DRAFT ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

JOGIKUTI-MANGALAPUR ELECTRICITY DISTRIBUTION LINE SUBPROJECT

Rupandehi District, Lumbini Province

NEPAL ELECTRICITY AUTHORITY

DISTRIBUTION AND CONSUMER SERVICES DIRECTORATE

DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT (DSUEP)

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NEPAL

AUGUST 2022

DATE	REVISION	PREPARED	APPROVED

"This Environmental and Social management Plan is a document of the Proponent. The views expressed herein do not necessarily represent those of

EIB’s Board of Directors, Management, or Staff, and may be preliminary in nature.”

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ACRONYMS AND ABBREVIATIONS

AIS	Air Insulated Substation
CBOs	Community Based Organizations
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPA	Core Project Area
CSC	Construction Supervision Consultants
DCSD	Distribution and Consumer Service Directorate
DD	Data Deficient
DDR	Due Diligence Report
DHM	Department of Hydrology and Meteorology
DoS	Department of Survey
DSUEP	Distribution System Upgrade and Expansion Project
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EMF	Electromagnetic Fields
EPA	Environment Protection Act
EPR	Environment Protection Regulations
ESIA	Environmental and Social Impact Assessment
ESM	Environmental and Social Monitoring
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMU	Environment and Social Management Unit
ESP	Environment and Social Policy
ESS	Environmental and Social Standards
EU	European Union
GHG	Green House Gas
GoN	Government of Nepal
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
IEE	Initial Environmental Examination
IUCN	International Union for Conservation of Nature and Natural Resources
LC	Least Concern
LPG	Liquid Petroleum Gas
MoEWRI	Ministry of Energy, Water Resources and Irrigation
NEA	Nepal Electricity Authority
NEAEC	NEA Engineering Company
OHS	Occupational Health and Safety
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
SPA	Surrounding Project Area
SWM	Solid Waste Management

WEIGHT AND MEASURES

%	Percent/ Percentage	LV	Low Voltage
cum	Cubic Meter	m	Meter
dB	Decibel	amsl	Average Mean Sea Level
g	Gram	mm	Millimeter
ha	Hectare	MVA	Mega Volt Ampere
Kg	Kilogram	MW	Megawatt
Km	Kilometer	NRs.	Nepalese Rupees
kV	Kilovolt	^{o}C	Degree Celsius
kWh	Kilo Watt Hour	sq.m.	Square Meter
ltr	Liter		

EXECUTIVE SUMMARY

As required by the Environmental and Social Management Framework (ESMF) of DSUEP for "Category III" Subprojects, this Environmental and Social Management Plan (ESMP) has been prepared for Jogikuti-Mangalapur Electricity Distribution Line Subproject. This ESMP documents existing baseline conditions, concerns of local stakeholders, and recommends environmental and social management measures, monitoring and reporting requirements for the Subproject components (i.e., construction of 33/11kV substation of capacity 24MVA and 33kV distribution line i.e., underground cabling) during the preconstruction, construction and operational phases.

The primary environment and social issues identified from the study are:

i. The substation land lies slightly depressed area in the Terai region's flat plain. Additional volume of 25,398 cum of spoil will be necessary for filling the depressed substation land.
ii. The distribution line (underground cabling) route passes through the RoW of access road.
iii. During construction, issues of dust, noise and solid waste will arise but their impact is expected to be minimal.
iv. There are no significant biological issues within the Subproject footprint area.
v. The proposed substation land is owned by GoN, and managed by Tilottama Municipality. However, the two users are still cultivating the land. The crop might be affected from the construction activities.
vi. Tilottama Municipality has allocated land for substation construction (ANNEX 2).

The primary mitigation measures proposed for this Subproject are:

i. Local people will be prioritized for employment and construction materials will be purchased from the local market as far as possible.
ii. Boundary wall, retaining wall adjoining to cultivated land, adequate drainage system will be constructed from the outlet system of substation land and compaction (of spoil material used for filling) will be done to mitigate possible erosion and inundation issues.
iii. Trench excavation and/or drilling for underground cabling will be done preferably at the edge of the RoW of access road in coordination with local stakeholders.
iv. Income restoration activities (skill development training) along with additional assistance will be provided to the users cultivating the land.
v. Advance notice of three months will be given to users to harvest their crops.
vi. Loss compensation of standing crops will be provided based on market rate.
vii. Additional financial assistance to the previous titleholders.
viii. Avoidance of child labor, provision of equal wages for men and women, and priority to people from socially backward community for employment are advised.
ix. Preparation and execution of Environmental, health and safety plan by the contractor is recommended to address occupational hazard and safety related issues.
x. Use of insulation, guarding, grounding, electrical protective devices, and industry-standard safe work practices are advised.

NRs. 53,79,200.00 is estimated to implement associated E&S mitigation measures and monitoring activities. This ESMP along with DDR is considered sufficient to meet the environmental and social requirements for the Subproject at present design conditions.

1. INTRODUCTION

1.1 Project Background

The proposed Distribution System Upgrade and Expansion Project (DSUEP) is expected to enhance and expand the electricity distribution system to improve the reliability (voltage level and reduction in power loss) and coverage of electricity supply in the Sudhurpaschim, Karnali and Lumbini Provinces. Upgradation of system efficiency and expansion of coverage area will improve quality of life in the region, enhance economic activities, and reduce dependency on petroleum and fuelwood. DSUEP will expand distribution lines of 33kV and 11kV in the three provinces as part of Government of Nepal (GoN)'s program "to achieve affordable electricity fulfilling the demands at the local levels for all the households by 2022".

There are various Subprojects within DSUEP. The European Investment Bank (EIB) has provided loan finance to 13 Subprojects under DSUEP. Of these 13 Subprojects, based on the geographical locations and implementation cost, NEA has clustered the Subprojects. Nine Subprojects lie in six districts of Lumbini Province, and five Subprojects lie in three districts of Sudhurpaschim Province. The project will construct 13 new 33/11kV substations, and 133 km long 33kV distribution lines along with the installation of transformers.

The Jogikuti-Mangalapur Electricity Distribution Line Subproject (hereafter referred to as "the Subproject") is one among the 13 Subprojects being constructed under DSUEP. The Subproject is located in Rupandehi district approximately 268 km from Kathmandu through Prithvi Highway, Narayanghat-Mugling Highway, East-West Highway, Siddhartha Highway at Mangalapur and then through Mangalapur-Kanchibazar Road near Tilottama Municipality Ward -7 Office.

1.2 Scope of ESMP

Within the framework of Environmental and Social Management Framework (ESMF) of DSUEP, the scope of ESMP is to identify environmental and social issues (including potential impact of the Subproject), recommend measures for environmental and social management, and recommend monitoring and reporting requirements for the Subproject.

Specifically, the construction of 33/11kV substation (including guardhouse, staff quarter, office building, control building inner service road & drainages facilities, storage yards) is within the scope of ESMP. The scope also includes construction of 33kV distribution line with underground cabling.

1.3 Objectives of ESMP

In accordance with the EIBs' safeguard standards and GoN's legislative requirements, the objective of the ESMP is to recommend a structured list of actions to maximize the positive impacts and avoid/minimize the negative impacts of the Subproject. The objectives of this ESMP are to;

- Document the indicators of existing physical, biological, and socio-economic environmental components of the Subproject impact area.
- Document the concern of local stakeholders and address them as appropriate.
- Identify, predict, and assess the potential adverse and beneficial environmental impacts of the Subproject during preconstruction, construction, operation and maintenance phases.
- Recommend environmental and social mitigation measures to enhance positive impacts and avoid/minimize negative impacts of the Subproject.
- Recommend monitoring plan, institutional arrangement, and suggest capacity-building activities for effective implementation of ESMP.

1.4 Project Description

Brief of the general and technical features of the Subproject are given in the following table.

Table 1-1: Technical Description of the Proposed Project

Description	Features
Proponent	Nepal Electricity Authority
Project	Distribution System Upgrade and Expansion Project
Sub Project	Jogikuti-Mangalapur Electricity Distribution Line Subproject
Funding Agency	EIB
Project Location	Tilottama Municipality, Rupandehi, Lumbini Province
Distribution Line	
33kV Line Starting Point	Tapped from 33kV Line at Tilottama-7, Mangalapur, Rupandehi
33kV Line End Point	Mangalapur Substation (Proposed) at Tilottama-7, Mangalapur, Rupandehi
System Voltage	33kV
Max, Min System Voltage	36, 30kV
Climatic Condition	Wind Speed: As per IS 802-1-1 Maximum Ambient Temperature: 45 °C Altitude (Min, Max): 115, 130 amsl
Length of Line	0.549Km
Right of way	6 m
Number of Circuit	2
Conductor	ACSR Dog or ACSR Wolf
Line Capacity/Thermal Limit	26.8 MW (Dog) at 0.9 power factor
Type of Poles	Steel Tubular Pole, 13m
Pole Configurations	Single Pole Structures, H-Pole Structures etc.
Diameter of a Single Pole	0.22m (As per IS 2713-3)
Substation	
Location	Tilottama-7, Mangalapur, Rupandehi Co-ordinate: Lat 27°36'17.83"N, Long 83°29'10.29"E Elevation: 122 amsl
Voltage Level	33/11kV
Substation Capacity	24MVA
No./ Capacity of Transformer	1 no. 8MVA and 1 no. of 16MVA

Description	Features
Type of Transformer	3 Phase, ONAN, Mineral Oil
Type of Substation	AIS (33kV) and Indoor (11kV)
No. of 33kV Line Bays	2
No. of 33kV Transformer Bays	2
Number of 11kV Feeders	5
Substation Area	10159 sq.m. (1.02 ha)

Source: Feasibility Study Report, 2021

1.4.1 Location of Subproject

The Subproject lies in ward 7 of Tilottama Municipality of Rupandehi District in Lumbini Province. The Substation area lies at latitude 27°36'17.83"N, longitude 83°29'10.29"E.

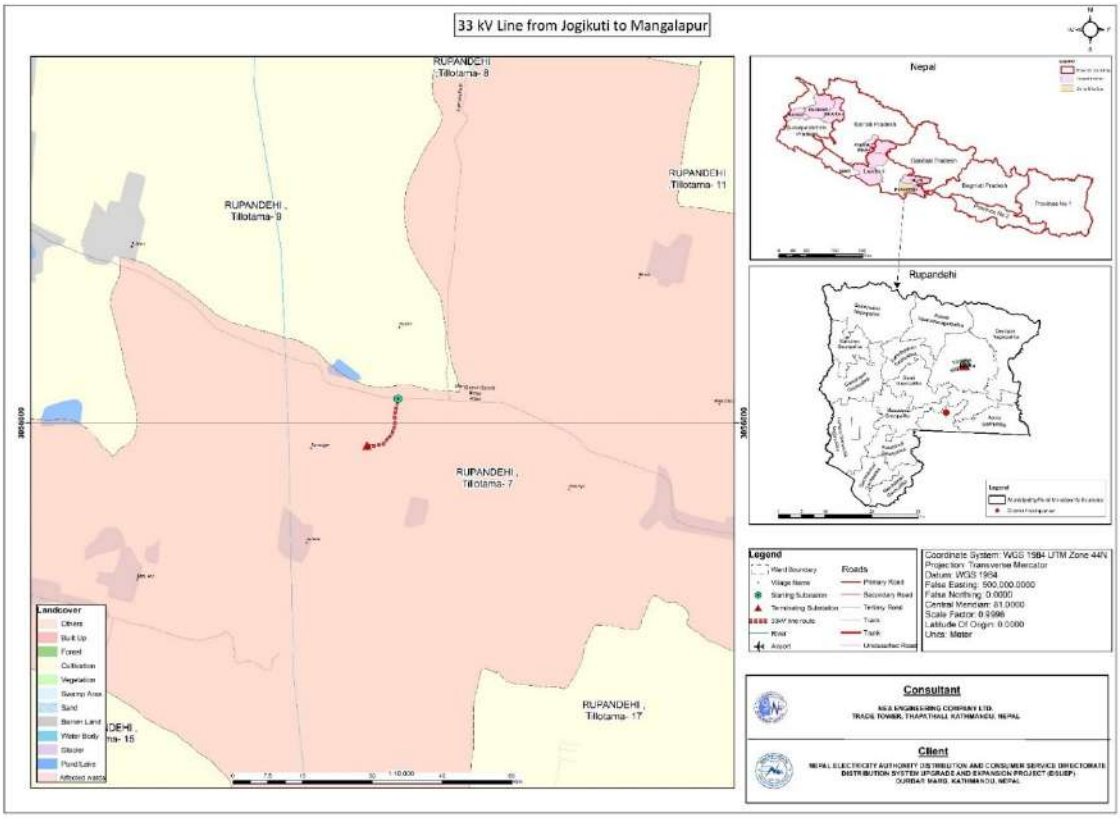


Figure 1-1: Layout and Location Map of Subproject
Source: Digital Data from Department of Survey, 2021 and Field Study, 2021

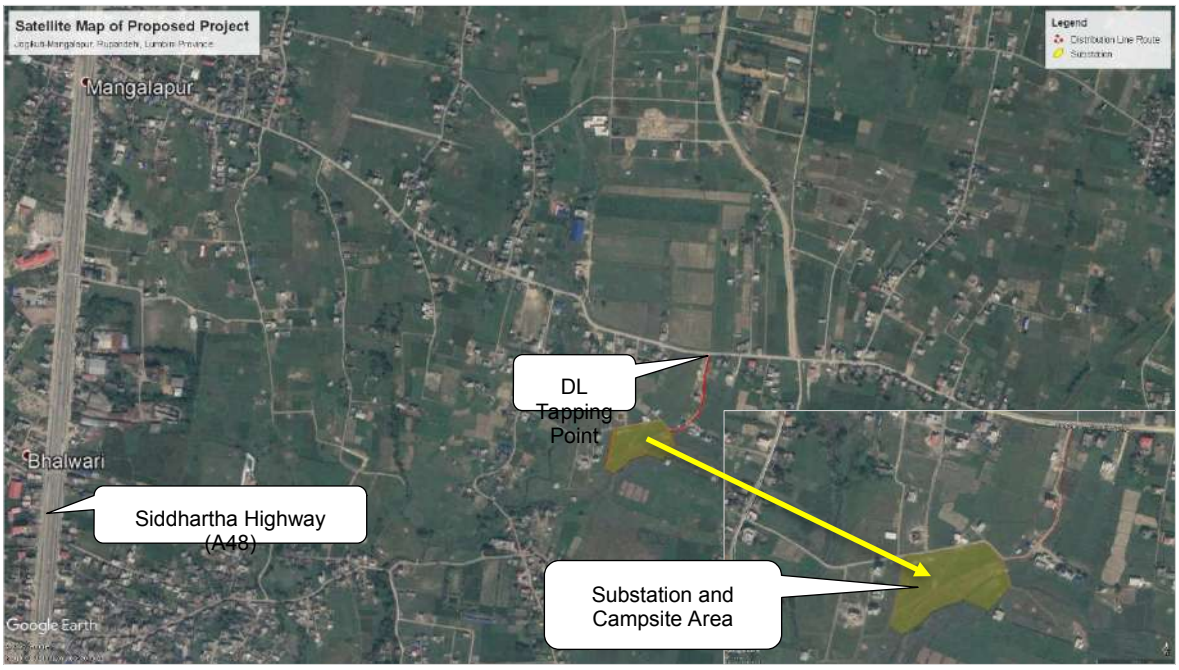


Figure 1-2: Bird-Eye View of Subproject in Satellite Map
Source: Digital Data from Department of Survey, 2021 and Field Study, 2021

1.4.2 Accessibility to the Proposed Site

The Subproject site is approximately 268 km away from Kathmandu and can be reached via Prithvi Highway, Narayanghat-Mugling Highway, East-West Highway, Siddhartha Highway at Mangalapur and then through Mangalapur-Kanchibazar Road near Tilottama Municipality Ward -7 Office.

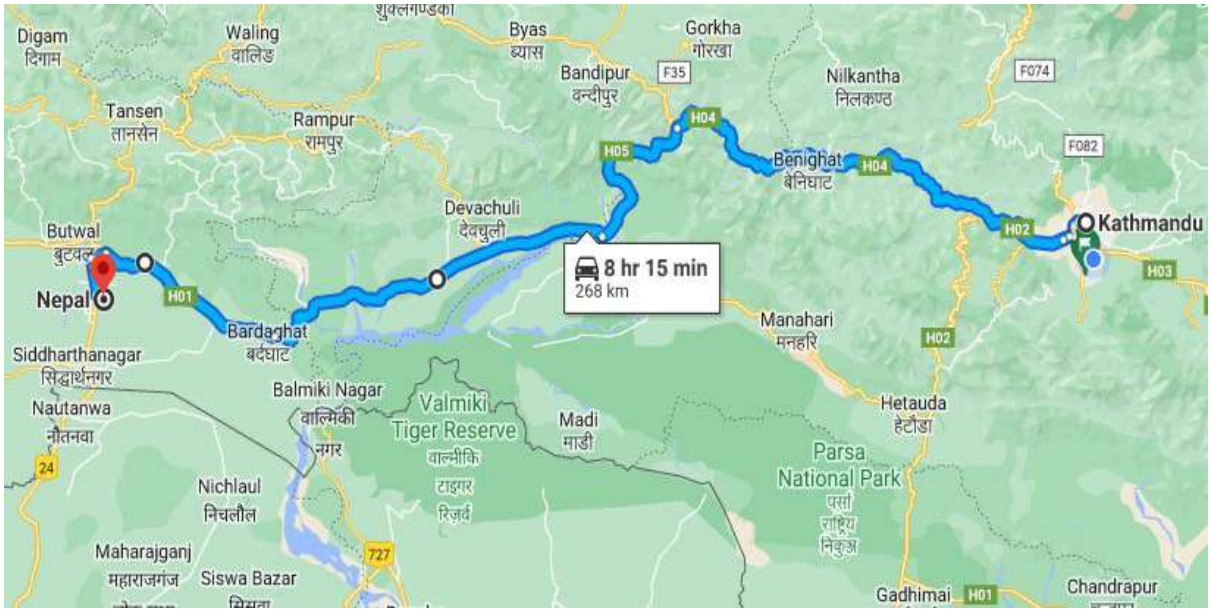


Figure 1-3: Accessibility to the Proposed Site
Source: https://maps.google.com/ on 2/16/2022

1.4.3 Subproject Components

Major components of the Subproject are 33/11kV substation and 33kV distribution line. The structures of the Subproject are briefly described below.

A. Substation

The proposed substation 33/11kV is of capacity 24 MVA. The major component of the substation is power transformer, which is supported by the switchgear components and Civil Structures. Map, layout, pictures of substation components and other facilities are shown in ANNEX 1.

Transformers: Power Transformers are used for 33/11kV substations. These transformers are mineral oil based with ONAN/ONAF (Oil Natural Air Natural/Oil Natural Air Forced) cooling mechanisms. In existing practice, the transformers used for 33/11kV substation in Nepal are typically of 1 MVA, 3 MVA, 8 MVA and 16 MVA depending upon the load supplied by the substation. This Subproject comprises of power transformer of 8 & 16 MVA ONAN type.

Electrical Switchgear: Electrical Switchgear comprises of equipments including Circuit Breaker, Earth Switch, Current Transformer, Potential Transformers installed in the substation. Electric Switchgear facilitates power conversion.

Civil Structures: A control building will be constructed for the operation of the substation. It houses the operating station, along with battery systems. Guard House and Staff Quarter will also be constructed for smooth operation of the substation.

Switchyard, Boundary, Roads, Drainage and Essentials: The outdoor civil structure in the proposed substation includes boundary wall, main entrance gates and Switchyard. The power transformer and components of power system are laid in the switchyard based on the prudent engineering practice. Steel structures are used to support the components as per requirements. Roads are paved within the boundary as essential for the transport of power transformer and other components. The substation location also serves as site store for storage of distribution system components.

B. 33kV Distribution Line (DL)

The 33kV DL serves as the pathway for feeding electricity to the proposed substation. Aluminum Conductor Steel Reinforced (ACSR) type conductors are stringed on Steel Tubular Pole from the starting point of the line. In general, the 33kV lines comprises of the Steel Tubular Poles, Insulators, Conductors and Supporting Stays.

Steel Tubular Poles: Steel tubular poles will be installed in this subproject. 11 m and 13 m long poles shall be used depending upon the location of the poles and number of circuits used in the line. The poles to be erected, will be supported by stays wherever necessary. Insulators will be installed at cross arms to support the conductor from the poles.

Insulators: The insulators provide insulation to the poles from high voltage in the conductors. Pin type insulators will be employed for suspension whereas disc types will be employed for tension poles. Porcelain type insulators will be used owing to its dielectric strength, better compressive strength, higher resistance to degradation, suitability for extreme climate, and environment friendly characteristics over its counterparts.

Conductor: ACSR Conductor – Aluminum Conductors Steel Reinforced, conductors with stranded layers of aluminum and steel will be used for 33kV lines. Aluminum strands carry the current whereas the steel in between provides the mechanical strength for the conductor. Typically, 100 sq. mm conductors are used in 33kV line for this subproject which is also known as ACSR DOG conductor.

Stay/Guy Sets: Stay Wires are used to support or provide the balancing tension to the poles. These are made up of steel materials and can be used in multiples for a single pole, depending upon the requirements.

1.4.4 Construction Work and Resource Requirement

- The substation land proposed (1.02ha) is owned by GoN and managed by Tilottama Municipality (ANNEX 2), while the distribution line alignment passes through RoW of access road. Underground cabling is proposed for the distribution line.
- During the implementation of Subproject, about 41 people will be deployed in the construction on daily basis.
- Major construction equipment to be used are: Excavator (1), Roller (1), Drilling Machine (1), and Crane (1).
- For construction power, 1 Grid Supply- 120kV A Distribution Transformer, and 2 Diesel Generators (50kVA each) as alternate supply will be required.
- The construction schedule is estimated to be 24 Months after award of the tender.

1.4.5 Major Construction Activities in the Subproject

i. Preconstruction Phase: The activities to be carried out before the construction phase are:

- Demarcation of proposed substation land area
- Receive public opinion
- Permanent clearance of the substation land

ii. Construction Phase: The activities to be carried out during the construction phase are:

- Transportation of construction materials
- Leveling of land area for the proposed substation
- Construction of substation structures
- Installation of equipment
- Pole erection work for 33 kV, 11kV and low-tension distribution lines
- Stringing of 33 kV, 11kV and low-tension distribution line

iii. Operation Phase: The activities to be carried out during the operation phase are:

- Operation of the Substation
- Maintenance of the substation, facilities and equipment
- Pruning of trees and weeds

1.5 Legal Requirement for ESMP

Based on the Environmental Screening Criteria and Social Screening Criteria defined in ESMF of DSUEP, “Environmental and Social Screening Report of

Jogikuti-Mangalapur Electricity Distribution Line Subproject" concluded that this Subproject requires preparation of ESMP alongwith DDR.

1.6 Methodology and Approaches of ESMP Preparation

Following methodology and approaches were adopted to prepare the ESMP.

1. **Review of Literature:**
   The study started with the review of previous relevant reports, EIB's Environmental and Social Safeguard, ESMF for DSUEP and SES (NEA), feasibility study reports, and relevant social safeguard documents prepared by the NEA and consultant.
2. **Site Inspection and Field Visit:**
   After approval of inception and screening report, ESMP study team had visited the site (refer to ANNEX 3 for field visit photographs) from 2078/06/03 to 2078/06/10 (19-26 September 2021). The necessary baseline data/information of physical, biological, socio-economic, and cultural environment was collected through site observation, testing (air/noise/water[1]), walk-through survey, consultative meeting/discussion with concerned stakeholders within the Subproject footprint area.
3. **Stakeholder Identification:**
   Prior to stakeholder consultation, stakeholder identification and analysis was done. The identified stakeholders are categorized in three groups (Figure 1-4).

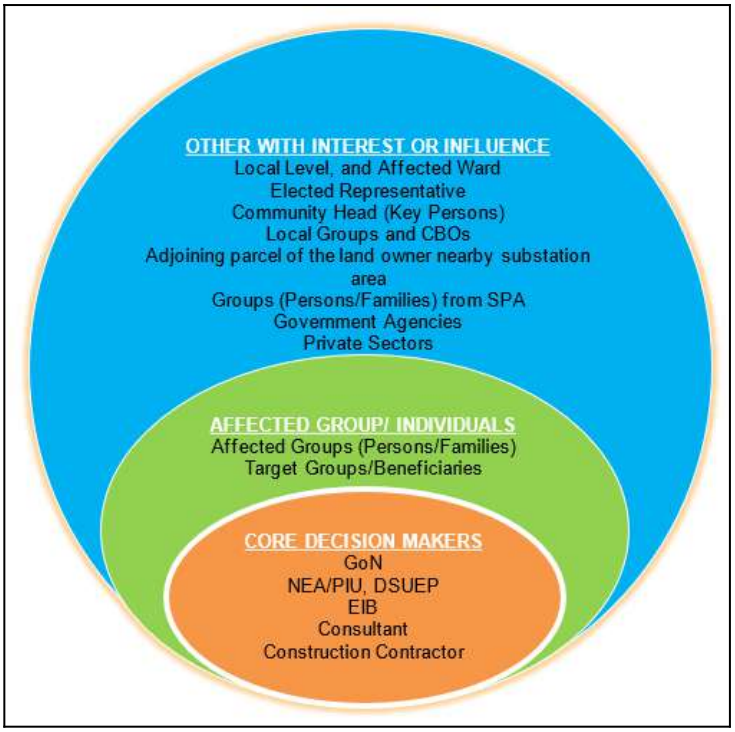


Figure 1-4: Identified Stakeholder from Identification Process[2]

[1] *The air quality data was monitored by Temtop Airing-1000 PM Detector, noise by UNI-T UT 353 Mini Sound Meter (dB) and water quality by EXTECH ExStik II DO600.*

[2] *Referenced Meaningful stakeholder engagement: a joint publication of the MFI working group on environmental and social standards / Reidar Kvam, PP-19, 2019. (Retrieved from https://publications.iadb.org/publications/english/document/Meaningful_Stakeholder_Engagement_A_Joint_Publication_of_the_MFI_Working_Group_on_Environmental_and_Social_Standards_en.pdf, January 2022) for stakeholder mapping process.*

4. Public Consultation:

Local level stakeholders including the people along the distribution line and users were notified through a notice from NEA (ANNEX 4) consisting of objectives of consultation, venue, and time requesting their presence in the consultation meeting. The notice was pasted in ward office and proposed substation area. The proof of notice pasting is attached in ANNEX 5. The consultation meeting was conducted at the office of Tilottama Municipality-7 on 2078/06/05 and 2078/09/12 (21 September and 27 December 2021). Hard copies of Subproject features and activities in Nepali language were shared at the time of consultation. Each of the components, activities and possible enviro-social issues during Subproject implementation was briefed. The views/consent, concerns, recommendations/suggestions, and demands of the participants were documented in the form of minutes. The summary of consultation meeting minutes is given in table below and the copy of minutes is attached in **ANNEX 6**.

Table 1-2: Summary of Issues, Comments and Suggestions Received During Consultation

Date	Location	Participants	Issues, Comments and Suggestions Received
2078/06/05 (21 September 2021)	**Ward Office, Tilottama Mun. - 7**	Stakeholders Female: 5 Male: 8 Study Team: 5 Total: 18	The experts from NEA Engineering Company briefed about the Subproject.
			During monsoon and heavy rain, the proposed area for substation is inundated. Appropriate drainage system should be constructed by the Subproject
			Local people should be prioritized for employment opportunities during the project construction, based on qualification and skills
			During project construction and implementation, coordination with local people and stakeholders will make the implementation effective
			We, the local people express our full support for the expansion of the 33kV line to the substation
			The proposed substation area lies at क्षेत्र ट नं. Public land *(पर्ती)* and no individual or institution own the land.
			The Subproject needs to compensate for any loss of private property that may occur during the construction of the project's infrastructures
			We, the local people and stakeholders express our full support and assurance for the implementation of the Subproject

Figure 1-5: Consultation with Stakeholders and Communities in the Subproject Area

Source: Digital Data from Department of Survey, 2021, World Base Map, 2021 and Field Study, 2021

5. Third Party Verification:

The DSUEP Project had requested the ward offices of concerned local level for the verification of consultations undertaken by study team during the field visit. The ward chairperson[3] had made recommendations the DSUEP Project with letters that the needful and meaningful consultations have been undertaken during the project consultation and the views of local people are recorded as evident in the minutes annexed (**ANNEX 6**) in this report.

6. Data Analysis:

All potential subproject impacts on physical, biological, socio-economic and cultural resources were integrated and assessed using best practices of Multilateral Development Banks, as well as compliance with national requirements. The Geographic Information System and SW Maps were used for the field assessment and analysis of the Subproject area data and presentation of the maps in the ESMP report.

7. Impacts Identification, Prediction and Evaluation:

After field visit, the data, and feedback were put together to identify the associated impacts, their magnitude, extent and duration which was further

[3] *Ward is the bottom level unit under Government of Nepal. The Ward Chairman is an elected representative of ward responsible for planning and budgeting at ward level, collecting and maintaining data of households, maintaining records of public property, conducting child and environment-friendly programs, carrying out market monitoring and ensuring smooth supply of essential goods and services, issuing letter of recommendation and certifying various documents related to personal incidents, land, house, citizenship, etc.*

ranked based on matrix of National EIA Guidelines – 2050. Based on impact ranking, their respective mitigation measures were proposed.

Table 1-3: Impact Ranking Matrix as per National EIA Guidelines – 2050

Magnitude	Score	Extent	Score	Duration	Score	Significance	Score
High	60	Regional	60	Long Term	20	Insignificant Impact	<44
Moderate	20	Local	20	Medium Term	10	Significant Impact	45-74
Low	10	Site Specific	10	Short Term	05	Very Significant Impact	>75

8. Report Preparation:

The draft report was prepared after incorporating all the comments and suggestion obtained from local stakeholders based on field assessment, impact identification, prediction and evaluation.

9. Disclosure of ESMP Report:

The final ESMP report will be disclosed from NEA and EIB's web portal. At affected local level, ESMP reports will be shared with concerned local level (municipality) along with ward office for disclosure to the authorities and stakeholders.

1.7 Classification of Impact Area

The National Environment Impact Assessment Guidelines (GoN, 2050) has mentioned the "Core Project Area", and "Surrounding Project Area" based on proximity and magnitude of the impacts due to construction and operation of the proposed project. For the scope of this ESMP impact area has been classified as:

Core Project Area: Core Project Area (CPA) refers to the permanent and temporary land used for the proposed Subproject construction activities. CPA is considered the project footprint area and is highly impacted.

Surrounding Project Area: Immediate vicinity of the project footprint location of the proposed Subproject site is considered Surrounding Project Area (SPA). SPA is considered a moderate and indirect impact area. For this Subproject, whole area of the concerned ward is defined as SPA.

2. EXISTING ENVIRONMENTAL CONDITIONS

2.1 Physical Environment

1. Topography, Geomorphology and Land Use

The Subproject area is located in the Southwestern region at the foothill of the Chure range in Rupandehi District of Lumbini Province. It is situated at 27°36'17.83"N latitude and 83°29'10.29"E longitude, with an elevation of 122 meters above sea level (amsl).

Geomorphologically, the area is located in the flat Terai Region, and is made up of sediments of Quaternary to Recent deposit. Any water body is not present in the vicinity of the Subproject. The land in the proposed substation location is being used for cultivation by few locals. The substation land is depressed and there is a high chance of inundation from flooding during monsoon. The proposed distribution line alignment passes through the edge of RoW of existing access road through underground cabling.

2. Geology and Seismic Risks

The Subproject site is composed of Quaternary to Recent alluvium deposit. The geology consists of alluvium boulders, gravels, sands and clays, which are loosely deposited and uncemented.

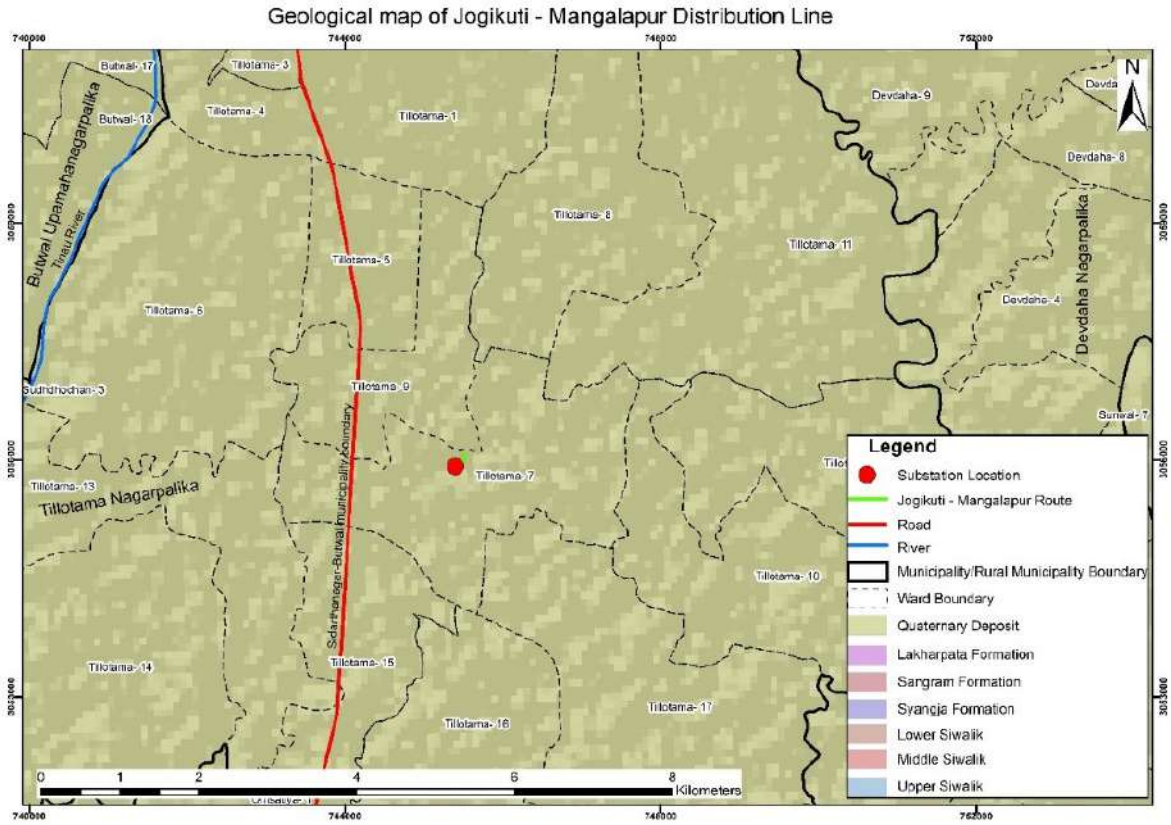


Figure 2-6: Geological Map of Proposed Project[4]

[4] *Department of Survey (DoS) 2020*

The seismic hazard map shows a horizontal seismicity coefficient of 100gal the Subproject area, which is equal to 0.06g. The site is less susceptible to earthquake hazard.

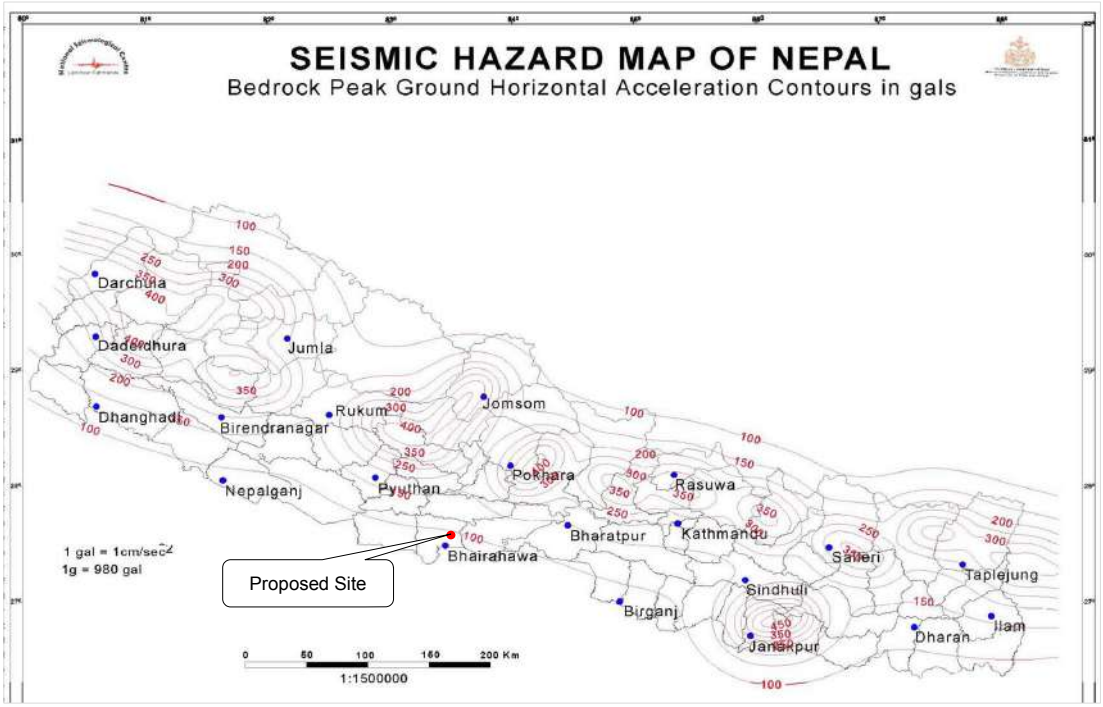


Figure 2-7: Seismic Hazard Map of Nepal Showing Proposed Subproject Site[5]

3. Climatic Condition

The proposed Subproject area is located in the lower-tropical climatic zone. As there is no meteorological station within the Subproject area, data recorded at the nearest station, i.e., Bhairahawa Airport was taken as a reference. The minimum temperature recorded is 8.88°C (in January), while the maximum temperature recorded is 36.86°C (in April) (DHM, 2021). The area receives the highest rainfall in July. The summer monsoon is prevalent from June to September. The average annual rainfall is 1566.65 mm.

4. Air and Noise Quality and Polluting Sources

The major air pollution sources observed in the project area are vehicular emission and dust emission from roads. Noise pollution sources noted at the time of field study include vehicular movement. The air quality of the CPA was found within the range of national ambient air quality standard while average noise level at substation exceeded noise quality standard. Following table shows the real-time air quality and noise level recorded during field study.

Table 2-4: Ambient Air and Noise Quality Parameter Measurement

SN	Location/	**Air Quality**[6]**-***Temtop Airing-1000 PM Detector (µg/m³)*	**Noise Level -***UNI-T UT 353 Mini Sound Meter (dB)*

[5] *Department of Mines and Geology, http://seismonepal.gov.np/publications, Retrieved on 2078/03/06(6/20/2021)*

[6] *National Indoor Air Quality Standard, 2009*

	Chainage	$PM_{2.5}$	Level	PM_{10}	Level.	Average Time of Measurement	Measured	Ref.[7]	Area
1.	Substation	*65.1*	100	93.7	200	1-hour	67	55	Urban Residential Area

Source: Field Visit, 2021

5. Solid Waste Management

The proposed Substation lies in semi-urban area. The waste was found littered in front of houses, shops and business area near substation and Mangalapur and Jogikuti areas. The waste comprised of plastics (bottles, bags and packaging), textiles, and metal cans. Organic waste was also observed in few areas. People nearby the Subproject area have been managing biodegradable waste within the household premises. They sell the recyclable waste to scrap collectors.

2.2 Biological Environment

The Subproject area lies in lower tropical bioclimatic zone (less than 500 m amsl). The proposed Subproject site does not fall under any protected areas and ecologically sensitive areas. The site is 36 Km away from the nearest protected area, i.e., Chitwan National Park.

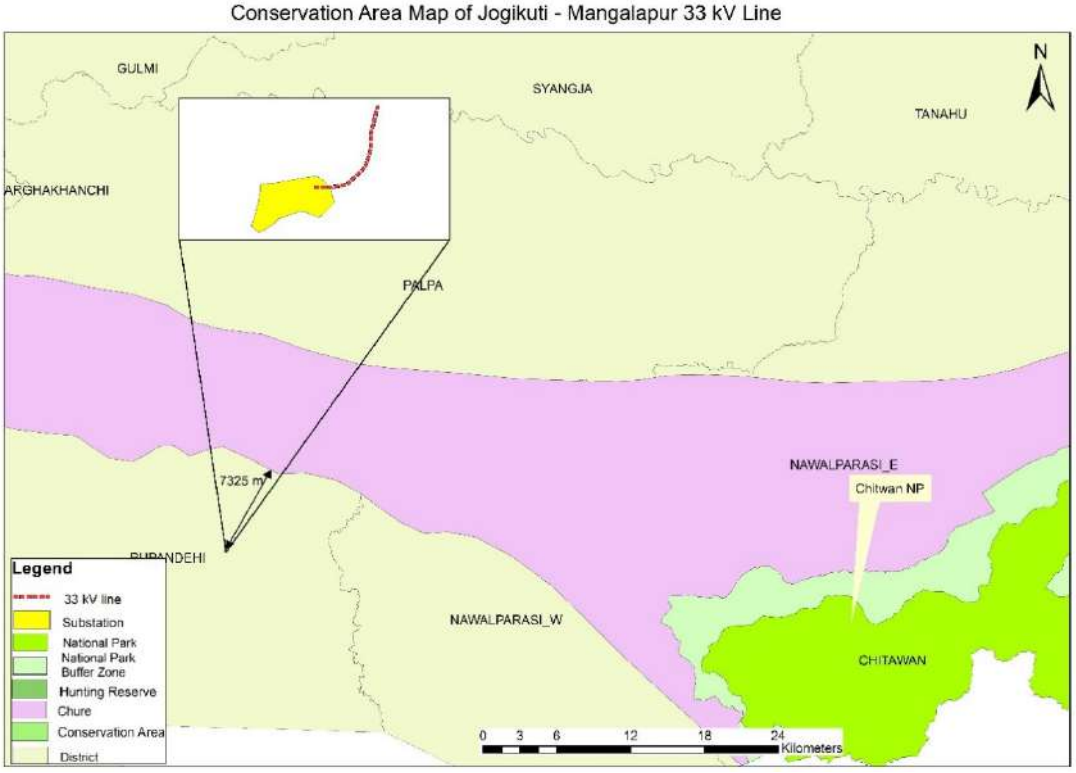


Figure 2-8: Location of Subproject area with respect to Nearby Protected Areas

During field visit, ten species of birds were recorded from project site, and its peripheral area.

[7] *National Ambient Sound Quality Standard, 2012*

Table 2-5: List of Birds Found within the Subproject Area

S.N.	Common/ Local Name	Scientific Name	GoN	IUCN	CITES
1.	Ghar Kaag (House Crow)	*Corvus splendens*		LC	
2.	Dangre (Jungle Myna)	*Acridotheres fuscus*		LC	
3.	Gauthali (Swallow)	*Hirundo rustica*		LC	
4.	Dhukur (Spotted Dove)	*Streptopelia chinensis*		LC	
5.	Chil (Black Kite)	*Milvus migrans*		LC	II
6.	Bhangera (House sparrow)	*Passer domesticus*		LC	
7.	Jureli (Black Bulbul)	*Hypsipetes leucocephalus*		LC	
8.	Suga (Rose-ringed parakeet)	*Psittacula krameri*		LC	
9.	Fisto (Common tailorbird)	*Orthotomus sutorius*		LC	
10.	Parewa (Piegon)	*Columba livia*		LC	

Source: Field Visit, 2021
Note: Least Concern (LC)

A total of seven species of herpetofauna were recorded during field visit, which includes five species of reptiles, and two species of amphibians.

Table 2-6: List of Herpetofauna Found within the Outlying Project Area

S.N.	Common/ Local Name	Scientific Name	GoN	IUCN	CITES
1.	Karet sarpa (Common Krait)	*Bungarus caeruleus*		LC	
2.	Chhipkali (Common House Gecko)	*Hemidactylus frenatus*		LC	
3.	Goman (Indian Cobra)	*Naja naja*		LC	II
4.	Chheparo (Oriental Garden Lizard)	*Calotes versicolor*		LC	
5.	Paani sarpa/ Water Snake	*Xenochrophis sanctijohannis*		LC	
6.	Bhyaguta (Asian Common Toad)	*Duttaphrynus melanostictus*		LC	
7.	Bhyaguta (Indian Bullfrog)	*Hoplobatrachus tigerinus*		LC	II

Source: Field Visit, 2021

Note: Least Concern (LC), and Appendix II lists species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled.

2.3 Socio-Economic and Cultural Environment

The Subproject site lies in Ward 7 of Tilottama Municipality. According to the Municipal profile of Tilottama Municipality (Tilottama, 2018), total population of this municipality is 123,836 living in 25,503 households. Total male population is 63,316 and female population is 60,508. The total population of ward 7 is 10,492 among which 5,345 are male, and 5,146 are female living in 2,126 households. Most of the people in this area follow Hinduism. The majority ethnic composition nearby the Subproject area are of Chhetri/Brahmin (Terai) and Tharu/Chaudhary.

Nearly 80% of the population in agro-based occupation followed by small trade and business/enterprises and services.

The major health issues reported are headache, Backache, Upper Respiratory Tract Infection (URTI), Presumed Non-Infectious Diarrhea, Fungal Infection, Gastritis, ARI/Lower Respiratory Tract Infection (LRTI), Refractive Error, Conjunctivitis, and cataract. The nearest accessible health facilities are located at Bhairahawa and Butwal, within 25-30 minutes driving distance. The Subproject site is connected to Siddhartha Highway at a distance of 1.54 Km.

The proposed Substation area is owned by GoN and is managed by Tilottama Municipality. Thus, the substation will not require the relocation of any private or public property. However, two users[8] from Tharu/Chaudhary have been cultivating the land for over a decade as an additional minor support for household income sources. There will be chance of damaging the agricultural crops. They have agreed to stop cultivating the land if the municipality provides them with other place for settlement (ANNEX 6). The physical activities proposed for the Subproject (substation and distribution line) will not require land acquisition and resettlement.

[8] Krishna Bahadur Kaushia and Ram Bahadur Kaushia Tharu are the two users known at the time consultation who are cultivating crops since decade ago.

3. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

This chapter identifies the possible environmental, and social impacts in the Subproject site that may arise during the construction and operation phase. All the relevant environmental and social impacts associated with this Subproject are sequentially illustrated in subsequent sub-headings along with their mitigation measures.

3.1 Beneficial Impacts

A. Construction Phase

1. Increased Economic Opportunities for Local People

Impacts

Altogether about 41 people (2 Engineers, 4 Supervisors, 5 Foreman, 5 Skilled Lineman/Electricians, 15 Laborers and 10 Helpers) will be deployed on a daily basis during construction of 33/11kV substation and 33kV distribution line (underground cabling work) over the implementation period of 24 months. Working together with technical experts, local people will be able to enhance their technical skills in construction work. The construction activities require different construction materials like aggregate, sand, cement, steel, etc., which can be supplied from local market.

Impact Rating: Very Significant (Table 3-1)

Augmentation Measures

- While employing manpower, local people within the Subproject area will be given priority based on qualification and skills.
- The construction material, if available, shall be brought from the locally available legally operating market near Mangalapur.

B. Operation Phase

1. Enhancement in Rural Electrification

Impacts

Intermittent tripping and voltage drop problem nearby the area will be reduced. The local economy will benefit through improved reliability of electricity supply, which is a necessary condition for economic growth. Different industries within/nearby the proposed subproject area will be established. It will promote the use of new types of home appliances, use of electric motors for irrigation, and establishment of small and large industries.

Impact Rating: Very Significant (Table 3-1)

Augmentation Measures

- Proper and timely maintenance of the Substation will be done to maintain reliable power supply.

2. Reduction in Green House Gas (GHG) emissions

Impacts

Net Green House Gas (GHG) emissions resulting from the subproject area are expected to decrease as the distribution lines will improve and expand electricity supply which will trigger change in energy use pattern to electricity from GHG emitting traditional sources like Guitha (made from cow dung), firewood and

timber along with Kerosene for cooking/lighting, heating and diesel for water pumping.

Impact Rating: Very Significant (Table 3-1)

Augmentation Measures

- Proper and timely maintenance of the Substation will be done to maintain reliable power supply so that people will keep continuing the use of electricity.

3.2 Potential Adverse Impacts

3.2.1 Physical Environment

A. Construction Phase

1. Impact Associated with Change in Land Use

Impacts

The Subproject will require about 1.02 ha land for the substation. The proposed substation area falls in Government Land in Tilottama Municipality. The distribution line passes through the edge of RoW of access road. The construction of the substation will bring change in land use permanently while underground cabling will be done for the distribution line.

Impact Rating: Significant (Table 3-1)

Mitigation/Enhancement Measures

- Construction of labor camp and facilities will be carried out within the substation area.
- Minimal impact will occur from underground cabling throughout the distribution line route.

2. Impact Associated with Stability and Underground Cabling

Impacts

Substation land lies at the flat plain with slightly depressed for which filling of ground before foundation work is necessary. The DL alignment with a total length of 0.549 Km passes through the RoW of existing road. Due to overhead line issues, underground cabling through the line section has been proposed. Construction activities during trench excavation and backfilling, ground levelling and foundation excavation work at substation may lead to problems such as sheet erosion during rainy period and subsidence of adjoining land or damage to physical structures.

Impact Rating: Insignificant (Table 3-1)

Mitigation/Enhancement Measures

- A boundary wall will be constructed first to avoid unnecessary spills towards cultivated land at South-Eastern/Western parts of the Substation area.
- During underground cabling, proper warning sheath will be provided for protection and safety measures.
- Trench excavation will be done just before laying cable. For this, excavated section will have to be rehabilitated within third day of trench excavation.
- By phasing construction activities, disturbance will be limited to the areas necessary for construction.
- An adequate site drainage system will be provided around stockpiled materials, campsites, the foundation work area and outlet system from the substation area.

3. Impact Associated with Spoil Material

Impacts

As substation site is located on a low-lying area, filling of about 25,398 cum will be required. This might cause concerns of spoil management in the substation site if filling is not properly done.

Impact Rating: Insignificant (Table 3-1)

Mitigation/Enhancement Measures

- Spoil required for filling will be purchased from the nearby authorized burrowing sites.
- Spoil will be covered with tarpaulin during transportation from earth-borrowing areas to the substation.
- Simultaneous water sprinkling and compaction of spoil will be done using roller.
- Excavated spoil will not be disposed in the access road during the start of trench work so as not to create hurdles for pedestrian.

4. Impact due to Air and Noise Pollution

Impacts

The impact on air quality during the construction period is expected to be insignificant, as site clearance, excavation, stockpiling of construction materials, waste burning at camp sites and equipment installation are localized and short term. Transportation of the materials and movement of construction crews and equipment will cause minor impact on air quality. Construction-related noise will be limited to vehicular movement and inside-the-fence construction activities at substation sites; construction related noise is not expected to exceed acceptable levels.

Impact Rating: Insignificant (Table 3-1)

Mitigation/Enhancement Measures

- Contractors' vehicles and equipment should meet Nepali vehicle emissions standards.
- Dust emissions will be controlled with water sprays on earthen roads nearby settlements in substation area.
- Open burning of wastes should be strictly prohibited.
- Construction workers should use face masks at all times.
- All dust generating loads carried in open trucks should be covered.
- Contractors shall monitor noise during the construction as well as use the standard construction equipment.
- Personal Protective Equipment (PPE) such as earplugs, earmuffs, etc. will be provided to the workers in high noise areas.

5. Impact Associated with Solid Waste

Impacts

The waste generated during construction within the subproject area are cement bags, iron bars, and other leftover construction materials, and waste generated in the labor camp. Biodegradable wastes generated from labor camp may give foul smell, and attract rodents. It will cause adverse impact, if not properly managed.

Impact Rating: Insignificant (Table 3-1)

Mitigation/Enhancement Measures

- Segregation of organic, and inorganic wastes in different storage areas or facilities in the designated location shall be done.
- Waste generated from the campsite shall be properly managed without littering to nearby open ground outside the substation boundary.

- The biodegradable waste generated from the campsite will be managed through constructing a ground pit, and covered by the sufficient thick layer of soil on daily basis.
- Reusable waste like debris, broken brick pieces, sand, stone, waste cement, and sand mix shall be used as refills for making ground leveling.
- The packing materials used for casing components should be recyclable, and non-hazardous.
- The construction contractor shall ensure proper management of ground drainage from camps as a preventive measure against mosquitoes, and other pests.
- Recyclable wastes like left out/non-usable reinforcement bars and packing materials shall be sent or sold to scrap vendors.
- Chemical waste generated from transformer shall be collected in leakage proof, corrosion free, specially designed container and sealed carefully.
- Coordination shall be done with local level government for proper waste management during construction period.

B. Operation Phase

1. Issues Related to Electric and Fire Hazard

Impacts

Employees performing servicing or maintenance of substations may be exposed to electric shock, burns and injuries from unexpected energization or release of energy stored in the equipment.

Impact Rating: Significant (Table 3-1)

Mitigation/Enhancement Measures

- Shutdown shall be taken during maintenance work.
- Use of insulation, guarding, grounding, electrical protective devices, and safe work practices is advised.
- Boundary walls and security fences around substation are essential to prevent unauthorized access.
- Only trained and authorized personnel shall be allowed for electrical works.
- Warning signs shall be installed.

3.2.2 Biological Environment

The proposed Subproject avoids forestland or other sensitive biodiversity areas. Hence, there will be no significant impact to biological environment because of construction of substation and underground cabling.

A. Construction Phase

1. Loss of Habitat

Impacts

As the substation site and DL alignment are not located in the immediate vicinity of forestland or sensitive biodiversity area, the potential for adverse impact on biological habitat is none.

Impact Rating: Insignificant (Table 3-1)

Mitigation/Enhancement Measures

- No specific mitigation measures necessary.

A. Operation Phase

1. Bird Electrocution and Collision

Impacts

The Subproject area is located in semi-urban area and important habitat of avian fauna were not observed in the subproject area. However, there is a potential for electrocution risks to bird species which perch on power line infrastructures (Substation especially). Minimizing bird collision and electrocution risk is a win-win for biodiversity and the power transmission sector.

Impact Rating: Insignificant (Table 3-1)

Mitigation/Enhancement Measures

- Provision of bird guards above the poles and white spirals in the conductors to improve visibility in substation (refer to *ANNEX 1* for representative photographs).
- Connector part mechanisms must be burr-free.

3.2.3 Socio-Economic and Cultural Environment

The anticipated impacts on the socio-economic and cultural environment associated with Subproject are discussed below:

A. Construction Phase

1. Impact Associated with Transformation of Land

Impacts

The Subproject requires about 1.02ha of land for the placement of the substation. The land belongs to GoN. The construction activities of the Subproject will not involve any private land however could loss the standing crops cultivated by the users during construction phase. There will be no land acquisition, and thus no resettlement issues.

Impact Rating: Insignificant (Table 3-1)

Mitigation/Enhancement Measures

- Tilottama Municipality has allocated land for substation construction (ANNEX 2.
- Proper demarcation of the Substation area shall be done.
- Trench excavation and/or drilling for underground cabling will be done in coordination with local stakeholders, preferably along the edge of the RoW of access road.
- Advance notice of three month will be provided to users' to harvest their crops.
- Loss compensation of standing crops will be provided based on market rate.
- Special assistance for income restoration activities will be conducted.

2. Issues Related to Child Labor and Gender

Impacts

During the Subproject construction, people will be employed on daily/monthly wages for excavation, transportation of construction materials, and other construction-related works. There might be discrimination on women and vulnerable groups while hiring the worker and they might be provided less wage than men. Contractors might use child labor for the shake of economic benefits. This is harmful to the child's health or physical, mental, moral or social development.

Impact Rating: Very significant (Table 3-1)

Mitigation/Enhancement Measures

- Provide equal wage to male and female for similar nature of work
- People from socially backward community should be given priority
- Restrict use of children below 16 years of age in labor work (or as per government and ILO guidelines).
- Provide gender friendly construction environment with separate cabins and toilet for women in the camp.
- Suitable work assignment for women.

3. Socially Undesirable Activities

The workers may use alcohol and other forms of intoxication, gambling, quarrel with locals, disrespect local culture and religion, and may promote socially undesirable activities in and around the project area.

Impact Rating: Insignificant (Table 3-1)

Mitigation/Enhancement Measures

- Organization of awareness programs on gender based violence risks for the Subproject workers.
- Restrict movement of workers out of camp after certain hours in the night time.
- Restrict use of alcohol and gambling in the camp.

- Supply water supply, daily consumable items, communication facility in the camp so as not to create additional pressure on the local services
- Orient workers to show respect to local tradition and culture;
- Prepare a code of conduct for all project staff, orient them and monitor that these are effectively followed by all;
- Assign a Community Liaison Officer (CLO) by the project to keep close and regular consultation and coordination with local communities;
- Regular monitoring of worker's behavior and take appropriate actions against rule violators.

4. Occupational Hazards and Safety

Impacts

Occupational health hazard and safety of staff is a major issue during the construction period. Primary victims are the construction workers. In addition, the pedestrian might also be injured.

Impact Rating: Very significant (Table 3-1)

Mitigation/Enhancement Measures

- Contractor shall prepare the Environmental, Health and Safety plan ANNEX 7and take approval from the Client before implementation. Safety officer should be employed during construction period.
- All employees shall be provided with the necessary training, and safety equipment as required for their responsibilities and duties. The Contractor will adhere to labor Act 2074 and Labor Rules 2075.
- The basic facilities of drinking water, sanitation & clean resting place, canteen, and first aid are required for the campsite.
- All the workers shall have health insurance over the period of construction.
- Installation of warning signs (High Voltage, Fire Safety Signs, and Emergency Signs) as shown in ANNEX 8.
- NEA will be responsible to supervise the EHS performance of the construction Contractor, and workers health and safety.

B. Operation Phase

1. Hazards and Safety

Impacts

Employees working in the operation and maintenance of the electric components are exposed to electric shock, electrocution, fires, and explosions.

Impact Rating: Significant (Table 3-1)

Mitigation/Enhancement Measures

- There will be the use of insulation, guarding, grounding, electrical protective devices, and industry-standard safe work practices.
- Boundary walls and / or security fences around substations to prevent unauthorized access.
- Only trained and authorized personnel will be allowed for the electrical works.
- No electric wire shall be stringed above the house.
- Security fences around the substation.
- Establishment of warning signs.
- Shutdown shall be done during maintenance work.

2. Electric and Magnetic Field Effect

Electric power distribution lines create electric and magnetic field together, referred to as electromagnetic fields (EMF). Electrical flux density declines in inverse proportion to the square of the distance and magnetic fields decline in

inverse proportion to the cube of the distance; there will be no impact outside of the substation boundaries[9]. Research on the long-term effects of EMF associated with distribution lines is inconclusive with respect to health risks. As noted in the World Bank EHS guidelines for transmission and distribution systems, there is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions lines and equipment.

Impact Rating: Insignificant (Table 3-1)

[9] *E.g., at a distance of 10 meters from a single distribution line or conductor, electrical flux density drops to 1% of the field strength at a distance of 1 meter from the conductor: 1/ (10*10) = 1%. Likewise, the magnetic field drops to 0.1% of the field strength at the conductor: 1/ (10*10*10) = 0.1%.*

Table 3-7: Impact Identification and Evaluation Matrix

S.N.	Issues	Impacts	Impact Rating				
			Nature	Magnitude	Extent	Duration	Rating
3.1	**Beneficial Impacts**						
A	**Construction Phase**						
1	Increased Economic Opportunities for Local People	41 people (2 Engineer, 4 Supervisor, 5 Foreman, 5 Skilled Lineman/Electrician, 15 Labor and 10 Helper) will be deployed in the normal day basis during construction phase for construction of 33/11kV substation over the implementation period of 24 months. The construction activities require different construction materials like aggregate, sand, cement, steel, etc., which can be supplied from local market.	D	H (60)	L (20)	ST (05)	VSI (85)
B	**Operation Phase**						
1	Enhancement in Rural Electrification	The local economy will benefit through improved reliability of electricity supply, which is a necessary condition for economic growth.	I	H (60)	L (20)	ST (05)	VSI (85)
2	Reduction in Green House Gas (GHG) emissions	Net Green House Gas (GHG) emissions resulting from the subproject area are expected to decrease as the distribution lines will improve and expand electricity supply which will trigger change in energy use pattern to electricity	I	H (60)	L (20)	LT (20)	VSI (100)
3.2	**Adverse Impacts**						
1	**Physical Environment**						
A	**Construction Phase**						
1	Impact Associated with Change in Land Use	Landuse of 1.02ha land for substation construction will be changed permanently into built-up area while 22 cm diameter steel tubular pole installation will require negligible area of land at the RoW of access road.	D	M (20)	SS (10)	LT (20)	SI (50)
2	Impact Associated with Stability and Underground Cabling	Trench excavation or drilling work during underground cabling work might affect the entities and subsidence of adjoining land might happen.	D	L (10)	SS (10)	ST (05)	II (25)
3	Impact associated with	The substation ground level is depressed, filling of spoil will be necessary in huge quantity i.e., 25,398 cum. This might cause	D	L (10)	SS (10)	ST (05)	II (25)

S.N.	Issues	Impacts	Impact Rating				
			Nature	Magnitude	Extent	Duration	Rating
	Spoil Material	concerns of spoil management in the substation site if land-filling is not properly executed.					
4	Impact due to Air, and Noise Pollution	Construction activities such as site clearance, ground leveling, excavation of the building foundation, spoil management work, waste burning, haphazard stockpiling of construction materials, vehicular movement will generate dust, emission and noise.	D	L (10)	SS (10)	ST (05)	II (25)
5	Impact associated with Solid Waste	The waste generated during construction within the subproject area are cement bags, iron bars, and other leftover construction materials, and waste generated in the labor camp. Biodegradable wastes generated from labor camp may give foul smell, and attract rodents.	D	L (10)	SS (10)	ST (05)	II (25)
B	**Operation Phase**						
1	Issues Related to Electric and Fire Hazard	Employees performing servicing or maintenance of substations may be exposed to electric shock, burns and injuries from unexpected energization or release of energy stored in the equipment.	I	M (20)	SS (10)	LT (20)	SI (50)
1	**Biological Environment**						
A	**Construction Phase**						
1	Loss of Habitat	No issues	D	L (10)	SS (10)	ST (05)	II (25)
B	**Operation Phase**						
1	Bird Electrocution and Collision	The Subproject area is located in semi-urban area and there is no presence of important habitat of avian fauna. Although the electrocution can cause a risk to bird species which perch on power line infrastructures (Substation and distribution line).	I	L (10)	SS (10)	LT (10)	II (30)
1	**Socio-Economic and Cultural Environment**						
A	**Construction Phase**						
1	Impacts Associated with Transformation of Land	The Project will require about 1.02ha of land for the placement of the substation. The land belongs to GoN. However, two users are cultivating the crops for a decade. They will be affected by project implementation. Standing crops may be damaged by Subproject construction.	D	M (20)	SS (10)	ST (05)	II (35)
2	Issues Related to Child Labor	Potential discrimination against women and vulnerable groups while hiring workers, not providing minimum wages, and	D	H (60)	SS (10)	ST (05)	VSI (75)

S.N.	Issues	Impacts	Impact Rating				
			Nature	**Magnitude**	**Extent**	**Duration**	**Rating**
	and Gender	potential use of child labor.					
3	Socially Undesirable Activities	The workers may use alcohol and other forms of intoxication, gambling, quarrel with locals, disrespect local culture and religion, and may promote socially undesirable activities in and around the project area.	I	L (10)	SS (10)	ST (05)	II (25)
4	Occupational Hazards, and Safety	Occupational health hazard and safety of workers is a major issue during the construction period.	D	H (60)	SS (10)	ST (05)	VSI (75)
B	**Operation Phase**						
1	Hazards and Safety	Employees working in the operation and maintenance of the electric components might get exposed to electric shock, electrocution, fires, and explosions.	D	M (20)	SS (10)	LT (20)	SI (50)
2	Electric and Magnetic Field Effect	Electric power distribution lines create electric and magnetic field together, referred to as electromagnetic fields (EMF).	I	L (10)	SS (10)	LT (20)	II (40)

Note: Direct (D), Indirect (I), High (H), Moderate (M), Low (L), Regional (R), Local (L), Site Specific (SS), Long Term (LT), Medium Term (MT), Short Term (ST), Insignificant Impact (II), Significant Impact (SI), Very Significant Impact (VSI)

3.3 Management Specifications for the Construction and Operational Phases

The overall Environmental and Social Management Plan of the subproject along with mitigation and management measures is presented in table below. This ESMP will be implemented in three stages: (i) pre-construction (ii) construction, and (iii) operations and maintenance. This ESMP is living document and will be updated and modified under the supervision of Environmental and Social Management Unit (ESMU) of the Project Implementation Unit (PIU) as necessary based on field conditions, construction Contractor's performance, and stakeholders' feedback.

Table 3-8: Construction and Operational Management Specifications

Environmental Issues	Mitigation and Management Measures	Mitigation Costs (NRs.)	Institutional Responsibility	
			Implementation	Supervision
1. Beneficial Augmentation Measures				
A. Construction Phase				
1. *Increased Economic Opportunities for Local People*	• Local people within the Subproject area will be prioritized based on qualification and skills. • The construction material, if available, shall be bought from the locally available legally operating market near Mangalapur.	Embedded within Contract Document	Construction Contractor	NEA/PIU (DSUEP)
B. Operation Phase				
1. *Enhancement in Rural Electrification*	• Proper and timely maintenance of the Substation will be done to maintain reliable power supply.	-	NEA Transmission Operations units and Distribution Service Center(s)	NEA
2. *Reduction in Green House Gas (GHG) emissions*	• Proper and timely maintenance of the Substation will be done to maintain reliable power supply so that people will keep continuing the use of electricity.	-	-	GoN/MoEWRI
2. Adverse Mitigation/ Enhancement Measures				
1. Physical Environment				
A. Construction Phase				
1. *Impact Associated with Change in Land Use*	• Construction of labor camp and facilities within the substation area. • Minimal impact will occur from underground cabling throughout the distribution line route.	Embedded within Contract Document	Construction Contractor	NEA/PIU (DSUEP) and Tilottama Municipality
2. *Impact Associated with Stability*	• A boundary wall will be constructed first to avoid unnecessary spills towards cultivated land at South-Eastern/Western parts of the Substation area.	Embedded in Contract Document	Construction Contractor	NEA/PIU (DSUEP)

Environmental Issues	Mitigation and Management Measures	Mitigation Costs (NRs.)	Institutional Responsibility	
			Implementation	Supervision
and Underground Cabling	• During underground cabling, proper warning sheath will be provided for protection and safety measures. • Trench excavation will be done just before laying cable. For this, excavated section will have to be rehabilitated within third day of trench excavation. • By phasing construction activities, disturbance will be limited to the areas necessary for construction. • An adequate site drainage system will be provided around stockpiled materials, campsites, the foundation work area and outlet system from the substation area.	* Drainage canal construction along outlet system from the substation area - 18,00,000.00		
3. *Impact Associated with Spoil Material*	• Spoil required for filling will be purchased from the nearby authorized burrowing sites. • Spoil will be covered with tarpaulin during transportation from earth-borrowing areas to the substation. • Simultaneous water sprinkling and compaction of spoil will be done using roller. • Excavated spoil will not be disposed in the access road during the start of trench work so as not to create hurdles for pedestrian.	Embedded within Contract Document	Construction Contractor	NEA/PIU (DSUEP)
4. *Impact due to Air and Noise Pollution*	• Contractors' vehicles and equipment should meet Nepali vehicle emissions standards. • Dust emissions will be controlled with water sprays on earthen roads nearby settlements in substation area. • Open burning of wastes should be strictly prohibited. • Construction workers should use face masks at all times. • All dust generating loads carried in open trucks should be covered. • Contractors shall monitor noise during the construction as well as use the standard construction equipment. • Personal Protective Equipment (PPE) such as earplugs, earmuffs, etc. will be provided to the workers in high noise areas.	* Air Quality Monitoring- 1,50,000.00 * Sprinkling Water (Dust Management) 3,00,000.00 * Noise Level Monitoring:	Construction Contractor	NEA/PIU (DSUEP)

Environmental Issues	Mitigation and Management Measures	Mitigation Costs (NRs.)	Institutional Responsibility	
			Implementation	Supervision
		50,000.00 * Provision of PPE and other cost will be embedded within Contract Document		
5. *Impact Associated with Solid Waste*	• Segregation of organic, and inorganic wastes in different storage areas or facilities in the designated location shall be done. • Waste generated from the campsite shall be properly managed without littering to nearby open ground outside the substation boundary. • The biodegradable waste generated from the campsite will be managed through constructing a ground pit, and covered by the sufficient thick layer of soil on daily basis. • Reusable waste like debris, broken brick pieces, sand, stone, waste cement, and sand mix shall be used as refills for making ground leveling. • The packing materials used for casing components should be recyclable, and non-hazardous. • The construction contractor shall ensure proper management of ground drainage from camps as a preventive measure against mosquitoes, and other pests. • Recyclable wastes like left out/non-usable reinforcement bars and packing materials shall be sent or sold to scrap vendors. • Chemical waste generated from transformer shall be collected in leakage proof, corrosion free, specially designed container and sealed carefully. • Coordination shall be done with local level government for proper	Solid Wastes Management: 1,00,000.00 and other cost will be embedded within Contract Document	Construction Contractor	NEA/PIU (DSUEP) and Tilottama Municipality

Environmental Issues	Mitigation and Management Measures	Mitigation Costs (NRs.)	Institutional Responsibility	
			Implementation	Supervision
	waste management during construction period.			
B. Operation Phase				
1. *Issues Related to Electric and Fire Hazard*	• Shutdown shall be taken during maintenance work. • Use of insulation, guarding, grounding, electrical protective devices, and safe work practices is advised. • Boundary walls and security fences around substation are essential to prevent unauthorized access. • Only trained and authorized personnel shall be allowed for electrical works. • Warning signs shall be installed.	-	NEA Transmission Operations units and Distribution Service Center(s)	NEA
2. Biological Environment				
A. Construction Phase				
1. *Loss of Habitat*	• No specific mitigation measures necessary.	-	Construction Contractor	NEA/PIU (DSUEP)
B. Operation Phase				
1. *Bird Electrocution and Collision*	• Provision of bird guards above the poles and white spirals in the conductors to improve visibility in substation (ANNEX 1). • Connector part mechanisms must be burr-free.	Embedded within Contract Document	NEA Transmission Operations units and Distribution Service Center(s)	NEA
3. Socio-Economic, and Cultural Environment				
A. Construction Phase				
1. Impact Associated with Transformation of Land	• Proper demarcation of the Substation area shall be done. • Trench excavation and/or drilling for underground cabling will be done in coordination with local stakeholders, preferably along the edge of the RoW of access road. • Advance notice of three month will be provided to users' to harvest their crops.	Embedded within Contract Document	Construction Contractor	NEA/PIU (DSUEP) and Tilottama Municipality

Environmental Issues	Mitigation and Management Measures	Mitigation Costs (NRs.)	Institutional Responsibility	
			Implementation	Supervision
	• Loss compensation of standing crops will be provided based on market rate. • Special assistance for income restoration activities will be conducted.			
2. *Issues Related to Child Labor and Gender*	• Provide equal wage to male and female for similar nature of work • Restrict use of child below 16 years of age in labor work (or as per government and ILO guidelines). • Provide gender friendly construction environment with separate cabins and toilet for women in the camp. • Prepare suitable work categorization for women.	Embedded within Contract Document	Construction Contractor	NEA/PIU (DSUEP) and Tilottama Municipality
3. *Socially Undesirable Activities*	• Organization of awareness programs on gender based violence risks for the Subproject workers. • Restrict movement of workers out of camp after certain hours in the night time. • Restrict use of alcohol and gambling in the camp. • Supply water supply, daily consumable items, communication facility in the camp so as not to create additional pressure on the local services • Orient workers to show respect to local tradition and culture; • Prepare a code of conduct for all project staff, orient them and monitor that these are effectively followed by all; • Assign a Community Liaison Officer (CLO) by the project to keep close and regular consultation and coordination with local communities; • Regular follow up and monitoring on worker's behavior and take appropriate measure on rule violators.	Embedded within Contract Document	Construction Contractor	NEA/PIU (DSUEP)

Environmental Issues	Mitigation and Management Measures	Mitigation Costs (NRs.)	Institutional Responsibility	
			Implementation	Supervision
4. *Occupational Hazards and Safety*	• Contractor shall prepare the Environmental, Health and Safety plan (ANNEX 7) and take approval from the Client. Safety officer should be employed during construction period • All employees shall be provided with the necessary training, and safety equipment as required for their responsibilities and duties. The Contractor will adhere to labor Act 2074 and Labor Rules 2075. • The basic facilities of drinking water, sanitation & clean resting place, canteen, and first aid are required for the campsite. • All the workers shall have health insurance over the period of construction. • Installation of warning signs (High Voltage, Fire Safety Signs, and Emergency Signs) as shown in ANNEX 8. • NEA will be responsible to supervise the EHS performance of the construction Contractor, and workers health and safety.	* EHS Awareness Trainings: 1,50,000.00 and other cost will be embedded within Contract Document	Construction Contractor	NEA/PIU (DSUEP)
B. Operation Phase				
1. *Hazards and Safety*	• Use of insulation, guarding, grounding, electrical protective devices, and safe work practices. • Boundary walls and / or security fences around substations to prevent unauthorized access. • Only trained and authorized personnel will be allowed for the electrical works. • No electric wire shall be stringed above the house. • Security fences around the substation. • Establishment of warning signs. • Shutdown shall be taken during maintenance work.	-	NEA Transmission Operations units and Distribution Service Center(s)	NEA

Note: The provision of environment and social management cost should be included in the project cost making each item visible in BOQ of bidding document for the safeguard compliance by the construction contractor.

3.4 Livelihood Support Activities

The majority of community people living outside of footprint area (SPA) are from Chhetri/Brahmin (Terai) and Tharu/Chaudhary. Two users family have cultivating in the proposed public land since decade. Tilottama Municipality had made decision for the use of that land for substation construction under NEA (ANNEX 2). Following table shows the livelihood support activities for the users affected by the Subproject.

Table 3-9: Livelihood Support Activities

Type of Loss	Scope	Who is Entitled	Entitlement	Responsible for the Delivery of the Entitlement	Remarks
A. Income Restoration Activities	Special assistance for income restoration activities	Support for land users (households) losing income sources based on agriculture at Subproject footprint area and other people from SPA area	At least one-person from each affected user (households if interested) will be considered for income generating vocational training and skill improvement options as per their choice expressed during consultation *(such as, building electricians and tailoring training)* and the people from SPA area	Training cost will be addressed by NEA	The NEA/PIU and PSC will facilitate to this support for organizing skill development training.
B. Additional assistance to land users	Household income affected as a result of Subproject construction	Crop users (households) cultivating agricultural crops	One-time financial assistance equivalent to 90[10] days of wage to be computed based on district wage rates for each users under special assistance.	Assistance cost will be addressed by NEA	The NEA/PIU and PSC will ensure timely payment to the users
C. Loss of Standing Agricultural Crops	Land acquired for a Subproject related activity	Land Users	Advance notice of three month to be provided to users' to harvest their crops. Cash compensation for loss of agricultural crops at current market value of crops (if destroyed).	Cash compensation based on the crops loss types and market rates NEA will address all the cost.	The NEA/PIU will ensure that the payment of compensation is made prior to construction of Subproject. PSC will facilitate for this loss estimation and procedural works

Table 3-10: Crop Loss Estimation from Area Affected for Cultivation and Estimated Production

Municipality	Area in Kattha	Area in Hectare (ha)	Productivity Per Kattha (Kg.)	Productivity Per Hectare (Kg.)	Three Seasons Production (Kg.)	Rate/ Kg (NRs.)	Amount (NRs.)
Tilottama Municipality	30.000	1.016	90.000	2,657.700	8,100.000	108.00	874,800.00

[10] *NEA, 2019: Environment and Social Management Framework (ESMF) for Distribution System Upgrade & Expansion Project (DSUEP), Kathmandu, Nepal; "Annexure 3 Entitlement Matrices".*

y							
Total	30.000	1.016	90.000	2,657.700	8,100.000	108.00	874,800.00

Source: Field Visit, 2022

3.5 Institutional Arrangement

The Ministry of Energy, Water Resources and Irrigation (MoEWRI) is responsible for planning and execution of the plans for the overall development of water and energy sector in Nepal. Nepal Electricity Authority (NEA) under MoEWRI is the responsible agency for the implementation of the DSUEP. The project comes under Distribution and Consumer Services Directorate (DCSD) of NEA. Project Implementation Unit (PIU) under DSUEP is the implementing unit of the project. Environment and Social Management Unit will be within PIU. All the resources needed for the EMP implementation for the construction and operation phase will be provided by the PIU. The site offices under PIU will have the supervision consultant with environmental and social safeguard specialist, who will be responsible for compliance monitoring during the construction phase. S/he will also provide technical support in preparing the monitoring report.

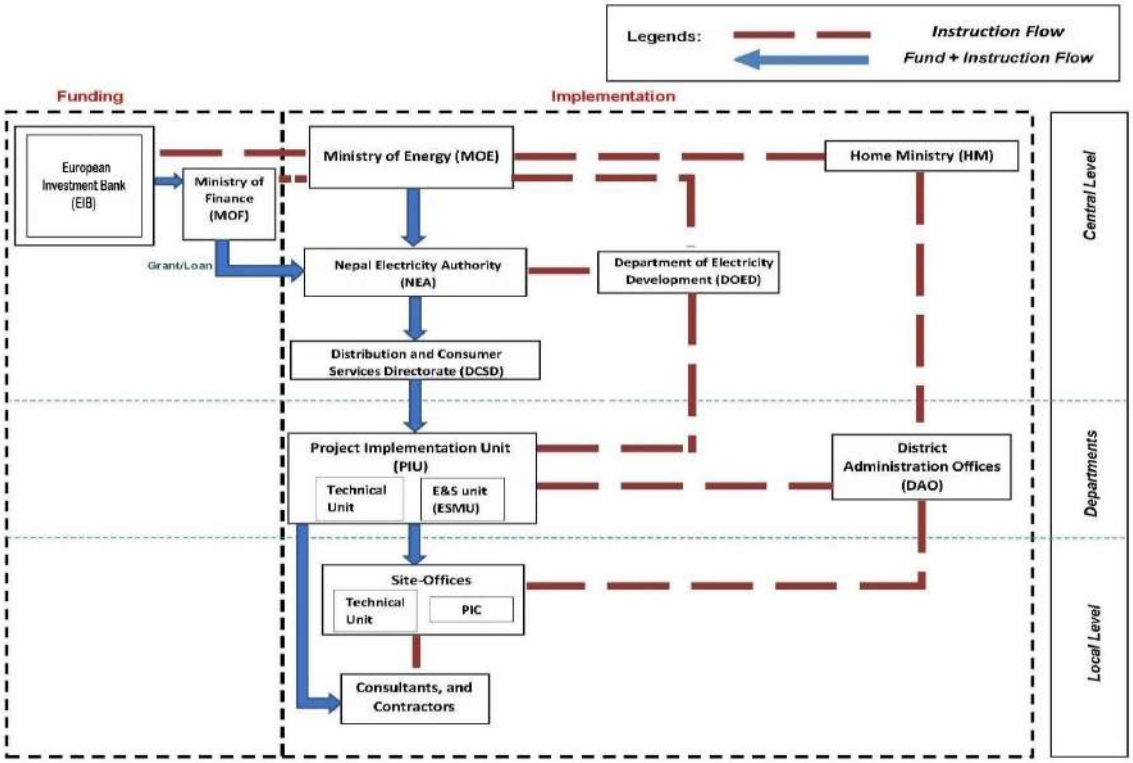


Figure 3-9: Institutional Arrangement for Environmental and Social Management

Source: ESMF-DSUEP

Contractor shall have the main responsibility to ensure the compliance. The Contractor shall prepare an Environment, Health and Safety (EHS) report that would be approved by DSUEP before field mobilization. They need to strictly follow the EHS plan requirements. Contractor shall urgently comply with corrective actions for any noncompliance as instructed by PIU. The ESMU of PIU will provide safeguard and ESMP compliance orientation to all environment monitors and safeguard team of the Contractor.

3.6 Grievance Redress Mechanism

The Grievance Redress Mechanism (GRM) has been established to receive, evaluate, and facilitate the resolution of affected people's concerns, complaints, and grievances about the social and environmental related issues at the subproject level. The GRM is designed to be simple, transparent and responsive. GRM shall address only the concerns arising due to the project implementation activities, mainly during construction stage.

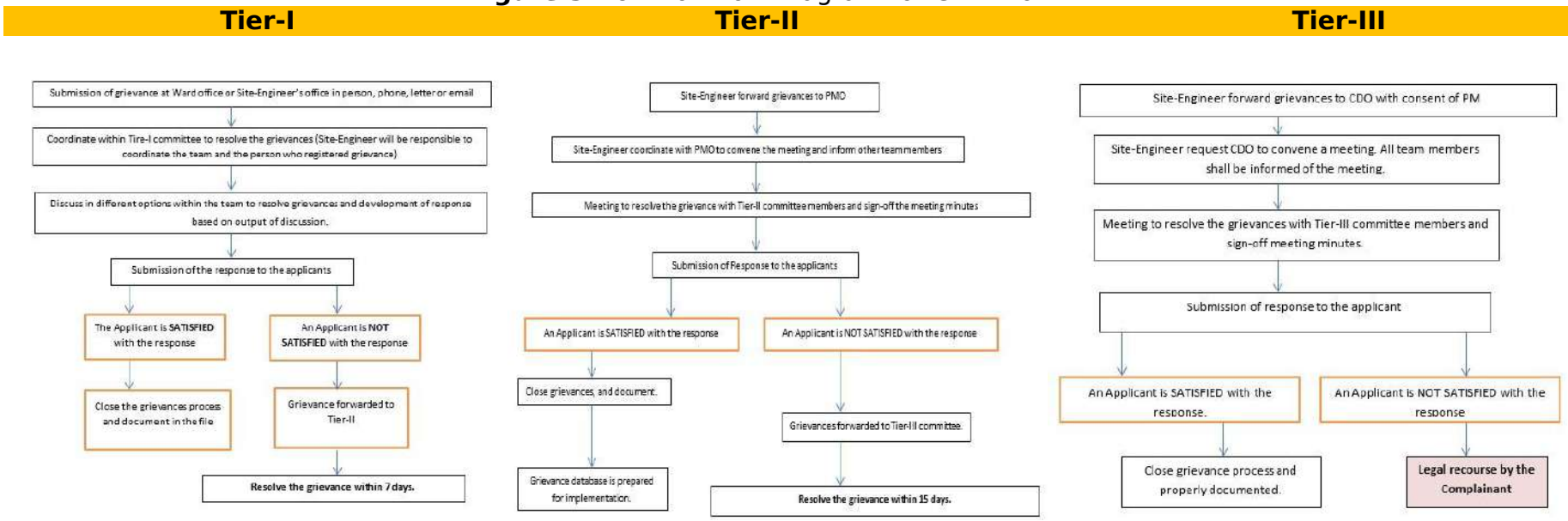
This process entails the concerned party submitting a grievance either in-person, or via phone, letter, or email to the Site-Engineer or the concerned Municipality Chief or the concerned Ward Chair. The Site-Engineer will record such complaint. In cases where Ward Chair has received such grievance, s/he should forward the grievance to the Site-Engineer. The Site-Engineer shall notify the committee members of Tier-I and arrange meeting to resolve the received grievances. If not resolved such grievances will be forwarded to Tier II and Tier III. The three level of GRM will work on time-bound schedules as mentioned in Table 3-11. The Subproject will hold regular meetings for Tier-I, to follow up if any grievances are received or not and to resolve the grievances received and update its status to PIU. Figure 3-10 describes the Workflow Diagram of GRM for the Subprojects.

Table 3-11: Levels of Grievance Redress Mechanism

Provisions	**Levels of Grievance Redress Mechanism**					
	First Level (Tier-I)		**Second Level (Tier-II)**		**Third Level (Tier-III)**	
Level	Local Level		Project Manager Office (PMO) headed by the Project Manager (PM) at Project Implementation Unit (PIU)		District Level	
Supervisory	NEA Site-Engineer		PMO		Chief District Officer (CDO)	
Assistance	Chief/Mayor of Concerned Local Level and Chairperson/ Representative of Ward, Construction Contractor's (CC) Representative and Project Supervision Consultant's (PSC) Safeguards Officer		NEA Site-Engineer and PSC's Social Expert, and Construction Contractor		PMO, affected persons, representative from Rural Municipality/Municipality, Site-Engineer, PSC's Social Expert. *If deemed necessary, representative from Forest Office, representative from Land Revenue Office, and representative from Land Survey Office are invited.*	
Days for Resolving Complain	7 days of receipt of a complaints/ grievance		15 days of complaints forwarded by Site-Engineer		15 days	
Committee Members	**Committee Member**	**Designation**	**Committee Member**	**Designation**	**Committee Member**	**Designation**
	Ward Chair	Coordinator	Project Manager	Coordinator	Chief District Officer (CDO)	Chair
	Site-Engineer-NEA	Member secretary	Site-Engineer	Member Secretary	Project Manager	Coordinator
	Community Liaison Officer from PSC	Member	Mayor/ Chair of municipality	Member	Site-Engineer	Member Secretary
	Contractor engineer	Member	Community Relations Manager from PSC	Member	Municipality Chief/Ward Chair	Member
	Affected person (one male and one female)	Member	Contractor Engineer	Member	Community Relations Manager from PSC	Member
	Women Member of ward committee	Member	Representative from affected people (at least 2, one male and one female)	Members	Contractor Engineer	Member
	One IP member	Member	Women Member of	Member	Representatives from	Members

Provisions	Levels of Grievance Redress Mechanism					
	First Level (Tier-I)		Second Level (Tier-II)		Third Level (Tier-III)	
	(if IPs are affected)		Municipality committee		affected people (at least 2, one male and one female)	
			One IP member (if IPs are affected)	Member	Women Member of Municipality committee	Member
					One IP member (if IPs are affected)	Member

Figure 3-10: Workflow Diagram for GRM from NEA[11]



* Affected People (AP) have the right to refer the grievances to appropriate courts of law if not satisfied with the redress at any stage of the process i.e., the AP will have the choice to approach country's judicial system.

[11] *Grievance Redress Mechanism (GRM) Prepared for the sub-projects financed by European Investment Bank (EIB) under Distribution System Upgrade and Expansion Project (DSUEP), Nepal Electricity Authority (NEA), August 2021.*

3.7 Compliance with Environmental Laws and Regulations

During the ESMP report preparatory phase, different legal instruments (constitution, acts, policy, plan, rules and international conventions/agreements) have been reviewed. Key provisions of those legal documents that might be relevant to this project have been summarized in tabulated form and given in ANNEX 9, which will guide the NEA, EIB, consultant and the construction contractor to effectively and efficiently implement ESMP maintaining the international and national standard.

4. MONITORING AND REPORTING MECHANISM

4.1 Environmental and Social Monitoring

Environmental and Social Monitoring (ESM) is undertaken to collect data/information of the Subproject environment and social aspect to assess the compliance concerning regularity standards, planning documents, and effectiveness of the implementation of Environmental and Social Protection Measures recommended in ESMP. It involves the assessment of physical, biological, and socioeconomic, and cultural variables associated with activities, and stages. To ensure effective implementation of ESMP, PIU/NEA (DSUEP) and Construction Supervision Consultants (CSC) will be responsible for undertaking monitoring the Subproject.

The main objectives of the environmental monitoring plan are listed below,

- To ensure that the Subproject baseline conditions were adequately documented such that a comparative evaluation of the Subproject baseline before, and after commencement of the Subproject could be made precisely for impact evaluation.
- To ensure that the mitigation commitments by the NEA for the minimization of adverse impacts, and enhance the beneficial impacts, and the mitigation measures, and enhancement program are complied, and implemented in time, and with sincerity.
- To confirm that the Subproject impacts are within the limits of the impact prediction or not, and to minimize unpredicted impacts that occurred during Subproject construction and operation.

Table 4-12: Environmental Monitoring Plan[12]

SN	Environmental Component	Indicators	Monitoring Methods	Location	Schedule	Responsibility
1.	Budget allocation for implementation of mitigation measures	Budget heading and amount in figures in contract documents	Review of Subproject documents, and records, and inquires with Subproject staff	-	Once, during pre-construction	NEA/PIU (DSUEP)
2.	Employment for Locals	Job placement ToR, notice of vacancies published in local media/notice board	Appointment document, and job announcement	Project area	Once, after vacancy announcement	Construction Contractor/ NEA/PIU (DSUEP)
Physical Environment						
1.	Alteration of Land	Demarcation of land for substation	Field observation, Meeting minutes with stakeholders	Substation area	Early Subproject Implementation Phase	Construction Contractor under the supervision of PIU Safeguard Officers/Local Level
2.	Stability and Erosion Issues	Backfilling in excavated part after construction, subsidence/sliding and erosional evidence, damages to adjoining entities, pit hole and its foundation materials compaction, design and working framework	Direct Site Inspection and records	Project area	Early Subproject Implementation Phase and Monthly	Construction Contractor under the supervision of PIU Technical Team
3.	Spoil Management	Excavation and filling as per design, compaction and watering facility	Observation, records and contract documents	Construction site	Early Subproject Implementation Phase and Monthly	Construction Contractor under the supervision of PIU Safeguard Officers

[12] *Nepal Electricity Authority 2019: Environment and Social Management Framework (ESMF) for Distribution System Upgrade & Expansion Project (DSUEP), Kathmandu.*

SN	Environmental Component	Indicators	Monitoring Methods	Location	Schedule	Responsibility
4.	Air quality	Emission and Dust around Subproject area, Foul smell, suspended particulate matter, State of vehicles used	Observation, and taking records for spraying water and vehicle log book of maintenance work	Construction site	Quarterly	Construction Contractor under the supervision of PIU Safeguard Officers
5.	Noise pollution	Noise level dB(A) of Construction vehicles and construction schedule	Observation, and measurement using digital sound meter	Construction site	Quarterly	Construction Contractor under the supervision of PIU Safeguard Officers
6.	Solid Waste Management	Solid waste segregation, collection and management mechanism, adherence to waste management practices	Direct Site Observation and practices	Construction site	Quarterly	Construction Contractor under the supervision of PIU Safeguard Officers
7.	Electric, and Fire Hazard	Evidence of workforce skill development training, installation of warning signs, electrical, mechanical insulation, and guarding system	Incident Record, and Direct Site Inspection	Construction site	Daily	NEA
Biological Environment						
1.	Habitat Loss	Not Applicable				Construction Contractor
2.	Bird Collision	Preventive measures included Subproject infrastructure, incidence of an accident, and causes	Carcasses count to test the efficacy of preventative measures	Project area	Every 3 Month[13]	NEA
Social, and Cultural Environment						
1.	Subproject's Assistance	Number of land owners/users received assistance from NEA and people's active participation during training program	Notice from NEA/PIU for a call to users to receive assistance (crop loss and additional assistance) and	Subproject Area	Before and during construction phase	NEA/PIU and PSC

[13] *Bennun, L., van Bochove, J., Ng, C., Fletcher, C., Wilson, D., Phair, N., Carbone, G. (2021). Mitigating biodiversity impacts associated with solar, and wind energy development. Guidelines for project developers. Gland, Switzerland: IUCN, and Cambridge, UK: The Biodiversity Consultancy. (https://portals.iucn.org/library/sites/library/files/documents/2021-004-En.pdf)*

SN	Environmental Component	Indicators	Monitoring Methods	Location	Schedule	Responsibility
			associated documents, training proposal, training minutes/attendances, receipts, photographs, visual evidences			
2.	Workers, Labor Camp Location, and Management	Number of workers from Subproject area, and its surrounding settlement, Basic facilities within the camps as suggested in ESMP, and Inclusiveness of marginalized, and indigenous groups people as workers	FGD with local people, Direct Site Inspection and verification	Project area	Weekly during construction; Monthly during operation	Construction Contractor
3.	Child, and Gender issues	Engagement of child in any form (direct/indirect or on/off-site), wage discrimination among male, and female workers, basic facilities for females as per recommended in ESMP, psychological, and physical assault evidence (recorded/verbal complain)	Direct Site Observation, Direct Consultation with the (Female) workers, Consultation with local people nearby the Subproject area,	Construction site	Weekly/Daily as per nature of indicator	Construction Contractor under the supervision of PIU Safeguard Officers
4.	Occupational Hazard and Safety	No. of toolbox talk/ safety orientation to workers, No. of accidents registered, use of the personal protective instrument by the workers	Direct Site Observation, Official records	Construction site	Daily during construction, Monthly during operation	Construction Contractor under the supervision of PIU Safeguard Officers
5.	Grievance Redressing Mechanisms	Committee formation records, GRC Meeting minutes, issue settlement records on the campsite, Gender, social, and others associated with Project.	Review of official records of GRC	Project area	Monthly	Construction Contractor under the supervision of PIU/PSC

4.2 ESMP Implementation and Monitoring Cost

The cost estimates for the ESMP are shown in Table 4-13. These estimates cover the basic monitoring activities and the mitigation measures to be complied from the contractor's side. The ESMP cost estimated for this Subproject is NRs 53,79,200.00.

Table 4-13: ESMP Implementation and Monitoring Cost

SN	Budget Items	Estimated Lump Sum Amount for Monitoring (NRs)
1	**Compliance with Environment Plan**	**2,00,000.00**
1.1	Air Pollution Monitoring *(at Substation)*	1,50,000.00
1.2	Noise Pollution Monitoring *(at Substation)*	50,000.00
2	**Mitigation Measures and Compliance to EHS Plan**	**5,50,000.00**
2.1	Sprinkling of water, covering during transportation and proper storage of construction material	3,00,000.00
2.2	Segregation and management of Solid Waste	1,00,000.00
2.3	EHS Awareness raising trainings to the labors	1,50,000.00
3	**Meeting of Safeguard Desk and Grievance Redress Committee at Field Level**	**3,50,000.00**
4	**Income Restoration Activities** *(Skill Development Training)*	**15,00,000.00**
5	**Additional Assistance Cost for Land Users**[14]	**1,04,400.00**
6	**Drainage and embankment management**	**18,00,000.00**
7	**Crop Loss Compensation**	**8,74,800.00**
Total		**53,79,200.00**

[14] Calculated based on wage rate for unskilled worker (Man-days/Day) = NRs. 580.00 [Approved District Rate of Rupandehi, DAO Rupandehi, 2078– Retrieved from https://dccrupandehi.gov.np/wp-content/uploads/2021/10/%E0%A4%86.%E0%A4%B5._%E0%A5%A8%E0%A5%A6%E0%A5%AD%E0%A5%AE%E0%A5%A4%E0%A5%AD%E0%A5%AF_%E0%A4%95%E0%A5%8B_%E0%A4%B8%E0%A5%8D%E0%A4%B5%E0%A5%80%E0%A4%95%E0%A5%83%E0%A4%A4_%E0%A4%9C%E0%A4%BF%E0%A4%B2%E0%A5%8D%E0%A4%B2%E0%A4%BE_%E0%A4%A6%E0%A4%B0%E0%A4%B0%E0%A5%87%E0%A4%9F_1.pdf].

5. CONCLUSION

Potential environmental impacts of the Subproject are not diverse, mainly relating to construction, and are all site-specific being confined to the Core Project Area i.e., within the substation area. Civil works will cause temporary impacts on air, noise and water quality, crop losses, occupational and community health and safety. Key impacts during operation and maintenance include safety risks related to the presence of electricity infrastructure and associated risks at the substation. The potential environmental impacts of the Subproject are identified and are deemed to be mitigated through adherence to national requirements and international good practice measures and standards as specifically recommended in ESMP and DDR. The implementation of ESMP and DDR is to be supervised and monitored by PIU, supported by Project Supervision Consultant. The total ESMP and DDR cost estimated for this Subproject is NRs. 53,79,200.00. This ESMP along with DDR is considered sufficient to meet the environmental and social requirements for the Subproject at present design conditions.

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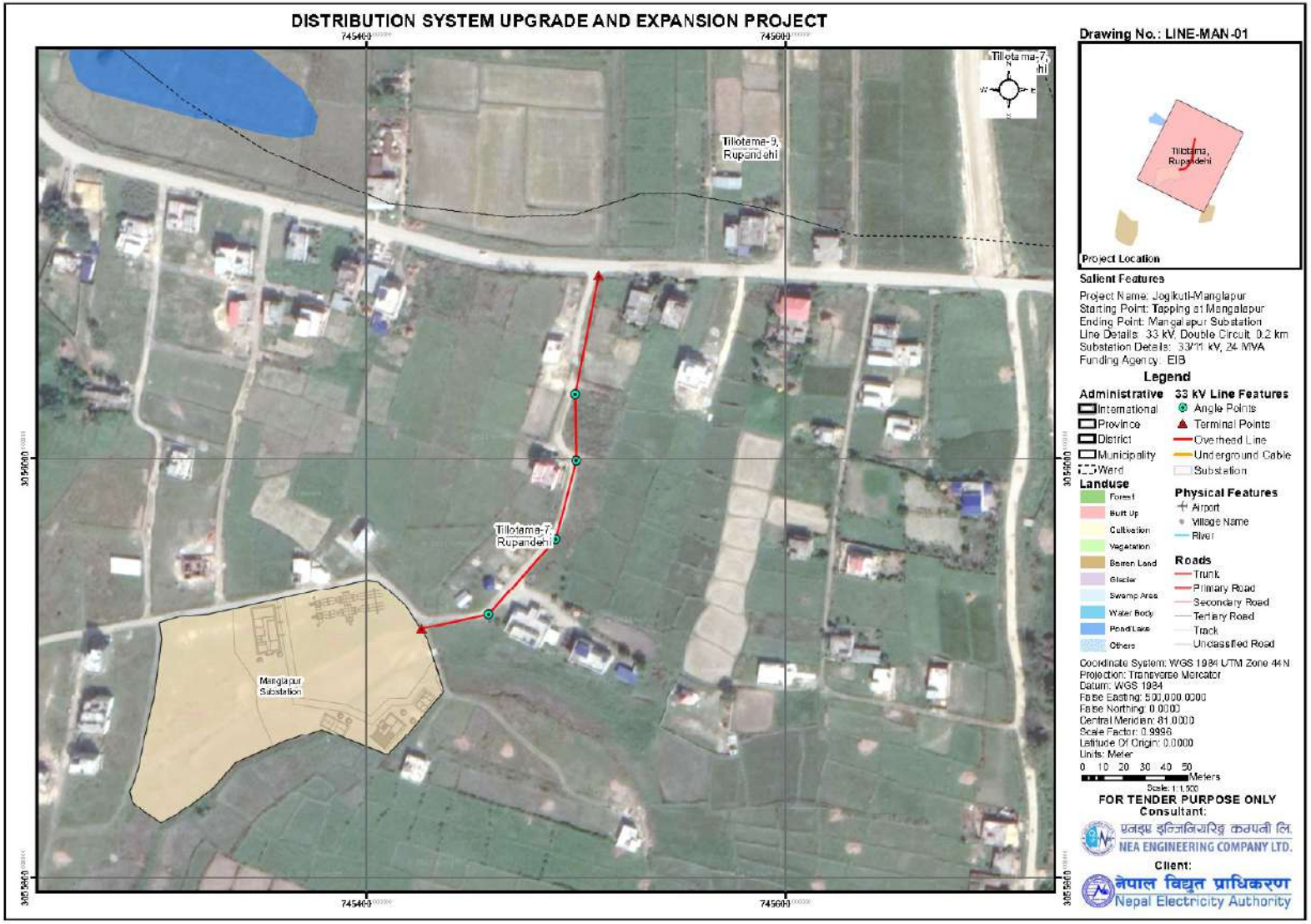
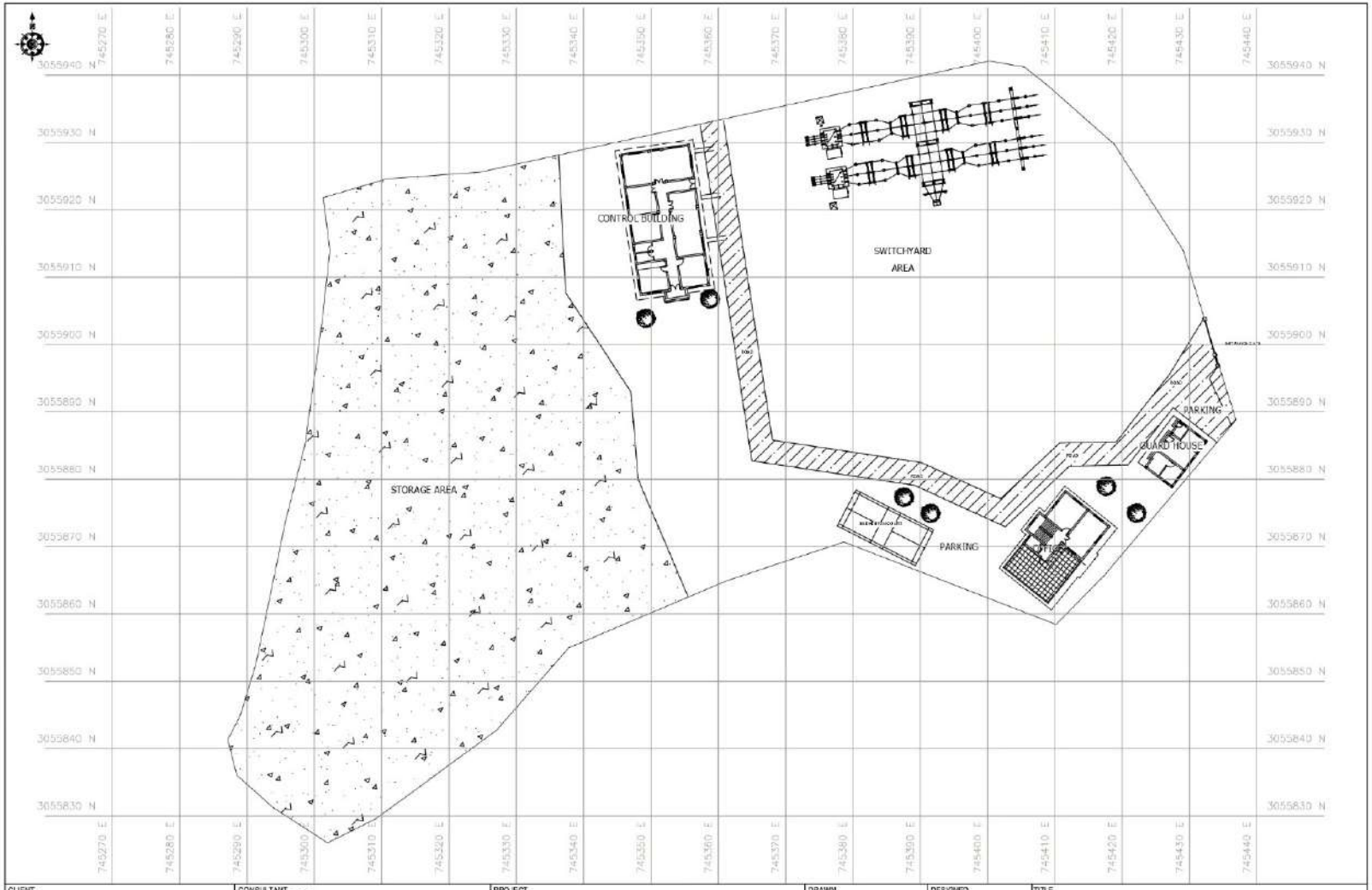
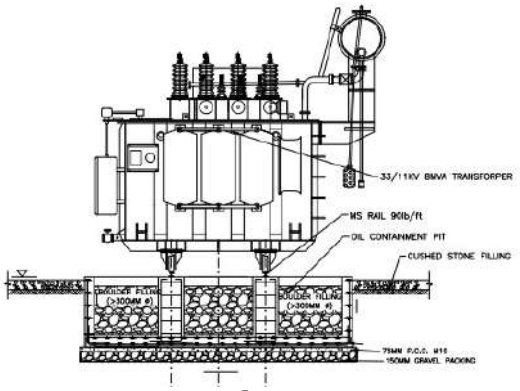
ANNEXES

ANNEX 1: MAP, LAYOUT, SUBSTATON COMPONENTS AND PHOTOGRAPHS OF ANCILLIARY FACILITIES

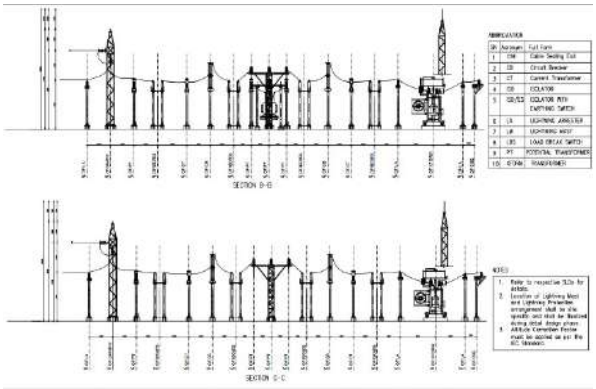




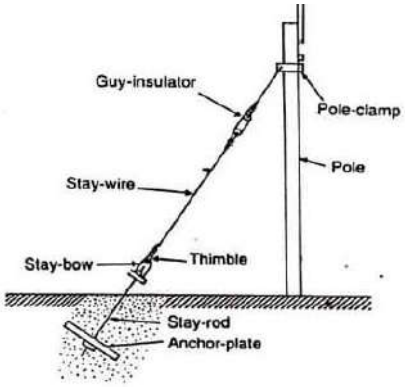
CLIENT: NEPAL ELECTRICITY AUTHORITY DISTRIBUTION AND CONSUMER SERVICES DIRECTORATE DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT DURBARMARGA, KATHMANDU, NEPAL	CONSULTANT: NEA ENGINEERING COMPANY LTD. TRADE TOWER, THAPATHALI, KATHMANDU, NEPAL	PROJECT: DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT FOR TENDER PURPOSE ONLY NOT IN SCALE	DRAWN / DESIGNED DRAFTING CHECK / DESIGN CHECK APPROVED / DRAWING NO. SS-MAN-01	TITLE: 33/11 KV SUBSTATION LAYOUT FOR MANGALAPUR SUBSTATION



Transformer

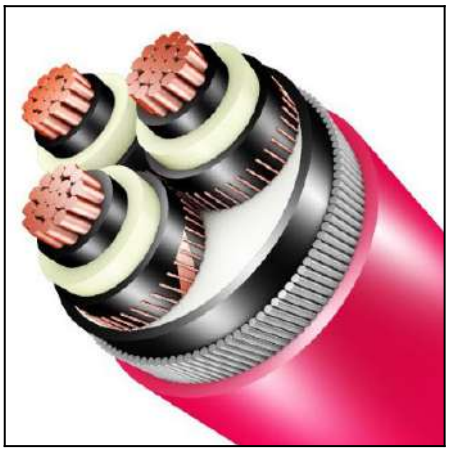


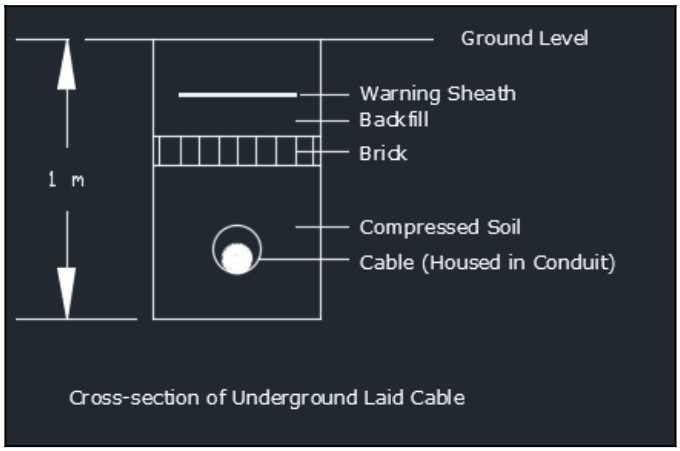
Switch Yard



Steel Tubular Pole and Stay/Guy Sets

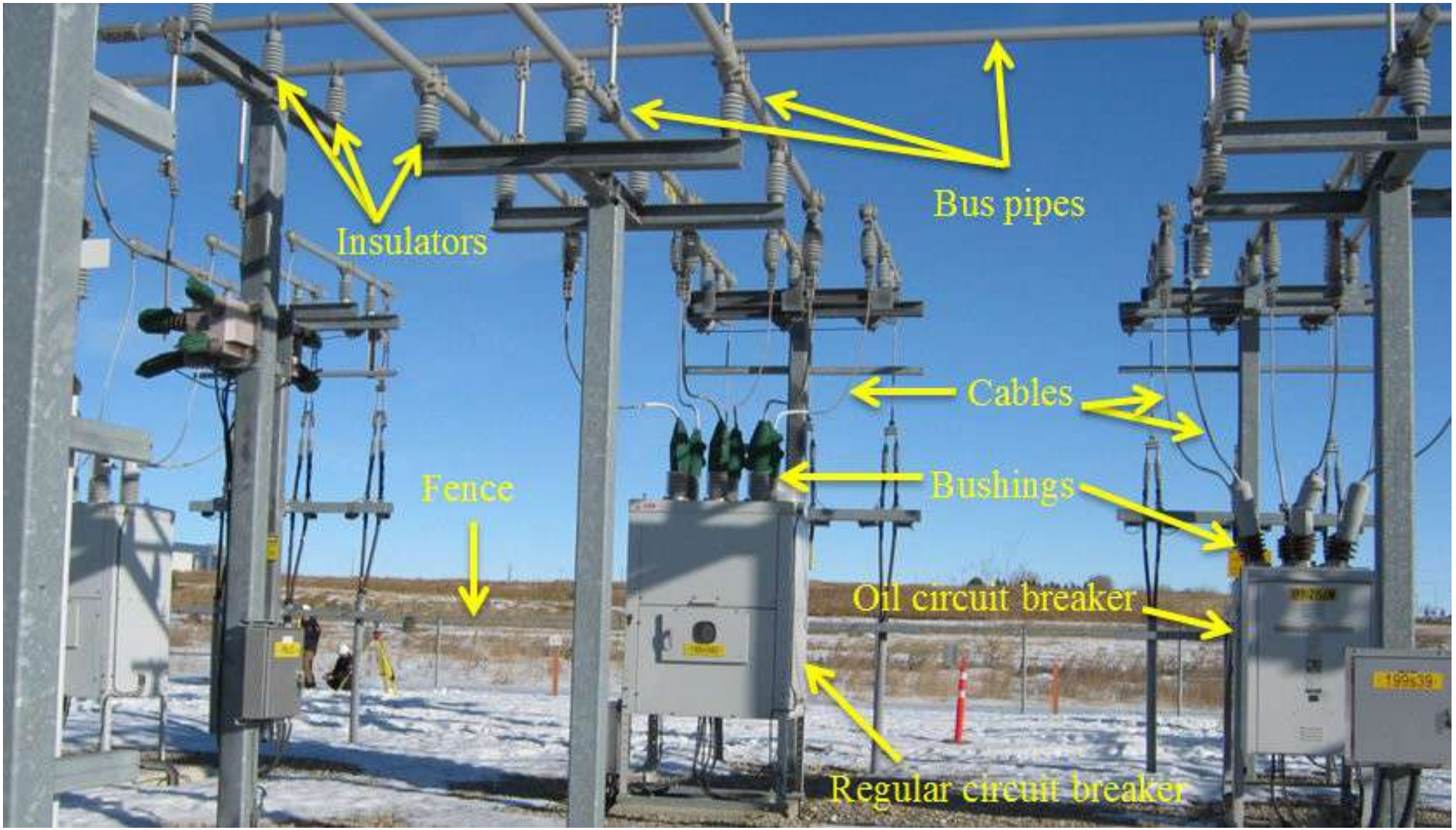
Pin Insulator





Underground Power Cable and Laying System

Typical Diagram of Control Building, Office Building, Staff Quarter and Guard House



Component Location within 33kV Substation

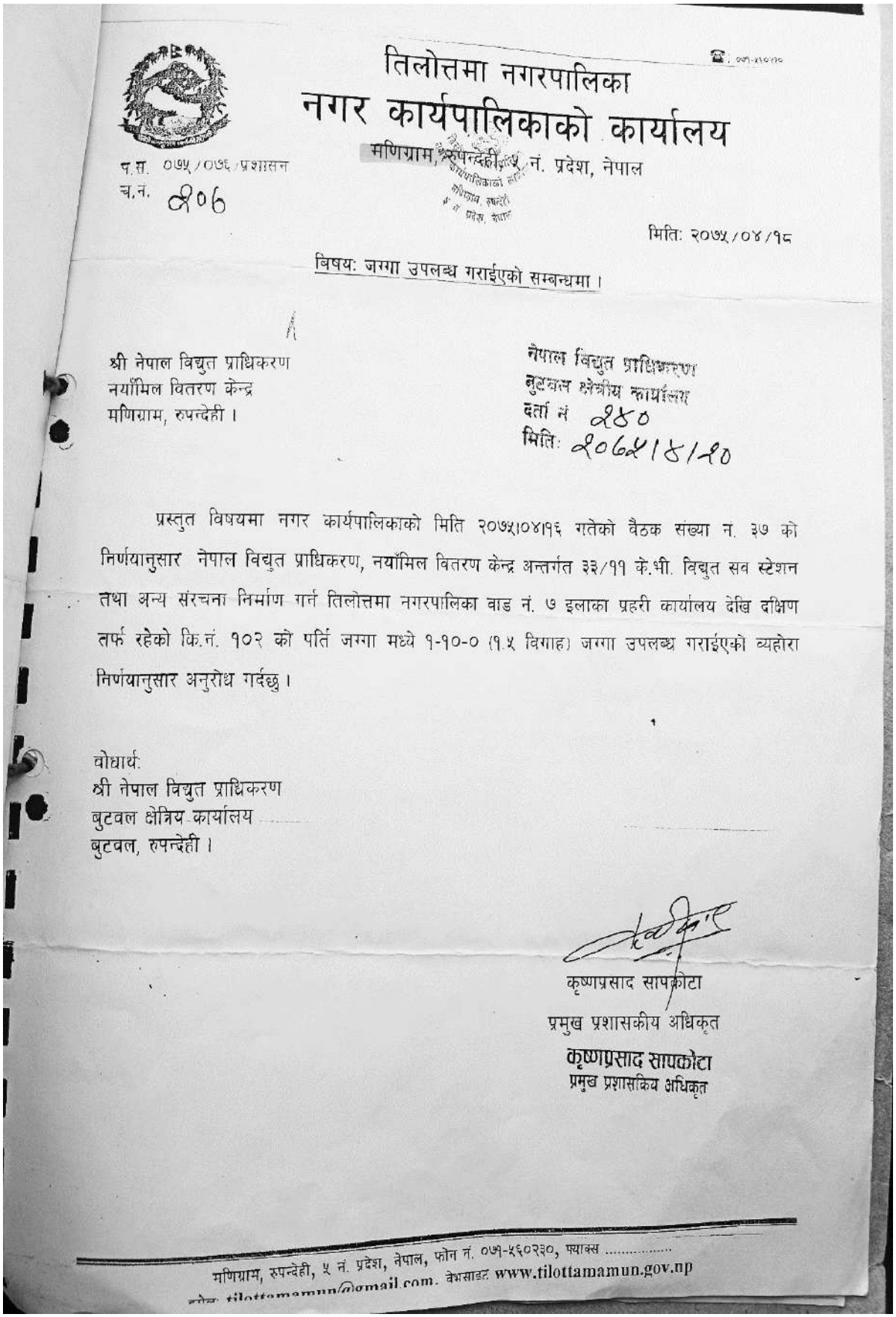
Bird Diverting Reflector

Wishbone Prevents Bird Landing on Wire

White Spiral in Wire Improves Visibility of Wire

Construction of Nest at Poles also divert Brid not sitting at Wires

ANNEX 2: CERTIFICATE OF LAND OWNERSHIP



तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय
मणिग्राम, रुपन्देही, ५ नं. प्रदेश, नेपाल

प.सं. ०७५/०७६/प्रशासन
च.नं. ४०६

मितिः २०७५/०४/१८

विषयः जग्गा उपलब्ध गराईएको सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण
नयाँमिल वितरण केन्द्र
मणिग्राम, रुपन्देही ।

नेपाल विद्युत प्राधिकरण
बुटवल क्षेत्रीय कार्यालय
दर्ता नं २४०
मिति: २०७५/४/२०

प्रस्तुत विषयमा नगर कार्यपालिकाको मिति २०७५।०४।१६ गतेको बैठक संख्या न. ३७ को निर्णयानुसार नेपाल विद्युत प्राधिकरण, नयाँमिल वितरण केन्द्र अन्तर्गत ३३/११ के.भी. विद्युत सब स्टेशन तथा अन्य संरचना निर्माण गर्न तिलोत्तमा नगरपालिका वाड नं. ७ इलाका प्रहरी कार्यालय देखि दक्षिण तर्फ रहेको कि.नं. १०२ को पर्ति जग्गा मध्ये १-१०-० (१.५ विगाह) जग्गा उपलब्ध गराईएको व्यहोरा निर्णयानुसार अनुरोध गर्दछु ।

बोधार्थ:
श्री नेपाल विद्युत प्राधिकरण
बुटवल क्षेत्रिय कार्यालय
बुटवल, रुपन्देही ।

कृष्णप्रसाद सापकोटा
प्रमुख प्रशासकीय अधिकृत

कृष्णप्रसाद सापकोटा
प्रमुख प्रशासकिय अधिकृत

मणिग्राम, रुपन्देही, ५ नं. प्रदेश, नेपाल, फोन नं. ०७१-५६०२३०, फ्याक्स .....
इमेल: tilottamamun@gmail.com, वेभसाइट: www.tilottamamun.gov.np

नेपाल सरकार

भूमि व्यवस्था ,सहकारी तथा गरिबी निवारण मन्त्रालय

नापी विभाग

नापी कार्यालय बुटवल, रूपन्देही

फोन नं. ०७१५४६२०९

मिति २०७८।०६।०८

प.सं.२०७८।७९
च.नं.

नेपाल विधुत प्राधिकरण वितरण प्रणाली स्तरोन्ती तथा विस्तार आयोजनाको चलानी न ४५ मिति २०७८।६।०६को पत्र सँग सम्वन्धित रहनेगरी फिल्डबुक उतार गरीएको।

जिल्ला : रूपन्देही न.पा./गा.वि.स.:- करहीया वडा नं ५ कि.नं.१०२ सिट न ५

जमीनको कित्ता नं.	जग्गावालाको नाम, घर, वतन, नागरिकता नम्बर तथा बाबु र बाजेको नाम	व्यहोरा	सहीछाप	मोहीको नाम, घर, वतन, नागरिकता नम्बर तथा बाबु र बाजेको नाम	व्यहोरा	सहीछाप	बिरह (घर, बगैंचा, पोखरी आदि)	किसिम: कृषि क्षेत्र	किसिम: व्यवसायिक तथा बसोबास क्षेत्र	क्षेत्रफल	चौहद्दी: पूर्व	चौहद्दी: पश्चिम	चौहद्दी: उत्तर	चौहद्दी: दक्षिण	मिति: नापी भएको	मिति: २ हिले सूचना प्रकाशित	प्रमाण संकेत	दर्ता गर्नेको नाम र दस्तखत	कैफियत
१०२	प्रति			७ २ ४ १०			प्रति	८/	-	-	-	६	१०	२	२०		प्रति		मा पो का च न २६०८ मिति ०२१।८।१६को आदेश अनुसार [illegible] ६ ८५

प्रिन्ट दिने रुजू गर्ने प्रमाणित गर्ने

ANNEX 3: FIELD VISIT PHOTOGRAPHS

Southwest View of Substation at Mangalapur, Tilottama Municipality-7

North Face of Substation at Mangalapur and Expert Team During Field Visit

Stakeholders during Public Consultation cum FGD Meeting at Tilottama Municipality-7

Stakeholders during Public Consultation cum FGD Meeting near Substation

Community People during Interaction Meeting near Substation

Measurement of Air and Noise Quality at Substation Site, Tilottama Municipality-7

ANNEX 4: NOTICE FOR PUBLIC CONSULTATION

नेपाल विद्युत प्राधिकरण

(नेपाल सरकारको स्वामित्व)

वितरण तथा ग्राहक सेवा निर्देशनालय

फ्याक्स: ०१-४१५३१४४
फोन नं : ०१-४१५३१४५
दरबारमार्ग, काठमाण्डौं।

नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना

नेपाल वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजनाको वातावरणीय तथा सामाजिक अध्ययन प्रतिवेदन तयारी सम्बन्धि सूचना

सूचना प्रकाशन मिति: २०८१/०६/०५

लुम्बिनी प्रदेश रूपन्देही जिल्ला तिलोत्तमा (नगरपालिका/गाउँपालिका/महानगरपालिका/उपमहानगरपालिका) मा यूरोपियन इन्भेस्टमेन्ट बैंकको ऋण सहयोग भएको नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजना प्रस्तावक रही कार्यान्वयन गर्न लागिएको तौलिहवा-मंगलापुर विद्युत वितरण लाईन आयोजना कार्यान्वायन हुनुभन्दा अघि सो आयोजनाले त्यस क्षेत्रको वातावरण तथा सामाजिक पक्षहरुमा के-कस्तो प्रभाव पार्दछ भनि स्थानीय सरोकारवालाहरु सँग छलफल गर्न आयोजना क्षेत्रका सम्पूर्ण सबै सरोकारवालाहरुको निम्न स्थान तथा समय उपस्थितिका लागि यो सूचना प्रकाशित गरिएको छ।

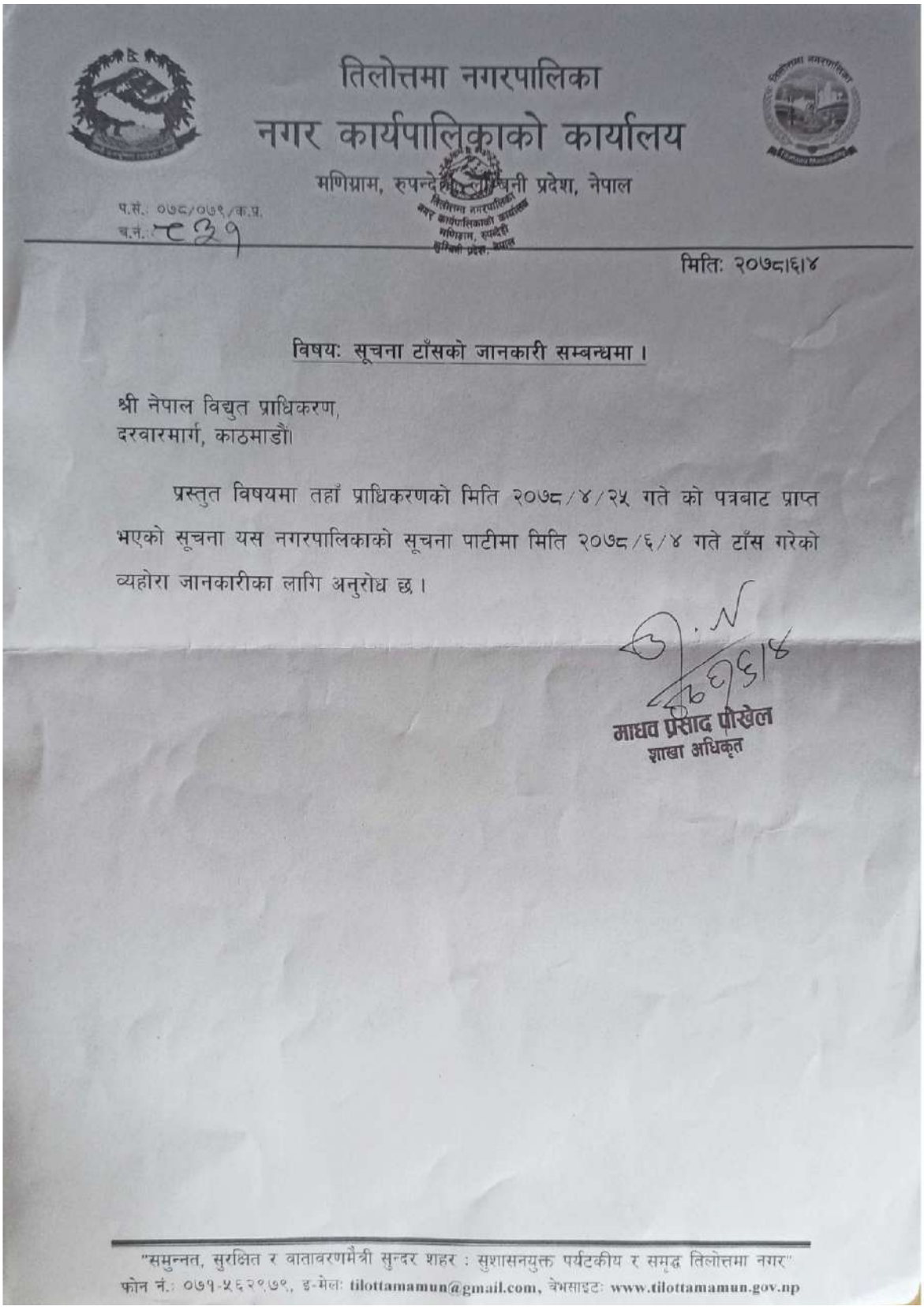
सार्वजनिक छलफल हुने स्थान, मिति र समय:

स्थान: तिलोत्तमा नगरपालिका ६ नं वडा कार्यालय

मिति: २०८१/०६/०५

समय: बिहान, १०:०० बजे

ANNEX 5: PROOF OF PUBLIC NOTICE PASTING



तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय

मणिग्राम, रुपन्देही, लुम्बिनी प्रदेश, नेपाल

प.सं.: ०७८/०७९/क.प.
च.नं.: ८३१

मितिः २०७८।६।४

विषयः सूचना टाँसको जानकारी सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण,
दरबारमार्ग, काठमाडौं।

प्रस्तुत विषयमा तहाँ प्राधिकरणको मिति २०७८/४/२५ गते को पत्रबाट प्राप्त भएको सूचना यस नगरपालिकाको सूचना पाटीमा मिति २०७८/६/४ गते टाँस गरेको व्यहोरा जानकारीका लागि अनुरोध छ ।

माधव प्रसाद पौखेल
शाखा अधिकृत

"समुन्नत, सुरक्षित र वातावरणमैत्री सुन्दर शहर : सुशासनयुक्त पर्यटकीय र समृद्ध तिलोत्तमा नगर"
फोन नं.: ०७१-५६२९७९, इ-मेलः tilottamamun@gmail.com, वेभसाइटः www.tilottamamun.gov.np

तिलोत्तमा नगरपालिका
७ नं. वडा कार्यालय

केवलानी, रुपन्देही, लुम्बिनी प्रदेश, नेपाल

च.नं: ०७८/७९
च.नं: ९२४

मितिः २०७८/०६/०४

विषयः सूचना टाँस गरिएको सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण
नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना
दरवारमार्ग, काठमाडौं ।

प्रस्तुत विषयमा तहाँ आयोजनाको च.नं. २०७८/७९ DSUEP पत्र संख्या १७ मिति २०७८/०४/२५ गतेको पत्रानुसार तहाँ आयोजनाबाट **"जोगीकुटी-मंगलापुर विद्युत वितरण लाईन"** सम्बन्धि मिति २०७८/०६/०४ गते प्रकाशित सूचना पत्र यस कार्यालयको सूचना पाटीमा टाँस गरिएको व्यहोरा जानकारीका लागि अनुरोध छ ।

०८/०६/२०७८
दुर्गा प्रसाद पाण्डे
वडा अध्यक्ष

ANNEX 6: CONSULTATION MEETING MINUTES

तिलोत्तमा नगरपालिका
७ नं. वडा कार्यालय
केवलानी, रुपन्देही, लुम्बिनी प्रदेश, नेपाल

च.नं. ४७६५

तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय
७ नं. वडा कार्यालय
लुम्बिनी प्रदेश, रुपन्देही

मिति: २०७९/०२/२५

श्री वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजना,
वितरण तथा ग्राहक सेवा निर्देशनालय,
नेपाल विद्युत प्राधिकरण,
दरबारमार्ग, काठमाण्डौ।

विषय: मंगलापुर सब-स्टेशनको निर्माण-पूर्व गरिएको परामर्श बारे।

महोदय,

उपरोक्त विषयमा नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजनाले यस तिलोत्तमा नगरपालिका वडा नं.७ मा ने.वि.प्रा. लाई भोगाधिकार दिईएको जग्गामा निर्माण हुन गईरहेको ३३/११ के.भी. विद्युतीय सब-स्टेशनको निर्माण-पूर्व निर्माण क्षेत्रमा मिति २०७८/०६/०५ मा परामर्श/सार्वजनिक सुनुवाई गरेको र सो परामर्श/सुनुवाई हुने समय र स्थानको बारेमा यस वडा कार्यालय तथा अन्य सरोकारवालाहरुलाई पूर्व-सूचित गरिएको व्यहोरा प्रमाणित गरिन्छ।

भवदीय,

देवी प्रसाद पंगेनी
वडा अध्यक्ष

Date: ....
Page: ....

आज मिती २०७८ असोज ५ गते शुक्रवार रुपन्देही जिल्ला तिलोत्तमा नगरपालिका वार्ड नं ६ वडा कार्यालयमा नेपाल विद्युत प्राधिकरण वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजना (DSUEP) अन्तर्गत जोगीकुटी- मोतीपुर विद्युत वितरण लाईन र सब स्टेसन निर्माण पूर्व वातावरणिय तथा सामाजिक अध्ययन प्रतिवेदन तयारीका लागी NEA ईन्जिनियरिङ कम्पनी, EIB का प्रतिनिधि खटाई आउनुभएका विज्ञ तथा हामी स्थानिय सरोकारवाला व्यक्तिको उपस्थितीमा देहाय विषयमा छलफल गरियो ।

उपस्थिती

क्र.सं	नाम	ठेगाना	फोन नं	हस्ताक्षर
१.	दुर्गा पाण्डे	वडा अध्यक्ष ति.न.पा-६	९८४६०२५२६१	Landy
२.	श्याम बहादुर कार्की	स्थानिय समाजसेवी वडा नं ८	९८४६०२२२२४	
३.	भरत पौडेल	ति.न.पा.६ सरोकारवाला	९८४६०२३१७१	
४.	वाम देव पन्त	,, ,, ,, ,,	९८४८५३८०८१	
५.	ईश्वर कार्की	,, ,, ,,	३८४६०२८११३	
६	कृष्ण बहादुर थापा	,, ,, ,, ,,	९८४६२०३६३२	कृष्ण
७	अनिता थापा श्रेष्ठ	,, ,, ,,	9819189644	अविष्यु
८	पन्टी थापा	,, ,, ,,	9814435032	पन्टी
९	शिलु खत्री	,, ,, ,,	9811942403	सिल्
१०	तारा माया गुरुङ	,, ,,	9847280469	
११.	सावित्री बस्नेत	,, ,, ,,	9847316626	Sabrijit
१२	नारायण प्र. मापकोटा	,,	9806725267	
१३	भिम कु. थापा	,, ,,	9818048555	
१४	राम चन्द्र पुडासैनी	,, ,,	९८०८५३५६४९	
१५	शिव ढकाल			
१६	विजय सेन रङ्का	आयोजना प्रमुख	9841592698	
१७	सुवास चन्द्र घिमिरे	समाजशास्त्री		
१७	दिवस अधिकारी	वातावरणविद		
१८	कृष्ण कार्की	समाजशास्त्री	९८२३११८६८६	

उपस्थित सरोकारवाला व्यूहरू संग छलफल गरी निम्न बमोजीमको प्रस्ताव सहित सहमति गरियो ।

१) जोगीकुटी - मंगलापुर विद्युत वितरण लाईन आयोजनाको बारेमा NEA Engineering Company का विज्ञ तथा आयोजना प्रमुख बाट जानकारी अवगत गरायो ।

२) प्रस्तावित सब स्टेसन क्षेत्र वर्षाको समयमा पानी धेरै जम्मा हुने हुदा सो पानि लाई उपयुक्त नाला निर्माण गरी निकास दिने काम आयोजनाले गर्नु पर्ने ।

३) आयोजना निर्माणका क्रममा शिप र दक्षताका आधारमा स्थानिय बासी-लाई प्राथमिकता दिनुपर्ने ।

४) आयोजना निर्माण गर्दा स्थानिय तह तथा सरोकारवाला संग समन्वय गरी काम गर्दा प्रभावकारी हुने ।

५) प्रस्तावित ३३ के.भि लाईन सब स्टेसन सम्म विस्तार गर्न स्थानिय बासी को समर्थन रहने व्यहोरा जानकारी गराउनो ।

६) प्रस्तावित सब स्टेसन क्षेत्र र हाल ऐलानी जग्गा रहेको र सो जग्गामा कुनै व्यक्ती वा संस्थाको हक दावी नरहेको व्यहोरा गराउने ।

७) आयोजना निर्माणका लागी स्थानिय बासी हेल्प विकाश संस्था, स्थानियतह सबैको साथ समर्थन रहने व्यहोरा जानकारी गराउनो ।

८) आयोजना निर्माणका क्रममा निजी सम्पत्तिमा क्षती हुने अवस्था आएमा सो को संबोधन आयोजनाले गर्ने ।

DATE:

आज मिति २०७८ पौष १२ गते सोमबार नेपाल सरकार, नेपाल विद्युत प्राधिकरण " वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना (DSUEP) अन्तरगत जोगिकुटी-मंगलापुर विद्युत लाईन विस्तार योजना को तिलोत्तमा नगरपालिका वडा नं ६ मंगलापुर टक्का मा निर्माण हुन गईरहेको सबस्टेसन तथा ३३ के.भि लाईन विस्तार हुने क्षेत्र का आदीवासी जनजाती सरोकारवाला संग आयोजनाले पार्न सक्ने प्रभाव बारेमा लक्षित का सरोकारवाला संग छलफल गरीयो।

उपस्थिती	ठेगाना	संपर्क नं	हस्ताक्षर
१- श्री कृष्ण बहादुर कोशिया थारु	मंगलापुर मितगा	- ९८६७०८९३४२	कृष्ण
२- श्री राम बहादुर कोशिया थारु	" "	- ९८०७५६९८२६	राम
३- टिकाराम पुन मगर	नेपाल मगर संघ	९८४७०५४५५६	
४- छबल बहादुर पुन मगर	"	९८४७०६६६३१	

छलफल को विषय: आयोजनाले आदिवासी जनजातीलाई पर्न सक्ने प्रभाव

* उल्लेखित विषयमा छलफल गर्दा निम्नबमोजिमको राय सुझाव सहित सहमती प्राप्त भयो

१- प्रस्तावित आयोजना को बारेमा २०७८/०४/०१ मा आयोजना का तिरबाट पूर्ण रुपमा जानकारी प्राप्त भएको र आज पनि मौखिक रुपमा जानकारी ~~प्राप्त भएको~~ अवगत भयो।

२- यस आयोना अन्तरगत निर्माण हुने जमिन नेपाल सरकार को ऐलानी जमिन भएकोले आदिवासी थारु समुदायको customary land / language / religion / rituals मा कुनै प्रकारको बाधा व्यवधान तथा नकारात्मक प्रभाव नपर्ने व्यहोरा जानकारी गराउँदछौ।

३- आयोजना निर्माण पश्चात यस क्षेत्रमा विद्यमान विद्युत सेवामा रहेको व्यवधान हटी प्रयाप्त बिजुली प्राप्त हुने तथा सेवा आफ्नी निर्बाध संचालन हुने हुँदा आयोजना छिट्टै सम्पन्न ~~हुन~~ हुने विश्वास सहित हामी बाट आयोजना लाई पूर्ण समर्थन र सहयोग रहने व्यहोरा जानकारी गराउँछौं।

कृष्ण राम

Scanned with CamScanner

तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय

मणिग्राम, रुपन्देही
लुम्बिनी प्रदेश, नेपाल

प.सं. : ०७८/७९
च.नं. : २२२४

मितिः २०७८/९/१३

विषयः जानकारी सम्बन्धमा।

श्री नेपाल विद्युत प्राधिकरण,
वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना,
दरबारमार्ग, काठमाडौं।

प्रस्तुत विषयमा यस नगरपालिका अन्तर्गत वडा नं. ७ को कार्यालयको प.सं. ०७८/०७९ च.नं. २०४४ मिति २०७८/०९/१२ गतेको पत्रानुसार तहाँ कार्यालयद्वारा निर्माण हुन गइरहेको जोगिकुटी-मंगलापुर विद्युत लाईन विसतार आयोजना अनतर्गत तिलोत्तमा-७, केवलानी (दल्का) मापर्ने सरकारी ऐलानी जग्गामा कुनै पनि आदिवासी जनजातीको Customary Land, धर्म संस्कृति तथा रीतिरिवाजमा नकारात्मक असर नपर्ने तथा सो क्षेत्रमा कुनै पनि संचरना नरहेको कुरा जानकारीका लागि अनुरोध छ।

माधव प्रसाद [illegible]
शाखा अधिकृत

०६८-०९-१३
वासुदेव घिमिरे
नगर प्रमुख

ANNEX 7: OUTLINE OF ENVIRONMENTAL, HEALTH AND SAFETY PLAN

Chapter 1: Project Overview
- 1.1 Scope of the document
- 2.2 Overview of health and safety features
- 2.3 Project Health, Safety, and Environmental Goals & Objectives

Chapter 2: Safety policy of the Project
- 2.1 Safety policy statement
- 2.2 Contractor's overall safety responsibilities
- 2.3 Contractor's safety Specialist responsibilities
- 2.4 Contractor's Supervisor responsibilities
- 2.5 Worker's responsibilities
- 2.6 Disciplinary policy procedures
- 2.7 Involvement of the public
- 2.8 Color coding for PPE

Chapter 3: Health policy, and amenities
- 3.1 Camp establishment, and operation
  - 3.1.1 Accommodation (Washing, cooking, bedding facilities with locking)
  - 3.1.2 Toilets
  - 3.1.3 Drinking water
  - 3.1.4 Waste collection bin
  - 3.1.5 Lighting
  - 3.1.6 Ventilation
  - 3.1.7 Maintenance of facilities
  - 3.1.8 Menstrual Kit Accessibility
- 3.2 First-aid facilities
- 3.3 Insurance of construction workers
- 3.5 Site facilities for works of short duration
- 3.6 Avoiding fire hazards

Chapter 4: Employee training
- 4.1 Competent person designation
- 4.2 Safety induction for new employees
- 4.3 Toolbox meetings

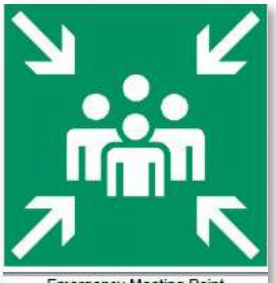
Chapter 5: Accidents, and emergency
- 5.1 First aid requirements
- 5.2 Assisting coworkers in medical emergencies
- 5.3 Emergency evacuation plan
- 5.4 Standby emergency vehicle
- 5.5 Accident investigations

Chapter 6: Toolbox safety talks
- 6.1 Overview of toolbox meetings
- 6.2 Recognize the warning signs
- 6.3 Good housekeeping
- 6.4 Trenching and excavation
  - 6.4.1 Trenching
  - 6.4.2 Competent person
  - 6.4.3 Protective systems to prevent subsidence
  - 6.4.4 Other safety requirements
- 6.5 Access to scaffolds
- 6.7 Falling object protection
  - 6.7.1 Falling object protection alternatives
  - 6.7.2 Falling object protection methods
- 6.8 Slips, trips, and falls

ANNEX 8: OCCUPATIONAL HEALTH AND SAFETY RELATED SIGNS

SIGNAL NOTICE

First Aid
प्राथमिक उपचार



Emergency Meeting Point
आकस्मिक भेला हुने ठाउँ

Fire Extinguisher
अग्नी नियन्त्रण उपकरण

Fire hose
अग्नी नियन्त्रण पाइप

DANGER SIGNS

Keep Out
निर्माण क्षेत्र- टाढै रहनुहोस्

Danger
खतरा - खुल्ला खाल्डो

Danger of open trench
खतरा - खुल्ला ट्रेन्च

No operation without safety guards
सुरक्षाका साधनबिना यो उपकरण संचालन गर्न निषेध

INSTRUCTION SIGNS

Do Not Touch
छुनु मनाही

Food and Drinks Prohibited
खाना तथा मद्यपान निषेध

Slow Sign for Traffic Control
यातायात नानुहोस्

Directional Exit Sign
बाहिर जाने दिशा

SAFETY AND SAFETY INSTRUCTION SIGNS

Safety Gloves Required
सेफ्टी पन्जाको आवश्यक

Safety Vests Required
सेफ्टी भेस्टको आवश्यक

Safety Glasses Required
सेफ्टी चश्मा आवश्यक

Safety Shoes Required
सेफ्टी जुता आवश्यक

Wear safety harness
सेफ्टी हार्नेस लगाउनुहोस्

ANNEX 9: REVIEW OF LEGISLATIVE PROVISIONS

SN	Legislation	Provisions	Relevancy with respect to Project
1.	**Constitution of Nepal**	• Constitution of Nepal is the main legal document, which emphasizes on right of clean environment of the people, natural resources protection, preservation and its prudent use. Rights regarding clean environment, under article 30: • It includes 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 fulfillment of the basic needs of citizens, by generating and developing renewable energy in article 51 (g).	DSUEP helps to fulfil the rights of people to live in clean environment along with to fulfil the basic needs by providing access of sufficient energy.
2.	**Environment Protection Act 2076 (2019 AD)**	• Section 3 of the Act requires the proponent to conduct environmental studies in relation to the prescribed proposals of any developmental works. Subsection 2 of this act provides the framework about the environmental study report prepared pursuant to sub-section (1) shall, in fulfillment of the process as prescribed, be submitted to the relevant bodies of Government of Nepal for approval.	Environmental Studies and approved of report from authorized body before construction of any project is mandatory to minimize the negative impacts in Nepal which is addressed in EPA, 2076.
3.	**Environmental Protection Rule, 2077 (2020 AD) [First Amendment on 2078 (2021)]**	• Under the Environmental Protection Rules (2077) first amendment (2078), rule (3) as mentioned in annex (1), Section (F) (Energy, Water Resources and Irrigation Sector) sub-section (1), a proponent shall be required to carry out the Brief Environmental Studies for construction of transmission line project less than 66kV in forest land for another purpose.	This rule provides the overall guidance to what type of environmental studies is required according to project by Government of Nepal.
4.	**Nepal Environmental Policy and Action Plan,**	The aims of NEPAP are: • To manage natural and physical resources efficiently and sustainably • To balance the development efforts and environmental	DSUEP should follow the aims of NEPAP to protect and conserve the physical, biological and social

SN	Legislation	Provisions	Relevancy with respect to Project
	2050(1993)	conservation for sustainable fulfilment of basic needs • To preserve endemic and endangered species and their habitats; the promotion of private and public institutions for biological resources inventory and conservation • To safeguard national heritage • To mitigate adverse environmental impact of development protects and human actions • To integrate environment and development through appropriate institutions, adequate legislation and economic incentives and sufficient public resources	environment during construction of 33kV distribution line along with substation.
5.	**CITES Act, 2017**	Prohibits for the treat and business of protected species is explained in Section 1, Rule 3 of this act. However, Sub-Rule 2 of the Rule 3 has allowed for the export and import of protected species for certain circumstances mention under sub-rule after taking approval. The Section 5 of the acts state the provision of punishment for the unauthorized import, export and provision mentioned in Section 3.	This act binds the workers along with the people not to collect, treat and business of the protected plants and animals listed in appendices of CITES.
6.	**Electricity Act 1992**	• No person shall be entitled to conduct survey, generation, transmission or distribution of electricity without obtaining license under this act. • The Electricity Act of 1992 has provision of land procurement for the development of projects that involve electricity generation, transmission or distribution. The Act states that the licensee may submit an application to GoN to purchase the land or house of any person if it is required for the generation, transmission or distribution of electricity. Upon the receipt of such an application, GoN may make the land or house, so requisitioned, available to any corporate body under the prevailing laws.	The main goal of this project is to distribute the sufficient amount of electricity by constructing 33kV line and substation by conducting the survey to minimize the impacts.
7.	**Soil and Watershed Conservation Act, 2039**	Soil and watershed conservation Act, 1982 expedient to make legal provisions on the land and watershed conservation by controlling natural calamities such as flood, landslide and soil erosion and maintain convenience and economic interests of the general	To do the works, which can act, as causative factor of flood, landslide and soil erosion should strictly be

SN	Legislation	Provisions	Relevancy with respect to Project
	(1982 AD)	public.	prohibited during the construction of this project.
8.	**Rural Energy Policy, 2006**	Rationale of formulating and implementing this policy is to create conducive environment that will self-motivate and mobilize local institutions, rural energy user groups, non-government organizations, cooperatives and private sector organization for the development and expansion of rural energy resources. The government will facilitate and promote to involve private development and expansion of new technologies. It has also envisioned subsidy provision for promotion of such renewable energy technologies.	This project helps to improve the distribution and motivate to use the electricity in rural areas of western Nepal.
9.	**Labor Act, 2074 (2017 AD)**	This labor Act was made under the management of parliament under sub-clause 1 of clause 296 of Constitution of Nepal. Sub-section 3 of Section 2 states that the employees should not be compelled to other work other than they are assigned for. In addition, Sub-section 5 of Section 2 states about prohibition of child labor in any organization and sub-section 6 of Section 2 states that there should not be any kind of discrimination among the employee's regard of religion, ethnicity, gender, origin, language or intelligence or other kind of characters.	Construction of project is only possible when the rights of labor is secure. In this project, the contractor should follow this act strictly.
10.	**Child Labor (Prohibition and Regulation) Act, 2056 (2000 AD)**	As per section 3 of this act, no child having not attained the age of 14 years shall be engaged in works as a laborer.	Child labor is strictly prohibited in this project and contractor should follow this act.
11.	**Solid Waste Management Act, 2068 (2011 AD)**	This act has been formulated with a goal of minimizing solid waste production from the target area by setting rules and regulation on solid waste management (SWM) in the country in order to develop better environment for the systematic and effective	This act provides the overall framework to manage the solid waste generated from

SN	Legislation	Provisions	Relevancy with respect to Project
		management of solid waste and to involve all the concern stakeholders in SWM practice. The main features of this act are discussion of 3R principle (Reduce, Reuse and Recycle). 3R principle seems to be very beneficial as it not only increases the life of landfill site but also save the money, which could be used for other infrastructure development. Section 4 of the act assign the local body to manage or use the solid waste discharged or dumped in collection center, transfer station or treatment plant or collected during cleaning.	households to project level. In addition, the proponent should manage the waste generated during construction.
12.	**Solid Waste Management Rules, 2070 (2013 AD)**	The solid waste management rule was formulated as per provision made in article 50 of Solid Waste Management Act, 2068. This regulation has emphasized the segregation of waste at source and mentioned that the responsibility of proper disposal and management of source belongs to the producers themselves. Section 3 of the rule describes about the segregation and management of solid waste. It has mentioned that it is essential to segregate degradable and non-degradable solid waste at source.	These rules provide the overall framework about how to reduce the volume of waste to dispose from the source during construction of substation.
13.	**Fifteenth Plan**	Vision of 15th plan is in contribution to the prosperity of the nation through sustainable and reliable development of hydropower by setting the goal which is ensure energy security through intensifying hydropower generation. In addition, one of the strategies of government of Nepal in 15th plan is to make the distribution system effective and reliable to increase energy efficiency and increase power consumption by expanding access to electricity by formulating the required policies.	This 5-year interim plan sets the goal about generation and distribution of hydroelectricity in Nepal, which is directly related to this project.
14.	**United Nations Framework Convention on Climate Change**	UNFCCC, Signatories: 165. Parties: 195. (1), Article (4), commitment (f) states climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects	Goal of this project is to replace the traditional form of energy by clean energy i.e., electricity which ultimately reduces the air pollution and

SN	Legislation	Provisions	Relevancy with respect to Project
	(UNFCCC), 1992	on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change. After it entered into force on 21 March 1994, in accordance with, it mandates the individual state for prioritization of resource conservation with development.	smoke.
15.	**Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 and its Amendment 2014/52/EU**	This Directives in Annex II 3(b) speaks for Projects Referred to in Article 4 (2) for only on "Industrial installations for carrying gas, steam and hot water; transmission of electrical energy by overhead cables (Projects not included in Annex I)" should follow EIA study.	As per the nature and scope of the details, the proposed Subproject is of electricity distribution system instead of overhead electricity transmission lines for which no EIA level study is required.
16.	**ILO 169**	The main objective of this convention is to secure the rights of indigenous and tribal people along with the gender equality and non-discrimination of workers during work. The Article 1 on First Part of this convention mainly focused on following points: (a) the social, cultural and economic conditions of tribal people in independent countries differentiate from other parts of the national community and their status is managed fully or partially by their own customs or traditions or by special laws or regulations; (b) people in independent countries who are regarded as indigenous on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonization or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions. • Self-identification as indigenous or tribal shall be regarded as a fundamental criterion for determining the groups to which the	Nepal is the part of ILO convention that's why ILO 169 should strictly followed during construction and implementation of any types

SN	Legislation	Provisions	Relevancy with respect to Project
		provisions of this Convention apply. • The use of the term people in this Convention shall not be construed as having any implications as regards the rights, which may attach to the term under international law.	
17.	**Environment and Social Management Framework**	• ESMF is to guide DSUEP sub-projects in the area of E&S management using appropriate instruments, methodologies, procedure and responsibilities during the project cycle. NEA and the project partners shall apply during design and development of the sub-projects in order to comply with the Government of Nepal E&S regulations and the EIBs' standards on E&S assessment and management, Involuntary Resettlement, Indigenous People, Gender, etc.).	Main guiding document for E&S study to identify issues and recommending appropriate practical augmentation/ mitigation measures
18.	**Environmental and Social Policy (ESP)**	• This policy speaks for the mandatory E&S requirements for each Project like, screening, DDR, E&S Assessment, ESMP, ESMF, Information Disclosure, Consultation and Monitoring and Evaluation.	Mandatory requirement for ESMP study
19.	**EIB E&S Standards**	• This Standard recognizes the importance of the promoters' commitment to effective and sustained environmental and social performance through the establishment of an environmental and social management system commensurate with the identified impacts and risks.	Mandatory requirement for ESMP study

ANNEX 10: DUE DILIGENCE REPORT

I. PROJECT DESCRIPTION

A. Background

Distribution System Upgrade and Expansion Project (DSUEP), hereinafter referred as *"Project"*) is expected to enhance and expand the electricity distribution system to improve the reliability (voltage level and reduction in power loss) and coverage of electricity supply in the Sudhurpaschim, Karnali and Lumbini Provinces. The Government of Nepal (GoN) and Nepal Electricity Authority (NEA) have agreed to receive loan financing from European Investment Bank (EIB) to 13 Subprojects under DSUEP. The Environmental and Social Management Framework (ESMF) has provisioned that the Subprojects that are likely to have environmental and social risks/impacts easily addressed through ESMP are categorized as Category III Subprojects requiring Due Diligence Report (DDR) along with ESMP report. The main objective of the E&S due diligence process is to review any potential social issues and risks associated with the activities related to the sub-projects. The Jogikuti-Mangalapur Electricity Distribution Line Subproject (hereafter referred to as "*Subproject*") is one of the 13 Subprojects being constructed under DSUEP.

B. Subproject Components

This DDR is focused on the impacts of the following components;

a) **33kV Substation:** The substation 33/11 kV of capacity 24MVA has been proposed. The major component of the substation is Power Transformer of ONAN/ONAF (Oil Natural Air Natural/Oil Natural Air Forced) cooling mechanisms; which is supported by the switchgear (Circuit Breaker, Earth Switch, Current Transformer, Potential Transformers) components and Civil Structures like control building, guard house, staff quarter, switchyard, boundary walls, internal access road, drainage and essentials.
b) **33kV Distribution Line:** The 33 kV DL of 0.549 km length serves as the pathway for feeding electricity to the proposed substation. In general, 33 kV line comprises of the Steel Tubular Poles, Insulators, Conductors and Supporting Stays.

II. SUBPROJECT DESCRIPTION

The Subproject is located at Mangalapur, Tilottama Municipality-7 of Rupandehi District of Lumbini Province. The site is approximately 268 Km through Prithivi Highway, Narayanghat-Mugling Highway, East-West Highway and Siddhartha Highway in southwest of Kathmandu. It constitutes of 33/11kV substation of capacity 24MVA and 33kV distribution line of 0.549Km length in 1.02ha land. The substation land is owned by Government and managed by Tilottama Municipality.

III. FIELD WORK: ASSESSMENT AND PUBLIC CONSULTATION

Literature review comprised the review of previous relevant reports, EIB's Environmental and Social Safeguard documents, ESMF for DSUEP and feasibility study reports, and relevant social safeguard documents prepared by the NEA. The study team had conducted field visit from 2078/06/03 to 2078/06/10 (19-26 September 2021) and 2078/09/11-12 (26-27 December 2021). Local level stakeholders including the users, local people and teachers were notified through a notice from NEA which included the objectives, venue, and time of consultation

requesting their presence in the consultation meeting. The meeting was conducted at the ward office and substation area on 2078/06/05 and 2078/09/12 (21 September and 27 December 2021) respectively. Hard copies of Subproject features and activities were shared in Nepali language during the consultation. Construction activities and possible environmental and social issues during Subproject implementation was briefed. In total, 18 participants (5 female and 13 male) participated in the meeting. The views/consent, concerns, recommendations/suggestions, and demands of the participants were documented in the form of minutes (ANNEX 6).

IV. SOCIO-ECONOMIC PROFILE

In Tilottama Municipality, the male population is 47,178 and female population is 52,971 aggregating the total population to 1,00,149. Ward No. 7 has the total population of 9,170 among which 4,237 are male, and 4,933 are female living in 2,124 households. The majority ethnic composition nearby the Subproject area is of Chhetri/Brahmin (Terai) and Tharu/Chaudhary. Nearly 75% population rely on agriculture based earning source along with daily wage labor, small trade and business/enterprises and services. During consultation, it was known that two users were cultivating agriculture crops as a secondary income source (ANNEX 6).

V. SOCIAL IMPACTS

i. The substation land of 1.02ha is owned by the Government and is managed by Tilottama Municipality. Tilottama Municipality has decided to provide 1.02ha land for NEA to construct substation on 2075/04/16 (ANNEX 2). The two land users who are cultivating the land will be affected. The household income source for these two users will get affected nominally by the Subproject implementation.

ii. No relocation impacts or impacts on structures and private land acquisition are anticipated at any of the identified proposed Subproject footprint area.

No negative impact are envisaged on the culture and livelihood of Chhetri/Brahmin (Terai), Tharu/Chaudhary, Muslims, and other community at the time of Subproject construction.

VI. ENTITLEMENT MATRIX

Components	Capacity/ Length with No.	Area (Sq.m)	Land Ownership	Involuntary Resettlement (IR) Impacts	Indigenous People (IP) Impacts	Proposed Mitigation Measures
Construction of New Substation A.	24 MVA/ 1	Required: 1.02ha	GoN	Tilottama Municipality has allocated land for substation construction by NEA (**ANNEX 2**). The land is being cultivated by 2 users. Of total land, only a part will be used for 33kV substation construction. No any structures are present on the proposed site. No IR impacts are anticipated.	The land users are from Tharu/ Chaudhary people cultivating agriculture crops. No negative impact on the religious sites, professions, customary rights, religion and values of Tharu/Chaudhary, Muslims, and other community at the time of Subproject construction.	Appropriate financial assistance and crop loss compensation will be provided as provisioned in Table 3-9.

VII. INFORMATION DESSIMINATION

The DDR is publicly available in Nepal Electricity Authority Office and Project Implementation Unit.

VIII. GRIEVANCE REDRESS

The Subproject will entail the concerned party submitting a grievance either in-person, or via phone, letter, or email to the Site-Engineer or the concerned Municipality Chief or the concerned Ward Chair. The Site-Engineer will record such complaint. In cases where Ward Chair has received such grievance, s/he should forward the grievance to the Site-Engineer. The Site-Engineer shall notify the committee members of Tier-I and arrange meeting to resolve the received grievances. The Subproject level GRM committee will ensure the grievances are addressed. If not resolved, such grievances will be forwarded to Tier-II and then to Tier-III as described in **Section 3.6**.

IX. CONCLUSION

The due diligence study findings suggests that there are minimal social impacts associated with the Subproject which will be addressed with minimal mitigation measures. No relocation impacts or impacts on structures and private land acquisition are anticipated at any of the identified proposed Subproject footprint area except for addressing the secondary income source of two land users in the substation footprint area (addressed in Table 3-8). NEA will address the total implementation cost as estimated in Table 4-13.