ToR report is prepared in accordance with the legal requirements of GoN, field study, consultation with stakeholders and officials.

3.1 Type of Data

Primary and secondary data shall be acquired on physical, biological, and socio-economic and cultural environment of the project area for IEE study. The project area includes the VDCs and municipalities affected by the project unless otherwise stated. Primary information shall be obtained by field visit whereas secondary information by consulting the project maps, survey report and other related document. The data of the core project area or direct impact zone shall be site specific and quantitative. Information on project affected VDCs/ Municipalities shall also be collected. Following are the types of data to be collected on physical, biological and socio-economic and cultural environment.

3.1.1 Physical Environment

- Meteorological data: Temperature, rainfall, and humidity of the project area;
- Air and noise quality of the project area;
- Land use and land use pattern;
- Geological data: Rock type, slope stability, erosion, landslides, etc. of the project area;
- Spoil materials: Total volume, type, volume to be used for construction, disposal volume and others.

Table 3-1: Detail of Topographic Maps of Project Area

S.N	Name of Topographic Sheet	Sheet No.	Scale
1	Pokhara	2884 13A	1:25000
2	Bhorletar	2884 13B	1:25000
3	Sisaghat	2884 13D	1:25000
4	Naya Risin	2784 01B	1:25000
5	Damauli	2784 02A	1:25000

3.1.2 Biological Environment

Characterization of bio-climatic zone, species and forest type of the project area, forest management practice, forest categories by management- community forest, government forest etc. along the proposed TL alignment, community forest users group (CFUG), estimated number of trees and wood volume along the RoW, other data as per given tables in Annex- II. In addition the following information shall be collected;

- Flora: Floral diversity of the project area, dominant species, density, non-timber forest product (NTFP), ethno-botanical use.
- Fauna: Major wild species of mammals, birds, reptiles and amphibians in the project area, their habitat, occurrence, migration, illegal hunting.
 - Site Description (Water body/holes, vegetation cover, ground and soil/rock features),
 - Important habitat type/features including trees/shrub/herbs/epiphytes and others.
 - Habitat use- active/temporary/migratory corridor; breeding/feeding or hunting/resting and others.
 - Habitat continuity and connectivity on either side of RoW.
 - State of habitat in terms of degradation/fragmentation and human encroachments.
- Rare, Endangered, Threatened and Protected Species: presence of these species along the TL alignment and its immediate surroundings, overall conservation status of wildlife in and around the project area.

3.1.3 Socio-economic and Cultural Environment

- Demography: Population, male/female ratio, population- age group wise, number of household, household size, population growth rate, population density etc.
- Settlements: Settlement pattern- scattered or aggregated, in uphill or lowland, name of major settlements in vicinity of the proposed alignment, growing settlements, types of settlement near the substation and transmission line corridor
- Ethnicity: Ethnic groups, dominance/minority, ethnic composition, vulnerable community and marginalized group of the project area.
- Language: Languages in the project area, number of people speaking, script, literature and media of local language.
- Religion: Religion in the project area, number of religion followers, religious harmony/influence.
- Festivals: Festivals in the project area, festive seasons, their importance.
- Archeological, Historical and Religious Sites: Existing such site, their location, distance to the proposed TL alignment/substation, their importance, fame of area- local/regional, conservation status.
- Migration: Migration pattern- in/out, seasonal/permanent, causes of migration, impact of migration in population dynamics of local area.
- Gender Aspect: Women's right- property and participation, privilege, violence, disparity, child marriage, human trafficking, any other social evils.
- Law and Order Situation: Crime and violence, major incidents, major types of crime, causes and trends of crime and violence, local conflict for resources, honor etc, traditional conflict resolution system, police post, legal access etc.
- Occupation: Major occupation of local people in the project area, local people in their occupation by numbers/percentage, traditional occupation, local employment opportunities, economically active people by percentage.
- Agriculture: Available agricultural land, cropping pattern, irrigation facility, productivity, farming trends- traditional/modern, average land holding size, food security, market access for agro-products, livestock, support to farmers etc.
- Trade and Industries: Market centers in the project area, trading commodities, trading routes, exports to local/regional/foreign market, local craftsmanship, cottage industries, potential sector/products/resources identified in the project area, tourism and other service sector etc.
- Income Level: Average income level of local people, sources of income, poverty level (in percentage) in Districts/VDCs/ Municipalities poverty by ethnic group wise.
- Education and Literacy: Educational institutions in the project area, enrolment rate, dropout rate, literacy- male and female, literacy in ethnic/group wise, non-formal education program, etc.
- Health and Sanitation: Health institutions in the project area, health facilities, common disease, child/mother mortality rate, malnutrition, drinking water supply, use of latrine, general cleanliness, hygiene awareness etc.
- Road and Transportation: Road network in the project area, public transportation, road access to surrounding project area, means of transportation, transportation cost, impact of road construction in rural setting etc.
- Energy: Electrification in the project area, means of electrification, fuel sources for household use, access to fuel wood, local price of fuel (firewood, kerosene) etc.

- Communication and Other Facilities: Telephone (landline/wireless) network in the project area, accessibility to internet and other means of modern communication (television, radio, newspaper),
- Development Initiative/Activities in the Project Area: Development projects of local level (District/VDC), regional and national level in the project area, nature and size of the projects, its future impact in the project area, development issues/ initiatives / activities in the local area.

3.2 Data Collection Method

The EPR, 1997 and other environmental provisions govern the methodology of the IEE study. Literature review, filed investigation (households' survey, observation, photographs, etc.) and stakeholders meetings shall be used to collect the facts and figures.

3.2.1 Literature Review

While carrying out the IEE, literature review on topographic maps, land use maps, CBS publications; project survey report and other hydropower related environmental reports shall be done. Information on climate (temperature, rainfall, and relative humidity), etc. shall be obtained from Department of Meteorology. Similarly, data on geology, hydrology and sedimentation shall be obtained from project feasibility study report. District level data on forests, species and the community identification, and identification of wildlife and birds will initially be gathered from literature review. The literatures published by the Ministry of Forest and Soil Conservation will be collected and reviewed for the data on forest and wildlife. On socio-economic and cultural environment District and VDC level demographic data and other related information shall be collected through literature review.

3.2.2 Field Investigation

Field visit by multidisciplinary experts to collect baseline information on physical, biological, and socio-economic and cultural environment shall be conducted during IEE report preparation. The following methods shall be adopted to collect baseline information on physical, biological and socio-economic and cultural environment.

a. Physical Environment

- Site specific observation of air and noise quality;
- Field observation by Civil Engineer using checklist for data on land use pattern, topography, drainage, watershed, etc. and
- Photographs of the project area.

b. Biological Environment

- Field observation by ecologist/environmentalist;
- Quadrat (20mx20m size) samplings in representative forest types at different locations of project structures and facilities;
- Key informants survey; stakeholders meetings;
- Meeting with Community Forest Users' Groups (CFUGs) and District Forest Office.

The data from forest sampling will be quantitatively analyzed for frequency, density, basal area, importance value index (IVI) and estimated wood volume. The aforementioned parameters were calculated by using the following formula:



$$\text{Frequency (F) \%} = \frac{\text{Total number of plots in which the species occurred}}{\text{Total number of plots sampled}} \times 100$$

$$\text{Density (D)/hectare} = \frac{\text{No. of individuals of a species}}{\text{Size of the plot} \times \text{Total number of plots sampled}} \times 10,000$$

The basal area is the trunk cross-sectional area. The basal area of each of the forest component will be calculated on the basis of diameter at breast height.

$$\text{Basal area (BA)} = \pi r^2 = 3.142 (\text{dbh}/2)^2$$

Wood volume of standing tree was calculated by using the following formula:

$$\text{Wood volume of standing trees} = 1/2 \times \text{BA} \times \text{Height}$$

The forest/vegetation loss due to the project implementation will be studied based on the format on "Table for Forest Loss" provided by the Ministry of Energy (Annex- II).

c. Socio-economic and Cultural Environment

- Field observation by Sociologist/ Socio-economist and Statistician;
- Households survey of the project affected families (a sample copy of the households survey questionnaire is given in Annex-III);
- Key informant survey: interactions with the local leaders, government officials, teachers and other knowledgeable persons; and stakeholders meetings (a sample copy of VDC checklist is presented in Annex-III);
- At least one Market Survey will be carried out in each VDC/Municipality;
- Focused Group Discussion (FGD): FGD meeting with forest users groups.

3.3 Data Analysis

A team of experts specialized in engineering, forestry, and socioeconomics visited the project area in March 2016, to collect baseline information of the area, identify the likely impacts of the proposed project during construction and operation phases and inform stakeholders regarding the project. During this visit, the team visited the project site proposed for structures and facilities as well as settlements of the affected VDCs and collected required data on physical, biological and socioeconomic and cultural environment of the area. Topographical maps were referred for site investigations. The study team observed various assets and took GPS location point references and photographs to establish the baseline. The team also visited relevant government offices of the affected district to interact with concerned officials and collect necessary information and their concerns.

The study team has adopted a participatory approach with maximum involvement of different stakeholders of the project at the local and district levels to generate relevant information for the IEE. The study team has maintained a close contact with the district level government relevant line agencies, VDC level key stakeholders and other stakeholders while conducting fieldwork for the IEE.



3.4 Identification, Evaluation and Prediction of Impact

The proponent/ consultant shall identify, predict and evaluate impacts of the proposal on the physical, biological, socio-economic and cultural environment. After data collection, analyses and interpretation of impacts on the issues shall be identified, predicted and organized accordingly.

To identify impacts, the following 'Impact Identification Methods', depending on the nature of impact shall be employed:

- Checklists
- Interaction Matrix
- Map Overlays in ArcGIS
- Expert Judgment

To predict the impacts, the following 'Impact Prediction Techniques', depending on the nature of impact shall be used:

- Extrapolative
- Normative
- Mathematical Models
- ArcGIS, Maps
- Expert Judgment

While categorizing the impacts into 'identified' and predicted', depending on the nature of impact, the following aspects shall be affixed to each of the impact:

- Nature: direct or indirect
- Magnitude: high, moderate, low
- Extent: IIA, DIA, regional, national, trans-boundary
- Timing: short term, medium term, long term
- Duration: Temporary, Permanent

Once known impacts are grouped, they shall be evaluated in terms of their environmental significance as important or unimportant. To evaluate, identified and predicted impacts, the following 'Impact Evaluation Methods', depending on the nature of impact shall be employed:

- Consultation with experts and stakeholders
- Use of numerical values (National EIA Guidelines 1993)
- Consideration of Policies, Laws and Local Customs

After impacts evaluation, significant and important impacts on physical, biological, socio-economic and cultural environmental domain shall be sort out to meet the requirements stipulated by rule 7 of Schedule-6 of Environmental Protection Rules (EPR).

3.5 Public Involvement

A team of experts visited the project site for field investigation during the month Falgun, 2072 BS to collect the baseline information of the project area and identify the potential environmental impact areas and the pertinent issues. The news about the field study during ToR phase was covered by a local newspaper "Damauli Khabar" (Annex IV).

During the field visit, the team met the local stakeholders and discussed with some key persons. Meetings were mainly focused on issues likely to arise due to implementation of the project, existing environment of the project area and views/concerns of stakeholders. The views,

opinions, suggestions and information received from the participants were documented for incorporation in the ToR.



(a)



(b)

Picture 1: Group Meetings at Syamgha VDC

Besides, consultation with stakeholders, project affected families; peoples' representatives, government officials, etc. have been done to obtain the valuable suggestions. During IEE study public consultation will be carried out to involve the public in all the activities in the project area. Such consultation will be based on the manual for public involvement prepared by DoED (2058 BS). The study shall document public issues and make public participation during the IEE process. The study shall document public issues and make public participation during the IEE process. Local and district level government institutions/bodies, local user groups, local NGOs and CBOs, etc. shall be consulted during IEE report preparation. The public consultation shall mainly focus on the findings of the IEE, building up the awareness about the project plans and programs, building up the mutual consensus on the implementation of the project, identification of key issues and consideration of these issues in the IEE report and in the project design.



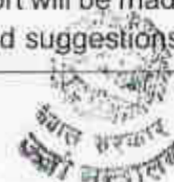
(a)



(b)

Picture 2: Group Meetings at (a) Kahu Shivapur VDC and (b) Byas Municipality

Public views, options and relevant issues raised during the consultation will be recorded. In addition to the aforementioned plan, the IEE team perform other public consultation according to the requirements, situations and demands of the stakeholders. The study will also be analyzed the possible alternatives of project as per EPR, 1997. The draft IEE report will be made available to stakeholders in corresponding VDCs and DDCs to take feedback and suggestions regarding



the procedure adopted and implemented in the project. The comments and suggestions from stakeholders will be incorporated while preparing the IEE report.

3.5.1 Consultation of the Concerned Agencies

The following organizations will be consulted during the preparation of IEE report.

Central Level Agency: Ministry of Energy, Ministry of Forest and Soil Conservation (MoFSC), Department of Electricity Development (DoED), and Department of Forest.

District Level Agency: District Development Committee, District Administrative Office, District Agriculture Office, District Health Office, District Forest Office, and other concerned district level agencies.

Local Level Agency: Village Development Committees, Community Forest Offices, Health/sub-health posts, non-governmental organizations, Community Based Organization, etc.

3.5.2 Public Notice

As per EPR 1997, a 15 days public notice will be published in a national daily newspaper. The notice will consist of a statement regarding brief project information and request to provide comments and suggestions within 15 days to the project office or ESSD. The local people and stakeholders will be requested to provide their concerns or issues or suggestions regarding the IEE report in written form.

A team from ESSD will be mobilized in the field with copy of public notice along with cover letters to the concerned VDCs/Municipalities, CFUGs, district level line agencies and other local stakeholders. A copy of the notice will be affixed at the DDCs office, VDCs offices, local schools, clubs, health posts, local NGOs and other suitable places and proof of deed (*Muchulkas*) will be collected. Summary of the draft IEE report will be distributed to the concerned VDCs/Municipalities and CFUGs and a copy of IEE report provided to DDCs and District Forest Offices. The recommendation letters will be collected from the affected VDCs. In addition, consent letter will be collected from the affected CFUGs. The comments/suggestions raised by local people/stakeholders/institutions will be incorporated in the IEE report.



4 REVIEW OF POLICIES AND LEGAL PROVISION

The IEE shall review the following Plans/Policies, Acts, Rules/Regulations, Guidelines, Standards, Strategies and relevant documents provide an account of the review in the IEE report in the context of project implementation:

4.1 Constitution of Nepal, 2072

4.2 Plans and Policies

- Three Years Interim Plan, 2070 B.S
- Nepal Environmental Policy and Action Plan, 2050 (1993) and 2055(1998)
- Hydropower Development Policy, 2058 (2001)
- National Water Plan, 2062 (2005)
- वन क्षेत्रको जग्गा अन्य प्रयोजनको लागि उपलब्ध गराउने कार्यविधि, २०६३
- शासकीय तथा आर्थिक सुधारको तत्कालीन कार्ययोजना, २०६९

4.3 Acts

- Environment Protection Act, 2053 (1997)
- Water Resources Act, 2049 (1992)
- Electricity Act, 2049 (1992)
- Land Acquisition Act, 2034 (1977)
- Forest Act, 2049 (1993)
- Labor Act, 2048 (1992)
- Soil and Water Conservation Act, 2039 (1982)
- Local Self-Governance Act, 2055 (1999)

4.4 Rules/Regulations

- Environment Protection Rules, 2054 (1997)
- Electricity Regulation, 2050 (1993)
- Forest Regulations, 2051(1995)
- Water Resources Regulation, 2050 (1993)
- Local Self Governance Regulation, 2056 (1999)

4.5 Guidelines/Conventions

- National Environmental Impact Assessment Guidelines, 2050 (1993);
- EIA Guidelines for Forestry Sector, 2051 (1995);
- Forest Produce collection and sale / Distribution Guidelines, 2054 (1998);
- Convention on Biological Diversity, 1992;
- Convention on International Trade in Endangered Species of wild Fauna & Flora, 1973
- Community Forest Guidelines, 2058.



The review of these relevant documents shall be presented in the IEE report by considering the following;

- Highlight of Articles, Clauses, Rules, Chapters, and Sections that are attracted to the study and project/proposal implementation.

- How the provisions are relevant and mandatory to the study process as well as to the project implementation, are observed and followed in the study, mitigation measures/planning and construction and operation.
- Identification and discussion of legal provisions that hinders the project implementation with possible way out for easement.



5 EXISTING ENVIRONMENTAL CONDITION

Existing Physical, Biological and Socio-economic Condition along the TL alignment has been discussed in detail in this chapter.

5.1 Physical Environment

The proposed alignment passes through different terrain affecting variety of land use pattern. The topography, land use, climatic condition, geomorphology and geology, seismology, air, water and noise condition, watershed and drainage pattern, crossing of other utilities and air traffic that shall be influenced due to the construction of this project has been discussed in each topic ahead.

5.1.1 Topography

The proposed route alignment of length 41.851km traverses through hilly region of Western Nepal. The alignment runs through several topographic features comprising of rugged hills with mild and steep slope, undulating land forms and flat terrain. The altitudinal variation of the transmission line points are between 1184m to 327m at Kotbari, Lekhnath-9 Municipality and Byas-6 Municipality respectively. The altitudinal variation of the angle points along the alignment is given in Figure 5-1.

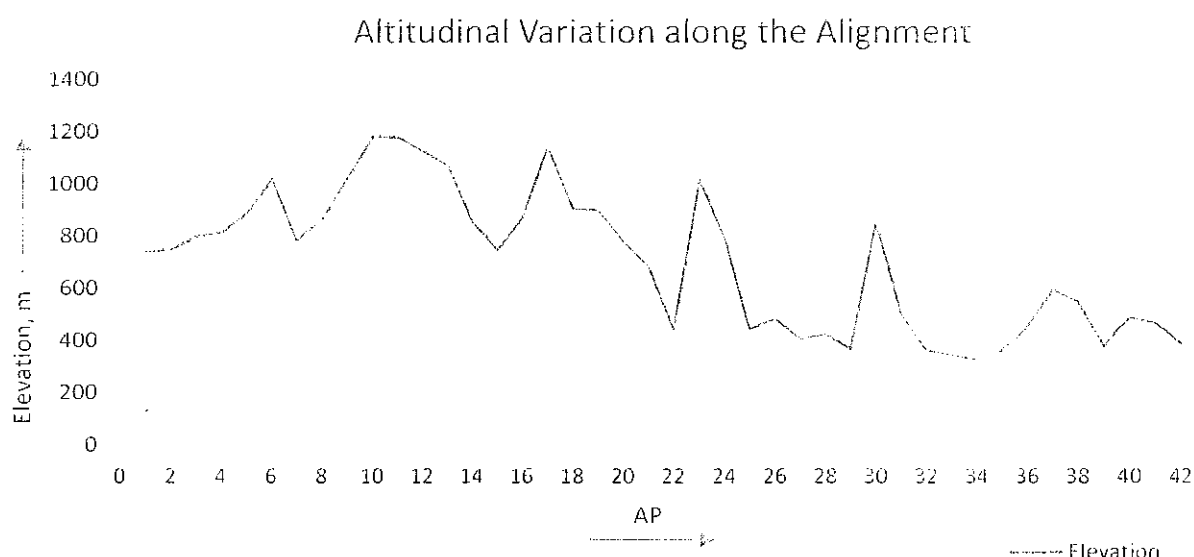


Figure 5-1: Altitudinal Variation along the Alignment

5.1.2 Land Use

For transmission line of 220kV capacity, the right of way (RoW) is defined as 15m on either side from the central line. A total of 125.62ha of land will be acquired by the project as RoW including both temporary and permanent acquired land. The main land use pattern of the project area is cultivated land, forest, grazing land/grassland, sand, bush, river and barren land. The alignment avoids densely populated areas, major structures and dense forests. The other land uses along the alignment consists of crossing of road, rivers, rivulets, river beaches, transmission lines, telephone lines and distribution lines. The land use data is presented in Table 5-1 and land use map is in Figure 5-2 below.

5.1.3 Climate

Subtropical and tropical climates prevail in the project area. The project area experiences strong seasonal variations, with wet monsoons from June to September and dry weather from October to May. The table below lists the climatic data such as minimum and maximum temperature, maximum monthly rainfall of the project affected districts.

Table 5-2: Climatological Data along the Project Area

S.N.	District	Climatic Zone	Max Temp. (°C)	Min. Temp. (°C)	Average annual rainfall (mm)
1	Kaski	Subtropical and Upper tropical	31.9°C in June	7.53°C in January	2840
2	Tanahun	Subtropical and Upper tropical	38.0°C in May	6.2°C in January	2406

Source: District Profile of Kaski and Tanahun districts

5.1.4 Geomorphology and Geology

The proposed alignment of TL passes through Hilly region represented by low grade metamorphic rocks such as phyllite, quartzite and slate. During the field visit, it was observed that some APs of the TL are located at relatively flat and stable areas covered by colluvial and alluvial deposit.

5.1.5 Seismology

This project is situated in seismic zone factor of 1 which is not satisfactory from the seismic point of view but as a whole of country Nepal, it is good that this alignment does not pass through the most dangerous seismic zone.

5.1.6 Air and Noise Quality

The proposed TL passes mainly through the hill ridge avoiding roads and settlements and market centers. However, at some stretches, it traverses along the RoW of gravel and earthen roads. It also traverses through Prithvi highway along section AP35 to AP36 and some local roads in some stretch. The main source of air pollution along the alignment is due to the vehicular movement along the earthen road.

5.1.7 Water Quality

The water quality of river and other water bodies along the TL corridor appears to be unpolluted. However, dumping of solid wastes into the river was observed at some stretches. But, the water quality along the stretch was fair enough from the eye sight point of view as it was clean and clear at most of the stretch. Water quality data are not in practice to obtain in TL projects.

5.1.8 Watershed Conditions and Drainage Patterns

The alignment traverse through the hilly region of Nepal. The watershed of the proposed TL route is observed to be fairly intact and stable. The major rivers which cross the alignment of this section include Seti River and Madi Khola. The watershed is fed by mostly Machhapuchhre Mountains' snow and its Kawache Glacier, and Annapurna I and II Mountains' snow and its glacier. An identification of water body, springs and rivers in proximity of the construction site, storage facilities where it is likely to get toxic and hazardous chemicals leak especially near substation shall be identified in IEE.

5.1.9 Soil Erosion and Land Stability

The site observation of the corridor revealed that the line traverses through undulated topography. No major unstable areas were observed along the alignment. The Angle Points have been located on stable ground.

5.1.10 Crossings of Other Utilities

The proposed Lekhnath-Damauli 220kV TL crosses 27 times the major rivers like Seti River, Madi Khola, Gunadi Khola, Sage Khola, and Thudi Khola etc. and other rivulets, 1 time by 132kV TL, 9 times by existing 11kV line; 8 times by 400V and 26 times by 220V lines. Similarly, it crosses Prithvi Highway once, many others black-topped roads and other inter-connected gravel/earthen/trails/feeder roads numerous times.

5.1.11 Air Traffic

Pokhara airports exist around 7.7km west from the proposed alignment. Moreover, project officials will consult with Civil Aviation Authority at Kathmandu regarding probable disturbance of the proposed TL to the flying route of air plane during IEE study.

5.2 Biological Environment

Vegetation of the project area covers tropical to sub-tropical types of forest. The project area covers agricultural lands, community forest area and private trees area.

5.2.1 Vegetation and Forest Resources

Proposed Lekhnath-Damauli 220 kV TL alignment starts from substation at Lekhnath of Kaski district and runs mostly along the Madi river valley and finally terminates at substation proposed at Kahu-Shivapur of Tanahu district. The altitudinal variation of the route ranges from about 327m (AP34) to 1184m (AP10). This change in the elevation provides a variety of niches for different types of vegetation to grow.

The walk over survey along the TL alignment revealed that the major vegetation in the project area comprises of *Schima-Castanopsis* forest and in the upper stretch of the route whereas *Shorea robusta* forest in the lower stretch. The walk over survey also divulged that the villagers at the peripheral of the TL have planted fodder, fire wood, timber and fruit bearing species to meet their local needs. The people have planted Bamboo (*Bambusa* sp.), Kutmero (*Litsea monopelata*), Khanyu (*Ficus semicordata*), Badahar (*Artocarpus lakoocha*), etc. Other trees like Kapro (*Ficus lacor*), Khirro (*Sapium insigne*), Simal (*Bombax ceiba*), Tooni (*Toona ciliata*), Pipal (*Ficus religiosa*), Mauwa (*Engelhardtia spicata*) and Uttis (*Alnus nepalensis*) were also reported. Similarly, shrubs and herbs such as Banmara (*Eupatorium adenophorum*), Simali (*Vitex negundo*), Titepati (*Artemisia vulgaris*), Dhurseli (*Colebrokia oppositifolia*), Hade Unyo (*Dicranopterus linearis*), Aiselu (*Rubus paniculatus*), Asuro (*Adhatoda vasica*), etc. are available in the project area.

5.2.2 Community Forests

During the ToR phase, about 16 community forests have been identified in project affected VDCs and Municipalities. The final verification of the community forests shall be done in detail IEE phase. The following table shows the details of the community forests that are likely to be affected by the proposed TL Project.



Table 5-3: List of Affected Community Forests

S. N.	District	VDC/Municipality*	Name of CF	Area of CF (ha)	Remarks
1.	Kaski	Lekhnath*	Sailapakho Badahara	35.08	AP 3-AP4
			Pakhure Dada	6.5	AP4
			Puranother-Bilauneghari		AP7, AP6-AP8
			Saunepani Jurethumka		
		Kapase		25.0	
		Kalika	Maidipakha	48.5	
			Kaule	34.5	
		Hansapur	Gaira Pokhari	6.04	
			Indrako pakho	40.06	
		Rupakot	Saldanda		
			Kalukhola		
2.	Tanahu	Thumki	Jimire	69.5	AP 20
		Siddha	Shyaldada Thuloswara	204.0	
		Shyamgha	Sapankot	180.0	AP28-AP29
		Byas*	Tekan Thumka	83.0	
		Kahu Shivapur	Beltar Bachang Gauda	7.3	

5.2.3 Wildlife

Some of the major wildlife reported from the project area are categorized as follows.

5.2.3.1 Mammals

Some of the wild animals reported from the project areas are Leopard (*Panthera pardus*), Jackal (*Canis aureus*), Common Langur (*Presbytis entellus*), Porcupine (*Hystrix indica*), Squirrel (*Funambulus* sp.) and Rhesus Monkey (*Macaca mulatta*). These records were made mainly from the consultation with villagers.

5.2.3.2 Birds

Forests, bamboo grooves, gardens, agricultural fields, rivers, streams, and cliffs provide variety of habitat for different species of birds. Common bird species reported in the project area are; Common Myna (*Acridotheres tristis*), Gaunthali (*Hirundo* sp.), House crow (*Corvus splendens*), House sparrow (*Passer domesticus*), Lampuchhre (*Urocissa* sp.), Kalij Pheasant (*Lophura leucomelana*), Jureli (*Pycnonotus cafer*), Titra (*Francolinus* sp.), Ullu (*Otus scops*), Chibe (*Dicrurus adsimilis*), etc.

5.2.3.3 Rare and Protected Species of Flora and Fauna

Sal (*Shorea robusta*) and Simal (*Bombax ceiba*) found in the project area are protected tree species of Nepal. The GoN has banned the commercial felling, transportation or export of these tree species. None of the bird species reported during the ToR phase study in the project area fall under this category.



5.3 Socio-economic and Cultural Environment

5.3.1 Demography

According to the Census 2011, total population of Kaski and Tanahun districts is 8,15,386 and with 3,79,795 (46.58%) male and 4,35,591 (53.42%) female respectively. Total number of households (HH) of two districts is 2,03,982 with an average size of 4.0. Literacy rate and population density of Tanahun district is less than in Kaski district. Details of demographic characteristics of the project affected districts are given in Table 5-4:

Table 5-4 : Demographic Characteristics of the Project Affected Districts

S.N.	District	Kaski	Tanahun
1	Total Population	492098	323288
2	Male	236385	143410
3	Female	255713	179878
4	Total Numbers of Households	125673	78309
5	Average Households size	3.92	4.13
6	Area	2017	1546.83
7	Population Density (persons/ sq.km)	244	209
8	Sex Ratio (males per 100 females)	92.44	79.73
9	Percent of Literacy Rate (5 years & above)	82.38	74.8

Source: Population Census, 2011

Total population of 11 VDCs and 2 municipalities in the project area is 1,66,115 with 74,490 (44.84%) male and 91,685 (55.16%) female. Similarly, there are 42,290 HHs in the project VDCs/Municipalities and average HH size is 3.93. Table 5.5 shows demographic characteristics of the project VDCs.

Table 5-5: Demographic Characteristics of the Project Affected VDCs/Municipalities

District/VDCs/ Municipalities*	Population			HHs	Sex Ratio	Average HH size	Area (sq.km.)	Pop. Density (person/sq.km)
	Total	Male	Female					
Kaski								
Lekhnath*	68622	31218	37404	17405	83.46	3.94	105.77	648.8
Kalika	3880	1745	2135	1026	81.73	3.78	23.03	168.5
Majhthana	2933	1254	1739	833	72.11	3.52	13.89	211.2
Deurali	2373	1017	1356	648	75.00	3.66	18.6	127.6
Rupakot	2958	1277	1681	728	75.97	4.06	16.78	176.3
Hanshpur	3635	1581	2054	963	76.97	3.77	17.96	202.4
Siddha	2982	1253	1729	814	72.47	3.66	20.8	143.4
Thumki	3328	1500	1828	828	82.06	4.02	24.28	137.1
Tanahu								
Shyamgha	4893	2096	2797	1263	74.94	3.87	39.01	125.4
Manpang	6698	2863	3835	1721	74.65	3.89	59.94	111.7
Jamune Bhanjyang	9838	4416	5422	2408	81.45	4.09	61.73	159.4
Byas*	46877	21191	25686	12300	82.50	3.81	97.03	483.1
Kahun Shivapur	7098	3079	4019	1353	76.61	5.25	70.52	100.7
Total/Average	166115	74490	91685	42290	81.25	3.93	569.34	291.8

Source: CBS, 2011

5.3.2 Ethnicity

The project area is populated by heterogeneous ethnic communities. Major ethnic groups in the project area are Brahmin, Chhetri, Magar, Gurung and Dalit (Kami, Sarki, Damai, Dholi). Similarly, other ethnic groups are Newar, Thakuri, Darai, Kumal and other castes settle in the project area. Remarkable number of Muslims, have been settling in the project area, mainly in Syamgha VDC.

Table 5-6: Caste wise Population in the Project Affected VDC/Municipalities

S.N.	Caste	Population	Percentage (%)
1	Brahmin	38447	23.14
2	Magar	27886	16.79
3	Chettri	21671	13.05
4	Gurung	16750	10.08
5	Kami	15407	9.27
6	Newar	9874	5.94
7	Damai	6110	3.68
8	Sarki	5976	3.60
9	Thakuri	3523	2.12
10	Darai	3273	1.97
11	Kumal	1160	0.69
12	Other	16038	9.65
Total		166115	100.00

5.3.3 Language

Majority of the population in the project area speaks Nepali language. Besides that, some people speak their own ethnic languages- Magar, Gurung, Tamang and others.

5.3.4 Religion

Majority people in the project area practice Hindu, followed by Buddha and Islam. In recent years, some local people are getting converted to Christianity.

5.3.5 Education and Literacy

The literacy rate of the project affected VDCs and Municipalities is 79.6%. Out of the total literate person, male literacy rate is 87.94% and that of female is 72.86% (Table 5-7).

Table 5-7 : Literacy rate of the Project Affected VDCs/Municipalities

Districts	VDC/Municipality*	5 years & above Population			Literacy Status (%)		
		Total	Male	Female	Total	Male	Female
Kaski	Lekhnath*	63419	28486	34933	82.2	90.5	75.45
	Kalika	3641	1622	2019	79.21	90.32	70.28
	Majhthana	2765	1130	1635	71.75	86.28	61.71
	Deurali	2197	924	1273	70.51	81.49	62.53
	Rupakot	2708	1153	1555	77.07	88.29	68.75
	Hanshpur	3382	1445	1937	72.56	82.91	64.84
	Siddha	2779	1160	1619	74.63	85.6	66.77
	Thumki	3074	1364	1710	79.34	91.2	69.88
	Shyamgha	4452	1868	2584	75.29	84.31	68.77
Tanahun	Manpang	6135	2576	3559	72.03	81.33	65.3
	Jamune Bhanjyang	9036	3993	5043	78.53	84.48	71.45
	Byas*	43012	19167	23845	81.85	88.42	76.57
	Kahun Shivapur	6332	2711	3621	64.18	74.92	56
	Total	152932	67599	85333	79.6	87.94	72.86

Source: CBS, 2011

There are higher secondary schools at every VDCs of the project area. Schools of all levels (primary, lower secondary, secondary, higher secondary) are found in villages along the proposed TL route besides government school there are private boarding schools in nearby settlement along the TL route.

5.3.6 Festivals

Since the project area is dominantly inhabited by Hindu people, Hindu festivals like Dashain, Tihar, Maghe Sankranti are widely celebrated in the project area. Some Magar and Gurung people celebrates Lhosar (New Year festival according to Tibetan calendar) and Muslim people celebrate Id.

5.3.7 Migration

The proposed 220 kV TL route runs through rural area. The starting and termination point located nearby the city area. As mentioned above, settlements are growing along the highway and in and surrounding of Lekhnath and Damauli cities. Therefore, it is apparent that people are migrating to these cities from remote VDCs of the project districts.

5.3.8 Gender Aspect

Land and property holding is dominated by male. School enrolment is higher among boys as compared to girls. Women in the project area are mostly engaged as housewives. Some women are observed as engaged in small business. Girl trafficking was not reported during the field visit.

5.3.9 Occupation

Agriculture is major occupation of local people in the project area. More than 85% of the people are engaged in agricultural activities having land, livestock and poultry. Rest of the people are engaged in business, government service, labor, agro-based industries, livestock poultry farming and bee keeping, etc. However, large number of young locals is in foreign employment from the project area.

5.3.10 Agriculture

Agriculture is the prime economic activity in Project area. But the main constraint in agriculture development here is water logging by drainage congestion, irrigation shortage and traditional farming system. The cropping patterns are depended on factors like land types, soil characteristics, rainfall pattern, and seasonal fluctuations of temperature. In the project area paddy, wheat, maize, millets are the most important food crops and oilseed and vegetables are the major cash crops. The cropping pattern in project area is paddy-wheat-maize, paddy-potato-empty, paddy-winter vegetable- maize, paddy-potato and maize.

Livestock raising (mainly cattle, buffaloes and goats) is an important subsistence farming activity in the project area. Livestock provide meat, milk, eggs, and a cash income. Large livestock are also an integral part of cropping activities, providing draught power and producing organic fertilizer. Livestock is grazed on private and communal land.

5.3.11 Trade and Industries

Major markets in the project area are Lekhnath and Damauli. Local emerging markets also observed, in the project area along the road during the field survey. Few small scale industries and business such as block, marble stone cutting, fisheries farm, stone crusher, hotel/restaurant, traditional ornament, agro-vet service etc. are reported in the project VDCs.



5.3.12 Income Level

Major income sources of the households are agriculture, livestock and business in the settlements along the proposed 220 kV TL route. Secondary sources of income are off-farm activities such as labor work, service and local level small industries. Foreign remittance is now one of significant income sources to many HHs in the project area as in other parts of Nepal.

5.3.13 Health and Sanitation

The health situation of the project area is satisfactory and water related diseases (diarrhea, dysentery, influenza, cough/cold, typhoid) and common fever, pneumonia, pox, gastric, measles, jaundice skin diseases urinary tract infection, chronic bronchitis etc. are still common here. There is a sub-health post in each VDC. The health service in the project area is delivered through the existing district government hospital, private hospitals, sub-health post, and clinics which provides local level health services satisfactory. Traditional healing by Dhami, Jhankri and Lama is also practiced in some place of the project area. Awareness level towards health and sanitation (particularly towards safe drinking water, use of toilets, etc.) is apparently satisfactory in the project districts.

5.3.14 Road and Transportation

The district headquarters are linked by black topped road and there are regular bus services from major cities of country. The inner project areas are also almost accessible by gravel or earthen roads.

5.3.15 Energy

All 11 VDCs and 2 municipalities in the project area have been electrified partially or fully. They are electrified almost through NEA Grid system. Fuel wood is main source of energy for cooking food in the project area. Improved cooking stove, kerosene and liquefied petroleum gas (LPG) are also found in use for cooking food in the project affected area.

5.3.16 Communication and Other Facilities

Communication services through wireless and landline telephone are available in the project area. Similarly, the postal and modern communication facilities like television, cable network, email/ internet and fax are also available in major market centers. Local and national newspapers are also available regularly in the main market centers.

5.3.17 Income Pattern

During the field survey, it was observed that the main sources of household income are agriculture, animal husbandry, and off-farm (non-agricultural) activities. Off-farm activities include professional services, petty trade, business (hotel and restaurant), cottage industry, pensions, wage labor, fishing, hatchery, boating and sale of non-timber forest products in the settlements along the proposed 220 kV TL route. Foreign remittance is now one of significant income sources to many households in the project area as in other parts of Nepal. Since the alignment is nearby of the touristic route, so tourism is another major income source of the people of project area. Cash expenditure in non-food item (education, medicine, festival, purchasing assets and consumption goods) is higher in recent year.

5.3.18 Religious, Historical and Archeological Sites

Kaski district itself is a famous for natural resources. High Mountain, spring water, gorge, forest and vegetation, livestock, etc. are the main attraction of the district. The famous mountain Machapuchhre, Davi's falls, Fewa Lake etc. are the world famous places of the district.

Bindabasini, is the main religious place for Hindu in the project area and some mosque and church were also observed in the project area. Similarly, there are religious and archeological places like Gupteshwor cave, Mahendra cave and Byas cave are some other historical, archeological and religious places of the project area. However, none of these will be affected by the project.

5.3.19 Tourism Activity

Kaski district itself is a main destination for tourism in Nepal. Almost tourists who come to visit Nepal definitely visit Pokhara and Lekhnath. The main tourist destination in the project area are Fewa lake, Begnas lake, Davi's falls, Guteshwor cave, Mahendra cave, Seti river, Bindhyabashini temple, Sarangkot, Machhapuchhre, Panchase area, Devghat and Bandipur area.

5.3.20 Non-Governmental Organization (NGO) Activities

Some NGOs and Clubs are working in the field of water supply (drinking and irrigation), health and sanitation, sports, women awareness Dalit awareness and income generating activities in the project area.

5.3.21 Status of Women

Women in the project area are mostly engaged as housewives. Rural women are mostly engaged in collection of firewood/ fodder, and caring of children and old family member is common but urban women are engaged in other activities like teaching, industry, business etc. Project affected districts are touristic area so some women are engaged in this field too. Some women are observed as engaged in small business along the highway. Decision making process about economic activities is mostly exercised by both sexes. Land and property holding is dominated by male. School enrolment is higher in boys as compared to girls. This is significantly low in the Dalit community. Girl trafficking was not reported during the field visit. Domestic violence, child marriages are also not common in the project area.



6 ENVIRONMENTAL IMPACTS

This chapter addresses issues raised by stakeholder and issues considered in IEE in the construction and operation of the Lekhnath-Damauli 220kV TL Project. The construction and operation of the project will result in changes to the existing baseline condition.

6.1 Issues Raised by Public and Stakeholders

Following the ToR meetings and group discussion, the IEE team analyzed the opinions, suggestions and concerns expressed by the local level agencies in response to public notice. Major issues and impacts that are raised by the stakeholders are presented below;

- Works should be carried out in due consultation and coordination with CFUGs and there should be minimum impacts on Community Forest by the project;
- Technical and financial support for the improvement of infrastructure of school, health post and road located in the project affected VDCs;
- Consensus should be taken from forest users' group and affected people whose land falls under the transmission line alignment;
- Plantation should be carried out in barren land;
- Compensation to be given as per the market rate;
- Private land and house should be avoided as far as possible;
- Training and forestation program should be carried out;
- Priority for employment should be given to local people;
- Due care should be given to minimize the impacts on existing environment;
- Continue interaction with local people and local institutions before and during implementation of the project;
- Minimize impact on occupation and safety hazards; and
- Maximum utilization of local resources and manpower for project implementation.

6.2 Issues Identified by Experts

The environmental issues that are likely to occur during the construction as well as the operation and maintenance phases of the proposed project are discussed here. The IEE will not be limited to the issues mentioned below. Additional issues identified during the course of the IEE shall also be covered in detail. The main environmental issues identified during the ToR field visits are listed for following three types of environment.

6.2.1 Physical Environment

A) Construction Phase

- Permanent land take for tower pads;
- Soil erosion during the construction of tower pads;
- Impact due to stock piling;
- Impact on air, noise and water quality;
- Impact on drainage pattern;
- Soil erosion and sedimentation related to excavation works; temporary access roads;
- Waste disposal during construction.

B) Operation Phase

- Impact due to land fragmentation;
- Visual/aesthetic impacts;
- Impact on land use;



- Interference with air traffic;
- Impact of change in natural drainage system;
- Impact due to Electromagnetic effect.

6.2.2 Biological Environment

A) Construction Phase

- Loss of forest and vegetation cover due to site clearance within the RoW;
- Impact on nearby forest due to increase in demand for firewood and timber;
- Disturbances to wildlife habitat and movement due to construction related activities;
- Likely illegal hunting and poaching;
- Likely impacts on rare, endangered and protected species of flora and fauna (if any, identified during the detail IEE study);
- Risk of forest fire.

B) Operation Phase

- Electrocuting of birds and mammals;
- Habitat Fragmentation;
- Likely changes in biological environment.

6.2.3 Socio-economic and Cultural Environment

6.2.3.1 Adverse Issues

A) Construction Phase

- Acquisition of land and private property;
- Relocation and resettlement;
- Occupational health and safety hazards;
- Conflict among the outsiders and local people resulting impacts on law and order situation;
- Loss of standing crops and farming hindrances;
- Pressure on infrastructures, communal resources and practices;
- Sudden cash flow due to increased economic activities and its effects on local economy and people;
- Change in land value;
- Influx of workers;
- Issues of vulnerable group and gender issues;
- Increase pressure on existing health and sanitation facilities.

B) Operation Phase

- Loss of agricultural productions;
- Restriction on land use pattern within the RoW;
- Land fragmentation;
- Farming hindrances due to tower foundations;
- Electro-magnetic effects due to transmission line;
- Noise from the substations;
- Occupational health and safety hazards;
- changes in land value near to tower and substation;
- Aesthetic value.



6.2.3.2 Beneficial Issues

A) Construction Phase

- Employment opportunity for local people;
- Increase in local skills in the relevant areas;
- Increase in economic activities and economic opportunities;
- Development of new infrastructures;
- Creation of fire line in dense forest area.

B) Operation Phase

- Reduction in system loss;
- Enhancement of power supply;
- Opportunities for hydropower development;
- Plantation of NTFPs of short height along the RoW in the forest.

6.3 Issues Prioritized for IEE study

The priority issues identified during the ToR with regard to physical, biological, socio-economic and cultural environment are presented below;

- Acquisition of land and assets;
- Loss of vegetation and plant species;
- Loss of wildlife habitat; compensation for land and property;
- Restriction of land use along the RoW;
- Employment opportunity to the local people;
- Appropriate mitigation measures for the affected people and area.



7 ALTERNATIVE ANALYSIS

7.1 Introduction

The IEE shall examine and describe all alternatives that were examined in the course of developing the proposed project and identify other alternatives which would achieve the identified objectives of the project. The alternatives shall be examined in order to minimize the adverse impacts and maximize the benefits in the context of cost effectiveness, labor intensiveness and low risks of environmental hazards.

The IEE shall compare the alternatives in terms of potential environmental impacts, location, designs and technologies. It shall also study alternatives in terms of methods, operation procedures and the materials to be used during construction. The alternatives proposed for consideration in the IEE are discussed below.

7.2 No Action Alternative

In the "no action" or "do nothing" alternative, no environmental impacts due to project implementation shall occur, as this option represents the *status quo* condition. There are a number of hydropower project under construction in the Seti-Madi river basin. The power generated by such projects cannot be fully consumed in the project area itself, therefore evacuation of power through TL is necessary. Without the construction of this line, the power generated by the different hydro projects will be wasted. Therefore, there is no other option but to construct the proposed line. The IEE team shall assess these impacts.

The following table shows the assessment of the different alternative routes. Out of these, Route-II was selected based on following description presented in Table 7-1.

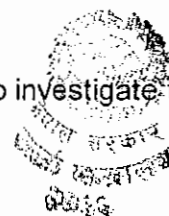
Table 7-1: Alternative Routes

S.N.	Description	Route-I	Route-II	Route-III
1.	Total Length (km)	43.56	41.851	63.590
2.	No. of AP	21	42	25
3.	Access Facility	Near to Prithvi Highway	Village road	Village road
4.	No of Crossing of Existing lines (132/33 kV TL)	4/1	3/0	4/1
5.	No. of river/khola/kholsi crossing	2/11/75	4/12/75	2/16/123
6.	No of village crossing	21	17	26
7.	No of road/highway crossing	6/2	1/2	6/2
8.	Forest area (in length km)	20.84	19.5	41.16
9.	Advantage	Easily accessible, easy construction and maintenance, length less than route -III	Settlements and forest area less than other two alternatives route I and III	Easily accessible from village road
	Priority of Order	2	1	3

7.3 Other Alternatives

In addition to the above mentioned alternatives, the IEE team shall also investigate the following:

- Design alternatives;
- Technology, time schedule and construction materials;



- Construction methods, use of construction materials and equipment, time schedule;
- Alternative in the context of power evacuation methods;
- Study of alternative by considering future plans;
- Alternative measures to reduce the effect of electromagnetic field (EMF).

7.3.1 No Forest Option

Although practically, it is not possible to avoid forest, no forest option will also be studied in the IEE phase. The proposed alignment has been routed nose to nose, valleys and at ridges so as to avoid forest clearance to the extent possible. Furthermore, the locations for APs have been also selected at elevated spots to avoid felling of the trees and trimming. Efforts to avoid the dense forest area have been made.



8 MITIGATION AND ENHANCEMENT MEASURES

8.1 Introduction

The IEE shall recommend appropriate and pragmatic mitigation measures for all of the identified environmental impacts. These actions shall be designed to eliminate or minimize adverse environmental impacts to reasonable levels or to the levels as indicated by national standards. Similarly, enhancement measures shall be proposed to enhance the beneficial impacts. The cost required for mitigation and enhancement measures shall be identified in detail and incorporated in IEE report.

The cost for mitigation and enhancement measures shall be provided separately differentiating into "Physical Environment", "Biological Environment", and "Socio-economic and Cultural Environment". Furthermore the cost shall be differentiated according to "Construction Phase" and "Operation Phase".

All the proposed mitigation and enhancement measures are the prime responsibility of the proponent. Summary of Cost Benefit Assessment shall be given which shall include the followings:

- Cost of Environmental Mitigation Measures
- Cost of Enhancement Measures
- Cost for other Social Support Programs and Corporate Social Responsibility (CSR)
- Cost of Environmental Monitoring
- Total Project Cost, and
- Percentage of Total Environmental Cost to the Total Project Cost

8.2 Types of Mitigation Measures

The IEE team shall recommend the following types of mitigation measures:

- Preventive measures
- Design and corrective measures
- Compensatory measures

Moreover, the IEE report shall propose the organizational structures and agencies to be consulted while implementing the mitigation programs. A matrix including identified impacts and proposed mitigation measures shall also be included in IEE report. The proposed impact mitigation measures matrix shall be categorized in terms of physical, biological, socio-economic and cultural environments. The matrix shall be further categorized in terms of construction and operation phases. The cost for mitigation and enhancement measures shall be provided.



9 ENVIRONMENTAL MONITORING

The monitoring plan shall be required for assessing the actual impacts during project construction and operation. The plan shall specify the physical, biological and socio-economic and cultural environment in terms of parameters, indicators, location, sampling and measurement variables.

The IEE report shall also be specific about the nature of monitoring required, agency carrying out these activities, the cost and any other necessary inputs. In monitoring plan, the following areas shall be described for the construction as well as operation phase:

- The monitoring plan shall be categorized in terms of "Physical", "Biological" and "Socio-economic and Cultural Environment". Moreover, baseline, impact and compliance monitoring plan shall be categorized in terms of construction and operation phases.
- Baseline and impact monitoring plan shall include parameters, indicators, methods, schedule, and location.
- Compliance monitoring plan shall include parameters, indicators, method and schedule.
- Organization set-up, budget and manpower required for carrying out monitoring plan shall be proposed. Furthermore, the monitoring cost includes cost of impact and compliance monitoring activities at least for 2 years of project operation phase.
- Agencies to be consulted while implementing monitoring plan shall also be identified.

All the proposed monitoring plans are the prime responsibility of the proponent.



10 REPORT FORMAT AND DELIVERABLES

A full-fledge report of IEE will be prepared as per EPR, 1997 (Schedule-5 Pertaining to Rule 7). The main text of the report will contain details of assessment and its finding, impacts, mitigation/enhancement measures, institutional requirement including local public and stakeholders concerns together with annexes, maps, photographs, etc.

The IEE report including public concerns and issues shall be submitted to Ministry of Energy (MoEn) through Department of Electricity Development (DoED). The report will be finalized incorporating all possible comments and suggestions to be obtained from the Ministry of Energy. The report shall be deemed to be final after approval by this Ministry.

A list of references cited in the text of main report shall be presented in IEE report. The published or name of publication and journal/unpublished (reports) information shall be listed in the following order: author(s); date of publication; title of the report; volume, number, series if any; and page number.

In addition to the information required under Schedule-5 pertaining to Rule 7 of EPR, 1997 the followings shall be attached as annexes; A copy of approved ToR; records of the public involvement in the project activities; copy of public comments and concerns, a copy of valid survey license; a copy of public notice; recommendation letters from concern VDCs and affected CFUGs; relevant photographs of project area; list of human resource involved during IEE report preparation; list of contact persons during IEE process; tables, maps, charts, graphs, figures, etc. A colour map showing the project affected VDC boundary and project layout shall also be included in it. The executive summary of the IEE shall be presented both in Nepali and English language.

If the project requires land from government forest/community forest or trees are needed to be cut down from government forest/community forest, then comments and suggestions from district forest office and affected community forest will be attached in the IEE report along with their recommendation letters.



Annex-I
Survey License



अनुमतिपत्र महाशाखा

अनुमतिपत्र २०७२ ७३

२०७२/११/२७

चलानी नम्बर - २६१

लेखनाथ-दमौली २२० के.भी. विद्युत प्रसारण लाईन आयोजनाको सर्वेक्षण अनुमतिपत्र वारे ।

✓ श्री नेपाल विद्युत प्राधिकरण
पो.ब.नं. १००२०, प्रधान कार्यालय
दरबारमार्ग, काठमाडौं
फोन: ०१-४१५३०५४ ।

प्रस्तुत विषयमा तर्हाले लेखनाथ - दमौली २२० के.भी. विद्युत प्रसारण लाईन आयोजना को सर्वेक्षण अनुमतिपत्र पाउन दिएको दरखास्त उपर कारवाही हुँदा विद्युत ऐन, २०४९को दफा ४ को उपदफा २ र विद्युत नियमावली, २०५० को नियम ८ बमोजिम नेपाल सरकार, ऊर्जा मन्त्रालय (सचिवस्तर)को मिति २०७२.११.०२को निर्णयानुसार मिति २०७४/११/०१ सम्म । दुई वर्ष) बहाल रहने गरी जारी भएको २२० के.भी. प्रसारण लाईनको सर्वेक्षण अनुमतिपत्र संख्या: वि.वि.वि. ०७२/७३ वि.प्र.स. २३६ यसै पत्र साथ संलग्न गरी पठाइएको व्यहोरा अनुरोध छ ।

संलग्न: विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र संख्या वि.वि.वि. ०७२/७३ वि.प्र.स. २३६ ।

Handwritten signature
२०७२/११/२७
आशिष श्रेष्ठ
इन्जिनियर

सिधार्थ:

श्री ऊर्जा मन्त्रालय, सिंहदरवार

श्री विद्युत विकास विभाग

➤ आयोजना अध्ययन महाशाखा

➤ निरीक्षण महाशाखा

➤ आर्थिक प्रशासन शाखा : मिति २०७२ ०६ १९ मा आ.र.नं. ४५६७ ने.रा.वैक ध.भौ.नं. ०२८९३७ बाट अनुमतिपत्र दस्तुर बापत राखेको धरौटी रकम रु १,००,०००/०० । अक्षरेपी रु. एक लाख मात्र । र मिति २०७२*०८ १६ मा आ.र.नं. ४५९७ ने.रा.वैक ध.भौ.नं. ०२९९९७ बाट अनुमतिपत्र दस्तुर बापत राखेको धरौटी रकम रु १,००,०००/०० । अक्षरेपी रु. एक लाख मात्र । गरी जम्मा भएको रु २,००,०००/०० । अक्षरेपी रु. दुई लाख मात्र । राजश्व छातामा जम्मा हुन ।





नेपाल सरकार

ऊर्जा मन्त्रालय

विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र

(लेखनाथ-दमौली २२० के.भि. विद्युत प्रसारण लाईन आयोजना)

अनुमतिपत्र संख्या : वि. वि. वि. ०७२/७३, वि.प्र.स. २३६

श्री नेपाल विद्युत प्राधिकरण
प्रधान कार्यालय, काठमाडौं ।

महाशय,

विद्युत प्रसारणको सर्वेक्षण अनुमतिपत्र पाउन मिति २०७२/०८/२१ मा दिनु भएको दरखास्त अनुसार देहायको विवरण खोली विद्युत ऐन, २०४९ को दफा ४ को उपदफा (२) र विद्युत नियमावली, २०५० को नियम ८ बमोजिम यो अनुमतिपत्र प्रदान गरिएको छ ।

१. विद्युत प्रसारणको सर्वेक्षण गर्न चाहने व्यक्ति वा संगठित संस्थाको पूरा नाम र ठेगाना :

श्री नेपाल विद्युत प्राधिकरण
पो.ब.नं. १००२०, प्रधान कार्यालय,
दरबारमार्ग, काठमाडौं
फोन: ०१-४१५३०५४ ।

२. प्रसारण गरिने विद्युत उपलब्ध गराउने परियोजना / स्थानको विवरण :-
नेपाल विद्युत प्राधिकरणको केन्द्रीय प्रसारण प्रणाली ।

३. विद्युत प्रसारण कहाँबाट कहाँ गर्ने हो सो को विवरण :-
गण्डकी अञ्चल कास्की जिल्लाको लेखनाथ नगरपालिकामा नेपाल विद्युत प्राधिकरणको सवस्टेसन देखि सोहि जिल्लाको कालिका, माझथाना, हंसपुर हुँदै गण्डकी अञ्चल तनहुँ जिल्लाको रुपाकोट, देउराली, पेलुङ्गा, सल्यानडाँडा, थुम्की, सिद्ध, स्याम्घा, ब्यास नगरपालिका, मनपन, जामुने गा.वि.स. हुँदै कहु शिवपुरमा प्रस्तावित नेपाल विद्युत प्राधिकरणको सवस्टेसन सम्म र ब्यास नगरपालिकाको दमौली सवस्टेसन सम्म ।

४. सर्वेक्षण गर्ने क्षेत्र :

(क) अञ्चल : गण्डकी ।
(ख) जिल्ला : कास्की र तनहुँ ।
(ग) गा.वि.स. र नगरपालिका : प्रकरण ३ मा उल्लेख भएको प्रसारण लाईनको रूटमा पर्ने गा.वि.स. तथा न.पा हरू।

(घ) पूर्व: ८४° २०' ००" पू पश्चिम: ८४° ०२' ३०" पू
उत्तर: २८° १३' ४५" ऊ दक्षिण: २७° ५७' ००" ऊ

५. विद्युत प्रसारणको भोल्टेज र परिमाणहरु :-

भोल्टेज : २२०,००० भोल्ट (डबल सर्किट) ।
परिमाण : ६०० मेगावाट ।

६. सर्वेक्षण प्रकृति :- संभाव्यता अध्ययन तथा वातावरणीय अध्ययन ।

७. अनुमतिपत्र बहाल रहने अवधि :-

मिति : २०७२/११/०२ देखि २०७४/११/०१ सम्म ।



अन्य शर्तहरू

- क. त्यस संस्थान विद्युत विकास विभाग माफत पेश गरेको दरखास्त साथ पेश गरिएको विवरणहरूको अधीनमा रहे प्रस्तुत प्रसारण लाइन आयोजनाको संभाव्यता तथा वातावरणीय अध्ययन गर्नु पर्नेछ ।
- ख. विद्युत नियमावली, २०१० को नियम २१ बमोजिम सर्वेक्षणको कार्य तीन महिनाभित्र शुरू गरी सो को जानकारी विद्युत विकास विभागलाई दिनु पर्नेछ । सर्वेक्षण कार्य प्रगति विवरण प्रत्येक ६६ महिनामा विद्युत विकास विभागलाई दिनु पर्नेछ । विभागले आवश्यक देखेमा अनुगमनको प्रयोजनको लागि कुनै पनि समयमा आवश्यक विवरणहरू माग गर्न सक्नेछ ।
- ग. प्रस्तावित प्रसारण लाइन आयोजनाको दायो वाया अन्य विद्युत प्रसारण लाइन आयोजनाहरू भएमा तिनको RoW मा असर नपर्ने गरी आयोजनाको संभाव्यता अध्ययन कार्य गर्नुपर्नेछ । साथै प्रस्तावित प्रसारण लाइन आयोजनाको क्षेत्र वरिपरि अन्य प्रसारण लाइन आयोजनाहरूको सर्वेक्षण कार्य भईरहेको भए ती आयोजनाहरूसँग पनि आवश्यक समन्वय गर्नुपर्नेछ ।
- घ. सर्वेक्षण कार्यको सिलसिलामा कसैको घर जग्गामा प्रवेश गर्नु परेमा सम्बन्धित व्यक्तिलाई पूर्व सूचना दिएर मात्र त्यस्तो घर जग्गामा प्रवेश गर्न सकिनेछ । त्यसरी प्रवेश गर्दा कुनै हानी, नोक्सानी हुन गएमा अनुमतिपत्र प्राप्त व्यक्ति वा संस्थाले नै क्षतिपूर्ति दिनुपर्नेछ ।
- ङ. सर्वेक्षण कार्य सम्पन्न भएको ३० दिन भित्र ३ प्रति प्रतिवेदन विद्युत विकास विभागमा पेश गर्नुपर्नेछ ।
- च. त्यस संस्थाले पेश गरेको सर्वेक्षण कार्यको कार्य तालिका (Work Schedule) बमोजिम अनुमतिपत्रको प्रकरण ७ मा उल्लेखित अवधिभित्र सम्पन्न गर्नुपर्ने आवश्यक अध्ययन कार्यहरू पूरा गरी विद्युत विकास विभागमा उल्लेखनीय प्रगती सहितको गुणात्मक प्रतिवेदन पेश गर्नुपर्नेछ । कुनै कारणवश अध्ययन कार्य सम्पन्न गर्न थप समय आवश्यक परेमा कार्य सम्पन्न गर्न नसकेको यथोचित कारण समेत खुलाई पुरा भईसकेका अध्ययन कार्यहरूको प्रगति विवरण सहित प्रक्रिया पुर्‍याई नविकरणका लागि दरखास्त दिएमा यस अनुमतिपत्रलाई नविकरण गर्न सकिनेछ । अन्यथा यो अनुमतिपत्र स्वतः रद्द हुनेछ ।
- छ. आयोजनाको मोटामोटी रुट नक्सा संलग्न अनुसूची १ (टोपो नक्शाको Route Alignment) बमोजिम हुनेछ ।
- ज. प्रस्तावित आयोजनाको अध्ययन कार्य गर्दा प्रचलित कानून अनुसार IEE वा EIA गर्नुपर्ने भएमा सो पनि गर्नुपर्ने छ । वातावरण सम्बन्धी अन्य कुराहरू प्रचलित कानून अनुसार हुनेछ ।
- झ. यस अनुमतिपत्रद्वारा सर्वेक्षण गर्न अनुमति दिईएको आयोजना निर्माण गर्न चाहेमा प्रकरण (६) मा उल्लेख भएको सम्पूर्ण अध्ययन कार्यहरू सम्पन्न गरी विद्युत नियमावली, २०१० को नियम १९ बमोजिम यस सर्वेक्षण अनुमतिपत्रको म्यादभित्रै नियम १३ बमोजिमका विवरणहरू खुलाई विद्युत प्रसारणको अनुमतिपत्रको लागि दरखास्त दिनुपर्नेछ ।
- ञ. यस अनुमतिपत्र बमोजिमको सर्वेक्षण गर्न लाग्ने सम्पूर्ण रकम त्यस संस्था आफैले व्यवस्था गर्नुपर्नेछ र त्यस्तो खर्चप्रति नेपाल सरकारको कुनै दायित्व हुनेछैन ।
- ट. नेपाल सरकारको अनुमतिविना यो अनुमतिपत्र बिक्री गर्न वा अन्य कुनै प्रकारले कसैलाई हस्तान्तरण गर्न पाइने छैन ।
- ठ. त्यस संस्थाको स्वामित्वको संरचनामा कुनै हेरफेर वा परिवर्तन भएमा सो को जानकारी विद्युत विकास विभागलाई अविलम्ब दिनुपर्नेछ ।
- ड. यस अनुमतिपत्रमा उल्लेख भए भन्दा फरक हुने गरी आयोजनाको अध्ययन गर्नु पर्ने भएमा सो को पूर्व स्वीकृति लिनु पर्ने छ ।
- ढ. यस अनुमतिपत्रमा कुनै संशोधन गर्नु पर्ने भएमा आवश्यकता एवम् औचित्यताका आधारमा गर्न सकिनेछ ।



अनुमतिपत्र दिने अधिकारीको

सही :

नाम : समिन प्रसाद, शर्मा

पद: सचिव

ऊर्जा मन्त्रालय

मिति : २०७२।११।०२

Annex-II

Table for Forest Loss, Land Loss, Crop Loss and Structure/Other Properties Loss

A. Tables Related to Biological Environment
1. Forest loss at different Project Components

S.N.	PROJECT COMPONENT*	TYPE OF FOREST	FOREST AREA (ha.)	LOSS OF VEGETATION			CROWN COVER (%)	BASAL AREA (%)	VEGETATION TYPE
				Seedling per ha.	Saplings per ha.	No. of trees >10 cm DBH			
1	Switch yard	Gvt. managed							
		Community							
		Leasehold							
		Religious							
		Private							
2	TP1 to TP2							
								
								
								
3	TP.. to TP..							
								
								
4	TL Access Road / Service Road							
								
								
5	Substation	...							
								
								
6	Total					Sum			

Note: Other components can be added as appropriate/required as per the project layout.

ToR Report

NEA-ESSD

2. Total loss in terms of plant species

BOTANICAL NAME	LOCAL NAME	AVG. DBH/ RANGE* (for >= 10 cm DBH)	LOSS OF VEGETATION**				STANDING WOOD VOLUME		BIOMASS FOR STANDING TREE (kg.) (Wet) (Dry)	BIOMASS USAGES***
			LOSS OF REGENERATION		LOSS OF TREE (number)					
			Seedlings per ha.	Saplings per ha.	Pole class	Tree class	Timber (cft.)	Fuel wood (chatta)		
1.										
2.										
...										
Total					Sum	Sum	Sum	Sum	Sum	Sum

Note: * Avg. DBH and Range of DBH to be given for Pole and Tree Class

** Seedling 0-4 cm DBH; Sapling 4-10 cm DBH; Pole Class 10-30 cm DBH; Tree Class >30 cm DBH

*** Possible usages are - fire wood, fodder, etc.

3. Total Forest Loss

TYPE OF FOREST	AREA (ha.)	LOSS OF VEGETATION				CROWN COVER (%)	STANDING WOOD VOLUME		BIOMASS FOR STANDING TREE AND GROUND VEGETATION (kg.)		BIOMASS USAGES
		LOSS OF REGENERATION		LOSS OF TREE (no)							
		Seedlings per ha.	Saplings per ha.	Pole class	Tree class		Timber (cft.)	Fuel wood (chatta)	(Wet)	(Dry)	
		Sum	Sum	Sum	Sum		Sum	Sum	Sum	Sum	
1. Govt.											
2. Community											
3. Religious											
4. Leasehold											
5. Private.											
Total		Sum	Sum	Sum	Sum		Sum	Sum	Sum	Sum	Sum

Note:

- Seedling 0-4 cm DBH; Sapling 4-10 cm DBH; Pole Class 10-30 cm DBH; Tree Class >30 cm DBH

* Possible usages are - fire wood, fodder, etc.

4. Loss of Non-Timber Forest Product (NTFP)

COMMERCIALY IMPORTANT SPECIES (NTFP)	Government Managed		Community Managed		Religious		Leasehold		Remarks
	Seedlings per ha. (no./ha.)	Saplings per ha. (no./ha.)	Seedlings per ha. (no./ha.)	Saplings per ha. (no./ha.)	Seedlings per ha. (no./ha.)	Saplings per ha. (no./ha.)	Seedlings per ha. (no./ha.)	Saplings per ha. (no./ha.)	
1.									
2.									
...									

Note: -Seedling 0-4 cm DBH; Sapling 4-10 cm DBH;

= Use Govt. approved methodologies, if available. If not, other methodologies can be used.

5. Land Requirement

LAND TYPE	LAND REQUIREMENT (ha.)			PROJECT COMPONENT
	Temporary	Permanent	Total	
1. Agricultural.				[TL RoW, Tower Pads, Campsite, Spoil deposit, Road, Substation, etc.]
2. National forest				
3. Community forest				
4. Leasehold forest				
5. Religious forest				
6. Private forest				
Total	Sum	Sum	Sum	



B. Table Related to Land Loss

1-Types of Land FALLING under Transmission Line Corridor

LINE COMPONENTS.	Particulars	LAND TYPE (In hectare)										Total area (In ha.)	Remarks		
		Forest					Cultivated		Barren		River & Flood Plain			Built up/ Residential	
		Gvt.	CF	LHF	Rel.	Pvt.	Govt. (रिजारी)	Pvt.	Gvt.	Pvt.				Public	Pvt.
Under T/L conductor ...	TP1 to TP2														
	TP1. to TP3														
 to ...														
	TP.. to TP..														
Tower Pads	Sub-Total														
	Total number of Tower Pads/area*														
Substation/s	Near Power house														
	Near delivery point													Only if needed. Clearly state if not required	
	Total Area														

Note:

- The area shall include all the land irrespective of need to clear of vegetation and others, including tower foundations.
- * - Number of Tower Pads and area required are to be given as - no./ha.
- ** - If there are more than one substations, all have to be included identifying locations
- LAND REQUIREMENT FROM NATIONAL PARK, RESERVE FOREST, BUFFER ZONE, AND CONSERVATION AREA SHALL BE ACCOUNTED USING SIMILAR TABLES SUITABLE BY DIFFERENT FIELD/COLUMN

2 Types of Land to be ACQUIRED under Transmission Line Corridor

LINE COMPONENTS.	Particulars	LAND TYPE (In hectare)											Total area (In ha.)	Remarks	
		Forest					Cultivated		Barren		River & Flood Plain	Built up/ Residential			
		Gvt.	CF	LHF	Rel.	Pvt.	Govt. (देहात)	Pvt.	Gvt.	Pvt.		Public			Pvt.
Under T/L conductor ...	TP1 to TP2														
	TP1. to TP3														
 to ...														
	TP.. to TP..														
	Sub-Total														
Tower Pads	Total number of Tower Pads/area*														
Substation/s**	Near Power house														
	Near delivery point													Only if needed. Clearly state if not required	
	Total Area														

Note:

- The area shall include all the land irrespective of need to clear of vegetation and others, including tower foundations.
- * - Number of Tower Pads and area required are to be given as - no./ha.
- ** - If there are more than one substations, all have to be included identifying locations
- LAND REQUIREMENT FROM NATIONAL PARK, RESERVE FOREST, BUFFER ZONE, AND CONSERVATION AREA SHALL BE ACCOUNTED USING SIMILAR TABLES SUITABLY ADJUSTED BY FIELD/COLUMN NAMES.



ToR Report

NEA-ESSD

3. Types of Temporary Land required for the Project

S.N.	PROJECT COMPONENTS :	LAND TYPE (in hectare)										Total area (in ha.)	Remarks	
		Forest					Cultivated		Barren		River & Flood Plain			Built up/ Residential Public Pvt.
		Govt.	CF	LHF	Rel.	Pvt.	Govt. (रेकर्दी)	Pvt.	Govt.	Pvt.				
1	Campsites													
2	Storage Facilities													
	Total Area													

Note:

- 1) * - Other components can be added as appropriate/required based on the project layout. The table shall account all the land required by the project
- 2) Give separate tables for Permanent and Temporary land requirements. However, it is advised to use temporary land for these facilities.
- 3) LAND REQUIREMENT FROM NATIONAL PARK, RESERVE FOREST, BUFFER ZONE, AND CONSERVATION AREA SHALL BE ACCOUNTED USING SIMILAR TABLES SUITABLY ADJUSTED BY DIFFERENT FIELD/COLUMN NAMES.



C. Tables Related to Socio-Economic and Cultural environment

1(A)-Loss of Land of Project Affected Families and Households

S.N.	Owner's Name and Family size	VDC/ Ward No.	Project Component*	Loss of Land in the project area (m ²)				Total land loss ha.	Value of lost land (Rs.)	Total Land owned ha.	% of land loss	Remarks
				Khet	Bari	Pakho/Parti/Ghar Bari*	Forest					

Note:

– Mention the category loss for each family

* – Use separate row for each project component for the family as required

1(B)-Total Loss of Land of Project Affected Families and Households

S.N.	VDC	Project Component*	Loss of Land in the project area (Ropani/ ha.)				Remarks
			Khet	Bari	Pakho/Parti	Ghar Bari	
	VDC1						
	VDC2						
						
		Total					
		Total land available in all VDCs					
		% of lost land in all VDCs					
		Value of Lost Land (Rs.)					

Note:

Use separate row for each project component

Annex-II

Note:

Use additional columns as required for other cereal crops

Note:

Use additional columns as required for other cereal crops

Note:

Use additional columns as required for other cereal crops

11

arks

Remarks

marks

1000

4 (A)-Distribution of Settlements/Infrastructures/etc. within 100 m and up to 300 m from TOWER POINT

Tower Point	Geographical Co-ordinate	Location (VDC, Ward)	Land Types under tower pad and its ownership	Settlements/ Infrastructures/ houses/ schools/ temples /Hat-Bazars /etc. within 100 m	Distance from the edge of Tower Point (m)	Settlements/ major infrastructures/ within a distance greater than 100 m (up to 300 m)	Distance from the edge of Tower point (m)	Remarks
TP								

4 (B) -Distribution of Settlements/infrastructures/etc. within 100 m and up to 300 m from the Transmission LINE CONDUCTOR

Transmission line section (from TP to TP)	VDCs/Ward No	Settlements/ infrastructures//houses/schools/ temples/ Hat-Bazar/ within 100 m from T/L conductor	Distance from the Conductor (m)	Settlements/Major structures within a distance greater than 100 m (up to 300 m) from TL Conductor	Distance from the Conductor (m)	Remarks
TP... to TP...						

4 (C) -Distribution of Settlements/Infrastructures/etc. within 100 m substation

Substation	Location (VDC, Ward)	Settlements/ Infrastructures/ houses/ schools/temples/Hat-Bazars/etc. within 100 m	Distance from the edge of perimeter (m)	Remarks
Near Power house				
Near Delivery point				



Annex-III

Sample of Households Questionnaire, KII Guidelines And VDC Checklist



नेपाल विद्युत प्राधिकरण

लेखनाथ-दमौली २२० के.भी. प्रसारण लाइन आयोजनाको
प्रारम्भिक वातावरणीय परिक्षण (IEE) को लागि तैयार गरिएको
घरधुरी प्रश्नावली

२०७३

जग्गा मात्र पर्ने / घर मात्र पर्ने / घर र
जग्गा दुवै पर्ने / अन्य सरचना पर्ने
(.....)

यस प्रश्नावलीमा सोधिएका सबै व्यक्तिगत सूचना तथाकाइ ऐन २०१५ अनुसार गोप्य राखिने छन् र तथ्याङ्किय प्रयोजनका लागि मात्र प्रयोग गरिनेछन्।

१. आयोजना क्षेत्र सम्बन्धि सामान्य जानकारी:

१. जिल्ला: २ गा.वि.स./न.पा.
३. वडा नं. ४. गाउँ/टोल
५. आयोजना स्थल: ५.१. सबस्टेशन ५.२. टावर (टावर नं.)
५.३ टावर नं. देखि सम्म

२. परिवार सम्बन्धी जानकारी :

- २.१ घरमूलीको नाम:
२.२ लिंग: १. पुरुष २. महिला
२.३ धर्म: २.४ जात/जाति:
२.५ परिवारमा बोलिने भाषा: २.६ परिवार संख्या:
२.७ तपाईं यस गाउँमा कहिलेदेखि बसिरहनु भएको छ ?
१. जन्मदेखि नै बसोबास गर्दै आएको २. बसाई सरी आएको , कति वर्ष पहिले
२.८ परिवारको प्रकार: १. एकल परिवार (छुट्टिएर बसेका) २. संयुक्त परिवार:

२.९ पारिवारिक बिबरण :

कृपया तपाईंको परिवारको सदस्यहरुबारे (मानो नछुट्टिई बसेका) विस्तृत विवरण दिनुहोस् (घरमूलीबाट शुरु गर्ने)

क्र.सं	नाम	लिंग	उमेर (वर्ष)	शिक्षा (५ वर्ष माथि)	वैवाहिक स्थिति	पेशा (१४ वर्ष माथि)		सिप/ तालिम प्राप्त भए सो को बारेमा उल्लेख गर्ने	६ महिना भन्दा बढी समय बाहिर बसेको भए		
						मुख्य	सहायक		समय (महिना)	कारण	ठाउँ
१.					वि. अवि						
२.					वि. अवि						
३.					वि. अवि						
४.					वि. अवि						
५.					वि. अवि						
६.					वि. अवि						
७.					वि. अवि						
८.					वि. अवि						
९.					वि. अवि						
१०.					वि. अवि						
११.					वि. अवि						
१२.					वि. अवि						



३. कृषि, पशुपालन तथा व्यापार व्यवसाय:

३.१ कृषि

कृषया तपाईंको आफ्नो वा परिवारको नाममा भएको जग्गा जमीन बारे निम्न विवरण दिनुहोस् ।

जग्गाको स्वामित्व	सिँचीत खेत (क्षेत्रफल)	बारी (क्षेत्रफल)	अन्य (खुलाउने).....
आफ्नै			
अरुको कमाई आएको			
अरुलाई कमाउन दिएको			

३.१.१ के तपाईंले गत वर्षमा कुनै जग्गा बेच्नुभयो ? १. बेचे २. बेचेको छैन

३.१.२ गत वर्षमा तपाईंले खेती गर्नुभएको जग्गामा कुन कुन खाद्यान्न बाती/नगदे वाली/फलफुलहरु लगाउनु भयो, तिनीहरुको उत्पादन, उत्पादन खर्च एवं आम्दानी बारे बताउनुहोस् ।

खाद्यान्न बालिहरु	वालीहरु	खेती गरेको जमिनको क्षेत्रफल	कुल उत्पादन	प्रति इकाई मूल्य	जम्मा आम्दानी (रु.)	उत्पादन खर्च	जम्मा खुद आम्दानी (रु.)
	धान						
	गहु						
	मकै						
	कोदो						
	दाल गोडागुडी						
	अन्य....						
नगदेवालीहरु (व्यवसायिक उत्पादन)	जम्मा						
	आलु						
	तोरी						
	ऊखु						
	तरकारी						
	जम्मा						

३.१.३ के तपाईंको जग्गामा भएको गत वर्षको उत्पादनले तपाईंको परिवारलाई पर्याप्त भयो ?

१. भयो २. भएन

३.१.४ यदि अपर्याप्त भयो भने कति महिनाको लागि पुगेन ? महिना

३.१.५ आफ्नो उत्पादित खाद्यान्न अपर्याप्त भएको बेला आफ्नो परिवारलाई तपाईं कसरी खुवाउनु हुन्छ ?

- | | |
|--------------------------|------------------------------|
| १. ऋण गरेर | २. दैनिक ज्यालादारी काम गरेर |
| ३. घरको अन्य सामान बेचेर | ४. जंगली खाद्य पदार्थ खाएर |
| ५. भारी बोक्ने काम गरेर | ६. अन्य |

३.१.६ के तपाईंको परिवारको ऋण छ ? १. छ २. छैन

३.१.७ यदि ऋण छ भने, ऋण लिनुको कारण के हुन् ? (३ भन्दा बढीमा चिन्ह नलगाउने)

- | | |
|-------------------------------------|---|
| १. घर निर्माण/सुधार | २. खेतीको लागि जग्गा किन्न |
| ३. घडेरी किन्न | ४. आप्रवाशनको लागि / वैदेशिक रोजगारीको लागी |
| ५. शिक्षाको लागि | ६. औषधोपचारको लागि |
| ७. विहे/व्रतबन्ध आदि काम | ८. खाद्यान्न/लत्ताकपडा खरिद |
| ९. अन्य कार्य भए उल्लेख गर्ने | |



३.१.८ तपाईंको परिवारको न्यूनतम आधारभूत आवश्यकताहरू पूरा गर्न मासिक आम्दानी कति जानि हुनुपर्छ ?
जम्मा/लागू: मासिक आम्दानी रु.

३.२ पशुपालन :

३.२.१ तपाईंले गाईवस्तु पाल्नु भएको छ ?

१. छ २. छैन

३.२.२ यदि पाल्नुभएको छ भने निम्न विवरण दिनुहोस् ।

क्र.स.	पशुपंक्षी को प्रकार	संख्या	पशु/पंक्षी पालनबाट जम्मा वार्षिक आम्दानी (रु.)	पशु/पंक्षी पालनको लागी जम्मा वार्षिक लागत (रु.)	खुद आम्दानी (रु.)	कैफियत
१.	गाई		पशुपंक्षी बेचेर दुध, दही, घिऊ बाट			
	गोरु					
२.	भैसी					
	रांगा					
३.	भेंडा/वाखा/खसी/बोका		अन्य बाट			
४.	सुँगुर/बंगुर					
५.	कुखुरा/हाँस /परेवा					
६.	अन्य					
	जम्मा					

३.३ व्यापार तथा साना उद्योग :

तपाईंको परिवारका सदस्यहरूमध्ये कसैको आफ्नै व्यापार वा घरेलु उद्योग छ कि ? (२.९ को पेशा संग सम्बन्धित)

१. छ २. छैन

यदि छ भने तलको विवरण दिनुहोस् ।

व्यवसायको किसिम	स्थान	औसत मासिक आम्दानी

४. घर र घरायसी सामग्रीहरूको विवरण

४.१. यो घर तपाईंको आफ्नै हो ?

१. हो २. होईन

४.२. यदि होईन भने तपाईंले भाडामा लिनु भएको हो ?

१. हो २. होईन ३. अरुको घरमा बसेको

४.३. आफ्नो घरको भित्ताको सामग्री :

४.४. भुईँको सामग्रीहरू:

४.५. छानाको सामग्री:

४.६. घरको तला:

१. एक तला २. दुइ तला ३. तिन तला ४. तिन तला भन्दा माथि



५. आम्दानी तथा खर्चको विवरण :

५.१ खर्च : गत महिना तपाईंको घरमा निम्न शिर्षक अनुसारमा भएको खर्चको विवरण दिनु होस् :

शिर्षक	मासिक रु.	वार्षिक रु.
१. खाना खर्च		
२. लत्ता कपडा		
३. घरभाडा		
४. शिक्षा		
५. यातायात		
६. इन्धन (मट्टितेल, ग्यास, दाउरा आदि)		
७. टेलिफोन/पत्रपत्रिका/केबुल टि.भी.		
८. पानी/बिजुली		
९. अन्य (खुलाउने)		
जम्मा		

५.२ आम्दानी : विगत १२ महिना यता तपाईंको परिवारले निम्न स्रोतबाट कति आम्दानी गर्नु ?

आम्दानीका स्रोतहरू	रु.	
१. कृषिजन्य उत्पादनको विक्रि र उपभोग [आफैले उत्पादन गरेको] बाट		(३.१.२ बाट लिने)
२. पशुपालनबाट आम्दानी		(३.२.२ बाट लिने)
३. उद्योग/व्यवसाय/व्यापार/ठेकापट्टा		
४. नोकरी (तलब)		
५. दैनिक ज्याला मजदूरी		
६. वैदेशिक रोजगारीको कमाई (विप्रेषण)		
७. बहाल/ब्याज/लाभांश		
८. पेन्सन		
९. सामाजिक सुरक्षा भत्ता (वृद्ध, एकल महिला, अपांग आदि)		
१०. अन्य आम्दानी (खुलाउने)		
जम्मा		

६. ऊर्जा तथा खानेपानीको आपूर्ति:

६.१ तपाईंको खानेपानीको मुख्य स्रोत के हो ? १. ईनार/कूवा २. ट्यूब वेल ३. सार्वजनिक घारा
४. पाइपबाट आपूर्ति ५. अन्य.....

६.२ हाल भईरहेको पानीको स्रोतले तपाईंको खानेपानी आवश्यकता पुरा गर्छ ? १. गर्छ २. गर्दैन

६.२.१ यदि पुरा गर्दैन भने कति महिनाको लागि पुग्दैन ?महिना

६.२.२ ति अपुग महिनामा खानेपानीको आवश्यकता कसरी पुरा गर्नुहुन्छ ?

१..... २..... ३.....

६.३ तपाईंको गाउँघरमा बिजुली बत्ती छ ? छ । छैन ।

यदि छैन भने तपाईं उज्यालोको लागि के प्रयोग गर्नुहुन्छ ?

१. टुकी (मट्टितेल) २. तेल (दियो)
३. सौर्य ऊर्जा ४. अन्य.....

६.४ तपाईं खाना पकाउनको लागि निम्न मध्ये के प्रयोग गर्नु हुन्छ ?

- | | |
|----------|-----------|
| १. दाउरा | २. मडितेल |
| ३. गुईछा | ४. विजुली |
| ५. ग्यास | ६. अन्य |

६.४.१ यदि तपाईं दाउरा बाल्नुहुन्छ भने एक महिनामा कति भारी दाउरा बाल्नुहुन्छ ?

परिणाम भारीमा अन्दाजी (तौल: १ भारी बराबर २५ के.जी.)
(मूल्य: १ भारी रु.)

६.४.२ तपाईं घरमा बाल्नको लागि दाउरा कहाँबाट ल्याउनुहुन्छ ?

- | | |
|-----------------|------------|
| १. सरकारी वन | २. निजी वन |
| ३. सामुदायिक वन | ४. किनेर |
| ५. अन्य | |

६.४.३ तपाईंलाई घाँसपात, स्याउला, दाउरा, काठ आदिको लागि पायक पर्ने वन कुन हो ?

१. वनको नाम : गा.वि.स./वडा नं. :

२. ठाँउ : दुरी (घण्टा/मिनेट)

३ वनको प्रकार: सामुदायिक/राष्ट्रिय/कवुलियती/नीज / धर्मिक/ अन्य.....

७. स्वास्थ्य र सरसफाई :

७.१ तपाईं वा तपाईंका परिवारका सदस्यहरु दिशापिसाव कहाँ गर्नुहुन्छ ?

- | | | |
|------------------|---------------|-------------------|
| १. आफ्नै चर्पीमा | २. खुला चौरमा | ३. नदीको किनारामा |
| ४. वनजङ्गलमा | ५. अन्य | |

७.२ सडेगलेको वा ठोसपदार्थ/फोहोरमैला कहाँ फाल्ने गर्नु भएको छ ?

- | | | | |
|----------------------------|----------|----------|---------|
| १. सुरक्षित ठाउँमा थुपारेर | २. जलाएर | ३. गाडेर | ४. अन्य |
|----------------------------|----------|----------|---------|

७.३ के तपाईंको परिवारको कुनै सदस्य गत वर्ष सिकिस्त विरामी भएका थिए ?

- | | |
|--------|-----------|
| १. थिए | २. थिएनन् |
|--------|-----------|

७.४ कस्तो किसिमको रोग लागेको थियो र कुन उपचार विधि अपनाउनु भएको थियो ?

<u>रोग</u>	<u>उपचार विधि</u>	<u>उपचार गराएको स्थान</u>
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८. प्रसारण लाइन आयोजनाबाट पर्ने प्रभावहरु :

८.१ यदि जग्गा/जमिन आयोजना बाट प्रभावित भएको खण्डमा मात्र :

८.१.१ यस आयोजनाबाट तपाईंको प्रभावित हुने जग्गा जमिनको निम्नलिखित विवरण दिनुहोस ।

गा.वि.स / न.पा. वार्ड नं	ठाउँको नाम	कुल क्षेत्रफल	हाल जग्गाको प्रयोग	जग्गाको स्वामित्व	आयोजनाबाट प्रभावित जग्गाको		
					किसिम खेत/बारी /अन्य	क्षेत्रफल	मूल्य रु.हजारमा
				नम्बरी / ऐलानी			
				नम्बरी / ऐलानी			
				नम्बरी / ऐलानी			

(नोट : जग्गाको मूल्य चलन चल्तीको भाऊ बमोजिम राख्ने)

८.२ यदि घर, गोठ वा अन्य संरचना आयोजना बाट प्रभावित भएको खण्डमा मात्र :

(Tower To), Substation, Tower No

८.२.१ तपाईंको जम्मा कति वटा घर गोठ छन् : घर सख्या गोठ सख्या

८.२.२ आयोजनाबाट तपाईंको के के संरचना प्रभावित भएका छन् ? घर/गोठ बारे

१. घर वटा २. गोठ वटा ३. अन्य संरचना वटा (खुलाउने)

८.२.३ आयोजनाबाट प्रभावित संरचनाहरु तपाईंको आफ्नै हो ? १. हो २. होइन

प्रभावित हुने संरचनाको बारेमा निम्न विवरण दिनुहोसः

संरचनाको नाम :	
ल (मिटर)	चौ
तला	किसिम :
गारोको किसिम :	छानोको किसिम :

संरचनाको नाम :	
ल (मिटर)	चौ
तला	किसिम :
गारोको किसिम :	छानोको किसिम :

संरचनाको नाम :	
ल (मिटर)	चौ
तला	किसिम :
गारोको किसिम :	छानोको किसिम :

संरचनाको नाम :	
ल (मिटर)	चौ
तला	किसिम :
गारोको किसिम :	छानोको किसिम :

९. घर जग्गाको मुआब्जा/पुनर्वास सम्बन्धि

९.१ यहाँ बाहेक अन्यत्र तपाईंको घर वा जग्गा छ ? १. छ २. छैन

९.२ यदि छ भने के र कहाँ छ ?

किसिम ठाँउ
घर
जग्गा
घडेरी

९.३ तपाईंले पाउने / पाएको मुआब्जा रकम के को लागी प्रयोग गर्नु हुन्छ/ भयो ?

१. जग्गा किन्ने २. घर बनाउने ३. ऋण तिर्ने
४. ब्यापार गर्ने ५. घरेलु उद्योग ६. अन्य

९.४ तपाईंले उचित मुआब्जा पाएमा अन्यत्र बसाई सर्नु हुन्छ ?

१. सधैं २. सधैंन

९.५ यदि बसाई गर्न चाहनु हुन्छ भने किन ?

१. २. ३.

१०. आयोजनाप्रतिको अवधारणा

१०.१ तपाईंलाई यस प्रस्तावित प्रसारण लाइन आयोजनाको बारेमा केही जानकारी छ ?

१. छ २. छैन

यदि छ भने कुन श्रोतबाट जानकारी प्राप्त गर्नुभयो ?

१. २. ३.



१०.२ प्रस्तावित प्रसारण लाइन आयोजना प्रति तपाईंको कस्तो अवधारणा छ ?

१. सकारात्मक २. नकारात्मक ३. नटम्य

४. केही पनि थाहा छैन ५. आयोजना प्रति अवधारणा बनाउने बेला भएको छैन

१०.२.१ यदि नकारात्मक धारणा भएमा किन होला ? कारण बताईदिनु हुन्छ कि ?

१..... २..... ३.....

१०.३ यस प्रसारण लाइन आयोजनाबाट तपाईंले कुनै कुराको आशा राख्नु भएको छ ?

१. छ १. छैन, यदि छ भने के कुराको आशा राख्नु भएको छ ?

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११. स्थानिय सहभागिता :

११.१ तपाईं वा तपाईंको परिवारको कुनै सदस्य यस क्षेत्रमा संचालित सरकारी, गैरसरकारी वा अन्य संस्थाहरुमा सहभागी हुनु हुन्छ ?

१. छ १. छैन

११.२ यदि सहभागी हुनु हुन्छ भने निम्न विवरण दिनु होस् ।

संस्थाको नाम र ठेगाना	सहभागिता को किसिम	स्थापना भएको साल	संस्थाले गर्ने काम/उद्देश्य

१२. आयोजनाको बारेमा तपाईंका अन्य केही भनाई अथवा धारणा भएमा उल्लेख गर्नुहोस्

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-
-
-
-

उत्तरदाताको नाम:

सम्पर्क टेलिफोन:

प्रश्नावली भर्नेको नाम र सही:

मिति:

रुजु गर्नेको नाम र सही:

मिति:



नेपाल विद्युत प्राधिकरण

लेखनाथ-दमौली २२० के.भी. प्रसारण लाइन आयोजनाको प्ररम्भिक वातावरणीय परिक्षण (IEE) को लागि
कृषिजन्य र अन्य वस्तुको मूल्य सम्बन्धी बजार सर्वेक्षण फारम

२०७३

- | | |
|---|--|
| <p>१. <u>जग्गा</u> मूल्य रु. (रोपनी)
 <u>सिंचित खेत</u>
 <u>असिंचित खेत</u>
 <u>वारी</u>
 <u>खरवारी</u></p> <p>२. <u>खाद्यान्न मूल्य (रु. /किलो)</u></p> <p>धान
 गहुं
 मकै
 कोदो
 जौ
 दाल
 आलु
 मासको दाल
 गहत
 तोरी
 अन्य</p> <p>४. <u>अन्य उत्पादन</u> <u>मूल्य रु. (लिटर/माना)</u></p> <p>दूध
 दहि
 घिउ
 तेल
 माछा</p> | <p>३. <u>फलफूल मूल्य (रु./किलो/दर्जन)</u></p> <p>लिच्ची
 कागती र निवुवा
 आरु
 नासपाती
 अम्बा
 कटहर
 केरा
 मेवा
 आंप
 अन्य</p> <p>५. <u>मासु मूल्य रु. (किलो)</u></p> <p>कुखुरा
 खसी
 राँगो
 सुँगुर</p> |
|---|--|



६. पाल्नु जनावर (अनुमानित मूल्य प्रति गोटा रु.)

रांगा
भैसी
हलगोरु
बाखा
सुंगुर
कुखुरा

७. निर्माण सामाग्री इकाई मूल्य रु.

काठ
ईट्टा
सिमेन्ट
फलामे डण्डी
ढुङ्गा
बालुवा
बाँस

८. ज्याला मजदुरी (प्रतिदिन) ज्याला खाना जम्मा रु.
कृषि मजदुर (पुरुष)
कृषि मजदुर (महिला)
सिकर्मी
डकर्मी
अन्य.....

१. गा.बि.स..... २. वडा नं..... ३. ठाउँ.....

मिति.....



Annex-IV
News Covered by Local Media



दमौली खबर

राष्ट्रिय दैनिक

दमौली-लेखनाथ विद्युत

प्रसारण लाईन बन्दै

दमौली खबर संस्वाददाता

महायुक्त निर्देशक कृष्णप्रसाद

फाल्गुण २३ दमौली । तमहु

जोशीले जानकारी दिए ।

जलविद्युत आयोजनामा आधारित

प्राधिकरणको टोलीले अहिले

दमौली-लेखनाथ दुई सय २०

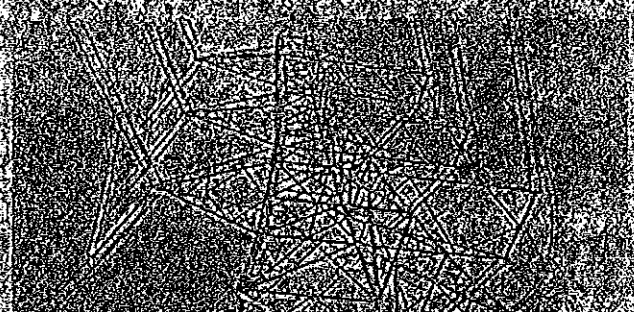
प्रभावित क्षेत्रका नागरिकसँग प्रत्यक्ष

केभिए विद्युत प्रसारण लाईन निर्माण

अस्तीकृत गरिएको छ । यसका

गोपनी भएको छ । नेपाल विद्युत

आधारमा आगामी दिनमा थप



प्राधिकरणले तमहु खलविद्युत

अध्ययन रोजाइको काम थाले

आयोजनामा आधारित एक सय

शाखाको समर्थक प्रस्ताव प्रकाश

उपयोगको विद्युतलाई गरिने

गोडेलले जानकारी दिए ।

प्रसारणमा लाईनको लागि प्रयोग

कोसि र अर्कोपट्टर जस्ता

प्रसारण लाईन निर्माण गर्ने लागेको

लाइन बन्दैको कानुनबन्दी थप

थी ।

जगत्पालिका र यसमा रहे

आयोजना निर्माणको प्रक्रिया

कार्यको सिद्धाशुद्धी लगाकोट

शुरू भएपछि प्रसारण लाईनको

दमौली जोडिने र लेखनाथ

प्रक्रिया पनि थालिएको छ । पहिलो

नगरपालिकामा प्रयोग गरिने छ ।

नगरपालिका प्रसारण लाईन निर्माण

वातावरणीय प्रभाव मूल्यांकन

क्षेत्रमा प्रारम्भिक वातावरणीय प्रभाव

टोलीका सदस्य समितिले इन्जिनियर

मल्याकनको काम शुरू भएको

सुलभ श्रेयले प्रसारण लाईन क्षेत्रका

प्राधिकरणको वातावरण तथा

नागरिकमा अस्तीकृत र सल्लाह

सामाजिक अध्ययन विभागका

सकलन भेटेको जानकारी दिए ।



Annex-V
Attendance of Group Meetings



नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
खरिपाटी, भक्तपुर

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ-दमौली (अपर सेती) २२० के.भी प्रसारण लाइन आयोजनाबाट प्रभावित क्षेत्रमा पर्ने सक्ने वातावरणीय प्रभावहरूका बारेमा वातावरण तथा सामाजिक अध्ययन विभागबाट प्रारम्भिक वातावरणीय परीक्षण (IEE) को कार्यसूचि (ToR) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरु विच निम्न मिति, समय र स्थानमा छलफल गरी निम्नलिखित रायसुझाव संकलन गरियो ।

मिति :- २०६२/११/१९ स्थान :- काँडे शिपिपु -१, भर्केनी^{२०}
उपस्थिति समय :-

क्र.सं.	नाम थर	पेशा/पद	ठेगाना/संस्था	सम्पर्क नं.	सही
१	सोम ब. थापा मजद	कृषि	भर्केनी	९८०६९५१२९०	
२	नर ब. थापा	कृषि	भर्केनी		
३	बसन्ती थापा		भर्केनी	९८५०६५५०१८	
४	सुम ब. थापा	उपस्थित	भर्केनी	९८०५११५०९९	
५	बसन्ती श्रेष्ठ	गृहीणी	भर्केनी		
६	जगेश श्रेष्ठ	कृषि	भर्केनी	९८५०६५३२२०	
७	प्रकाश जोडेल	बोकरी	बी. वि. प्रा.	९८५११५६३३३	
८	कृष्ण प्र. जोशी	"	"	९८५११६८०७६	
९	सुलभ श्रेष्ठ	"	"	९८५१६९८६२४	
१०					
११					
१२					
१३					
१४					
१५					

राय सुझाव :

- १) पहिलो तथा दोस्रो लाई प्रभाव तयार गरी प्रसारण लाइन लैजायुपर्ने
- २) पहिलो तथा दोस्रो लाई डोचिने प्रभाव हुने।
- ३) प्रभावित व्यक्तिहरूलाई रोक (का) बन्नुपर्ने
- ४) सुझाव लागू गर्न नसकेको भएमा तालिमको माग (का) गर्ने
- ५) वन हिउँदको लागू गर्न नसकेको भएमा तालिम तथा कार्यक्रमहरूको माग (का) गर्ने

नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
खरिपाटी, भक्तपुर

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ-दमौली (अपर सेती) २२० केभी प्रसारण लाईन आयोजनाबाट प्रभावित क्षेत्रमा पर्ने सक्ने वातावरणीय प्रभावहरूका बारेमा वातावरण तथा सामाजिक अध्ययन विभागबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) को कार्यसूचि (ToR) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरू विच निम्न मिति, समय र स्थानमा छलफल गरी निम्नलिखित रायसुझाव संकलन गरियो ।

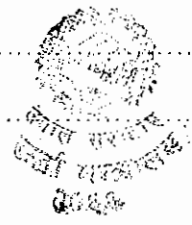
मिति :- २०७२-११-१९ स्थान :- व.प.स. - ८
उपस्थिति

समय :-

क्र.सं.	नाम थर	पेशा/पद	ठेगाना/संस्था	सम्पर्क नं.	सही
१	मनव. पौड्या	कृषक	व.प.स. - ८	९८०६६९९३६०	मनव. पौड्या
२	राजि. क. पौड्या	कृषक	"		राजि. क. पौड्या
३	लक्ष्मण गुरुङ	श्रमिक	"		लक्ष्मण गुरुङ
४	पौडीया डोम	गृहिणी	"		पौडीया डोम
५	प्रकाश मण्डारी	श्रमिक		९८२६०९३९१०	प्रकाश मण्डारी
६	कमल लामाला	नोकरी	"	९८९९४०१२२	कमल लामाला
७	सुहास नेम्बाङ	श्रमिक	"		सुहास नेम्बाङ
८	गोविन्द खत्री	"	"		गोविन्द खत्री
९	लक्ष्मण गुरुङ	कृषक	"		लक्ष्मण गुरुङ
१०	प्रकाश मण्डारी	नोकरी	न. वि. ३१	९८२९९५३३३	प्रकाश मण्डारी
११	कृष्ण प्रसाद	"	"		कृष्ण प्रसाद
१२	सुलभ शर्मा	"	"	९८२९६९६२८	सुलभ शर्मा
१३					
१४					
१५					

राय सुझाव :

- १) व.प.स. १ जग्गाको शान्तिशास्त्र
- २) शे.प. सुहास मण्डारी
- ३) राजि. क. पौड्या



नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
खरिपाटी, भक्तपुर

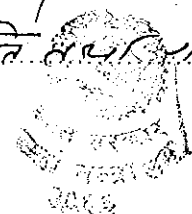
नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ-दमौली (अपर सेती) २२० के.भी प्रसारण लाईन आयोजनाबाट प्रभावित क्षेत्रमा पर्ने सक्ने वातावरणीय प्रभावहरुका बारेमा वातावरण तथा सामाजिक अध्ययन विभागबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) को कार्यसूचि (ToR) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरु विच निम्न मिति, समय र स्थानमा छलफल गरी निम्नलिखित रायसुझाव संकलन गरियो ।

मिति :- २०७२-११-२० स्थान :- हेलपुरा-९, ताप्लेजुङ
उपस्थिति समय :-

क्र.सं.	नाम थर	पेशा/पद	ठेगाना/संस्था	सम्पर्क नं.	सही
१	पुष्पराज सुब्बा	विद्युत नं.वि.प्र.	हेलपुरा-९	९७४६०९४२०४	पुष्पराज सुब्बा
२	पिपरी बज्रा	कृषि	हेलपुरा-९	९७४६०९४२०३	पिपरी बज्रा
३	बिष्णु पुर्वा	कृषि	हेलपुरा-९	०६९४३२२३६	बिष्णु पुर्वा
४	सुनंदा राय	कृषि	हेलपुरा-९	—	—
५	शुक्ल बज्रा	कृषि	हेलपुरा-९	—	—
६	शुक्ला सुब्बा	कृषि	हेलपुरा-९	९७४६०९४२०५	शुक्ला सुब्बा
७	पिता सुब्बा	कृषि	हेलपुरा-९	०६९४३२२३६	पिता सुब्बा
८	देउ राय सुब्बा	कृषि	हेलपुरा-९	९७४६०९४२०४	देउ राय सुब्बा
९	जोरा सुब्बा	कृषि	हेलपुरा-९	—	—
१०	देउ राय सुब्बा	कृषि	हेलपुरा-९	—	—
११	देउ बज्रा सुब्बा	कृषि	हेलपुरा-९	—	—
१२	देउ सुब्बा	कृषि	हेलपुरा-९	—	—
१३	देउ सुब्बा	कृषि	हेलपुरा-९	—	—
१४	देउ सुब्बा	कृषि	हेलपुरा-९	—	—
१५	देउ सुब्बा	कृषि	हेलपुरा-९	—	—
१६	देउ सुब्बा	कृषि	हेलपुरा-९	—	—

राय सुझाव :

- १) परे लपा जाँगाको डालिद रक्षागुन
- २) सुझाव लागू गर्ने तालिमको व्यवस्था
- ३) प्रभावित व्यक्तिहरुलाई रोगरागीको व्यवस्था
- ४) आयोजना विकासमा पक्षधारीता हुनुपर्ने
- ५) सीपमूलक तालिम दिदा प्रभावित व्यक्तिहरुलाई रक्षागुन



खरिपाटी, भक्तपुर

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ-दमौली (अपर सेन्टी) ३२० के.भी प्रसारण लाईन आयोजनाबाट प्रभावित क्षेत्रमा पर्न सक्ने वातावरणीय प्रभावहरूका बारेमा वातावरण तथा सामाजिक अध्ययन विभागबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) को कार्यसूचि (ToR) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरु विच निम्न मिति, समय र स्थानमा छलफल गरी निम्नलिखित रायसुझाव संकलन गरियो ।

मिति :- 2062-99-29 स्थान :- का. वि. वि. पत्राचार समय :-

उपस्थिति

क्र.सं.	नाम थर	पेशा/पद	ठेगाना/संस्था	सम्पर्क नं.	सही
१	रिखी राम पौडेल	कृषि	पतेनीटार		
२	मित्रलाल श्रेष्ठ	कृषि	पतेनीटार		Mitradal
३	मिना पौडेल	कृषि	पतेनीटार	१८५६१९५८५१	मिना
४	नवराज पौडेल	कृषि	पतेनीटार	१८५६५१७५५१	
५	सुमित्रा श्रेष्ठ	कृषि	पतेनीटार	१८५६०५७५३६	सुमित्रा
६	कमल कुमार श्रेष्ठ	वैदेशिक रोजगार	पतेनीटार		
७	प्रविष्म श्रेष्ठ	"	"	१८१३५९९५६०	
८	पद्म थापा	शिक्षण	"	१८१६१४७९५९५४	
९	ओम ब. थापा	शिक्षण	सिर्दी	१८१६१८९५००	
१०	दिग लाल श्रेष्ठ	कृषि	पतेनी टार	१८५६२७५९५५	Harmlal
११	तिलु मल्ल	सिलाई	पतेनी टार	१८५६८०६७३५	
१२	वासुमती श्रेष्ठ	कृषि	"		
१३	तिलु माया मल्ल	कृषि	"		
१४	सुकुन्तला उरुङ्ग	कृषि	"	१८५६१७९५६५	सुकुन्तला
१५		ना.वि.डी	ना.वि.डी	५८५९९६८०६८	
१६		"	"	५८५९९२६३३३	

राय सुभाष :

- १) सुरक्षा समन्वय जनसेवा लालिनी
- २) पारदर्शकताको इतिहास
- ३) सोम्वारे पारदर्शकता
- ४) जनसंगठन संरचना समन्वय निर्माण कार्यसहित



नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
खरिपाटी, भक्तपुर

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ-दमौली (अपर सेती) २२० के.भी प्रसारण लाईन आयोजनाबाट प्रभावित क्षेत्रमा पर्ने सक्ने वातावरणीय प्रभावहरूका बारेमा वातावरण तथा सामाजिक अध्ययन विभागबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) को कार्यसूचि (ToR) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरू बिच निम्न मिति, समय र स्थानमा छलफल गरी निम्नलिखित रायसुभाव संकलन गरियो।

मिति : २०७२-११-२१ स्थान :- स्थान-४
उपस्थिति

समय :-

क्र.सं.	नाम थर	पेशा/पद	ठेगाना/संस्था	सम्पर्क नं.	सही
१	चन्द्रब. नेपाली	कर्मिकाम	स्थान-४		चन्द्रब. नेपाली
२	राम रत्न दिमाल	शिक्षक	स्थान-४	९८४६७२३१२१	
३	नरेन्द्र विक्रम शह	क्र.पु. आर्मी	स्थान-४	९८१७१५७६३३	
४	रामजी दुःजाना	कृषी	स्थान-४	९८४६३७१३०५	
५	दिपक उशाद दुःजाना	कृषी	स्थान-४	९८४६२५३४८६	
६	प्रकाश चौडेल	लेकरी	ने. वि. प्र.	९८५११५६३३३	
७	कृष्ण प्र. जोशी	"	"	९८५११६८०७६	
८	सुलभ श्रेष्ठ	"	"	९८४१६९८६२५	
९					
१०					
११					
१२					
१३					
१४					
१५					

राय सुभाव :

- १) प्रस्तावित लाईन बल्ती/छद्मलाई लाई तथा अनासंगिकलाई न
दाति हुने गरी लगाउनुपर्ने।
- २) प्रभावित घर तथा जग्गाको क्षतिपूर्ति गर्नु।
- ३) प्रभावित मार्केटलाई नालिने कार्य गर्नु।
- ४) बनेबनेगल बजारलाई नयाँ संरचनाको लागि क्षतिपूर्ति गर्नु।

२०७२

नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
खरिपाटी, भक्तपुर

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ-दमौली (अपर सेरी) २२० के.भी प्रसारण लाईन आयोजनाबाट प्रभावित क्षेत्रमा पर्ने सक्ने वातावरणीय प्रभावहरूका बारेमा वातावरण तथा सामाजिक अध्ययन विभागबाट प्रारम्भिक वातावरणीय परिक्षण (IEE) को कार्यसूचि (TOR) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरु विच निम्न मिति, समय र स्थानमा छलफल गरी निम्नलिखित रायसुझाव संकलन गरियो ।

मिति :- २०७२-११-११ स्थान :- लेखनाथ - ६

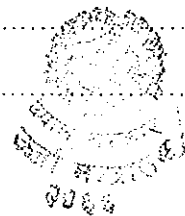
समय :-

उपस्थिति

क्र.सं.	नाम थर	पेशा/पद	ठेगाना/संस्था	सम्पर्क नं.	सही
१	सुमित राय	आर्थिक नायक	२५/१५५१-६	९८४६३९७४८८	सही
२	सुमित राय	आर्थिक नायक	२५/१५५१-६	९८०६४२०१२	सही
३	कृष्ण नं ३५१७		२५/१५५१-६	९८२६९८२२६९	सही
४	कृष्ण व. विष्ट	वडा नायक	२५/१५५१-६	९८४६०४०३९८	सही
५	सुमित नं ३५१७		२५/१५५१-६	९८४६६९०६०	सही
६	विष्णु माया नं ३५१७		२५/१५५१-६		
७	सुमित व. विष्ट	कृषक	२५/१५५१-६	९८०२८८४४५-१	सही
८	सुमित नं ३५१७	शिक्षक	२५/१५५१-६	९८०२८८४४५	सही
९	कृष्ण प्रसाद नं ३५१७	नं. ३५१७		९८२९९५८५६	सही
१०	पद्मा शर्मा नं ३५१७	नं. ३५१७		९८५९९२६३३३	सही
११	सुमित प्रसाद	"	"	९८४९६९८२४	सही
१२					
१३					
१४					
१५					

राय सुझाव :

- १) घर तथा जग्गाको मूल्यांकन उचित नभएको भन्ने भनाई (विशेषगरी तार मुक्तिको जग्गाको मूल्यांकन गरी गर्ने हुनाले आतिथ्यिका व्यक्तित्व हुने)
- २) प्रसारण लाईनको कालो तथा गतजंगललाई कट्टा प्रभाव पार्ने गरी काट्नुपर्ने।
- ३) सुदुरा हाथको तालिमको व्यवस्था।



नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
खरिपाटी, भक्तपुर

नेपाल विद्युत प्राधिकरणद्वारा प्रस्तावित लेखनाथ-दमौली (अपर सेती) २०० केभी प्रसारण लाईन आयोजनाबाट प्रभावित क्षेत्रमा पर्न सक्ने वातावरणीय प्रभावहरूका बारेमा वातावरण तथा सामाजिक अध्ययन विभागबाट प्रारम्भिक वातावरणीय परीक्षण (IEE) को कार्यसूचि (ToR) तयार गर्ने सिलसिलामा खटिआएका वातावरणीय अध्ययन टोली तथा स्थानीयवासी, सरोकारवालाहरू विच निम्न मिति, समय र स्थानमा छलफल गरी निम्नलिखित रायसुझाव संकलन गरियो।

मिति :- २०७१-११-२२ स्थान :- माइदिङ्गो - ६, १५/१२/११ समय :-
उपस्थिति

क्र.सं.	नाम थर	पेशा/पद	ठेगाना/संस्था	सम्पर्क नं.	सही
१	एकबंजारा		माइदिङ्गो - ६	९८०२८३६९९३	
२	लेखनाथ बस्नेत		"	९७४६०१२०८७	हाम्रो
३	सुदामा चौधरी		"		
४	विष्णुमान शिवा		"		
५	नारायण प. बस्नेत		"	९८०६६२६५६२	
६	सुविमोहन बस्नेत	इन्जिनियर	"	९८४६६०२८००	सुविमोहन
७	सुदामा शिवा	कृषक	सिन्धुपाल्चोक	९८०६९९६९२८	सुदामा
८	कालिदास सुब्बा	कृषक	माइदिङ्गो - ६	९८९७९४३९२२	कालिदास
९	नारायण प. बस्नेत	"	"	९८९६६०८९२८	नारायण
१०	ए. वि. बस्नेत		"	९८९७९७६८०९	ए. वि.
११	सुदामा चौधरी	"	सिन्धुपाल्चोक	९८४६२०९८२६	सुदामा
१२	सुविमोहन बस्नेत		माइदिङ्गो - ६	९८४६३२३२४४	सुविमोहन
१३	कालिदास सुब्बा		"	९८४६३९९२०९	कालिदास
१४	कृष्ण शिवा	नाइजी	न. वि. वि.	९८२९९६८०६	कृष्ण
१५	सुदामा चौधरी	"	"	९८२९९२८३३३	सुदामा
१६	सुदामा चौधरी	"	"	९२४९६९८६२४	सुदामा

राय सुझाव :

- १) माइदिङ्गो अन्तिम भूकम्पको अनुपपत्ति
- २) लेखनाथ बस्नेत ०५९८५८/
- ३) सुदामा शिवा ०५९८५८/
- ४) सुविमोहन बस्नेत ०५९८५८/



Annex-VI
IEE Format



Lekhnath-Damauli 220 kV Transmission Line Project

Chapter Plan for the IEE Report

Abbreviation and Acronyms
Executive Summary (English)
Executive Summary (Nepali)
Table of Content

1. INTRODUCTION

- 1.1 Proponent
- 1.2 Institution responsible for preparing the document
- 1.3 Rationality for conducting IEE
- 1.4 Objective of IEE Study
- 1.5 Structure of the Report

2. PROJECT DESCRIPTION

- 2.1 Project Location
- 2.2 Salient Features
- 2.3 Project Accessibility
- 2.4 Project Components
- 2.5 Project Area Delineation
- 2.6 Construction Planning
- 2.7 Project Schedule

3. DATA REQUIREMENT AND STUDY METHODOLOGY

- 3.1 Desk study and literature review
- 3.2 Data requirement, collection methods and analysis
 - 3.2.1 Physical environment
 - 3.2.1.1 Data requirement and collection methods
 - 3.2.1.2 Data analysis
 - 3.2.2 Biological Environment
 - 3.2.2.1 Data requirement and collection methods
 - 3.2.2.2 Data analysis
 - 3.2.3 Socio-economic and cultural environment
 - 3.2.3.1 Data requirement and collection methods
 - 3.2.3.2 Data analysis
- 3.3 Impact identification and prediction
- 3.4 Public involvement
- 3.5 Time, cost and specialists used for the study



4. REVIEW OF POLICY AND LEGAL PROVISIONS

5. EXISTING ENVIRONMENT CONDITION

5.1 Physical

5.2 Biological

5.3 Socio-economic and cultural

6. ENVIRONMENTAL IMPACTS

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6.2.1.1 Construction phase

6.2.1.2 Operational phase

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6.2.2.2 Operational phase

6.2.3 Socio- economic and cultural

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7. ALTERNATIVE ANALYSIS

8. MITIGATION AND ENHANCEMENT MEASURES

8.1 Enhancement measures

8.2 Mitigation measures

8.2.1 Physical

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8.2.1.2 Operational phase

8.2.2 Biological

8.2.2.1 Construction phase

8.2.2.2 Operational phase

8.2.3 Socio- economic and cultural

8.2.3.1 Construction phase

8.2.3.2 Operational phase

8.3 Mitigation and enhancement cost

9. ENVIRONMENTAL MONITORING

10. CONCLUSION

REFERENCES

APPENDICES



DECLARATION FROM IEE STUDY TEAM MEMBERS

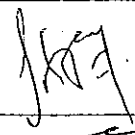
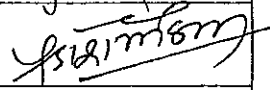
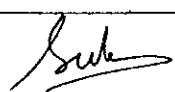
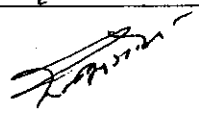
Title of the IEE Report: IEE of Lekhnath Damauli 220kV Transmission Line Project

Name/Address of the Project Proponent: Nepal Electricity Authority, Durbar Marg, Kathmandu

We declare the following:

- We have read and checked the content of this IEE report;
- We have conducted the study professionally using acceptable methodologies;
- The study findings are correct to the best of our knowledge; and have not been altered in any manner;
- The mitigating measures proposed are, to the best of our knowledge, reliable, practical and adequate to comply with the relevant legal requirements; and
- We shall be accountable for any misleading information in any part of this report

LIST OF IEE STUDY TEAM MEMBERS

S.N.	Name	Qualification	Area(s) of study in IEE	Signature
1	Rabindra Prasad Chaudhary	M.Sc. Zoology	Biological Environment	
2	Krishna Prasad Joshi	M.Sc. Statistics	Socio-economic and Cultural Environment	
3	Prakash Gaudel	M.Sc. Env. Science	Biological Environment	
4	Anup K.C.	M.Sc. Env. Science	Biological Environment	
5	Sulav Shrestha	B.E. Civil	Physical Environment	
6.	Ramesh Gautam	M.A. Sociology	Socio-economic and Cultural Environment	

Date:

Official stamp:

