ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

DUBICHAUR-DHIKPUR DISTRIBUTION LINE SUBPROJECT

SUBSTATION (33/11 KV) AND DISTRIBUTION LINE (33 KV)

DANG DISTRICT, LUMBINI PROVINCE

NEPAL ELECTRICITY AUTHORITY

DISTRIBUTION AND CONSUMER SERVICE DIRECTORATE

DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT (DSUEP)

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ABBREVIATIONS

ACSR	Aluminum Conductor Steel Reinforced
AIIB	Asian Infrastructure and Investment Bank
BES	Brief Environment Study
COVID-19	Corona Virus Disease
CDP	Community Development Program
CPA	Core Project Area
DCSD	Distribution and Consumer Services Directorate
DHM	Department of Hydrology and Meteorology
DL	Distribution Line
DSUEP	Distribution System Upgrade and Expansion Project
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EPA	Environment Protection Act
EPR	Environment Protection Regulation
EMF	Electromagnetic Field
ESP	Environmental and Social Policy
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
ESSs	Environmental and Social Standards
GHG	Green House Gas
GIS	Geographic Information System
GoN	Government of Nepal
GRM	Grievance Redress Mechanism
IEE	Initial Environmental Examination
IP	Indigenous People
IUCN	International Union for Conservation of Nature
IUSGS	International Union of Geological Sciences
LPG	Liquid Petroleum Gas
MDB	Multilateral Development Bank
MoEWRI	Ministry of Energy, Water Resources and Irrigation
MHT	Main Himalayan Thrust

NEA	Nepal Electricity Authority
PPE	Personal protective equipment
RM	Rural Municipality
RoW	Right of Way
SMC	Sub Metropolitan City
SPA	Surrounding Project Area
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
US EPA	United States, Environment Protection Agency
USGS	United States Geological Survey
VC	vulnerable community

Unit

%	Percent/ Percentage
CO_2	Carbon dioxide
dB	Decibel
g	Gram
ha	Hectare
HHs	Households
Kg	Kilogram
Km	Kilometer
kV	Kilovolt
kWh	Kilo Watt Hour
ltr	Liter
LV	Low Voltage
m	Meter
masl	Meter Above Sea Level
mm	Millimeter
MVA	Mega Volt Ampere
MW	Megawatt
NRs.	Nepalese Rupees
^oC	Degree Centigrade
sq.m.	Square Meter

EXECUTIVE SUMMARY

Description of Project: Nepal Electricity Authority (NEA) under Ministry of Energy, Water Resources and Irrigation is responsible for the implementation of the Distribution System Upgrade and Expansion Project (DSUEP). DSUEP will enhance the distribution system to improve reliability and quality of electricity supply in the Karnali Province and Lumbini Province. The proposed **Dubichaur-Dhikpur Distribution Line Subproject** is located in Ghorahi Sub-Metropolitan City (SMC), Ward No. 9 of Dang District in Lumbini Province. The Subproject requires 0.51 ha of land (Government Land) for the construction of substation. The 2.67 km of 33 kV distribution line passes along the Right of Way (RoW) of the roads, and the edge of the farm lands. The proposed subproject is financed with loan by Asian Infrastructure Investment Bank (AIIB).

Description of Environment

Physical Environment: The Subproject (substation and distribution line) area lies in Dang Valley of Chure Range. The substation lies at Latitude 28°3'47.03"N, Longitude 82°21'59.27"E and elevation of 606 masl. The climate of the Subproject area is sub-tropical. The average maximum temperature during summer fluctuates between 29° C & 38° C and minimum temperature in winter season ranges range from 10° C to 18° C. The average annual rainfall is estimated at approximately 1500 mm per year. The air quality and noise level of the SPA was found within the range of National Ambient Air Quality Standard and Noise Quality Standard, respectively. No water sources were recorded within distribution line (33kV) and nearby the substation area.

Biological Environment: The proposed Subproject (substation and distribution line alignment) Core Project Area avoids the forestland. The Subproject does not lie in any protected area, although it is located in the Chure region without any induced impact to the biological environment. The Subproject components substation and 33 kV distribution line does not intercept any forest areas, thus there will be no any issues of tree loss. The surrounding environment of the Subproject area contains sparse vegetation with species common to the area. Similarly, the bird species recorded in the surrounding environment are House Crow (*Corvus splendens),* Western Spotted Dove (*Spilopelia suratensis),* Rock Dove (*Columba livia),* House Sparrow (*Passer domesticus),* Tree Sparrow (*Passer montanus),* Grey Francolin (*Francolinus pondicerianus) and* Common Quail (*Coturnix coturnix*).

Socio-Economic Environment: The major ethnic compositions within the surrounding project area i.e., Ward No. 9 of Ghorahi SMC are Tharu (24.38%), Chhetri (26.14%) and Dalit (12.56%) of total population 7,434. The implementation of this Subproject will increase the electricity beneficiaries to 8,440 HHs, 107 commercial establishments and 75 industries. Ghorahi and Tulsipur are the nearest business market nearby the Subproject area. The transportation facilities in this local level seems to be satisfactory. Tube-well and tap/piped water is the main source of drinking water in the surrounding area. People of the Subproject have access with communication facilities mainly through mobile telephone services. The nearest and easily accessible well-equipped health facility to the proposed Subproject is in Ghorahi, located at 30-minute driving distance from substation site. The main occupation of people in the area is agriculture with nearly 70% contribution followed by small trade business/enterprises and services.

Potential Impacts and Mitigation Measures: Civil works will be involved with temporary impacts on air, noise and water quality and occupational and community health and safety; particularly related to working with electricity and in the context of the COVID-19 pandemic. Long-term impacts, although insubstantial, during operation and maintenance include occupational and community health and safety risks related to the presence of electricity infrastructure. The potential environmental issues and mitigation measures identified in screening and the preparation of ESMP report will be addressed during the compliance monitoring carried out by the safeguard team. No issues were identified in the land requirement procedure and pole erection activities. Construction of substation and erection of poles for distribution lines would not affect any private structures as the proposed substation land is unused government land, and local people have agreed & permitted to install poles at the edge of farm-lands without affecting any private structures along the distribution line. The ESMP cost estimated for the Subproject is NRs 13,00,000.00 associated to mitigation measures and monitoring activities. NEA Project Implementation Unit has agreed on the estimated cost for the mitigation measures and monitoring activities.

Environmental and Social Management Plan: The ESMP serves as a guide to implement environmental and social mitigation measures and responsibility of the concerned agencies during the construction and operations of the Subprojects. Monitoring and inspection of the environmental and social activities will be carried out by Environment and Social Management Unit and Project Supervision Consultant of PIUESMP will be an integral part of the contractor's Bidding document which will be updated by the contactor during the sub-project construction period.

Institutional Arrangements: To ensure the full compliance to the ESMP, institutional arrangement for monitoring and reporting has been proposed. All the resources needed for the implementation of ESMP for the construction and operation phase will be provided by the PIU. Project Supervision Consultant's with Environmental and Social Safeguard Specialist will be responsible for compliance monitoring activities during the construction phase. Environment and Social Management Unit of NEA will provide regular updates to the site offices regarding the implementation of ESMP. Contractor shall prepare an Environment, Health and Safety (EHS) plan approved by the PIU before field mobilization. Contractor should mobilize a safety officer at each work site during the construction period.

Public consultation: Public consultations have been conducted in the Subproject area. People in the Subproject area noted that electricity service is poor with frequent interruptions. People have suggested to install poles at the edge of farm-lands, and project components should not affect any house and structures along the line. The impacts on the crops while stringing of lines should be minimized. Prospective electricity consumers and people to be affected are supportive and have recommended for quick implementation of the project.

***Grievance Redress Mechanism (GRM)*:** A three-tier 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 issues at Subproject level. In each Subproject, two levels i.e., Tier-I and Tier-II of Grievance Redress Mechanism have been established. During the ESMP study period, NEA has disseminated

letters to the local level stakeholders regarding the formation of the GRM at the Subproject level.

Conclusion: The environmental impacts envisaged from the implementation of proposed Subproject are site specific, short term, temporary and reversible in nature. The Subproject will provide significant benefits to people and economy by providing the reliable and improve electricity supply. This ESMP is considered sufficient to mitigate the environmental and social issues identified for the Subproject and will be updated during the Subproject construction stage.

1. INTRODUCTION

1.1 Project Background

The proposed Distribution System Upgrade and Expansion Project (DSUEP) will enhance the distribution system to improve reliability and quality of electric supply in the Lumbini Province. The project aims improvement in voltage level and reduction in power loss which in turn will improve Nepal Electricity Authority's (NEA) financial health, improve electricity supply reliability, and reduce dependence on petroleum-fueled accessories. Government of Nepal (GoN) has envisaged DSUEP to extend the reach of 33 kV and 11 kV distribution lines "to achieve affordable electricity fulfilling the demands at the local levels for all the households by 2022". Asian Infrastructure Investment Bank (AIIB) is financing a loan to upgrade existing and build new distribution systems in Lumbini Province and Karnali Province of Nepal. This ESMP is prepared for Dubichaur-Dhikpur distribution line Subproject of DSUEP.

This Subproject has three major components:

Component 1: construction, extension and augmentation of distribution lines and substations, especially 33 kV lines and 33/11 kV substations.

Component 2: construction of 11 kV lines, distribution transformers, and Low Voltage (LV) lines for new power distribution facilities.

Component 3: Capacity Building, Project Implementation Support, and Technical Assistance.

1.2 Scope of Study

This study ensures that the project meets the requirements of Nepal Government's Environmental Regulations and Environmental and Social Policy (ESP) & Environmental and Social Standards (ESSs) of AIIB. This report provides the measures for environmental and social management, monitoring and reporting of the project.

1.3 Objective of ESMP

The Environment and Social Management Plan aims to sets out the measures required to maximize the benefits of the project; and to avoid, minimize and mitigate any adverse environmental and social impacts caused by the project. The objectives of this ESMP are to:

- Describe the existing natural and socio-economical resources in and surrounding the Subproject area;
- Based on existing environmental conditions, identify and access potential significant impacts during project preconstruction, construction, and operation & maintenance stages;
- Identify and recommend mitigation measures to minimize any potential impacts caused by Subproject activities;
- Identify the local concerns on environmental and social issues, and address them;
- Develop environmental management plan and monitoring plan including cost;

- Recommend institutional arrangement, including capacity building to ensure proper environmental and social safeguards implementation during construction and operation phases.

1.4 Legal Provision

Rule 3 (1) of Environment Protection Act (EPA), 2019 describes completing Environmental Studies as per Schedule 1 or 2 or 3 under Environment Protection Regulation 2020 (First Amendment in 2021/05/24 on Nepal Gazette). For this Subproject, none of the legal provisions are compliable to Schedule 1 or 2 or 3, and hence, detailed environmental studies (Brief Environmental Study (BES) or Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) is not mandatory. According to the E & S safeguard Screening report, safeguard risks/issues identified for this Subproject fall under Category III (ESMF), which triggers the preparation of ESMP to execute the Subproject. This Subproject has minimal or no adverse environmental and social impact; does not physically displace any family; and does not result in economic displacement of more than 10% of productive assets for any family.

1.5 Methodology for the ESMP

The methodology adopted for this ESMP study is as follows:

i. Literature Review: Published literature of government institutions and international organizations were reviewed to collect information on project surroundings. The Municipality/Rural Municipality (RM) and its Ward profiles were used to collect the socio-economic baseline information of the Subproject. National policies, legislative frameworks and Multilateral Development Bank (MDB) policies were reviewed to understand the priorities and any legally binding requirements were studied that should be complied with while implementing the project. The Legislative provisions relevant to the project are listed in **Annex 4**.

ii. Field Survey and Investigation: Field surveys were conducted to generate information on the physical, biological and socio-economic environment of the Subproject area. The air quality data was recorded using Temtop Airing-1000 PM Detector, noise level using UNI-T UT 353 Mini Sound Meter (dB) and water quality using EXTECH ExStik II DO600. Field observation of the core project area and the surrounding vicinity (within 500m) of Subproject footprint area was considered for the biological assessment. Consultation was conducted with local communities around substation site and the settlement areas that benefit from the project.

iii. 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, and also complied to national requirements. Geographic Information System (GIS) was used for the field assessment and analysis of the CPA and SPS data and presentation of the maps in the ESMP report. The Subproject footprint Ward and Municipality/RM were considered for the collection of socio-economic and baseline information.

iv. Impact Evaluation: Significance of impacts were evaluated based on reversibility, nature, magnitude, extent and duration of the impact. Identification of magnitude, extent and duration is as provided in the National EIA Guidelines, 1993 of Nepal. Evaluation if impacts and their mitigation measures are based on expert opinion and inputs from DSUEP's technical and safeguard consultant team.

v. Public Consultation: As per the Government of Nepal EPA and the AIIB Environmental and Social Policy (ESP), pre-notifications with subject of consultation, venue, and time were given at Subproject footprint area, local level and affected Ward office in presence of concerned local stakeholders. Consultations were conducted in the Subproject area; at substations and the distribution line system settlement areas with local stakeholders.

vi. Report Format: The ESMP report is prepared as per the Environmental and Social Policy (ESP) of the AIIB, which contains an executive summary, a main report, and annexes as appropriate, including one on the nature and findings of consultations undertaken. All the comments and suggestions from the field consultation are mentioned in the ESMP report.

1.6 Classification of Impact Area

The National Environment Impact Assessment Guidelines (GoN, 2050) has defined "Core Project Area", and "Surrounding Project Area" based on proximity and magnitude of the impacts during construction and operation of the proposed project.

Core Project Area (CPA) refers to the temporary and permanent area for the proposed project construction and associated activities. It is the area where direct impacts can be seen. For **Dubichaur-Dhikpur Distribution Line Subproject**, proposed substation area with 0.51 ha and Right of Way (RoW) of 33 kV distribution line with 2.67 km length is considered as CPA. The Subproject components are located within the Ward No.9 of Ghorahi Municipality. The major settlements in the subproject area are Pokhara and Dubichaur. The distribution line stringing route passes along the cultivated land (0+000 to 2+000) and along the RoW of the road alignment (2+000 to 2+600).

Surrounding Project Area (SPA) is the immediate vicinity (500m) of the footprint location of the proposed Subproject site. SPA is the moderate and indirect impact area. For this Subproject the 33 kV distribution line will be located within the Ward No. 9 of Ghorahi SMC and the adjoining Wards; Ward No. 11 of Ghorahi SMC and Ward No.17 of Tulsipur SMC of Dang district is considered as SPA. The SPA will have impact with the beneficiary's area of 11 kV lines and Low Tension (LT) lines service. The impact area showing the CPA and SPA area is presented in the google map **Figure 1-1**.

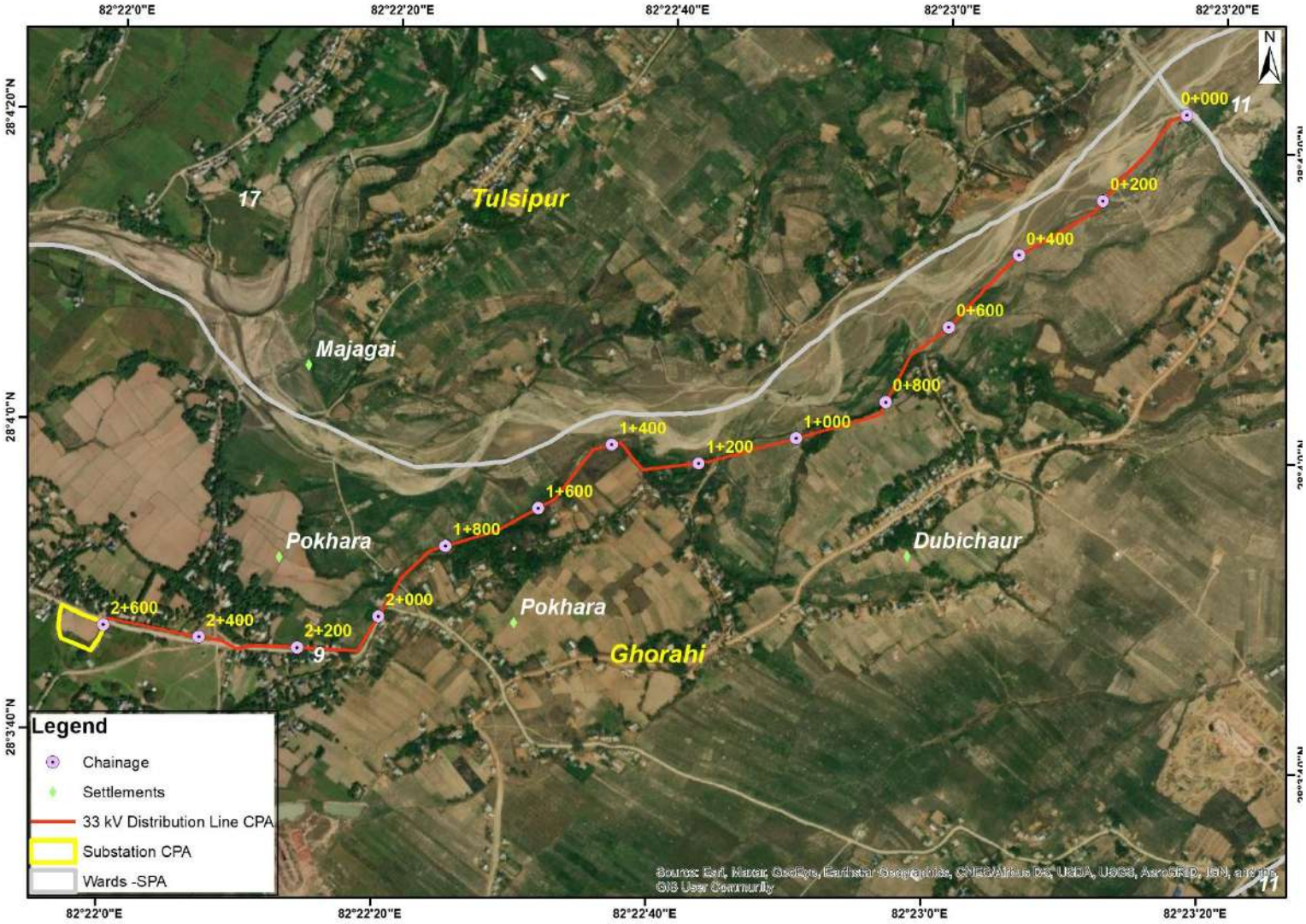


Figure 1-1: Core Project Area (CPA) and the Surrounding Project Area (SPA) Wards of the Dubichaur-Dhikpur DL Subproject

2. DESCRIPTION OF THE SUBPROJECT

2.1 Subproject Location and Accessibility

The proposed **Dubichaur-Dhikpur Distribution Line Subproject** is located within Ghorahi Sub-Metropolitan City (SMC), Ward No. 9 of Dang District in Lumbini Province. The tapping point of 33 kV line lies in Ghorahi-Tulsipur Highway at Khaira near Hapur Khola. The proposed distribution line (33 kV) is of 2.67 km length and run by the edge of private farm lands, Hapur Khola and RoW of access road. There is the access to road within the proposed Subproject Ward area. The Subproject location with the road accessibility is presented in the map below **Figure 2-1**. The main features of the Subproject are presented in **Table 2-1**.

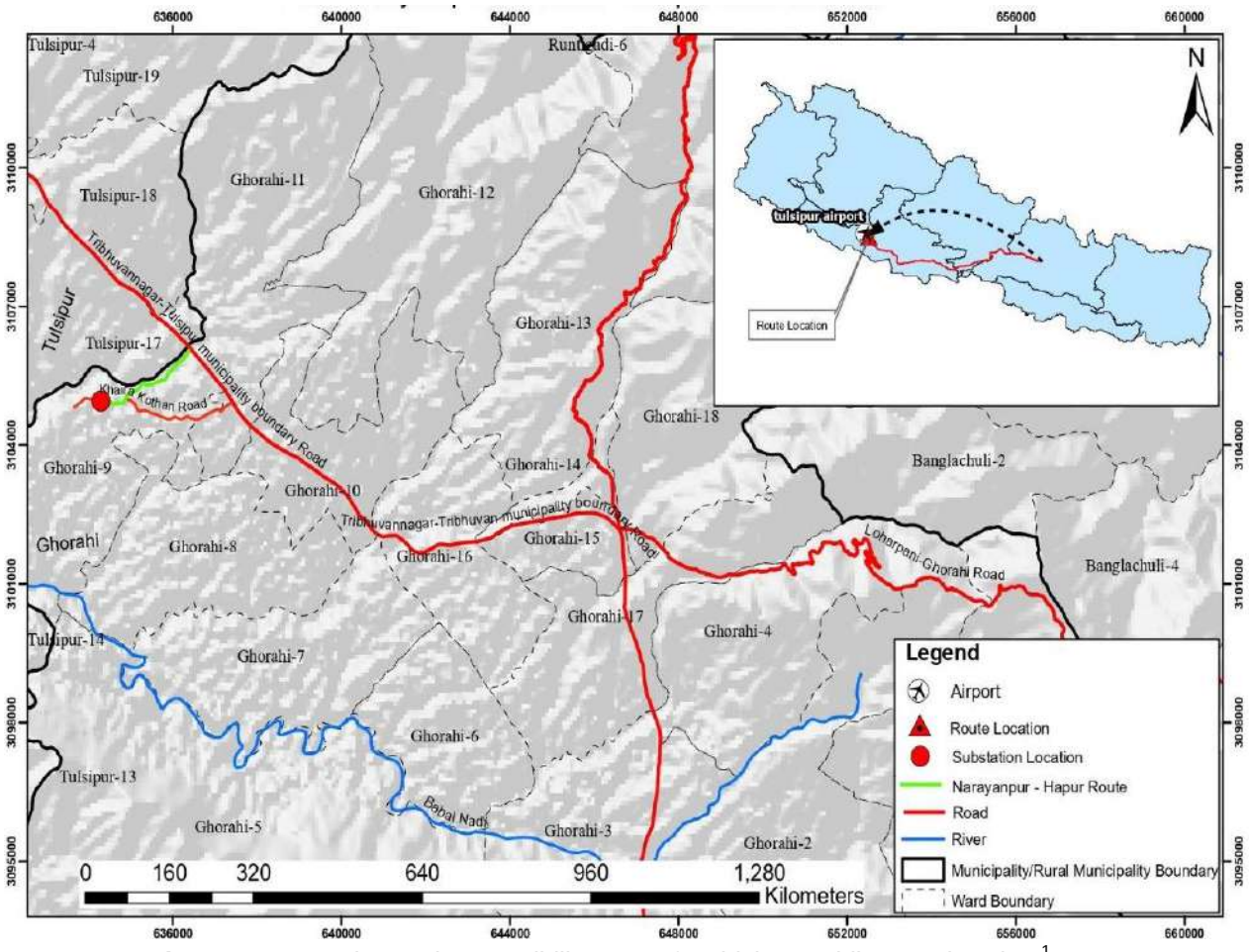


Figure 2-1: Location and Accessibility Map of Dubichaur-Dhikpur Subproject[1]

[1] *Source: Department of Survey, 1995 and Field Study 2021*

Table 2-1: Technical Description of the proposed Subproject

Description	Features
Proponent	Nepal Electricity Authority
Project	Distribution System Upgrade and Expansion Project (DSUEP)
Subproject	**Dubichaur-Dhikpur Distribution Line Subproject**
Funding Agency	AIIB
Project Location	Ghorahi SMC-9, Dang, Lumbini Province
Distribution Line	
33kV Line Starting Point	Tapped from Existing Jhinni - Tulsipur 33 kV DL at Ghorahi SMC-9, Khaira, Dang. Co-ordinate: Lat 28°4'22.05"N, Long 82°23'17.78"E
33kV Line End Point	Makundanda Substation (Proposed) at Ghorahi SMC-9, Makundanda, Dang Co-ordinate: Lat 28°3'47.03"N, Long 82°21'59.27"E
Land type	Government/Private
System Voltage	33 kV
Max, Min System Voltage	36, 30 kV
Climatic Condition	Wind Speed: As per IS 802-1-1 Maximum Ambient Temperature: 40 ^{o}C Altitude (Min, Max): 606, 617 masl
Length of Line/ No. of Pole	2.67 km/67 Poles
Right of Way	6 m
Number of Circuit	1
Conductor	ACSR Dog
Line Capacity/Thermal Limit (approx.)	13.4 MW at 0.9 power factor
Type	Steel Tubular Pole with 11m/13m Height
Pole Configurations	Single Pole Structures, H-Pole Structures etc. (With and without Stay Sets)
Diameter of a Single Pole (approx.)	0.22m (As per IS 2713-3)
Planting Depth of Pole	2.2m
Insulators	Porcelain Disc and Pin Insulator
Substation	
Location	Ghorahi SMC-9, Makundanda, Dang Co-ordinate: Lat 28° 3'47.03"N, Long 82°21'59.27"E Elevation: 606 masl
Land type	Government
Voltage Level	33/11 kV
Substation Capacity	8 MVA
Number and Capacity of Transformer	1 nos., 6/8 MVA
Type of Transformer	3 Phase, ONAN/ONAF, Mineral Oil
Type of Substation	AIS (33kV) and Indoor (11kV)
Number of 33kV Line Bays	1
Number of 33kV Transformer Bays	1
Number of 11kV Feeders	4
Substation Area	0.51 ha, Parcel Number (Dhikpur 6ka, 541)

2.2 Subproject Components

The major components of the Subproject are the 33/11 kV substation and 33 kV distribution line (DL). The 33 kV DL is tapped from an existing 33 kV network line and acts as a source feeding to the proposed 33/11 kV substation. 11 kV distribution feeders emerge from the substation, eventually supplying the electricity to the consumers. The structures of the Subproject are briefly described below.

2.2.1 33 kV Distribution Line (DL)

The 33 kV 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 33 kV lines comprises of the Steel Tubular Poles, Insulators, Conductors and Supporting Stays. Length of distribution line is 2. 67 km and the total number of steel tubular poles to be erected are estimated as 67.

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 33 kV 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 33 kV 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.

2.2.2 Substation

The proposed substation 33/11 kV is of capacity 6/8 MVA. The substation plays the role of lowering the 33 kV voltage level to 11 kV, which will then be stringed as distribution feeder to supply the consumers. The major component of the substation is power transformer, which is supported by the switchgear components and Civil Structures. The facility and components' sample pictures are shown in **Annex 3**.

Transformers: Transformer is the major component of the distribution substation. It transforms power from higher voltage to lower voltage for distribution purpose. Power Transformers are used for the 33/11 kV 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 33/11 kV 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 6/8 MVA ONAF type.

Electrical Switchgear: Electrical Equipment comprising of Circuit Breaker, Earth Switch, Current Transformer, Potential Transformers, etc. installed in the substation are called Electric Switchgear. They facilitate the objective of power conversion.

Civil Structures: A control building is essential for the operation of the substation. It houses the operating station, along with battery systems. Guard House and Staff Quarter are other essential buildings for smooth operation of the substation.

Switchyard, Boundary, Roads, Drainage and Essentials: The outdoor civil structure in the proposed substation includes the 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 component wise 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.

2.2.3 11 kV Lines and LT Lines

11 kV lines and LT lines take the access of electricity to the consumer households. It is why the construction of those lines are always encouraged by the local people. The line route, thus the installation of poles and lines, are envisaged to go through the edge of local roads. If any line route pass through any private lands, permission from the corresponding land owner will be taken before construction of those lines.

The detailed line route survey for 11 kV and LT lines have not been done yet. A separate screening will be prepared for 11kV lines. The scope of detailed survey is in the scope of the construction Contractor. The construction Contractor will conduct Pre-Construction Survey (PCS) to finalize the line route of 11 kV lines and LT lines for the construction. PCS will prepare the detailed line route of those lines and submit to PIU for approval. After the detailed line route is submitted by the Contractor and approved by PIU, E&S team of Project Supervision Consultant (PSC) will conduct an E&S study and submit the findings that

- Do the lines pose any adverse Environmental or Social issues?
- If there are any Environmental or Social issue, how can they be resolved? If the lines do not pose any adverse Environmental or Social issue, the lines will be cleared by PIU after seeking concurrence from AIIB.
- If the solution measures are not implementable in the field, PCS will suggest for any other way to divert or reroute the lines? If yes, PCS will propose alternative line route. The lines will be cleared by PIU after seeking concurrence from AIIB, given that the lines do not pose any adverse Environmental or Social issue.

2.3 Major Construction Activities in the Subproject

Activities in the Subproject area can be sub-divided into three categories viz, Pre-Construction Phase, Construction Phase and Operation Phase. The proposed Dubichaur-Dhikpur Line Subproject does not intercept forest area, thus there will be no issues of tree loss in the RoW of 33 kV lines and the substation area.

I. **Preconstruction phase**: The activities to be carried out before the construction phase are:
- Demarcation of land area for the proposed substation
- Receive public opinion
- Make clearance of the substation land area permanently
- Distribution line route selection

II. **Construction phase**: The activities to be carried out during the construction phase are:
- Assign the land area for temporary storage of construction materials
- Transportation of construction materials
- Leveling of land area for the proposed substation
- Construction of substation structures
- Pole erection work for 33 kV, 11 kV and low-tension distribution lines
- Stringing of 33 kV, 11 kV and low-tension distribution line

III. **Operation phase**: The activities to be carried out during the operation phase are:
- Maintenance of the substation and 33 kV distribution line route

2.4 Energy to be used

During the construction period diesel fuel will be used to power construction equipment and transport vehicles, which emits air pollutants and greenhouse gases in insignificant quantity. Use of firewood shall be restricted in the labor camp, whereas the workers shall be provided LPG for cooking.

2.5 Land Required

The **Dubichaur-Dhikpur Subproject** will require about 0.51 ha land for building the substation. The land is protected by Ghorahi Sub Metropolitan City and managed by Shree Primary School at Makundanda. The Ghorahi SMC with the agreement of the Shree Primary School has already given written permission to NEA to construct the substation in the designated area. The 33 kV distribution line of 2.67 km passes along the RoW of the road and the edge of private farm lands by the bank of Hapur Khola. Poles shall be installed at the edge of farmland, which will not affect the usability and valuation of the lands.

2.6 Material Requirement and Sources

A 33/11 kV substation, 33 kV, 11 kV and low-tension distribution lines will be constructed for this Subproject. Minimal excavation at the pole locations will be done to erect steel tubular poles of 11 m and 13 m. The depth of burial for 11 m (approximately 256 kg) and 13 m

(approximately 343 kg) poles are 1.8 m and 2.17 m respectively. The construction works for substation will not produce significant amount of spoils and thus it will not require spoil-dumping site. Similarly, excavation works carried out for digging pit holes for poles produces insignificant spoils which does not require management of earthworks.

Civil construction works will involve excavation for foundation of substation, steel reinforcement, cement, coarse aggregates, and fine aggregates (sand). Materials will be procured from legally operating local markets. Following estimated volume of construction materials are required for the proposed 33 kV distribution line and the substation.

Table 2-2: Approximate Quantity of Material for 33 kV line

SN	Particular	Unit	Requirement
1	Amount of Steel	Ton/Km	5800
2	M15 concrete for Pole base	Cum/Km	12.5

Source: Design Report, DSUEP

Table 2-3: Approximate Quantity of Material for 33/11 kV Substation

SN	Particular	Unit	Support Structures, Road, Drainage	Control Building	Staff Quarter	Office Building	Guard House
1	M15 Concrete	cum	100	25	224	120	5
2	M25 Concrete	Cum	300	170	125	75	27
3	Reinforcement bar	Ton	7	27	20	12	4

Source: Design Report, DSUEP

2.7 Major Equipment and Power Requirements

Major equipments used during the Project implementation are:

One Excavator, One Roller, One Drilling Machine, One Crane, one Grid Supply of 100 kVA Distribution Transformer, and two 50 kVA capacity diesel generators.

2.8 Workforce Requirement

Local people in the surrounding Subproject area will be encouraged for the employment. Based on the skills (skilled, semi-skilled and unskilled labor), local people will be used for the construction and both male and female will get equal opportunity during construction. The number of human resources required depends upon the complexity of the project as well as the geographical location of the project. In case, of construction of 33 kV lines and 33/11 kV substations, the workforce typically varies from terai to hilly to mountain region. Expected number of manpower employed is enlisted hereunder.

Table 2-4: Human Resource Required for construction of 33 kV line and substation in a day of Construction

SN	Human Resource/Day	For Distribution Line	For Substation
1	Engineer (No.)	1	2
2	Supervisor (No.)	2	4
3	Foreman (No.)	3	5
4	Skilled (Lineman/Electrician) (No.)	5	5
5	Helper (No.)	2	10
6	Labor (No.)	12	15

Source: Design Report, DSUEP

2.9 Construction and Implementation Schedule

Implementation of the proposed Subproject comprises construction of a new 33/11 kV substation, 33 kV lines, 11 kV lines, low tension lines, and installation of distribution transformers. It includes construction and installation of components as mentioned in subsection 2.2. The estimated completion period is 24 Months.

Table 2-5: Construction Schedule of Project Implementation

SN	Activities/ Months	**Months** *(After the completion of Detailed Survey Study)*					
		1-3	**4-6**	**7-10**	**11-15**	**16-20**	**20-24**
1.	Invitation for tender, evaluation, and award						
2.	Implementation of Environmental and Social Safeguards						
3.	Erection of Poles						
4.	Stringing of conductor						
5.	Construction of substation						
6.	Charging and Testing						

Source: Design Report, DSUEP

3. DESCRIPTION OF THE ENVIRONMENT

3.1 Physical Environment

3.1.1 Topography and Land Use

The Subproject area lies in Ward No. 9 of Ghorahi SMC of Dang District, Lumbini Province. The Subproject components are located within the Chure Range of Nepal. The proposed distribution line (33 kV) of 2.67 km passes along flat plain parallel to Hapur Khola (Stream). The tapping point is situated at Latitude 28°4'22.05"N, Longitude 82°23'17.78"E with an elevation of 617 masl (**Figure 3-1**). The proposed distribution line stringing route passes along the private farm lands parallel to the Hapur Khola, which is a tributary of Babai River, originating from the base of Mahabharat Range.

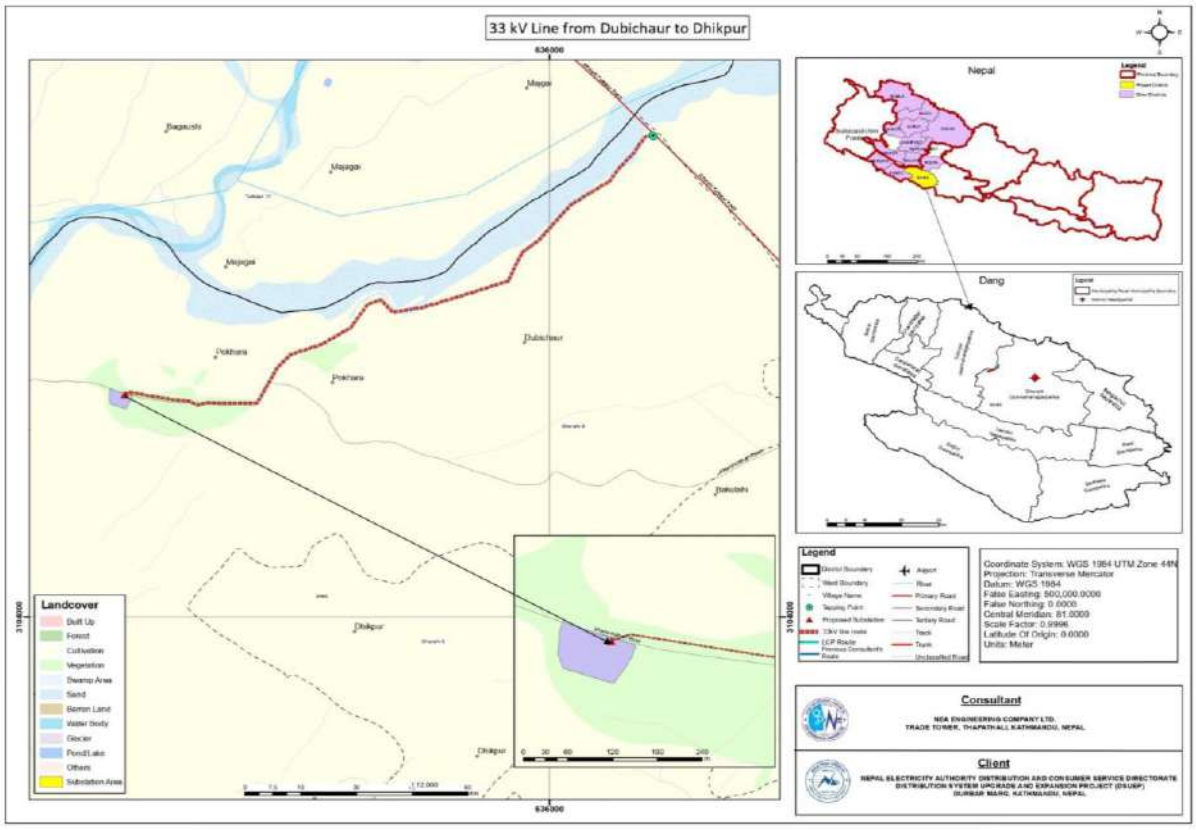


Figure 3-1: Location map and Land use details of the Subproject[2]

The substation lies at Latitude 28°3'47.03"N, Longitude 82°21'59.27"E and elevation of 606 masl. The site lies in depressed flat and barren land. The proposed substation boundary lies within 0.51 ha area. None of the private and public entities will be affected due to the implementation of the proposed Subproject, as poles will be installed within the RoW of existing road and the edges of the cultivated land. The land use map details of the Subproject are presented in **Annex 2**.

[2] *Source: Topographic Map, Department of Survey, 1995 and Field Study 2021*

Figure 3-2: Tapping Point of DL at Khaira

Figure 3-3: Dubichaur-Dhikpur Substation View

3.1.2 Geology

The Subproject area lies geologically in Dang Valley of Chure Range with Quaternary deposit. The surrounding Siwalik mountains are rocky and is made up of calcite and quartzite Group. Alluvial/loam, soft soil and Calcareous beds together with colluvium deposit and thin soil layer mixed with gravel are predominant in this area. No major geological hazard has been identified associated with the proposed Subproject except moderate chances of erosion within the expanded flood plain area of Hapur Khola.

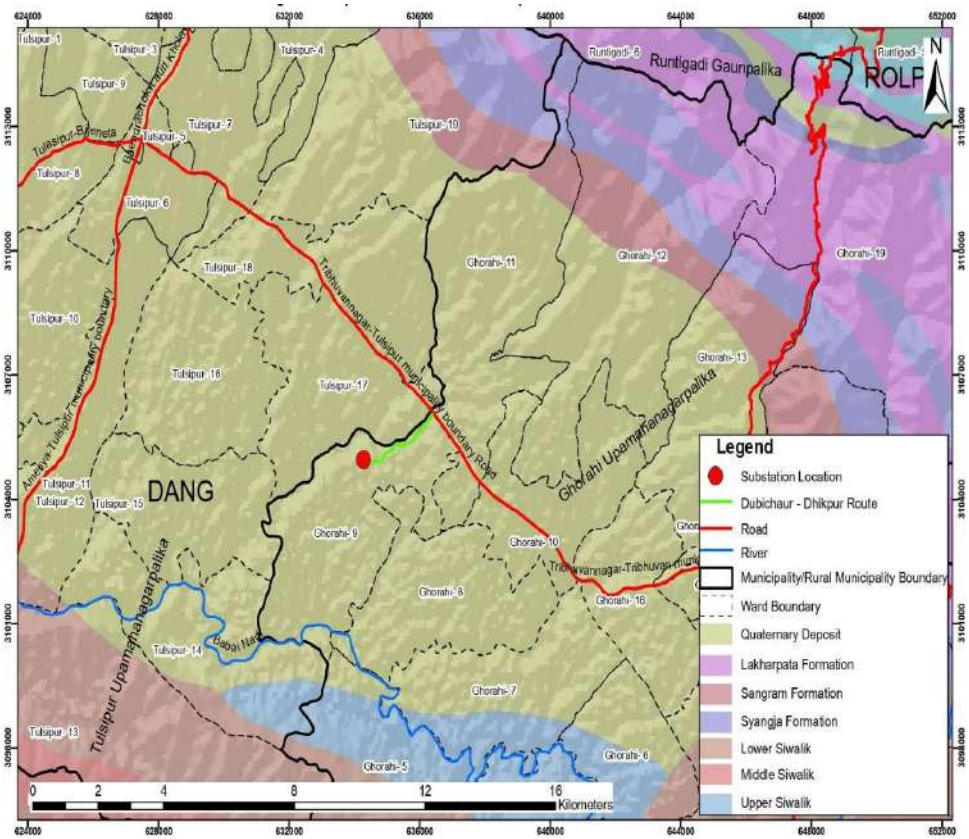


Figure 3-4: Geological Map of proposed Subproject Area[3]

[3] *Source: Department of Mines and Geology (DMG), 2020*

3.1.3 Seismology

The entire country of Nepal is in a seismically active zone caused by subduction of Indian tectonic plate under the Tibetan Plate. According to National Seismological Center of Nepal several big earthquakes have been felt in Nepal, the earthquakes of magnitude 6 to 7 are mostly confined to the Main Himalayan Thrust (MHT) between the foothills and the Higher Himalaya. Moreover, earthquake generation is confined to the crustal depth of 20 km. However, shallow earthquakes at depths down to 6 km are generated because of strike slip faults. Therefore, the substation and distribution lines of this Subproject will be designed and operated in accordance with seismic design requirements and best engineering practice. The seismic activity in Nepal between 1964 and 2019 as in IUSGS portal is shown in **Figure 3-5.**

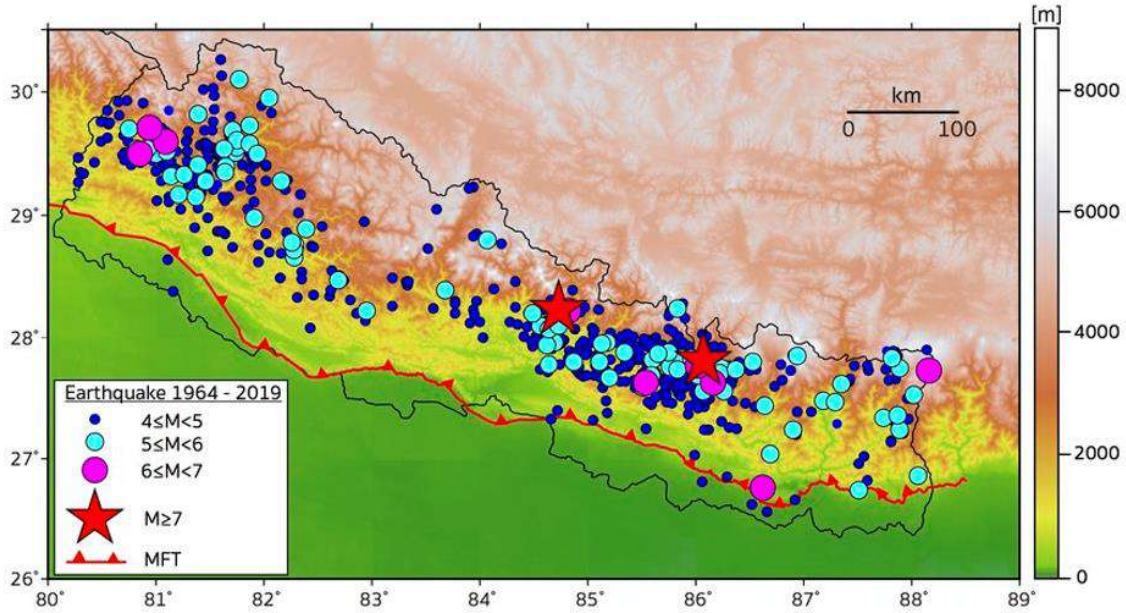


Figure 3-5: Seismicity map of Nepal from 1964 -2019[4]

3.1.4 Climate

The climate of the Subproject area is sub-tropical. According to DHM 2019, the average maximum temperature during summer fluctuates between 29° C & 38° C and minimum temperature in winter season ranges range from 10° C to 18° C. The relative humidity is in the range of 84% to 87%. The average annual rainfall is estimated at approximately 1500 mm per year. Almost 80% of rainfall occurs during monsoon (June to September).

3.1.5 Air, Noise, Water Quality and Polluting Sources

The major air polluting sources recorded are only from vehicular emission and dust problem from plying of vehicles and high wind velocity. Noise polluting sources noted at the time of field study are similar to the air polluting sources. Unnecessary honking along the access road of site is the source of noise generation. Following table shows the real-time quality of air and noise during field study.

[4] *Source: USGS catalogue, 2019*

Table 3-1: Ambient Air and Noise Quality within the Proposed Subproject Site

SN	Location/ Chainage	**Air Quality[5]-**Temtop Airing-1000 PM Detector (µg/m^3)					**Noise Level -**UNI-T UT 353 Mini Sound Meter (dB)		
		$PM_{2.5}$	**Level**	**PM_{10}**	**Level**	**Average Time of Measurement**	**Measured**	**Ref.[6]**	**Area**
1.	Tapping Point	57.3	100	27.2	200	1-hour	47	50	Residential Area
2.	Substation	20.9		29.3			40.3		

Source: Field Visit, 2021

The air quality and noise level of the SPA was found within the range of National Ambient Air Quality Standard and Noise Quality Standard, respectively.

There are no water sources within and nearby the substation area, instead 33 kV distribution line route 1.5 km will pass parallel to Hapur Khola. The physical parameters of Hapur Khola water were tested nearby tapping point.

Table 3-2: Water Quality of Stream along the Distribution Line Route

SN	DL/ SS	Location	Stream Name	Flood plain width (m)	DL distance from Stream	**Parameter-** *EXTECH ExStik II DO600*					
						Temp. (^oC)	***Ref[7].***	***pH***	***Ref.***	***EC (µc/cm)***	***Ref.***
1.	DL	Ghorahi SMC-9, Khaira (Ch. 0+000)	Hapur Khola	164	30m	27.8	<40^{o}C	7.33	5.5-9.0	112	1500

Source: Field Visit, 2021

The water quality of the Hapur Khola (stream) was found to be within accepted limit for the aquatic life. The water parameter data was assessed using Nepal Water Quality Guidelines. The construction activities of the Subproject will not have any adverse impact to the local stream.

3.1.6 Solid Waste Management

Wastes were found littered in front of HHs and along the side of the access road near Subproject area. People of the nearby area were found managing organic wastes within the household premises. Recyclable waste (large quantity) was sold to scrap collector occasionally. The estimated quantity of solid waste generation from the labor camp is shown in **Table 3-3**.

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

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

[7] *Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem, 2019*

Table 3-3: Estimated Daily Solid Waste Generation from Campsite

SN	Description	Calculation	Remarks
1.	Total Labors within the Campsite	= 20 Labors	
2.	Total Waste Generation to be Expected	= 20 * 123.62 g/capita/day = 2472.4 g/capita/day = 2.4724 kg/day	
3.	Organic Waste Composition Responsible for Foul Smell, and Rodents	= 1.26 kg/day	Assuming 51% organic waste
Rest other waste is recyclable, and non-decomposable which could be stored for long period, and have less impact on the environment if properly managed. The amount of organic waste is manageable within the Subproject site as organic waste per day will be expected to be only 1.26 kg/day.			

3.2 Biological Environment

The proposed Subproject's distribution line avoids forest but passes along the private farm lands parallel to Hapur Khola flood plain at Khaira, Ghorahi SMC-9 of Dang District. The proposed Subproject lies at an elevation below 1000 (606-617) masl in upper tropical bioclimatic zone. The proposed Subproject development site does not lie within any protected area and conservation area, although it is located within the Chure region without any induced impact to the biological environment. The Subproject components (substation and 33 kV distribution line) does not intercept any forest area, thus there will be no any issue of tree loss.

The Banke National Park lies at a distance of 16.84 km from the proposed substation site, thus there will be no any impact to the protected species of the National Park. There will be Natural stream "Hapur Khola" (stream) flows parallel along the line route of distribution line.

Altogether eight species of birds were noted around the surrounding project area; House Crow (*Corvus splendens),* Western Spotted Dove (*Spilopelia suratensis),* Rock Dove (*Columba livia),* House Sparrow (*Passer domesticus),* Tree Sparrow (*Passer montanus),* Grey Francolin (*Francolinus pondicerianus) and* Common Quail (*Coturnix coturnix*). All these bird species are of least concern under IUCN categorization.

3.3 Socio-economic Environment

Demography and Ethnic Compositions: The proposed Subproject area lies in Ward No. 9 of Ghorahi SMC. Ghorahi and Tulsipur are the nearest business markets nearby the Subproject area. The general demographic information of the affected Ward is presented in Table 3-4. The major ethnic compositions within the surrounding project area i.e., Ward No. 9 of Ghorahi SMC are Tharu (24.38%), Chhetri (26.14%) and Dalit (12.56%) of total population of 7,434. Majority of people follow Hindu religion and rest follow Buddhism and Christian religions. The Core Project Area (CPA) of the Subproject will not affect any indigenous people.

Table 3-4: General Demographic Characteristic of Subproject Municipality

SN	Wards	Population			Total Households
		Male	Female	Total	
Ghorahi Sub-Metropolitan City					
1.	All	72,329	83,835	156,164	35,419
2.	9	3,385	4,049	7,434	1,589

Source: (CBS, Rural Municipality-Municipality Profile of Dang District, 2018)

Road Accessibility: Subproject-Ward No. 9 of Ghorahi SMC is connected to Ghorahi city through Khaira-Kothari Road and Ghorahi-Tulsipur Road.

Electricity Beneficiaries: The implementation of this Subproject will increase the electricity beneficiaries to 8,440 HHs, 107 commercial establishments and 75 industries. This will expand the electricity supply in the Subproject area with clean energy sources.

Water and Sanitation: Tube-well and tap/piped water is the main source of drinking water in the surrounding Subproject area. Almost all the houses in the area have some sort of toilet facility.

Health Facility: The nearest and easily accessible equipped health facility nearby the proposed Subproject area is in Ghorahi located at 30-minute driving distance from substation site.

Communication: People of the Subproject have access to communication facilities mainly through mobile telephone services. In the Subproject area, people have access to local and national FM Radio networks and local newspaper facilities.

Occupation: Agriculture is the main occupation of people in the Subproject area with nearly 70% contribution; small trade and business/enterprises and services are other occupation of people in the Subproject area. Intermittent tripping and voltage drop of electricity was adversely affecting irrigation of crops and daily household chores activities.

COVID-19: The coronavirus (COVID-19) pandemic has been defined as global and national health crisis; the virus has spread in almost all parts of Nepal. Heedful of its vulnerabilities, the Government of Nepal had enforced a nationwide lockdown in 2020/2021 and activated its federal, provincial and local level mechanisms to respond to the crisis. In case of any sudden surge or outbreak of COVID-19, quarantine facilities and immediate health supports should be provided to the workers and personnel involved in construction.

Other seasonal and minor diseases like dengue, fever, sneezing, coughs, gastritis, diabetes and mental disorder have been reported within the Subproject area.

4. ANTICIPATED ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

The environmental and social impacts predicted during the construction of proposed Subproject are discussed in this chapter. National Environmental Impact Assessment Guidelines (GoN, 2050) has been referred for the predicting magnitude, extent, and duration of the project-induced environmental impacts in Subproject area. This chapter identifies the basic environmental and social impacts in the Subproject area that will arise during the construction. The detailed impacts of each domain of environmental and social safeguards have been addressed in this chapter.

4.1 Anticipated Beneficial Impacts

Construction Phase

4.1.1 Local Employment

Local employment will be created during the construction phase. As mentioned in section 2.8 Workforce Requirement, the typical construction team will have 15 to 20 workers for the period 10-12 months for the erection of poles and stringing the distribution lines and 16-18 months of time for building the substation. Local people within the SPA will be encouraged for employment during construction phase. Both male and female will get equal opportunity during construction. Based on the skill levels (skilled, semi-skilled and unskilled labor), local people will be used for the construction as far as possible. *The magnitude of impact is moderate, the extent is local, and the duration is short-term.*

Operation Phase

4.1.2 Local Economy and Enhancement in Rural Electrification

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. Intermittent tripping and voltage drop problem nearby the settlement area will be reduced. Upgrading and expansion of electricity distribution helps to way-out many electricity related issues and promotes the use of new types of home appliances, use of electric motors for irrigation, and establishment of small and large industries. *The magnitude of impact is high, the extent is local, and the duration is long-term.*

4.1.3 Greenhouse Gas Emission Balance

Net Green House Gas (GHG) emissions resulting from the Subproject area are expected to be low as the distribution lines will improve and expand electricity supply from clean energy sources. It will reduce the emission of GHG from the traditional source like Guitha (made from cow dung), firewood and timber along with commercial fuel Kerosene for cooking/lighting, heating and diesel for water pumping. *The magnitude of impact is high, the extent is local, and the duration is long term.*

4.2 Anticipated Adverse Impacts

A. Physical Environment

Construction Phase

4.2.1 Change in Land Use

The Subproject requires about 0.51 ha land for the substation. Distribution lines pass through the edge of cultivated land parallel to Hapur Khola. The construction of the substation will bring change in land use permanently. Potential impacts caused by distribution lines will be limited to approximately 0.22 m of land for each pole, at the edge of roads and cultivated lands. *The impacts due to use of land will be moderate in magnitude, site specific and long term in duration.*

Mitigation Measures

- Steel Tubular Pole for distribution lines will be planted at the right way of existing road without hampering traffic movement. In case of cultivated land, minimal land will be used at the edge for planting the poles.
- Cropping calendar will be followed while erecting poles and stringing of conductors so that standing crops will not be damaged.
- In case of loss of standing crops, compensation will be made to the respective land owner as per the prevailing market rate.

4.2.2 Erosion and Flooding

The proposed Subproject's distribution line is nearby the Hapur Khola and is susceptible to high erosion from flooding[8] during rainy season. The distribution line with 2 km length passes nearby and parallel to the Hapur Khola (20-30m distance) from the adjoining edge of cultivated land until the start of Makundanda settlement area. Then, it will pass through RoW of Khaira-Kothari Road (600m) up to the proposed substation. Possible flooding during the rainy season may result erosion nearby distribution line alignment. *The magnitude of impact is moderate, the extent is site-specific, and the duration is long-term.*

Mitigation Measures

- Concrete foundation is recommended for Steel tubular pole installation for 33 kV lines.
- Pit hole prepared for the installation of steel tubular pole shall not be left open as possibility of accident may arise.
- Protection works along the eroded section of the Hapur Khola at 2 km of the distribution line stretch.
- The client needs to coordinate with local level governments and request the local government to give priority for the embankment activities for the protection of cultivated land and proposed 33 kV distribution lines.

4.2.3 Air Quality

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 of short term. Transportation of the

[8] *(Ghorahi SMC, 2018), P-44.*

materials and movement of construction crew and equipment will have minor impact on air quality. *The impact on air quality will be minor in magnitude, site-specific in terms of extent, and of short duration.*

Mitigation 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.

4.2.4 Noise

Noise is inevitable during construction. As noted in section 3.1.5, noise is less around the substation area as the area is rural and settlement is sparse. 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. *The impact on noise level will be minor in magnitude, site-specific in terms of extent, and of short duration.*

Mitigation Measures

- Contractors will be required to monitor noise during the construction.
- For substation site, boundary walls serve as noise barrier, and it should be constructed as early as possible.

4.2.5 Drainage and Water Quality

Substation land area of 0.51 ha. will result in slight alteration of drainage patterns, although the alterations in drainage will not be quantifiable. Interference with drainage patterns will be temporary during construction phase only. The impact on water quality during the construction period is expected to be insignificant. Water will be used primarily as a cement additive for construction of substation foundations and boundary walls, and to control dust. *The magnitude of impact is low, the extent is site-specific, and the duration is short-term.*

Mitigation Measures

- Storm water run-off from substation sites will be minimized and controlled with bunding temporary dikes (constructed boundary walls will also help contain run-off water).
- Proper management of ground drainage from camps as a preventive measure against breeding of mosquitoes, and other pests.

4.2.6 Soil and Muck

As the proposed substation land's ground level is low, filling of soil is necessary. The required filling materials shall be purchased from nearby authorized crusher plant approved by local government. For distribution lines, the excavation activity will be insignificant. *The magnitude of impact is low, the extent is site-specific, and the duration is short-term.*

Mitigation Measures

- Soil required for filling the substation area shall be purchased from the nearby authorized crusher plant approved by the local government.
- Soil shall be covered with tarpaulin while transporting it from earth-borrowing areas.
- Simultaneous water sprinkling and compaction of spoil shall be done using the roller.

4.2.7 Solid Wastes

The wastes generated during construction within the Subproject area are cement bags, iron bars, and other leftover construction materials, and waste generated by the labor camp. It might cause adverse impact if not properly managed. Organic wastes generated from labor camp may give foul smell and attract rodents if not managed properly. Inorganic wastes generated during implementation shall be managed through source segregation. *The magnitude of impact is low, the extent is site-specific, and the duration is short-term.*

Mitigation Measures

- Source segregation of organic and inorganic wastes in different storage areas or facilities in the designated location.
- Organic waste generated from the campsite shall be managed within the substation premises, through composting in the bin or by constructing a ground pit and covered by 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 ground leveling.
- Packing materials used for casing components should be recyclable.
- 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.
- Effective coordination shall be done with local level government for proper waste management during construction period.

Operation Phase

4.2.8 Electric and Fire Hazard

Employees performing servicing or maintenance of substations may be exposed to electric shock, burns and injuries from the unexpected energization or release of stored energy in the equipment. *The magnitude of impact is considered moderate, the extent is site-specific, and the duration is long term.*

Mitigation Measures

For this, the following mitigation measures will be practiced:

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

B. Biological Environment

The proposed Subproject avoids forest area and other sensitive biodiversity area. Hence, there will be no significant impact to biological environment because of construction of substation and distribution lines.

Construction Phase

4.2.9 Loss of Habitat

As the proposed substation area is a barren land and poles will be installed at the edge of roads and private farm land, no loss of forest and other biodiversity is expected. *The magnitude of impact is moderate, the extent is site-specific, and the duration is short term*

Mitigation Measures

- Labors and staff shall be made aware to avoid illegal activities in adjoining forest.
- Labors and staffs should be restricted to use firewood for cooking.

Operation Phase

4.2.10 Bird electrocution and collision

The Subproject area is located in semi-urban setting and there is no presence of critical habitat of avian fauna. Electrocution is a risk to bird species that perch on power line infrastructures (substation and distribution line). List of birds presented in section 3.2, may collide to distribution lines and substation Minimizing bird collision and electrocution risk is therefore a win-win for biodiversity and the power sector. *The magnitude of impact is low, the extent is site-specific, and the duration is long term.*

Mitigation Measures

- Bird guards should be installed above the poles and white spirals in the conductors to improve visibility electrical structures.

C. Socio-Economic and Cultural Environment

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

Construction Phase

4.2.11 Land Requirement

The land required for the proposed substation area is 0.51 ha, is owned by Ghorahi SMC and used by Shree Primary School Makundanda. NEA has been given the right to use the land to build and operate a substation. The construction activities of the Subproject will not involve any private land. So, there will be no land acquisition, and thus no resettlement impacts. For the construction of distribution lines, owners of private land along the route have assured and committed for necessary help and support during implementation. They have agreed on NEA's proposal that poles shall be installed on the edge of cultivated lands and appropriate compensation for the loss of crops shall be given (**Annex 5**). Compensation shall be made on the basis of crops types and quantity of loss equivalent to

the market price. *The impacts will be low in magnitude, site specific and long term in duration.*

Mitigation Measures

- Distribution pole of diameter 0.22 m should be installed on the edge of cultivated land making no loss of standing crops.
- If there is loss of crops, appropriate compensation shall be made.

4.2.12 Public Health

Construction activities will be of small scale, causing no significant adverse impact to existing quality of air, water, and sound. Local people except the workers do not involve in construction activities. Considering COVID-19 pandemic, workers will be advised to avoid unnecessary contact with local people. *The magnitude of impact is low, the extent is site-specific, and the duration is short term.*

Mitigation Measures

- Contractors shall implement health and safety plans.
- Awareness on HIV/AIDS and other sexually transmitted disease should be provided to the labors.
- Awareness on basic sanitation and waste management should be provided to the labors.

4.2.13 Occupational Hazards and Safety of Workers

Occupational health hazard and safety of workers is the major issue during the construction period. Working without adopting safety measures during excavation work, spoil management work, mechanical and electrical equipment handling activities, chemical handling, etc. during construction may call the risk of accidents. Primary victims are the workers involved in the construction. *So, the envisaged direct impact is high in magnitude, site specific in extent, short term in duration.*

Mitigation Measures

- Contractor shall prepare the Environmental, Health and Safety plan and take approval from the Client (NEA/PIU). Contractor shall employ Safety officer 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 7**.
- NEA will be responsible to supervise the EHS performance of the construction Contractor, and worker's health and safety.

4.2.14 Child Labor, and Gender Issues

During the construction period, people employed on daily wages for excavation, transportation of construction materials, and other construction-related works should avoid the involvement children and should avoid gender discrimination. Gender discrimination may occur as the Contractor may not be sensitive towards gender equity. Contractors should equally pay men and women workers. Construction area should be gender friendly with required facilities. *The envisaged impact is high in magnitude, site-specific in extent, and short-term in duration.*

Mitigation Measures

The Subproject will ensure to:

- Provide equal wage to male and female for similar nature of work.
- Restrict use of child labor i.e., below 16 years of age (which is as per government and ILO guidelines).
- Provide female friendly construction environment with separate cabins and toilet for women in the camp.
- Prepare suitable work categorization for women.

4.2.15 Socially Undesirable Activities

The workers may use alcohol and other forms of intoxication, gamble and quarrel with locals, disrespect local culture and religion, and may promote socially undesirable activities in and around the project area. *So, the envisaged impact is low in magnitude, local in extent, and short-term in duration.*

Mitigation Measures.

- Restrict movement of workers out of camp after dinner time in the night.
- Prohibit the 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 staffs, orient them, and monitor that these are effectively followed by all.
- Assign a public relation officer to keep close and regular consultation and coordination with local communities.
- Regular monitoring of workers' behavior and take appropriate measure on rule violators.

Operation Phase

4.2.1 Hazards and Safety

Occupational health hazard and safety of staffs is the major issue during the operation phase of the substation. The possible electric shock and fire hazard might cause injury or death to staffs thus the protection measures should be taken all the time. *The envisaged direct impact is high in magnitude, site specific in extent, long term in duration.*

Mitigation Measures

- There will be the 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 work on DL route

4.2.2 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; so, 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.

[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%.

5. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

5.1 Methodology in Information Disclosure, Consultation and Participation

Following methodologies were followed for information disclosure, consultation and participation:

i. Identification of the stakeholders: It is important to understand how the Subproject activities will relates to different institution/groups/individuals. Stakeholders are the groups that might be affected by the Subproject or might influence Subproject outcomes. The stakeholders were grouped in three categories. (**Figure 5-1**).

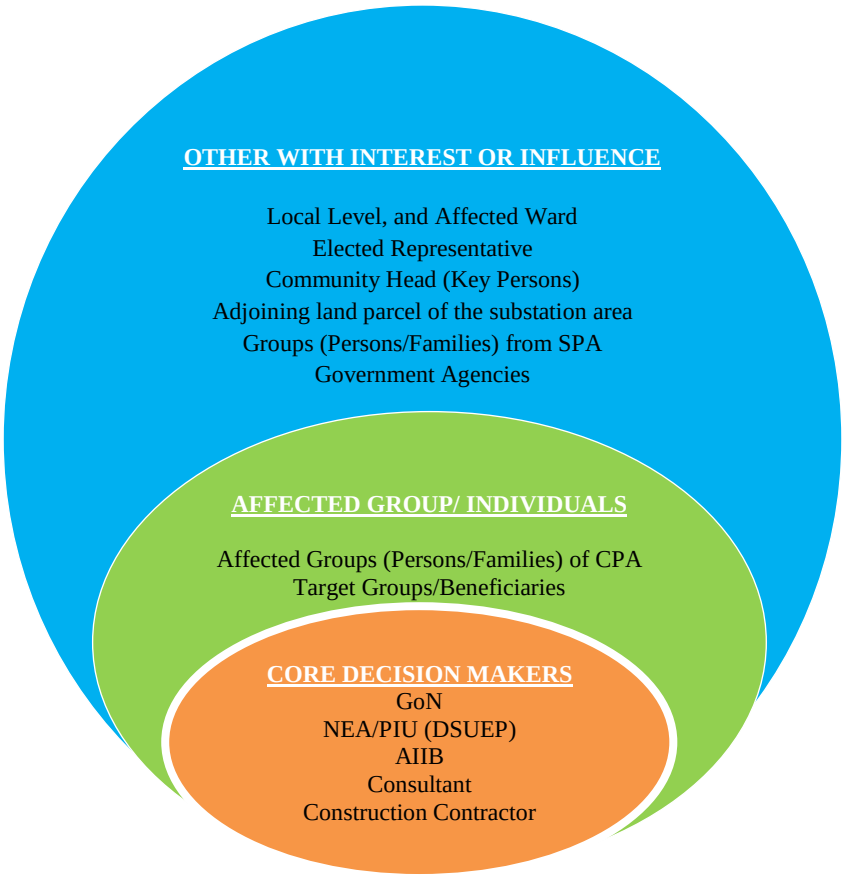


Figure 5-1: Identified Stakeholder for the Subproject[10]

ii. The notices with subject of consultation, venue, and time were pasted at Subproject footprint area, local level and affected Ward office in presence of concerned local stakeholders (**Annex 1**). People were explained about the notices and their views were noted and agreed as Minutes.

iii. Study team members visited all the local government offices within the Subproject influence area. Representatives from each local body were also consulted. All local governments were given request letters for their active support in project implementation. Municipalities were requested to provide written suggestions. The

[10] *Referenced Meaningful stakeholder engagement: a joint publication of the MFI working group on environmental and social standards / Reidar Kvam, PP-19, 2019.*

deed of enquiry (Muchulkas) and Letter of Declaration from the stakeholders are presented in **Annex 6**.

iv. Local communities nearby substation area and along the distribution line routes were consulted and were briefed about the Subproject activities and likely benefits with their suggestions (included in the Minutes).

v. During the Subproject construction phase, booklets informing about the Subproject activities, likely impacts and mitigation measures together with the complaints handling mechanisms will be developed and distributed in the Subproject area.

5.2 Consultation and Information Disclosure

Consultation aims to encourage participation of stakeholders and communities of the Subproject area in identification of issues, comments and suggestions. The Subproject affected groups (persons/families) were given more emphasis during the field consultations. Public consultations were conducted at Ghorahi SMC, Ward No.9, Makundanda settlement on 8th and 9th September 2021, and Dubichaur settlement on 10th September 2021 (**Figure 5-2**). The concerns expressed and issues raised during the consultation were documented as in the form of minutes (**Annex 5**).

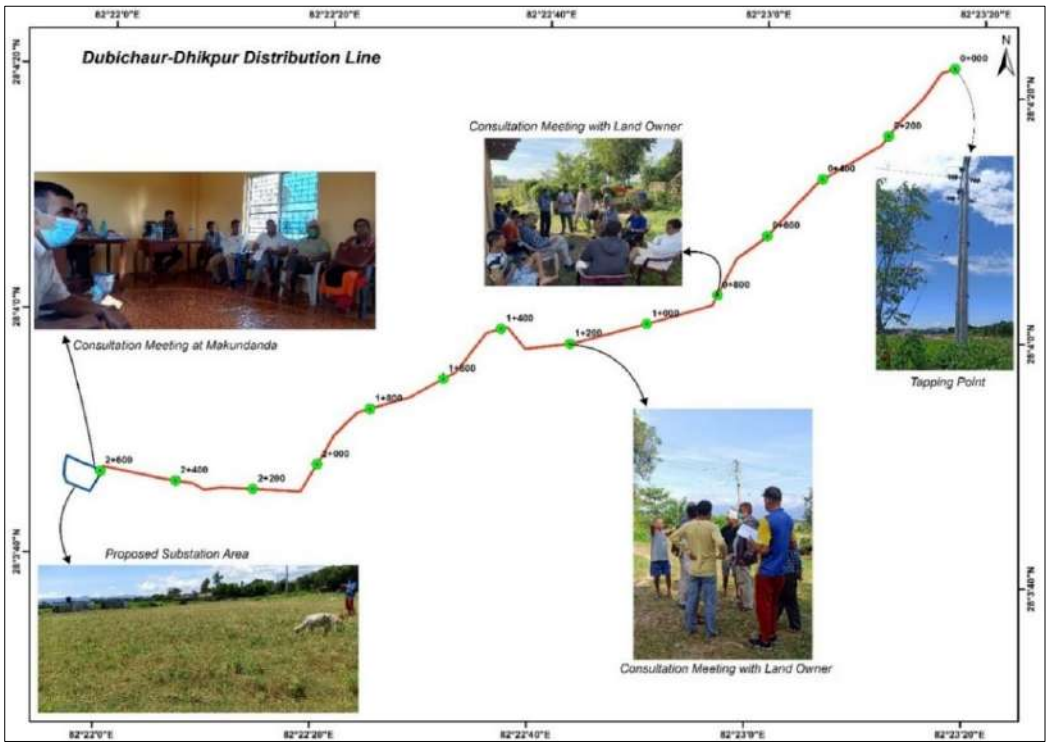


Figure 5-2: Consultation with the stakeholders and communities in the Subproject Area.[11]

Major benefits expected from the implementation of Subproject through the perspective of local people were identified from public interaction, and that included improvement in the rural electrification facilities ensuring the uninterrupted electricity in the households and better functioning of industries in the locality. The issues, comments and suggestions received in the consultation are presented in **Table 5-1**.

[11] *Field Study, 2021. Used SW Map and GIS*

5.3 Comments and Suggestion Received

Table 5-1: Summary of issues, comments and suggestions received in Consultations

Source: Field Visit, 2021

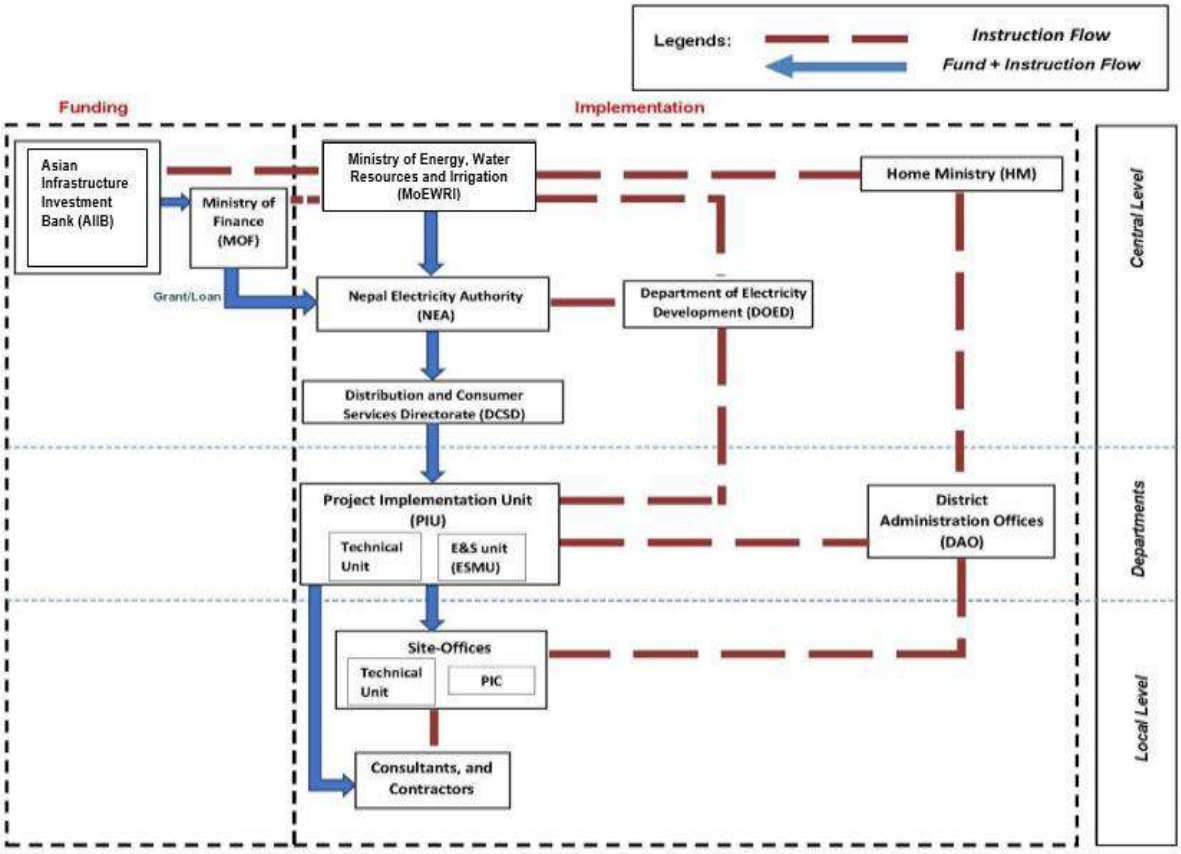
Date	Location	Issues, comments, and suggestions received	Participants
8th September 2021	Ghorahi SMC-9, Makundanda	• The proposed substation area is public land and managed by the Shree primary school Makundanda. The school management committee is fully committed to provide this land for use of substation construction. • Toilets and drinking water well located on the substation construction site should be relocated/reconstructed. • For the operation and safety of the school, people requested to construct a 10 room one-storied building (with zinc roof and brick/block wall) and a wall for compounding the school. • This Subproject has the full support of local people and school families.	7,3F-4M
9th September 2021	Ghorahi SMC-9, Makundanda	• The Subproject should give priority to local manpower based on their skill and efficiency. • The proposed substation is adjacent to the school area and that area is not used by any community, person, or organization. Therefore, that place is suitable to build a substation but, the Subproject should assist to school. • The distribution line should be constructed without affecting the housing and structures. • Local stakeholders have full support for the construction of the Subproject.	13,1F-12M
10th September 2021	Ghorahi SMC-9, Dubichaur	• While erecting the pole, the pole should not be erected in the middle of the cultivated land. • Poles to be erected between Tehara and Aspari irrigation canals should be done without affecting the irrigation canal structures. • During the construction of the Subproject, work should be done in coordination with the landlords, communities, and local stakeholders. • In case of damage to crops on private land during stringing works of distribution lines, NEA should compensate the damage. • Landowners requested to build a gravel road from the north of Giriraj KC's house (Pokhra) to the land of Gehendra Bahadur Basnet because the distribution line passes through the same route. • Stakeholders requested to run the Subproject as soon as possible.	22,2F-20M

6. INSTITUTIONAL ARRANGEMENT AND GRIEVANCE REDRESS MECHANISM

6.1 Institutional Arrangement

The Ministry of Energy, Water Resources and Irrigation (MEWRI) is responsible for overall planning and execution of the plans for the overall development of water and energy sector in Nepal. Nepal Electricity Authority (NEA) under MEWRI 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 activities during the construction phase. He will also provide technical support in preparing the monitoring report.

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/PIU 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 shall provide safeguard compliance orientation to all environment monitors and safeguard team of the contractor, one month before the construction works start.



Source: ESMF-DSUEP

Figure 6-1: Institutional Arrangement for Environmental and Social Management

6.2 Grievance Redress Mechanism

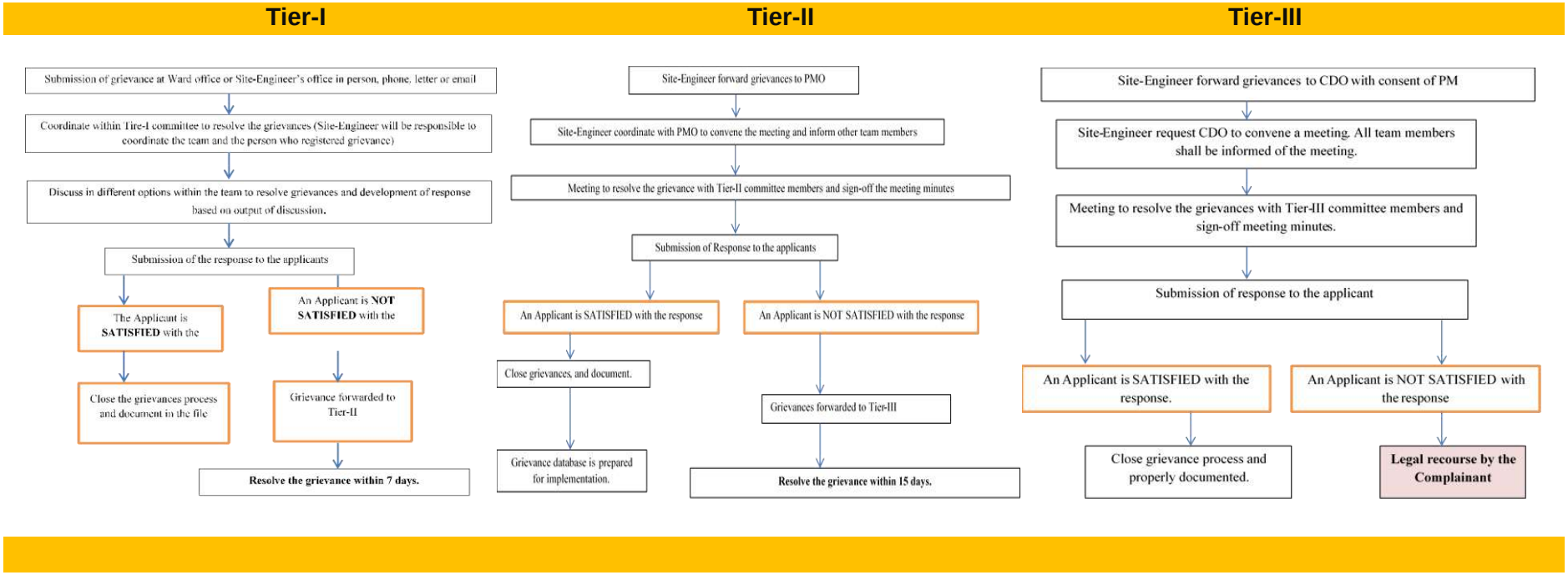
The Grievance Redress Mechanism (GRM) has been established to receive, evaluate, and facilitate the resolution of affected people's concerns, complaints, and grievances about the social and environmental related issues at the subproject level. The GRM is designed to be simple, transparent and responsive. GRM shall address only the concerns arising due to the project implementation activities, mainly during construction stage. Social Comment Addressed -In each subproject, three levels Grievance Redress Mechanism will be established. During the ESMP study period NEA has disseminated letters to the local level stakeholders regarding the formation of the GRM at the subproject level. Till date NEA has established Tier-I and Tier-II GRM has been established at local wards level and Municipality/RM level. Tier-II will be established before construction work starts.

GRM 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, he/she should forward the grievance to the field office 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 carried to Tier II and Tier III. The three levels of GRM will be based on time-bound schedules as mentioned in **Table 6-1**. The subproject will carry the regular meeting for Tier-I, once a month to follow up if any grievances are received or not and to resolve the grievances received and update its status to PIU. **Figure 6-2** describes the Workflow Diagram of GRM for the subprojects.

Table 6-1: Levels of Grievance Redress Mechanism Based on Time Bound

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**
	Municipality Chief	Coordinator	Project Manager	Coordinator	Chief District Officer (CDO)	Chair
	Site-Engineer-NEA	Member secretary	Site-Engineer	Member Secretary	Project Manager	Coordinator
	Safeguards Expert from Consultant	Member	Municipality Chief	Member	Site-Engineer	Member Secretary
	Contractor Engineer	Member	Safeguards Expert from Consultant	Member	Municipality Chief/Ward Chair	Member
	Ward Chair	Member	Contractor Engineer	Member	Safeguards expert from consultant	Member
					Contractor Engineer	Member
					Representative from affected people	Member

Figure 6-2: Workflow Diagram for GRM from NEA[12]



***** 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.

[12] *Grievance Redress Mechanism (GRM) Prepared for the sub-projects financed by Asian Infrastructure Investment Bank (AIIB) under Distribution System Upgrade and Expansion Project (DSUEP), Nepal Electricity Authority (NEA), May 2021.*

7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7.1 Environmental and Social Management Plan and Mitigation Measures

The overall Environmental and Social Management Plan of the Subproject is presented in **Table 7-1**. The 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 ESMU of PIU.

Table 7-1: Environmental and Social Management Plan (ESMP)

Project Activity	Environmental and Social Issues	Management/Mitigation Measures	Mitigation Cost	Responsibility	
				Planning and Implementation	Supervision and Monitoring
Pre-construction Phase					
Approvals, permits and clearances	Installation of poles along the edge of private farm lands	• Site office and the contractor must inform the community prior to the installation of poles and stringing of the line along DL route		Site Office/ Contractor/	DSUEP (PIU)/NEA
Construction Phase					
Construction work in substation area and distribution line alignment of	• Inadequate/unsafe working conditions	• Appropriate contract clauses to ensure satisfactory implementation of contractual environmental, health, and safety measures.		Site Office/Contractor	PIU/NEA
	• Accident may arise if the pit hole (depth-2m and diameter-0.22 m) prepared for steel tubular poles remains open for long time	• Pit holes for the steel tubular pole shall not be left open and should be filled instantly by erecting poles and concrete-cement around the base, should be used to strengthen the pole erection • Contractor should follow the guideline provided by the PIU	Project Cost	Contractor/ Site Office	PIU/ESMU/ PIU
	• Dust emission - transportation of materials and movement of construction crews and equipment will	• Water sprays to be used for dust control as necessary in the earthen roads of the settlements nearby the substation area and proper storage of the construction materials (sand, cements, aggregates and spoil) to be stored in substation area.	Air Quality Monitoring- 1,50,000.00 (NRs.) Sprinkling water (Dust Management) 2,00,000.00 (NRs.)	Contractor/ Site Office	PIU/ESMU

	cause minor impact	• Steel poles firstly stocked in the substation area and secondly in the open barren area in coordination with Rural Municipalities and Municipalities. No social and environmental issues for the stockpiling of the steel poles and stringing wires			
	• Noise emission-Construction related noise will be limited to vehicular movement and inside-the-fence construction activities at substations sites	• Boundary walls serves as a noise barrier, and these shall be constructed as early as possible. • Construction equipment to meet national emissions and noise control standards.	Noise Level Monitoring-50,000.00 (NRs.) Provision of PPE in Project Cost	Contractor/ Site Office	PIU/ESMU
	• Interference with drainage patterns will be temporary at substation during construction phase	• A proper drainage system should be managed within the substation area. • Storm water run-off need to be minimized and controlled with bunding temporary dikes • Drainage management as a preventive measure against breeding of mosquitoes and other pests	Project Cost	Contractor/ Site Office	PIU/ESMU
	• Possible erosion and flooding in Hapur Khola	• Concrete foundation is recommended for Steel tubular pole installation for 33 kV lines. • Pit hole prepared for the installation of steel tubular pole shall not be left open as possibility of accident may arise.	Project Cost	Contractor/ Site Office	PIU/ESMU
		• Protection works along the eroded sections in the Hapur Khola, 20-30 m distance from the distribution line. • Client needs to coordinate with local level governments to give priority for the embankment	Cost from Local Government	Ghorahi SMC	Ghorahi SMC/PIU

		activities for the protection of cultivated land and proposed 33 kV distribution lines.			
	• Construction associated wastes generated within substation area and campsite location	• Organic waste generated from the campsite shall be managed within the substation premises, through composting in the bin or by constructing a ground pit, and covered by a thick layer of soil • Reusable waste like debris, broken brick pieces, sand, stone, waste cement, and sand mix should be used as refills for ground leveling. • Recyclable wastes like left out/non-usable reinforcement bars, and packing materials to be sent or sold to scrap vendors. • Effective coordination with local level government for the proper waste management	Solid wastes management – 1,00,000.00 (NRs.)	Contractor/ Site Office	PIU/ESMU
	• Illegal fishing and bird hunting by the labors	• Discouraged by supplying adequate food items (poultry and fish) requirement within the camp. • Awareness on legal provisions upon illegal hunting of biodiversity need to be disseminated	Project Cost	Contractor/ Site Office	PIU/ESMU
	• Use of firewood from nearby forests	• Workers and staffs should be restricted to use firewood for cooking. • Providing LPG based stoves in Labor camp.	Project Cost	Contractor/ Site Office	PIU/ESMU
	• Loss of standing crops at pole installation locations (depth-2m and diameter-0.22 m)	• Poles to be installed at the edge of cultivated land making no loss of standing crops. • Need to make prior consultation with landowners before installation of the poles. • If there is loss of crops, appropriate compensation shall be provided.	Project Cost	Contractor/Site Office	PIU/ESMU
Environment, Health and Safety	• Injury and sicknesses workers and members of the public	• Contractor shall prepare the Environmental, Health and Safety plan and take approval from the client. Provision of safety officer in the work team shall be made during construction period. • All employees shall be provided with the		Contractor/Site Office	PIU/ESMU

	• Potential fecal coliform contamination in drinking water	necessary training, and safety equipment as required for their responsibilities and duties. • Basic facilities of drinking water, sanitation & clean resting place, canteen, and first aid shall be made available for the campsite. • Provision of health insurance to employees. • Security fences around the substation. • Installation of warning signs (High Voltage, Fire Safety Signs, and Emergency Signs). • Awareness on HIV/AIDS and other sexually transmitted disease. • Awareness on providing basic sanitation facilities and waste management control to the labors. • For coronavirus (COVID-19) pandemic situation, Contractors should arrange for quarantine and health services for infected workers.	Establishment of Labor Camp with basic facilities – In Project Cost EHS Awareness Trainings -1,50,000.00 (NRs.) COVID-19 measures 2,00,000.00 (NRs.)		
Management of electric equipment's, toxic materials of chemical wastes	• Possible spills resulting in contamination of soil, water, and air	• Chemical waste generated from transformer shall be collected in leakage proof, corrosion free, specially designed container, and sealed carefully	1,00,000.00 (NRs.)	Contractor/ Site Office	PIU/ESMU
Operation and Maintenance Phase					
Electric shock and fire hazard	• Injury or death to the workers and public	• Use of insulation, guarding, grounding, electrical protective devices, and safe work practices. • Boundary walls and / or security fences around	Project Cost	NEA	NEA

		substations to prevent unauthorized access. • Only trained and authorized personnel shall be allowed for the electrical works. • No electric wire to be stringed above the house. • Installation of warning signs.			
Routine operations and maintenance	• Potential disturbance to other utility functions and vehicular traffic.	• Maintain warning / advisory signs in good and visible condition • Visual and technical inspection	Project Cost	NEA	NEA
Oil spillage	• Contamination of land/nearby water bodies	• Substation transformers should be stored within secure and impervious bundled areas with a storage capacity of at least 110% of the capacity of oil in transformers and associated reserve tanks.	Project Cost	NEA	NEA
Bird electrocution and collision	• Electrocution can cause a risk to bird species which perch on power line infrastructures	• Provision of bird guards above the poles and white spirals on the conductors to improve visibility	Project Cost	NEA	NEA

(*The provision of environment and social management cost should be included in the project cost making each items visible in BOQ of bidding document for the safeguard compliance by the construction contract)*

7.2 Proposed Monitoring Plan

The monitoring proposed in
Table 7-2 will be of value primarily for establishing baseline conditions in the Subproject area, and then for ambient quality monitoring.

Table 7-2: Minimum Provisions for Environmental Monitoring

Parameters to be Monitored	Location	Measurements	Frequency	Responsibility
Construction Stage				
Clearing of construction site	Substation boundaries	• Field inspection of Subproject Sites and ensure that appropriate safety measures are implemented	Clearing and restoration: weekly	Contractors to implement corporate EHS plan, drainage management and solid waste control in substation area.
Air: SPM, Noise: dB(A)	Substation boundaries and nearest receptor to substation	• Spot check for noise and dust using portable monitoring device	Air, and noise: quarterly during construction period	Contractors need to conduct the air and noise monitoring during the construction period at the substation location

Construction wastes: on-site inspection	Visual inspection of active construction areas, including equipment staging areas and camps	• Spot check / visual inspection of solid waste (spoil, muck etc.) generation and disposal. • Analysis of transformer oils to determine if polychlorinated biphenyls are present.	Monthly spot checks for construction waste management	PIU safeguard officers to provide oversight via regular field inspections, and submit monitoring reports to the Bank
Occupational health and safety	Substation boundaries	• No. of Toolbox talk and safety orientation to the workers • No. of workplace accidents • Use of PPE by workers	Daily Inspection during construction Monthly Inspection during operation phase	Inspection of the construction site by safety officer and PIU safeguard officer
Child involvement in construction work (need to be prohibited)	Substation work	• Spot inspection at construction sites	Monthly Inspection during construction	Site Office

7.3 Environmental and Social Mitigation and Monitoring Cost

Preliminary cost estimates for the ESMP implementation are shown in **Table *7-3***. These estimates cover the basic monitoring activities and the mitigation measures to be complied from the contractor's side. The ESMP cost estimated for the **Dubichaur-Dhikpur Distribution Line** is NRs 13,00,000.00. The community support activities and the costs will be presented in the Community Development Plan (CDP). NEA has agreed for the effective implementation of the mitigation and monitoring cost items as mentioned in table below.

Table 7-3: Mitigation Measures and Monitoring Activities Cost Estimates

SN	Budget Items	Unit	Rate (NRs.)	Estimated Amount for Monitoring (NRs)
1	Air Quality Monitoring (at substation)	6 (Times)	25,000.00	150,000.00
2	Noise Level Monitoring (at substation)	6 (Times)	8,334.00	50,000.00
3	Sprinkling of water to be used for dust control necessary in the earthen roads of the settlements nearby the substation area and proper storage of the construction materials (sand, cements, aggregates and spoil)	200 (Times) During Excavation and Civil works	1000.00	2,00,000.00
4	Management of electric equipment's, toxic materials of chemical wastes	-	L.S.	1,00,000.00
5	Segregation and management of solid wastes	-	L.S.	1,00,000.00
6	COVID-19 measures (considering pandemic situation) standardize the quarantine facilities with health aid to the labors	-	L.S.	200,000.00
7	EHS Awareness raising trainings to the labors	10 (Events)	15,000.00	1,50,000.00
8	Meeting of Safeguard Desk and Grievance Redress Committee at Field Level	24 (Months)	14,583.00	3,50,000.00
Total				**13,00,000.00**

8. CONCLUSION

Potential environmental impacts of this Subproject are not diverse and are all site-specific i.e., confined to the Core Project Area. Civil works will have minimal temporary impacts on air, noise and water quality. Erection of poles during construction shall follow RoW of existing roads and the edge of farmlands. The PIU should give prior information before installation of the poles. In the ESMP consultations conducted in the settlement area, people have agreed for the implementation of the Subproject and have suggested to install poles on the edge of farm-lands, without affecting any private structures along the distribution line. If there is loss of crops, appropriate compensation shall be provided. Mitigation measures are suggested in this ESMP to avoid any possible environmental and social impacts. The total ESMP cost for this Subproject is NRs. 13,00,000.00. NEA Project Implementation Unit has agreed to implement the estimated cost for the mitigation measures and monitoring activities.

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ANNEXES

Annex 1: SAMPLE NOTICE FOR PUBLIC CONSULTATION AND GRM FORMATION LETTER TO STAKEHOLDERS

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 मितिः .....

..... प्रदेश ..... जिल्ला .....(नगरपालिका/गाउँपालिका/महानगरपालिका/उपमहानगरपालिका) मा एसियन इन्फ्रास्ट्रकचर इन्भेस्टमेन्ट बैंकको ऋण सहयोग भएको नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजना प्रस्तावक रही कार्यान्वयन गर्न लागिएको ..... 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 समयः

स्थानः

मितिः

समयः

नेपाल विद्युत प्राधिकरण

(नेपाल सरकारको स्वामित्व)

वितरण तथा ग्राहक सेवा निर्देशनालय

नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना

(ए.आई.आई.बि.)

फ्याक्स: ०१-४१५३९४४
फोन नं : ०१-४१५३९४५
दरबारमार्ग, काठमाण्डौं।

प.सं. ०७८/७९: ९३८. मिति: २०७८/१०/०७

श्री .....
.....

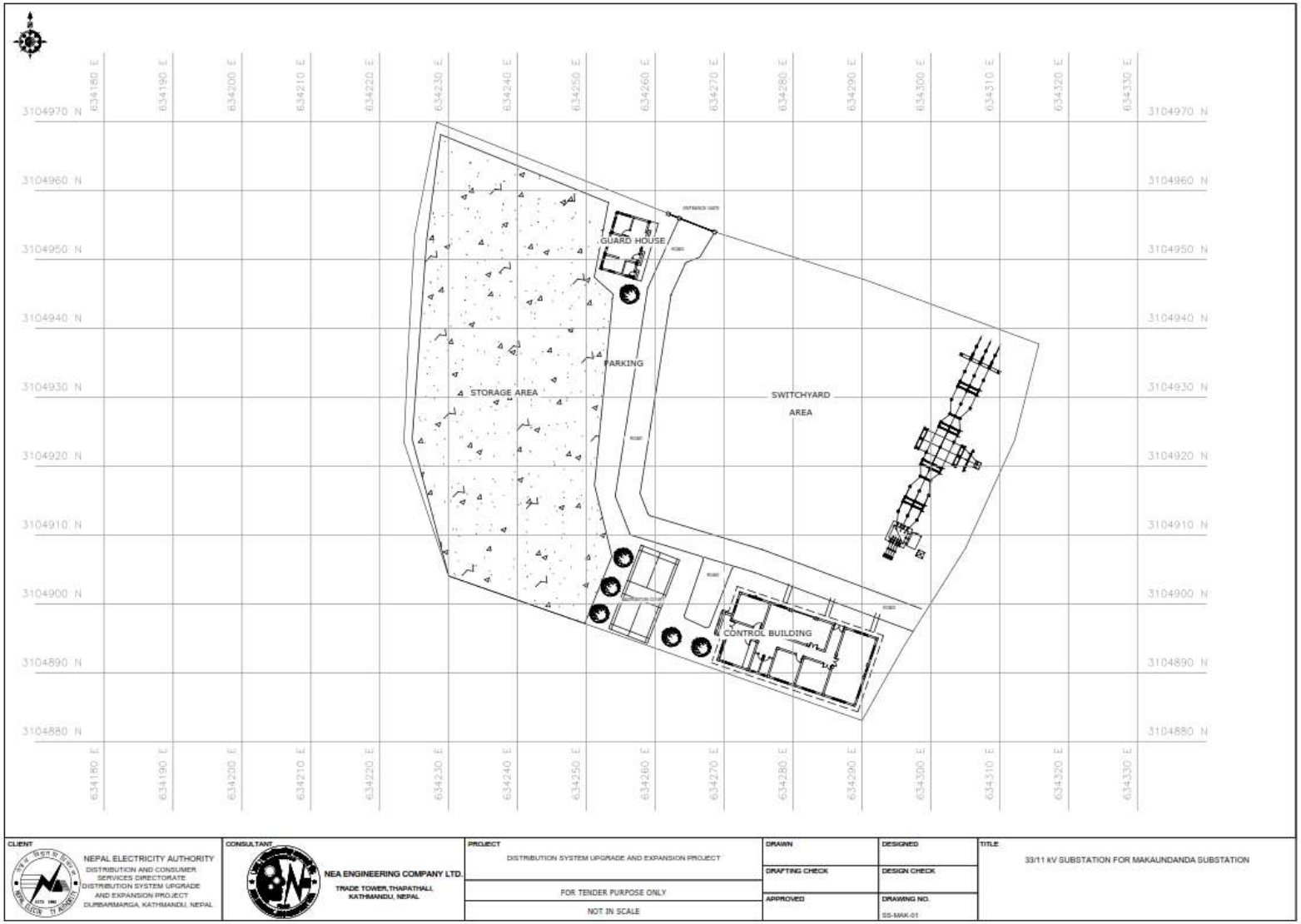
विषय: गुनासो समाधान संयन्त्र गठन भएको सम्बन्धमा ।

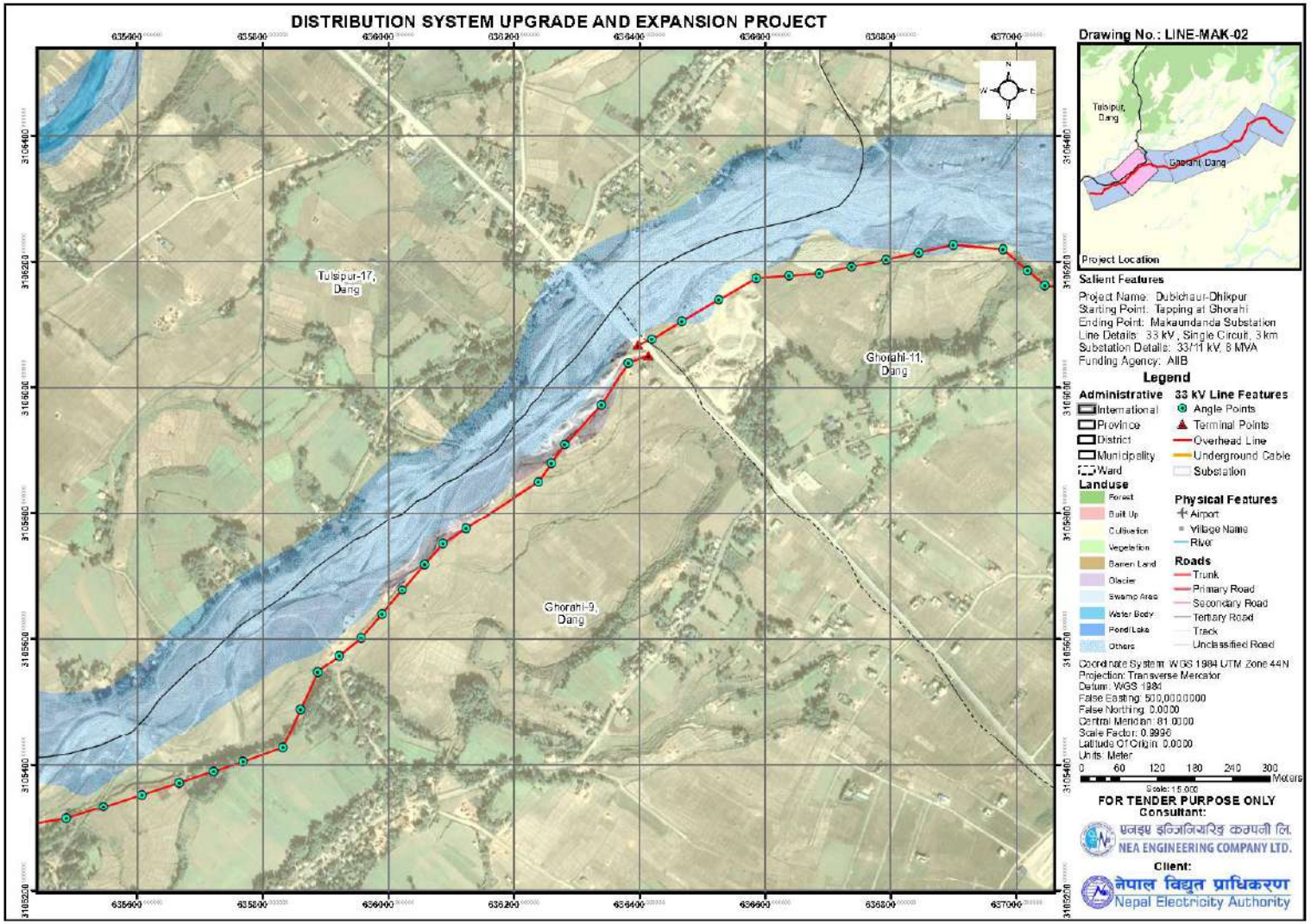
उपरोक्त विषयमा एसियन इन्फ्रास्ट्रकचर इन्वेस्टमेन्ट बैंक (ए.आई.आई.बि.) को ऋण-सहयोगमा नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजना (ए.आई.आई.बि.) प्रस्तावक रही कार्यान्वयन गर्न लागिएको ..... आयोजना अन्तर्गत नेपाल सरकारको पूर्ण-विद्युतीकरण गर्ने लक्ष्य बमोजिम तहाँ ***वडा/गाउँपालिका/नगरपालिका/उप-महानगरपालिकामा*** ३३/११ के.भी. सब-स्टेशन, ३३ के.भी. लाईन, ११ के.भी. लाईन, ४०० भी. लाईन, आदि निर्माण कार्यहरु हुने भएकोले सो कार्यहरु गर्दा स्थानीय सरोकारवालाहरुको कुनै गुनासो भए सो गुनासोको समाधान गर्न गुनासो समाधान संयन्त्र निर्माण गरिएको छ । अतः संलग्न गुनासो समाधान संयन्त्र दस्तावेज बमोजिम आफ्ना गुनासोहरु दर्ता गर्न र सोही दस्तावेजमा भनिए बमोजिम गुनासोको समाधान हुने व्यहोरा सम्पूर्ण सरोकारवालाहरुलाई जानकारी गराइन्छ ।

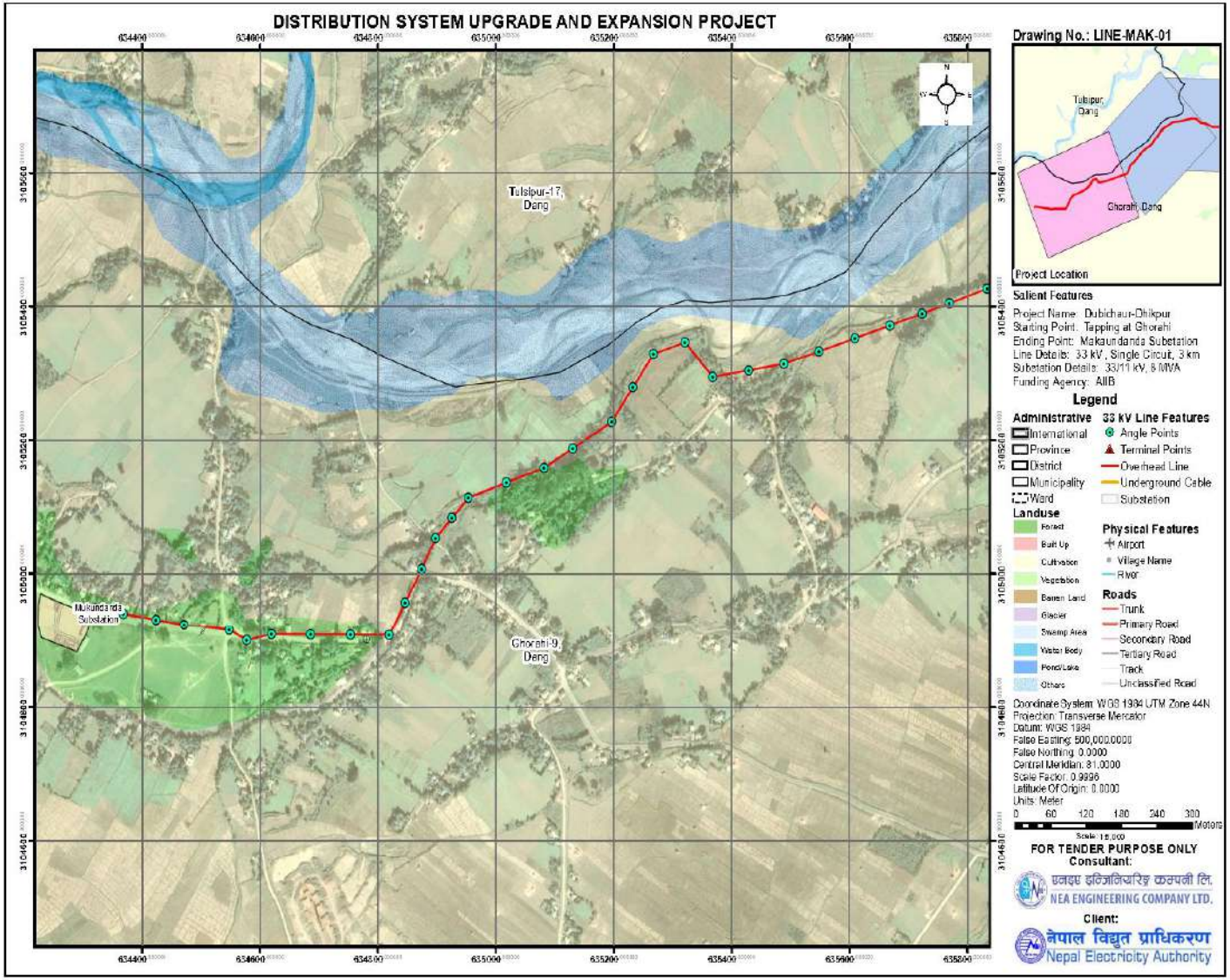
भवदीय,

(केशव श्रेष्ठ)
आयोजना प्रमुख

Annex 2: LAYOUT MAPS OF SUBSTATION AND DISTRIBUTION LINE ALIGNMENT




DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-MAK-02
Tulsipur-17, Dang
Ghorahi-11, Dang
Ghorahi-9, Dang
Project Location
Salient Features
Project Name: Dubichaur-Dhikpur
Starting Point: Tapping at Ghorahi
Ending Point: Makaundanda Substation
Line Details: 33 kV, Single Circuit, 3 km
Substation Details: 33/11 kV, 6 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Physical Features
Airport
Village Name
River
Roads
Trunk
Primary Road
Secondary Road
Tertiary Road
Track
Unclassified Road
Coordinate System: WGS 1984 UTM Zone 44N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: 81.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter
0 60 120 180 240 300 Meters
Scale: 15,000
FOR TENDER PURPOSE ONLY
Consultant:
एनइए इञ्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-MAK-01
Tulsipur-17, Dang
Ghorahi-9, Dang
Mukundanda Substation
Tulsipur, Dang
Ghorahi, Dang
Project Location
Salient Features
Project Name: Dubichaur-Dhikpur
Starting Point: Tapping at Ghorahi
Ending Point: Makaundanda Substation
Line Details: 33 kV, Single Circuit, 3 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
Physical Features
Airport
Village Name
River
Roads
Trunk
Primary Road
Secondary Road
Tertiary Road
Track
Unclassified Road
Coordinate System: WGS 1984 UTM Zone 44N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: 81.0000
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Latitude Of Origin: 0.0000
Units: Meter
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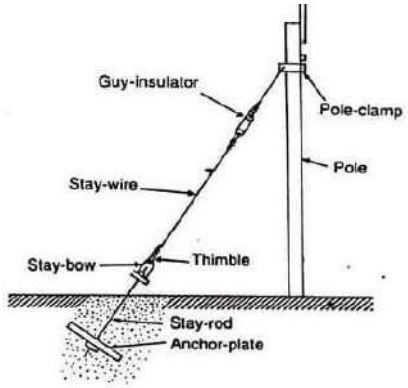
Scale: 1:6,000
FOR TENDER PURPOSE ONLY
Consultant:
एनइए इञ्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority

Annex 3: FACILITY AND COMPONENTS

Transformer

Switch Yard

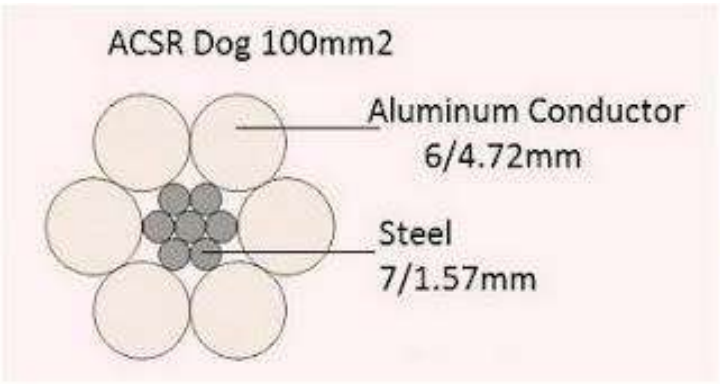


Stay/Guy Sets

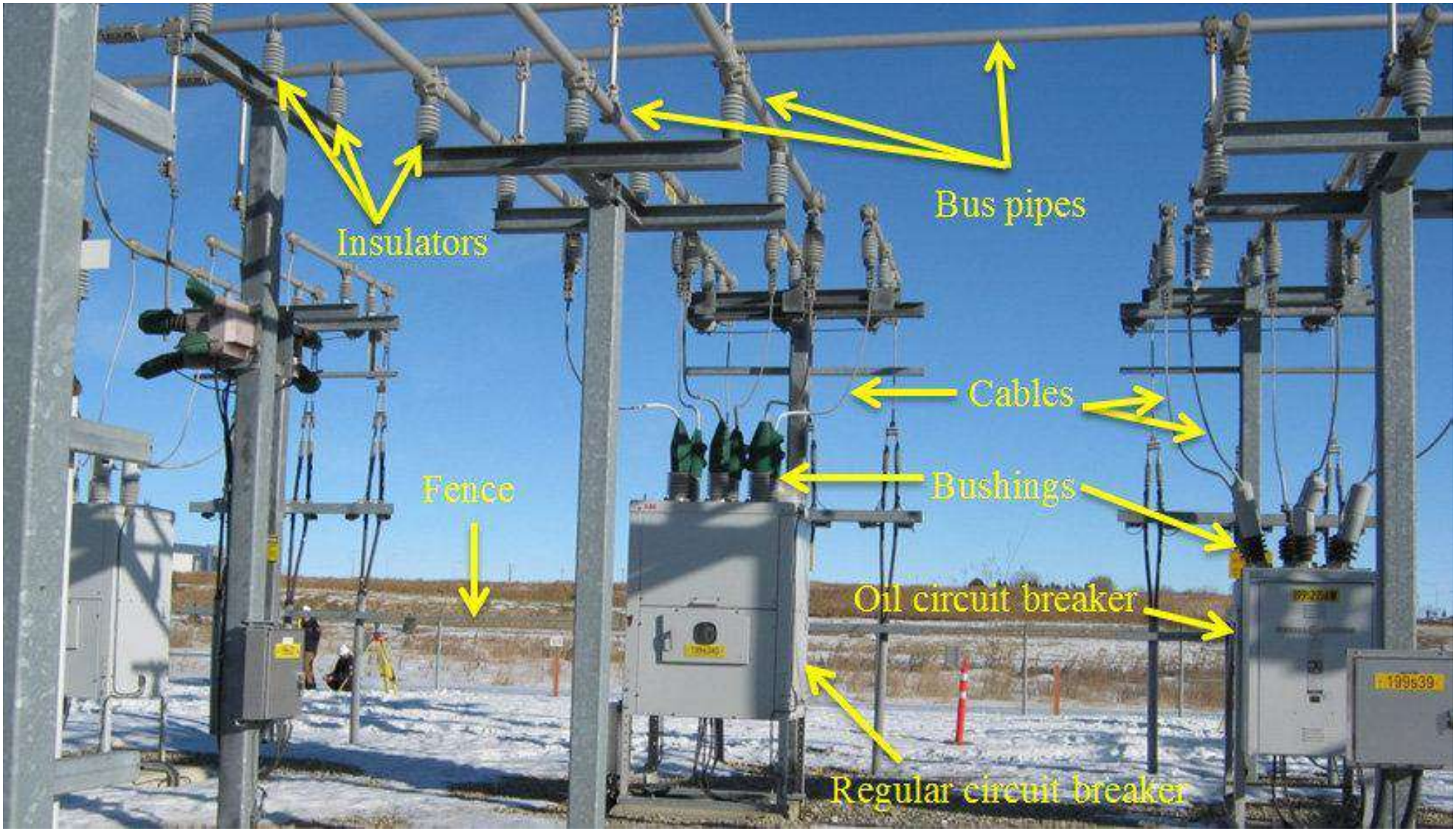
Steel Tubular Pole

Insulator

Civil-Structures Supporting Electrical Components



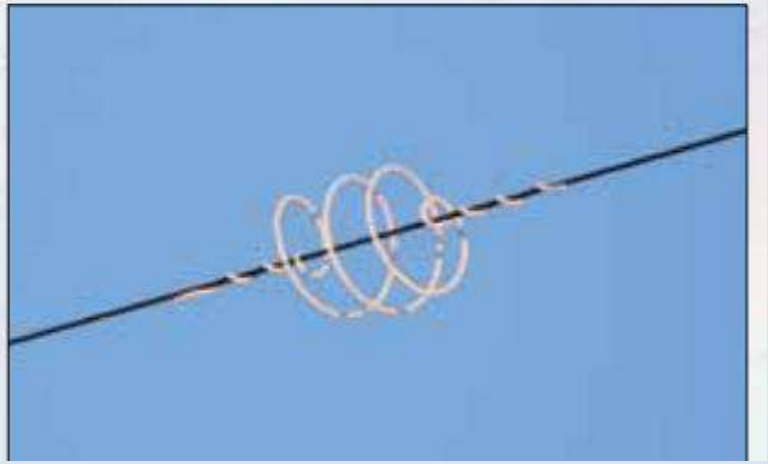
Conductor



Possible components within 33 kV/11 kV 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 4: LEGISLATIVE PROVISIONS

SN	Legal Provisions	Description	Relevancy concerning Project
1.	**Constitution of Nepal**	● The Constitution of Nepal is the main legal document, which emphasizes the right to a clean environment of the people, natural resources protection, preservation, and its prudent use. Rights regarding the clean environment, under article 30: ● It includes making multi-purpose development of water resources, while according priority to domestic investment based on public participation to ensure a reliable supply of energy affordably, and easily, 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 fulfill the rights of people to live in a clean environment along with fulfilling the basic needs by providing access to sufficient energy.
2.	**Environment Protection Act 2076 (2019 AD)**	● Section 3 of the Act requires the proponent to conduct environmental studies concerning the prescribed proposals of any developmental works. Subsection 2 of this act provides the framework for the environmental study report prepared according to sub-section (1) shall, in fulfillment of the process as prescribed, be submitted to the relevant bodies of the Government of Nepal for approval.	Environmental Studies, and approval of the report from the authorized body before construction of any project is mandatory to minimize the negative impacts in Nepal which is addressed in EPA, 2019.
3.	**Environmental Protection Rule, 2077 (2020 AD) [First Amendment on 2078 (2021)]**	● Under the Environmental Protection Rules (2020) first amendment (2021), 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 66 kV in forest land for another purpose.	This rule provides the overall guidance to what type of environmental studies is required according to the project by the Government of Nepal.
4.	**Nepal Environmental Policy, and**	The aims of NEPAP are: ● To manage natural, and physical resources efficiently, and sustainably	DSUEP should follow the aims of NEPAP to

	Action Plan, 2050(1993)	● To balance the development efforts, and environmental conservation for sustainable fulfillment 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 the adverse environmental impact of development projects, and human actions ● To integrate environment, and development through appropriate institutions, adequate legislation, and economic incentives, and sufficient public resources	protect, and conserve the physical, biological, and social environment during the construction of a 33 kV distribution line along with a substation.
5.	**Electricity Act 1992**	● No person shall be entitled to conduct survey, generation, transmission, or distribution of electricity without obtaining a license under this act. ● The Electricity Act of 1992 has the provision of land procurement for the development of Subprojects that involve electricity generation, transmission, or distribution. The Act states that the licensee may apply 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 a sufficient amount of electricity by constructing a 33 kV line, and substation by surveying to minimize the impacts.
6.	**Rural Energy Policy, 2006**	The rationale of formulating, and implementing this policy is to create a conducive environment that will self-motivate, and mobilize local institutions, rural energy user groups, non-government organizations, cooperatives, and private sector organizations 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 the promotion of such renewable energy technologies.	This project helps to improve the distribution, and motivate use the of electricity in rural areas of western Nepal.
7.	**Labor Act, 2074 (2017 AD)**	This labor Act was made under the management of parliament under sub-clause 1 of clause 296 of the Constitution of Nepal. Sub-section 3 of Section 2 states that the employees should not be compelled to other work other t n they are assigned for. In addition, Sub-section 5 of Section 2 states about the prohibition of child labor	The construction of a project is only possible when the rights of labor are secure. In this project, the Contractor should

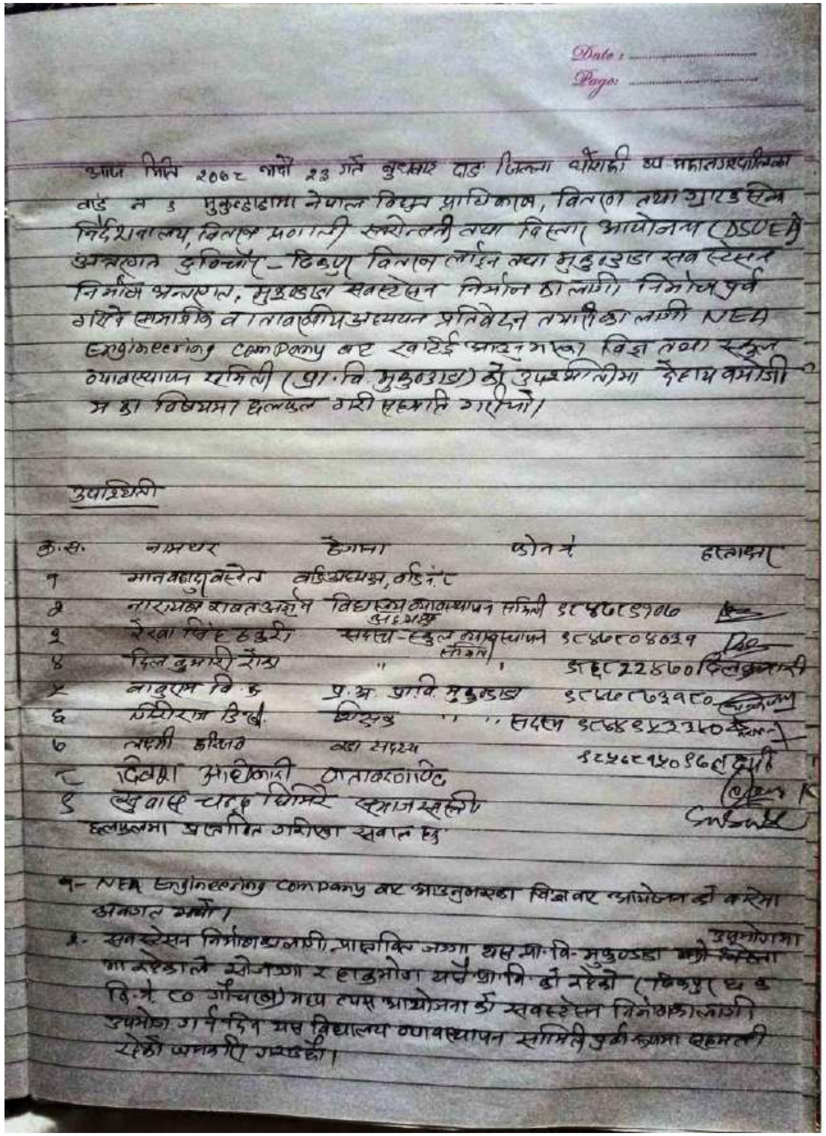
		in any organization, and sub-section 6 of Section 2 states that there should not be any kind of discrimination among the employee's regard of religion, ethnicity, gender, origin, language, or intelligence or other kinds of characters.	follow this act strictly.
8.	**Child Labor (Prohibition, and Regulation) Act, 2056 (2000 AD)**	As per section 3 of this act, no child has not attained the age of 14 years shall be engaged in works as a laborer.	Child labor is strictly prohibited in this project, and Contractors should follow this act.
9.	**Solid Waste Management Act, 2068 (2011 AD)**	This act has been formulated to minimize solid waste products from the target area by setting rules, and regulations on solid waste management (SWM) in the country to develop a better environment for the systematic, and effective management of solid waste, and to involve all the concerned stakeholders in SWM practice. The main features of this act are the discussion of the 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 saves the money which could be used for other infrastructure development. Section 4 of the act assigns the local body to manage or use the solid waste discharged or dumped in the collection center, transfer station, or treatment plant or collected during cleaning.	These acts provide the overall framework to manage the solid waste generated from households to the project level. Also, the proponent should manage the waste generated during construction.
10.	**Solid Waste Management Rules, 2070 (2013 AD)**	The solid waste management rule was formulated as per the provision made in article 50 of the 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 the segregation, and management of solid waste. It has been mentioned that it is essential to segregate degradable, and non-degradable solid waste at the source.	These rules provide the overall framework for how to reduce the volume of waste disposed of at the source during the construction of the substation.
11.	**Fifteenth Plan**	The vision of the 15th plan is to contribute to the prosperity of the nation through sustainable, and reliable development of hydropower by setting the goal which is to ensure energy security through intensifying hydropower generation. In addition, one of the strategies of the government of Nepal in	This 5-year interim plan sets the goal about the generation, and distribution of hydroelectricity in

		the 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:	Nepal which is directly related to this project.
12.	**United Nations Framework Convention on Climate Change (UNFCCC), 1992**	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, to minimize adverse effects on the economy, on public health, and the quality of the environment, of Subprojects or measures undertaken by them to mitigate or adapt to climate change. After it entered into force on 21 March 1994, it mandates the individual state for prioritization of resource conservation with development.	The goal of this project is to replace the traditional form of energy with clean energy i.e. electricity which ultimately reduces air pollution, and smoke.
13.	**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. Article 1 on the First Part of this convention mainly focused on the 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 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 provisions of this Convention apply.	Nepal is the part of ILO convention that's why ILO 169 should strictly follow during construction, and implementation of any types

		● 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.	
14.	**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 Financiers' 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
15.	**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
16.	**Environmental and Social Standards of AIIB** [13]	● Three associated mandatory environmental and social standards (ESSs) set out more detailed environmental and social requirements relating to the ESMP	ESMP requirement

[13] *https://www.aiib.org/en/policiesstrategies/download/environmentframework/20160226043633542.pdf*

Annex 5: CONSULATATION MEETING MINUTES



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आज मिति २०७८ भदौ २३ गते बुधबार दाङ जिल्ला घोराही उप महानगरपालिका वडा नं ३ मुकुन्डाडामा नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली सुधार तथा विस्तार आयोजना (DSUEP) अन्तर्गत दुबिचौर - ढिकपुर वितरण लाईन तथा मुकुन्डाडा सबस्टेसन निर्माण अन्तर्गत, मुकुन्डाडा सबस्टेसन निर्माणका लागि निर्माण पूर्व गरिने सामाजिक व वातावरणिय अध्ययन प्रतिवेदन तयारीका लागि NEA Engineering Company बाट खटाई आउनु भएका विज्ञ तथा स्कूल व्यवस्थापन समिति (प्रा.वि. मुकुन्डाडा) को उपस्थितीमा देहाय बमोजिम का विषयमा छलफल गरी सहमति गरियो।

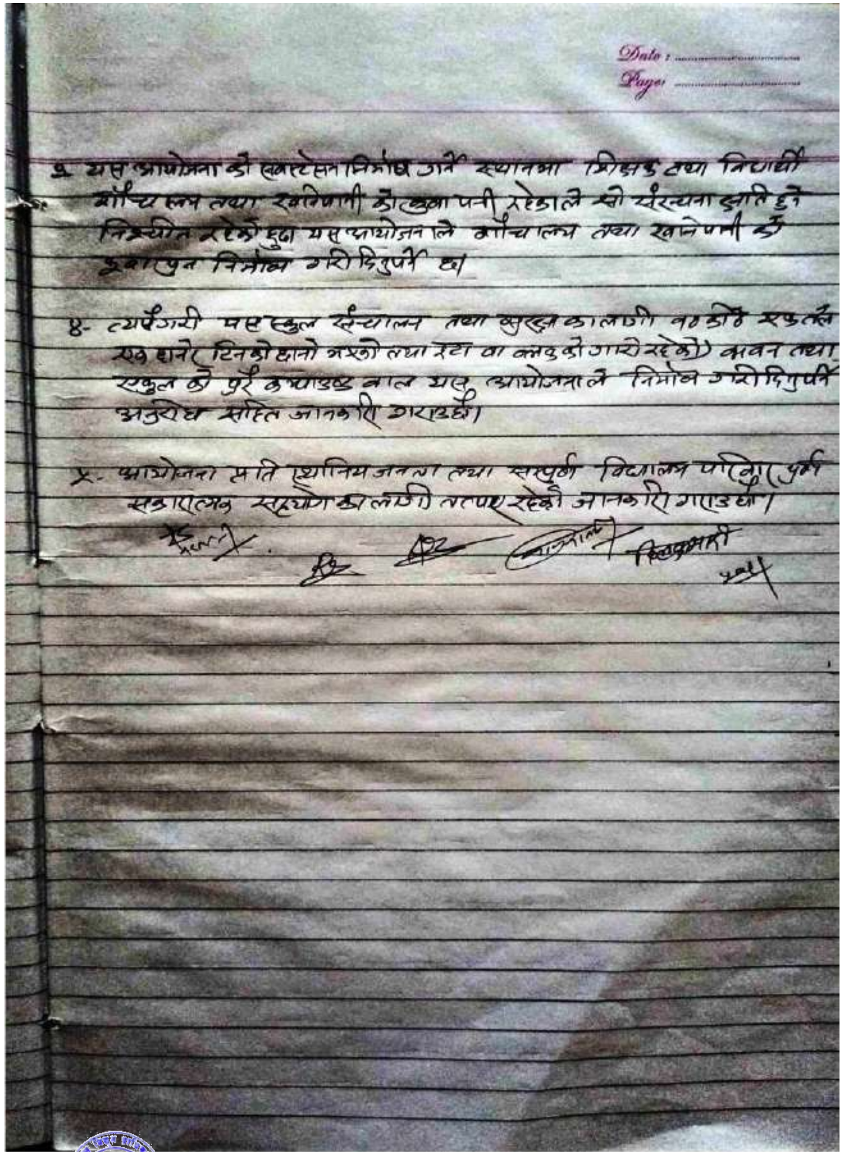
उपस्थिति

क्र.सं.	नामथर	ठेगाना	फोन नं.	हस्ताक्षर
१	मानबहादुर बस्नेत	वडाअध्यक्ष, वडा नं. ८		
२	नारायण रावत अहीर	विद्यालय व्यवस्थापन समिति अध्यक्ष	९८५७८६९७०७	[signature]
३	रेखा सिंह ठकुरी	सदस्य - स्कूल व्यवस्थापन समिति	९८४७८०४०३१	[signature]
४	दिल कुमारी रोका	"	९८६८२२८६०	दिलकुमारी
५	बाबुराम वि.क.	प्र.अ. प्रा.वि. मुकुन्डाडा	९८५७८७३१८०	[signature]
६	निरोराज डिस्वी	शिक्षक " " सदस्य	९८६८३५३३६०	[signature]
७	लक्ष्मी कडिजर	वडा सदस्य	९८५६८१५०३६८	[signature]
८	दिव्या अधिकारी	वातावरणविद्		[signature]
९	खुवास चन्द्र घिमिरे	समाजसेवी		[signature]

छलफलमा प्रस्तावित गरिएका सवाल हरु

१- NEA Engineering Company बाट आउनुभएका विज्ञबाट आयोजनाको बारेमा अवगत गराउनुभयो।

२- सबस्टेसन निर्माणका लागि प्रस्तावित जग्गा यस प्रा.वि. मुकुन्डाडा को उपभोगमा (जिल्ला) मा रहेकाले खोजग्गा र हाल भोग चलन प्रा.वि. को रहेको (ढिकपुर घ ३ कि.नं. ८० जग्गा) मध्ये उक्त आयोजनाको सबस्टेसन निर्माणका लागि उपभोग गर्न दिन यस विद्यालय व्यवस्थापन समिति पूर्ण रूपमा सहमती रहेको जानकारी गराउछौं।



Date :
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३- यस आयोजनाको सबस्टेसन निर्माण गर्ने स्थानमा विद्यालय तथा विद्यार्थी शौचालय तथा खानेपानी को धारा पनि रहेकाले सो संरचना क्षति हुने निश्चित रहेको हुदा यस आयोजनाले शौचालय तथा खानेपानी को पुनः निर्माण गरिदिनुपर्ने छ।

४- त्यसैगरी यस स्कूल संचालन तथा सुरक्षाका लागि बाहिरी स्कूलले एक हाने (टिनको छानो भएको तथा इटा वा ब्लकको गारो रहेको) भवन तथा स्कूल को पूर्ण कम्पाउण्ड वाल यस आयोजनाले निर्माण गरिदिनुपर्ने अनुरोध सहित जानकारी गराउछौं।

५- आयोजना प्रति स्थानिय जनता तथा सम्पूर्ण विद्यालय परिवार पूर्ण सकारात्मक सहयोगका लागि तत्पर रहेको जानकारी गराउछौं।

[signatures] दिलकुमारी

आज मिती २०७८ भाद्र २४ गते १३:० जिल्ला चोराही उपमहानगरपालिका वडा नं ३ मुकुन्डाडा मा नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना (DSUEP) अन्तरगत दुविचौर - ढिकपुर आयोजना अन्तरगत मुकुन्डाडा मा प्रस्तावित सब स्टेसन निर्माण पूर्व वातावरणीय तथा सामाजिक अध्ययन प्रतिवेदन तयारी को लागि NEA Engineering Company बाट खटिई आउनु भएका विज्ञ तथा हामी स्थानिय सरोकारवाला को उपस्थितीमा देहाय को विषयमा छलफल तथा सहमति भयो।

उपस्थिती:

क्र.स.	नामथर	पद/ठेगाना	मोबाईल नं.	हस्ताक्षर
१	मानबहादुर मस्केत	वडा अध्यक्ष	[illegible]	[illegible]
२	मधुमालती गौतम	वडा सदस्य	[illegible]	मधुमती
३	रिपम बहादुर (केसी)	उपभोक्ता समिति अध्यक्ष	[illegible]	[illegible]
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५	ताराबहादुर के सी	राधाकृष्ण टोल वि.स. (सल्लाहकार)		[illegible]
६	नारायण रावत अर्सेन	अध्यक्ष वि.व्य.स. प्रा.वि. मुकुन्डाडा		[illegible]
७	बाबुराम वि.क.	प्र.अ. प्रा.वि. मकुन्डाडा	[illegible]	[illegible]
८	अमरसिंह वस्नेत	सिद्ध बाबा टोल (अध्यक्ष)	[illegible]	[illegible]
९	बल बहादुर वस्नेत			
१०	शमराज पोरखेल	राधाकृष्ण टोल वि.स. (अध्यक्ष)		[illegible]
११	सितासाम वि.क.			
१२	हरि प्रसाद चौधरी	राधा कृष्ण टोल विकास संस्था (सदस्य)		[illegible]
१३	तिलक बं [illegible]			[illegible]
१४	दिव्या अधिकारी	वातावरणविद		[illegible]
१५	सुवास चन्द्र घिमिरे	समाजशास्त्री		Sush
१६	कृष्ण कार्की	समाजशास्त्री		[illegible]

छलफल मा प्रस्तावित गरेको सवाल हरु:

१- आयोजना बाट आउनुभएका विज्ञ बाट दुविचौर-ढिकपुर लाईन विस्तार आयोजना तथा सब स्टेसन को उपआयोजना को बारेमा जानकारी भयो।

२- आयोजना निर्माण का क्रममा सीप र दक्षता का आधारमा स्थानिय जनशक्तीलाई प्राथमिकता दिनुपर्ने।

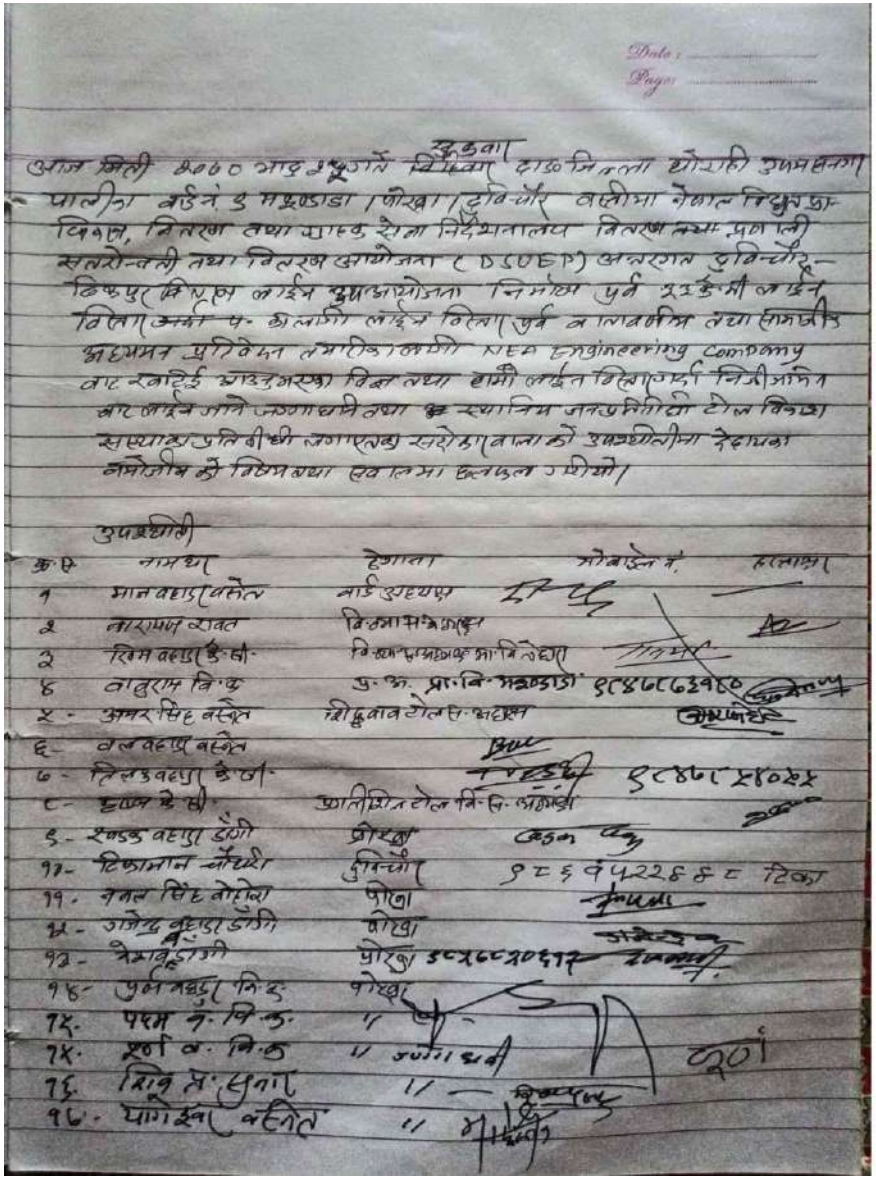
३- यस आयोजना निर्माण पश्चात यस क्षेत्रमा सहज निर्वाध विद्युत आपुर्ति हुने हुँदा यो आयोजना प्रति पूर्ण समर्थन रहने तथा छिटो आयोजना निर्माण गरिनुपर्ने।

४- सब स्टेसन क्षेत्र स्कूल क्षेत्रभित्र पर्ने र सो क्षेत्र कुनै पनि व्यक्ति तथा संस्था को सट्टा समुदाय को भोगचलन रहेको नरहेको ले सो स्थानमा सब स्टेसन निर्माण गर्न उपयुक्त हुने हुँदा स्कुल लाई आयोजना ले सहयोग गर्नुपर्ने।

५- लाईन विस्तार गर्दा घर तथा संरचना मा क्षति हुने भएमा उचित क्षतिपूर्ति दिनुपर्ने।

६- आयोजना निर्माण मा हामी सरोकारवाला को पूर्ण समर्थन रहेको जानकारी गराउँछौं।

[illegible]

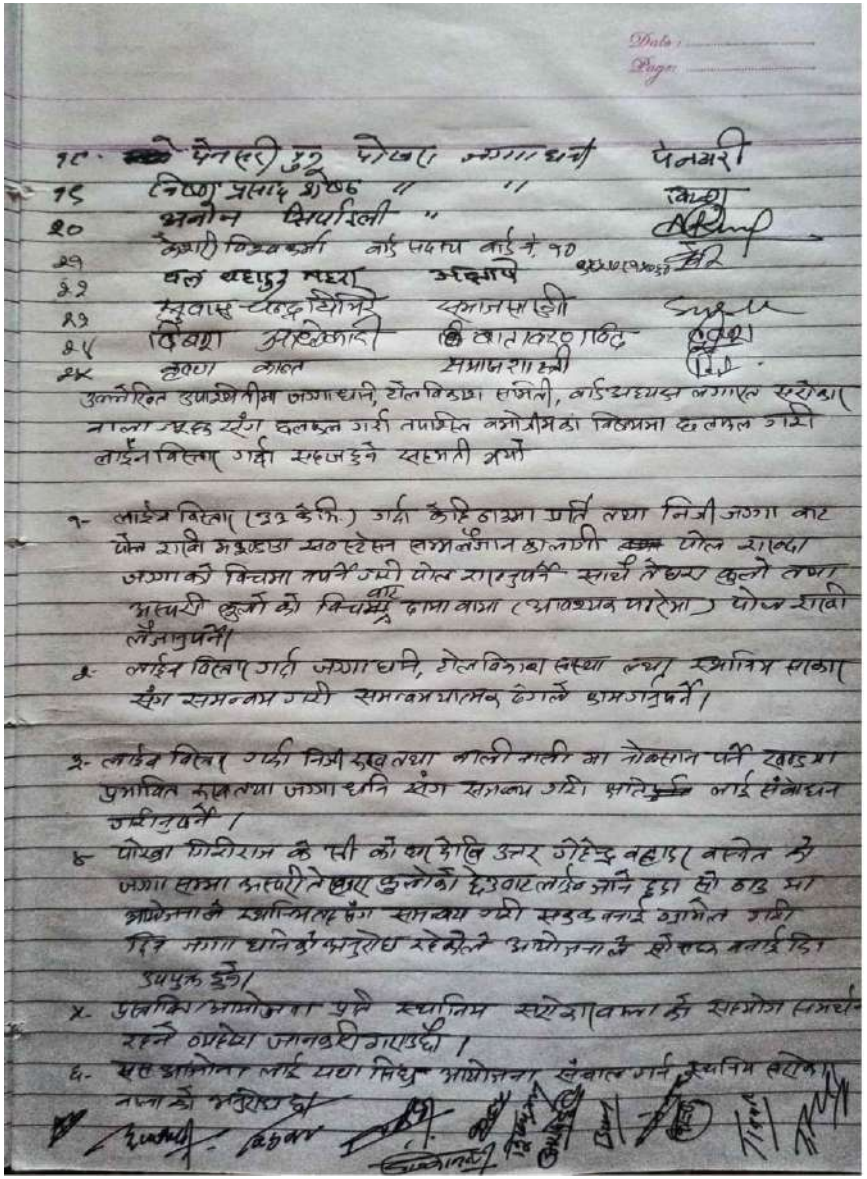


मुचुल्का

आज मिती २०८० भाद्र ७ गते डाङ जिल्ला घोराही उपमहानगरपालिका वडा नं. ३ मझुवाडाडा / पोखरा / दुविचौर बस्तीमा नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय वितरण तथा प्रणाली सुदृढीकरण तथा विस्तार आयोजना (DSUEP) अन्तरगत दुविचौर-ढिकपुर वितरण लाईन उपआयोजना निर्माण पूर्व ३३ के.भी. लाईन विस्तार गर्नका लागि लाईन विस्तार पूर्व वातावरणीय तथा सामाजिक अध्ययन प्रतिवेदन तयारीका लागि NEA Engineering Company बाट खटिई आउनुभएका विज्ञ तथा हामी लाईन विस्तार गर्दा निजी जग्गा बाट लाईन जाने जग्गाधनी तथा स्थानीय जनप्रतिनिधि टोल विकास संस्थाका प्रतिनिधि लगायतका सरोकारवालाको उपस्थितीमा देहायका बमोजीमको विषयमा छलफल गरियो।

उपस्थिती

क्र.सं.	नामथर	ठेगाना	मोबाइल नं.	हस्ताक्षर
१	मानबहादुर बस्नेत	वार्ड अध्यक्ष		
२	नारायण रावत	वि.व्या.स. अध्यक्ष		
३	रिम बहादुर के.सी.	वि.व्या. प्रअध्यक्ष मा.वि. लेघा		
४	बाबुराम वि.क.	प्र.अ. प्रा.वि. मझुवाडाडा	९८४८८६३१६०	
५	अमर सिंह बस्नेत	... टोल वि. अध्यक्ष		
६	बलबहादुर बस्नेत			
७	तिलक बहादुर के.सी.		९८४८८५४०५५	
८	... के.सी.	... टोल वि.सि. अध्यक्ष		
९	खड्क बहादुर डाँगी	पोखरा		
१०	टिकाराम चौधरी	दुविचौर	९८६९५२२६४८	टिका
११	नवल सिंह वोहोरा	पोखरा		
१२	गजेन्द्र बहादुर डाँगी	पोखरा		
१३	प्रेमबहादुर डाँगी	पोखरा	९८५८८४०६१७	
१४	पूर्ण बहादुर वि.क.	पोखरा		
१५	पदम ब. वि.क.	"		
१५	पूर्ण ब. वि.क.	" जग्गाधनी		
१६	रिवु ब. सुनार	"		
१७	पार्वती बस्नेत	"		



१८	पेनसरी पुरू	पोखरा जग्गाधनी	पेनसरी
१९	विष्णु प्रसाद श्रेष्ठ	" "	
२०	अनोन सिपाहिली	"	
२१	कुमारी विश्वकर्मा	वार्ड सदस्य वार्ड नं. १०	
२२	बल बहादुर महरा	अधिकृत	
२३	सुवास चन्द्र घिमिरे	समाजशास्त्री	
२४	दिवश अधिकारी	वातावरणविद्	
२५	कृष्ण कार्की	समाजशास्त्री	

उल्लेखित उपस्थितीमा जग्गाधनी, टोल विकास समिती, वडाअध्यक्ष लगायत सरोकारवालाहरू संग छलफल गरी तपसिल बमोजीमको विषयमा छलफल गरी लाईन विस्तार गर्दा सहजहुने सहमती भयो।

१- लाईन विस्तार (३३ के.भी.) गर्दा कैहि ठाउमा पर्ति तथा निजी जग्गा बाट पोल राखी मझुवाडा सबस्टेसन सम्मलैजान कालागी पोल राख्दा जग्गाको बिचमा नपर्ने गरी पोल राख्नुपर्ने साथै तेस्रा कुलो तथा अस्थायी कुलोको किनारबाट दायाबाया (आवश्यक परेमा) पोल राखी लैजानुपर्ने।

२- लाईन विस्तार गर्दा जग्गा धनी, टोलविकास संस्था तथा स्थानिय सरकार संग समन्वय गरी समन्वयात्मक ढंगले कामगर्नुपर्ने।

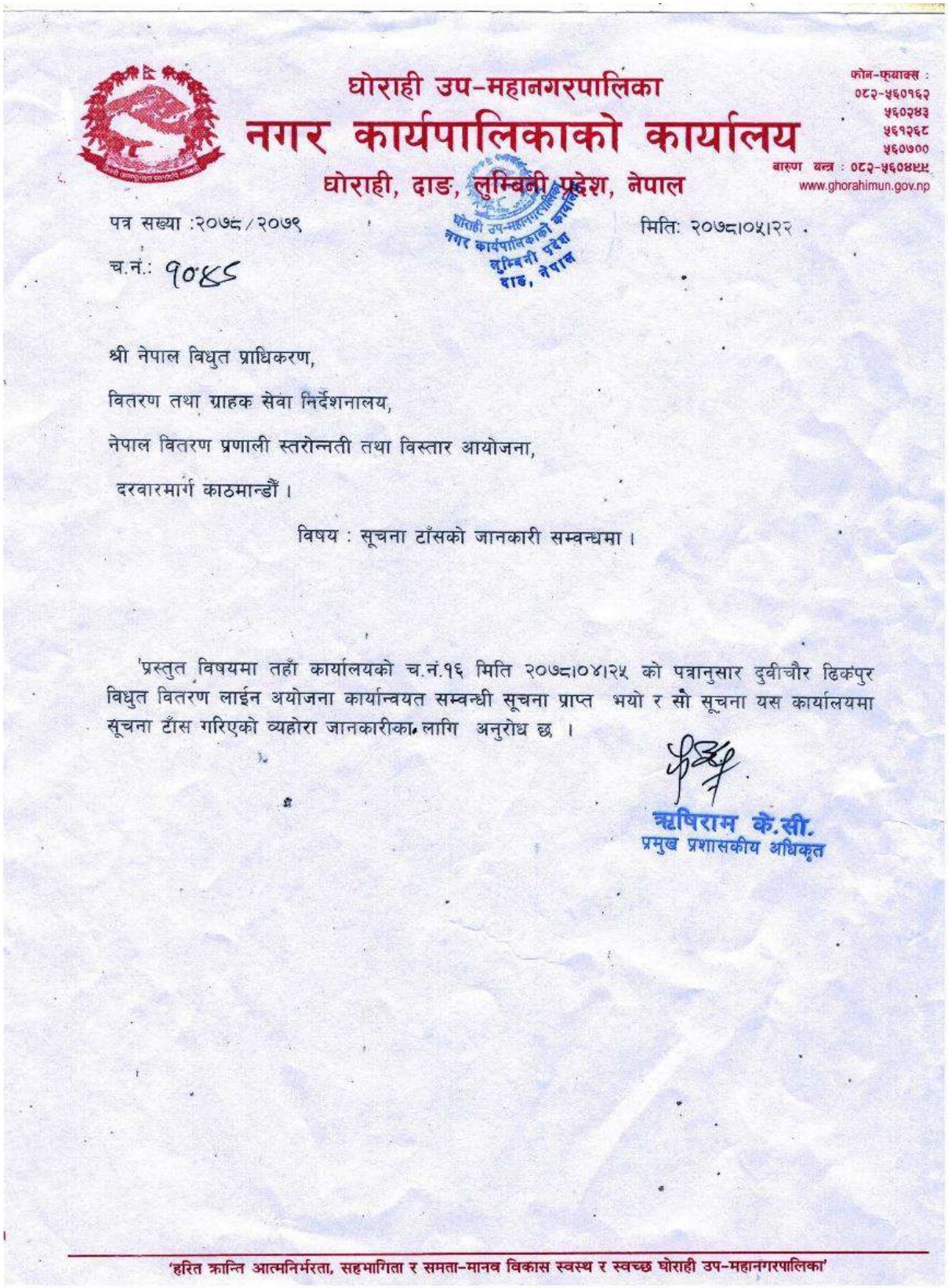
३- लाईन विस्तार गर्दा निजी रुख तथा बालीनाली मा नोक्सान पर्ने खण्डमा प्रभावित रुख तथा जग्गा धनि संग समन्वय गरी क्षतिपूर्ति लाई संबोधन गरिनुपर्ने।

४- पोखरा गिरिराज के.सी. को घरदेखि उत्तर गजेन्द्र बहादुर बस्नेत को जग्गा सम्म अस्थायी तेस्रा कुलोको डिलबाट लाईन जाने हुदा सो ठाउँ मा आयोजनाले स्थानियहरूसँग समन्वय गरी सडक बनाई व्यवस्थित गरी दिन जग्गा धनीको अनुरोध रहेकोले आयोजनाले सो सडक बनाईदिन उपयुक्त हुने।

५- प्रस्तावित आयोजना प्रति स्थानिय सरोकारवालाको सहयोग समर्थन रहने अपेक्षा जानकारी गराइयो।

६- यस आयोजना लाई यथा शिघ्र आयोजना संचालन गर्न स्थानिय सरोकारवालाको अनुरोध छ।

Annex 6: DEED OF ENQUIRY (MUCHULKAS)



घोराही उप-महानगरपालिका
नगर कार्यपालिकाको कार्यालय
घोराही, दाङ, लुम्बिनी प्रदेश, नेपाल

फोन-फ्याक्स : ०८२-५६०१६२, ५६०२४३, ५६१२६८, ५६०७००
बारुण यन्त्र : ०८२-५६०४५५
www.ghorahimun.gov.np

पत्र सङ्ख्या :२०७८/२०७९
मितिः २०७८।०५।२२ .
च.नं.: १०४८

श्री नेपाल विद्युत प्राधिकरण,
वितरण तथा ग्राहक सेवा निर्देशनालय,
नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना,
दरबारमार्ग काठमान्डौं ।

विषय : सूचना टाँसको जानकारी सम्वन्धमा ।

'प्रस्तुत विषयमा तहाँ कार्यालयको च.नं.१६ मिति २०७८।०४।२५ को पत्रानुसार दुवीचौर ढिकपुर विद्युत वितरण लाईन अयोजना कार्यान्वयत सम्वन्धी सूचना प्राप्त भयो र सो सूचना यस कार्यालयमा सूचना टाँस गरिएको व्यहोरा जानकारीका लागि अनुरोध छ ।

ऋषिराम के.सी.
प्रमुख प्रशासकीय अधिकृत

'हरित क्रान्ति आत्मनिर्भरता, सहभागिता र समता-मानव विकास स्वस्थ र स्वच्छ घोराही उप-महानगरपालिका'

घोराही उप–महानगरपालिका

९ नं.वडा कार्यालय, ढिकपुर दाङ

लुम्बीनी प्रदेश , नेपाल

९ नं. वडा कार्यालय
ढिकपुर, दाङ
लुम्बिनी प्रदेश, नेपाल

प.सं. :-०७८/०७९
च.नं. :- ६२५

मिति : २०७८/०५/२३

विषय :– सूचना टाँस गरीएको सम्बन्धमा ।

श्री जोजस संग सम्बन्ध राख्दछ ।

उपरोक्त विषयमा दाङ घोराही उप महानगरपालिका वडा नं.०९मा एसिएन ईन्फास्टक्चर इन्भेष्टमेन्ट बैंक को वित्तीय व्यबस्थापनमा नेपाल विद्युत प्राधिकरण,वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजना प्रस्तावक रही कार्यान्वयन गर्न लागेको दुविचौरा ढिकपुर वितरण लाईन आयोजना कार्यान्वयन हुनु भन्दा अगाडी यस क्षेत्रको बातावरण तथा सामाजिक क्षेत्रमा के कस्तो प्रभाव पार्छ भनि सम्बन्धित सरोकारवालाहरुसंग छलफल गर्न सुचना जनकारी पठाएको हुँदा उक्त सूचना सुचना प्राटीमा टाँस गरी जानकारी पठाएको व्यहोरा अनुरोध छ ।

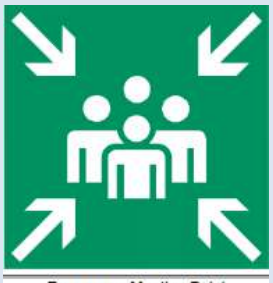
मधुमती

मधुमती गौतम
का.वा.अध्यक्ष

Annex 7: SAFETY RELATED SIGNS AND WASTE MANAGEMENT PRACTICES

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

Slow Sign for Traffic Control
यातायात नियन्त्रण

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


निर्माणस्थलमा गर्नहुने र नहुने कुराहरु


निर्माणस्थलमा गर्नहुने र नहुने कुराहरु

Annex 8: PHOTOGRAPHS

Substation at Shree Primary School Makundanda, Makundanda

11 kV Line Crossing in Dhikpur Line

Cultivated Land Along the RoW of Road DL at Makundanda

Tapping Point Near Hapur Khola at Khaira

Tapping Point at Khaira, DL Passes from Khola side Road at the Left Bank of the Hapur Khola, the DL Passes from the Cultivation, the DL Passes from the Roadside at the Pokhara, End Substation Land at Makundanda

Stakeholders during Public Consultation cum FGD Meeting at Ghorahi SMC, Dang

Stakeholders during Public Consultation cum FGD Meeting at Ward-9, Ghorahi SMC

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

LAMAHI-GADHAWA DISTRIBUTION LINE SUBPROJECT

SUBSTATION (33/11KV) AND DISTRIBUTION LINE (33KV)

DANG DISTRICT, LUMBINI PROVINCE

NEPAL ELECTRICITY AUTHORITY

DISTRIBUTION AND CONSUMER SERVICE DIRECTORATE

DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT (DSUEP)

DURBARG MARG, KATHMANDU

NEPAL

CONSULTANT:

NEA ENGINEERING COMPANY LIMITED, TRADE TOWER

THAPATHALI, KATHMANDU, NEPAL

SEPTEMBER, 2022

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ABBREVIATIONS

ACSR	Aluminum Conductor Steel Reinforced
AIIB	Asian Infrastructure and Investment Bank
BES	Brief Environment Study
COVID-19	Corona Virus Disease
CDP	Community Development Programme
CPA	Core Project Area
DCSD	Distribution and Consumer Services Directorate
DHM	Department of Hydrology and Meteorology
DL	Distribution Line
DSUEP	Distribution System Upgrade and Expansion Project
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EPA	Environment Protection Act
EPR	Environment Protection Regulation
EMF	Electromagnetic Field
ESP	Environmental and Social Policy
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
ESSs	Environmental and Social Standards
GHG	Green House Gas
GIS	Geographic Information System
GoN	Government of Nepal
GRM	Grievance Redress Mechanism
IEE	Initial Environmental Examination
IP	Indigenous People
IUCN	International Union for Conservation of Nature
IUSGS	International Union of Geological Sciences
LPG	Liquid Petroleum Gas
MDB	Multilateral Development Bank
MoEWRI	Ministry of Energy, Water Resources and Irrigation
MHT	Main Himalayan Thrust

NEA	Nepal Electricity Authority
PPE	Personal protective equipment
RM	Rural Municipality
RoW	Right of Way
SPA	Surrounding Project Area
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
US EPA	United States, Environment Protection Agency
USGS	United States Geological Survey
VC	Vulnerable Community

Unit

%	Percent/ Percentage
CO_2	Carbon dioxide
dB	Decibel
g	Gram
ha	Hectare
HHs	Households
Kg	Kilogram
Km	Kilometer
kV	Kilovolt
kWh	Kilo Watt Hour
ltr	Liter
LV	Low Voltage
m	Meter
masl	Meter Above Sea Level
mm	Millimeter
MVA	Mega Volt Ampere
MW	Megawatt
NRs.	Nepalese Rupees
^oC	Degree Centigrade
sq.m.	Square Meter

EXECUTIVE SUMMARY

Description of Project: Nepal Electricity Authority (NEA) under Ministry of Energy, Water Resources and Irrigation is responsible for the implementation of the Distribution System Upgrade and Expansion Project (DSUEP). DSUEP will enhance the distribution system to improve reliability and quality of electric supply in the Karnali Province and Lumbini Province. The proposed **Lamahi-Gadhawa Distribution Line Subproject** is located within Lamahi Municipality, Ward No. 4 and 5, and Gadhawa Rural Municipality (RM), Ward No. 5, 6 and 7 of Dang District in Lumbini Province. The Subproject requires 0.69 ha of land (Government Land) for the construction of substation. The 33 kV distribution line of 10.35 km passes along the Right of Way (RoW) of the road and private land with installation of poles at the edge of the private farm lands. The proposed subproject is financed with loan by Asian Infrastructure Investment Bank (AIIB).

Description of Environment

Physical Environment: The Subproject (substation and distribution line) area lies in Dang Valley of Chure Range. The substation lies at Latitude 27°48'46.47"N, Longitude 82°31'18.27"E and elevation of 248 masl. The climate of the Subproject area is sub-tropical. The annual average maximum temperature is 28.73°C and minimum with 15.94^{o}C. The average annual rainfall is estimated at approximately 1560.9 mm per year. The air quality and noise level of the SPA was found within the range of National Ambient Air Quality Standard and Noise Quality Standard, respectively. No water sources were recorded within and nearby the substation area and within the alignment of distribution line.

Biological Environment: The proposed Subproject Core Project Area avoids the forestland. The Subproject does not lie in any protected area, although it is located in the Chure region without any induced impact to the biological environment. The Subproject components substation and 33 kV distribution line does not intercept any forest area, thus there will be no any issues of tree loss. The surrounding environment of the Subproject area contains sparse vegetation with species common to the area. Similarly, the bird species seen in the surrounding environment are House Crow (*Corvus splendens),* Western Spotted Dove (*Spilopelia suratensis),* Rock Dove (*Columba livia),* Rose-ringed Parakeet (*Alexandrinus krameri),* House Sparrow (*Passer domesticus),* Tree Sparrow (*Passer montanus),* Grey Francolin (*Francolinus pondicerianus),* Common Quail (*Coturnix coturnix),* Black–backed Forktail (*Enicurus immaculatus*), Kingfisher (*Alcedo atthis),* Red-wattled Lapwing (*Vanellus indicus),* Ruddy Shelduck (*Tadorna ferruginea*) and White–rumped Vulture (*Gyps bengalensis).*

Socio-Economic Environment: The major ethnic compositions within the surrounding project area i.e., Ward No. 4 and 5 of Lamahi Municipality and Ward No. 5, 6 and 7 of Gadhawa RM of Dang District are Tharu (60%) with their population of 28,538 and 17,563 in Lamahi Municipality and Gadhawa RM, respectively and followed by Chhetri (11%) and Brahmins (9%) of total population. The implementation of the Subproject will increase the electricity beneficiaries to 18,707 HHs, 90 commercial purposes and 23 industries. Lamahi, Kolahi, Balampur, Legadi, Madhya Deupur and Maurahawa are the nearest business market nearby the Subproject. The transportation facilities in this local level seems to be satisfactory. Tube-well and tap/piped water is the main source of drinking water in the surrounding area. People of the Subproject have access with communication facilities mainly

through mobile telephone services. The nearest and easily accessible well-equipped health facility to the proposed Subproject is in Lamahi Bazar located at 30-minute driving distance from substation site. The main occupation of people in the area is agro base with nearly 60% contribution followed by small trade and business/enterprises and services.

Potential Impacts and Mitigation Measures: Civil works will be involved with temporary impacts on air, noise and water quality and occupational and community health and safety; particularly related to working with electricity and in the context of the COVID-19 pandemic. Long-term impacts, although insubstantial, during operation and maintenance include occupational and community health and safety risks related to the presence of electricity infrastructure. The potential environmental issues and mitigation measures identified in screening and the preparation of ESMP report will be addressed during the compliance monitoring carried out by the safeguard team. No issues were identified in the land requirement procedure and pole erection activities. Construction of substation and erection of poles for distribution lines would not affect any private structures as the proposed substation land is unused government land, and local people have agreed & permitted to install poles at the edge of farm-lands without affecting any private structures along the distribution line. The ESMP cost estimated for the Subproject is NRs 13,00,000.00 associated to mitigation measures and monitoring activities. NEA Project Implementation Unit has agreed on the estimated cost for the mitigation measures and monitoring activities.

Environmental and Social Management Plan: The ESMP serves as a guide to implement environmental and social mitigation measures and responsibility of the concerned agencies during the construction and operations of the Subprojects. Monitoring and inspection of the environmental and social activities will be carried out by Environment and Social Management Unit and Project Supervision Consultant of PIU. ESMP will be an integral part of the contractor's Bidding document which will be updated by the contactor during the sub-project construction period.

Institutional Arrangements: To ensure the full compliance to the ESMP, institutional arrangement for monitoring and reporting has been proposed. All the resources needed for the implementation of ESMP for the construction and operation phase will be provided by the PIU. Project Supervision Consultant's with Environmental and Social Safeguard Specialist will be responsible for compliance monitoring activities during the construction phase. Environment and Social Management Unit of NEA will provide regular updates to the site offices regarding the implementation of ESMP. Contractor shall prepare an Environment, Health and Safety (EHS) plan approved by the PIU before field mobilization. Contractor should mobilize a safety officer at each work site during the construction period.

Public consultation: Public consultations have been conducted in the Subproject area. People in the Subproject area noted that electricity service is poor with frequent interruptions. People have suggested to install poles at the edge of farm-lands, and project components should not affect any house and structures along the line. The impacts on the crops while stringing of lines should be minimized. Prospective electricity consumers and people to be affected are supportive and have recommended for quick implementation of the project.

***Grievance Redress Mechanism (GRM)*:** A three-tier 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 issues at Subproject level. In each Subproject, two levels i.e., Tier-I and Tier-II of Grievance Redress Mechanism have been established. During the ESMP study period, NEA has disseminated letters to the local level stakeholders regarding the formation of the GRM at the Subproject level.

Conclusion: The environmental impacts envisaged from the implementation of proposed Subproject are site specific, short term, temporary and reversible in nature. The Subproject will provide significant benefits to people and economy by providing the reliable and improve electricity supply. This ESMP is considered sufficient to mitigate the environmental and social issues identified for the Subproject and will be updated during the Subproject construction stage.

1. INTRODUCTION

1.1 Project Background

The proposed Distribution System Upgrade and Expansion Project (DSUEP) will enhance the distribution system to improve reliability and quality of electric supply in the Lumbini Province. The project aims improvement in voltage level and reduction in power loss which in turn will improve Nepal Electricity Authority's (NEA) financial health, improve electricity supply reliability, and reduce dependence on petroleum-fueled accessories. Government of Nepal (GoN) has envisaged DSUEP to extend the reach of 33 kV and 11 kV distribution lines "to achieve affordable electricity fulfilling the demands at the local levels for all the households by 2022". Asian Infrastructure Investment Bank (AIIB) is financing a loan to upgrade existing and build new distribution systems in Lumbini Province and Karnali Province of Nepal. This ESMP is prepared for Lamahi-Gadhawa distribution line Subproject of DSUEP.

This Subproject has three major components:

Component 1: construction, extension and augmentation of distribution lines and substations, especially 33 kV lines and 33/11 kV substations.

Component 2: construction of 11 kV lines, distribution transformers, and Low Voltage (LV) lines for new power distribution facilities.

Component 3: Capacity Building, Project Implementation Support, and Technical Assistance.

1.2 Scope of Study

This study ensures that the project meets the requirements of Nepal Government's Environmental Regulations and Environmental and Social Policy (ESP) & Environmental and Social Standards (ESSs) of AIIB. This report provides the measures for environmental and social management, monitoring and reporting of the project.

1.3 Objective of ESMP

The Environment and Social Management Plan aims to sets out the measures required to maximize the benefits of the project; and to avoid, minimize and mitigate any adverse environmental and social impacts caused by the project. The objectives of this ESMP are to:

- Describe the existing natural and socio-economical resources in and surrounding Subproject area;
- Based on existing environmental conditions, identify and assess potential significant impacts during project preconstruction, construction, and operation & maintenance stages;
- Identify and recommend mitigation measures to minimize any potential impacts caused by Subproject activities;
- Identify the local concerns on environmental and social issues and address them;
- Develop environmental management plan and monitoring plan including cost;

- Recommend institutional arrangement, including capacity building to ensure proper environmental and social safeguards implementation during construction and operation phases.

1.4 Legal Provision for the ESMP

Rule 3 (1) of Environment Protection Act (EPA), 2019 describes completing Environmental Studies as per Schedule 1 or 2 or 3 under Environment Protection Regulation 2020 (First Amendment in 2021/05/24 on Nepal Gazette). For this Subproject, none of the legal provisions are compliable to Schedule 1 or 2 or 3, and hence, detailed environmental studies (Brief Environmental Study (BES) or Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) is not mandatory. According to the E & S safeguard Screening report, safeguard risks/issues identified for this Subproject fall under Category III (ESMF), which triggers the preparation of ESMP to execute the Subproject. This Subproject has minimal or no adverse environmental and social impact; does not physically displace any family; and does not result in economic displacement of more than 10% of productive assets for any family.

1.5 Methodology for the ESMP

The methodology adopted for this ESMP study is as follows:

i. Literature Review: Review of published literature were conducted, with priority given to publications of government institutions as well as international organizations, to collect information on project surroundings. The Municipality/Rural Municipality (RM) and its Ward profiles are used to collect the socio-economic baseline information of the Subproject. National policies, legislative frameworks and Multilateral Development Bank (MDB) policies were reviewed to understand the priorities and any legally binding requirements were studied that should be complied with while implementing the project. The Legislative provisions relevant to the project are listed in **Annex 4**.

ii. Field Survey and Investigation: Field surveys were conducted to generate information on the physical, biological and socio-economic environment of the project area. The physical environment; air quality data was monitored by Temtop Airing-1000 PM Detector, noise level by UNI-T UT 353 Mini Sound Meter (dB) and water quality by EXTECH ExStik II DO600. Field observation of the core project area and the surrounding vicinity (500m) of project footprint area was applicable for the biological assessment. Priority was given to the consultation with local communities at substation sites and the settlement areas that benefit from the project.

iii. Data Analysis: All potential Subproject impacts on physical, biological, socio-economic and cultural resources were integrated and assessed using best practice 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 CPA and SPS data and presentation of the maps in the ESMP report. The project footprint Ward and Municipality/RM are considered for the collection of socio-economic and baseline information.

iv. Impact Evaluation: Significance of impacts are evaluated on the basis of reversibility, nature, magnitude, extent and duration of the impact. Identification of magnitude, extent and duration is as provided in the National EIA Guidelines, 1993 of Nepal. While evaluating the impacts and prescribing mitigation, maximum efforts were made to get expert opinion and input from the DSUEP's technical and safeguard consultant team.

v. Public Consultation: As per the Government of Nepal EPA and the AIIB Environmental and Social Policy (ESP), pre-notifications with subject of consultation, venue, and time were given at Subproject footprint area, local level and affected Ward office in presence of concerned local stakeholders. Consultations were conducted in the Subproject area; at substations and the distribution line system settlement areas with local stakeholders.

vi. Report Format: The ESMP report is prepared as per the Environmental and Social Policy (ESP) of the AIIB, which contains an executive summary, a main report, and annexes as appropriate, including one on the nature and findings of consultations undertaken. All the comments and suggestions from the field consultation are mentioned in the ESMP report.

1.6 Classification of Impact Area

The National EIA Guidelines (GoN, 2050) has mentioned on 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.

Core Project Area (CPA) refers to the temporary and permanent area for the proposed project construction and associated activities. It is the area where direct impacts can be seen. For **Lamahi-Gadhawa Distribution Line Subproject**, proposed substation area with 0.69 ha and Right of Way (RoW) of 33 kV distribution line with 10.35 km length is considered as CPA. The Subproject components are located within the Ward No. 4 and 5 of Lamahi Municipality and Ward No. 5, 6 and 7 of Gadhawa RM. The major settlements are Lamahi, Arnahawa, Kolhai, Chailahi, Bhurdanda, Balarampur, Bodipur, Aatipakhar, Balapur and Gadhawa. The distribution line stringing route passes along the RoW of the road from Lamahi to Gadhawa.

Surrounding Project Area (SPA is the immediate vicinity (500m) of the footprint location of the proposed Subproject site. SPA is the moderate and indirect impact area. For this Subproject Lamahi Municipality, Ward No. 4 and 5, and Gadhawa RM Ward No. 5, 6 and 7 of Dang district is considered as SPA. The SPA will have impact with the beneficiary's area of 11 kV lines and Low Tension (LT) lines service. The impact area showing the CPA and SPA area is presented in the google map **Figure 1-1**.

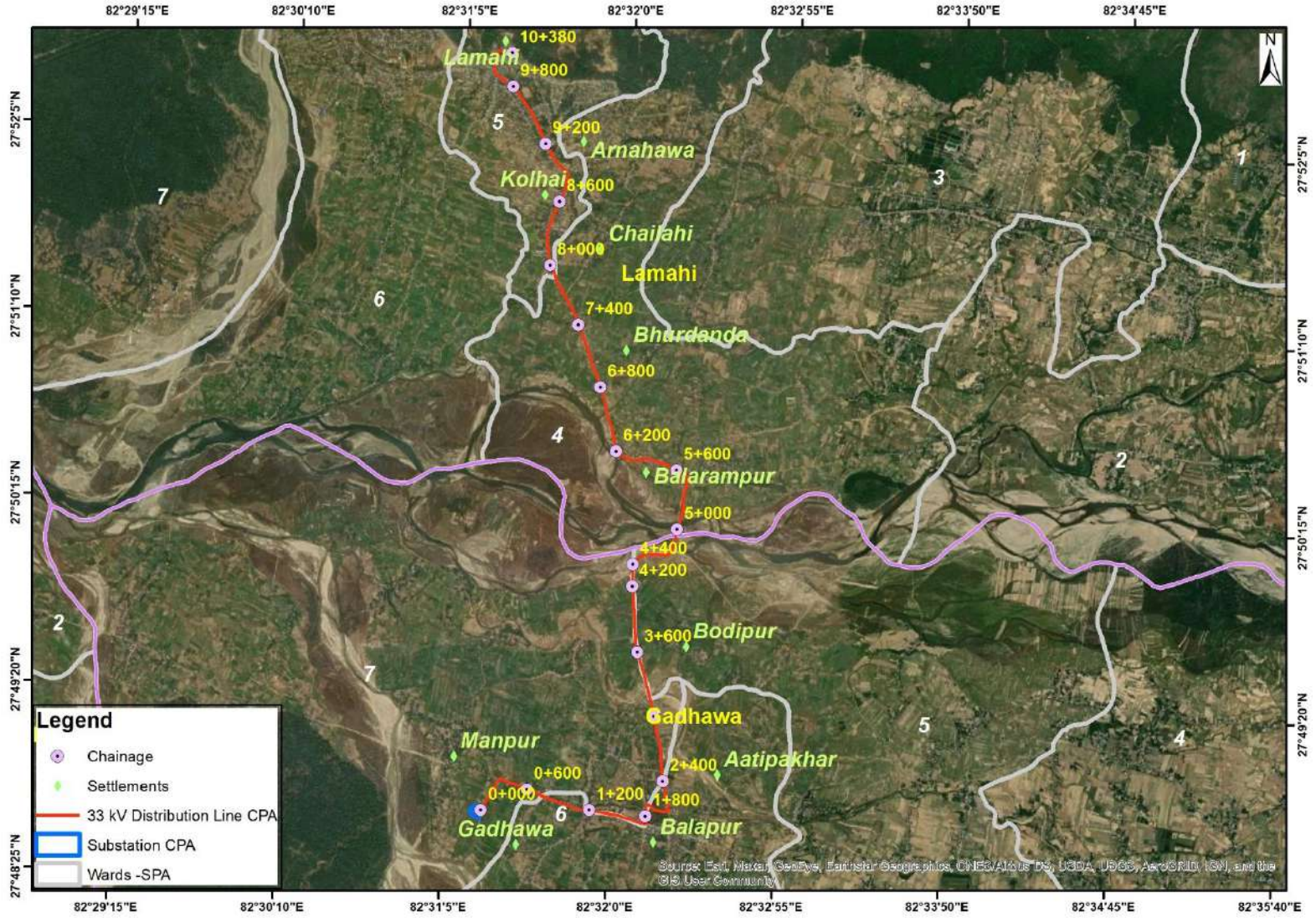


Figure 1-1*:* Core Project Area (CPA) and the Surrounding Project Area (SPA) Wards of the Lamahi-Gadhawa DL Subproject

2. DESCRIPTION OF THE SUBPROJECT

2.1 Subproject Location and Accessibility

The proposed **Lamahi-Gadhawa Distribution Line Subproject** is located within, Lamahi Municipality, Ward No. 4 and 5, and Gadhawa RM Ward No. 5, 6 and 7 of Dang District in Lumbini Province. The tapping point of 33 kV line lies in Lamahi substation, Lamahi Municipality-5 just adjoining to the East-West Highway (Mahendra Highway). The proposed distribution line (33 kV) is of 10.35 km length and run by the edge of private farm lands, and RoW of Lamahi-Koilabas Road up to the Gadhawa chowk towards south after crossing West-Rapti River; then through Kalakanti (MRM)-Gadhawa-Rajpur Postal highway section towards west from same chowk. There is the access to road within the proposed Subproject Ward area. The Subproject location and the accessibility map are presented in **Figure 2-1**. The main features of the Subproject are presented in **Table 2-1**.

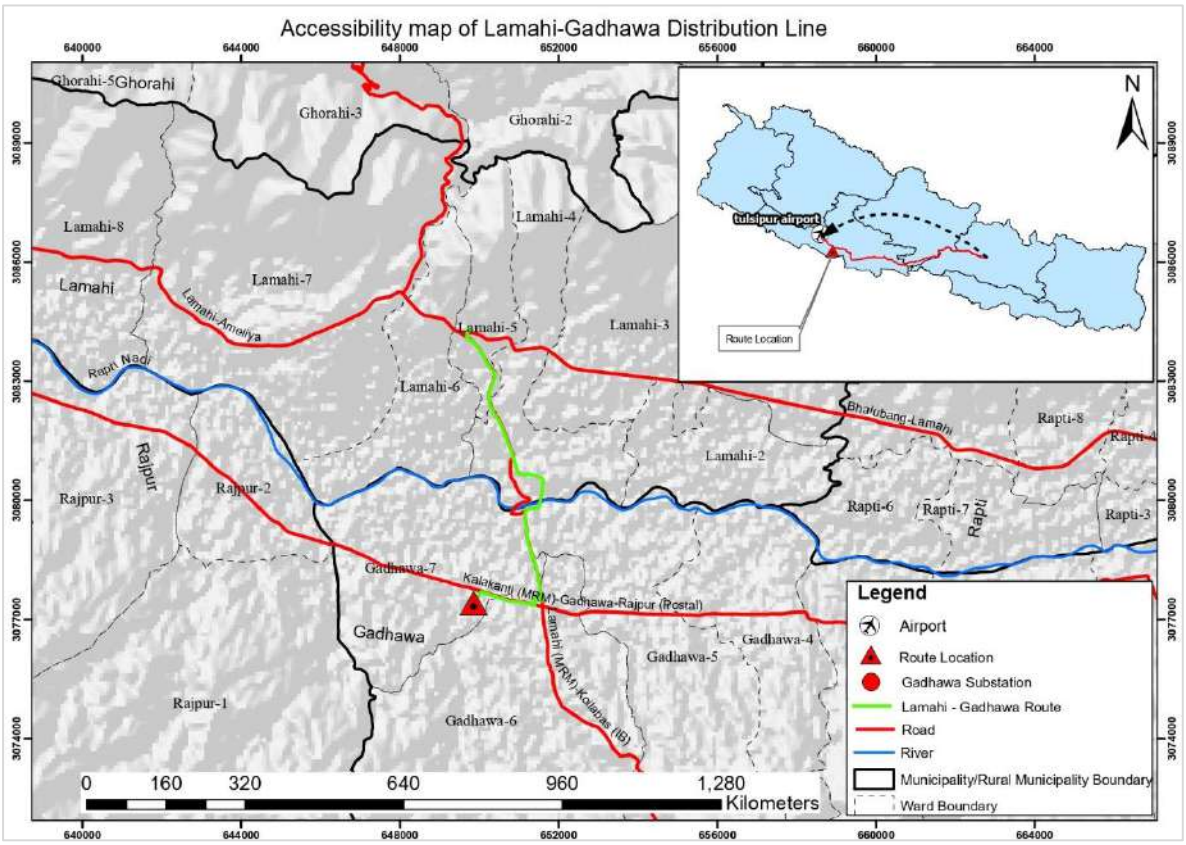


Figure 2-1: Location and Accessibility Map of Lamahi-Gadhawa Subproject[1]

[1] *Source: Department of Survey, 1995 and Field Study 2021*

Table 2-1: Technical Description of the proposed Subproject

Description	Features
Proponent	Nepal Electricity Authority
Project	Distribution System Upgrade and Expansion Project (DSUEP)
Sub Project	Lamahi-Gadhawa Distribution Line Subproject
Funding Agency	AIIB
Project Location	Lamahi Municipality and Gadhawa Rural Municipality, Dang, Lumbini Province
Distribution Line	
33kV Line Starting Point	Line Bay Extension at 132/33 kV Lamahi Municipality-5 and 6, Lamahi Substation Point, Dang Co-ordinate: Lat 27°52'29.81"N, 82°31'20.06"E
33kV Line End Point	Gadhawa Substation (Proposed) at Gadhawa RM-7, Bhedi Dumna, Dang Co-ordinate: Lat 27°48'46.47"N, Long 82°31'18.27"E
Type of Land	Government/Ailani
System Voltage	33 kV
Max, Min System Voltage	36, 30 kV
Climatic Condition	Wind Speed: As per IS 802-1-1 Maximum Ambient Temperature: 45 ^{o}C Altitude (Min, Max): 230, 280 masl
Length of Line /Number of poles	10.35 km (2.43 km underground cabling and 7.92 km stringing line route)/ No. of Poles: 198
Right of way	6 m
Number of Circuit	2
Conductor	ACSR Dog
Line Capacity/Thermal Limit (approx.)	13.4 MW at 0.9 power factor
Type of Poles	Steel Tubular/Telescopic Pole, 13m
Pole Configurations	Single Pole Structures, H-Pole Structures etc. (With and without Stay Sets)
Diameter of a Single Pole (approx.)	0.22m (As per IS 2713-3) for Steel Tubular Pole 0.45m approx. for Steel Telescopic Pole
Planting Depth of Pole	2.2m
Insulators	Porcelain Disc and Pin Insulator
Substation	
Location	Gadhawa RM-7, Gadhawa, Dang Co-ordinate: Lat 27°48'45.99"N, Long 82°31'17.64"E Elevation: 248 masl
Type of Land	Government/Ailani
Voltage Level	33/11 kV
Substation Capacity	8 MVA
Number and Capacity of Transformer	1 nos., 8 MVA
Type of Transformer	3 Phase, ONAN/ONAF, Mineral Oil
Type of Substation	AIS (33kV) and Indoor (11kV)
Number of33kV Line Bays	1
Number of 33kV Transformer Bays	1
Number of 11kV Feeders	4
Substation Area	0.69 ha, Parcel Number (348)

2.2 Subproject Components

The major components of the Subproject are the 33/11 kV substation and 33 kV distribution line (DL). The 33 kV DL is tapped from an existing 33 kV network line and acts as a source feeding to the proposed 33/11 kV substation. 11 kV distribution feeders emerge from the substation, eventually supplying the electricity to the consumers. The structures of the Subproject are briefly described below.

2.2.1 33 kV Distribution Line (DL)

The 33 kV 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 33 kV 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. Length of 33 kV stringing line route is 7.92 km and the total number of steel tubular poles to be erected are estimated as 198.

Insulators: The insulators provide insulation to the poles from high voltage in the conductors. Pin type insulators will be employed for suspension poles 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 33 kV 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 33 kV 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.

2.2.2 Substation

The proposed substation 33/11 kV is of capacity 6/8 MVA. The substation plays the role of lowering the 33 kV voltage level to 11 kV, which will then be stringed as distribution feeder to supply the consumers. The major component of the substation is power transformer, which is supported by the switchgear components and Civil Structures.

Transformers: Transformer is the major component of the distribution substation. It transforms power from higher voltage to lower voltage for distribution purpose. Power Transformers are used for the 33/11 kV 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 33/11 kV 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 6/8 MVA ONAF type.

Electrical Switchgear: Electrical Equipment comprising of Circuit Breaker, Earth Switch, Current Transformer, Potential Transformers, etc. installed in the substation are called Electrical Switchgear. They facilitate the objective of power conversion.

Civil Structures: A control building is essential for the operation of the substation. It houses the operating station, along with battery systems. Guard House and Staff Quarter are other essential buildings for smooth operation of the substation.

Switchyard, Boundary, Roads, Drainage and Essentials: The outdoor civil structure in the proposed substation includes the 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 component wise 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.

2.2.3 11 kV Lines and LT Lines

11 kV lines and LT lines take the access of electricity to the consumer households. It is why the construction of those lines are always encouraged by the local people. The line route, thus the installation of poles and lines, are envisaged to go through the edge of local roads. If any line route passes through any private lands, permission from the corresponding land owner will be taken before construction of those lines.

The detailed line route survey for 11 kV and LT lines have not been done yet. The scope of detailed survey is in the scope of the construction Contractor. The construction Contractor will conduct Pre-Construction Survey (PCS) to finalize the line route of 11 kV lines and LT lines for the construction. PCS will prepare the detailed line route of those lines and submit to PIU for approval. After the detailed line route is submitted by the Contractor and approved by PIU, E&S team of Project Supervision Consultant (PSC) will conduct an E&S study and submit the findings that

- Do the lines pose any adverse Environmental or Social issues?
- If there are any Environmental or Social issue, how can they be resolved? If the lines do not pose any adverse Environmental or Social issue, the lines will be cleared by PIU after seeking concurrence from AIIB.
  If the solution measures are not implementable in the field, PCS will suggest for any other way to divert or reroute the lines? If yes, PCS will propose alternative line route. The lines will be cleared by PIU after seeking concurrence from AIIB, given that the lines do not pose any adverse Environmental or Social issue.

2.3 Major Construction Activities in the Subproject

Activities in the Subproject area can be sub-divided into three categories viz, Pre-Construction Phase, Construction Phase and Operation Phase. The proposed Lamahi-Gadhawa Line Subproject does not intercept forest area, thus there will be no issues of tree loss in the RoW of 33 kV lines and the substation area.

I. **Preconstruction phase**: The activities to be carried out before the construction phase are:
- Demarcation of land area for the proposed substation
- Receive public opinion
- Make clearance of the substation land area permanently
- Distribution line route selection

II. **Construction phase**: The activities to be carried out during the construction phase are:
- Assign the land area for temporary storage of construction materials
- Transportation of construction materials
- Leveling of land area for the proposed substation
- Construction of substation structures
- Pole erection work for 33 kV, 11 kV and low tension distribution lines
- Stringing of 33 kV, 11 kV and low tension distribution line

III. **Operation phase**: The activities to be carried out during the operation phase are:
- Maintenance of the substation and 33 kV distribution line route

2.4 Energy to be used

During the construction period diesel fuel will be used to power construction equipment and transport vehicles, which emits air pollutants and greenhouse gases in insignificant quantity. Use of firewood shall be restricted in the labor camp, whereas the workers shall be provided LPG for cooking.

2.5 Land Required

The **Lamahi-Gadhawa Subproject** will require about 0.69 ha land for building the substation. The land is government land and managed by Gadhawa RM. The 33 kV distribution line is 10.35 km length of which pass along the RoW of the East-West Highway Lamahi-Koilabas Road to the Gadhawa Chowk towards south after crossing West-Rapti River; then through Kalakanti-Gadhawa-Rajpur Postal Highway Section towards west from same Chowk till 1.7 km and finally to the substation in east direction. The distribution line starting from the taping point to Lamahi Municipality-5 with 2.43 km length will be underground cabling located within RoW of road.

2.6 Material Requirement and Sources

A 33/11 kV substation, 33 kV, 11 kV and low-tension distribution lines will be constructed for this Subproject. Minimal excavation at the pole locations will be done to erect steel tubular

poles of 11 m and 13 m. The depth of burial for 11 m (approximately 256 kg) and 13 m (approximately 343 kg) poles are 1.8 m and 2.17 m respectively. The construction works for substation will not produce significant amount of spoils and thus it will not require spoil-dumping site. Similarly, excavation works carried out for digging pit holes for poles produces insignificant spoils which does not require management of earthworks.

Civil construction works will involve excavation for foundation of substation, steel reinforcement, cement, coarse aggregates, and fine aggregates (sand). Materials will be procured from legally operating local markets. Following estimated volume of construction materials are required for the proposed 33 kV distribution line and the substation.

Table 2-2: Approximate Quantity of Material for 33 kV line

SN	Particular	Unit	Requirement
1	Amount of Steel	Ton/Km	5800
2	M15 concrete for Pole base	Cum/Km	12.5

Source: Design Report, DSUEP

Table 2-3: Approximate Quantity of Material for 33/11 kV Substation

SN	Particular	Unit	Support Structures, Road, Drainage	Control Building	Staff Quarter	Office Building	Guard House
1	M15 Concrete	Cum	100	25	224	120	5
2	M25 Concrete	Cum	300	170	125	75	27
3	Reinforcement bar	Ton	7	27	20	12	4

Source: Design Report, DSUEP

2.7 Major Equipment and Power Requirements

Major equipments used during the Project implementation are:

One Excavator, One Roller, One Drilling Machine, One Crane, one Grid Supply of 100 kVA Distribution Transformer, and two 50 kVA capacity diesel generators.

2.8 Workforce Requirement

Local people in the surrounding Subproject area will be encouraged for the employment. Based on the skills (skilled, semi-skilled and unskilled labor), local people will be used for the construction and both male and female will get equal opportunity during construction. The number of human resources required depends upon the complexity of the project as well as the geographical location of the project. In case, of construction of 33 kV lines and 33/11 kV substations, the workforce typically varies from terai to hilly to mountain region. Expected number of manpower employed is enlisted hereunder.

Table 2-4: Human Resource Required for construction of 33 kV line and substation in a day of Construction

SN	Human Resource/Day	For Distribution Line	For Substation
1	Engineer (No.)	1	2
2	Supervisor (No.)	2	4
3	Foreman (No.)	3	5
4	Skilled (Lineman/Electrician) (No.)	5	5
5	Helper (No.)	2	10
6	Labour (No.)	12	15

Source: Design Report, DSUEP

2.9 Construction and Implementation Schedule

Implementation of the proposed Subproject comprises construction of a new 33/11 kV substation, 33 kV lines, 11 kV lines, low tension lines, and installation of distribution transformers. It includes construction and installation of components as mentioned in subsection 2.2. The estimated completion period is 24 Months.

Table 2-5: Construction Schedule of Project Implementation

SN	Activities/ Months	**Months** *(After the completion of Detailed Survey Study)*					
		1-3	**4-6**	**7-10**	**11-15**	**16-20**	**20-24**
1.	Invitation for tender, evaluation, and award						
2.	Implementation of Environmental and Social Safeguards						
3.	Erection of Poles						
4.	Stringing of conductor						
5.	Construction of substation						
6.	Charging and Testing						

Source: Design Report, DSUEP

3. DESCRIPTION OF THE ENVIRONMENT

3.1 Physical Environment

3.1.1 Topography and Land Use

The Subproject area lies in Ward No. 4 and 5 of Lamahi Municipality and Ward No. 5, 6 and 7 of Gadhawa RM of Dang district, Lumbini Province. The Subproject components are located within the Chure Range of Nepal. The proposed distribution line (33 kV) of 10.35 km passes along flat plain of Deukhuri Valley of Dang district through dense settlement. The tapping point is situated at Latitude 27°52'29.81"N, Longitude 82°31'20.06"E with an elevation of 268 masl.

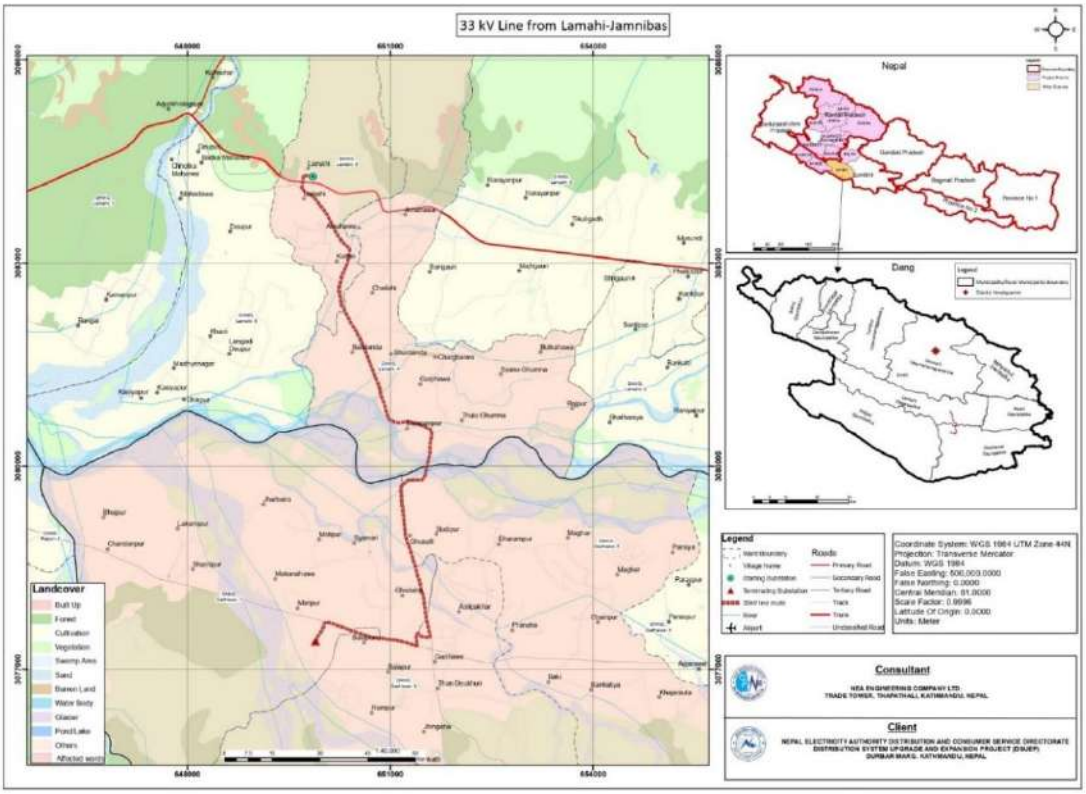


Figure 3-1: Location map and Land use details of the Subproject[2]

The substation lies at Latitude 27°48'46.47"N, Longitude 82°31'18.27"E and elevation of 248 masl. The site lies in depressed flat land. It is barren land and managed by Gadhawa RM and is not used for any purpose or have no any users. The proposed substation boundary lies within 0.69 ha area. None of the private and public entities will be affected due to the implementation of the proposed Subproject, as poles will be installed within the RoW of existing road. The proposed distribution line sections from the taping point to 2.43 km section within Lamahi Municipality-5 Ward will be underground with cabling. Then after 7.92 km of the distribution line to the proposed substation is with stringing route. The land use map details with the components of the Subprojects are presented in **Annex 2**.

[2] *Source: Topographic Map, Department of Survey, 1995 and Field Study 2021*

Figure 3-2: Tapping Point of DL at Lamahi Substation

Figure 3-3: Lamahi-Gadhawa Substation View

3.1.2 Geology

The Subproject area lies geologically in Deukhuri Valley of Chure Range with Quaternary to Recent deposit. Due to dense settlement from Lamahi Substation up to the Lamahi Municipality-5 Ward office at Maurighat Lalmatiya, The West Rapti River is braided and meandering pattern where high chance of riverbank cutting. The geology in and around the river is the deposit of non-cohesive soil with cobble, pebble, and gravel size content of limestone, sandstone, and coarse grain sand on the riverbank. The land is desolate and composed of cohesive silty clay (1.5 m) some silt (2.0 m) and top soil nearby the substation area. No major geological hazard has been identified associated with the proposed Subproject except moderate chances of erosion within the expanded flood plain area of West Rapti River.

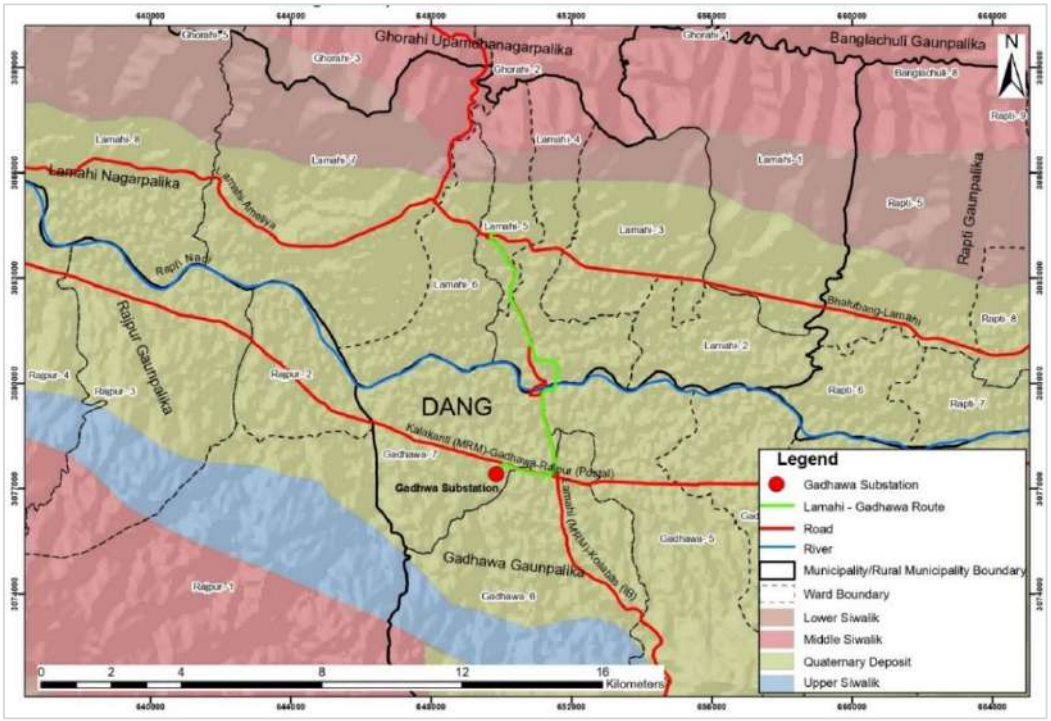


Figure 3-4: Geological Map of proposed Subproject Area[3]

[3] *Source: Department of Mines and Geology (DMG), 2020*

3.1.3 Seismology

The entire country of Nepal is in a seismically active zone caused by subduction of Indian tectonic plate under the Tibetan Plate. According to National Seismological Center of Nepal several big earthquakes have been felt in Nepal, the earthquakes of magnitude 6 to 7 are mostly confined to the Main Himalayan Thrust (MHT) between the foothills and the Higher Himalaya. Moreover, earthquake generation is confined to the crustal depth of 20 km. However, shallow earthquakes at depths down to 6 km are generated because of strike slip faults. Therefore, the substations and distribution lines of this Subproject will be designed and operated in accordance with seismic design requirements and best engineering practice. The seismic activity in Nepal between 1964 and 2019 as in IUSGS portal is shown in **Figure 3-5.**

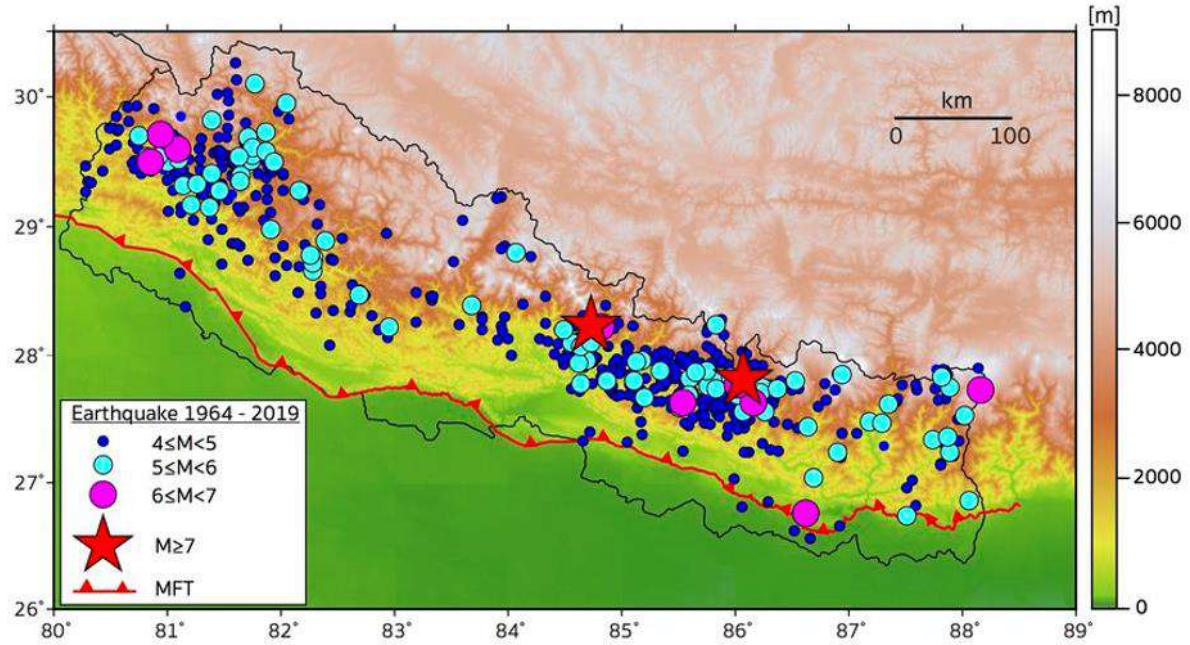


Figure 3-5: Seismicity map of Nepal from 1964 -2019[4]

3.1.4 Climate

The climate of the Subproject area is sub-tropical. According to DHM 2021, the annual average maximum temperature is 28.73°C and minimum with 15.94°C. The relative humidity is in the range of 84% to 87 %. The average annual rainfall is estimated at approximately 1560.9 mm per year. Almost 80% of rainfall occurs during monsoon (June to September).

3.1.5 Air, Noise, Water Quality and Polluting Sources

The major air polluting sources recorded are only from vehicular emission and dust problem from plying of vehicles and high wind velocity. Noise polluting sources noted at the time of field study are similar to the air polluting sources. Unnecessary honking along the access road of site is the source of noise generation. Following table shows the real-time quality of air and noise during field study.

[4] *Source: USGS catalogue, 2019*

Table 3-1: Ambient Air and Noise Quality within the Proposed Subproject Site

SN	Location/ Chainage	**Air Quality[5]-**Temtop Airing-1000 PM Detector (µg/m^3)					**Noise Level -**UNI-T UT 353 Mini Sound Meter (dB)		
		$PM_{2.5}$	**Level**	**PM_{10}**	**Level**	**Average Time of Measurement**	**Measured**	**Ref.[6]**	**Area**
1.	Tapping Point (Lamahi Bazar)	49.4	100	55.1	200	1-hour	47	50	Plying of Vehicle and business work
2.	West Rapti River Bridge	44.4		42.3			44.1		
3.	Substation	*37.2*		48.4			48.4		Plying of Vehicle

Source: Field Visit, 2021

The air quality and noise level of the SPA was found within the range of National Ambient Air Quality Standard and Noise Quality Standard, respectively.

There is not any presence of hydrological network within the tapping point and substation area instead DL will cross West Rapti River at Balarampur. Physical parameter of water was tested for West Rapti River and result obtained is presented in following table.

Table 3-2: Water Quality of Stream along the Distribution Line Route

SN	Location	Name River/ Stream	Flooding width Left-Right (m)	DL Pole from River/ Stream	**Parameter-** *EXTECH ExStik II DO600*		
					Temp. (^{o}C)	***pH***	***EC (µc/cm)***
1	Ch. 5+400	West Rapti River	526	80	37.8	8.53	0230

Source: Field Visit, 2021

The water quality of the West Rapti River was found to be within accepted limit for the aquatic life in the river. The water parameter data was assessed using Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem. The construction activities of the Subproject will not have any adverse impact to the local stream.

3.1.6 Solid Waste Management

Wastes were found littered in front of HHs and along the side of the access road near Subproject area. People of the nearby area were found managing organic wastes within the household premises. Recyclable waste (large quantity) was sold to scrap collector occasionally. The estimated quantity of solid waste generation from the labor camp is shown in **Table 3-3**.

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

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

Table 3-3: Estimated Daily Solid Waste Generation from Campsite

SN	Description	Calculation	Remarks
1.	Total Labors within the Campsite	= 20 Labors	
2.	Total Waste Generation to be Expected	= 20 * 123.62 g/capita/day = 2472.4 g/capita/day = 2.4724 kg/day	
3.	Organic Waste Composition Responsible for Foul Smell, and Rodents	= 1.26 kg/day	Assuming 51% organic waste

3.2 Biological Environment

The proposed Subproject's avoids the forest land but passes along the RoW of existing road and the edges of the private farm lands at Lamahi, Lamahi Municipality and Gadhawa RM of Dang District. The proposed Subproject lies at the elevation below 300 (243-268) masl in lower tropical bioclimatic zone. The proposed Subproject development site does not lie within any protected area and conservation area, although it is located within the Chure region without any induced impact to the biological environment. The Subproject components (substation and 33 kV distribution line) does not intercept any forest area, thus there will be no any issue of tree loss.

The common fish species in West Rapti area are Katle (*Acrossocheilus hexagonolepis*), Rohu (*Labeo rohita*), Annandale garra (*Garra annandalei*), and Indian Longfin Eel (*Mastacembelus armatus*) were reported during consultation.

Altogether fourteen species of birds were noted around the surrounding project area; House Crow (*Corvus splendens),* Western Spotted Dove (*Spilopelia suratensis),* Rock Dove (*Columba livia),* Rose-ringed Parakeet (*Alexandrinus krameri),* House Sparrow (*Passer domesticus),* Tree Sparrow (*Passer montanus),* Grey Francolin (*Francolinus pondicerianus),* Common Quail (*Coturnix coturnix),* Black–backed Forktail (*Enicurus immaculatus*), Kingfisher (*Alcedo atthis),* Red-Wattled Lapwing (*Vanellus indicus),* Ruddy Shelduck (*Tadorna ferruginea*) and White–rumped Vulture (*Gyps bengalensis).* All these bird species are of least concern except White-Rumped Vulture with critically endangered under IUCN categorization.

Herpetofauna like, Asian Common Toad (*Duttaphrynus melanostictus*), Changeable Lizard (*Calotes versicolor*), Chequered Keelback (*Fowlea piscator*), Common Rat Snake (*Ptyas mucusa*), Common Krait (*Bungarus caeruleus*), Indian Cobra (*Naja naja*) and Indian Bullfrog (*Hoplobatrachus tigerinus*) were reported in the surrounding area of the Subproject.

3.3 Socio-economic Environment

Demography and Ethnic Compositions: The proposed Subproject area lies in Ward No. 4 and 5 of Lamahi Municipality and Ward No. 5, 6 and 7 of Gadhawa RM of Dang District. Lamahi, Kolahi, Balampur, Legadi, Madhya Deupur and Maurahawa are the nearest business market nearby the Subproject area. The general demographic information of the affected Wards is presented in Table 3-4. The major ethnic compositions within the

surrounding project area are Tharu (60%) with their population of 28,538 and 17,563 in Lamahi Municipality and Gadhawa RM, respectively and followed by Chhetri (11%) and Brahmins (9%) of total population. Majority of people follow Hindu religion and rest follow Buddhism and Christian religions. The Core Project Area (CPA) of the Subproject will not affect any indigenous people.

Table 3-4: General Demographic Characteristic of Subproject Municipality

SN	Wards	Population			Total Households
		Male	Female	Total	
Lamahi Municipality					
1.	All	22,898	24,757	47,655	9,432
2.	4	2,417	2,618	5,035	991
3.	5	3,417	3,756	7,173	1,644
Gadhawa Rural Municipality					
1.	All	18,489	20,103	38,592	7,267
2.	5	2,866	2,978	5,844	1,080
3.	6	3,043	3,403	6,446	1,260
4.	7	2,350	2,634	4,984	916

Source: (CBS, Rural Municipality-Municipality Profile of Dang District, 2018)

Road Accessibility: Subproject-Wards of Lamahi Municipality and Gadhawa RM are connected to all-weather DBST road. The transportation facilities in this local level seems to be satisfactory.

Electricity Beneficiaries: The implementation of the Subproject will increase the electricity beneficiaries to 18,707 HHs, 90 commercial purposes and 23 industries. This will expand the electricity supply in the Subproject area with clean energy sources.

Water and Sanitation: Tap/piped water is the main source of drinking water in the surrounding Subproject area. Almost all the houses in the area have some sort of toilet facility.

Health Facility: The nearest and easily accessible equipped health facility to the proposed Subproject is in Lamahi Bazar located at 30-minute driving distance from substation site.

Communication: People of the Subproject have access with communication facilities mainly through mobile telephone services provided by both government and private sector. In the Subproject, people have access with local and national FM Radio networks and local newspaper facilities.

Occupation: Agriculture is the main occupation of people in the Subproject area with nearly 60% contribution; small trade and business/enterprises and services are other occupation of people in the Subproject area. Intermittent tripping and voltage drop of electricity was adversely affecting irrigation of crops and daily household chores activities.

COVID-19: The coronavirus (COVID-19) pandemic has been defined as global and national health crisis; the virus has spread in almost all parts of Nepal. Heedful of its vulnerabilities, the Government of Nepal had enforced a nationwide lockdown in 2020/2021 and activated its federal, provincial and local level mechanisms to respond to the crisis. In case of any

sudden surge or outbreak of COVID-19, quarantine facilities and immediate health support should be provided to the workers and personnel involved in construction.

4. ANTICIPATED ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

The environmental and social impacts predicted during the construction of proposed Subproject are discussed in this chapter. National Environmental Impact Assessment Guidelines (GoN, 2050) has been referred for the predicting magnitude, extent, and duration of the project-induced environmental impacts in Subproject area. This chapter identifies the basic environmental and social impacts in the Subproject area that will arise during the construction. The detailed impacts of each domain of environmental and social safeguards have been addressed in this chapter.

4.1 Anticipated Beneficial Impacts

Construction Phase

4.1.1 Local Employment

Local employment will be created during the construction phase. As mentioned in section 2.8 Workforce Requirement, the typical construction team will have 15 to 20 workers for the period 10-12 months for the erection of poles and stringing the distribution lines and 16-18 months of time for building the substation. Local people within the SPA and OPA will be encouraged for employment during construction phase. Based on the skill levels (skilled, semi-skilled and unskilled labor), local people will be used for the construction as far as possible. *The magnitude of impact is moderate, the extent is local, and the duration is short-term.*

Operation Phase

4.1.2 Local Economy and Enhancement in Rural Electrification

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. Intermittent tripping and voltage drop problem nearby the settlement area will be reduced. Upgrading and expansion of electricity distribution helps to way-out many electricity related issues and promotes the use of new types of home appliances, use of electric motors for irrigation, and establishment of small and large industries. *The magnitude of impact is high, the extent is local, and the duration is long-term.*

4.1.3 Greenhouse Gas Emission Balance

Net Green House Gas (GHG) emissions resulting from the Subproject area are expected to be low as the distribution lines will improve and expand electricity supply from clean energy sources. It will reduce the emission of GHG from the traditional source like Guitha (made from cow dung), firewood and timber along with commercial fuel Kerosene for cooking/lighting, heating and diesel for water pumping. *The magnitude of impact is high, the extent is local, and the duration is long term.*

4.2 Anticipated Adverse Impacts

A. Physical Environment

Construction Phase

4.2.1 Change in Land Use

The Subproject requires about 0.69 ha land for the substation. The proposed substation land area belongs to government land and managed by Gadhawa RM. The land managed by the Gadhawa RM will be converted to the substation area surrounded by proper boundary wall. While in case for Distribution Line, it passes adjoining to the East-West Highway Lamahi-Koilabas Road up to the Gadhawa Chowk towards south after crossing West-Rapti River; then through Kalakanti-Gadhawa-Rajpur Postal Highway Section towards west from same Chowk till 1.7 Km and finally to the substation in east direction. The construction of the Subproject will bring change in the existing land use of the area for permanent period. Potential impacts associated with distribution lines will be limited to approximately 0.22 m of land for each pole, at the edge roads and cultivated lands. *The impacts due to use of land will be moderate in magnitude, site specific and long term in duration.*

Mitigation Measures

- Steel Tubular Pole for distribution lines will be planted at the right way of existing road without hampering traffic movement. In case of cultivated land, minimal land will be used at the edge for planting the poles.
- Cropping calendar will be followed while erecting poles and stringing of conductors so that standing crops will not be damaged.
- In case of loss of standing crops, compensation will be made to the respective land owner as per the prevailing market rate.

4.2.2 Erosion and Flooding

The proposed Subproject's distribution line crosses West-Rapti River; then through Kalakanti-Gadhawa-Rajpur Postal Highway Section. The river crossing is susceptible to erosion from flooding[7] during rainy season. Possible flooding is during the rainy season resulting erosion nearby the distribution line alignments. *The magnitude of impact is moderate, the extent is site-specific, and the duration is long-term.*

Mitigation Measures

- Concrete foundation is recommended for Steel tubular pole installation for 33 kV lines.
- Pit hole prepared for the installation of steel tubular pole shall not be left open as possibility of accident may arise.

4.2.3 Air Quality

The impact on air quality during the construction period is expected to be insignificant, as site clearance, excavation, haphazard stockpiling of construction materials, waste burning at camp sites and equipment installation are localized and of short term. Transportation of the materials and movement of construction crews and equipment will have minor impact

[7] *(Ghorahi SMC, 2018), P-44.*

on air quality. *The impact on air quality will be minor in magnitude, site-specific in terms of extent, and of short duration.*

Mitigation Measures

- Contractors' vehicles and equipment should meet Nepali vehicle emissions standards.
- Dust emissions shall be controlled using 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

4.2.4 Noise

Noise is inevitable during construction. As noted in section 3.1.5, noise is less around the substation area as the area is rural and settlement is sparse. 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. *The impact on noise level will be minor in magnitude, site-specific in terms of extent, and of short duration.*

Mitigation Measures

- Contractors will be required to monitor noise during the construction.
- For substation site, boundary walls serve as noise barrier, and it should be constructed as early as possible.

4.2.5 Drainage and Water Quality

Substation land area of 0.69 ha will result in slight alteration of drainage patterns, although the alterations in drainage will not be quantifiable. Interference with drainage patterns will be temporary during construction phase only. The impact on water quality during the construction period is expected to be insignificant. Water will be used primarily as a cement additive for construction of substation foundations and boundary walls, and to control dust. *The magnitude of impact is low, the extent is site-specific, and the duration is short-term.*

Mitigation Measures

- Storm water run-off from substation sites will be minimized and controlled with bunding temporary dikes (constructed boundary walls will also help contain run-off water).
- Proper management of ground drainage from camps as a preventive measure against breeding places of mosquitoes, and other pests.

4.2.6 Soil and Muck

As the proposed substation land's ground level is low, filling of soil is necessary. The required filling materials shall be purchased from nearby authorized crusher plant approved by local government. For distribution lines, the excavation activity will be insignificant. *The magnitude of impact is low, the extent is site-specific, and the duration is short-term.*

Mitigation Measures

- Soil required for filling substation area shall be purchased from the nearby authorized crusher plant approved by the local government.
- Soil shall be covered with tarpaulin while transporting it from earth-borrowing areas.
- Simultaneous water sprinkling and compaction of spoil shall be done using the roller.

4.2.7 Solid Wastes

The wastes generated during construction within the Subproject area are cement bags, iron bars, and other leftover construction materials, and waste generated by the labor camp. It might cause adverse impact if not properly managed. Organic wastes generated from labor camp may give foul smell, and attract rodents if not managed properly. Inorganic wastes generated during implementation shall be managed through source segregation. *The magnitude of impact is low, the extent is site-specific, and the duration is short-term.*

Mitigation Measures

- Source segregation of organic and inorganic wastes in different storage areas or facilities in the designated location.
- The organic waste generated from the campsite shall be managed within the substation premises, through composting in the bin or by constructing a ground pit, and covered by 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 ground leveling.
- Packing materials used for casing components should be recyclable.
- 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, and specially designed container and sealed carefully.
- Effective coordination shall be done with local level government for proper waste management during construction period.

Operation Phase

4.2.8 Electric and Fire Hazard

Employees performing servicing or maintenance of substations may be exposed to electric shock, burns and injuries from the unexpected energization or release of stored energy in the equipment. *The magnitude of impact is considered moderate, the extent is site-specific, and the duration is long term.*

Mitigation Measures

For this, the following mitigation measures will be practiced:

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

B. Biological Environment

The proposed Subproject avoids forest area and other sensitive biodiversity area. Hence, there will be no significant impact to biological environment because of construction of substation and distribution lines.

Construction Phase

4.2.9 Loss of Habitat

As the proposed substation area is a barren land and poles will be installed at the edge of roads and private farm land, no loss of forest and other biodiversity is expected. *The magnitude of impact is moderate, the extent is site-specific, and the duration is short term*

Mitigation Measures

- Labors and staff shall be made aware to avoid illegal activities in adjoining forest.
- Labors and staffs should be restricted to use firewood for cooking

Operation Phase

4.2.10 Bird electrocution and collision

The Subproject area is located in rural setting and there is no presence of critical habitat of avian fauna. Electrocution is a risk to bird species that perch on power line infrastructures (substation and distribution line). List of birds presented in section 3.2, may collide to distribution lines and substation Minimizing bird collision and electrocution risk is therefore a win-win for biodiversity and the power sector. *The magnitude of impact is low, the extent is site-specific, and the duration is long term.*

Mitigation Measures

- Bird guards should be installed above the poles and white spirals in the conductors to improve visibility electrical structures.

C. Socio-Economic and Cultural Environment

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

Construction Phase

4.2.11 Land Requirement

The land required for the proposed substation area is 0.69 ha and is taken care by local government Gadhawa RM. The proposed physical activities of the Subproject will not be involved in private land. Therefore, there will be no land acquisition and resettlement impacts. In case of 33 kV distribution line, pass adjoining to the East-West Highway Lamahi-Koilabas Road up to the Gadhawa Chowk towards south after crossing West-Rapti River pass along the RoW of the road. The impacts on the crops while stringing of lines should be minimized. During the public consultation people have agreed to support the implementation of the Subproject (**Annex 5**). Compensation shall be made on the basis of crops types and quantity of loss equivalent to the market price.

Mitigation Measures

- Distribution pole of diameter 0.22 m should be installed on the edge of cultivated land making no loss of standing crops.
- If there is loss of crops, appropriate compensation shall be made.

4.2.12 Public Health

Construction activities will be of small scale, causing no significant adverse impact to existing quality of air, water and sound. Local people except the workers do not involve in construction activities. Considering COVID-19 pandemic, workers will be advised to avoid unnecessary contact with local people. *The magnitude of impact is low, the extent is site-specific, and the duration is short term.*

Mitigation Measures

- Contractors shall implement health and safety plans.
- Awareness on HIV/AIDS and other sexually transmitted disease should be provided to the labors.
- Awareness on basic sanitation and waste management should be provided to the labors.

4.2.13 Contractor Occupational Hazards and Safety

Occupational health hazard and safety of workers is the major issue during the construction period. Working without adopting safety measures during excavation work, spoil management work, mechanical and electrical equipment handling activities, chemical handling, etc. during construction may call the risk of accidents. Primary victims are the workers involved in the construction. *So, the envisaged direct impact is high in magnitude, site specific in extent, short term in duration.*

Mitigation Measures

- Contractor shall prepare the Environmental, Health and Safety plan 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).
- NEA will be responsible to supervise the EHS performance of the construction Contractor, and worker's health and safety.

4.2.14 Child Labor, and Gender Issues

During the construction period, people employed on daily wages for excavation, transportation of construction materials, and other construction-related works should avoid the involvement children and should avoid gender discrimination. Gender discrimination may occur as the Contractor may not be sensitive towards gender equity. Contractors should equally pay men and women workers. Construction area should be gender friendly

with required facilities. *The envisaged impact is high in magnitude, site-specific in extent, and short-term in duration.*

Mitigation Measures

The Subproject will ensure to:

- Provide equal wage to male and female for similar nature of work.
- Restrict use of child labor i.e., below 16 years of age (which is as per government and ILO guidelines).
- Provide female friendly construction environment with separate cabins and toilet for women in the camp.
- Prepare suitable work categorization for women.

4.2.15 Socially Undesirable Activities

The workers may use alcohol and other forms of intoxication, gamble and quarrel with locals, disrespect local culture and religion, and may promote socially undesirable activities in and around the project area. *So, the envisaged impact is low in magnitude, local in extent, and short-term in duration.*

Mitigation Measures.

- Restrict movement of workers out of camp after dinner time in the night.
- Prohibit the 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 public relation officer to keep close and regular consultation and coordination with local communities.
- Regular monitoring of workers' behavior and take appropriate measure on rule violators.

Operation Phase

4.2.1 Hazards and Safety

Occupational health hazard and safety of staffs is the major issues during the operation phase of the substation. The possible electric shock and fire hazard might cause injury or death to staffs thus the protection measures should be taken all the time. *The envisaged direct impact is high in magnitude, site specific in extent, long term in duration.*

Mitigation Measures

- There will be the use of insulation, guarding, grounding, electrical protective devices, and safe work practices.
- Boundary walls and 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 work on DL route

4.2.2 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; so, there will be no impact outside of the substation boundaries. [8] 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.

[8] 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%.

5. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

5.1 Methodology in Information Disclosure, Consultation and Participation

The following methodologies were followed for information disclosure, consultation and participation:

i. Identification of the stakeholders is important to understand how the Subproject activities will engage with different institution/groups/individuals. Stakeholders are the groups that might be affected by the Subproject or might influence Subproject outcomes. The stakeholders were considered in three groups (**Figure 5-1**).

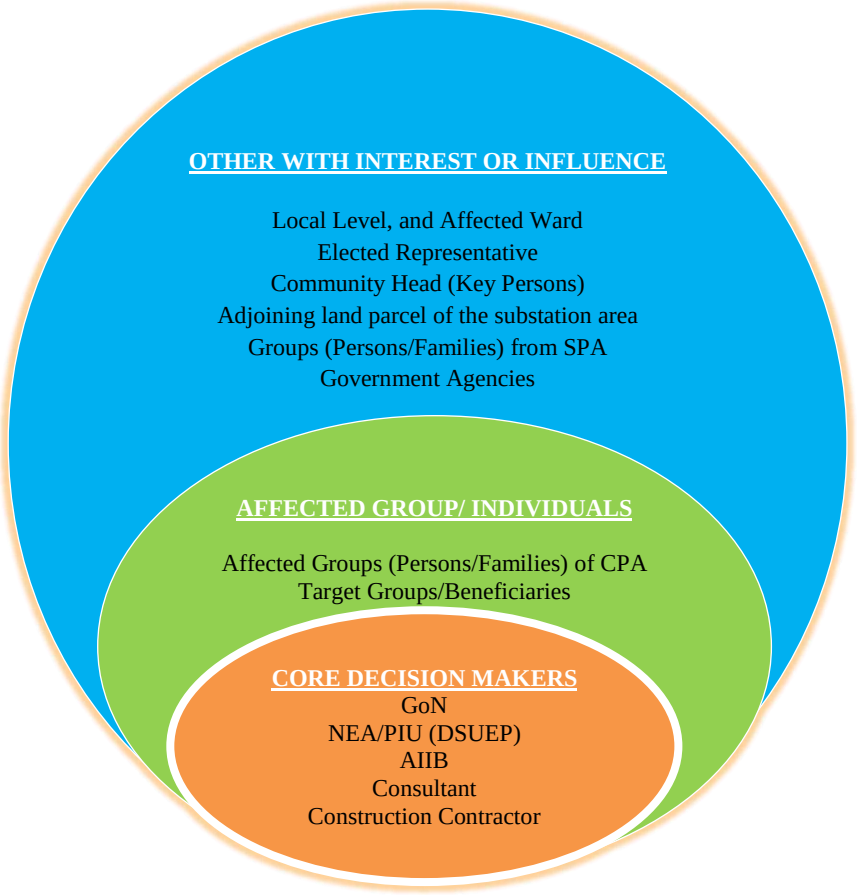


Figure 5-1: Identified Stakeholder in the Subproject[9]

ii. The notices with subject of consultation, venue, and time were pasted at Subproject footprint area, local level and affected Ward office in presence of concerned local stakeholders (**Annex 1**).

iii. Study team members visited all the local government offices within the Subproject influence area. Representatives from each local body were also consulted. All local governments were given request letters for their active support in project implementation. Municipalities were requested to provide written suggestions. The

[9] *Referenced Meaningful stakeholder engagement: a joint publication of the MFI working group on environmental and social standards / Reidar Kvam, PP-19, 2019.*

deed of enquiry (Muchulkas) and Letter of Declaration from the stakeholders are presented in **ANNEX 6**.

iv. Local communities nearby substation area and along the distribution line routes were consulted, and were briefed about the Subproject activities and likely benefits with their suggestions (included in the Minutes).

v. During the Subproject construction phase, booklets informing about the Subproject activities, likely impacts and mitigation measures together with the complaints handling mechanisms will be developed and distributed in the Subproject area.

5.2 Consultation and Information Disclosure

Consultation aims to encourage participation of stakeholders and communities of the Subproject area in identification of issues, comments and suggestions. The Subproject affected groups (persons/families) were given more emphasis during the field consultations. Public consultations were conducted at Lamahi Bazar, Lamahi Municipality, Ward No. 5 on 15th September (2021), at proposed substation area, Gadhawa RM, Ward No.7 on 16th September (2021), at Simrahawa, Lamahi Municipality, Ward No. 4 and Bhedi Dumna, Gadhawa RM, Ward No. 7 on 18th September (2021) (**Figure 5-2**). The concerns expressed/raised issues during the consultation were documented as in the form of minutes (**Annex 5**).

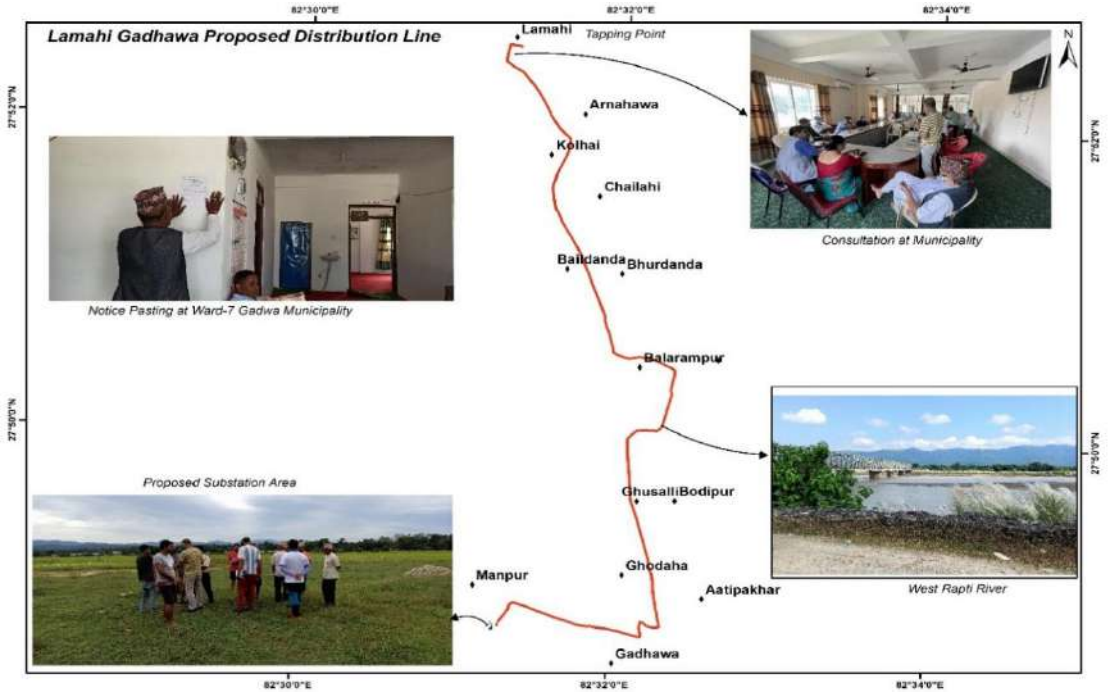


Figure 5-2: Consultation with the stakeholders and communities in the Subproject Area.[10]

Major benefits expected from the implementation of Subproject through the perspective of local people were identified from public interaction, and that included improvement in the rural electrification facilities ensuring the uninterrupted electricity in the households and better functioning of industries in the locality. The issues, comments and suggestions received in the consultation are presented in **Table 5-1** .

[10] *Field Study, 2021. Used SW Map and GIS*

5.3 Comments and Suggestion Received

Table 5-1: Summary of issues, comments and suggestions received in Consultations

Source: Field Visit, 2021

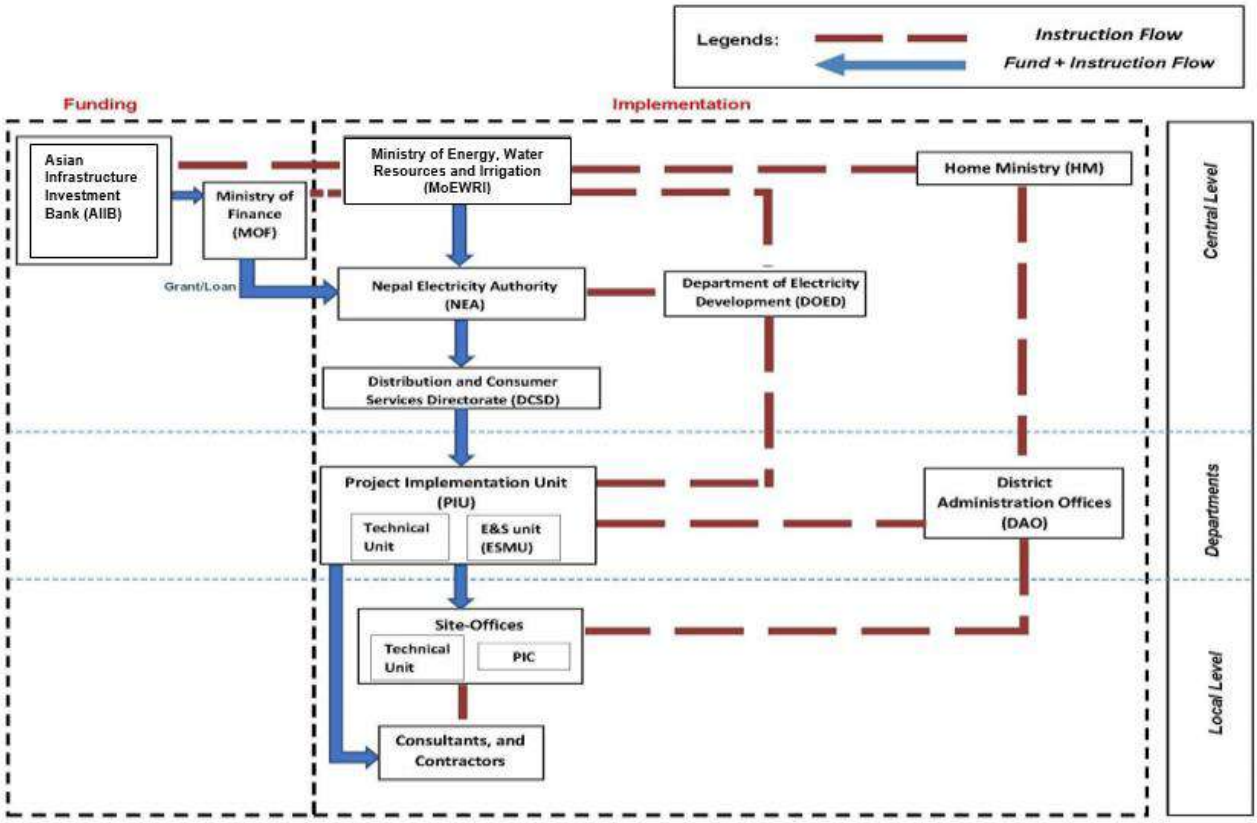
Date	Location	Issues, comments and suggestions received	Participants
15th September 2021	Lamahi Bazar, Lamahi Municipality. -5	• Underground cabling should be done within Ward No. 5 of Lamahi Municipality. • The underground cabling under all the security procedure and quality materials should be laid under the road-side canal and after completion of cabling the canal length needs to be reconstructed. • During expansion of DL and substation construction, proper coordination with local level, stakeholders and people should be given emphasis before implementation • Expansion of line needs to be completed without affecting private and public infrastructures • We (local level, stakeholder and local people) have full support and assurance for the implementation of Subproject	21,5F-16M
16th September 2021	Proposed Substation, Gadhawa RM-7	• For the Subproject construction, the proposed substation land is public and none of the user have been found using the land. Also, we (Stakeholder and Local People) have full support and assurance for the implementation of Subproject • Expansion of line needs to be completed without affecting private and public infrastructures • The conductor should be covered or use of covered conductor within the settlement area • Extension Tariff Counter needs to be established within substation boundary • Local people will be prioritized for employment opportunity based on qualification and skills • During expansion of DL and substation construction, proper coordination with local level, stakeholders and people should be given emphasis before implementation • Coverage of area with no access to electricity (LT lines) needs to be addressed and while expanding this, aesthetic value and composite line system should be given more concern • The implementation of this Subproject will be helpful in resolving present electricity problem; we (Stakeholders) request for the sooner implementation of Subproject for resolving the problem of electric power related issues • We (Stakeholder and Local People) have full support during implementation of Subproject.	26,4F-24M

Date	Location	Issues, comments and suggestions received	Participants
18th September 2021	Simrahawa, Lamahi Municipality. - 4	• The implementation of this Subproject will be helpful in resolving present electricity problem; we (Stakeholders) request for the sooner implementation of Subproject for resolving the problem of electric power related issues • Within the section of Ward No. 4 of Lamahi Municipality, expansion of DL will be executed only after finalization of land compensation issues from Koilabas-Lamahi Postal Highway • Expansion of line needs to be completed without affecting private and public infrastructures • Local people will be prioritized for employment opportunity based on qualification and skills • We (local level, stakeholder and local people) have full support and assurance for the implementation of Subproject	72,25F-47M
18th September 2021	Bhedi Dumna, Gadhawa RM-7	• Local people will be prioritized for employment opportunity based on qualification and skills • Capacity Building Training needs to be developed and organized for DL route affected people • We (Stakeholder and Local People) have full support during implementation of Subproject	11,5F-6M

6. INSTITUTIONAL ARRANGEMENT AND GRIEVANCE REDRESS MECHANISM

6.1 Institutional Arrangement

The Ministry of Energy, Water Resources and Irrigation (MEWRI) is responsible for overall planning and execution of the plans for the overall development of water and energy sector in Nepal. Nepal Electricity Authority (NEA) under MEWRI 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 activities during the construction phase. He will also provide technical support in preparing the monitoring report.



Source: ESMF-DSUEP

Figure 6-1: Institutional Arrangement for Environmental and Social Management

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 shall provide safeguard and ESMP compliance orientation to all environment monitors and safeguard team of the contractor one month before the construction works start.

6.2 Grievance Redress Mechanism

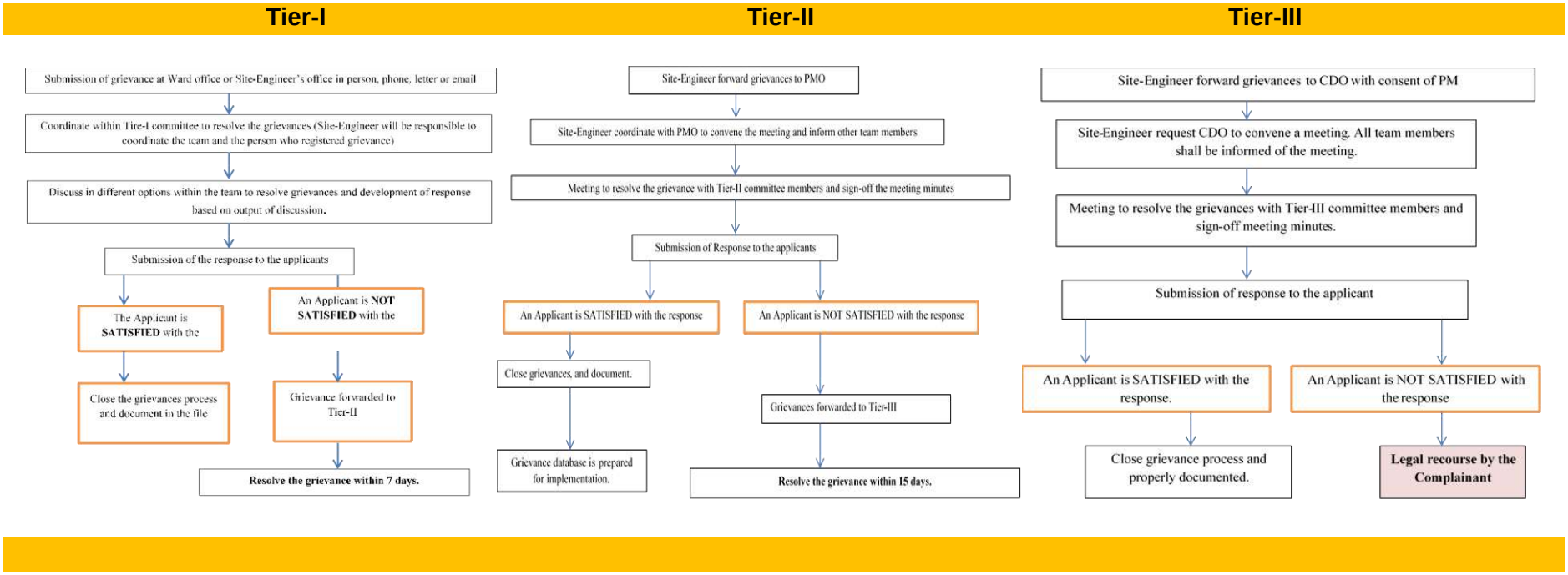
The Grievance Redress Mechanism (GRM) has been established to receive, evaluate, and facilitate the resolution of affected people's concerns, complaints, and grievances about the social and environmental related issues at the subproject level. The GRM is designed to be simple, transparent and responsive. GRM shall address only the concerns arising due to the project implementation activities, mainly during construction stage. Social Comment Addressed -In each subproject, three levels Grievance Redress Mechanism will be established. During the ESMP study period NEA has disseminated letters to the local level stakeholders regarding the formation of the GRM at the subproject level. Till date NEA has established Tier-I and Tier-II GRM has been established at local wards level and Municipality/RM level. Tier-II will be established before construction work starts.

GRM 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, he/she should forward the grievance to the field office 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 carried to Tier II and Tier III. The three levels of GRM will be based on time-bound schedules as mentioned in **Table 6-1**. The subproject will carry the regular meeting for Tier-I, once a month to follow up if any grievances are received or not and to resolve the grievances received and update its status to PIU. **Figure 6-2** describes the Workflow Diagram of GRM for the subprojects.

Table 6-1: Levels of Grievance Redress Mechanism Based on Time Bound

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**
	Municipality Chief	Coordinator	Project Manager	Coordinator	Chief District Officer (CDO)	Chair
	Site-Engineer-NEA	Member secretary	Site-Engineer	Member Secretary	Project Manager	Coordinator
	Safeguards Expert from Consultant	Member	Municipality Chief	Member	Site-Engineer	Member Secretary
	Contractor Engineer	Member	Safeguards Expert from Consultant	Member	Municipality Chief/Ward Chair	Member
	Ward Chair	Member	Contractor Engineer	Member	Safeguards expert from consultant	Member
					Contractor Engineer	Member
					Representative from affected people	Member

Figure 6-2: 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 Asian Infrastructure Investment Bank (AIIB) under Distribution System Upgrade and Expansion Project (DSUEP), Nepal Electricity Authority (NEA), May 2021.*

7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7.1 Environmental and Social Management Plan and Mitigation Measures

The overall Environmental and Social Management Plan of the Subproject is presented in **Table** 7-1. The 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 ESMU of PIU.

Table 7-1: Environmental and Social Management Plan (ESMP)

Project Activity	Environmental and Social Issues	Management/Mitigation Measures	Mitigation Cost	Responsibility	
				Planning and Implementation	Supervision and Monitoring
Pre-construction Phase					
Approvals, permits and clearances	Installation of poles along the edge of private farm lands	• Site office and the contractor must inform the community prior to the installation of poles and stringing of the line along DL route		Site Office/ Contractor/	DSUEP (PIU)/NEA
Construction Phase					
Construction work in substation area and distribution line alignment	• Inadequate/unsafe working conditions	• Appropriate contract clauses to ensure satisfactory implementation of contractual environmental, health, and safety measures.		Site Office/Contractor	PIU/NEA
	• Accident may arise if the pit hole (depth-2m and diameter-0.22 m) prepared for steel tubular poles remains open for long time	• Pit holes for the steel tubular pole shall not be left open and should be filled instantly by erecting poles and concrete-cement around the base should be used to strengthen the pole erection • Contractors should follow the guideline provided by the PIU	Project Cost	Contractor/ Site Office	PIU/ESMU/ PIU
	• Dust emission - transportation of materials and movement of construction crews and equipment will cause minor impact	• Water sprays to be used for dust control as necessary in the earthen roads of the settlements nearby the substation area and proper storage of the construction materials (sand, cements, aggregates and spoil)	Air Quality Monitoring-1,50,000.00 (NRs.) Sprinkling water (Dust Management) 2,00,000.00 (NRs.)	Contractor/ Site Office	PIU/ESMU
	• Noise emission-Construction related	• Boundary walls serves as a noise barrier, and these shall be constructed as early as possible.	Noise Level Monitoring-50,000.00 (NRs.)	Contractor/ Site Office	PIU/ESMU

	noise will be limited to vehicular movement and inside-the-fence construction activities at substations sites	• Construction equipment to meet national emissions and noise control standards.	Provision of PPE in Project Cost		
	• Interference with drainage patterns will be temporary at substation during construction phase	• A proper drainage system should be managed within the substation area. • Storm water run-off need to be minimized and controlled with bunding temporary dikes. • Drainage management as a preventive measure against breeding of mosquitoes and other pests	Project Cost	Contractor/ Site Office	PIU/ESMU
	• Construction associated wastes generated within substation area and campsite location	• Organic waste generated from the campsite shall be managed within the substation premises, through composting in the bin or by constructing a ground pit, and covered by a thick layer of soil. • Reusable waste like debris, broken brick pieces, sand, stone, waste cement, and sand mix should be used as refills for ground leveling. • Recyclable wastes like left out/non-usable reinforcement bars, and packing materials sent or sold to scrap vendors. • Effective coordination with local level government for the proper waste management	Solid wastes management – 1,00,000.00 (NRs.)	Contractor/ Site Office	PIU/ESMU
	• Illegal fishing and bird hunting by the labors	• Discouraged supplying adequate food items (poultry and fish) requirement within the camp. • Awareness on legal provisions upon illegal hunting of biodiversity need to be disseminated	Project Cost	Contractor/ Site Office	PIU/ESMU
	• Use of firewood from nearby forests	• Workers and staff should be restricted to use firewood for cooking • Provision of use of LPG gas in the Labor camp	Project Cost	Contractor/ Site Office	PIU/ESMU
	• Loss of standing crops at pole installation locations (depth-2m and diameter-0.22 m)	• Poles to be installed at the edge of cultivated land making no loss of standing crops. • Need to make prior consultation with landowners during installation of the poles and stringing of distribution lines	Project Cost	Contractor/Site Office	PIU/ESMU

		• If there is loss of crops, appropriate compensation shall be provided			
Environment, Health and Safety	• Injury and sicknesses workers and members of the public • Potential fecal coliform contamination in drinking water	• Contractor shall prepare the Environmental, Health and Safety plan and take approval from the client. Provision of safety officer in the work team shall be made during construction period. • All employees shall be provided with the necessary training, and safety equipment as required for their responsibilities and duties. • Basic facilities of drinking water, sanitation & clean resting place, canteen, and first aid shall be made available for the campsite. • Provision of health insurance to employees. • Security fences around the substation. • Installation of warning signs (High Voltage, Fire Safety Signs, and Emergency Signs). • Awareness on HIV/AIDS and other sexually transmitted disease. • Awareness on providing basic sanitation facilities and waste management control to the labors. • For coronavirus (COVID-19) pandemic situation, Contractors should arrange for quarantine and health services for infected workers.	Establishment of Labor Camp with basic facilities – In Project Cost EHS Awareness Trainings - 1,50,000.00 (NRs.) COVID-19 measures 2,00,000.00 (NRs.)	Contractor/Site Office	PIU/ESMU
Management of electric equipment's, toxic materials of	• Possible spills resulting in contamination of soil, water, and air	• Chemical waste generated from transformer shall be collected in leakage proof, corrosion free, specially designed container, and sealed carefully	1,00,000.00 (NRs.)	Contractor/ Site Office	PIU/ESMU

chemical wastes					
Operation and Maintenance Phase					
Electric shock and fire hazard	• Injury or death to the workers and public	• 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 shall be allowed for the electrical works. • No electric wire to be stringed above the house. • Installation of warning signs.	Project Cost	NEA Transmission Operations units and Distribution Service Center(s)	NEA
Routine operations and maintenance	• Potential disturbance to other utility functions and vehicular traffic.	• Maintain warning / advisory signs in good and visible condition • Visual and technical inspection	Project Cost	NEA	NEA
Oil spillage	• Contamination of land/nearby water bodies	• Substation transformers should be stored within secure and impervious bundled areas with a storage capacity of at least 110% of the capacity of oil in transformers and associated reserve tanks.	Project Cost	NEA	NEA
Bird electrocution and collision	• Electrocution can cause a risk to bird species which perch on power line infrastructures	• Provision of bird guards above the poles and white spirals on the conductors to improve visibility	Project Cost	NEA	

(*The provision of environment and social management cost should be included in the project cost making each items visible in BOQ of bidding document for the safeguard compliance by the construction contract)*

7.2 Proposed Monitoring Plan

The monitoring proposed in **Table 7-2** will be of value primarily for establishing baseline conditions in the Subproject area, and then for ambient quality monitoring.

Table 7-2: Minimum Provisions for Environmental Monitoring

Parameters to be Monitored	**Location**	**Measurements**	**Frequency**	**Responsibility**
Construction Stage				
Clearing of construction site	Substation boundaries	• Field inspection of Subproject Sites and ensure that appropriate safety measures are implemented	Clearing and restoration: weekly	Contractors to implement corporate EHS plan, drainage management and solid waste control in substation area.
Air: SPM, Noise: dB(A)	Substation boundaries and nearest receptor to substation	• Spot check for noise and dust using portable monitoring device	Air, and noise: quarterly during construction period	Contractors need to conduct air and noise monitoring during the construction period

Construction wastes: on-site inspection	Visual inspection of active construction areas, including equipment staging areas and camps	• Spot check / visual inspection of solid waste (spoil, muck etc.) generation and disposal. • Analysis of transformer oils to determine if polychlorinated biphenyls are present.	Monthly spot checks for construction waste management	PIU safeguard officers to provide oversight via regular field inspections, and submit monitoring reports to the Bank
Construction and Operation Stage				
Occupational health and safety	Substation boundaries	• No. of Toolbox talk and safety orientation to the workers • No. of workplace accidents • Use of PPE by workers	Daily Inspection during construction Monthly Inspection during operation phase	Inspection of the construction site by safety officer and PIU safeguard officer
Child involvement in construction work (need to be prohibited)	Substation work	• Spot inspection at construction sites	Monthly Inspection during construction	Site Office

7.3 Environmental and Social Monitoring Plan Cost Estimates

Preliminary cost estimates for the ESMP implementation are shown in **Table *7-3***. These estimates cover the basic monitoring activities and the mitigation measures to be complied from the contractor's side. The ESMP cost estimated for the **Lamahi-Gadhawa Distribution Line** is NRs 13,00,000.00. The community support activities and the costs will be presented in the Community Development Plan (CDP). NEA has agreed for the effective implementation of the mitigation and monitoring cost items as mentioned in table below.

Table 7-3: Mitigation Measures and Monitoring Activities Cost Estimates

SN	Budget Items	Unit	Rate (NRs.)	Total Amount (NRs)
1	Air Quality Monitoring (at substation)	6 (Times)	25,000.00	150,000.00
2	Noise Level Monitoring (at substation)	6 (Times)	8,334.00	50,000.00
3	Sprinkling of water to be used for dust control necessary in the earthen roads of the settlements nearby the substation area and proper storage of the construction materials (sand, cements, aggregates and spoil)	200 (Times) During Excavation and Civil works	1000.00	2,00,000.00
4	Management of electric equipment's, toxic materials of chemical wastes	-	L.S.	1,00,000.00
5	Segregation and management of solid wastes	-	L.S.	1,00,000.00
6	COVID-19 measures (considering pandemic situation) standardize the quarantine facilities with health aid to the labors	-	L.S.	200,000.00
7	EHS Awareness raising trainings to the labors	10 (Events)	15,000.00	1,50,000.00
8	Meeting of Safeguard Desk and Grievance Redress Committee at Field Level	24 (Months)	14,583.00	3,50,000.00
Total				**13,00,000.00**

8. CONCLUSION

Potential environmental impacts of this Subproject are not diverse and are all site-specific i.e., confined to the Core Project Area. Civil works will have minimal temporary impacts on air, noise and water quality. Erection of poles during construction shall follow RoW of existing roads and the edge of farmlands. The PIU should give prior information before installation of the poles. In the ESMP consultations conducted in the settlement area, people have agreed for the implementation of the Subproject and have suggested to install poles on the edge of farm-lands, without affecting any private structures along the distribution line. If there is loss of crops, appropriate compensation shall be provided. Mitigation measures are suggested in this ESMP to avoid any possible environmental and social impacts. The total ESMP cost for this Subproject is NRs. 13,00,000.00. NEA Project Implementation Unit has agreed to implement the estimated cost for the mitigation measures and monitoring activities.

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ANNEXES

Annex 1: SAMPLE NOTICE FOR PUBLIC CONSULTATION AND GRM FORMATION LETTER TO STAKEHOLDERS

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: .....

..... प्रदेश ..... जिल्ला .....(नगरपालिका/गाउँपालिका/महानगरपालिका/उपमहानगरपालिका) मा एसियन इन्फ्रास्ट्रकचर इन्भेस्टमेन्ट बैंकको ऋण सहयोग भएको नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजना प्रस्तावक रही कार्यान्वयन गर्न लागिएको ..... 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:

मिति:

समय:

नेपाल विद्युत प्राधिकरण

(नेपाल सरकारको स्वामित्व)

वितरण तथा ग्राहक सेवा निर्देशनालय

नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना

(ए.आई.आई.बि.)

फ्याक्स: ०१-४१५३९४४
फोन नं : ०१-४१५३९४५
दरबारमार्ग, काठमाण्डौं।

प.सं. ०७८/७९: ९३८. मिति: २०७८/१०/०७

श्री .....
.....

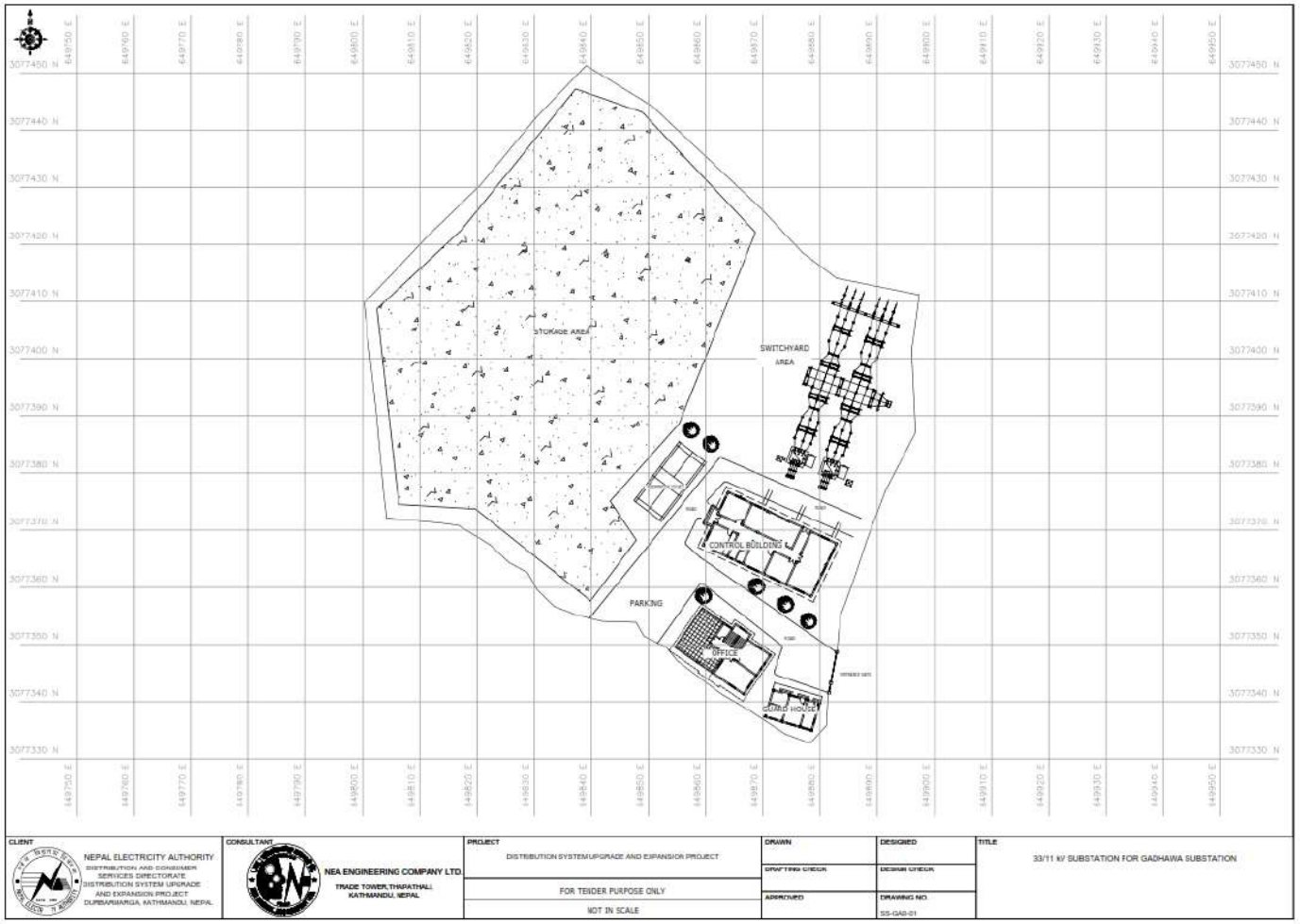
विषय: गुनासो समाधान संयन्त्र गठन भएको सम्बन्धमा ।

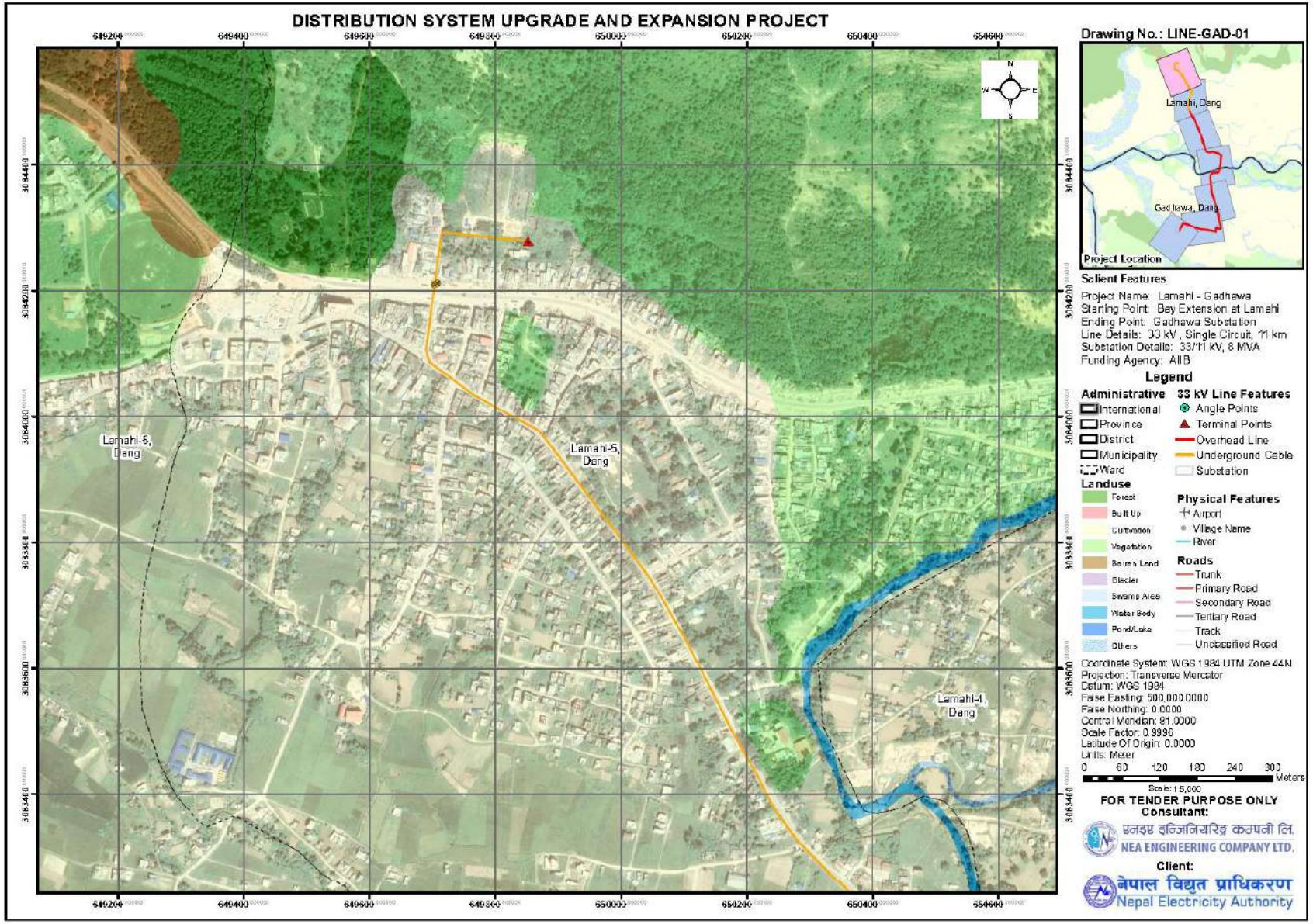
उपरोक्त विषयमा एसियन इन्फ्रास्ट्रक्चर इन्वेस्टमेन्ट बैंक (ए.आई.आई.बि.) को ऋण-सहयोगमा नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजना (ए.आई.आई.बि.) प्रस्तावक रही कार्यान्वयन गर्न लागिएको ..... आयोजना अन्तर्गत नेपाल सरकारको पूर्ण-विद्युतीकरण गर्ने लक्ष्य बमोजिम तहाँ ***वडा/गाउँपालिका/नगरपालिका/उप-महानगरपालिकामा*** ३३/११ के.भी. सब-स्टेशन, ३३ के.भी. लाईन, ११ के.भी. लाईन, ४०० भी. लाईन, आदि निर्माण कार्यहरु हुने भएकोले सो कार्यहरु गर्दा स्थानीय सरोकारवालाहरुको कुनै गुनासो भए सो गुनासोको समाधान गर्न गुनासो समाधान संयन्त्र निर्माण गरिएको छ । अतः संलग्न गुनासो समाधान संयन्त्र दस्तावेज बमोजिम आफ्ना गुनासोहरु दर्ता गर्न र सोही दस्तावेजमा भनिए बमोजिम गुनासोको समाधान हुने व्यहोरा सम्पूर्ण सरोकारवालाहरुलाई जानकारी गराइन्छ ।

भवदीय,

(केशव श्रेष्ठ)
आयोजना प्रमुख

Annex 2: LAYOUT MAPS OF SUBSTATION AND DISTRIBUTION LINE ALIGNMENT




DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-GAD-01
Lamahi, Dang
Gadhawa, Dang
Project Location
Salient Features
Project Name: Lamahi - Gadhawa
Starting Point: Bay Extension at Lamahi
Ending Point: Gadhawa Substation
Line Details: 33 kV, Single Circuit, 11 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Physical Features
Airport
Village Name
River
Roads
Trunk
Primary Road
Secondary Road
Tertiary Road
Track
Unclassified Road
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Projection: Transverse Mercator
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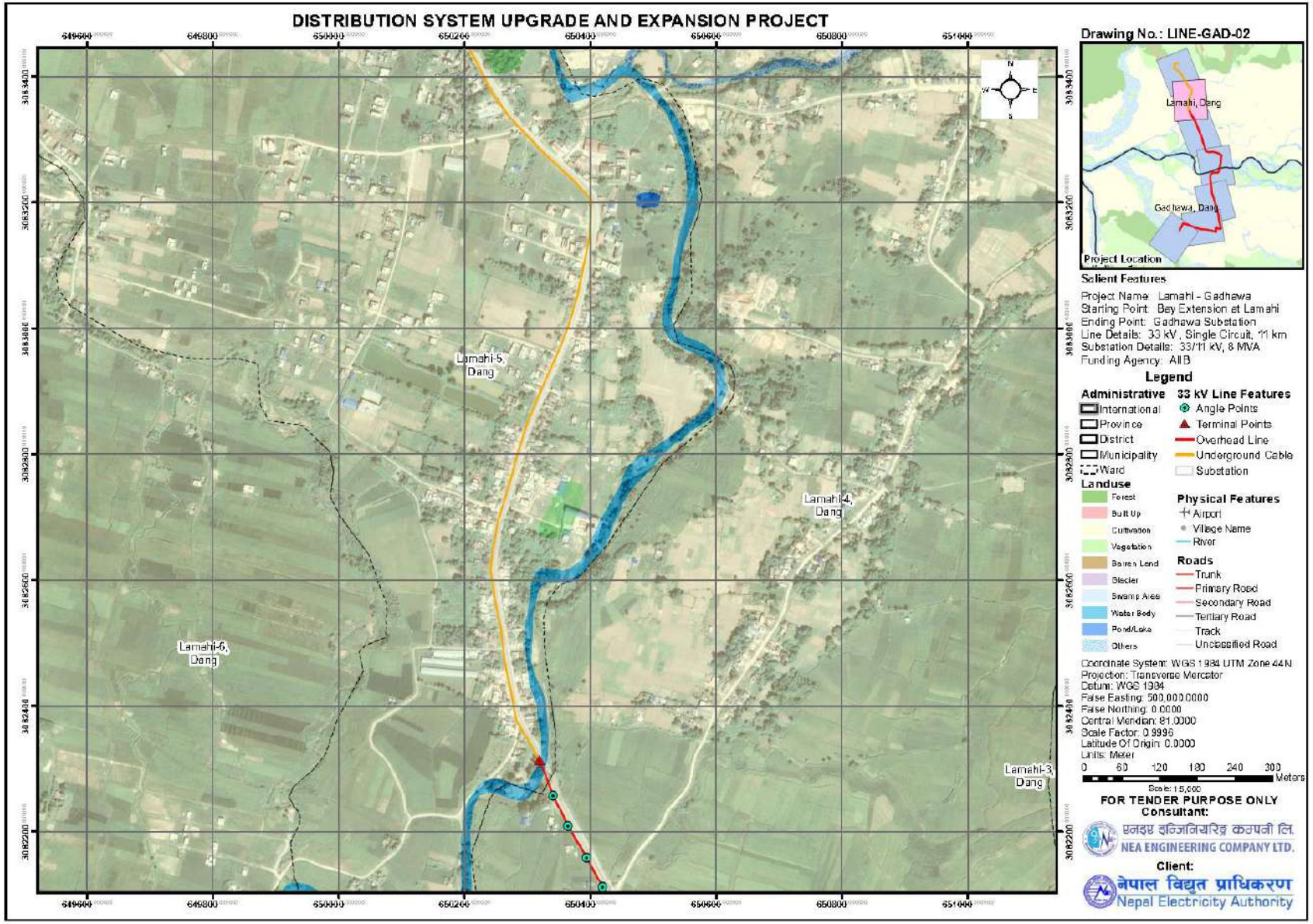
Meters
Scale: 1:5,000
FOR TENDER PURPOSE ONLY
Consultant:
एनइए इन्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority
Lamahi-6, Dang
Lamahi-5, Dang
Lamahi-4, Dang


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-GAD-02
Lamahi, Dang
Gadhawa, Dang
Project Location
Salient Features
Project Name: Lamahi - Gadhawa
Starting Point: Bay Extension at Lamahi
Ending Point: Gadhawa Substation
Line Details: 33 kV, Single Circuit, 11 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
Physical Features
Airport
Village Name
River
Roads
Trunk
Primary Road
Secondary Road
Tertiary Road
Track
Unclassified Road
Coordinate System: WGS 1984 UTM Zone 44N
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FOR TENDER PURPOSE ONLY
Consultant:
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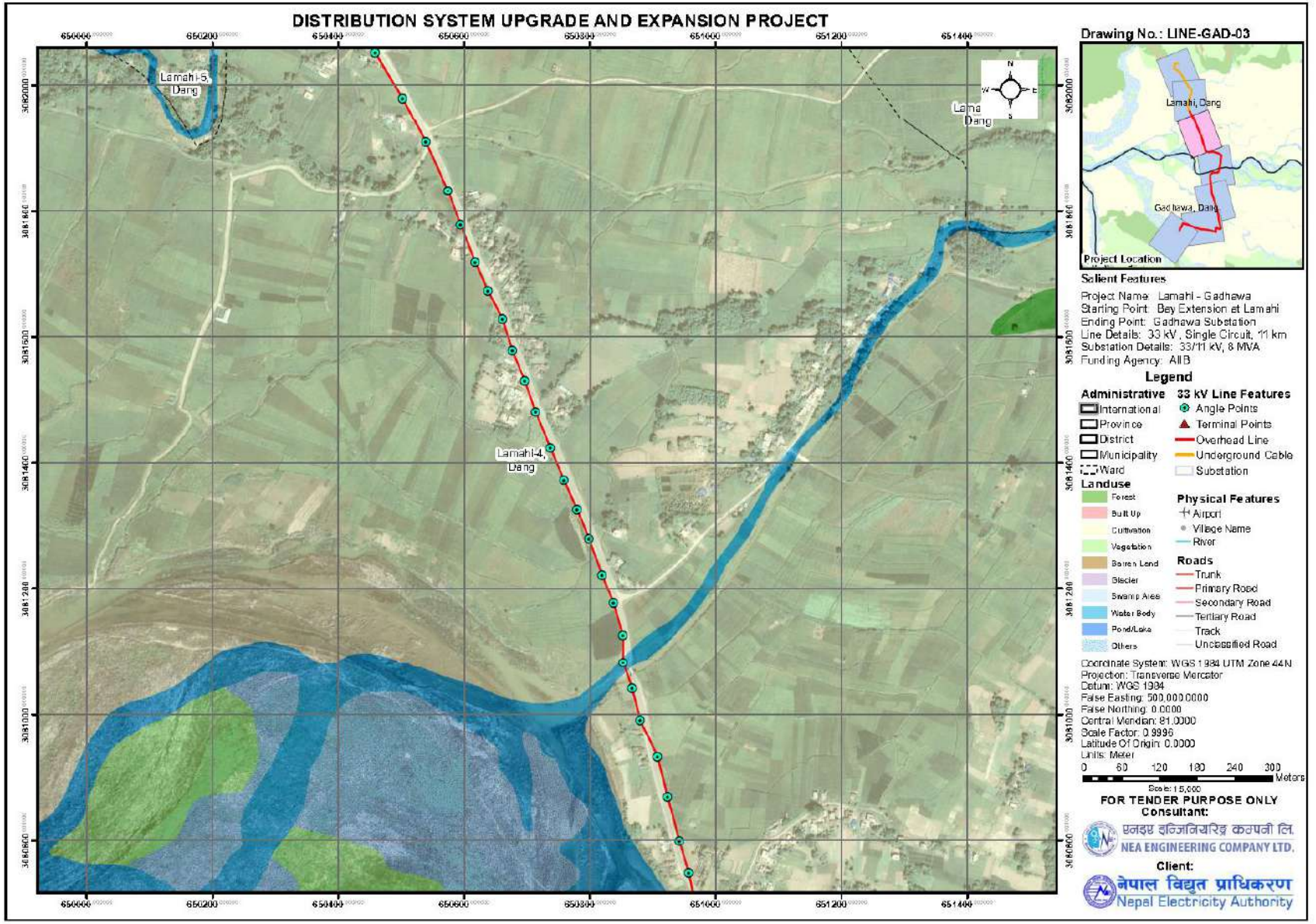
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority
Lamahi-5, Dang
Lamahi-4, Dang
Lamahi-6, Dang
Lamahi-3, Dang


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-GAD-03
Lamahi-5, Dang
Lamahi-4, Dang
Lamahi, Dang
Gadhawa, Dang
Project Location
Salient Features
Project Name: Lamahi - Gadhawa
Starting Point: Bay Extension at Lamahi
Ending Point: Gadhawa Substation
Line Details: 33 kV, Single Circuit, 11 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
Physical Features
Airport
Village Name
River
Roads
Trunk
Primary Road
Secondary Road
Tertiary Road
Track
Unclassified Road
Coordinate System: WGS 1984 UTM Zone 44N
Projection: Transverse Mercator
Datum: WGS 1984
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Central Meridian: 81.0000
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Units: Meter
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FOR TENDER PURPOSE ONLY
Consultant:
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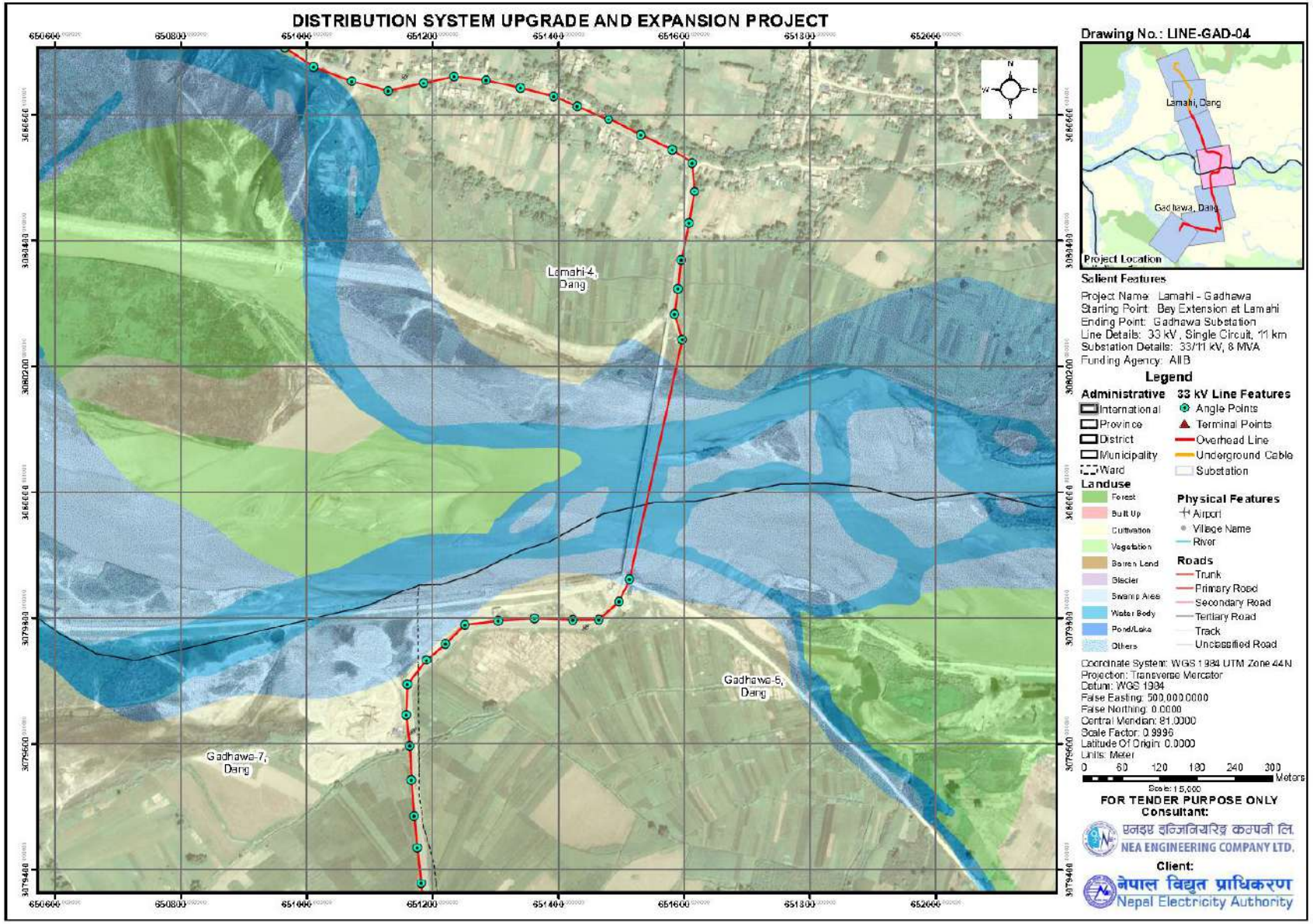
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-GAD-04
Lamahi, Dang
Gadhawa, Dang
Project Location
Salient Features
Project Name: Lamahi - Gadhawa
Starting Point: Bay Extension at Lamahi
Ending Point: Gadhawa Substation
Line Details: 33 kV, Single Circuit, 11 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Physical Features
Airport
Village Name
River
Roads
Trunk
Primary Road
Secondary Road
Tertiary Road
Track
Unclassified Road
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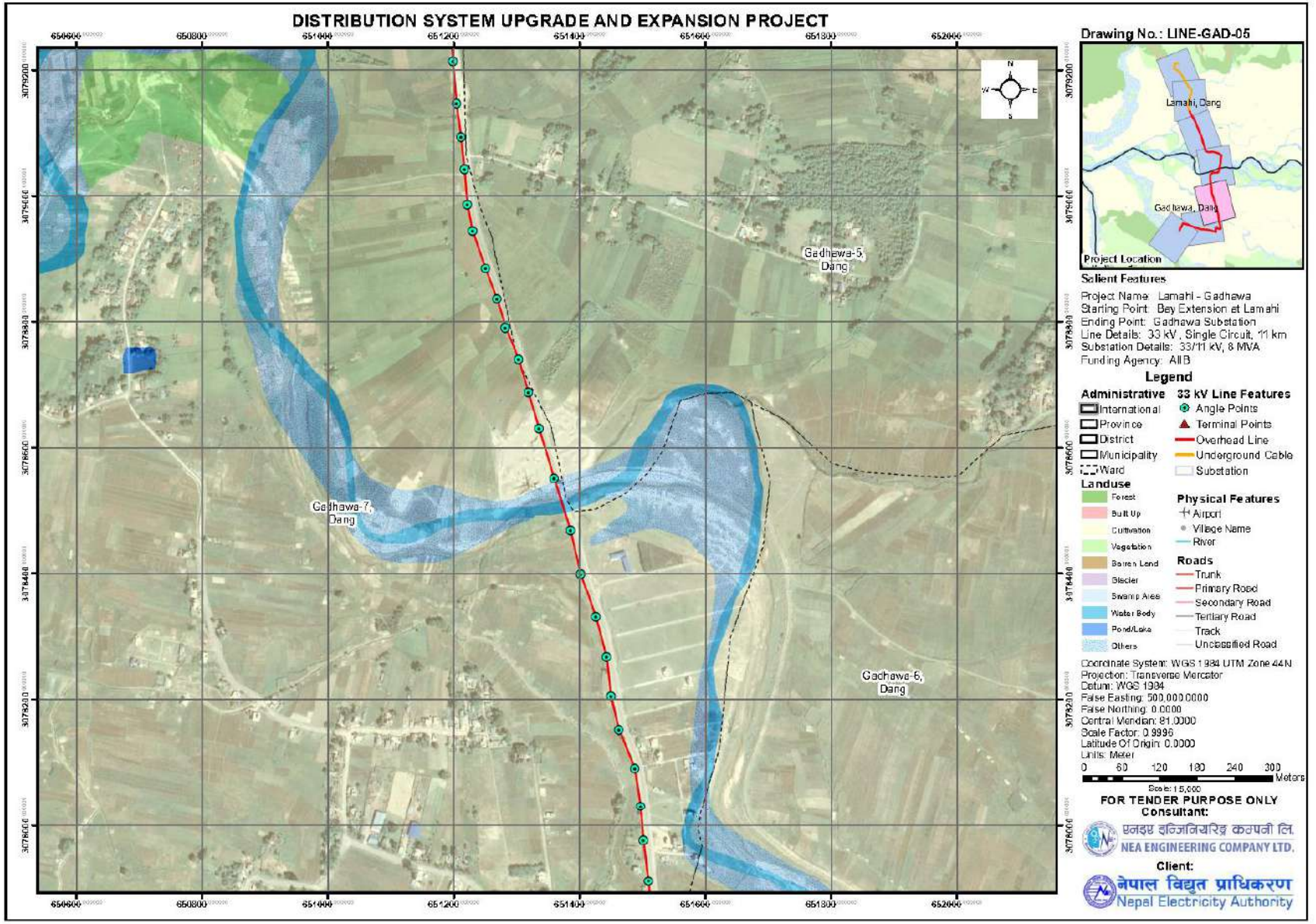
FOR TENDER PURPOSE ONLY
Consultant:
एनइए इन्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority
Lamahi-4, Dang
Gadhawa-6, Dang
Gadhawa-7, Dang


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-GAD-05
Lamahi, Dang
Gadhawa, Dang
Project Location
Gadhawa-5, Dang
Gadhawa-7, Dang
Gadhawa-6, Dang
Salient Features
Project Name: Lamahi - Gadhawa
Starting Point: Bay Extension at Lamahi
Ending Point: Gadhawa Substation
Line Details: 33 kV, Single Circuit, 11 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
Physical Features
Airport
Village Name
River
Roads
Trunk
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Secondary Road
Tertiary Road
Track
Unclassified Road
Coordinate System: WGS 1984 UTM Zone 44N
Projection: Transverse Mercator
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FOR TENDER PURPOSE ONLY
Consultant:
एनइए इन्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
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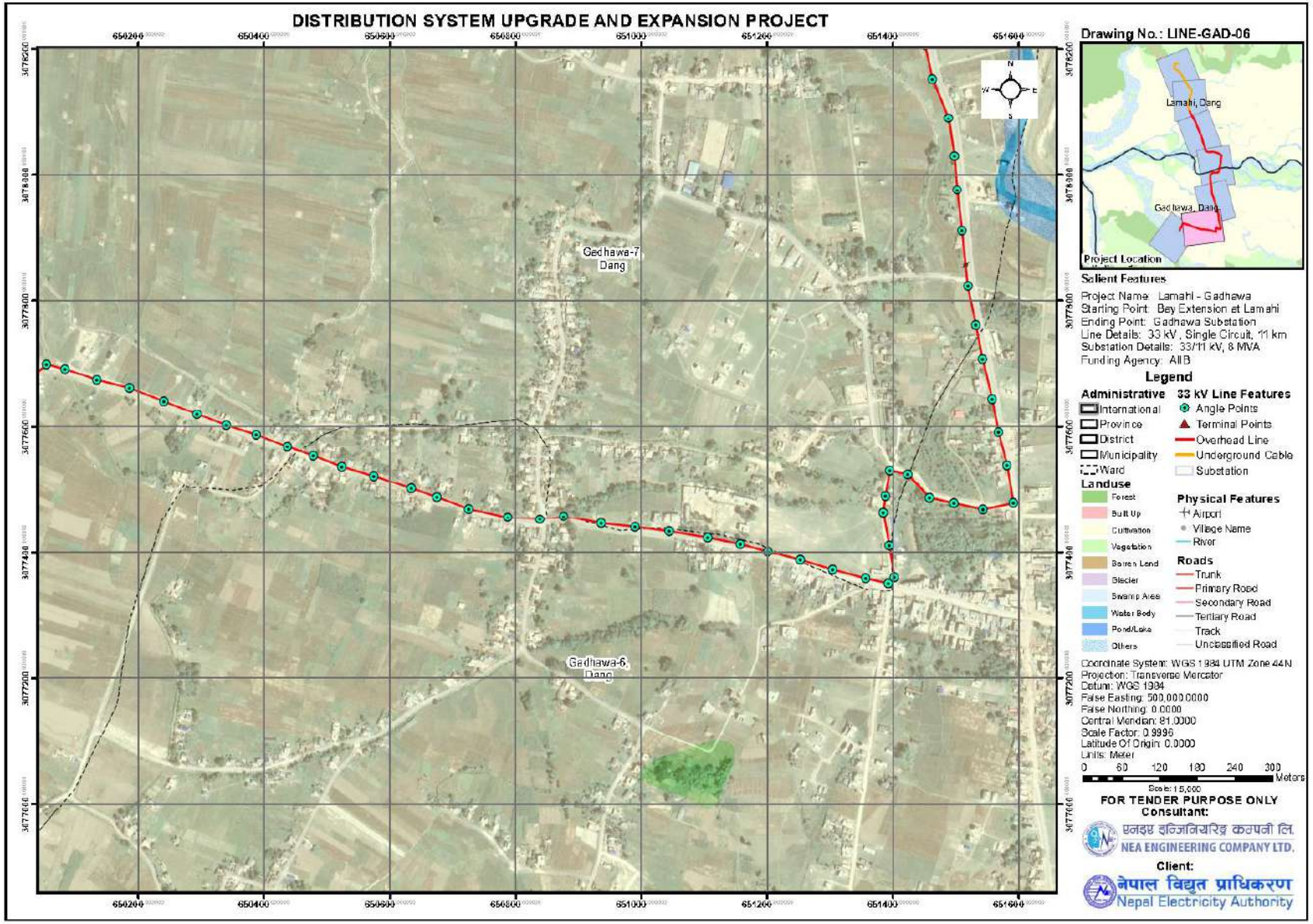
Nepal Electricity Authority


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-GAD-06
Lamahi, Dang
Gadhawa, Dang
Project Location
Salient Features
Project Name: Lamahi - Gadhawa
Starting Point: Bay Extension at Lamahi
Ending Point: Gadhawa Substation
Line Details: 33 kV, Single Circuit, 11 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
Physical Features
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Village Name
River
Roads
Trunk
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Tertiary Road
Track
Unclassified Road
Coordinate System: WGS 1984 UTM Zone 44N
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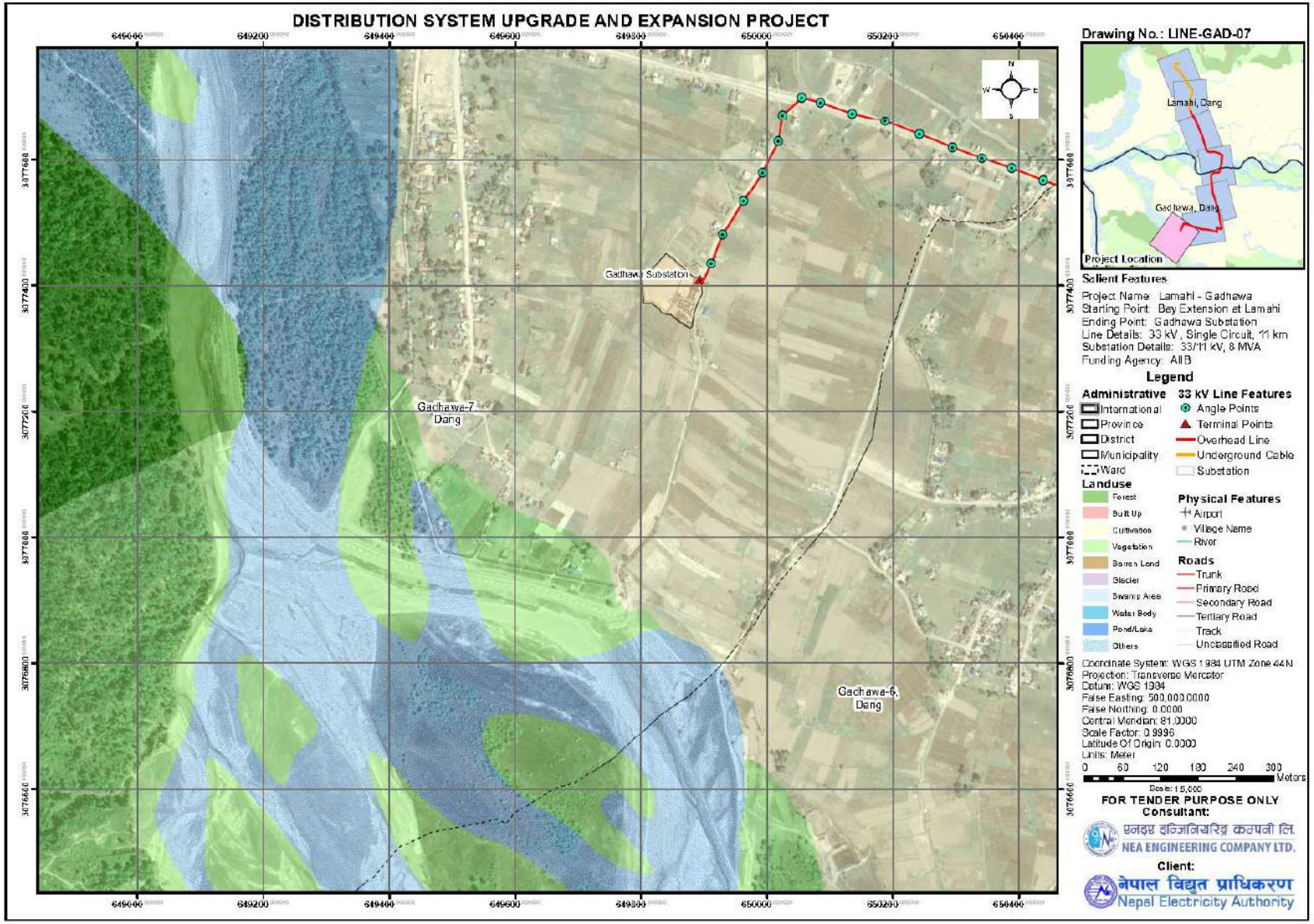
FOR TENDER PURPOSE ONLY
Consultant:
एनइए इन्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority
Gadhawa-7 Dang
Gadhawa-6 Dang


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-GAD-07
Lamahi, Dang
Gadhawa, Dang
Project Location
Gadhawa Substation
Gadhawa-7 Dang
Gadhawa-6, Dang
Salient Features
Project Name: Lamahi - Gadhawa
Starting Point: Bay Extension at Lamahi
Ending Point: Gadhawa Substation
Line Details: 33 kV, Single Circuit, 11 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
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Physical Features
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Village Name
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Trunk
Primary Road
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Tertiary Road
Track
Unclassified Road
Coordinate System: WGS 1984 UTM Zone 44N
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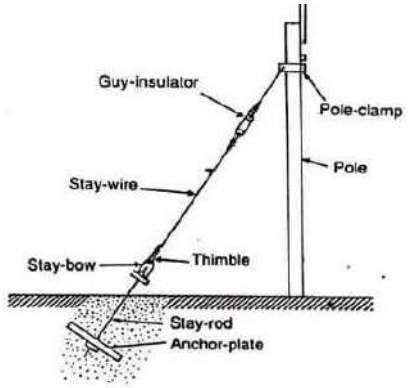
FOR TENDER PURPOSE ONLY
Consultant:
एनइए इन्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority

Annex 3: FACILITY AND COMPONENTS

Transformer

Switch Yard

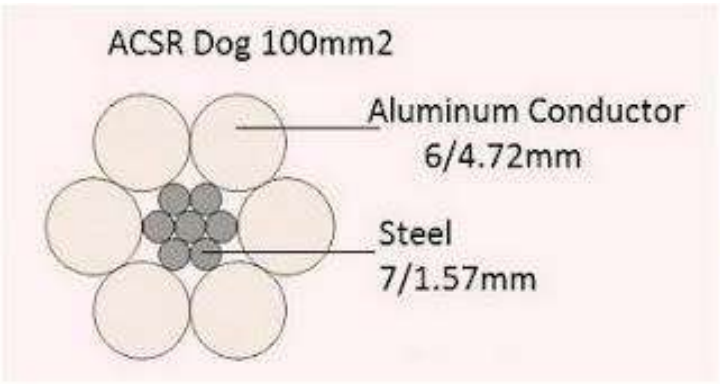


Stay/Guy Sets

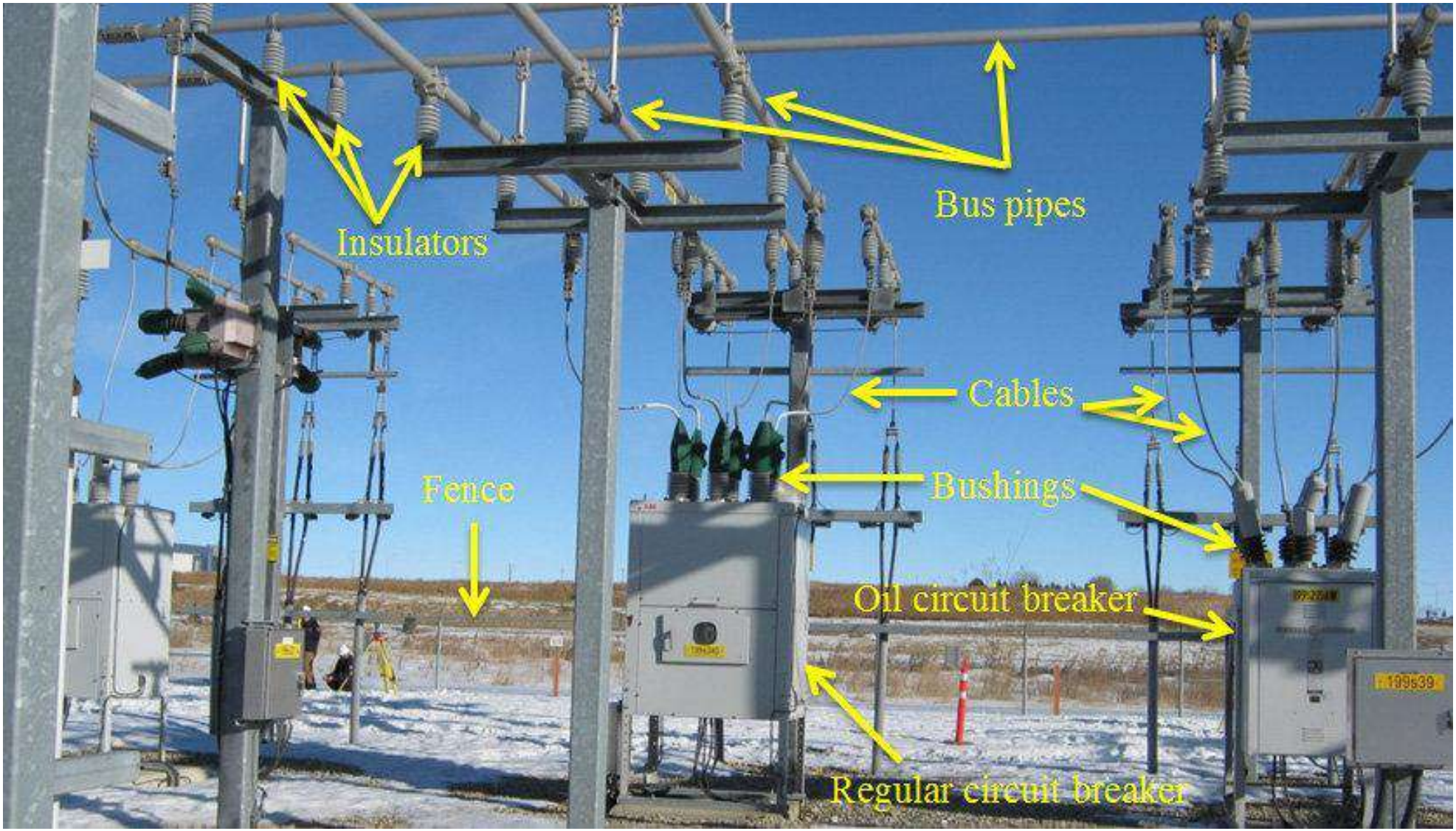
Steel Tubular Pole

Insulator

Civil-Structures Supporting Electrical Components



Conductor



Possible components within 33 kV/11 kV 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 4: LEGISLATIVE PROVISIONS

SN	Legal Provisions	Description	Relevancy concerning Project
1.	**Constitution of Nepal**	● The Constitution of Nepal is the main legal document, which emphasizes the right to a clean environment of the people, natural resources protection, preservation, and its prudent use. Rights regarding the clean environment, under article 30: ● It includes making multi-purpose development of water resources, while according priority to domestic investment based on public participation to ensure a reliable supply of energy affordably, and easily, 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 fulfill the rights of people to live in a clean environment along with fulfilling the basic needs by providing access to sufficient energy.
2.	**Environment Protection Act 2076 (2019 AD)**	● Section 3 of the Act requires the proponent to conduct environmental studies concerning the prescribed proposals of any developmental works. Subsection 2 of this act provides the framework for the environmental study report prepared according to sub-section (1) shall, in fulfillment of the process as prescribed, be submitted to the relevant bodies of the Government of Nepal for approval.	Environmental Studies, and approval of the report from the authorized body before construction of any project is mandatory to minimize the negative impacts in Nepal which is addressed in EPA, 2019.
3.	**Environmental Protection Rule, 2077 (2020 AD) [First Amendment on 2078 (2021)]**	● Under the Environmental Protection Rules (2020) first amendment (2021), 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 66 kV in forest land for another purpose.	This rule provides the overall guidance to what type of environmental studies is required according to the project by the Government of Nepal.
4.	**Nepal Environmental Policy, and**	The aims of NEPAP are: ● To manage natural, and physical resources efficiently, and sustainably	DSUEP should follow the aims of NEPAP to

	Action Plan, 2050(1993)	● To balance the development efforts, and environmental conservation for sustainable fulfillment 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 the adverse environmental impact of development projects, and human actions ● To integrate environment, and development through appropriate institutions, adequate legislation, and economic incentives, and sufficient public resources	protect, and conserve the physical, biological, and social environment during the construction of a 33 kV distribution line along with a substation.
5.	**Electricity Act 1992**	● No person shall be entitled to conduct survey, generation, transmission, or distribution of electricity without obtaining a license under this act. ● The Electricity Act of 1992 has the provision of land procurement for the development of Subprojects that involve electricity generation, transmission, or distribution. The Act states that the licensee may apply 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 a sufficient amount of electricity by constructing a 33 kV line, and substation by surveying to minimize the impacts.
6.	**Rural Energy Policy, 2006**	The rationale of formulating, and implementing this policy is to create a conducive environment that will self-motivate, and mobilize local institutions, rural energy user groups, non-government organizations, cooperatives, and private sector organizations 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 the promotion of such renewable energy technologies.	This project helps to improve the distribution, and motivate use the of electricity in rural areas of western Nepal.
7.	**Labor Act, 2074 (2017 AD)**	This labor Act was made under the management of parliament under sub-clause 1 of clause 296 of the 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 the prohibition of child labor in any organization,	The construction of a project is only possible when the rights of labor are secure. In this project, the contractor should

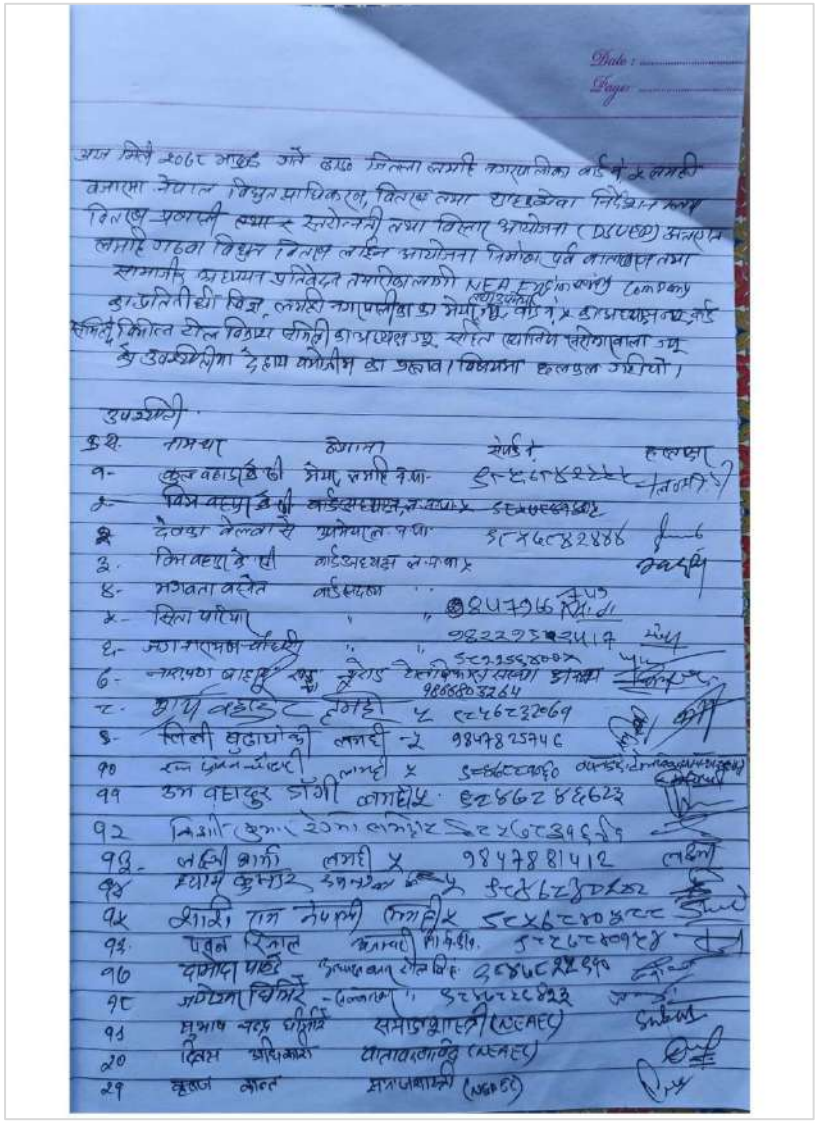
		and sub-section 6 of Section 2 states that there should not be any kind of discrimination among the employee's regard of religion, ethnicity, gender, origin, language, or intelligence or other kinds of characters.	follow this act strictly.
8.	**Child Labor (Prohibition, and Regulation) Act, 2056 (2000 AD)**	As per section 3 of this act, no child has not attained the age of 14 years shall be engaged in works as a laborer.	Child labor is strictly prohibited in this project, and contractors should follow this act.
9.	**Solid Waste Management Act, 2068 (2011 AD)**	This act has been formulated to minimize solid waste products from the target area by setting rules, and regulations on solid waste management (SWM) in the country to develop a better environment for the systematic, and effective management of solid waste, and to involve all the concerned stakeholders in SWM practice. The main features of this act are the discussion of the 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 saves the money which could be used for other infrastructure development. Section 4 of the act assigns the local body to manage or use the solid waste discharged or dumped in the collection center, transfer station, or treatment plant or collected during cleaning.	These acts provide the overall framework to manage the solid waste generated from households to the project level. Also, the proponent should manage the waste generated during construction.
10.	**Solid Waste Management Rules, 2070 (2013 AD)**	The solid waste management rule was formulated as per the provision made in article 50 of the 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 the segregation, and management of solid waste. It has been mentioned that it is essential to segregate degradable, and non-degradable solid waste at the source.	These rules provide the overall framework for how to reduce the volume of waste disposed of at the source during the construction of the substation.
11.	**Fifteenth Plan**	The vision of the 15th plan is to contribute to the prosperity of the nation through sustainable, and reliable development of hydropower by setting the goal which is to ensure energy security through intensifying hydropower generation. In addition, one of the strategies of the government of Nepal in	This 5-year interim plan sets the goal about the generation, and distribution of hydroelectricity in

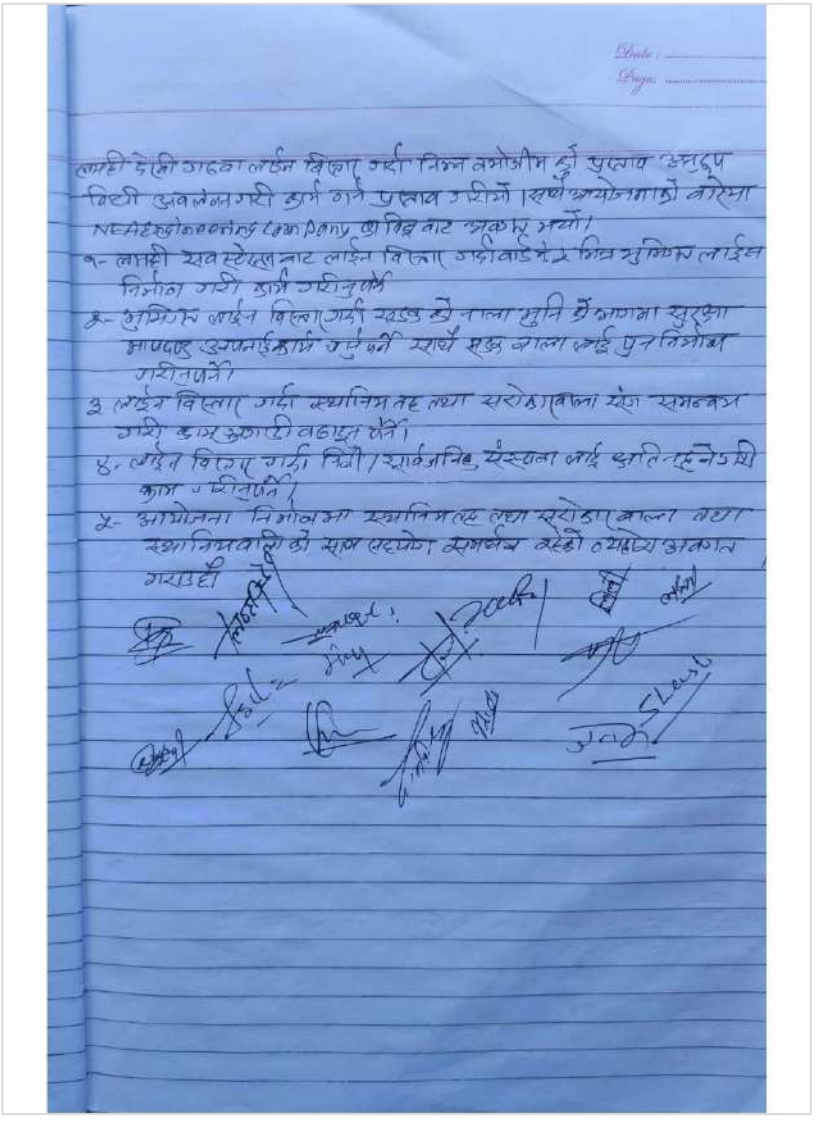
		the 15th plan is to make the distribution system effective, and reliable to increase energy efficiency, and increase power consumption by expanding access to electricity by formulating the required policies:	Nepal which is directly related to this project.
12.	**United Nations Framework Convention on Climate Change (UNFCCC), 1992**	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, to minimize adverse effects on the economy, on public health, and the quality of the environment, of Subprojects or measures undertaken by them to mitigate or adapt to climate change. After it entered into force on 21 March 1994, it mandates the individual state for prioritization of resource conservation with development.	The goal of this project is to replace the traditional form of energy with clean energy i.e., electricity which ultimately reduces air pollution, and smoke.
13.	**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. Article 1 on the First Part of this convention mainly focused on the 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 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 provisions of this Convention apply.	Nepal is the part of ILO convention that's why ILO 169 should strictly follow during construction, and implementation of any types

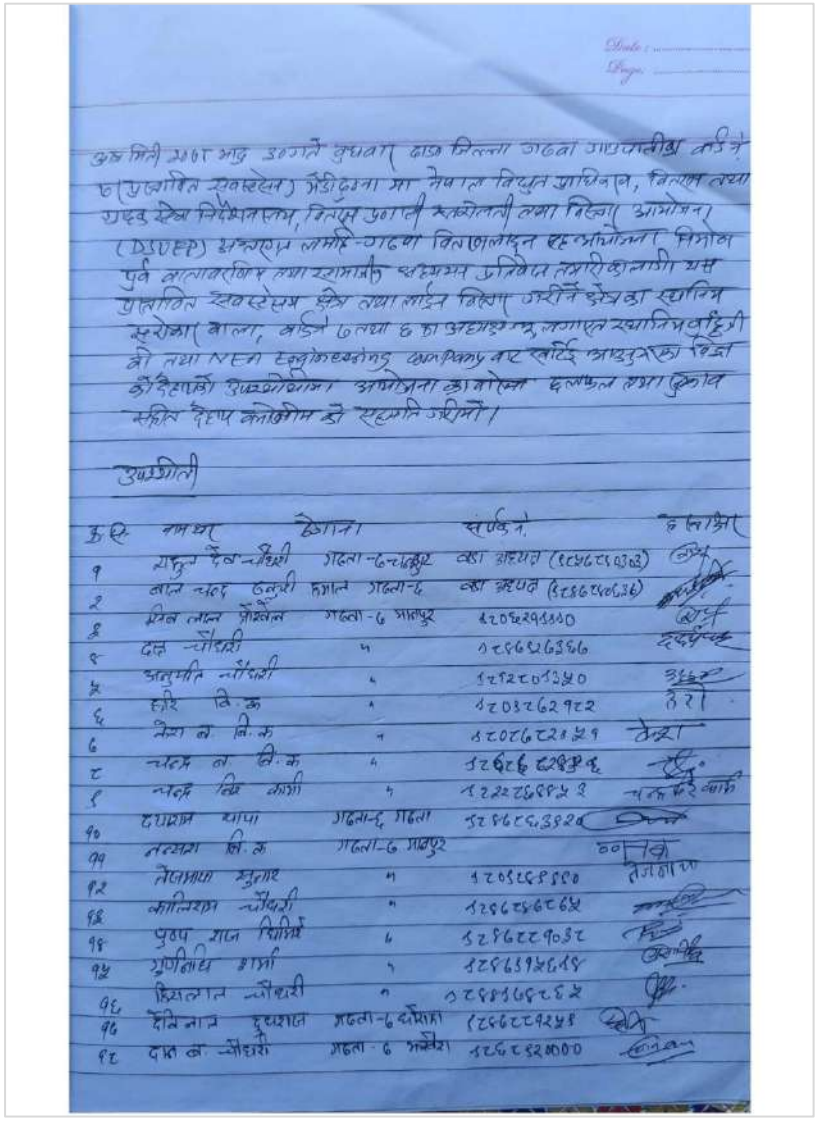
		● The use of the term **people** in this Convention shall not be construed as having any implications as regards the rights which may attach to the term under international law.	
14.	**Environment and Social Management Framework**	● ESMF is to guide DSUEP sub-projects in the area of E&S management using 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 Financiers' 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
15.	**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
16.	**Environmental and Social Standards of AIIB** [12]	● Three associated mandatory environmental and social standards (ESSs) set out more detailed environmental and social requirements relating to the ESMP	ESMP requirement

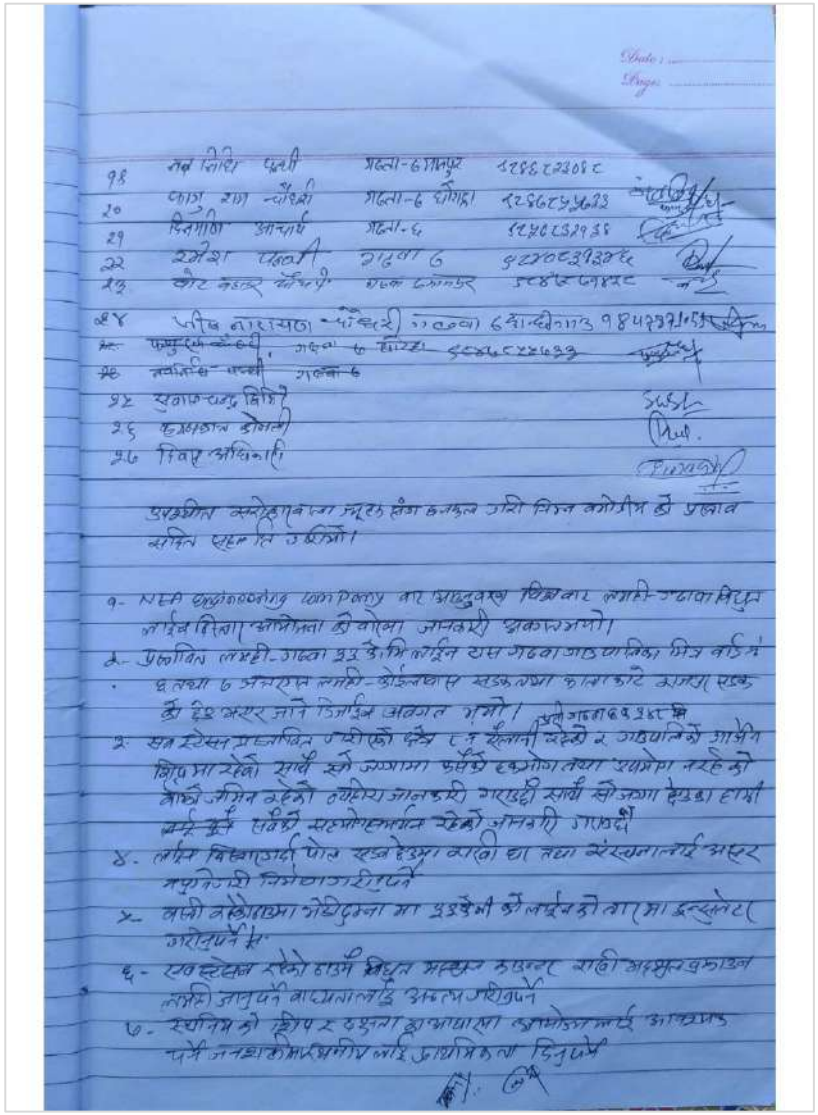
[12] *https://www.aiib.org/en/policiesstrategies/download/environmentframework/20160226043633542.pdf*

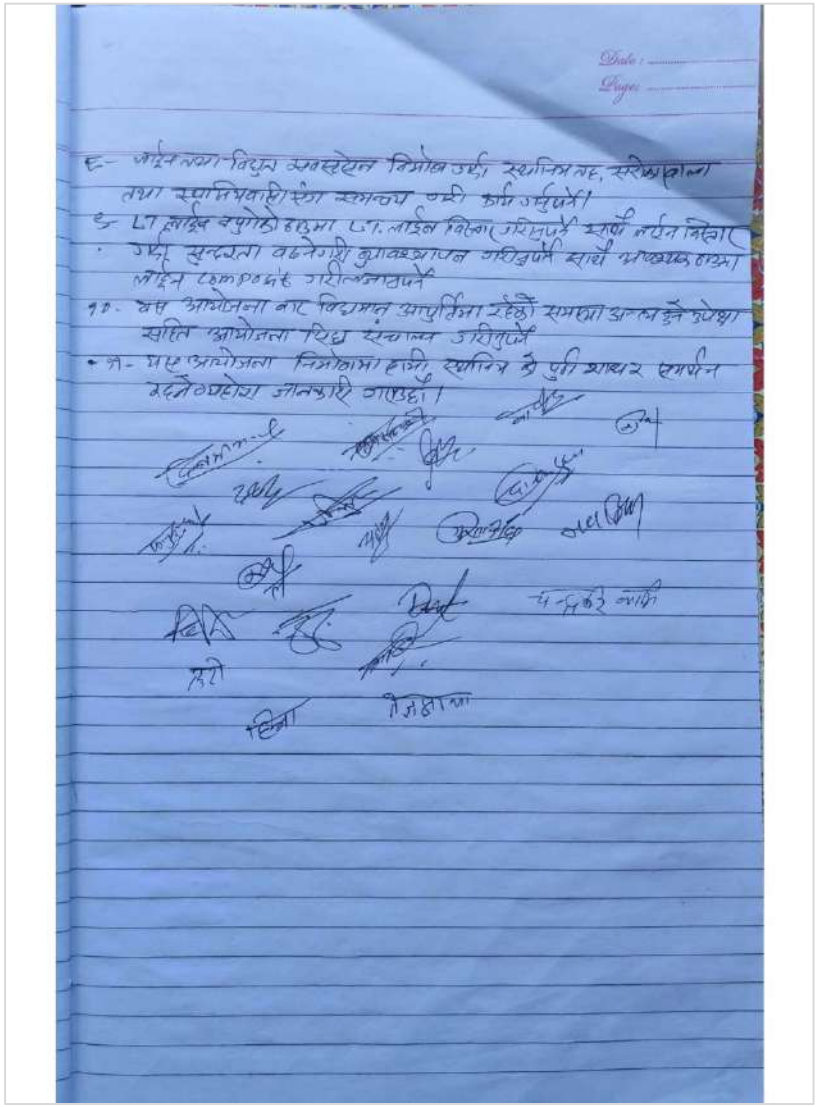
Annex 5: CONSULATATION MEETING MINUTES

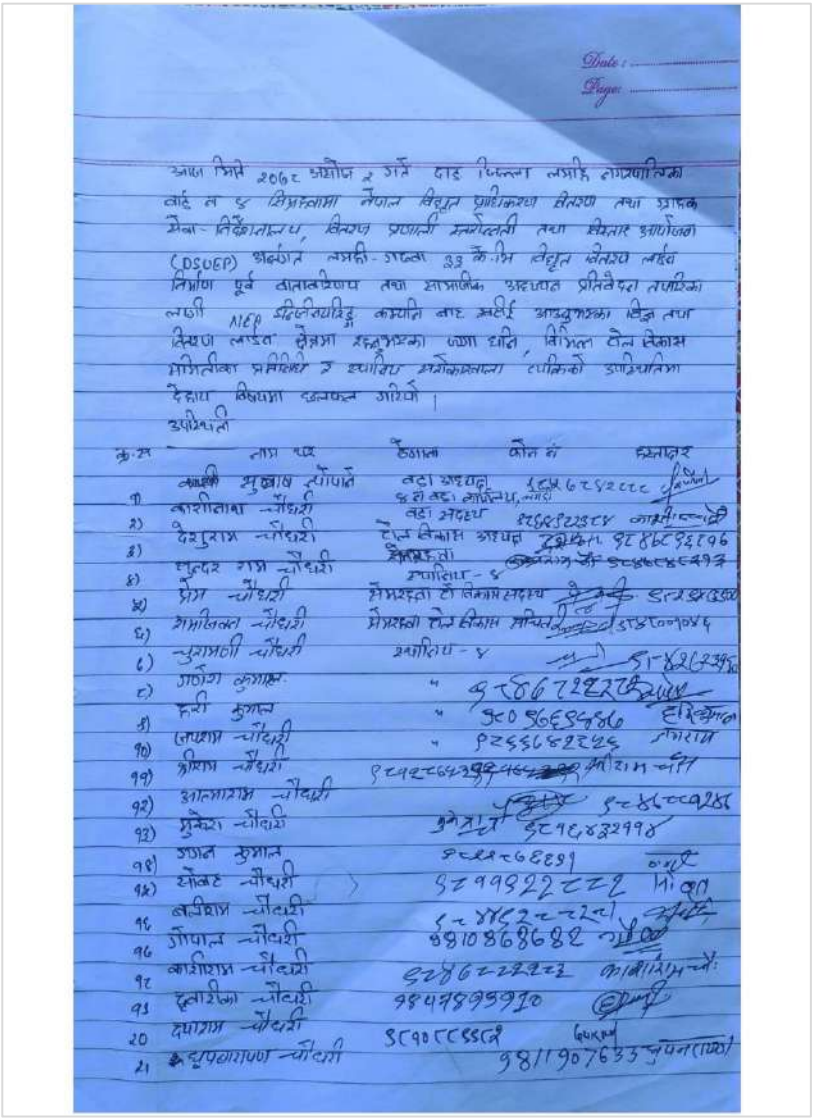


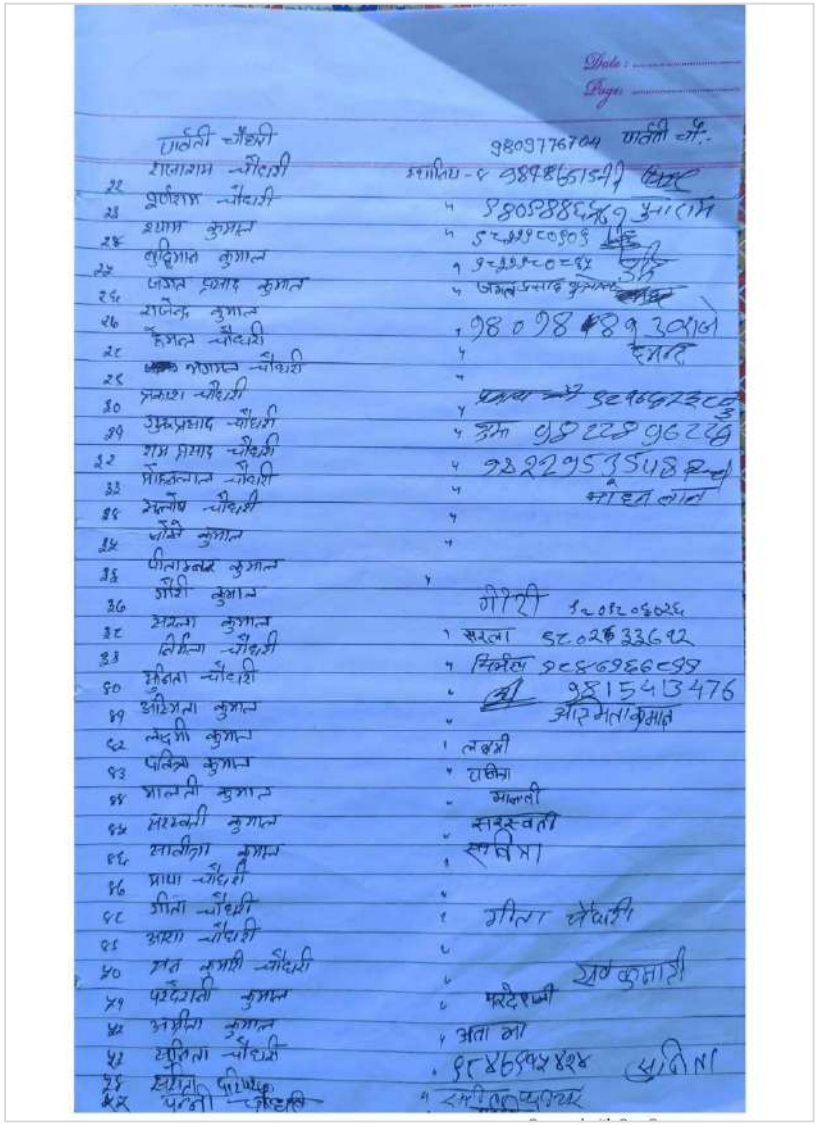


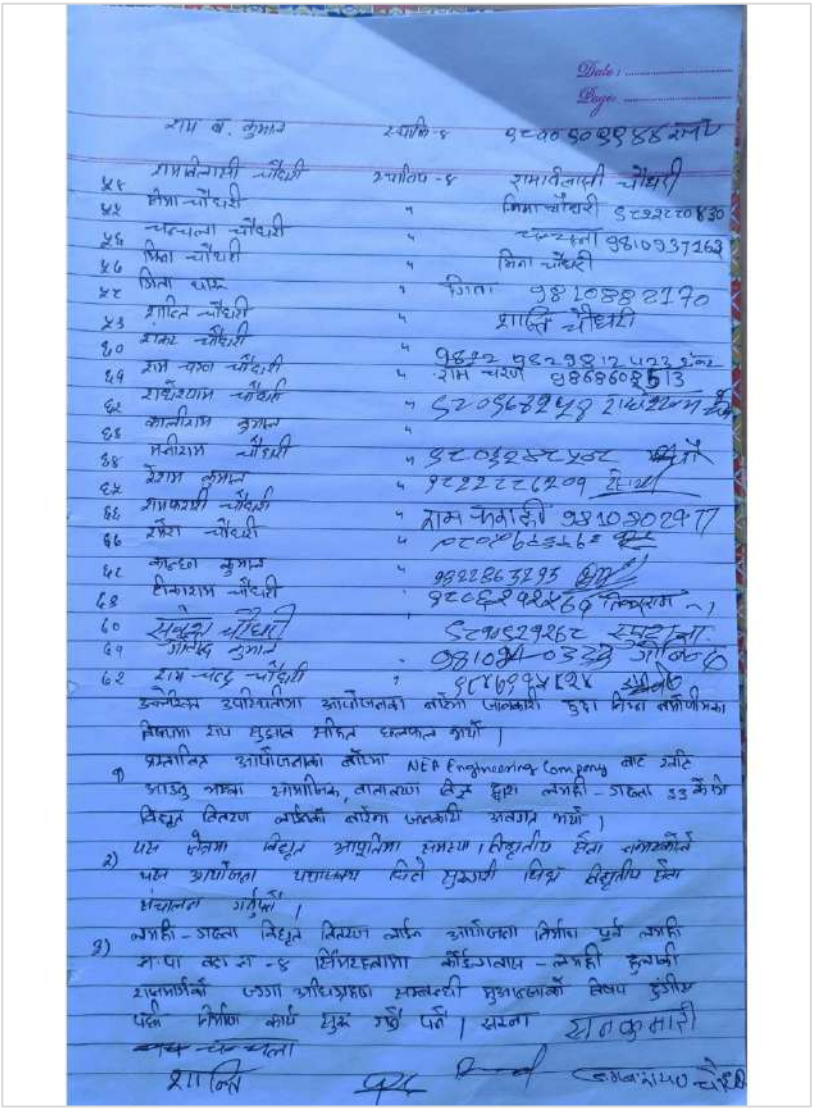


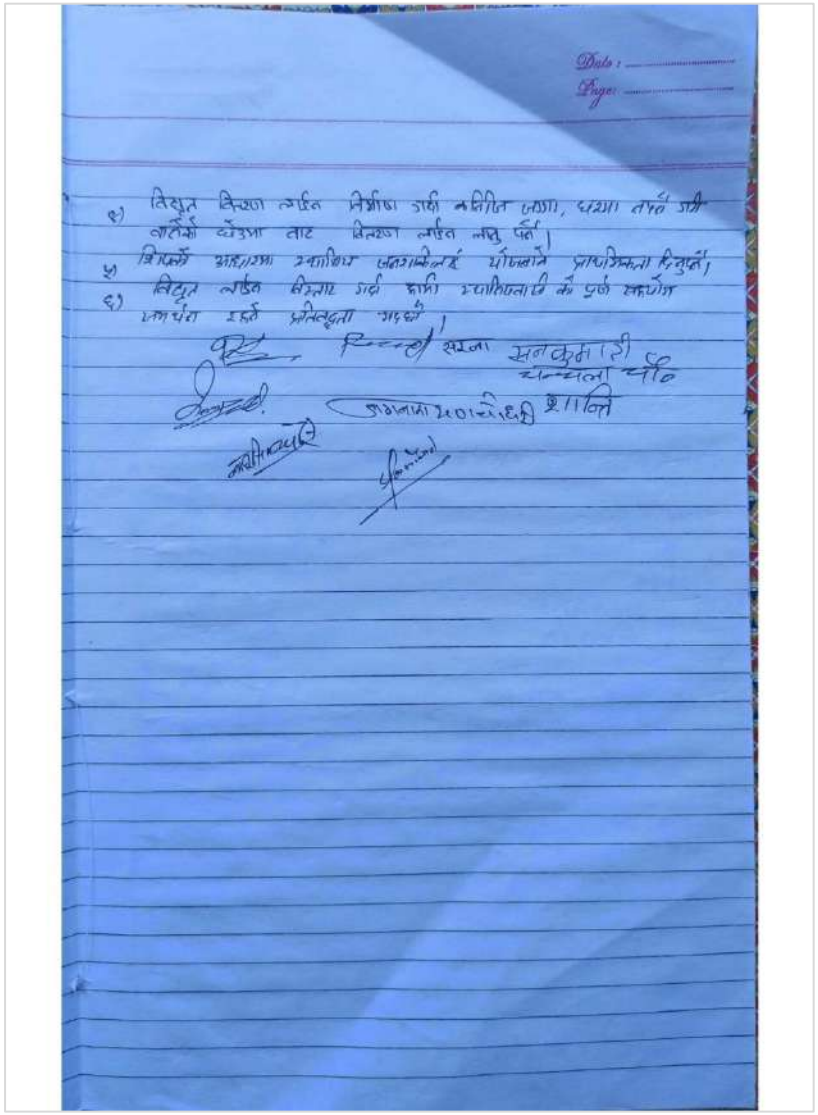


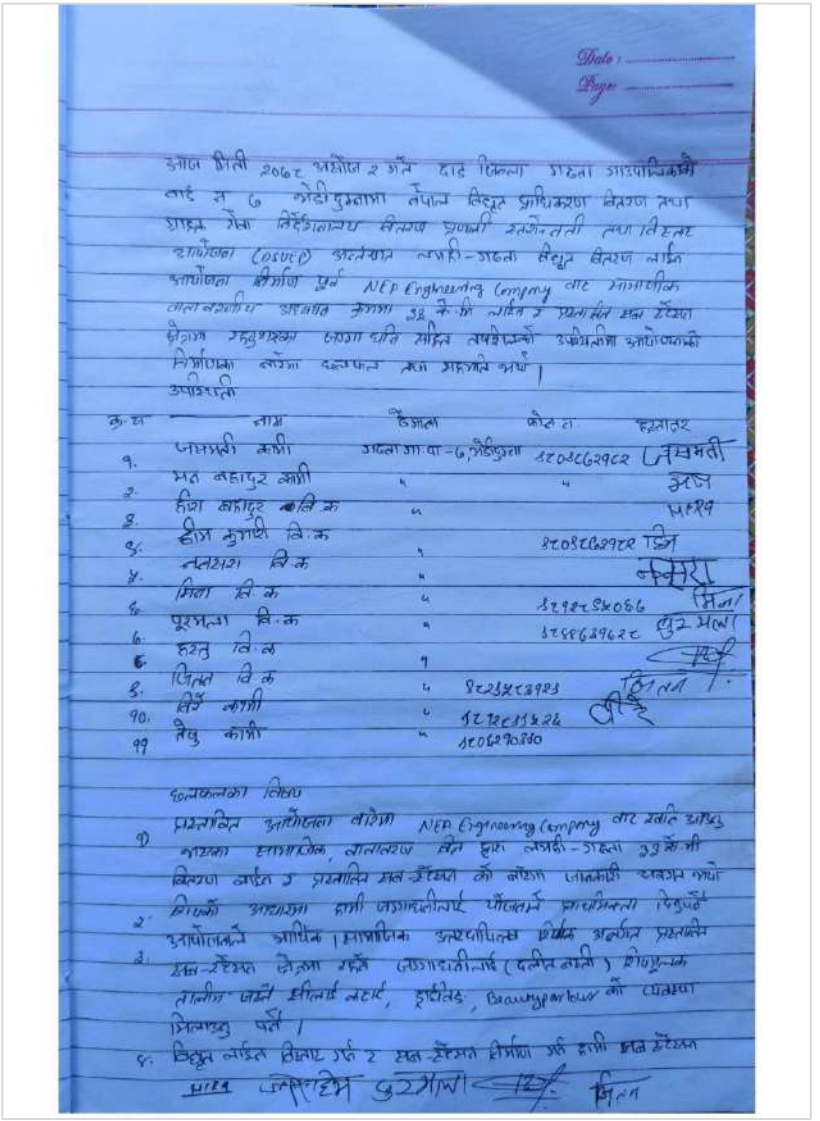


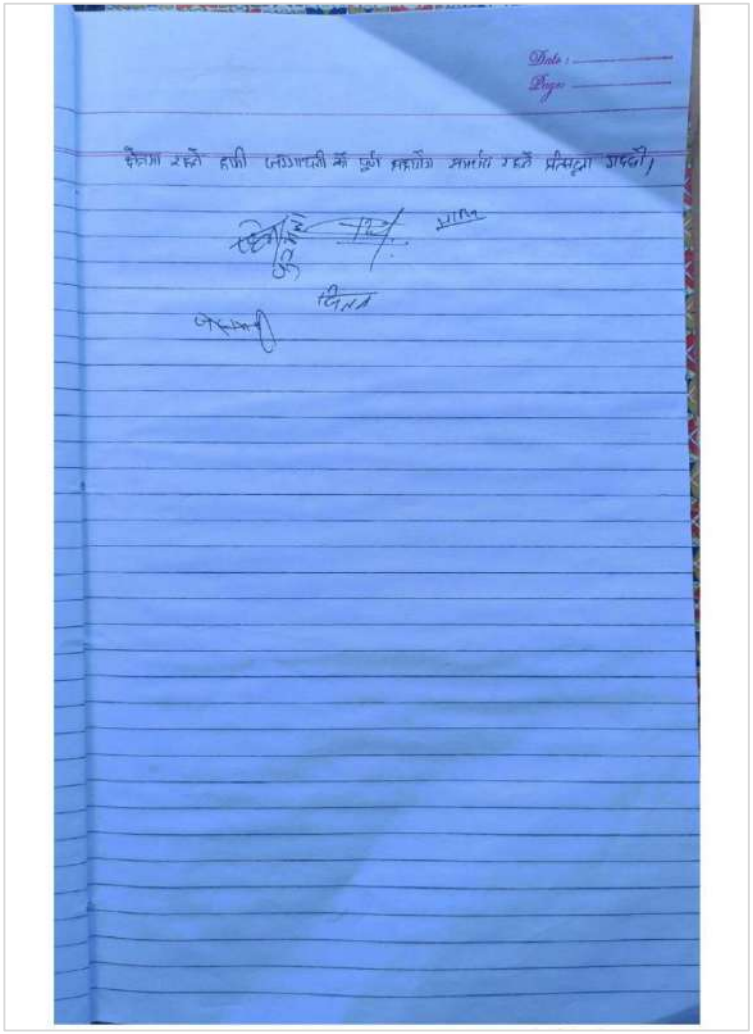




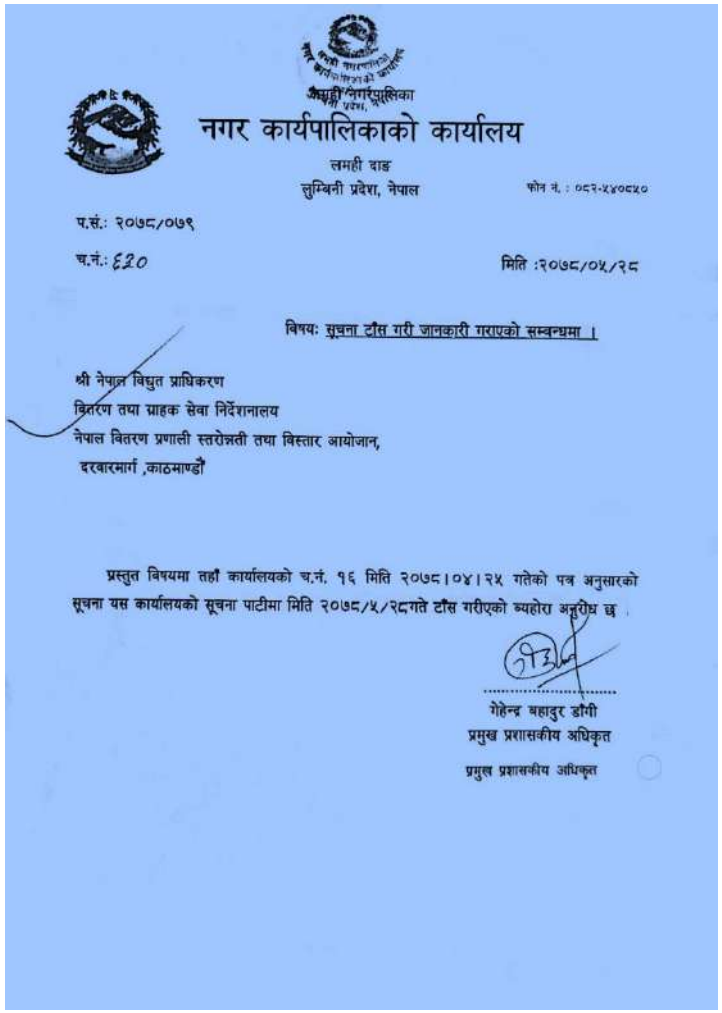








Annex 6: DEED OF ENQUIRY (MUCHULKAS)



नगर कार्यपालिकाको कार्यालय

लमही दाङ

लुम्बिनी प्रदेश, नेपाल फोन नं. : ०८२-५४०८५०

प.सं.: २०७८/०७९

च.नं.: ६२०

मिति :२०७८/०५/२८

विषयः सूचना टाँस गरी जानकारी गराएको सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण
वितरण तथा ग्राहक सेवा निर्देशनालय
नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना,
दरबारमार्ग ,काठमाण्डौं

प्रस्तुत विषयमा तहाँ कार्यालयको च.नं. १६ मिति २०७८।०४।२५ गतेको पत्र अनुसारको सूचना यस कार्यालयको सूचना पाटीमा मिति २०७८/५/२८गते टाँस गरीएको व्यहोरा अनुरोध छ ।

गेहेन्द्र बहादुर डाँगी
प्रमुख प्रशासकीय अधिकृत

प्रमुख प्रशासकीय अधिकृत

गढवा गाउँपालिका

गाउँ कार्यपालिकाको कार्यालय

गढवा दाङ

लुम्बिनी प्रदेश, नेपाल

प.सं:-२०७७।०७८ मिति : २०७८।०५।३०

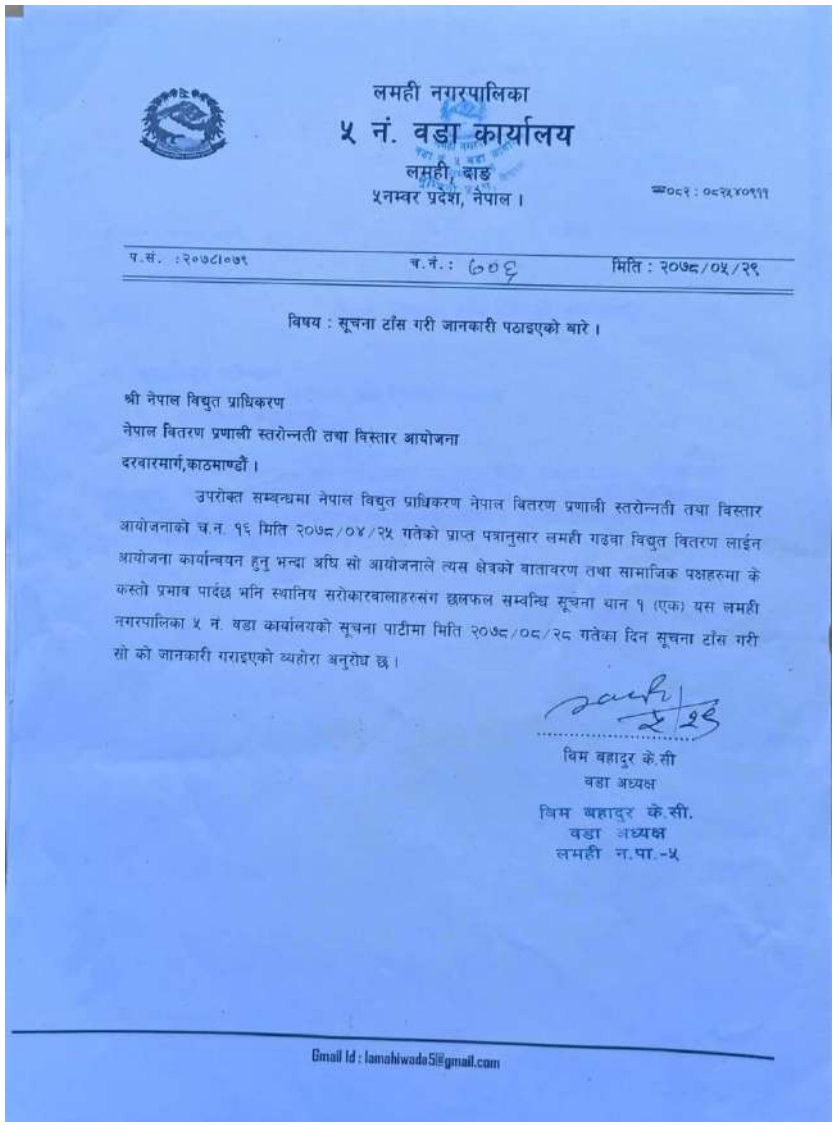
च.नं:- ५२०

विषय :- सूचना टाँसको जानकारी सम्बन्धमा ।

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

प्रस्तुत सन्दर्भमा तहाँ कार्यालयको पत्रसख्या १६ च.नं. २०७८/०७९ DSVEP मिति २०७८/०४/२५ गतेको पत्रबाट प्राप्त मिति २०७८/०५/२९ गतेको नेपाल वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजनाको वातावरणीय तथा सामाजिक अध्ययन प्रतिवेदन तयारी सम्बन्धि सूचना यस कार्यालयको सूचना पाटीमा टाँस गरिएको व्यहोरा अनुरोध छ ।

जानबहादुर योगी
प्रमुख प्रशासकीय अधिकृत



लमही नगरपालिका
५ नं. वडा कार्यालय
लमही, बाङ
५नम्बर प्रदेश, नेपाल ।

फोन नं : ०८२-५४०९११

प.सं. :२०७८।०७९ च.नं.: ७०६ मिति : २०७८/०५/२९

विषय : सूचना टाँस गरी जानकारी पठाइएको बारे ।

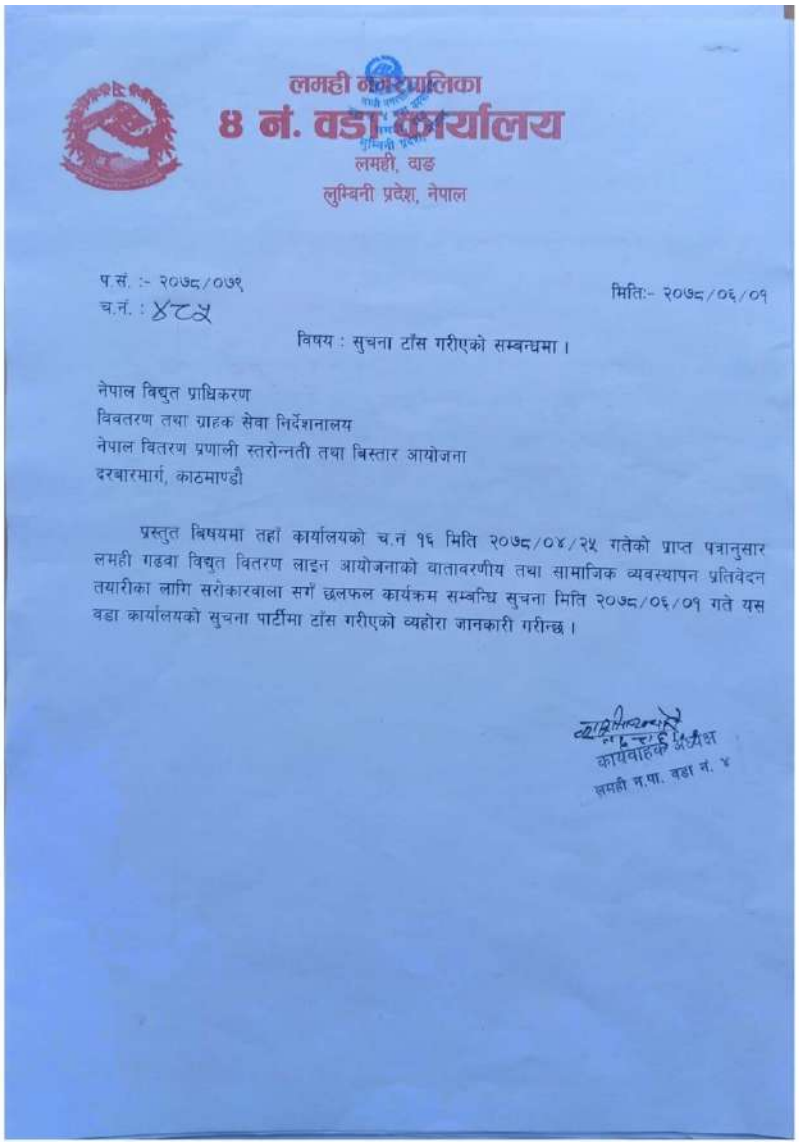
श्री नेपाल विद्युत प्राधिकरण
नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना
दरबारमार्ग,काठमाण्डौं ।

उपरोक्त सम्बन्धमा नेपाल विद्युत प्राधिकरण नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजनाको च.न. १६ मिति २०७८/०४/२५ गतेको प्राप्त पत्रानुसार लमही गढवा विद्युत वितरण लाईन आयोजना कार्यान्वयन हुनु भन्दा अघि सो आयोजनाले त्यस क्षेत्रको वातावरण तथा सामाजिक पक्षहरुमा के कस्तो प्रभाव पार्दछ भनि स्थानिय सरोकारवालाहरुसंग छलफल सम्बन्धि सूचना थान १ (एक) यस लमही नगरपालिका ५ नं. वडा कार्यालयको सूचना पाटीमा मिति २०७८/०८/२८ गतेका दिन सूचना टाँस गरी सो को जानकारी गराइएको व्यहोरा अनुरोध छ ।

विम बहादुर के.सी
वडा अध्यक्ष

विम बहादुर के.सी.
वडा अध्यक्ष
लमही न.पा.-५

Gmail Id : lamahiwada5@gmail.com



लमही नगरपालिका
४ नं. वडा कार्यालय
लमही, बाङ
लुम्बिनी प्रदेश, नेपाल

प.सं. :- २०७८/०७९
च.नं. : ४८२

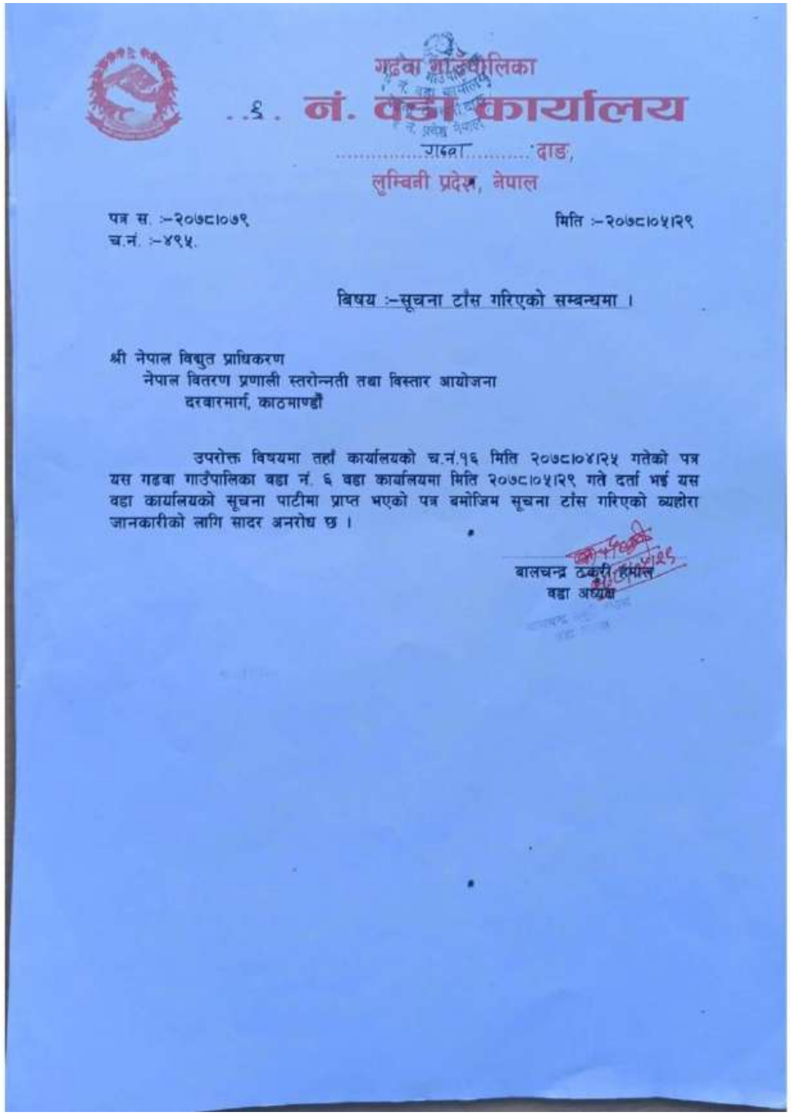
मितिः- २०७८/०६/०१

विषय : सुचना टाँस गरीएको सम्बन्धमा ।

नेपाल विद्युत प्राधिकरण
विवतरण तथा ग्राहक सेवा निर्देशनालय
नेपाल वितरण प्रणाली स्तरोन्नती तथा बिस्तार आयोजना
दरबारमार्ग, काठमाण्डौ

प्रस्तुत बिषयमा तहाँ कार्यालयको च.नं १६ मिति २०७८/०४/२५ गतेको प्राप्त पत्रानुसार लमही गढवा विद्युत वितरण लाइन आयोजनाको वातावरणीय तथा सामाजिक व्यवस्थापन प्रतिवेदन तयारीका लागि सरोकारवाला सर्ग छलफल कार्यक्रम सम्बन्धि सुचना मिति २०७८/०६/०१ गते यस वडा कार्यालयको सुचना पाटीमा टाँस गरीएको व्यहोरा जानकारी गरीन्छ ।

कार्यवाहक अध्यक्ष
लमही न.पा. वडा नं. ४



गढवा गाउँपालिका
..६.. नं. वडा कार्यालय
गढवा, दाङ,
लुम्बिनी प्रदेश, नेपाल

पत्र स. :–२०७८।०७९
च.नं. :–४९५.

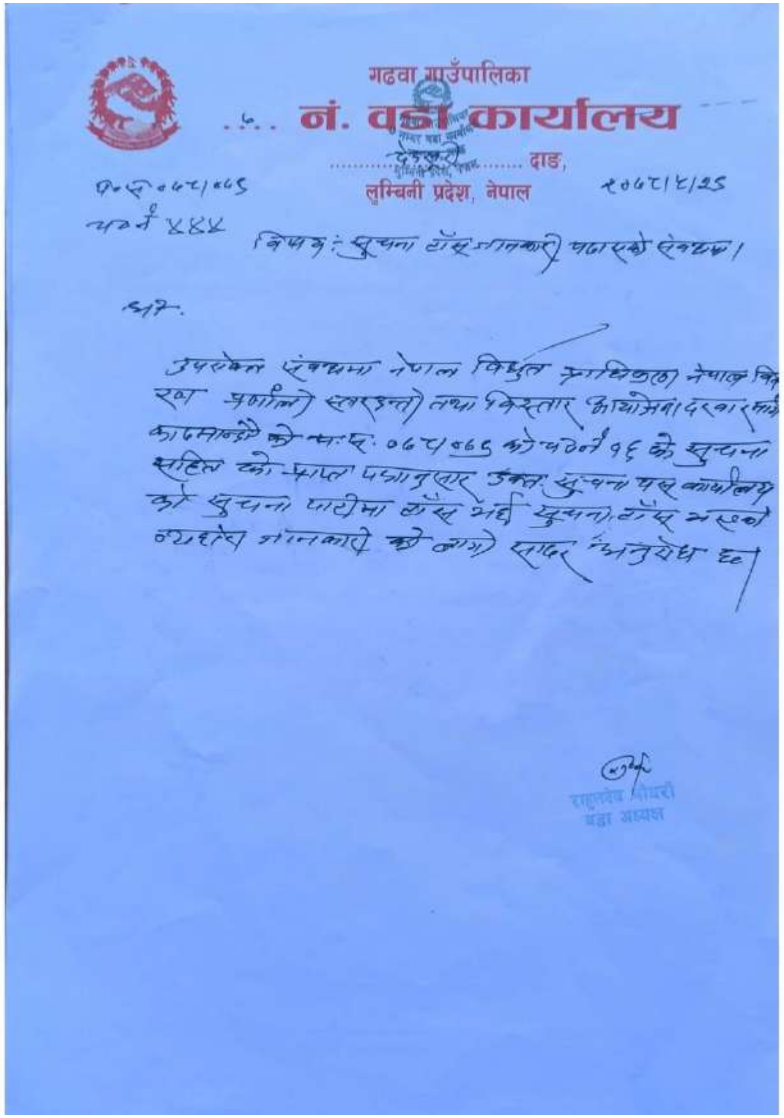
मिति :–२०७८।०५।२९

विषय :–सूचना टाँस गरिएको सम्बन्धमा ।

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

उपरोक्त विषयमा तहाँ कार्यालयको च.नं.१६ मिति २०७८।०४।२५ गतेको पत्र यस गढवा गाउँपालिका वडा नं. ६ वडा कार्यालयमा मिति २०७८।०५।२९ गते दर्ता भई यस वडा कार्यालयको सूचना पाटीमा प्राप्त भएको पत्र बमोजिम सूचना टाँस गरिएको व्यहोरा जानकारीको लागि सादर अनरोध छ ।

बालचन्द्र ठकुरी हमाल
वडा अध्यक्ष



गढवा गाउँपालिका
..७.. नं. वडा कार्यालय
देउखुरी, दाङ,
लुम्बिनी प्रदेश, नेपाल

प.स. ०७८/०७९
च.नं. ४४४

२०७८/५/२५

विषय: सूचना टाँस जानकारी पठाएको सम्बन्धमा।

श्री,

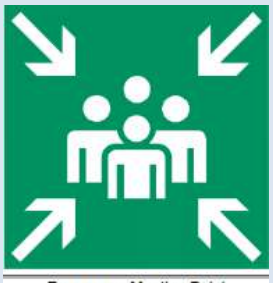
उपरोक्त सम्बन्धमा नेपाल विद्युत प्राधिकरण नेपाल वितरण प्रणाली स्तरउन्नती तथा विस्तार आयोजना दरबारमार्ग काठमाण्डौ को प.स. ०७८/०७९ को च.नं. १६ को सूचना सहित को प्राप्त पत्रानुसार उक्त सूचना यस कार्यालय को सूचना पाटीमा टाँस भई सूचना टाँस भएको व्यहोरा जानकारी को लागी सादर अनुरोध छ।

रघुनदेव चौधरी
वडा अध्यक्ष

Annex 7: SAFETY RELATED SIGNS AND WASTE MANAGEMENT PRACTICES

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 साधनविना यो उपकरण संचालन गर्न निषेध

INSTRUCTION SIGNS

Slow Sign for Traffic Control
बिस्तारै गाडुहोस्

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


निर्माणस्थलमा गर्नहुने र नहुने कुराहरु


निर्माणस्थलमा गर्नहुने र नहुने कुराहरु

Annex 8: PHOTOGRAPHS

Tapping point at Lamahi, DL Route for Underground Cabling, West Rapti River and Bridge view at the Left Bank, Material Deposited by the River and Proposed Substation Site at Bhedi Dumna (from left to right).

Bay Extension Point at Lamahi Substation

Discussion with DCS Officers at Lamahi

Proposed Land for Substation at Bhedi Dumna

Discussion with Local People about the Project

Stakeholders during Public Consultation cum FGD Meeting at Gadhawa RM, Dang

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

NARAYANPUR-HAPUR DISTRIBUTION LINE SUBPROJECT

SUBSTATION (33/11KV) AND DISTRIBUTION LINE (33KV)

DANG DISTRICT, LUMBINI PROVINCE

NEPAL ELECTRICITY AUTHORITY

DISTRIBUTION AND CONSUMER SERVICE DIRECTORATE

DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT (DSUEP)

DURBARG MARG KATHMANDU NEPAL

CONSULTANT:

NEA ENGINEERING COMPANY LIMITED, TRADE TOWER

THAPATHALI, KATHMANDU, NEPAL

SEPTEMBER, 2022

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXES

ABBREVIATIONS

ACSR	Aluminum Conductor Steel Reinforced
AIIB	Asian Infrastructure and Investment Bank
BES	Brief Environment Study
COVID-19	Corona Virus Disease
CDP	Community Development Program
CPA	Core Project Area
DCSD	Distribution and Consumer Services Directorate
DHM	Department of Hydrology and Meteorology
DL	Distribution Line
DSUEP	Distribution System Upgrade and Expansion Project
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EPA	Environment Protection Act
EPR	Environment Protection Regulation
EMF	Electromagnetic Field
ESP	Environmental and Social Policy
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
ESSs	Environmental and Social Standards
GHG	Green House Gas
GIS	Geographic Information System
GoN	Government of Nepal
GRM	Grievance Redress Mechanism
IEE	Initial Environmental Examination
IP	Indigenous People
IUCN	International Union for Conservation of Nature
IUSGS	International Union of Geological Sciences
LPG	Liquid Petroleum Gas
MDB	Multilateral Development Bank
MoEWRI	Ministry of Energy, Water Resources and Irrigation
MHT	Main Himalayan Thrust

NEA	Nepal Electricity Authority
PPE	Personal protective equipment
RM	Rural Municipality
RoW	Right of Way
SPA	Surrounding Project Area
SMC	Sub Metropolitan City
SWM	Solid Waste Management
US EPA	United States, Environment Protection Agency
USGS	United States Geological Survey
VC	Vulnerable Community

Unit

%	Percent/ Percentage
CO_2	Carbon dioxide
dB	Decibel
g	Gram
ha	Hectare
HHs	Households
Kg	Kilogram
Km	Kilometer
kV	Kilovolt
kWh	Kilo Watt Hour
ltr	Liter
LV	Low Voltage
m	Meter
masl	Meter Above Sea Level
mm	Millimeter
MVA	Mega Volt Ampere
MW	Megawatt
NRs.	Nepalese Rupees
^oC	Degree Centigrade
sq.m.	Square Meter

EXECUTIVE SUMMARY

Description of Project: Nepal Electricity Authority (NEA) under Ministry of Energy, Water Resources and Irrigation is responsible for the implementation of the Distribution System Upgrade and Expansion Project (DSUEP). DSUEP will enhance the distribution system to improve reliability and quality of electric supply in the Karnali Province and Lumbini Province. The proposed **Narayanpur-Hapur Distribution Line Subproject** is located within Ghorahi Sub-Metropolitan City (SMC), Ward No. 9, 10, 11 and 12 of Dang District in Lumbini Province. The Subproject requires 0.68 ha (Government Land) of land for the construction of substation. The 33 kV distribution line of 7.62 km passes along the Right of Way (RoW) of the road and private land with installation of poles at the edge of the private farm lands. The proposed subproject is financed with loan by Asian Infrastructure Investment Bank (AIIB).

Description of Environment

Physical Environment: The Subproject (substation and distribution line) area lies in Dang Valley of Chure Range. The substation lies at Latitude 28°5'8.60"N, Longitude 82°27'11.54"E and elevation of 692 masl. The climate of the Subproject area is sub-tropical. The average maximum temperature during summer fluctuates between 33°C & 40°C and minimum temperature in winter season ranges range from 10°C to 18°C. The average annual rainfall is estimated at approximately 1,500 mm per year. The air quality and noise level of the SPA was found within the range of National Ambient Air Quality Standard and Noise Quality Standard, respectively. No water sources were recorded within and nearby the substation area.

Biological Environment: The proposed Subproject Core Project Area avoids the forestland. The Subproject does not lie in any protected area, although it is located in the Chure region without any induced impact to the biological environment. The Subproject components substation and 33 kV distribution line does not intercept any forest areas, thus there will be no any issues of tree loss. The surrounding environment of the Subproject area contains sparse vegetation with species common to the area. Similarly, the bird species seen in the surrounding environment are House Crow (*Corvus splendens),* Western Spotted Dove (*Spilopelia suratensis),* Rock Dove (*Columba livia),* Rose-ringed Parakeet (*Alexandrinus krameri),* House Sparrow (*Passer domesticus),* Tree Sparrow (*Passer montanus),* Grey Francolin (*Francolinus pondicerianus),* Common Quail (*Coturnix coturnix),* Black-backed Forktail (*Enicurus immaculatus*), Kingfisher (*Alcedo atthis),* Red-wattled Lapwing (*Vanellus indicus),* and Ruddy Shelduck (*Tadorna ferruginea*). All these bird species are of least concern under IUCN categorizations.

Socio-Economic Environment: The major ethnic compositions within the surrounding project area i.e., Ward No. 9, 10, 11 and 12 of Ghorahi SMC are Tharu, Chhetri and Dalit (Kami, Damai and Sarki) constitute are 24.38%, 26.14% and 12.56%, respectively of total population of 34,525. The implementation of the Subproject will increase the electricity beneficiaries to 5,053 HHs, 69 commercial purposes and 64 industries. Ghorahi and Tulsipur are the nearest business market nearby the Subproject. The transportation facilities in this local level seems to be satisfactory. Tube-well and tap/piped water is the main source of drinking water in the surrounding area. People of the Subproject have access with communication facilities mainly through mobile telephone services. The nearest and easily accessible well-equipped health facility to the proposed Subproject is in Ghorahi located at 15-minute driving distance from substation site. The main occupation of people in the area is

agro base with nearly 70% contribution followed by small trade and business/enterprises and services.

Potential Impacts and Mitigation Measures: Civil works will be involved with temporary impacts on air, noise and water quality and occupational and community health and safety; particularly related to working with electricity and in the context of the COVID-19 pandemic. Long-term impacts, although insubstantial, during operation and maintenance include occupational and community health and safety risks related to the presence of electricity infrastructure. The potential environmental issues and mitigation measures identified in screening and the preparation of ESMP report will be addressed during the compliance monitoring carried out by the safeguard team. No issues were identified in the land requirement procedure and pole erection activities. Construction of substation and erection of poles for distribution lines would not affect any private structures as the proposed substation land is unused government land, and local people have agreed & permitted to install poles at the edge of farm-lands without affecting any private structures along the distribution line. The ESMP cost estimated for the Subproject is NRs 13,00,000.00 associated to mitigation measures and monitoring activities. NEA Project Implementation Unit has agreed on the estimated cost for the mitigation measures and monitoring activities.

Environmental and Social Management Plan: The ESMP serves as a guide to implement environmental and social mitigation measures and responsibility of the concerned agencies during the construction and operations of the Subprojects. Monitoring and inspection of the environmental and social activities will be carried out by Environment and Social Management Unit and Project Supervision Consultant of PIU. ESMP will be an integral part of the contractor's Bidding document which will be updated by the contactor during the sub-project construction period.

Institutional Arrangements: To ensure the full compliance to the ESMP, institutional arrangement for monitoring and reporting has been proposed. All the resources needed for the implementation of ESMP for the construction and operation phase will be provided by the PIU. Project Supervision Consultant's with Environmental and Social Safeguard Specialist will be responsible for compliance monitoring activities during the construction phase. Environment and Social Management Unit of NEA will provide regular updates to the site offices regarding the implementation of ESMP. Contractor shall prepare an Environment, Health and Safety (EHS) plan approved by the PIU before field mobilization. Contractor should mobilize a safety officer at each work site during the construction period.

Public consultation: Public consultations have been conducted in the Subproject area. People in the Subproject area noted that electricity service is poor with frequent interruptions. People have suggested to install poles at the edge of farm-lands, and project components should not affect any house and structures along the line. The impacts on the crops while stringing of lines should be minimized. Prospective electricity consumers and people to be affected are supportive and have recommended for quick implementation of the project.

***Grievance Redress Mechanism (GRM)*:** A three-tier 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 issues at

Subproject level. In each Subproject, two levels i.e., Tier-I and Tier-II of Grievance Redress Mechanism have been established. During the ESMP study period, NEA has disseminated letters to the local level stakeholders regarding the formation of the GRM at the Subproject level.

Conclusion: The environmental impacts envisaged from the implementation of proposed Subproject are site specific, short term, temporary and reversible in nature. The Subproject will provide significant benefits to people and economy by providing the reliable and improve electricity supply. This ESMP is considered sufficient to mitigate the environmental and social issues identified for the Subproject and will be updated during the Subproject construction stage.

1. INTRODUCTION

1.1 Project Background

The proposed Distribution System Upgrade and Expansion Project (DSUEP) will enhance the distribution system to improve reliability and quality of electric supply in the Lumbini Province. The project aims improvement in voltage level and reduction in power loss which in turn will improve Nepal Electricity Authority's (NEA) financial health, improve electricity supply reliability, and reduce dependence on petroleum-fueled accessories. Government of Nepal (GoN) has envisaged DSUEP to extend the reach of 33 kV and 11 kV distribution lines "to achieve affordable electricity fulfilling the demands at the local levels for all the households by 2022". Asian Infrastructure Investment Bank (AIIB) is financing a loan to upgrade existing and build new distribution systems in Lumbini Province and Karnali Province of Nepal.

This Subproject has three major components:

Component 1: construction, extension and augmentation of distribution lines and substations, especially 33 kV lines and 33/11 kV substations.

Component 2: construction of 11 kV lines, distribution transformers, and Low Voltage (LV) lines for new power distribution facilities.

Component 3: Capacity Building, Project Implementation Support, and Technical Assistance

1.2 Scope of Study

This study ensures that the project meets the requirements of Nepal Government's Environmental Regulations and Environmental and Social Policy (ESP) & Environmental and Social Standards (ESSs) of AIIB. This report provides the measures for environmental and social management, monitoring and reporting of the project.

1.3 Objective of ESMP

The Environment and Social Management Plan aims to sets out the measures required to maximize the benefits of the project; and to avoid, minimize and mitigate any adverse environmental and social impacts caused by the project. The objectives of this ESMP are to:

- Describe the existing natural and socio-economical resources in and surrounding Subproject area;
- Based on existing environmental conditions, identify and assess potential significant impacts during project preconstruction, construction, and operation & maintenance stages;
- Identify and recommend mitigation measures to minimize any potential impacts caused by Subproject activities;
- Identify the local concerns on environmental and social issues and address them;
- Develop environmental management plan and monitoring plan including cost;

- Recommend institutional arrangement, including capacity building to ensure proper environmental and social safeguards implementation during construction and operation phases.

1.4 Legal Provision:

Rule 3 (1) of Environment Protection Act (EPA), 2019 describes completing Environmental Studies as per Schedule 1 or 2 or 3 under Environment Protection Regulation 2020 (First Amendment in 2021/05/24 on Nepal Gazette). For this Subproject, none of the legal provisions are compliable to Schedule 1 or 2 or 3, and hence, detailed environmental studies (Brief Environmental Study (BES) or Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) is not mandatory. According to the E & S safeguard Screening report, safeguard risks/issues identified for this Subproject fall under Category III (ESMF), which triggers the preparation of ESMP to execute the Subproject. This Subproject has minimal or no adverse environmental and social impact; does not physically displace any family; and does not result in economic displacement of more than 10% of productive assets for any family.

1.5 Methodology for the ESMP

The methodology adopted for this ESMP study is as follows:

i. Literature Review: Review of published literature were conducted, with priority given to publications of government institutions as well as international organizations, to collect information on project surroundings. The Municipality/Rural Municipality (RM) and its Ward profiles are used to collect the socio-economic baseline information of the Subproject. National policies, legislative frameworks and Multilateral Development Bank (MDB) policies were reviewed to understand the priorities and any legally binding requirements were studied that should be complied with while implementing the project. The Legislative provisions relevant to the project are listed in **Annex 4**.

ii. Field Survey and Investigation: Field surveys were conducted to generate information on the physical, biological and socio-economic environment of the project area. The physical environment; air quality data was monitored by Temtop Airing-1000 PM Detector, noise level by UNI-T UT 353 Mini Sound Meter (dB) and water quality by EXTECH ExStik II DO600. Field observation of the core project area and the surrounding vicinity (500m) of project footprint area was applicable for the biological assessment. Priority was given to the consultation with local communities at substation sites and the settlement areas that benefit from the project.

iii. Data Analysis: All potential Subproject impacts on physical, biological, socio-economic and cultural resources were integrated and assessed using best practice 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 CPA and SPS data and presentation of the maps in the ESMP report. The project footprint Ward and Municipality/RM are considered for the collection of socio-economic and baseline information.

iv. Impact Evaluation: Significance of impacts are evaluated on the basis of reversibility, nature, magnitude, extent and duration of the impact. Identification of magnitude, extent and duration is as provided in the National EIA Guidelines, 1993 of Nepal. While evaluating the impacts and prescribing mitigation, maximum efforts were made to get expert opinion and input from the DSUEP's technical and safeguard consultant team.

v. Public Consultation: As per the Government of Nepal EPA and the AIIB Environmental and Social Policy (ESP), pre-notifications with subject of consultation, venue, and time were given at Subproject footprint area, local level and affected Ward office in presence of concerned local stakeholders. Consultations were conducted in the Subproject area; at substations and the distribution line system settlement areas with local stakeholders.

vi. Report Format: The ESMP report is prepared as per the Environmental and Social Policy (ESP) of the AIIB, which contains an executive summary, a main report, and annexes as appropriate, including one on the nature and findings of consultations undertaken. All the comments and suggestions from the field consultation are mentioned in the ESMP report.

1.6 Classification of Impact Area

The National EIA Guidelines (GoN, 2050) has mentioned on 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.

Core Project Area (CPA) refers to the temporary and permanent area for the proposed project construction and associated activities. It is the area where direct impacts can be seen. For **Narayanpur-Hapur Distribution Line Subproject**, proposed substation area with 0.68 ha and Right of Way (RoW) of 33 kV distribution line with 7.62 km length is considered as CPA. The Subproject components are located within the Ward No. 9, 10, 11 and 12 of Ghorahi SMC. The major settlements in the Subproject area are Chaghu, Khairi, Baruwagaun, Belhaniya, Dokrena, Pateni, Bijauridanda and Gurje. The distribution line stringing route passes along the private farm lands (0+000 to 7+000) and from the RoW of the road (7+000) to (7+600).

Surrounding Project Area (SPA) is the immediate vicinity (500m) of the footprint location of the proposed Subproject site. SPA is the moderate and indirect impact area. For this Subproject Ward No. 9, 10, 11 & 12 of Ghorahi SMC of Dang district is considered as SPA. The SPA will have impact with the beneficiary's area of 11 kV lines and Low Tension (LT) lines service. The impact area showing the CPA and SPA area is presented in the google map **Figure 1-1**.

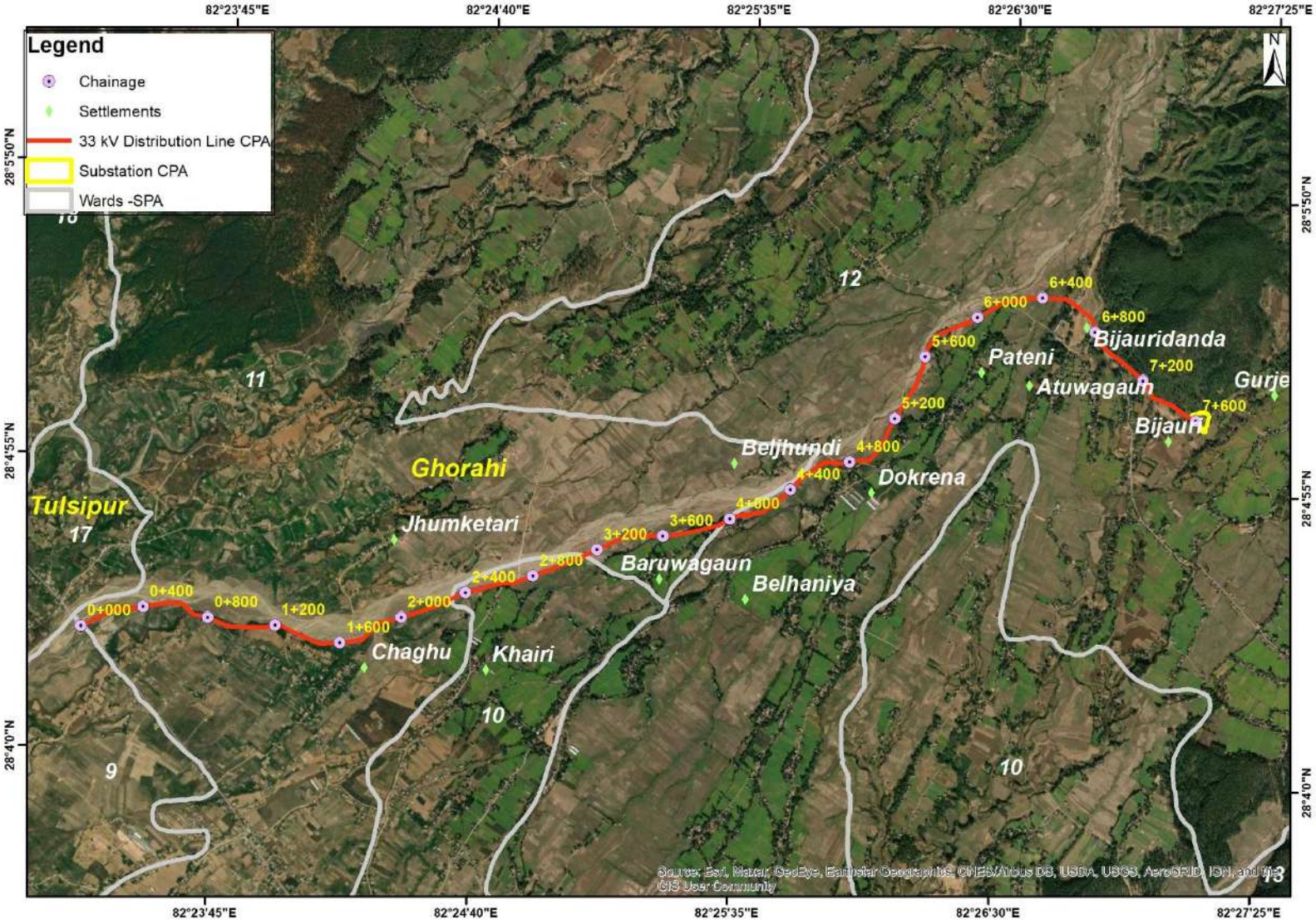


Figure 1-1: Core Project Area (CPA) and the Surrounding Project Area (SPA) Wards of the Narayanpur-Hapur DL Subproject

2. DESCRIPTION OF THE SUBPROJECT

2.1 Subproject Location and Accessibility

The proposed **Narayanpur-Hapur Distribution Line Subproject** is located within Ghorahi Sub-Metropolitan City (SMC), Ward No. 9, 10, 11 and 12 of Dang District in Lumbini Province. The tapping point of 33 kV line lies in existing Jhinni-Tulsipur 33 kV TL at Ghorahi-Tulsipur Highway at Khaira near Hapur Khola, Ghorahi SMC-9. The proposed distribution line (33 kV) is of 7.62 km length and run by the edge of private farm lands parallel to Hapur Khola, and RoW of access road. There is the access to road within the proposed Subproject Ward area. The Subproject location and the accessibility map are presented in **Figure 2-1.** The main features of the Subproject are presented in **Table 2-1**.

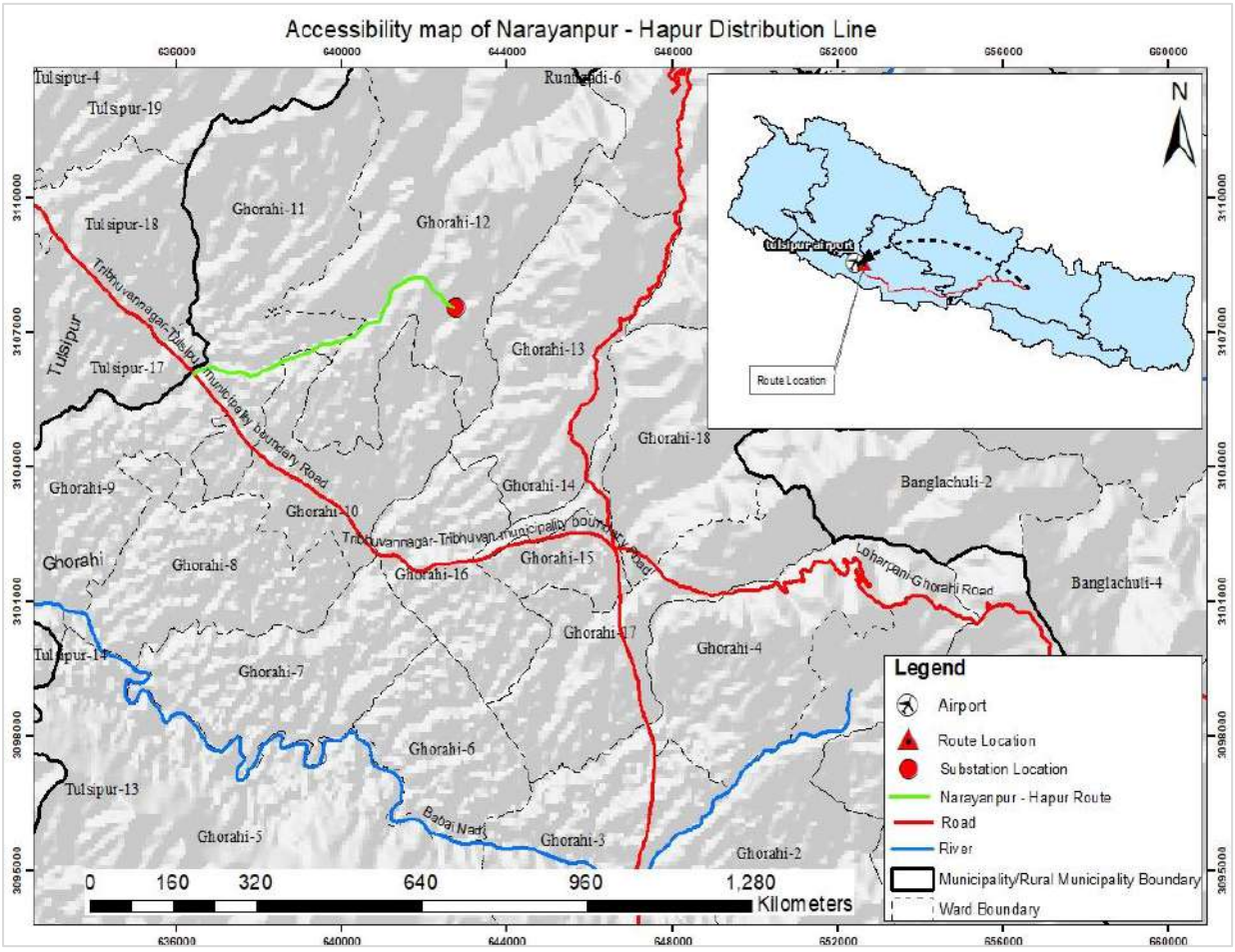


Figure 2-1: Location and Accessibility Map of Narayanpur-Hapur Subproject[1]

[1] *Source: Department of Survey, 1995 and Field Study 2021*

Table 2-1: Technical Description of the proposed Subproject

Description	Features
Proponent	Nepal Electricity Authority
Project	Distribution System Upgrade and Expansion Project (DSUEP)
Subproject	Narayanpur-Hapur Distribution Line Subproject
Funding Agency	AIIB
Project Location	Ghorahi Sub-Metropolitan City, Dang, Lumbini Province
Distribution Line	
33kV Line Starting Point	Tapped from Existing Jhinni - Tulsipur 33 kV TL at Ghorahi SMC-9, Khaira, Dang. Co-ordinate: Lat 28°4'22.50"N, Long 82°23'16.83"E
33kV Line End Point	Hapur Substation (Proposed) at Ghorahi SMC-12, Hapur, Thaklee, Dang Co-ordinate: Lat 28°5'8.60"N, Long 82°27'11.54"E
Type of Land	Government/Ailani
System Voltage	33 kV
Max, Min System Voltage	36, 30 kV
Climatic Condition	Wind Speed: As per IS 802-1-1 Maximum Ambient Temperature: 40 ^{o}C Altitude (Min, Max): < 617, 716 masl
Length of Line, Number of poles	7.62 km, 191
Right of Way	6 m
Number of Circuit	1
Conductor	ACSR Dog
Line Capacity/Thermal Limit (approx.)	13.4 MW at 0.9 power factor
Type of Poles	Steel Tubular Pole, 13m,
Pole Configurations	Single Pole Structures, H-Pole Structures etc. (With and without Stay Sets)
Diameter of a Single Pole (approx.)	0.22m (As per IS 2713-3) for Steel Tubular Pole 0.45m approx. for Steel Telescopic Pole
Planting Depth of Pole	1.6 m
Insulators	Porcelain Disc and Pin Insulator
Substation	
Location	Ghorahi SMC-12, Hapur, Thaklee, Dang Co-ordinate: Lat 28°5'8.60"N, Long 82°27'11.54"E Elevation: 692 masl
Type of Land	Government
Voltage Level	33/11 kV
Substation Capacity	8 MVA
Number and Capacity of Transformer	1 nos., 6/8 MVA
Type of Transformer	3 Phase, ONAN/ONAF, Mineral Oil
Type of Substation	AIS (33kV) and Indoor (11kV)
Number of 33kV Line Bays	1
Number of 33kV Transformer Bays	1
Number of 11kV Feeders	4
Substation Area	0.68 ha, Parcel Number (Hapur 3 ka, 541)

2.2 Subproject Components

The major components of the Subproject are the 33/11 kV substation and 33 kV distribution line (DL). The 33 kV DL is tapped from an existing 33 kV network line and acts as a source feeding to the proposed 33/11 kV substation. 11 kV distribution feeders emerge from the substation, eventually supplying the electricity to the consumers. The structures of the Subprojects are briefly described here below.

2.2.1 33 kV Distribution Line (DL)

The 33 kV 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 33 kV 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. Length of distribution line alignment is 7.62 km and numbers of steel tubular poles to be erected are estimated as 191.

Insulators: The insulators provide insulation to the poles from high voltage in the conductors. Pin type insulators will be employed for suspension poles 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 33 kV 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 33 kV 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.

2.2.2 Substation

The proposed substation 33/11 kV is of capacity 6/8 MVA. The substation plays the role of lowering the 33 kV voltage level to 11 kV, which will then be stringed as distribution feeder to supply the consumers. The major component of the substation is power transformer, which is supported by the switchgear components and Civil Structures. The facility and components' sample pictures are shown in **Annex 3**.

Transformers: Transformer is the major component of the distribution substation. It transforms power from higher voltage to lower voltage for distribution purpose. Power

Transformers are used for the 33/11 kV 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 33/11 kV 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 6/8 MVA ONAF type.

Electrical Switchgear: Electrical Equipment comprising of Circuit Breaker, Earth Switch, Current Transformer, Potential Transformers, etc. installed in the substation are called Electrical Switchgear. They facilitate the objective of power conversion.

Civil Structures: A control building is essential for the operation of the substation. It houses the operating station, along with battery systems. Guard House and Staff Quarter are other essential buildings for smooth operation of the substation.

Switchyard, Boundary, Roads, Drainage and Essentials: The outdoor Civil Structure in the proposed substation includes the 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 component wise 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.

2.2.3 11 kV Lines and LT Lines

11 kV lines and LT lines take the access of electricity to the consumer households. It is why the construction of those lines are always encouraged by the local people. The line route, thus the installation of poles and lines, are envisaged to go through the edge of local roads. If any line route passes through any private lands, permission from the corresponding land owner will be taken before construction of those lines.

The detailed line route survey for 11 kV and LT lines have not been done yet. The scope of detailed survey is in the scope of the construction Contractor. The construction Contractor will conduct Pre-Construction Survey (PCS) to finalize the line route of 11 kV lines and LT lines for the construction. PCS will prepare the detailed line route of those lines and submit to PIU for approval. After the detailed line route is submitted by the Contractor and approved by PIU, E&S team of Project Supervision Consultant (PSC) will conduct an E&S study and submit the findings that

- Do the lines pose any adverse Environmental or Social issues?
- If there are any Environmental or Social issue, how can they be resolved? If the lines do not pose any adverse Environmental or Social issue, the lines will be cleared by PIU after seeking concurrence from AIIB.
- If the solution measures are not implementable in the field, PCS will suggest for any other way to divert or reroute the lines? If yes, PCS will propose alternative line route. The lines will be cleared by PIU after seeking concurrence from AIIB, given that the lines do not pose any adverse Environmental or Social issue.

2.3 Major Construction Activities in the Subproject

Activities in the Subproject area can be sub-divided into three categories viz, Pre-Construction Phase, Construction Phase and Operation Phase. The proposed Narayanpur-Hapur Line Subproject does not intercept forest area, thus there will be no issues of tree loss in the RoW of 33 kV lines and the substation area.

I. **Preconstruction phase**: The activities to be carried out before the construction phase are:
- Demarcation of land area for the proposed substation
- Receive public opinion
- Make clearance of the substation land area permanently
- Distribution line route selection

II. **Construction phase**: The activities to be carried out during the construction phase are:
- Assign the land area for temporary storage of construction materials
- Transportation of construction materials
- Leveling of land area for the proposed substation
- Construction of substation structures
- Pole erection work for 33 kV, 11 kV and low tension distribution lines
- Stringing of 33 kV, 11 kV and low tension distribution line

III. **Operation phase**: The activities to be carried out during the operation phase are:
- Maintenance of the substation and 33 kV distribution line route

2.4 Energy to be used

During the construction period diesel fuel will be used to power construction equipment and transport vehicles, which emits air pollutants and greenhouse gases in insignificant quantity. Use of firewood shall be restricted in the labor camp, whereas the workers shall be provided LPG for cooking.

2.5 Land Required

The **Narayanpur-Hapur Subproject** will require about 0.68 ha land for building the substation. The land is government land and managed by Ghorahi SMC. The 33 kV distribution line 7.6 km length runs parallel to the bank of Hapur Khola from the edge of private farm lands and 500 m distance from the RoW of the road to the substation.

2.6 Material Requirement and Sources

A 33/11 kV substation, 33 kV, 11 kV and low-tension distribution lines will be constructed for this Subproject. Minimal excavation at the pole locations will be done to erect steel tubular poles of 11 m and 13 m. The depth of burial for 11 m (approximately 256 kg) and 13 m (approximately 343 kg) poles are 1.8 m and 2.17 m respectively. The construction works for substation will not produce significant amount of spoils and thus it will not require spoil-

dumping site. Similarly, excavation works carried out for digging pit holes for poles produces insignificant spoils which does not require management of earthworks.

Civil construction works will involve excavation for foundation of substation, steel reinforcement, cement, coarse aggregates, and fine aggregates (sand). Materials will be procured from legally operating local markets. Following estimated volume of construction materials are required for the proposed 33 kV distribution line and the substation.

Table 2-2: Approximate Quantity of Material for 33 kV line

SN	Particular	Unit	Requirement
1	Amount of Steel	Ton/Km	5800
2	M15 concrete for Pole base	Cum/Km	12.5

Source: Design Report, DSUEP

Table 2-3: Approximate Quantity of Material for 33/11 kV Substation

SN	Particular	Unit	Support Structures, Road, Drainage	Control Building	Staff Quarter	Office Building	Guard House
1	M15 Concrete	cum	100	25	224	120	5
2	M25 Concrete	Cum	300	170	125	75	27
3	Reinforcement bar	Ton	7	27	20	12	4

Source: Design Report, DSUEP

2.7 Major Equipment and Power Requirements

Major equipment used during the Project implementation are:

One Excavator, One Roller, One Drilling Machine, One Crane, one Grid Supply of 100 kVA Distribution Transformer, and two 50 kVA capacity diesel generators

2.8 Workforce Requirement

Local people within the SPA and OPA will be encouraged for the employment. Based on the skills (skilled, semi-skilled and unskilled labor), local people will be used for the construction and both male and female will get equal opportunity during construction. The number of human resources required depends upon the complexity of the project as well as the geographical location of the project. In case of construction of 33 kV lines and 33/11 kV substations, the workforce typically varies from terai to hilly to mountain region. Expected number of manpower employed is enlisted hereunder.

Table 2-4: Human Resource required for construction of 33 kV line and substation in a day of Construction

SN	Human Resource/Day	For Distribution Line	For Substation
1	Engineer (No.)	1	2
2	Supervisor (No.)	2	4

SN	Human Resource/Day	For Distribution Line	For Substation
3	Foreman (No.)	3	5
4	Skilled (Lineman/Electrician) (No.)	5	5
5	Helper (No.)	2	10
6	Labour (No.)	12	15

Source: Design Report, DSUEP

2.9 Construction and Implementation Schedule

Implementation of the proposed Subproject comprises construction of a new 33/11 kV substation, 33 kV lines, 11 kV lines, low tension lines, and installation of distribution transformers. It includes construction and installation of components as mentioned in subsection 2.2. The estimated completion period is 24 Months.

Table 2-5: Construction Schedule of Project Implementation

SN	Activities/ Months	**Months** *(After the completion of Detailed Survey Study)*					
		1-3	**4-6**	**7-10**	**11-15**	**16-20**	**20-24**
1.	Invitation for tender, evaluation, and award						
2.	Implementation of Environmental and Social Safeguards						
3.	Erection of Poles						
4.	Stringing of conductor						
5.	Construction of substation						
6.	Charging and Testing						

Source: Design Report, DSUEP

3. DESCRIPTION OF THE ENVIRONMENT

3.1 Physical Environment

3.1.1 Topography and Land Use

The Subproject area lies in Ward No. 9, 10, 11 and 12 of Ghorahi SMC of Dang District, Lumbini Province. The Subproject components are located within the Chure Range of Nepal. The proposed distribution line (33 kV) passes along flat plain parallel to Hapur Khola (Stream) of Dang district. The tapping point is situated at Latitude 28°4'22.50"N, Longitude 82°23'16.83"E with an elevation of 617 masl (**Figure 3-1**). The proposed distribution line stringing route passes along the private farm lands parallel to the braided Hapur Khola, which is a tributary of Babai River originating from the base of Mahabharat Range.

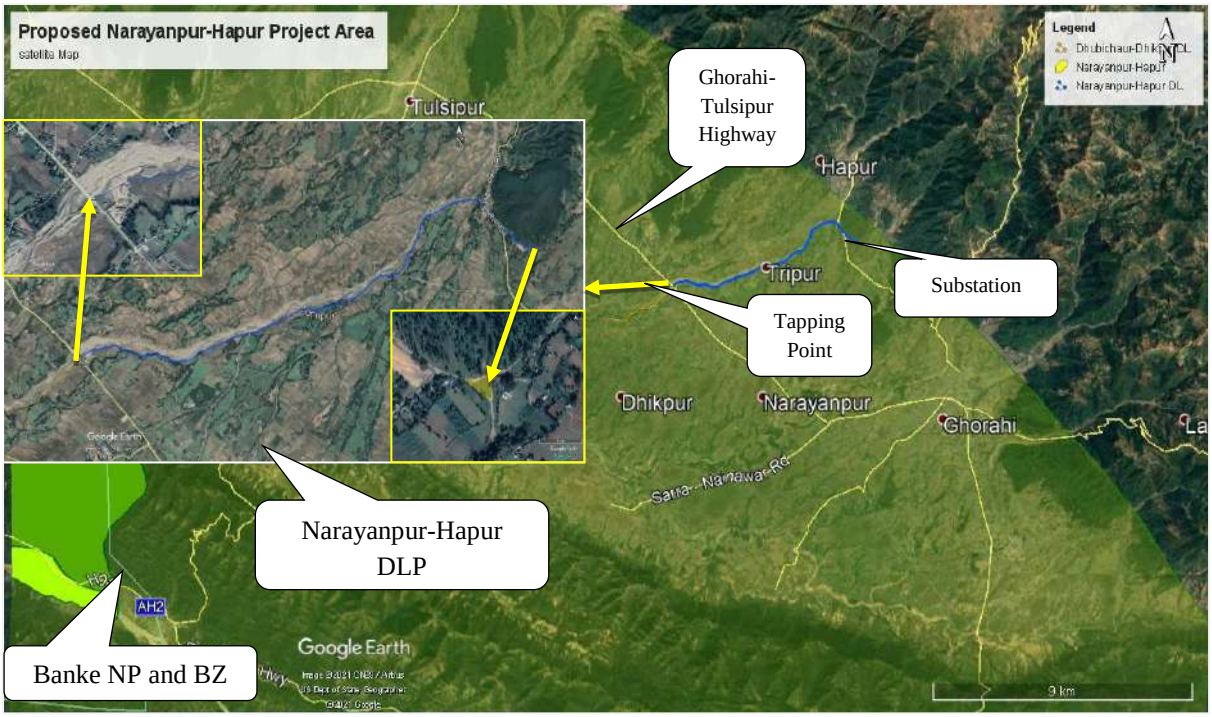


Figure 3-1: Location map and Land use details of the Subproject[2]

The substation lies at Latitude 28°5'8.60"N, Longitude 82°27'11.54"E and elevation of 692 masl (**Figure 3-3)**. The site lies in depressed flat land. It is barren land under Ghorahi SMC. In the consultations people have agreed for the implementation of the Subproject and have suggested to install poles at the edge of farm-lands, without affecting any private structures along the distribution line. The land use map details with the components of the Subprojects are presented in **Annex 2**.

[2] *Source: Topographic Map, Department of Survey, 1995 and Field Study 2021*

Figure 3-2: Narayanpur-Hapur Substation View facing North with Gentle Slope

Figure 3-3: Settlement Along the DL Route

3.1.2 Geology

The Subproject area lies geologically in Dang Valley of Chure Range with Quaternary deposit. The surrounding Siwalik Mountains are rocky and is made up of calcite and quartzite Group. Alluvial/loam, soft soil and Calcareous beds together with colluvium deposit and thin soil layer mixed with gravel are predominant in this area. No major geological hazard has been identified associated with the proposed Subproject except moderate chances of erosion within the expanded flood plain area of Hapur Khola.

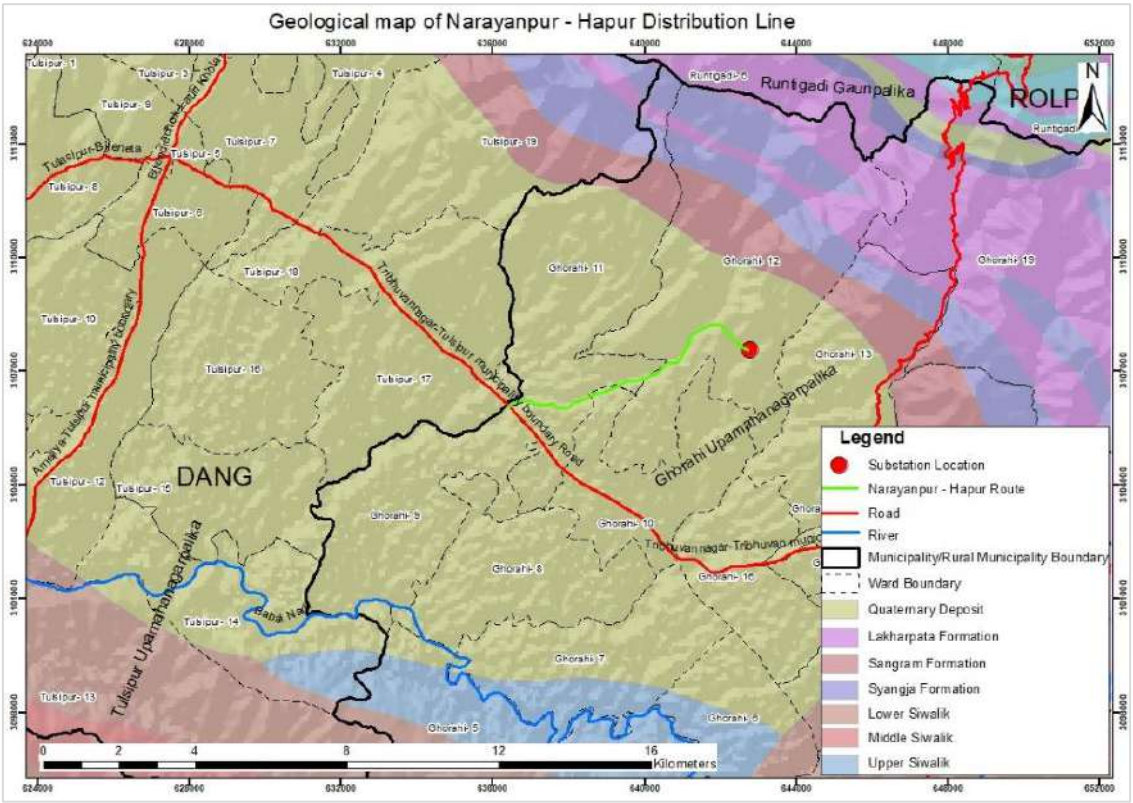


Figure 3-4: Geological Map of proposed Subproject Area[3]

[3] *Source: Department of Mines and Geology (DMG), 2020*

3.1.3 Seismology

The entire country of Nepal is in a seismically active zone caused by subduction of Indian tectonic plate under the Tibetan Plate. According to National Seismological Center of Nepal, several big earthquakes have been felt in Nepal, the earthquakes of magnitude 6 to 7 are mostly confined to the Main Himalayan Thrust (MHT) between the foothills and the Higher Himalaya. Moreover, earthquake generation is confined to the crustal depth of 20 km. However, shallow earthquakes at depths down to 6 km are generated because of strike slip faults. Therefore, the substations and distribution lines of this Subproject will be designed and operated in accordance with seismic design requirements and best engineering practice. The seismic activity in Nepal between 1964 and 2019 as in IUSGS portal is shown in **Figure 3-5.**

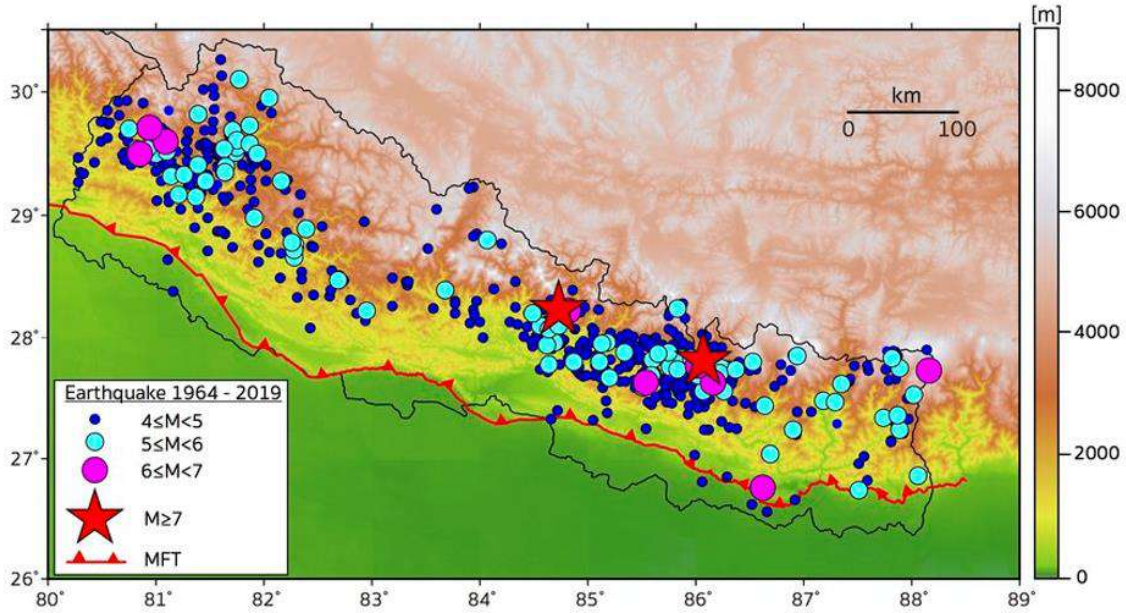


Figure 3-5: Seismicity map of Nepal from 1964 -2019[4]

3.1.4 Climate

The climate of the Subproject area is sub-tropical. According to DHM 2021, the average maximum temperature during summer fluctuates between 33°C & 40°C and minimum temperature in winter season ranges range from 10°C to 18°C. The relative humidity is in the range of 84% to 87%. The average annual rainfall is estimated at approximately 1500 mm per year. Almost 80% of rainfall occurs during monsoon (June to September).

Special precaution will be necessary for planting steel tubular pole during monsoon season and foundation excavation and construction of civil structures at substation area.

3.1.5 Air, Noise, Water Quality and Polluting Sources

The major air polluting sources recorded are only from vehicular emission and dust problem from plying of vehicles and high wind velocity. Noise polluting sources noted at the time of

[4] *Source: USGS catalogue, 2019*

field study are similar to the air polluting sources. Unnecessary honking along the access road of site is the source of noise generation. Following table shows the real-time quality of air and noise during field study.

Table 3-1: Ambient Air and Noise Quality within the Proposed Subproject Site

SN	Location/ Chainage	**Air Quality[5]-**Temtop Airing-1000 PM Detector (µg/m^3)					**Noise Level -**UNI-T UT 353 Mini Sound Meter (dB)		
		$PM_{2.5}$	**Level**	**PM_{10}**	**Level**	**Average Time of Measurement**	**Measured**	**Ref.[6]**	**Area**
1.	Tapping Point	20.9	100	29.3	200	1-hour	40.3	50	Residential Area
2.	Substation	57.3		47.2			47		

Source: Field Visit, 2021

The air quality and noise level of the SPA was found within the range of National Ambient Air Quality Standard and Noise Quality Standard, respectively.

There are no water sources within the substation area instead DL will pass parallel to Hapur Khola throughout most of route. The physical parameters of the Hapur Khola were tested as presented in following table.

Table 3-2: Water Quality of Stream along the Distribution Line Route

SN	DL/ SS	Location	Stream Name	Flood plain width (m)	DL distance from Stream	**Parameter-** *EXTECH ExStik II DO600*					
						Temp. (^oC)	***Ref[7].***	***pH***	***Ref.***	***EC (µc/cm)***	***Ref.***
1.	DL	Ghorahi SMC-9, Khaira (Ch. 0+000)	Hapur Khola	164	30m	27.8	<40^{o}C	7.33	5.5-9.0	112	1500

Source: Field Visit, 2021

The water quality of the Hapur Khola (stream) was found to be accepted limit for the aquatic life in the stream. The water parameter data was assessed using Nepal Water Quality Guidelines. The construction activities of the Subproject components will not have any adverse impact to the local stream.

3.1.6 Solid Waste Management:

Wastes were found littered in front of HHs and along the side of the access road near Subproject area. People of the nearby area were found managing organic wastes within the household premises. Recyclable waste (large quantity) was sold to scrap collector

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

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

[7] *Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem, 2019*

occasionally. The estimated quantity of solid waste generation from the labor camp is shown in **Table 3-3**.

Table 3-3: Estimated Daily Solid Waste Generation from Campsite

SN	Description	Calculation	Remarks
1.	Total Labors within the Campsite	= 20 Labors	
2.	Total Waste Generation to be Expected	= 20 * 123.62 g/capita/day = 2472.4 g/capita/day = 2.4724 kg/day	
3.	Organic Waste Composition Responsible for Foul Smell, and Rodents	= 1.26 kg/day	Assuming 51% organic waste
Rest other waste is recyclable, and non-decomposable which could be stored for long period and have less impact on the environment if properly managed. The amount of organic waste is manageable within the Subproject site as organic waste per day will be expected to be only 1.26 kg/day.			

3.2 Biological Environment

The proposed Subproject's distribution line avoids forest land at Khaira, Ghorahi SMC-9 to Thaklee of Ghorahi SMC-12 of Dang District. The proposed Subproject lies at elevation below 1000 (617-716) masl in upper tropical bioclimatic zone. The proposed Subproject development site does not lie within any protected area and conservation area, although it is located within the Chure region without any induced impact to the biological environment. The Subproject components (substation and 33 kV distribution line) does not intercept any forest area, thus there will be no any issue of tree loss. The Banke National Park lies at a distance of 18 km from the proposed substation site, thus there will be no any impact to the protected species of the National Park.

Altogether thirteen species of birds are reported around the surrounding project area. They are: House Crow (*Corvus splendens),* Western Spotted Dove (*Spilopelia suratensis),* Rock Dove (*Columba livia),* Rose-ringed Parakeet (*Alexandrinus krameri),* House Sparrow (*Passer domesticus),* Tree Sparrow (*Passer montanus),* Grey Francolin (*Francolinus pondicerianus),* Common Quail (*Coturnix coturnix),* Black-backed Forktail (*Enicurus immaculatus*), Kingfisher (*Alcedo atthis),* Red-wattled Lapwing (*Vanellus indicus),* and Ruddy Shelduck (*Tadorna ferruginea*). All these bird species are of least concern under IUCN categorization.

3.3 Socio-economic Environment

Demography and Ethnic Compositions: The proposed Subproject area lies in Ward No. 9, 10, 11 and 12 of Ghorahi SMC. Ghorahi and Tulsipur are the nearest business market nearby the Subproject. The general demographic information of the affected Ward is presented in **Table 3-4**. The major ethnic compositions within the surrounding project area i.e., Ward No. 9, 10, 11 and 12 of Ghorahi SMC are Tharu, Chhetri and Dalit (Kami, Damai

and Sarki) constitute are 24.38%, 26.14% and 12.56% respectively of total population of 34,525. Majority of people follow Hindu religion and rest follow Buddhism and Christian religions. The Core Project Area (CPA) of the Subproject will not affect any indigenous people.

Table 3-4: General Demographic Characteristic of Subproject Municipality

SN	Wards	Population			Total Households
		Male	Female	Total	
Ghorahi Metropolitan City					
1.	All	72,329	83,835	156,164	35,419
2.	9	3,385	4,049	7,434	1,589
3.	10	4,585	5,464	10,049	2,239
4.	11	3,215	3,918	7,133	1,522
5.	12	4,431	5,478	9,909	2,179

Source: (CBS, Rural Municipality-Municipality Profile of Dang District, 2018)

Road Accessibility: Subproject-Wards of Ghorahi SMC are connected with Ghorahi SMC Office by Ghorahi-Hapur-Peda Road, which passes through Tribhuvan Park in Western direction from Nayabazar.

Electricity Beneficiaries: The implementation of the Subproject will increase the electricity beneficiaries to 5,053 HHs, 69 commercial purposes and 64 industries. This will expand the electricity supply in the Subproject area with clean energy sources.

Water and Sanitation: Tube-well and tap/piped water is the main source of drinking water in the surrounding Subproject area. Almost all the houses in the area have some sort of toilet facility.

Health Facility: The nearest and easily accessible equipped health facility to the proposed Subproject is Ghorahi located at 15-minute driving distance from substation site.

Communication: People of the Subproject have access with communication facilities mainly through mobile telephone services provided by both government and private sector. In the Subproject, people have access with local and national FM Radio networks and local newspaper facilities.

Occupation: Agriculture is the main occupation of people in the Subproject area with nearly 70% contribution; small trade and business/enterprises and services are other occupation of people in the Subproject area. Intermittent tripping and voltage drop of electricity was adversely affecting irrigation of crops and daily household chores activities.

COVID-19: The coronavirus (COVID-19) pandemic has been defined as global and national health crisis; the virus has spread in almost all parts of Nepal. Heedful of its vulnerabilities, the Government of Nepal had enforced a nationwide lockdown in 2020/2021 and activated its federal, provincial and local level mechanisms to respond to the crisis. In case of any sudden surge or outbreak of COVID-19, quarantine facilities and immediate health support should be provided to the workers and personnel involved in construction.

4. ANTICIPATED ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

The environmental and social impacts predicted during the construction of proposed Subproject are discussed in this chapter. National Environmental Impact Assessment Guidelines (GoN, 2050) has been referred for the predicting magnitude, extent, and duration of the project-induced environmental impacts in Subproject area. This chapter identifies the basic environmental and social impacts in the Subproject area that will arise during the construction. The detailed impacts of each domain of environmental and social safeguards have been addressed in this chapter.

4.1 Anticipated Beneficial Impacts

Construction Phase

4.1.1 Local Employment

Local employment will be created during the construction phase. As mentioned in section 2.8 Workforce Requirement, the typical construction team will have 15 to 20 workers for the period 10-12 months for the erection of poles and stringing the distribution lines and 16-18 months of time for building the substation. Local people within the SPA will be encouraged for employment during construction phase. Based on the skill levels (skilled, semi-skilled and unskilled labor), local people will be used for the construction as far as possible. *The magnitude of impact is moderate, the extent is local, and the duration is short-term.*

Operation Phase

4.1.2 Local Economy and Enhancement in Rural Electrification

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. Intermittent tripping and voltage drop problem nearby the settlement area will be reduced. Upgrading and expansion of electricity distribution helps to way-out many electricity related issues and promotes the use of new types of home appliances, use of electric motors for irrigation, and establishment of small and large industries. *The magnitude of impact is high, the extent is local, and the duration is long-term.*

4.1.3 Greenhouse Gas Emission Balance

Net Green House Gas (GHG) emissions resulting from the Subproject area are expected to be low as the distribution lines will improve and expand electricity supply from clean energy sources. It will reduce the emission of GHG from the traditional source like Guitha (made from cow dung), firewood and timber along with commercial fuel Kerosene for cooking/lighting, heating and diesel for water pumping. *The magnitude of impact is high, the extent is local, and the duration is long term.*

4.2 Anticipated Adverse Impacts

A. Physical Environment

Construction Phase

4.2.1 Change in Land Use

The Subproject requires about 0.68 ha. land for the substation. The land is barren managed by Ghorahi SMC. The record of District land survey office, Dang shows that the land has been registered in government (Prati) land. The construction of the Subproject will bring change in the existing land use of the area for permanent period. Potential impacts caused by distribution lines will be limited to approximately 0.22 m of land for each pole, at the edge of roads and cultivated lands. *The impacts due to use of land will be moderate in magnitude, site specific and long term in duration.*

Mitigation Measures

- Steel Tubular Pole for distribution lines will be planted at the right way of existing road without hampering traffic movement. In case of cultivated land, minimal land will be used at the edge for planting the poles.
- Cropping calendar will be followed while planting poles and stringing of conductors so that standing crops will not be damaged.
- In case of loss of standing crops, compensation will be made to the respective land owner as per the prevailing market rate.

4.2.2 Erosion and Flooding

The proposed Subproject's area DL is nearby the Hapur Khola and is susceptible to high erosion from flooding[8] during rainy season. The distribution line length of 7 km passes nearby and parallel to the Hapur Khola (20-30m distance) from the cultivated land. And the remaining 620m length passes through the RoW of access road and reaches the substation. Possible flooding during rainy season may result erosion nearby the distribution line alignment. *The magnitude of impact is moderate, the extent is site-specific, and the duration is long-term.*

Mitigation Measures

- Concrete foundation is recommended for Steel tubular pole installation for 33 kV lines.
- Pit hole prepared for the installation of steel tubular pole shall not be left open as possibility of accident may arise.
- The client needs to coordinate with local level governments and request the local government to give priority for the embankment activities for the protection of cultivated land and proposed 33 kV distribution lines.

4.2.3 Air Quality

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 of short term. Transportation of the

[8] *(Ghorahi SMC, 2018), P-44.*

materials and movement of construction crew and equipment will have minor impact on air quality. *The impact on air quality will be minor in magnitude, site-specific in terms of extent, and of short duration.*

Mitigation 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.

4.2.4 Noise

Noise is inevitable during construction. As noted in section 3.1.5, noise is less around the substation area as the area is rural and settlement is sparse. 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. *The impact on noise level will be minor in magnitude, site-specific in terms of extent, and of short duration*

Mitigation Measures

- Contractors will be required to monitor noise during the construction.
- For substation site, boundary walls serve as noise barrier, and it should be constructed as early as possible.

4.2.5 Drainage and Water Quality

Substation land area of 0.68 ha. will result in slight alteration of drainage patterns, although the alterations in drainage will not be quantifiable. Interference with drainage patterns will be temporary during construction phase only. The impact on water quality during the construction period is expected to be insignificant. Water will be used primarily as a cement additive for construction of substation foundations and boundary walls, and to control dust. *The magnitude of impact is low, the extent is site-specific, and the duration is short-term.*

Mitigation Measures

- Storm water run-off from substation sites will be minimized and controlled with bunding temporary dikes (constructed boundary walls will also help contain run-off water).
- Proper management of ground drainage from camps as a preventive measure against breeding places of mosquitoes, and other pests.

4.2.6 Soil and Muck

As the proposed substation land's ground level is low, filling of soil is necessary. The required filling materials shall be purchased from nearby authorized crusher plant approved by local government. For distribution lines, the excavation activity will be insignificant. *The magnitude of impact is low, the extent is site-specific, and the duration is short-term.*

Mitigation Measures

- Soil required for filling substation area shall be purchased from the nearby authorized crusher plant approved by the local government.
- Soil shall be covered with tarpaulin while transporting it from earth-borrowing areas.
- Simultaneous water sprinkling and compaction of spoil shall be done using the roller.

4.2.7 Solid Wastes

The wastes generated during construction within the Subproject area are cement bags, iron bars, and other leftover construction materials, and waste generated by the labor camp. It might cause adverse impact if not properly managed. Organic wastes generated from labor camp may give foul smell, and attract rodents if not manage properly. Inorganic wastes generated during implementation shall be managed through source segregation. *The magnitude of impact is low, the extent is site-specific, and the duration is short-term.*

Mitigation Measures

- Source segregation of organic and inorganic wastes in different storage areas or facilities in the designated location.
- The organic waste generated from the campsite shall be managed within the substation premises, through composting in the bin or by constructing a ground pit, and covered by 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 ground leveling.
- Packing materials used for casing components should be recyclable.
- 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, and specially designed container and sealed carefully.
- Effective coordination shall be done with local level government for proper waste management during construction period.

Operation Phase

4.2.8 Electric and Fire Hazard

Employees performing servicing or maintenance of substations may be exposed to electric shock, burns and injuries from the unexpected energization or release of stored energy in the equipment. *The magnitude of impact is considered moderate, the extent is site-specific, and the duration is long term.*

Mitigation Measures

For this, the following mitigation measures will be practiced:

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

B. Biological Environment

The proposed Subproject avoids forest area and other sensitive biodiversity area. Hence, there will be no significant impact to biological environment because of construction of substation and distribution lines.

Construction Phase

4.2.9 Loss of Habitat

As the proposed substation area is a barren land and poles will be installed at the edge of roads and private farm land, no loss of forest and other biodiversity is expected. *The magnitude of impact is moderate, the extent is site-specific, and the duration is short term*

Mitigation Measures

- Labors and staff shall be made aware to avoid illegal activities in adjoining forest.
- Labors and staffs should be restricted to use firewood for cooking.

Operation Phase

4.2.10 Bird electrocution and collision

The Subproject area is located in rural setting and there is no presence of critical habitat of avian fauna. Electrocution is a risk to bird species that perch on power line infrastructures (substation and distribution line). List of birds presented in section 3.2, may collide to distribution lines and substation Minimizing bird collision and electrocution risk is therefore a win-win for biodiversity and the power sector. *The magnitude of impact is low, the extent is site-specific, and the duration is long term.*

Mitigation Measures

- Bird guards should be installed above the poles and white spirals in the conductors to improve visibility electrical structures.

C. Socio-Economic and Cultural Environment

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

Construction Phase

4.2.11 Land Requirement

The land required for the proposed substation area is 0.68 ha, is the government land managed by Ghorahi SMC. The proposed physical activities of the Subproject will not be involved in private land. So, there will be no land acquisition, and thus no resettlement impacts. During the public consultation people have agreed to support the implementation of the Subproject (**Annex 5**). Compensation shall be made on the basis of crops types and quantity of loss equivalent to the market price.

Mitigation Measures

- Distribution pole of diameter 0.22 m should be installed on the edge of cultivated land making no loss of standing crops.

- If there is loss of crops, appropriate compensation shall be made.

4.2.12 Public Health

Construction activities will be of small scale, causing no significant adverse impact to existing quality of air, water and sound. Local people except the workers do not involve in construction activities. Considering COVID-19 pandemic, workers will be advised to avoid unnecessary contact with local people. *The magnitude of impact is low, the extent is site-specific, and the duration is short term.*

Mitigation Measures

- Contractors shall implement health and safety plans.
- Awareness on HIV/AIDS and other sexually transmitted disease should be provided to the labors.
- Awareness on basic sanitation and waste management should be provided to the labors.
- For coronavirus (COVID-19) pandemic situation, contractor need to handle the situation in case of any sudden surge and standardize the quarantine facilities with health aid to the labors.

4.2.13 Occupational Hazards and Safety of Workers

Occupational health hazard and safety of workers is the major issue during the construction period. Working without adopting safety measures during excavation work, spoil management work, mechanical and electrical equipment handling activities, chemical handling, etc. during construction may call the risk of accidents. Primary victims are the workers involved in the construction. *So, the envisaged direct impact is high in magnitude, site specific in extent, short term in duration.*

Mitigation Measures

- Contractor shall prepare the Environmental, Health and Safety plan and take approval from the Client (NEA/PIU). Contractor shall employ Safety officer 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 7**.
- NEA will be responsible to supervise the EHS performance of the construction Contractor, and worker's health and safety.

4.2.14 Child Labor, and Gender Issues

During the construction period, people employed on daily wages for excavation, transportation of construction materials, and other construction-related works should avoid the involvement children and should avoid gender discrimination. Gender discrimination

may occur as the Contractor may not be sensitive towards gender equity. Contractors should equally pay men and women workers. Construction area should be gender friendly with required facilities. *The envisaged impact is high in magnitude, site-specific in extent, and short-term in duration.*

Mitigation Measures

The Subproject will ensure to:

- Provide equal wage to male and female for similar nature of work.
- Prohibit use of child labor i.e., below 16 years of age (which is as per government and ILO guidelines).
- Provide female friendly construction environment with separate cabins and toilet for women in the camp.
- Prepare suitable work categorization for women.

4.2.15 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. *The envisaged indirect impact is low in magnitude, local in extent, and short-term in duration.*

Mitigation Measures

- Restrict movement of workers out of camp after dinner time in the night.
- prohibit the 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 public relation officer to keep close and regular consultation and coordination with local communities.
- Regular monitoring of workers' behavior and take appropriate measure on rule violators.

Operation Phase

4.2.1 Hazards and Safety

Occupational health hazard and safety of staffs is the major issues during the operation phase of the substation. The possible electric shock and fire hazard might cause injury or death to staffs thus the protection measures should be taken all the time. *The envisaged direct impact is high in magnitude, site specific in extent, long term in duration.*

Mitigation Measures

- There will be the 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 work on DL route

4.2.2 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; so, 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.

[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%.

5. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

5.1 Methodology in Information Disclosure, Consultation and Participation

The following methodologies were followed for information disclosure, consultation and participation:

i. Identification of the stakeholders is important to understand how the Subproject activities will engage with different institution/groups/individuals. Stakeholders are the groups that might be affected by the Subproject or might influence Subproject outcomes. The stakeholders were considered in three groups (**Figure 5-1**).

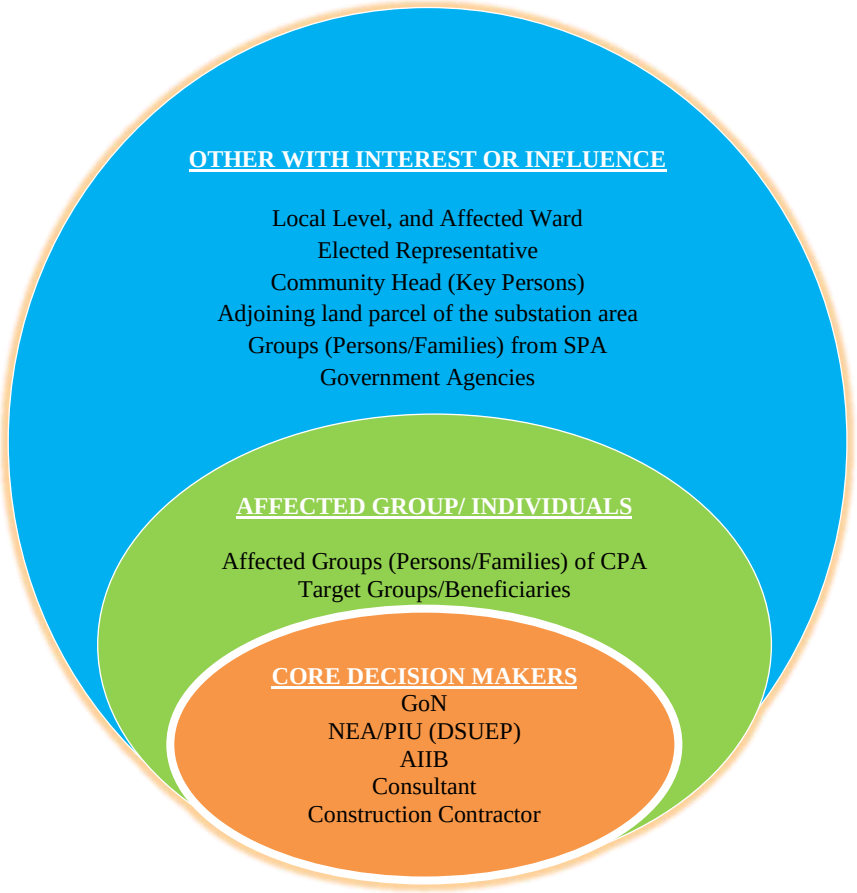


Figure 5-1: Identified Stakeholder in the Subproject[10]

ii. The notices with subject of consultation, venue, and time were pasted at Subproject foot print area, local level and affected Ward office in presence of concerned local stakeholders (**Annex 1**).

iii. Study team members visited all the local government offices within the Subproject influence area. Representatives from each local body were also consulted. All local governments were given request letters for their active support in project implementation. Municipalities were requested to provide written suggestions.

[10] *Referenced Meaningful stakeholder engagement: a joint publication of the MFI working group on environmental and social standards / Reidar Kvam, PP-19, 2019.*

iv. Local communities nearby substation area and along the distribution line routes were consulted, and were briefed about the Subproject activities and likely benefits with their suggestions (included in the Minutes).

v. During the Subproject construction phase, booklets informing about the Subproject activities, likely impacts and mitigation measures together with the complaints handling mechanisms will be developed and distributed in the Subproject area.

5.2 Consultation and Information Disclosure

Consultation aims to encourage participation of stakeholders and communities of the Subproject area in identification of issues, comments and suggestions. The Subproject affected groups (persons/families) were given more emphasis during the field consultations. Public consultations were conducted at Hapur Bijauri (Ward No.12), Khaira (Ward No.10) and Khaira (Ward No.11) settlement dated 10th, 11th and 12th September 2021, respectively (**Figure 5-2**). The concerns expressed/raised issues during the consultation were documented as in the form of minutes (**Annex 5**).

Major benefits expected from the implementation of Subproject through the perspective of local people were identified from public interaction, and that included improvement in the rural electrification facilities ensuring the uninterrupted electricity in the households and better functioning of industries in the locality. The issues, comments and suggestions received in the consultation are presented in **Table 5-1**.

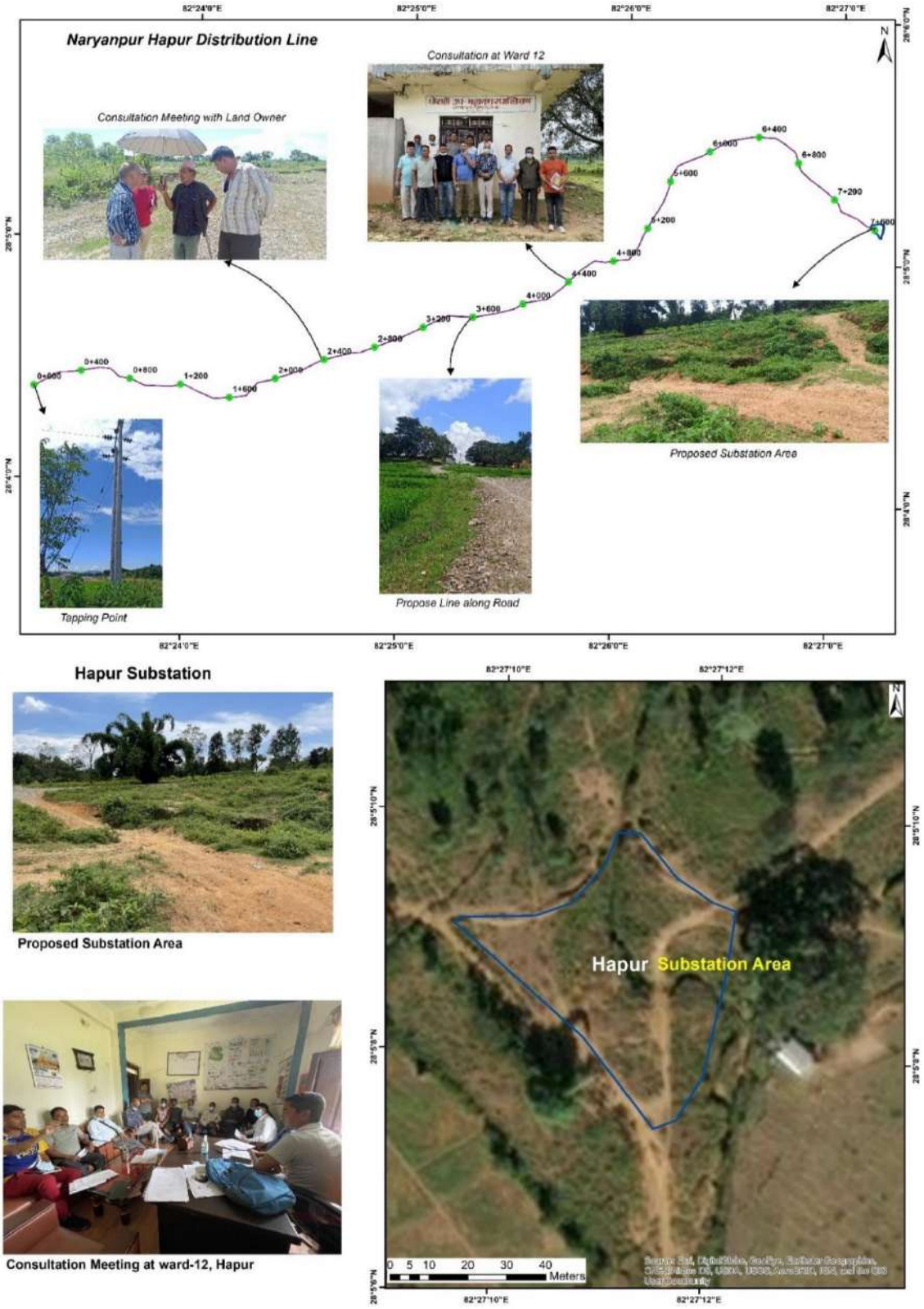


Figure 5-2: Consultation with the stakeholders and communities in the Subproject Area.[11]

[11] *Field Study, 2021. Used SW Map and GIS*

5.3 Comments and Suggestion Received

Table 5-1: Summary of issues, comments and suggestions received in Consultations

Source: Field Visit, 2021

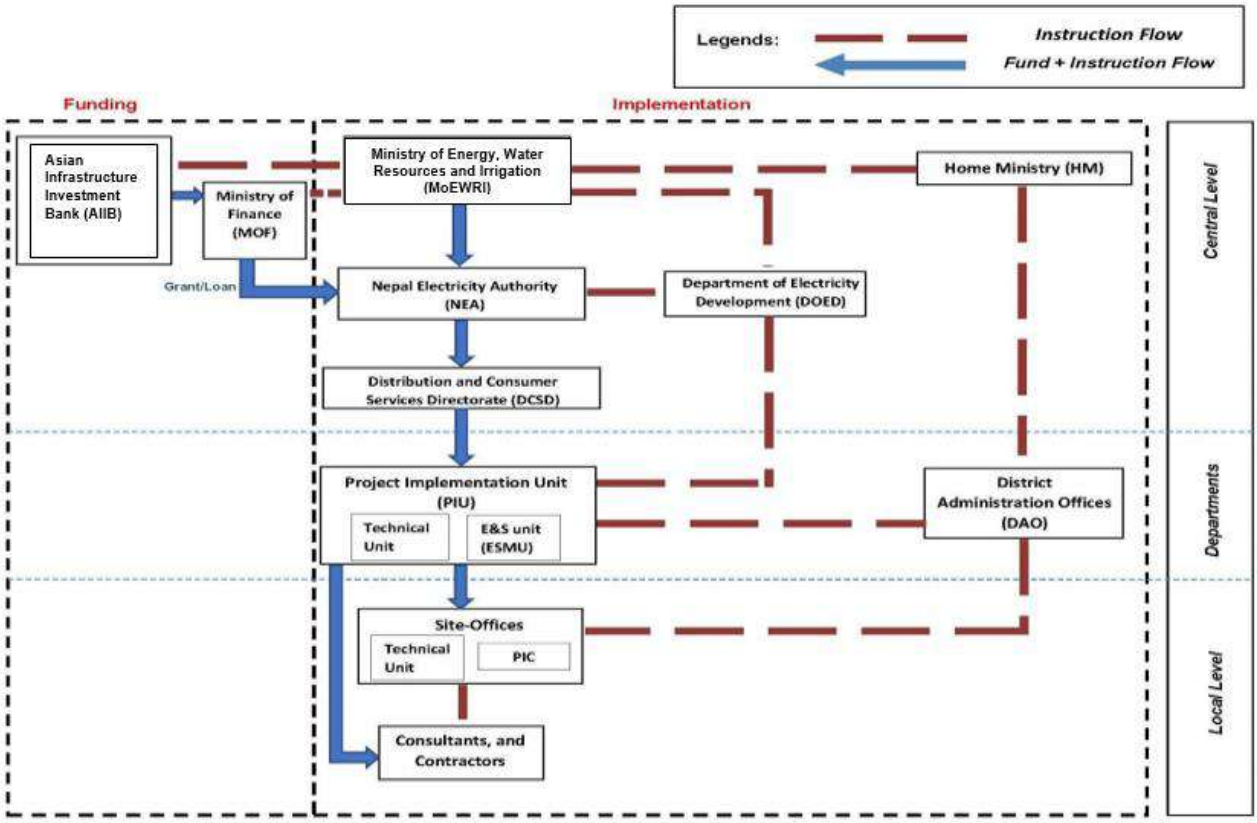
Date	Location	Issues, comments and suggestions received	Participants
10th September 2021	Hapur, Bijauri, Ghorahi SMC-12	• The proposed land for substation is pubic land and is not used from any persons or institutions and none of houses will be impacted during implementation • Within the proposed substation area, none of the marginalized, vulnerable and indigenous people are residing; on such no associated impact will be arises. • Most of the 33 kV DL will passes through public land and few from the private land; installation of pole will be completed at the edge of field or land parcel boundary • Fruitful coordination with local level, CBOs and local people will be helpful in effective implementation of Subproject • None of the Physical Cultural Resources (PCR) and archeological important sites within the substation and DL route • Local people will be prioritized for employment opportunity based on qualification and skills. • Adjoining playground should not be affected from the substation construction. And, support for playground management from Subproject. • Hapur youth club should be motivated through addressing appropriate support from Subproject through coordination with local level • To resolve problem of power tripping around the Subproject area, implementation of Subproject needs to be undergone immediately • We (Stakeholder, owner of parcel along the DL route and community people) will have full support during implementation of Subproject	16,1F-15M

Date	Location	Issues, comments and suggestions received	Participants
11th September 2021	Khaira, Ghorahi SMC-10	• The implementation of this Subproject will be helpful in resolving present electricity problem and during expansion of DL, we (private land owner) will be assured for support during implementation • Installation of pole during expansion of line will be completed through installing pole at the edge of land parcel • Compensation should be provided for the loss of trees and crops through appropriate coordination with owner	7,0F-7M
12th September 2021	Khaira, Ghorahi SMC-11	• Installation of pole during expansion of line will be completed through installing pole at the edge of land parcel, omitting small face land, Compensation should be provided for the loss of trees and crops through appropriate coordination with owner and assurance of organizing Capacity Building Training for affected people from Subproject • Fruitful coordination with local level, CBOs and local people will be helpful in effective implementation of Subproject • Local people will be prioritized for employment opportunity based on qualification and skills • Expansion of DL should be completed without affecting private and public infrastructure along the route • We (Stakeholder, owner of parcel along the DL route and community people) will have full support during implementation of Subproject	12,0F-12M

6. INSTITUTIONAL ARRANGEMENT AND GRIEVANCE REDRESS MECHANISM

6.1 Institutional Arrangement

The Ministry of Energy, Water Resources and Irrigation (MEWRI) is responsible for overall planning and execution of the plans for the overall development of water and energy sector in Nepal. Nepal Electricity Authority (NEA) under MEWRI 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 activities during the construction phase. He will also provide technical support in preparing the monitoring report.



Source: ESMF-DSUEP

Figure 6-1: Institutional Arrangement for Environmental and Social Management

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 shall provide safeguard compliance orientation to all environment monitors and safeguard team of the contractor one month before the construction works starts.

6.2 Grievance Redress Mechanism

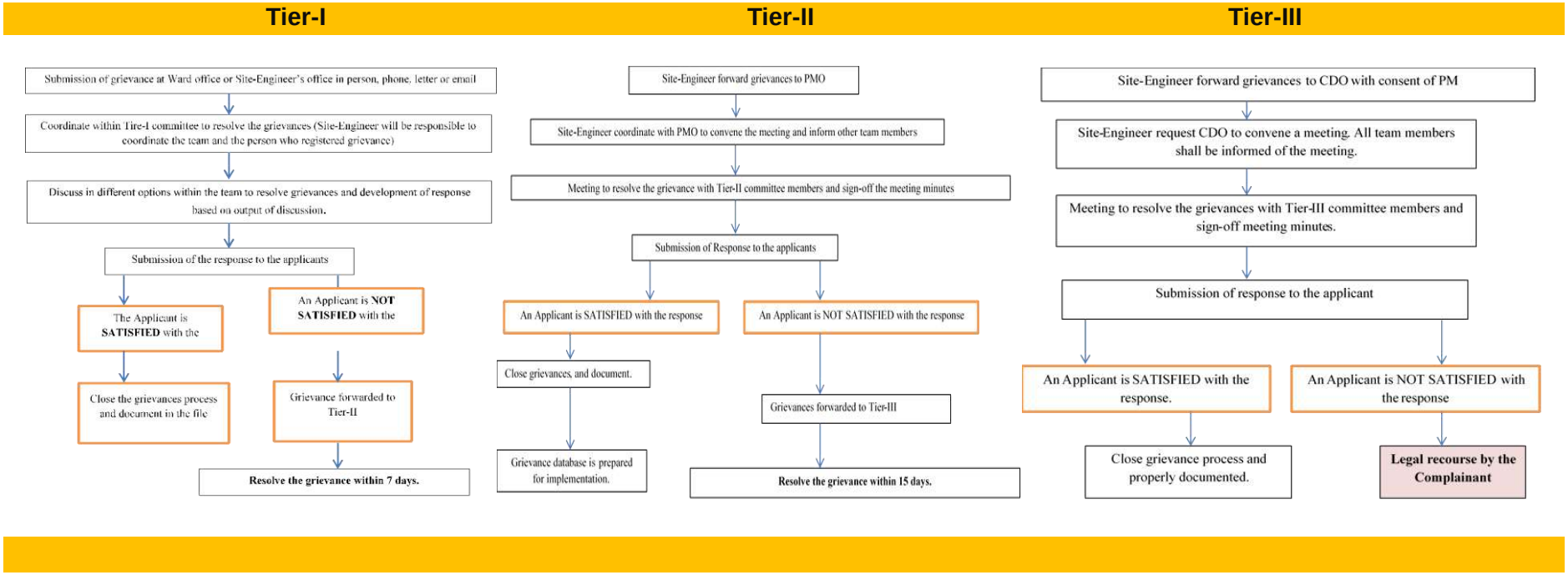
The Grievance Redress Mechanism (GRM) has been established to receive, evaluate, and facilitate the resolution of affected people's concerns, complaints, and grievances about the social and environmental related issues at the subproject level. The GRM is designed to be simple, transparent and responsive. GRM shall address only the concerns arising due to the project implementation activities, mainly during construction stage. Social Comment Addressed -In each subproject, three levels Grievance Redress Mechanism will be established. During the ESMP study period NEA has disseminated letters to the local level stakeholders regarding the formation of the GRM at the subproject level. Till date NEA has established Tier-I and Tier-II GRM has been established at local wards level and Municipality/RM level. Tier-II will be established before construction work starts.

GRM 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, he/she should forward the grievance to the field office 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 carried to Tier II and Tier III. The three levels of GRM will be based on time-bound schedules as mentioned in **Table 6-1**. The subproject will carry the regular meeting for Tier-I, once a month to follow up if any grievances are received or not and to resolve the grievances received and update its status to PIU. **Figure 6-2** describes the Workflow Diagram of GRM for the subprojects.

Table 6-1: Levels of Grievance Redress Mechanism Based on Time Bound

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**
	Municipality Chief	Coordinator	Project Manager	Coordinator	Chief District Officer (CDO)	Chair
	Site-Engineer-NEA	Member secretary	Site-Engineer	Member Secretary	Project Manager	Coordinator
	Safeguards Expert from Consultant	Member	Municipality Chief	Member	Site-Engineer	Member Secretary
	Contractor Engineer	Member	Safeguards Expert from Consultant	Member	Municipality Chief/Ward Chair	Member
	Ward Chair	Member	Contractor Engineer	Member	Safeguards expert from consultant	Member
					Contractor Engineer	Member
					Representative from affected people	Member

Figure 6-2: Workflow Diagram for GRM from NEA[12]



***** 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.

[12] *Grievance Redress Mechanism (GRM) Prepared for the sub-projects financed by Asian Infrastructure Investment Bank (AIIB) under Distribution System Upgrade and Expansion Project (DSUEP), Nepal Electricity Authority (NEA), May 2021.*

7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7.1 Environmental and Social Management Plan and Mitigation Measures

The overall Environmental and Social Management Plan of the Subproject is presented in **Table *7-1***. The 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 ESMU of PIU.

Table 7-1: Environmental and Social Management Plan (ESMP)

Project Activity	Environmental and Social Issues	Management/Mitigation Measures	Mitigation Cost	Responsibility	
				Planning and Implementation	Supervision and Monitoring
Pre-construction Phase					
Approvals, permits and clearances	Installation of poles along the edge of private farm lands	• Site office and the contractor must inform the community prior to the installation of poles and stringing of the line along DL route		Site Office/ Contractor/	DSUEP (PIU)/NEA
Construction Phase					
Construction work in substation area and distribution line alignment	• Inadequate/unsafe working conditions	• Appropriate contract clauses to ensure satisfactory implementation of contractual environmental, health, and safety measures.		Site Office/Contractor	PIU/NEA
	• Accident may arise if the pit hole (depth-2m and diameter-0.22 m) prepared for steel tubular poles remains open for long time	• Pit holes for the steel tubular pole shall not be left open and should be filled instantly by erecting poles and concrete-cement around the base should be used to strengthen the pole erection • Contractors should follow the guideline provided by the PIU	Project Cost	Contractor/ Site Office	PIU/ESMU/ PIU
	• Dust emission - transportation of materials and movement of construction crews and equipment will	• Water sprays to be used for dust control as necessary in the earthen roads of the settlements nearby the substation area and proper storage of the construction materials (sand, cements, aggregates and spoil) to be stored in substation area.	Air Quality Monitoring- 1,50,000.00 (NRs.) Sprinkling water (Dust Management)	Contractor/ Site Office	PIU/ESMU

	cause minor impact	• Steel poles firstly stocked in the substation area and secondly in the open barren area in coordination with Rural Municipalities and Municipalities. No social and environmental issues for the stockpiling of the steel poles and stringing wires	2,00,000.00 (NRs.)		
	• Noise emission- Construction related noise will be limited to vehicular movement and inside-the-fence construction activities at substations sites	• Boundary walls serves as a noise barrier, and these shall be constructed as early as possible. • Construction equipment to meet national emissions and noise control standards.	Noise Level Monitoring- 50,000.00 (NRs.) Provision of PPE in Project Cost	Contractor/ Site Office	PIU/ESMU
	• Interference with drainage patterns will be temporary at substation during construction phase	• A proper drainage system should be managed within the substation area. • Storm water run-off need to be minimized and controlled with bunding temporary dikes • Drainage management as a preventive measure against breeding of mosquitoes and other pests	Project Cost	Contractor/ Site Office	PIU/ESMU
	• Possible erosion and flooding in Hapur Khola	• Concrete foundation is recommended for Steel tubular pole installation for 33 kV lines. • Pit hole prepared for the installation of steel tubular pole shall not be left open as possibility of accident may arise.	Project Cost	Contractor/ Site Office	PIU/ESMU
		• Protection works along the eroded sections in the Hapur Khola, 20-30 m distance from the distribution line. • Client needs to coordinate with local level	Cost from Local Government	Ghorahi SMC	Ghorahi SMC/PIU

		governments to give priority for the embankment activities for the protection of cultivated land and proposed 33 kV distribution lines.			
	• Construction associated wastes generated within substation area and campsite location	• Organic waste generated from the campsite shall be managed within the substation premises, through composting in the bin or by constructing a ground pit, and covered, by a thick layer of soil • Reusable waste like debris, broken brick pieces, sand, stone, waste cement, and sand mix should be used as refills for making ground leveling. • Recyclable wastes like left out/non-usable reinforcement bars, and packing materials to be sent or sold to scrap vendors. • Effective coordination with local level government for the proper waste management	Solid wastes management – 1,00,000.00 (NRs.)	Contractor/ Site Office	PIU/ESMU
	• Illegal fishing and bird hunting by the labors	• Discouraged by supplying adequate food items (poultry and fish) requirement within the camp. • Awareness on legal provisions upon illegal hunting of biodiversity need to be disseminated	Project Cost	Contractor/ Site Office	PIU/ESMU
	• Use of firewood from nearby forests	• Workers and staffs should be restricted to use firewood for cooking. • Providing LPG based stoves in Labor camp.	Project Cost	Contractor/ Site Office	PIU/ESMU
	• Loss of standing crops at pole installation locations (depth-2m and diameter-0.22 m)	• Poles to be installed at the edge of cultivated land making no loss of standing crops. • Need to make prior consultation with landowners before installation of the poles. • If there is loss of crops, appropriate compensation shall be provided.	Project Cost	Contractor/Site Office	PIU/ESMU
Environment, Health and Safety	• Injury and sicknesses workers and members of	• Contractor shall prepare the Environmental, Health and Safety plan and take approval from the client. Provision of safety officer in the work team shall be		Contractor/Site Office	PIU/ESMU

	the public • Potential fecal coliform contamination in drinking water	made during construction period. • All employees shall be provided with the necessary training, and safety equipment as required for their responsibilities and duties. • Basic facilities of drinking water, sanitation & clean resting place, canteen, and first aid shall be made available for the campsite. • Provision of health insurance to employees. • Security fences around the substation. • Installation of warning signs (High Voltage, Fire Safety Signs, and Emergency Signs). • Awareness on HIV/AIDS and other sexually transmitted disease. • Awareness on providing basic sanitation facilities and waste management control to the labors. • For coronavirus (COVID-19) pandemic situation, Contractors should arrange for quarantine and health services for infected workers.	Establishment of Labor Camp with basic facilities – In Project Cost EHS Awareness Trainings - 1,50,000.00 (NRs.) COVID-19 measures 2,00,000.00 (NRs.)		
Management of electric equipment's, toxic materials of chemical wastes	• Possible spills resulting in contamination of soil, water, and air	• Chemical waste generated from transformer (if) needs to be collected in leakage proof, corrosion free special lined designed container for hazardous waste and sealed carefully	1,00,000.00 (NRs.)	Contractor/ Site Office	PIU/ESMU
Operation and Maintenance Phase					
Electric shock and fire hazard	• Injury or death to the workers and public	• 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 shall be allowed for the electrical works.	Project Cost	NEA Transmission Operations units and Distribution Service Center(s)	NEA

		• No electric wire to be stringed above the house. • Installation of warning signs.			
Routine operations and maintenance	• Potential disturbance to other utility functions and vehicular traffic.	• Maintain warning / advisory signs in good and visible condition • Visual and technical inspection	Project Cost	NEA	NEA
Oil spillage	• Contamination of land/nearby water bodies	• Substation transformers should be stored within secure and impervious bundled areas with a storage capacity of at least 110% of the capacity of oil in transformers and associated reserve tanks.	Project Cost	NEA	NEA
Bird electrocution and collision	• Electrocution can cause a risk to bird species which perch on power line infrastructures	• Provision of bird guards above the poles and white spirals on the conductors to improve visibility	Project Cost	NEA	NEA

(*The provision of environment and social management cost should be included in the project cost making each items visible in BOQ of bidding document for the safeguard compliance by the construction contract)*

7.2 Proposed Monitoring Plan

The monitoring proposed in
Table 7-2 will be of value primarily for establishing baseline conditions in the Subproject area, and then for ambient quality monitoring.

Table 7-2: Minimum Provisions for Environmental Monitoring

Parameters to be Monitored	Location	Measurements	Frequency	Responsibility
Construction Stage				
Clearing of construction site	Substation boundaries	• Field inspection of Subproject Sites and ensure that appropriate safety measures are implemented	Clearing and restoration: weekly	Contractors to implement corporate EHS plan, drainage management and solid waste control in substation area.
Air: SPM, Noise: dB(A)	Substation boundaries and nearest receptor to substation	• Spot check for noise and dust using portable monitoring device	Air, and noise: quarterly during construction period	Contractors need to conduct air and noise monitoring during the construction period

Construction wastes: on-site inspection	Visual inspection of active construction areas, including equipment staging areas and camps	• Spot check / visual inspection of solid waste (spoil, muck etc.) generation and disposal. • Analysis of transformer oils to determine if polychlorinated biphenyls are present.	Monthly spot checks for construction waste management	PIU safeguard officers to provide oversight via regular field inspections, and submit monitoring reports to the Bank
Construction and Operation Stage				
Occupational health and safety	Substation boundaries	• No. of Toolbox talk and safety orientation to the workers • No. of workplace accidents • Use of PPE by workers	Daily Inspection during construction Monthly Inspection during operation phase	Inspection of the construction site by safety officer and PIU safeguard officer
Child involvement in construction work (need to be prohibited)	Substation work	• Spot inspection at construction sites	Monthly Inspection during construction	Site Office

7.3 Environmental and Social Mitigation and Monitoring Cost

Preliminary cost estimates for the ESMP implementation are shown in **Table *7-3***. These estimates cover the basic monitoring activities and the mitigation measures to be complied from the contractor's side. The ESMP cost estimated for the **Narayanpur-Hapur Distribution Line** is NRs 13, 00,000.00. The community support activities and the costs will be presented in the Community Development Plan (CDP). NEA has agreed for the effective implementation of the mitigation and monitoring cost items as mentioned in table below.

Table 7-3: Mitigation Measures and Monitoring Activities Cost Estimates

SN	Budget Items	Unit	Rate (NRs.)	Total Amount (NRs)
1	Air Quality Monitoring (at substation)	6 (Times)	25,000.00	150,000.00
2	Noise Level Monitoring (at substation)	6 (Times)	8,334.00	50,000.00
3	Sprinkling of water to be used for dust control necessary in the earthen roads of the settlements nearby the substation area and proper storage of the construction materials (sand, cements, aggregates and spoil)	200 (Times) During Excavation and Civil works	1000.00	2,00,000.00
4	Management of electric equipment's, toxic materials of chemical wastes	-	L.S.	1,00,000.00
5	Segregation and management of solid wastes	-	L.S.	1,00,000.00
6	COVID-19 measures (considering pandemic situation) standardize the quarantine facilities with health aid to the labors	-	L.S.	200,000.00
7	EHS Awareness raising trainings to the labors	10 (Events)	15,000.00	1,50,000.00
8	Meeting of Safeguard Desk and Grievance Redress Committee at Field Level	24 (Months)	14,583.00	3,50,000.00
Total				**13,00,000.00**

8. CONCLUSION

Potential environmental impacts of this Subproject are not diverse and are all site-specific i.e., confined to the Core Project Area. Civil works will have minimal temporary impacts on air, noise and water quality. Erection of poles during construction shall follow RoW of existing roads and the edge of farmlands. The PIU should give prior information before installation of the poles. In the ESMP consultations conducted in the settlement area, people have agreed for the implementation of the Subproject and have suggested to install poles on the edge of farm-lands, without affecting any private structures along the distribution line. If there is loss of crops, appropriate compensation shall be provided. Mitigation measures are suggested in this ESMP to avoid any possible environmental and social impacts. The total ESMP cost for this Subproject is NRs. 13, 00,000.00. NEA Project Implementation Unit has agreed to implement the estimated cost for the mitigation measures and monitoring activities.

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ANNEXES

Annex 1: SAMPLE NOTICE FOR PUBLIC CONSULTATION AND GRM FORMATION LETTER TO STAKEHOLDERS

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: .....

..... प्रदेश ..... जिल्ला .....(नगरपालिका/गाउँपालिका/महानगरपालिका/उपमहानगरपालिका) मा एसियन इन्फ्रास्ट्रकचर इन्भेस्टमेन्ट बैंकको ऋण सहयोग भएको नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजना प्रस्तावक रही कार्यान्वयन गर्न लागिएको ..... 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:

मिति:

समय:

नेपाल विद्युत प्राधिकरण

(नेपाल सरकारको स्वामित्व)

वितरण तथा ग्राहक सेवा निर्देशनालय

नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना

(ए.आई.आई.बि.)

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

प.सं. ०७८/७९: 93८. मिति: २०७८/१०/०७

श्री .....
.....

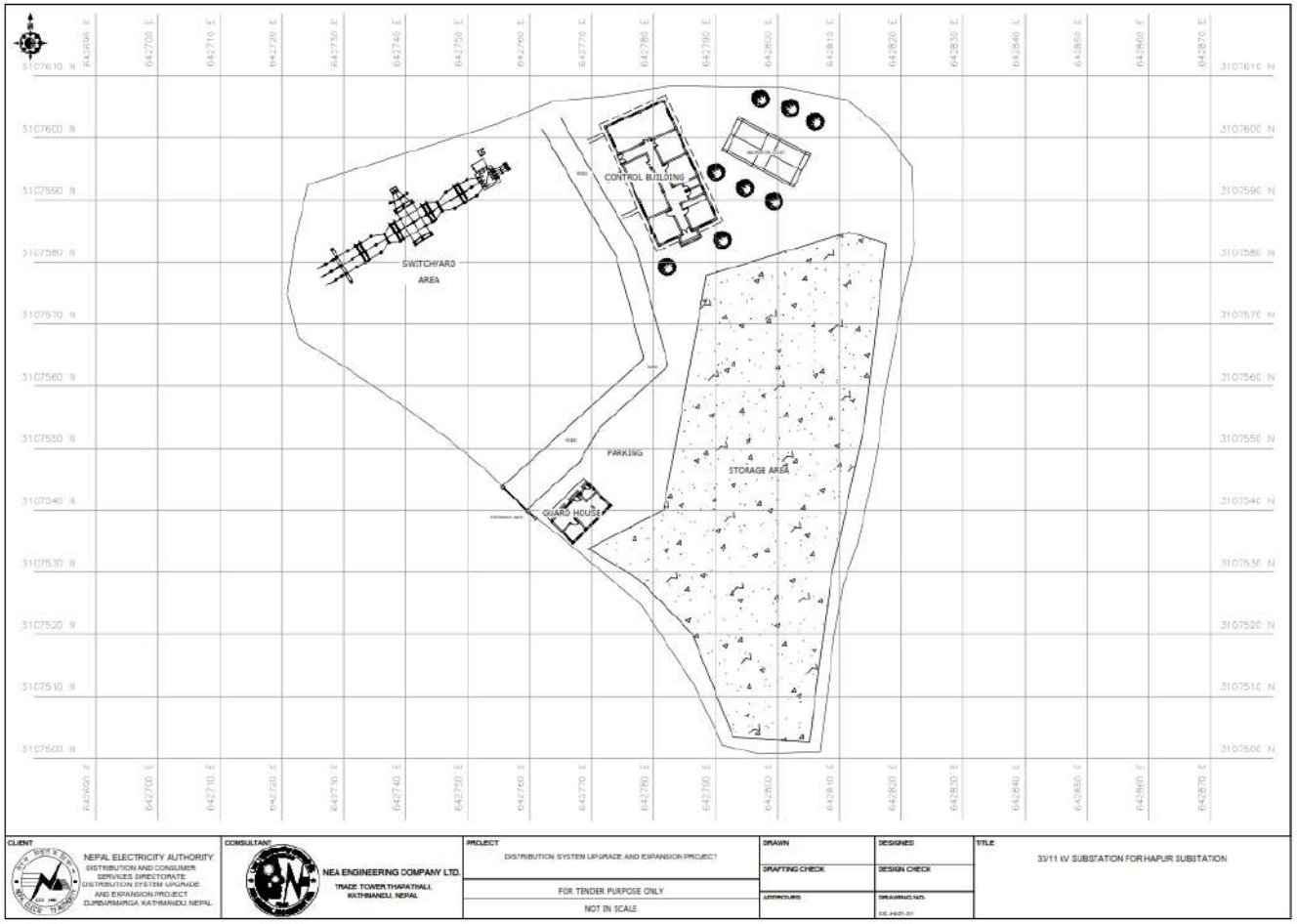
विषय: गुनासो समाधान संयन्त्र गठन भएको सम्बन्धमा ।

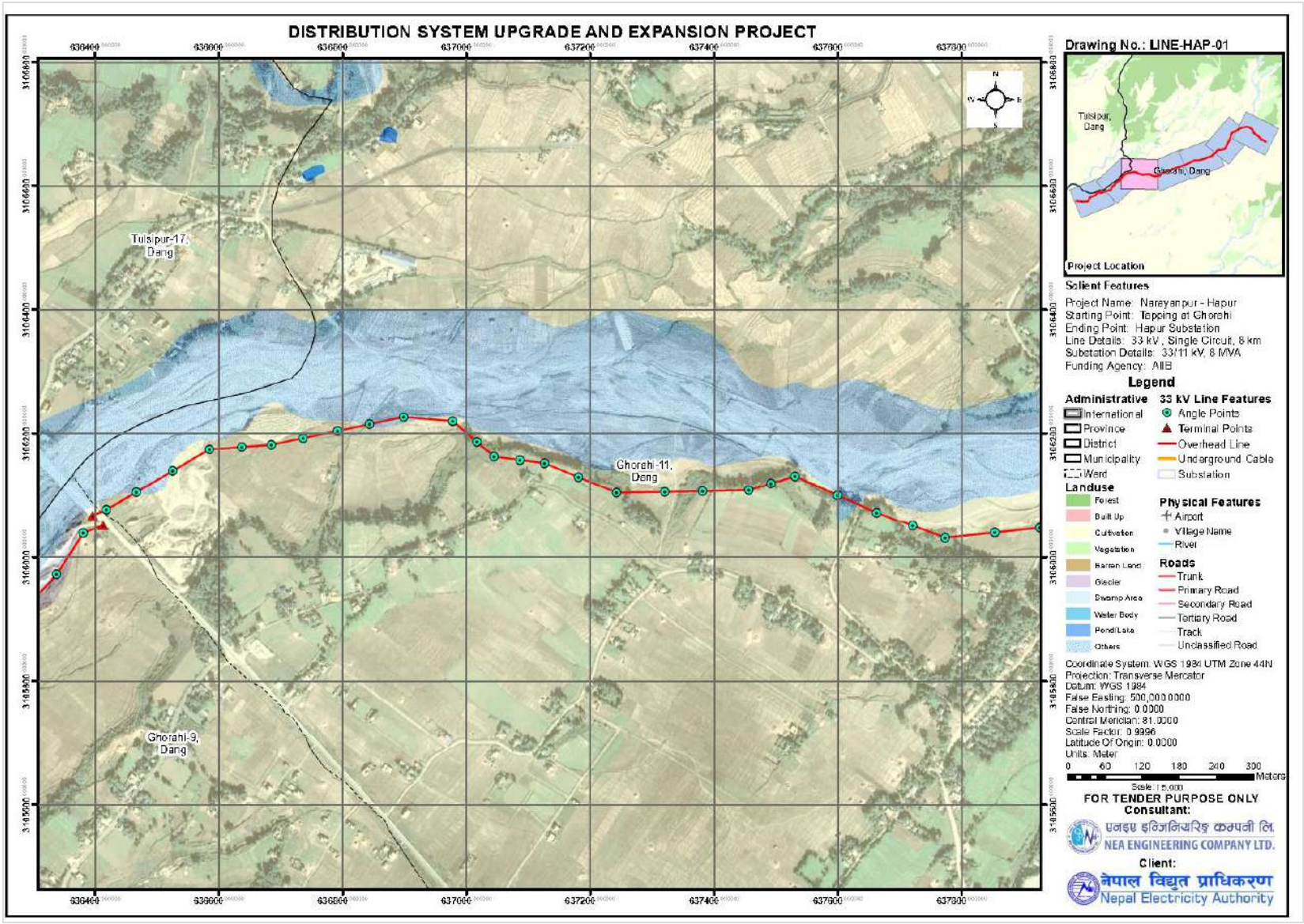
उपरोक्त विषयमा एसियन इन्फ्रास्ट्रक्चर इन्वेस्टमेन्ट बैंक (ए.आई.आई.बि.) को ऋण-सहयोगमा नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय, वितरण प्रणाली स्तरोन्नति तथा विस्तार आयोजना (ए.आई.आई.बि.) प्रस्तावक रही कार्यान्वयन गर्न लागिएको ..... आयोजना अन्तर्गत नेपाल सरकारको पूर्ण-विद्युतीकरण गर्ने लक्ष्य बमोजिम तहाँ ***वडा/गाउँपालिका/नगरपालिका/उप-महानगरपालिकामा*** ३३/११ के.भी. सब-स्टेशन, ३३ के.भी. लाईन, ११ के.भी. लाईन, ४०० भी. लाईन, आदि निर्माण कार्यहरु हुने भएकोले सो कार्यहरु गर्दा स्थानीय सरोकारवालाहरुको कुनै गुनासो भए सो गुनासोको समाधान गर्न गुनासो समाधान संयन्त्र निर्माण गरिएको छ । अतः संलग्न गुनासो समाधान संयन्त्र दस्तावेज बमोजिम आफ्ना गुनासोहरु दर्ता गर्न र सोही दस्तावेजमा भनिए बमोजिम गुनासोको समाधान हुने व्यहोरा सम्पूर्ण सरोकारवालाहरुलाई जानकारी गराइन्छ ।

भवदीय,

(केशव श्रेष्ठ)
आयोजना प्रमुख

Annex 2: LAYOUT MAPS OF SUBSTATION AND DISTRIBUTION LINE ALIGNMENT




DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-HAP-01
Tulsipur, Dang
Ghorahi, Dang
Project Location
Salient Features
Project Name: Narayanpur - Hapur
Starting Point: Tapping at Ghorahi
Ending Point: Hapur Substation
Line Details: 33 kV, Single Circuit, 8 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
Physical Features
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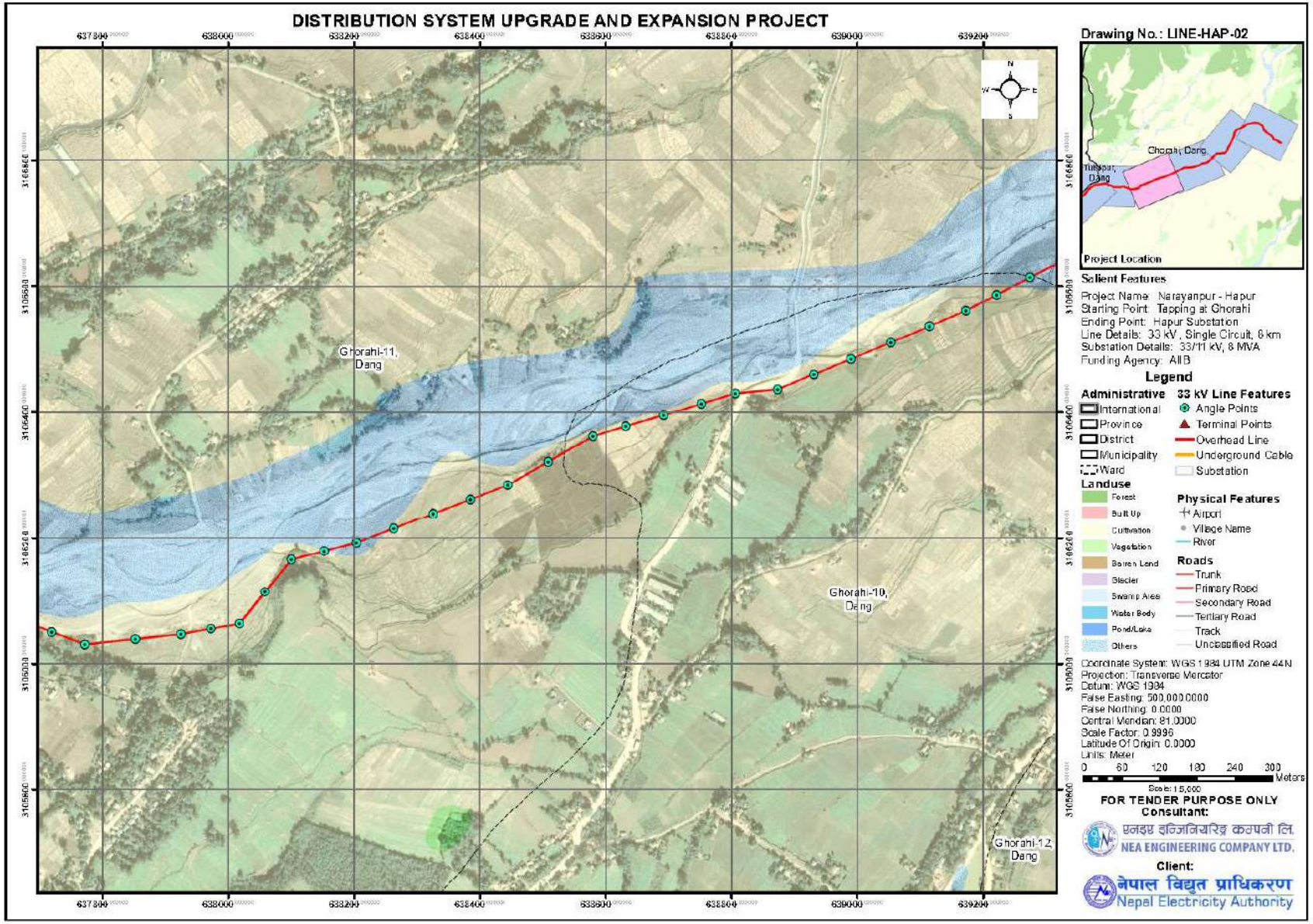
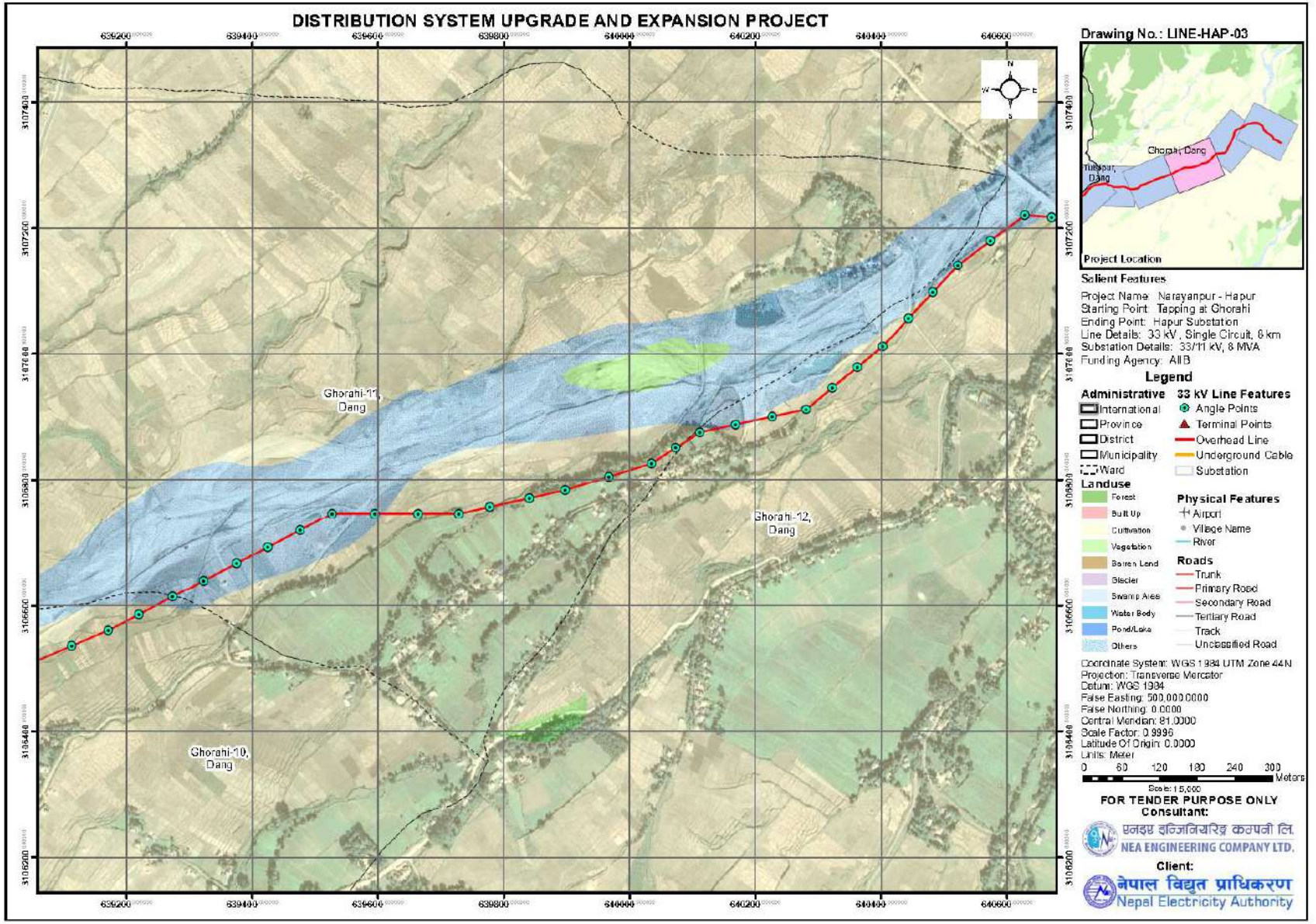
Village Name
River
Roads
Trunk
Primary Road
Secondary Road
Tertiary Road
Track
Unclassified Road
Coordinate System: WGS 1984 UTM Zone 44N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: 81.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter
0 60 120 180 240 300 Meters
Scale 1:5,000
FOR TENDER PURPOSE ONLY
Consultant:
एनइए इञ्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority
Tulsipur-17, Dang
Ghorahi-11, Dang
Ghorahi-9, Dang


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
637800
638000
638200
638400
638600
638800
639000
639200
3106800
3106600
3106400
3106200
3106000
3105800
Ghorahi-11, Dang
Ghorahi-10, Dang
Ghorahi-12, Dang
Drawing No.: LINE-HAP-02
Ghorahi, Dang
Tulsipur, Dang
Project Location
Salient Features
Project Name: Narayanpur - Hapur
Starting Point: Tapping at Ghorahi
Ending Point: Hapur Substation
Line Details: 33 kV, Single Circuit, 8 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Physical Features
Airport
Village Name
River
Roads
Trunk
Primary Road
Secondary Road
Tertiary Road
Track
Unclassified Road
Coordinate System: WGS 1984 UTM Zone 44N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: 81.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter
0 60 120 180 240 300 Meters
Scale: 15,000
FOR TENDER PURPOSE ONLY
Consultant:
एनइए इन्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-HAP-03
Ghorahi-11, Dang
Ghorahi-12, Dang
Ghorahi-10, Dang
Tulsipur, Dang
Project Location
Salient Features
Project Name: Narayanpur - Hapur
Starting Point: Tapping at Ghorahi
Ending Point: Hapur Substation
Line Details: 33 kV, Single Circuit, 8 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
Administrative
International
Province
District
Municipality
Ward
33 kV Line Features
Angle Points
Terminal Points
Overhead Line
Underground Cable
Substation
Landuse
Forest
Built Up
Cultivation
Vegetation
Barren Land
Glacier
Swamp Area
Water Body
Pond/Lake
Others
Physical Features
Airport
Village Name
River
Roads
Trunk
Primary Road
Secondary Road
Tertiary Road
Track
Unclassified Road
Coordinate System: WGS 1984 UTM Zone 44N
Projection: Transverse Mercator
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False Northing: 0.0000
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Units: Meter
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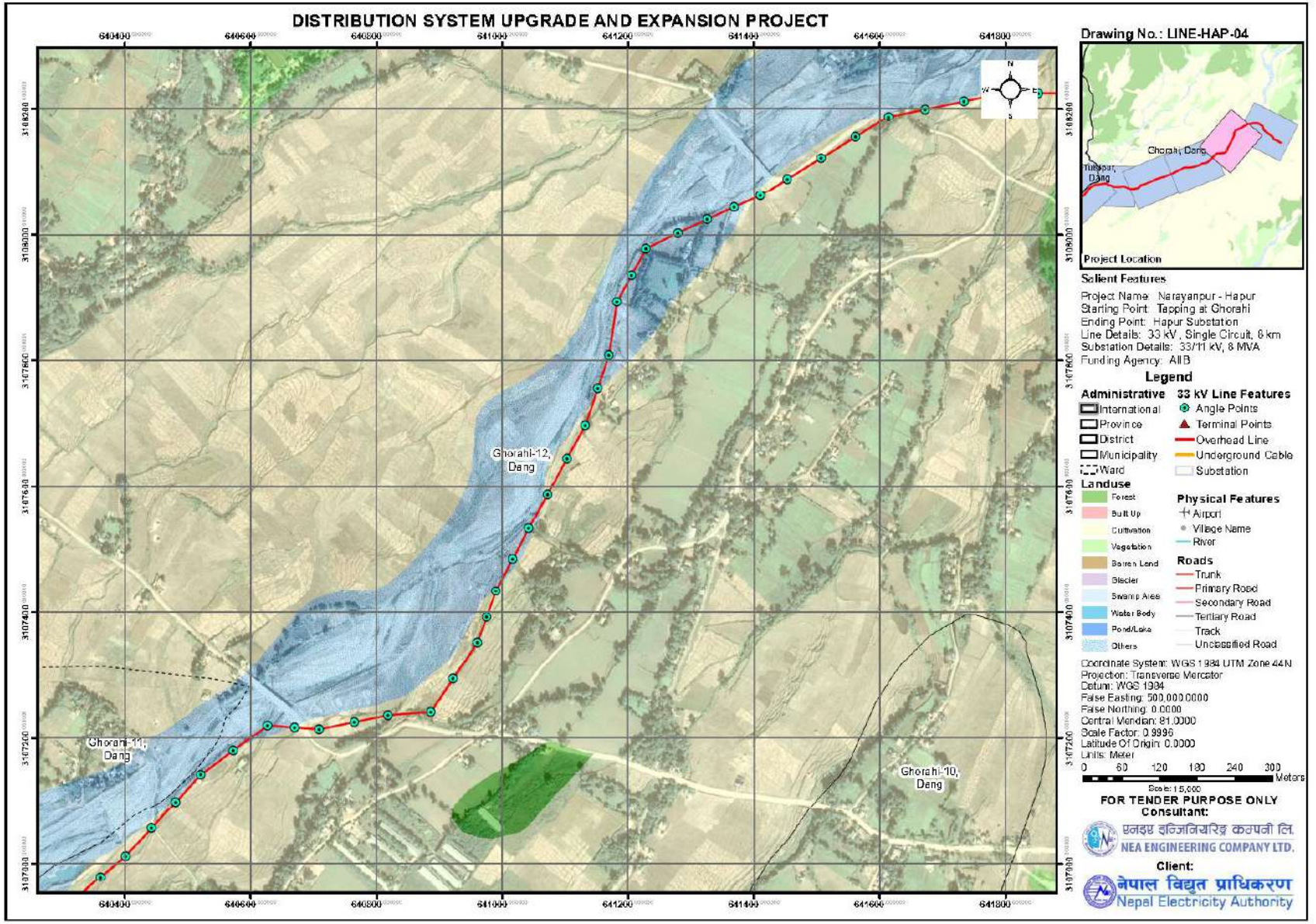
Scale: 1:5,000
FOR TENDER PURPOSE ONLY
Consultant:
एनइए इन्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
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Ghorahi-11, Dang
Ghorahi-10, Dang
Tulsipur, Dang
Project Location
Salient Features
Project Name: Narayanpur - Hapur
Starting Point: Tapping at Ghorahi
Ending Point: Hapur Substation
Line Details: 33 kV, Single Circuit, 8 km
Substation Details: 33/11 kV, 8 MVA
Funding Agency: AIIB
Legend
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Trunk
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Track
Unclassified Road
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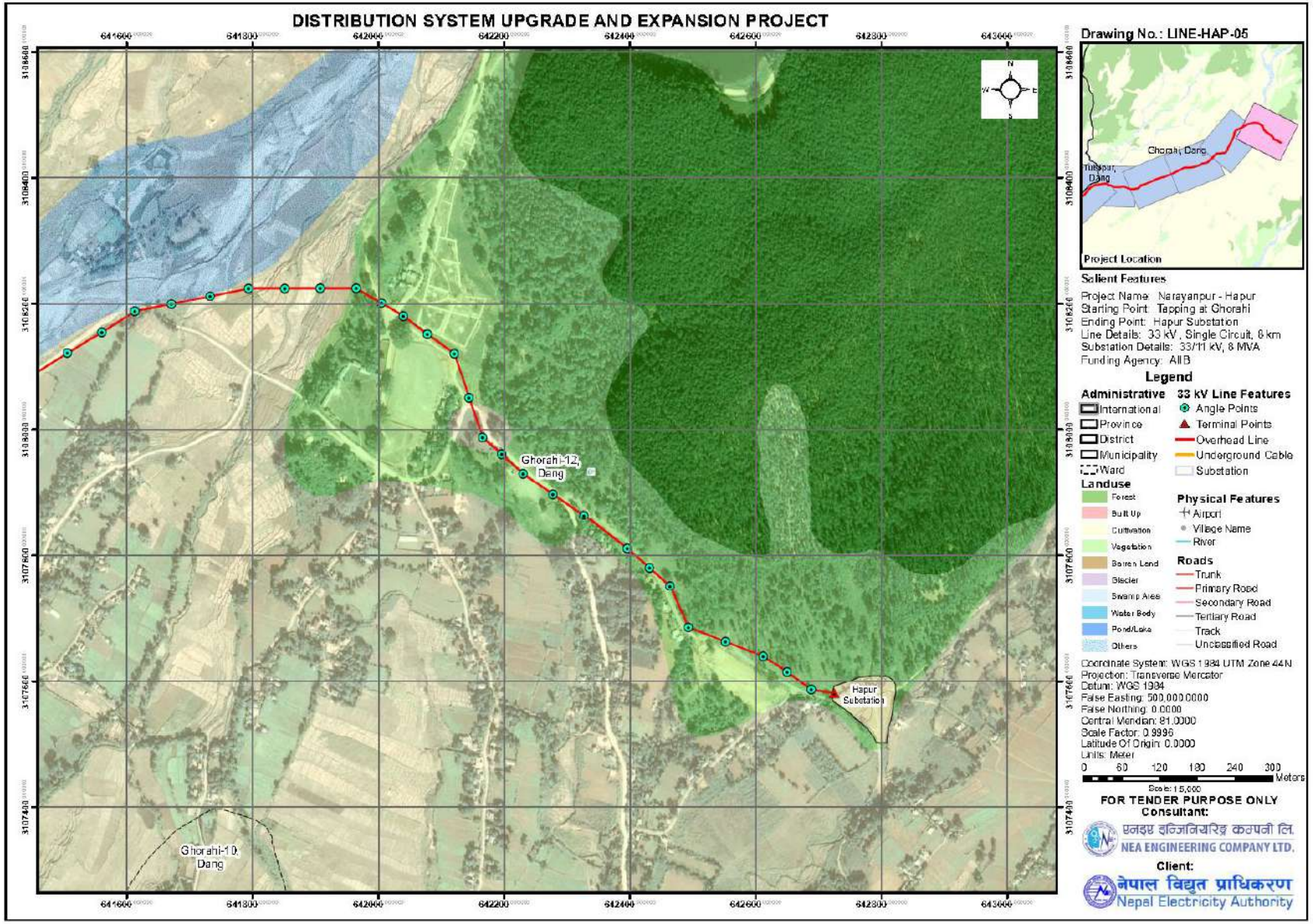
FOR TENDER PURPOSE ONLY
Consultant:
एनइए इन्जिनियरिङ्ग कम्पनी लि.
NEA ENGINEERING COMPANY LTD.
Client:
नेपाल विद्युत प्राधिकरण
Nepal Electricity Authority


DISTRIBUTION SYSTEM UPGRADE AND EXPANSION PROJECT
Drawing No.: LINE-HAP-05
Ghorahi-12, Dang
Ghorahi-10, Dang
Hapur Substation
Ghorahi, Dang
Tulsipur, Dang
Project Location
Salient Features
Project Name: Narayanpur - Hapur
Starting Point: Tapping at Ghorahi
Ending Point: Hapur Substation
Line Details: 33 kV, Single Circuit, 8 km
Substation Details: 33/11 kV, 8 MVA
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Airport
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Coordinate System: WGS 1984 UTM Zone 44N
Projection: Transverse Mercator
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FOR TENDER PURPOSE ONLY
Consultant:
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NEA ENGINEERING COMPANY LTD.
Client:
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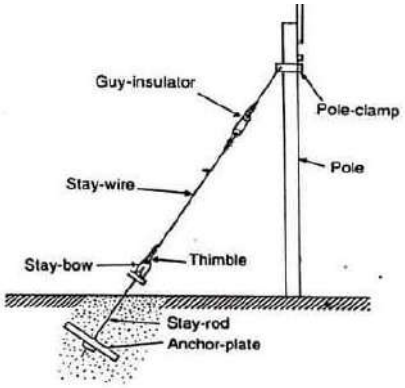
Nepal Electricity Authority

Annex 3: FACILITY AND COMPONENTS

Transformer

Switch Yard

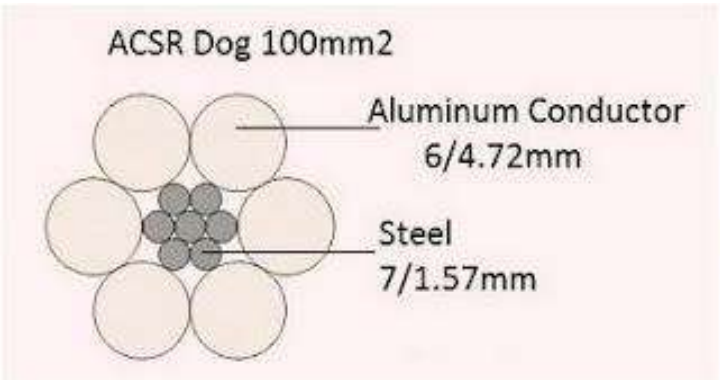


Stay/Guy Sets

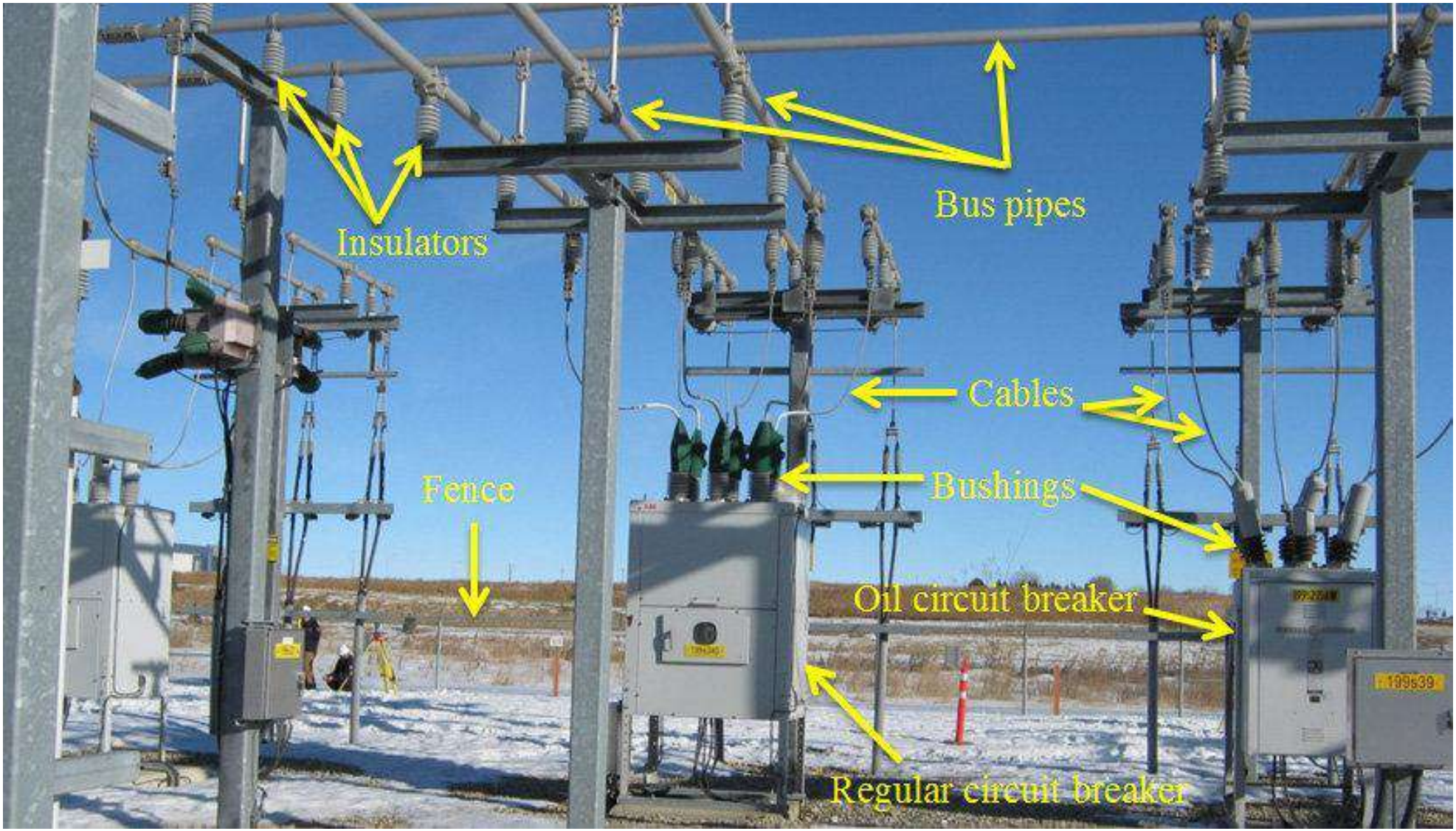
Steel Tubular Pole

Insulator

Civil-Structures Supporting Electrical Components



Conductor



Possible components within 33 kV/11 kV 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 4: LEGISLATIVE PROVISIONS

SN	Legal Provisions	Description	Relevancy concerning Project
1.	**Constitution of Nepal**	● The Constitution of Nepal is the main legal document, which emphasizes the right to a clean environment of the people, natural resources protection, preservation, and its prudent use. Rights regarding the clean environment, under article 30: ● It includes making multi-purpose development of water resources, while according priority to domestic investment based on public participation to ensure a reliable supply of energy affordably, and easily, 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 fulfill the rights of people to live in a clean environment along with fulfilling the basic needs by providing access to sufficient energy.
2.	**Environment Protection Act 2076 (2019 AD)**	● Section 3 of the Act requires the proponent to conduct environmental studies concerning the prescribed proposals of any developmental works. Subsection 2 of this act provides the framework for the environmental study report prepared according to sub-section (1) shall, in fulfillment of the process as prescribed, be submitted to the relevant bodies of the Government of Nepal for approval.	Environmental Studies, and approval of the report from the authorized body before construction of any project is mandatory to minimize the negative impacts in Nepal which is addressed in EPA, 2019.
3.	**Environmental Protection Rule, 2077 (2020 AD) [First Amendment on 2078 (2021)]**	● Under the Environmental Protection Rules (2020) first amendment (2021), 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 66 kV in forest land for another purpose.	This rule provides the overall guidance to what type of environmental studies is required according to the project by the Government of Nepal.
4.	**Nepal Environmental Policy, and**	The aims of NEPAP are: ● To manage natural, and physical resources efficiently, and sustainably	DSUEP should follow the aims of NEPAP to

	Action Plan, 2050(1993)	● To balance the development efforts, and environmental conservation for sustainable fulfillment 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 the adverse environmental impact of development projects, and human actions ● To integrate environment, and development through appropriate institutions, adequate legislation, and economic incentives, and sufficient public resources	protect, and conserve the physical, biological, and social environment during the construction of a 33 kV distribution line along with a substation.
5.	**Electricity Act 1992**	● No person shall be entitled to conduct survey, generation, transmission, or distribution of electricity without obtaining a license under this act. ● The Electricity Act of 1992 has the provision of land procurement for the development of Subprojects that involve electricity generation, transmission, or distribution. The Act states that the licensee may apply 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 a sufficient amount of electricity by constructing a 33 kV line, and substation by surveying to minimize the impacts.
6.	**Rural Energy Policy, 2006**	The rationale of formulating, and implementing this policy is to create a conducive environment that will self-motivate, and mobilize local institutions, rural energy user groups, non-government organizations, cooperatives, and private sector organizations 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 the promotion of such renewable energy technologies.	This project helps to improve the distribution, and motivate use the of electricity in rural areas of western Nepal.
7.	**Labor Act, 2074 (2017 AD)**	This labor Act was made under the management of parliament under sub-clause 1 of clause 296 of the 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 the prohibition of child labor in any organization,	The construction of a project is only possible when the rights of labor are secure. In this project, the contractor should

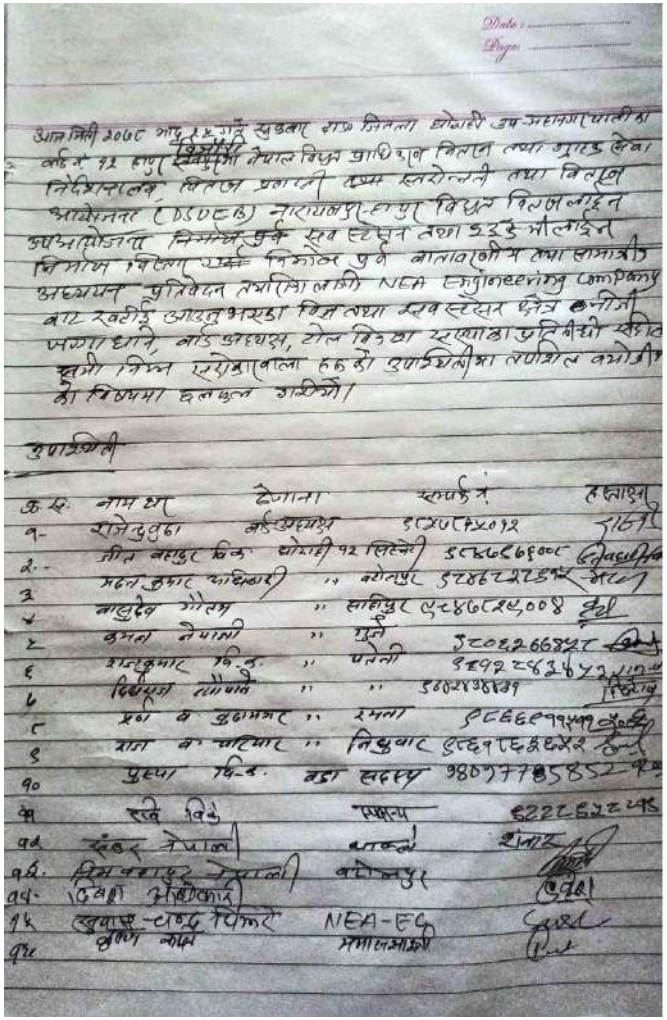
		and sub-section 6 of Section 2 states that there should not be any kind of discrimination among the employee's regard of religion, ethnicity, gender, origin, language, or intelligence or other kinds of characters.	follow this act strictly.
8.	**Child Labor (Prohibition, and Regulation) Act, 2056 (2000 AD)**	As per section 3 of this act, no child has not attained the age of 14 years shall be engaged in works as a laborer.	Child labor is strictly prohibited in this project, and contractors should follow this act.
9.	**Solid Waste Management Act, 2068 (2011 AD)**	This act has been formulated to minimize solid waste products from the target area by setting rules, and regulations on solid waste management (SWM) in the country to develop a better environment for the systematic, and effective management of solid waste, and to involve all the concerned stakeholders in SWM practice. The main features of this act are the discussion of the 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 saves the money which could be used for other infrastructure development. Section 4 of the act assigns the local body to manage or use the solid waste discharged or dumped in the collection center, transfer station, or treatment plant or collected during cleaning.	These acts provide the overall framework to manage the solid waste generated from households to the project level. Also, the proponent should manage the waste generated during construction.
10.	**Solid Waste Management Rules, 2070 (2013 AD)**	The solid waste management rule was formulated as per the provision made in article 50 of the 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 the segregation, and management of solid waste. It has been mentioned that it is essential to segregate degradable, and non-degradable solid waste at the source.	These rules provide the overall framework for how to reduce the volume of waste disposed of at the source during the construction of the substation.
11.	**Fifteenth Plan**	The vision of the 15th plan is to contribute to the prosperity of the nation through sustainable, and reliable development of hydropower by setting the goal which is to ensure energy security through intensifying hydropower generation. In addition, one of the strategies of the government of Nepal in	This 5-year interim plan sets the goal about the generation, and distribution of hydroelectricity in

		the 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:	Nepal which is directly related to this project.
12.	**United Nations Framework Convention on Climate Change (UNFCCC), 1992**	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, to minimize adverse effects on the economy, on public health, and the quality of the environment, of Subprojects or measures undertaken by them to mitigate or adapt to climate change. After it entered into force on 21 March 1994, it mandates the individual state for prioritization of resource conservation with development.	The goal of this project is to replace the traditional form of energy with clean energy i.e. electricity which ultimately reduces air pollution, and smoke.
13.	**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. Article 1 on the First Part of this convention mainly focused on the 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 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 provisions of this Convention apply.	Nepal is the part of ILO convention that's why ILO 169 should strictly follow during construction, and implementation of any types

		● 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.	
14.	**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 Financiers' 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
15.	**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
16.	**Environmental and Social Standards of AIIB** [13]	● Three associated mandatory environmental and social standards (ESSs) set out more detailed environmental and social requirements relating to the ESMP	ESMP requirement

[13] *https://www.aiib.org/en/policiesstrategies/download/environmentframework/20160226043633542.pdf*

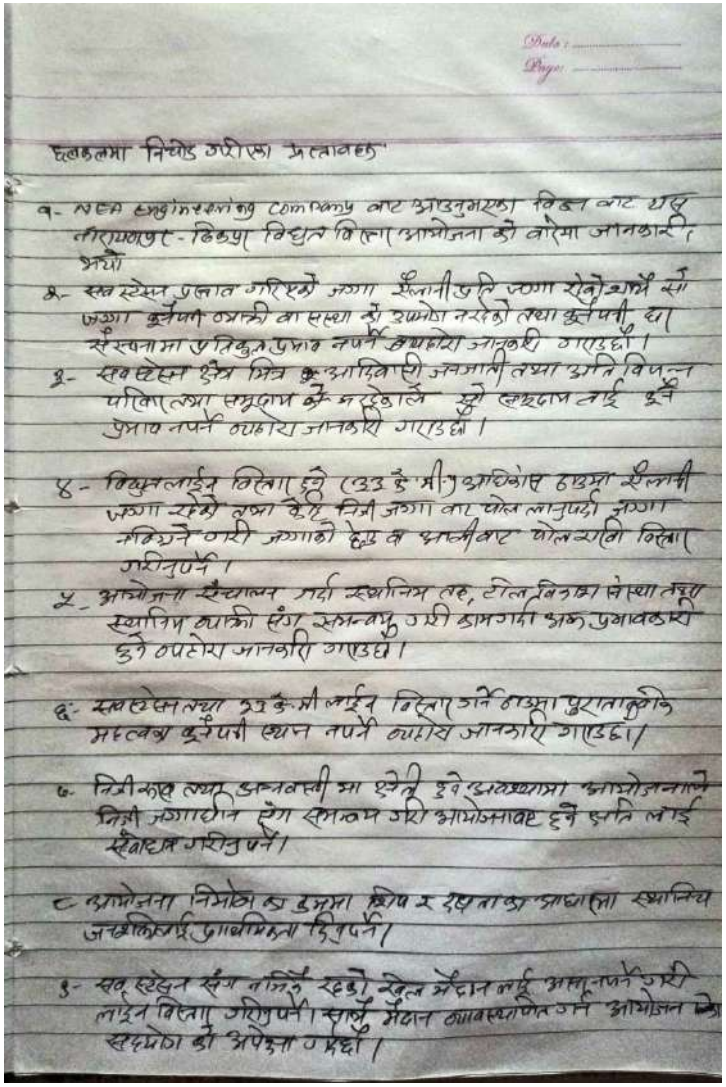
Annex 5: CONSULATATION MEETING MINUTES



आज मिति २०७८ साउन १६ गते सुक्रवार साझ जितला छोटारी उप-महानगरपालिका वडा नं १२ स्थित विद्युत प्राधिकरण जितला तथा गुराहु क्षेत्र निर्देशनालय जितला प्रमुख इन्जिनियर ज्यूज्यू तथा जितला आयोजनाहरु (DSUEP) नारायणपुर-हापुर विद्युत जितला लाईन उपआयोजना निर्माणको पुर्व स्थल स्टेडियम तथा ३३ के.भी लाईन निर्माण जितला उक्त निर्माणको पुर्व वातावरणीय तथा सामाजीक अध्ययन प्रतिवेदन तयारीका लागी NEA Engineering Company Pvt. Ltd. ओपतु भएका जितला तथा स्थल स्टेसन क्षेत्र वनीजी जग्गा धानेे, बाँडफाडमा, टोल छिमेका सरोकारवाला हरु को उपस्थितीमा तपशिल बमोजीम को विषयमा छलफल गरियो।

उपस्थिती

क्र.सं.	नाम थर	ठेगाना	सम्पर्क नं.	हस्ताक्षर
१-	राजेन्द्र पुतुवा	वडाध्यक्ष	९८५०८९५०१२	
२-	जीत बहादुर विक	योगाली १२ छिमेकी	९८४८८६९००८	
३	मदन कुमार अधिकारी	" नयेनपुर	९८४८५२८३९२	
४	बालुदेव गौतम	" सानिपुर	९८४८८२९,००९	
५	कमला नेपाली	" पुर्ने	९८०९२८६३४८	
६	रामकुमार फि.ब.	" पर्तनी	९८९२८९३४५४	
७	विश्वराज लौगाले	" "	९८०२४३८३७१	
८	प्रेम ब. कुढामगर	" रमला	९८६६८१९५१०	
९	राम ब. चाटमार	" निकुवार	९८६१८६६५२	
१०	पुष्पा फि.ब.	बडा सदस्य	९८०१७१८५८५२	
११	हरि विके	स्थानिय	९८२८६२८५४९	
१२	दंडर नेपाली	धाकुले	शंकर	
१३	विम बहादुर नेपाली	बोगेनपुर		
१४	दिबा अधिकारी			
१५	खुवाङ-चन्दु फिल्टर	NEA-EC		
१६		समाजसाझी		



छलफलमा निर्णय गरीएका प्रस्तावहरु

१- NEA Engineering Company Pvt. Ltd. आउनुभएका विद्युत लाईन नारायणपुर-हिरापुर विद्युत विस्तार आयोजना को बारेमा जानकारी गराउने।

२- सब स्टेसन प्रस्तावित जग्गा ईलाकी प्रति जग्गा रोक्नु पर्ने जग्गा कुनैपनी व्यक्ती वा संस्था को हकभोग नरहेको तथा कुनै पनी दावा संस्थानमा प्रतिकुल प्रभाव नपर्ने बारेमा जानकारी गराउने।

३- सब स्टेसन ईत्र भित्र कुनै आदिवासी जनजाती तथा अति विपन्न परिवार तथा समुदाय को नरहेको लागी सुनी छहारपाई हुने प्रभाव नपर्ने बारेमा जानकारी गराउने।

४- विद्युत लाईन विस्तार हुने ९३३ के.भी आधिकांस हाम्रा ईलाकी जग्गा रहेको तथा के.हु निजी जग्गा बाट पोल लाग्नुपर्ने जग्गा नक्सिने गरी जग्गाको हुनु वा बाली बाट पोल सारी दिने प्रस्ताव गरिनुपर्ने।

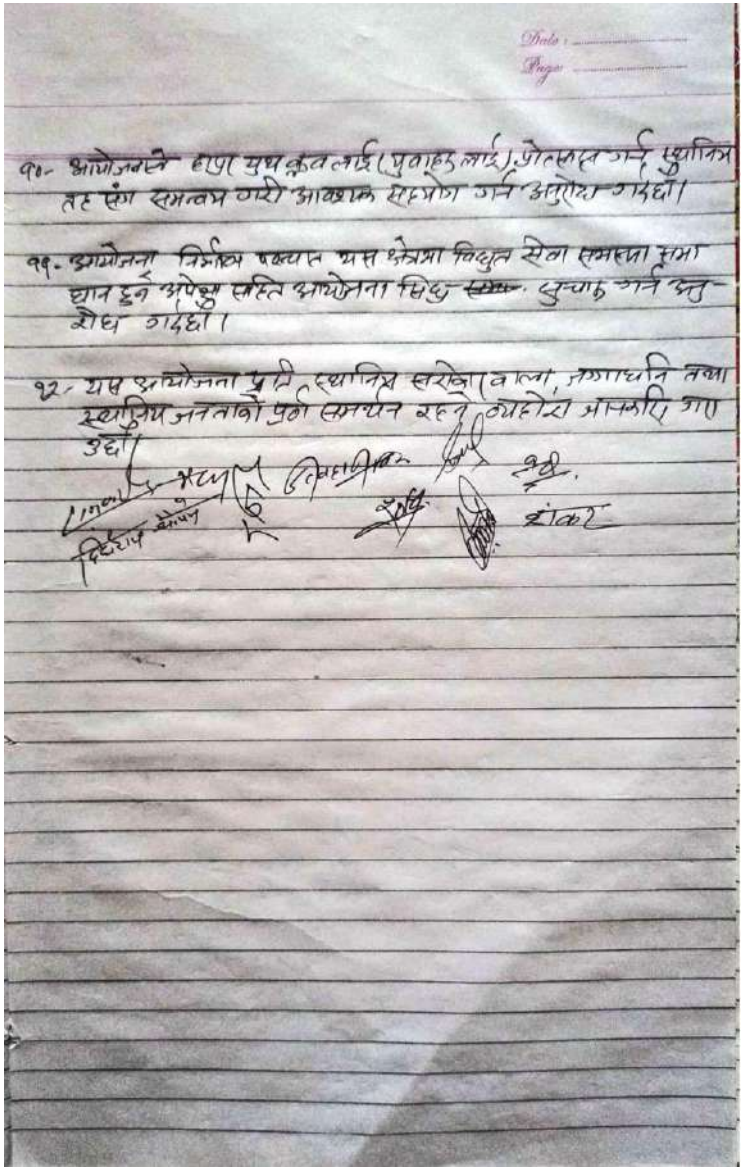
५- आयोजना स्थानान्तर गर्दा स्थानिय तह, टोल विकास संस्था तथा स्थानिय व्यक्ती संग समन्वय गरी हाम्रो गर्दा अक प्रभावकारी हुने बारेमा जानकारी गराउने।

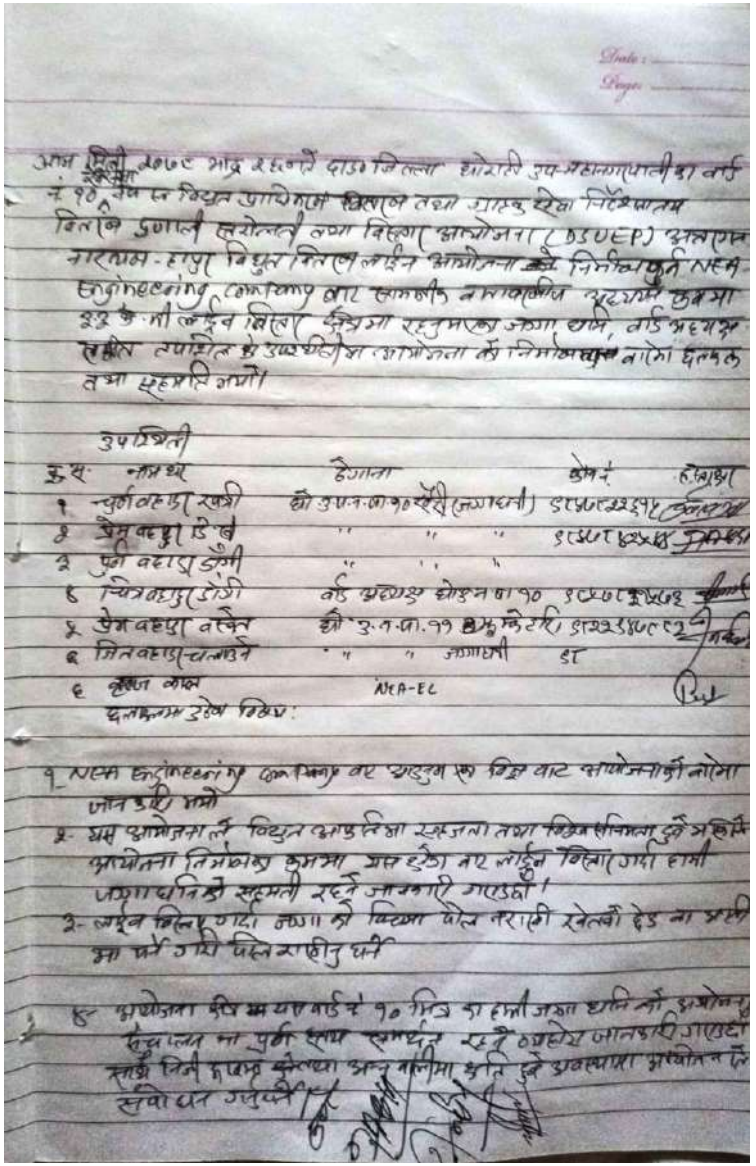
६- सब स्टेसन तथा ३३ के.भी लाईन विस्तार गर्ने हाम्रा पुरातात्विक महत्वका कुनैपनी स्थान नपर्ने बारेमा जानकारी गराउने।

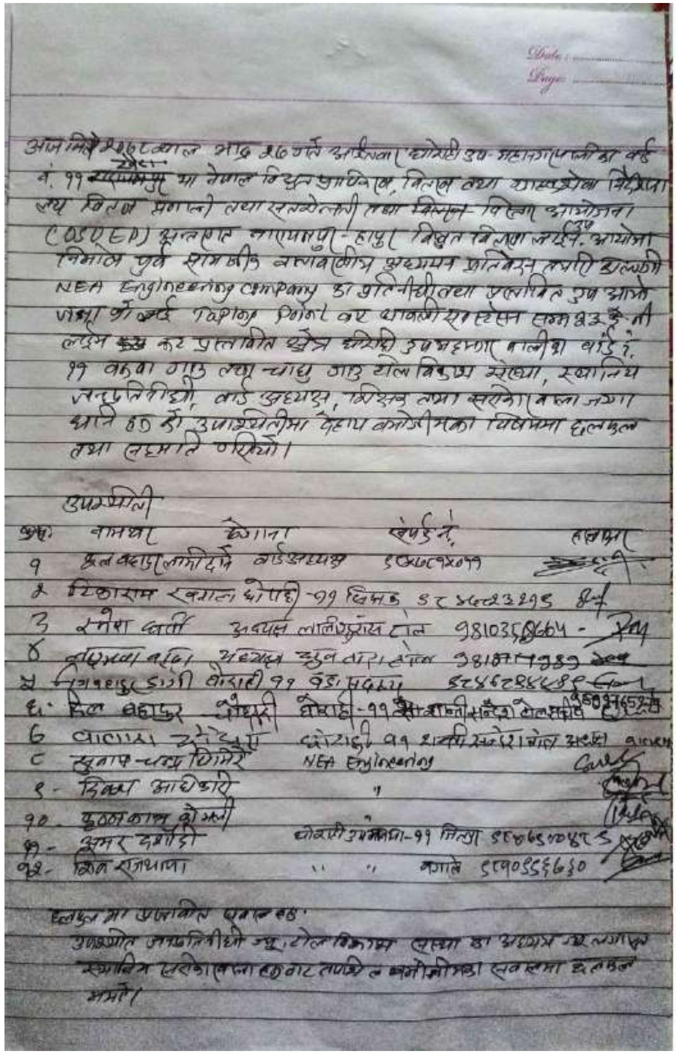
७- निजी घर तथा बस्तीबाट भा एकैपटी हुने प्रभावग्रस्तता आयोजनाले निजी जग्गाहरुमा हुने क्षतिपुर्ण गरी आयोजनाबाट हुने क्षति लाई सहयोग गरिनुपर्ने।

८- आयोजना निर्माण का क्रममा स्थिर र दक्षता का आधारमा स्थानिय जनशक्तिलाई प्राथमिकता दिनुपर्ने।

९- सब स्टेसन संग नजिकै रहेको खेलका मैदान लाई आवश्यकता गरी लाईन विस्तार गरिनुपर्ने। साथै मैदान व्यवस्थापन गर्न आयोजना को सहयोग को अपेक्षा गरेको।





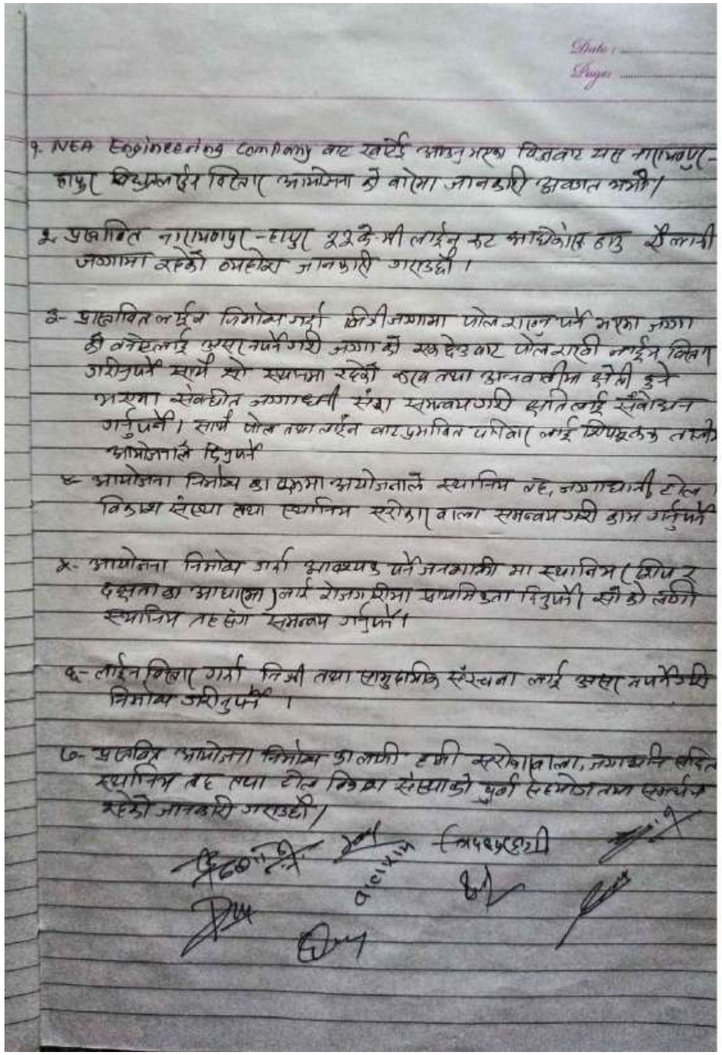


आज मिति २०८० साल भाद्र २८ गते अर्जुनधारा (घोराही) उप-महानगरपालिकाको वडा नं. ११ दोस्ता मा नेपाल विद्युत प्राधिकरण, वितरण तथा ग्राहक सेवा निर्देशनालय वितरण प्रणाली तथा स्तरोन्नती तथा विस्तार विद्युत आयोजना (DSUEP) अन्तरगत नारायणपुर-हापुर विद्युत वितरण लाइन उप आयोजना निर्माण पूर्व सामाजिक वातावरणीय व्यवस्थापन प्रतिवेदन तयारी कार्यको NEA Engineering Company का प्रतिनिधी तथा प्रस्तावित उप आयोजनाको लागि Tapping Point वट धाकडी सब स्टेसन सम्म ३३ के.भी. लाइन कर प्रस्तावित क्षेत्र घोराही उपमहानगरपालीका वार्ड नं. ११ वडा गाउँ तथा चाँदु गाउँ टोल विकास संस्था, स्थानिय जनप्रतिनिधी, वडा अध्यक्ष, शिक्षक तथा सरोकारवाला जग्गा धनि हरुको उपस्थितीमा देहाय बमोजिमका विषयमा छलफल तथा सहमति गरियो।

उपस्थिती

क्र.स.	नामथर	ठेगाना	सम्पर्क नं.	हस्ताक्षर
१	फुलबहादुर लामीछाने	वडाअध्यक्ष	९८५७८१२०११	
२	टिकाराम रवाल	घोराही-११ शिक्षक	९८५७८२३२९६	
३	रमेश खत्री	अध्यक्ष लालीगुराँस टोल	९८१०३५८६६४	
४	[illegible]	अध्यक्ष फुलबारी टोल	९८१८७११७३७	
५	मिनबहादुर डाँगी	घोराही ११ [illegible]	९८४६८९४४८६	
६	हिम बहादुर चौधरी	घोराही-११ सचिव शान्ती सन्देश टोल सचिव	९८०९७६५२८	
७	बालाराम चौधरी	घोराही ११ शान्ती सन्देश टोल अध्यक्ष	[illegible]	
८	सुनाफ चन्द्र घिमिरे	NEA Engineering		
९	विकास अधिकारी	"		
१०	फुलकान्त कोइराली	"		
११	अमर दमाँई	घोराही उपमहानगरपालिका-११ जिल्ला	९८४८६५७०४८५	
१२	विष्णु राजथापा	" " बगाले	९८४०३५३६३०	

छलफल मा प्रस्तावित एजेन्डाहरु:
उपस्थित जनप्रतिनीधी ज्यू, टोल विकास संस्था का अध्यक्ष ज्यू लगायत स्थानिय सरोकारवाला हरु बाट तपसिल बमोजिमका सवालमा छलफल भयो।



१. NEA Engineering Company बाट खटिई आउनुभएका व्यक्तिबाट यस नारायणपुर-हापुर विद्युत लाईन वितरण आयोजना को बारेमा जानकारी प्राप्त भयो।

२. प्रस्तावित नारायणपुर-हापुर ३३ के.भी. लाईनको रुट आसपास रहेका टोलवासी जग्गामा रहेको व्यहोरा जानकारी गराइयो।

३. प्रस्तावित लाईन निर्माण गर्दा निजी जग्गामा पोल गाड्नुपर्ने भएमा जग्गाधनीलाई असर नपर्ने गरी जग्गाको एक छेउबाट पोल गाडी लाईन बिछ्याउनुपर्ने साथै सो स्थानमा रहेको रुख तथा अन्नबालीमा क्षति हुने भएमा सम्बन्धित जग्गाधनी संग समन्वय गरी क्षतिलाई सम्बोधन गर्नुपर्ने। साथै पोल तथा लाईन बाट प्रभावित परिवारलाई क्षतिपूर्ति [illegible] आयोजनाले दिनुपर्ने

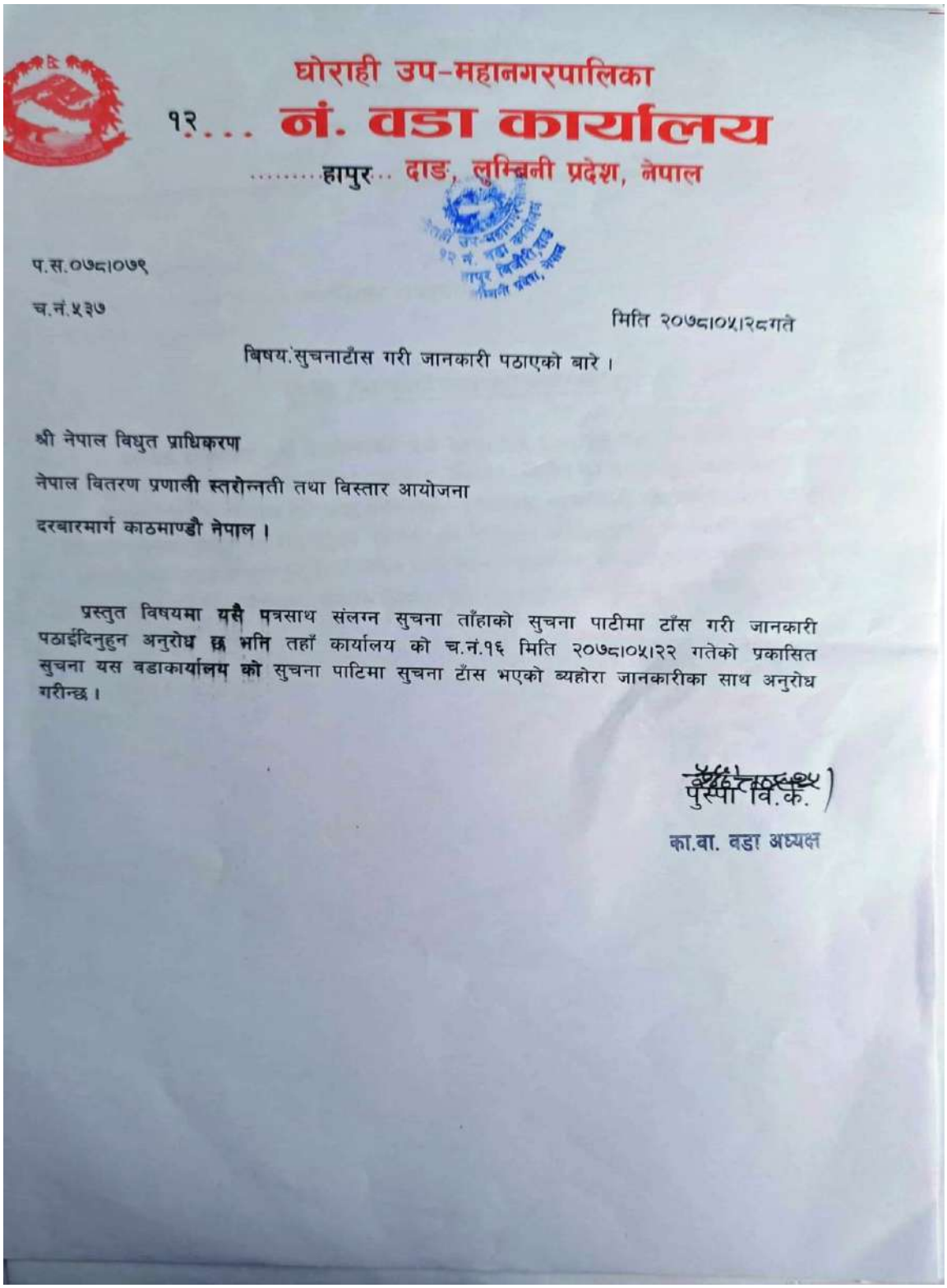
४. आयोजना निर्माण का क्रममा आयोजनाले स्थानिय तह, जग्गाधनी टोल विकास संस्था तथा स्थानिय सरोकारवाला समन्वय गरी काम गर्नुपर्ने

५. आयोजना निर्माण गर्दा आवश्यक पर्ने जनशक्ती मा स्थानिय (सिप र दक्षताका आधारमा) लाई रोजगारीमा प्राथमिकता दिनुपर्ने सो को लागी स्थानिय तह संग समन्वय गर्नुपर्ने।

६. लाईन विस्तार गर्दा निजी तथा सामुदायिक संरचना लाई असर नपर्नेगरी निर्माण गरिनुपर्ने।

७. प्रस्तावित आयोजना निर्माण का लागी हामी सरोकारवाला, जग्गाधनि सहित स्थानिय तह तथा टोल विकास संस्थाको पुर्ण सहयोग तथा समर्थन रहेको जानकारी गराउँदछौं।

Annex 6: DEED OF ENQUIRY (MUCHULKAS)



घोराही उप-महानगरपालिका

१२... नं. वडा कार्यालय

.....हापुर... दाङ, लुम्बिनी प्रदेश, नेपाल

प.स.०७८।०७९

च.नं.५३७

मिति २०७८।०५।२८गते

विषय:सुचनाटाँस गरी जानकारी पठाएको बारे ।

श्री नेपाल विधुत प्राधिकरण

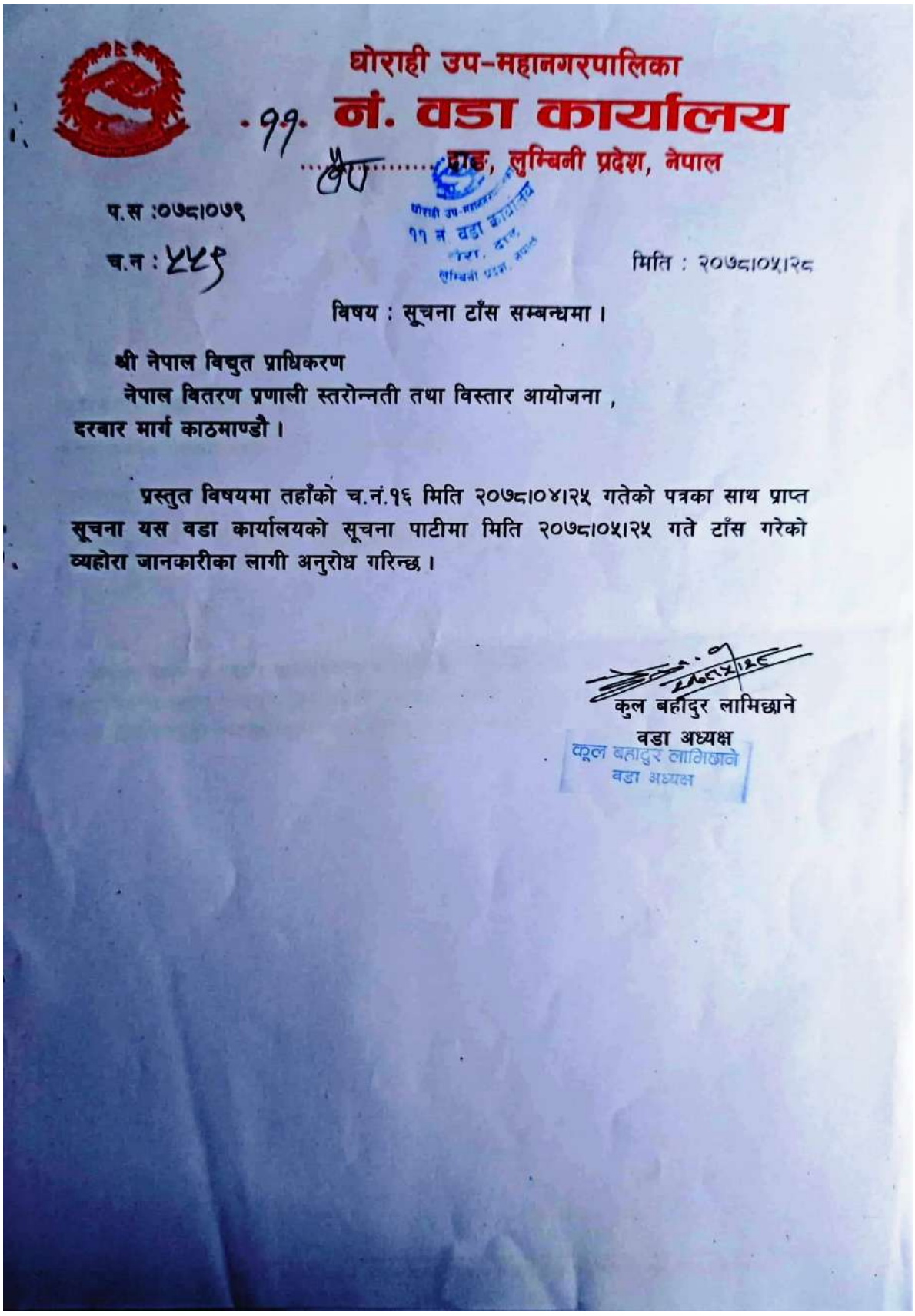
नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना

दरबारमार्ग काठमाण्डौ नेपाल ।

प्रस्तुत विषयमा यसै पत्रसाथ संलग्न सुचना ताँहाको सुचना पाटीमा टाँस गरी जानकारी पठाईदिनुहुन अनुरोध छ भनि तहाँ कार्यालय को च.नं.१६ मिति २०७८।०५।२२ गतेको प्रकासित सुचना यस वडाकार्यालय को सुचना पाटिमा सुचना टाँस भएको व्यहोरा जानकारीका साथ अनुरोध गरीन्छ ।

पुस्पा वि.क.

का.वा. वडा अध्यक्ष



घोराही उप-महानगरपालिका

नं. वडा कार्यालय

दाङ, लुम्बिनी प्रदेश, नेपाल

प.स :०७८।०७९

च.न : ४४९

मिति : २०७८।०५।२८

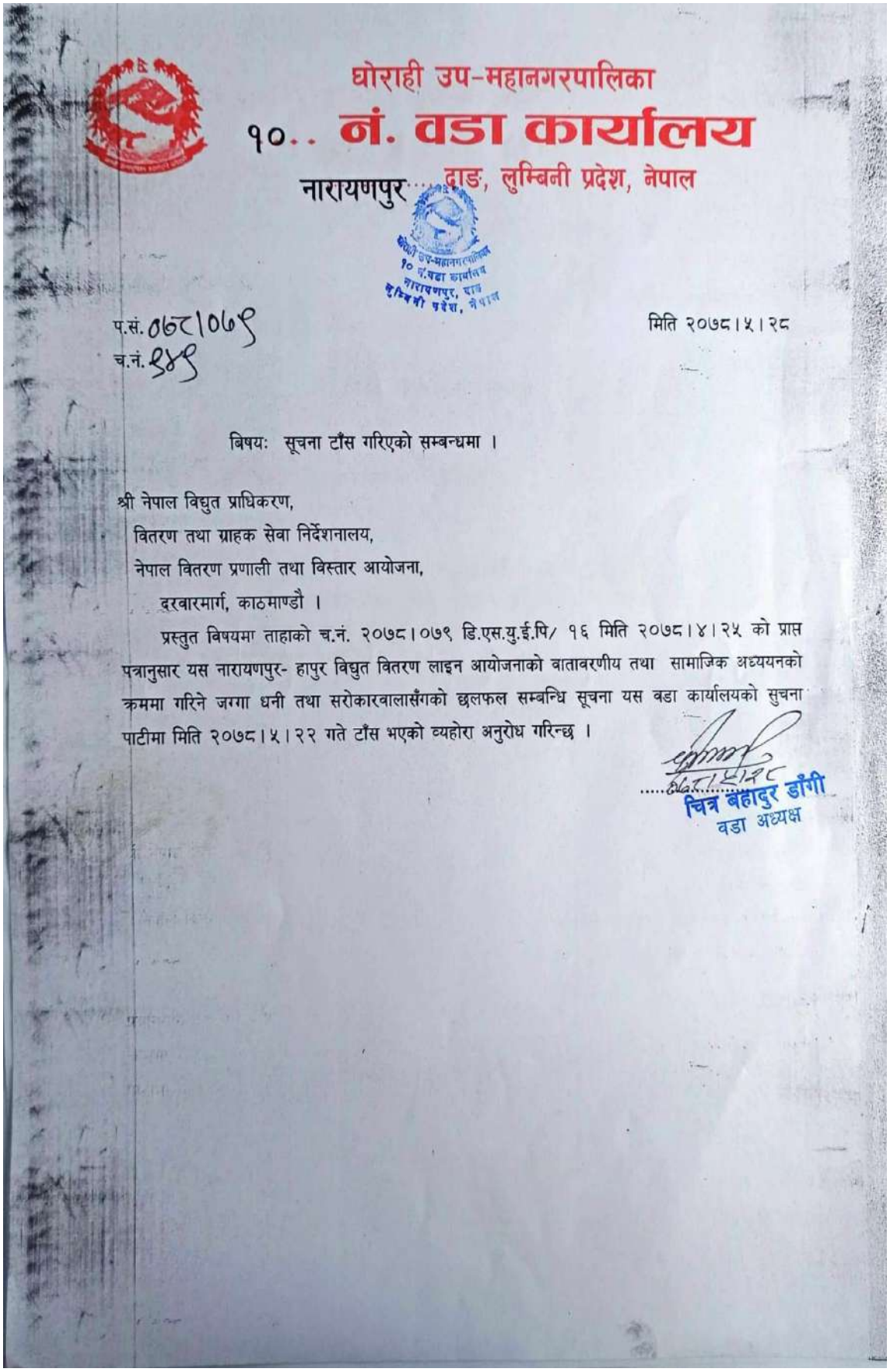
विषय : सूचना टाँस सम्बन्धमा ।

श्री नेपाल विद्युत प्राधिकरण
नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना ,
दरबार मार्ग काठमाण्डौ ।

प्रस्तुत विषयमा तहाँको च.नं.१६ मिति २०७८।०४।२५ गतेको पत्रका साथ प्राप्त सूचना यस वडा कार्यालयको सूचना पाटीमा मिति २०७८।०५।२५ गते टाँस गरेको व्यहोरा जानकारीका लागी अनुरोध गरिन्छ ।

कुल बहादुर लामिछाने
वडा अध्यक्ष

कुल बहादुर लामिछाने
वडा अध्यक्ष



घोराही उप-महानगरपालिका

१०.. नं. वडा कार्यालय

नारायणपुर.... दाङ, लुम्बिनी प्रदेश, नेपाल

घोराही उप-महानगरपालिका
१० नं.वडा कार्यालय
नारायणपुर, दाङ
लुम्बिनी प्रदेश, नेपाल

प.सं. ०७८।०७९
च.नं. ४४९

मिति २०७८।५।२८

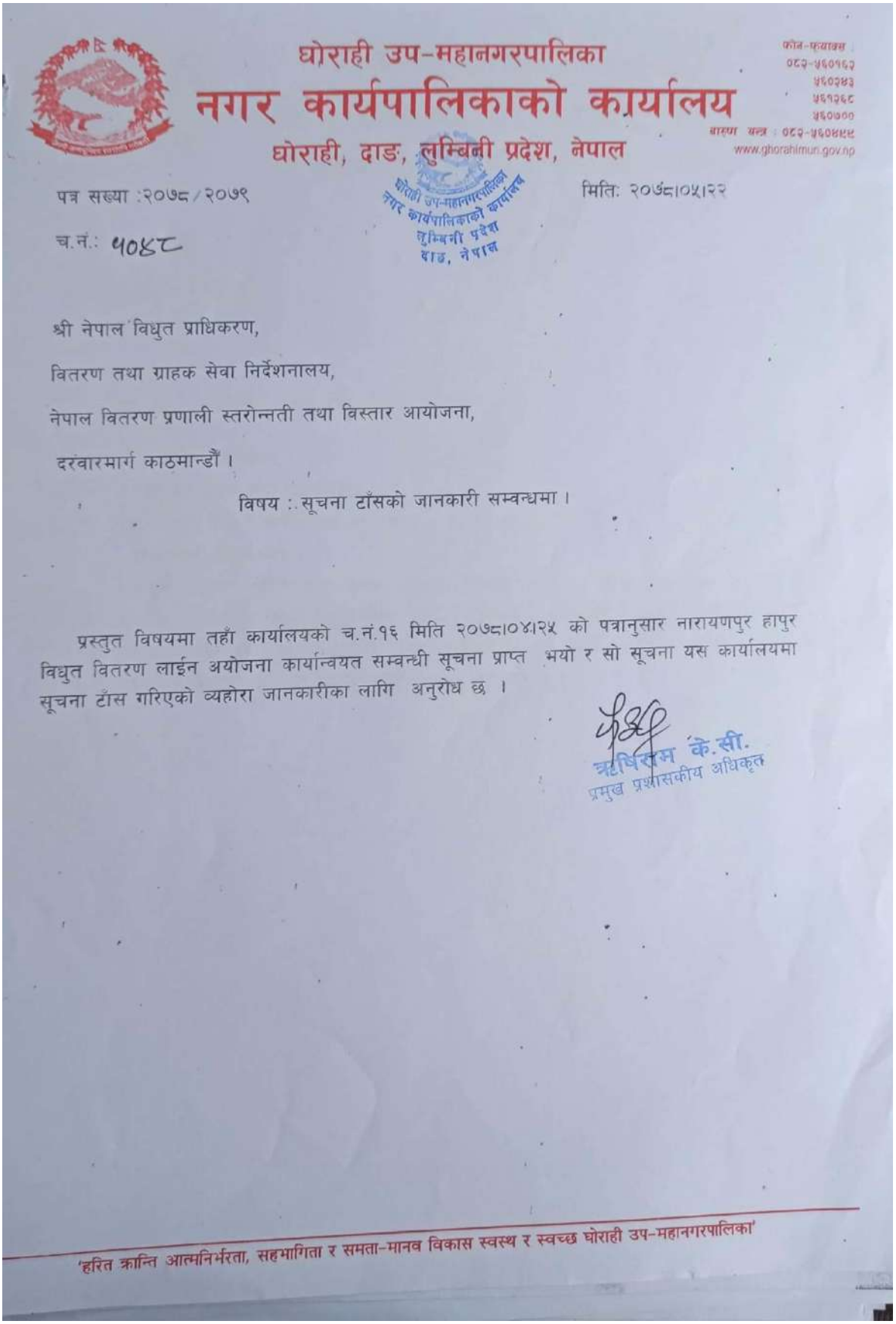
बिषय: सूचना टाँस गरिएको सम्बन्धमा ।

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

प्रस्तुत विषयमा ताहाको च.नं. २०७८।०७९ डि.एस.यु.ई.पि/ १६ मिति २०७८।४।२५ को प्राप्त पत्रानुसार यस नारायणपुर- हापुर विद्युत वितरण लाइन आयोजनाको वातावरणीय तथा सामाजिक अध्ययनको क्रममा गरिने जग्गा धनी तथा सरोकारवालासँगको छलफल सम्बन्धि सूचना यस वडा कार्यालयको सुचना पाटीमा मिति २०७८।५।२२ गते टाँस भएको व्यहोरा अनुरोध गरिन्छ ।

२८।५।७८

चित्र बहादुर डाँगी
वडा अध्यक्ष



घोराही उप-महानगरपालिका

नगर कार्यपालिकाको कार्यालय

घोराही, दाङ, लुम्बिनी प्रदेश, नेपाल

फोन-फ्याक्स : ०८२-५६०१६२, ५६०३४३, ५६१२६८, ५६०७००

बाह्रण यन्त्र : ०८२-५६०४४९

www.ghorahimun.gov.np

पत्र सङ्ख्या :२०७८/२०७९

च.नं.: ५०४८

घोराही उप-महानगरपालिका नगर कार्यपालिकाको कार्यालय लुम्बिनी प्रदेश दाङ, नेपाल

मिति: २०७८।०५।२२

श्री नेपाल विद्युत प्राधिकरण,

वितरण तथा ग्राहक सेवा निर्देशनालय,

नेपाल वितरण प्रणाली स्तरोन्नती तथा विस्तार आयोजना,

दरबारमार्ग काठमान्डौं ।

विषय : सूचना टाँसको जानकारी सम्बन्धमा ।

प्रस्तुत विषयमा तहाँ कार्यालयको च.नं.१६ मिति २०७८।०४।२५ को पत्रानुसार नारायणपुर हापुर विद्युत वितरण लाईन अयोजना कार्यान्वयत सम्बन्धी सूचना प्राप्त भयो र सो सूचना यस कार्यालयमा सूचना टाँस गरिएको व्यहोरा जानकारीका लागि अनुरोध छ ।

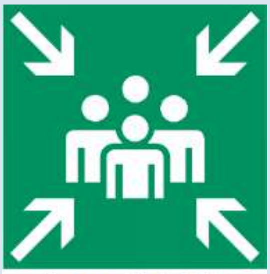
ऋषिराम के.सी.
प्रमुख प्रशासकीय अधिकृत

'हरित क्रान्ति आत्मनिर्भरता, सहभागिता र समता-मानव विकास स्वस्थ र स्वच्छ घोराही उप-महानगरपालिका'

Annex 7: SAFETY RELATED SIGNS AND WASTE MANAGEMENT PRACTICES

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 साधनविना यो उपकरण सञ्चालन गर्न निषेध

INSTRUCTION SIGNS

Do Not Touch

Food and Drinks Prohibited

Slow Sign for Traffic Control
बिस्तारै जानुहोस्

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 जुत्ता आवश्यक


निर्माणस्थलमा गर्नहुने र नहुने कुराहरु


निर्माणस्थलमा गर्नहुने र नहुने कुराहरु

Annex 8: PHOTOGRAPHS

North & South View of Narayanpur-Hapur Substation Area

Stakeholders during Public Consultation cum FGD Meeting at Ghorahi SMC, Dang

Tapping Point at Khaira, DL Passes from Khola side Road at the Left Bank of the Hapur Khola, the DL Passes from the Cultivation, the DL Passes from the Roadside at the Pokhara, End Substation Land at Makundanda

Stakeholders during Public Consultation cum FGD Meeting at Ward Office-12, Ghorahi SMC

Tapping Point at Hapur Khola, Line Passes from the Cultivation Land Near the Hapur Khola, Left Side of The Road Side at Community Forest, Line Near at the End Substation, Gentle Slope of End Substation