

NEPAL ELECTRICITY AUTHORITY

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN OF GRID TIED SOLAR POWER PROJECT, BLOCK NO. 5, COFFEE AREA-II NUWAKOT (6.5MW)



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March, 2021

ABBREVIATIONS AND ACRONYMS

BS	:	Bikram Sambat (Nepali Era)
CITES	:	Convention on International Trade In Endangered Species of Wild Fauna and Flora
CF	:	Community Forest
CSP	:	Community Support Program
DADO	:	District Agriculture Development Office
DCC	:	District Coordination Committee
DFO	:	Division Forest Office
DoED	:	Department of Electricity Development
ESMF	:	Environment and Social Management Framework
ESMP	:	Environment and Social Management Plan
EPR	:	Environment Protection Rules, 2020
ESSD	:	Environment and Social Studies Department
FY	:	Fiscal Year
GoN	:	Government of Nepal
GSEEP	:	Grid Solar and Energy Efficiency Project
GTSP	:	Grid Tied Solar Power Project
GRC	:	Grievance Redress Cell
GRM	:	Grievance Redress Mechanism
HHs	:	Households
IEE	:	Initial Environmental Examination
IP	:	Indigenous People
IUCN	:	International Union for Conservation of Nature
MoEn	:	Ministry of Energy (the then)
MoEWRI	:	Ministry of Energy, Water Resource and Irrigation
MW	:	Mega Watt
NAAQS	:	National Ambient Air Quality Standard
NEA	:	Nepal Electricity Authority
NPWCA	:	National Park and Wildlife Conservation Act
PAF	:	Project Affected Family
PAS	:	Project Affected Settlement
PM	:	Particulate Matter
PMO	:	Project Management Office
PV	:	Photovoltaic
TSP	:	Total Suspended Particle
VDC	:	Village Development Committee (the then)
WB	:	World Bank

Units

cft	:	cubic feet
dB	:	decibel
ha	:	Hectare
kg	:	kilogram
km	:	Kilometer
kV	:	Kilo Volt
m	:	meter
masl	:	meters above mean sea level
m ²	:	Square meter
MW	:	Megawatt

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1 INTRODUCTION

1.1 Background

Nepal with the installed capacity of 1332.858MW power generation connected to the national grid vis a vis a higher level of annual peak demand which stood at 1407.94 MW in 2076-05-23 suffers from power shortage in terms of peak demand every year (source: Annual Report, NEA, 2019/20). The Government of Nepal has emphasized the development of other potential resources particularly the renewable energies such as biomass, biogas, solar and wind along with hydropower for the production of electricity in order to meet the growing energy demand of the country in short term as well as long-term basis. To solve the present energy crisis, and enhance the energy network system of the country, Government of Nepal (GoN) has allocated budget under the title of “Renewable Energy and Capacity Expansion Project” under the soft loan of the World Bank (WB) and co-financing of the GoN in the fiscal year 2071/72. So, Nepal Electricity Authority (NEA), government owned institution has initiated the exploration of sites for the solar power development under project **Grid Tied Solar Power Project (GTSP)**. **According to survey license obtained from Department of Electricity (DoED), project is entitled as Grid Tied Solar Power Project, Block No 5, Nuwakot. It will be under Grid Solar and Energy Efficiency Project (GSEEP).** This is one of the major projects to produce electricity through solar energy (renewable energy) and thus strengthen and meet growing electricity demand of Nepal. The project produces clean and pollution free energy and thus is environment friendly.

1.2 Project Description

The project site Block No 5: Coffee area-II of Devighat powerhouse (PH), is selected for installation of PV solar farm house with a capacity of 6.5MW. The project site is located in Coffee area of Bidur Municipality-12, Nuwakot District of Bagmati Province of Nepal. The name of the settlement around the project area is Gauribesi. A total of 10.59 ha land will be required for the project, which is already owned by NEA for the construction of Devighat Hydro power project in FY 2036/37 (1984 AD). In the Coffee area-II there are two plots separated by coffee plantation area. The distance between two plots is 235 m. The northern plot has area coverage of 7.13ha. The southern part is separated by the canal in between having area coverage above the canal of 2.8ha and area coverage of 0.66ha below the canal.

The project site has sub-tropical climate, influenced by monsoon rains (June-September) and has summer months from March to May. The site has easy access to road as well as water resource. It is an open terraced land sloping south at an angle of about 30°. There is no natural forest within the site, no permanent structures and any monuments of historical nature and of religious importance within the site. Construction of guard house, water tank, toilets, temporary labor camp and storage camp will be required for the project. The solar farms including guard house will be fenced with chain-link and barbed wire on Y steel posts.

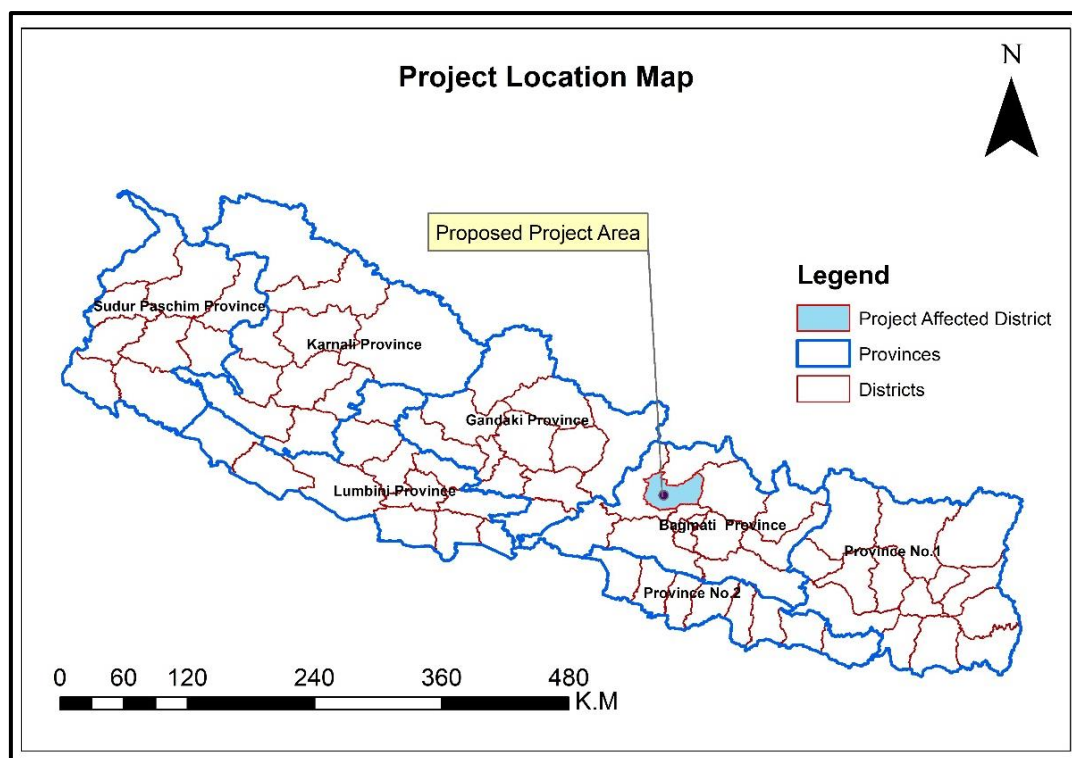


Figure 1-1: Project Location Map

Source: GIS Analysis

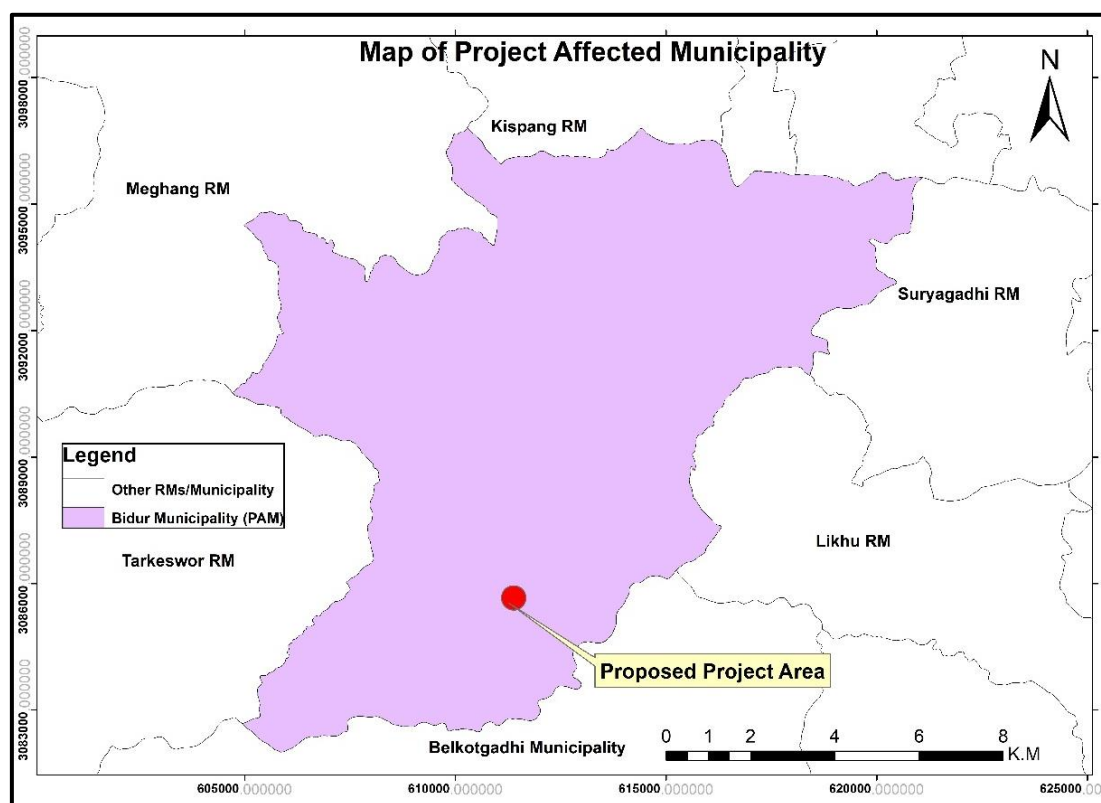


Figure 1-2: Project Affected Bidur Municipality showing Coffee Area II

Source: GIS Analysis



Figure 1-3: Google image of Coffee area-II

Source: Google Image

1.3 Construction Planning

The implementation of the proposed project comprises installation, erection, testing and commissioning works of solar panels. The estimated years of project completion is one (1) year.

1.3.1 Preliminary Works

Preliminary works for the proposed project consist of contract award, the detail design study and mobilization of the contractors. The detail design study will carry out the spotting of solar panels, preparation of longitudinal profiles, geological field test and laboratory testing, etc. Contractor will be responsible for the construction of ancillary structures like guard house, water tank, toilets, temporary labor camp and storage camp.

1.3.2 Land

The project requires approximately 10.59ha of land for solar panels erection and other physical facilities. For the erection of solar panels, approximately 8.58ha land will be needed and the remaining 2.01ha land will be used for other physical facilities such as construction of guard house, tank, inverter/transformer and so on. Since the area is under the ownership of NEA, there is no need to acquire land from the public. The land is predominantly barren land covered mostly with shrubs/bushes and some trees. The area does not fall under NEA's leased coffee

plantation area; thus, they will not be affected by the construction of the project. Since, these people have their own land for farming, the impact of the project will not be significant. In the same way, there is enough land under NEA around the area, thus the storage facilities shall be done within its own land.

1.3.3 Requirement of Workforce

During the stages of the construction period of the project, total manpower requirement is given in the table below:

Altogether approximately 201 people (192 people construction phase and 9 people operation phase) will be employed including 94 unskilled, 81 semi-skilled and 26 skilled human resources. Most of the unskilled manpower will be hired locally based on health and experiences in similar construction environments. An estimated 80-85 individuals will be hired locally, among these workers 50% will be local Indigenous People (Ips) and will be complemented by 10-15 migrant workers. Project assure that contractor provide proper accommodation for these migrant workers. The workforce will be used for a maximum of eight months during construction period.

Table 1-1: Manpower requirement for the project

Phase/Components	Manpower							Remarks
	Unskilled	Semi-skilled		Skilled				
				Civil		Electrical		
		Porter	Forman	Mason	Engineer	Overseer	Engineer	
Construction Phase								
Guard House	10	2	4	1	1			required to execute concrete casting works
Water Tank	20	2	6	1	2			required to support concrete casting works
Piles installation Works	16	4	8	2	3			
ITS Foundation	10	1	3	1	1			
Drainage Works	10	2	6	1	1			
Road Construction Works	12	2	4	1	1			
Mounting structures and PV module installation	16	10	22	1	2	1	2	
Operation Phase								
Project operation phase		2	3			2	2	

Source: GTSP

1.3.4 Materials

The main materials required for construction works related with the solar farm project will be as follows:

- Solar modules; Polycrystalline (pc-Si)
- Inverters (String/Central)
- Power supply
- Mounting Structures
- Aggregate
- Cement
- Sand
- Water

The requirement of the project materials is presented in the following table.

Table 1-2: Materials required during construction of the project

S.N.	Construction materials	Unit	Quantity of Construction Materials
1	Solar Panel	No.	23,694
2	Aggregates	m ³	514
3	Steel	metric ton	16
4	Cement	Bag	3,145
5	Sand	m ³	303
7	Water	Liter	89,125

Source: GTSP

The power supply needed for construction activities will be tapped from the existing 33kV TL which is within the 50m from the project site. Aggregate, cement and sand are needed in very minimal amount for the construction of controlled building, staff room and toilet. The required amount of cement will be acquired from local manufacturers. Likewise, sand will be purchased from the local market. Coarse aggregates will be produced at site from excavated materials or purchased from the nearby market. The excavated foundation material can be used as a backfill required for the foundation of mounting structure. The water required to clean solar panels is approximately 7000-20000lt. per MW plant. On the basis of this, total water requirement for this project on average is about 90,000 liters. The panels are planned to clean once a week. The project will arrange this quantity of water by pumping from Trishuli river or by deep boring.

1.3.5 Construction Method

Simple land labeling works to be done, not so major land excavation and cutting filling will be done for this project. There is no use of concrete batching plant for this project. Backhoe loaders, ramming machine and excavator are used during construction. There will be no blasting, only drilling for piling works will be done.

1.4 Objectives, Rationale and Methodologies for Preparing ESMP

Objectives

The objective of this Environment and Social Management Plan (ESMP) is to identify the potentially significant environmental issues and risks of the proposed project and to suggest appropriate mitigation measures to mitigate and/or minimize the adverse impacts so that the

project is implemented in an environmentally sound manner. The other general objectives of the study are to:

- Identify, predict and describe/ assess potential environmental and social impacts from the installation of the solar farm;
- Define the roles and responsibilities of all parties involved in project's environmental and social management (including monitoring mechanism which should be consistent with the provisions in the project's ESMF);
- Identify and describe measures for impact avoidance, minimization, and mitigation and their costs;
- Define environment and social management mechanism to ensure the implementation of mitigation measures and monitoring programs; and establish a supervision, monitoring and reporting as well as grievance handling mechanisms;
- Consult with potentially affected people, community and stakeholders and help to identify/understand people's concerns and suggestions and address them, if relevant.

Rationale

Based on the recommendation identified from screening report, the ESMP is prepared to address the impacts on the particular aspects and describe different measures to mitigate those impacts.

Methodology

This ESMP report is prepared in accordance with the screening report of the project, field study, consultation with local people/stakeholders and officials. Methodologies are used to prepare the ESMP; are:

- Field Investigation
 - ❖ Verification of site specific environmental and social issues and impacts
 - ❖ Identification of Zone of Influence
 - ❖ Identify and verify the project impact, mitigation measures and beneficial issues through public consultation process
 - ❖ Verification of secondary data/ information and collection of data/ information from the field.

The project team visited the site in 2077/07/19 to 2077/07/21. During site visit, two consultation meetings were conducted at Gauribeshi, involving nearby populations. Altogether, 20 persons participated in the meeting, with 19 males and one female.

Among these one consultation meeting was Free Prior Informed Consultation (FPIC). Altogether eight IPs were participated in this consultation meeting. People are found positive towards project and they placed some demands from project;

1. Project should provide employment opportunity to IPs.
2. During project construction, contractor should not hire outsider workers, if workers are available locally.
3. Project should provide employment opportunity to IP women.
4. Project should provide income generating training opportunity to IP women.
5. Project should provide income generating training opportunity to disabled IPs.
6. Project should provide scholarship opportunity to Intelligent IP children.

The detail of the meeting is given in Annex I. The team also visited district level line offices such as Ward No 12, Bidur Municipality, Bidur Municipality office and Division Forest Office (DFO).

2 EXISTING ENVIRONMENTAL AND SOCIAL SETTINGS

The proposed project area is located at Bidur Municipality-12 of Nuwakot District of Bagmati Province of Nepal. For the study of existing environmental and social settings, the study area is defined as the area for the erection of the solar panels and other physical facilities. The settlement area, forests or other vegetation and places having built up infrastructures or facilities that falls within the boundary of project site is also under the study area.

2.1 Physical Environment

The topography, land use, climatic condition, geology, seismology, air, water and noise condition, watershed and drainage pattern, solar potential and air traffic that shall be influenced due to the construction of this project has been discussed in each topic ahead.

2.1.1 Topography

The proposed site of Block 5, coffee area is located in the mid-hills of Nepal. The site is located in overall flat as well as mildly sloped terrain facing south. The altitudinal variation of the project site is between 520masl and 540masl at Bidur municipality of Nuwakot.

2.1.2 Land use

A total of 10.59ha land will be covered by the solar farm and accessory structures. The site is located about 10m above the Trishuli River. The land is owned by NEA and consists mostly of barren land covered with patches of shrubs and some trees.

2.1.3 Climatic Condition

According to Department of Hydrology and Meteorology, Nepal, maximum temperature and minimum temperature of Nuwakot were 31.3 °C and 7.6 °C respectively in 2020. In the same year 2020, annual rainfall was 2217mm.

2.1.4 Air Quality

The proposed site is accessible through Kathmandu-Galchi-Battar road (about 70Km) and 1Km of graveled road. The transportation density and frequency of the vehicles along the road is very low, so the air pollution levels are very low and can be considered as fairly good.

Due to the limited vehicular movement in the dusty earthen road from existing Devighat Forebay area to the site, there is limited fugitive emissions of Total Suspended Particles (TSPs) from the vehicular movement, whereas, gaseous emissions are relatively insignificant. Since there are no monitoring records of the ambient air quality of the project area, the level of TSP and PM₁₀ concentration in relation to the National Ambient Air Quality Standard (NAAQS) could not be stated. The transportation density and frequency of the vehicles along the road is very low.

2.1.5 Noise Quality

Noise pollution seems to be very less in the area. Only the vehicular movement is the major cause of noise pollution in and around the solar site at block 5. The noise level near Gauribeshi settlement is found to be 45dB which is within the range determined by Ministry of Environment, Science and Technology (MoEST) in National Standards of Sound Quality, 2069.

2.1.6 Water sources and Drainage Patterns

The main river which drains the project area is Trishuli River which is a snow fed river. Terrain of Coffee area II is flat as well as medium sloped terrain so that the chances of water logging in the area is minimal. Moreover, there is Trishuli River in the eastern side and erosion has been controlled with the help of bamboo grooves already present in the area.

2.1.7 Soil Erosion and Land Stability

During field visit of the Block 5, no any landslides were observed in coffee area site. There is a *Kholi* in the northern boundary and Trisuli River in the eastern boundary. So, there is a chance of flood and landslide during monsoon season in the project site.



Figure 2-1: (a) Trishuli River Eastern boundary (b) Kholi in northern boundary

2.2 Biological Environment

Vegetation and forest resources, ethno botany, mammals and birds as well as rare and protected species of flora and fauna found in the project area are studied in biological environment of the area.

2.2.1 Vegetation and Forest Resources

According to the climatology of the area, tropical deciduous and sub-tropical types of trees occur in the project area. Vegetation in such climate mainly comprises of trees like Sal, Sisau, Simal, Saa, Khote Salla, etc. No natural forest/community forest occur within the proposed project site. The nearest community forest from the project area is given in Table 2-14 below.

The baseline study of the project area showed that it comprised trees species like Sisau (*Dalbergia sissoo*), Bakaino (*Melia azedarach*), Sirish (*Albizia sp.*), Ipil-Ipil (*Leucaena leucocephala*), Chanp (*Michelia champaca*), Botdhairo (*Lagerstroemia parviflora*) Kutmero (*Litsea polyantha*), Simal (*Bombax ceiba*), Chilaune (*Schima wallichii*), Tuni (*Toona ciliata*), Teak (*Tectona grandis*), Aanp (*Mangifera indica*), Kapoor (*Cinnamomum camphora*), Kyamuna (*Cleistocalyx operculatus*), Bar (*Ficus Benghalensis*), Khirro (*Sapium insigne*), Dumri (*Ficus racemosa*), Pipal (*Ficus religiosa*), Mahuwa (*Engelhardtia spicata*), Pipal (*Ficus religiosa*), Rajbrikshya (*Cassia fistula*) etc.

Similarly, shrubs and herbs reported to occur in the project areas include Banmara (*Eupatorium sp.*), Ghangaru (*Pyracantha crenulata*), alupate jhar, *Galinsoga parviflora*, Lajjawati jhar (*Mimosa pudica*), Titepati (*Artemisia vulgaris*), Hade Unyo (*Dicranopteris linearis*), Aiselu (*Rubus spp.*), Dubo (*Cynodon dactylon*), Khar (*Andropogon pumilus*), Siru

ghans (*Imperata spp.*) etc. Nearby community forests present in the project affected ward of Bidur Municipality is given in the table below:

Table 2-1: Status of Community Forests in the Project Affected Ward

S. N.	Forest	Location	Area	House holds	Remarks
1.	Aakare Dhungedhara Hatti CF	Bidur-12	41.36	59	Not affected by the project
2.	Chandeshwori CF	Bidur-12	27.00	19	Not affected by the project

Source: DFO, Nuwakot, 2074/075

2.2.2 Ethno botany/ Vegetation Resources Use Pattern

There is not much significant major timber yielding plant around the project area. Common vegetation resources use pattern nearby the project area is presented in the table below.

Table 2-2: List of Common vegetation resources found around the Project area

S. N.	Common name	Scientific name	Usage
1	Bhogate	<i>Citrus maxima</i>	Fruit and nuts, support for climber
2	Nibuwa	<i>Citrus limon</i>	Fruit and nuts, insecticide
3	Kimbu	<i>Morus australis</i>	Fruit, fiber, fodder
4	Kutmero	<i>Litsea monopetala</i>	Fodder, medicinal plant
5	Sisau	<i>Dalbergia sissoo</i>	Animal bedding, Fiber and fiber yielding, Fodder, Medicinal plants, Seeds, Vegetables
6	Pipal	<i>Ficus religiosa</i>	Exudates, Fodder, Fruit and nuts
7	Kapur	<i>Cinnamomum camphora</i>	-
8	Amba	<i>Psidium guajava</i>	Fruit and nuts, Fodder
9	Tuni	<i>Toona ciliate</i>	Animal bedding, Utensils, handicrafts, Fodder, Insecticides and herbicides
10	Aap	<i>Mangifera indica</i>	Fruits and nuts
11	Bar	<i>Ficus benghalensis</i>	Religious
12	Sami	<i>Ficus benjamina</i>	Religious
13	Simal	<i>Bombax ceiba</i>	Animal bedding, Exudates, Fibre and fiber yielding, Fodder
14	Khirro	<i>Sapium insigne</i>	Animal bedding, Exudates, Fodder, Fruit and nuts
15	Salla	<i>Pinus roxburghii</i>	Animal bedding, Exudates, Fibre and fiber yielding, Fodder, Fruit and nuts
16	Naspati	<i>Pyrus communis</i>	Fruit
17	Dumri ghans	<i>Ficus racemose</i>	Animal bedding, Drying/tanning, Exudates, Fodder
18	Litchi	<i>Litchi chinensis</i>	Fruit
19	Sirish	<i>Albizia julibrissin</i>	Fodder
20	Bakaino	<i>Melia azedarach</i>	Fodder

Source: Key Informant Interview, 2020

2.2.3 Wildlife (Mammals and Birds)

Common mammals spotted in the nearby forest of the project area are Mriga (*Muntiacus muntjak*), Rabbit (*Lepus nigricollis*), Squirrel (*Funambulus sp.*), Chituwa (*Panthera pardus*), Dumsi (*Hystrix indica*), Mal sapro (*Martin flavigula*) etc. Common bird species are Cuckoo

(*Cuculus canorus*), Kalij (*Lophura leucomelanos*), Dhukur (*Streptopelia orientalis*), Suga (*Psittacula spp.*), Jureli (*Pycnonotus cafer*), Bakulla (*Bubulcus ibis*), Lampuchhre (*Urocissa erythrorhyncha*), Pigeon (*Columba livia*), Sparrow (*Passer domesticus*) etc. Limited information was available on herpetofauna in the project area. Some varieties of snakes, lizards have been reported in the area.

2.2.4 Rare and Protected Species of Flora and Fauna

None of the protected species of fauna (birds and mammals) are reported in the project site as per National Park and Wildlife Conservation Act, 2073 of Nepal. Similarly, no species of flora that are banned for commercial felling, transportation and export are found in the project area. The proposed area is not located within national park, wildlife sanctuary, buffer zone or conservation area. The nearest protected area i.e., Langtang Buffer Zone is located about 10.7Km from the project area. The area is not the suitable habitat for birds and mammals.

Table 2-3: Protection status of Mammals and Birds nearby project area

S.N.	Name		Protection status		
	Local Name	Scientific Name	NPWCA, 1973	CITES Appendix	IUCN
Mammals					
1	Ratuwa Mriga	<i>Muntiacus muntjak</i>	-	-	LC
2	Kharayo	<i>Lepus nigricollis</i>	-	-	LC
3	Lokharke	<i>Funambulus sp.</i>	-	-	LC
4	Chituwa	<i>Panthera pardus</i>	-	I	VU
5	Syal	<i>Canis aureus</i>			LC
6	Dumsi	<i>Hystrix indica</i>	-	-	LC
7	Malsapro	<i>Martes flavigula</i>	-	-	NE
Birds					
1	Koili	<i>Cuculus canorus</i>	-	-	LC
2	Kalij	<i>Lophura leucomelanos</i>	-	III	LC
3	Kaag	<i>Corvus splendens</i>	-	-	LC
4	Dhukur	<i>Streptopelia orientalis</i>	-	-	LC
5	Suga	<i>Psittacula spp.</i>	-	-	LC
6	Jureli	<i>Pycnonotus cafer</i>	-	-	LC
7	Bakulla	<i>Bubulcus ibis</i>	-	-	LC
8	Lampuchhre	<i>Urocissa erythrorhyncha</i>	-	-	LC
9	Parewa	<i>Columba livia</i>	-	-	LC
10	Bhangera	<i>Passer domesticus</i>	-	-	LC

EN- Endangered; VU- Vulnerable; NT- Near Threatened; LC- Least Concerned; (DD- Data Deficient)

Source: NPWCA, 2073; Flora and Fauna of Nepal in CITES Annexes; www.icunredlist.org

2.3 Socio-economic and Cultural Environment

Gauribeshi, Bidur Municipality-12 is the nearest settlement from the project site which is within 75m from project location (coffee area II). Though this settlement is not directly affected by the project activities and its component, but it will be indirectly affected by the project such as air and noise pollution, impacts on the pedestrians of the settlement. There are approximately 100HHs in the settlement with majority of Rai (80HHs), Brahmin (10HHs), Chhetri (5HHs) and Tamang (5HHs) community. Hinduism and Buddhism religion are followed by people in the settlement.

The economic character of Gauribeshi Settlement is based on agriculture and wage labor. Agriculture lands of the area are productive. Paddy, wheat, maize, millet and vegetables are

the major crops produced in the area. Furthermore, animal husbandry is another major source of income of the local villagers. Nowadays, poultry farming is the emerging occupation for the people of the project area. There is a water supply pipeline in the settlement which provides drinking water facilities. However, during dry season, there is scarcity of water in the settlement and people have to depend upon the water of Trishuli River.

The road that goes through the settlement is Battar-Charghare-Khadgabhanjyang road which is an earthen road. The road is being developed by the GoN for the interlinking of Dhading with Nuwakot and in near future will be a paved road. There are two *Maran Pati* near the project location. No other cultural and historical sites are present within and nearby the project site.

3 ASSESSMENT OF IMPACTS AND MITIGATION MEASURES

3.1 Land Use and Land Take

The land use change from the existing land use condition is mainly due to the erection of the solar panels. A total of 10.59ha land will be covered by the solar farm and associated facilities. The land is under the ownership of NEA, thus no individuals will be directly affected by the project activities and no mitigation measures are required.

3.2 Air Quality

Impacts:

a. Construction Phase

The construction activities consist of site clearance including clearance of trees, cut-fill work for the levelling and grading of the land. These activities will generate dust in the surrounding area of Gauribeshi settlement. Apart from these activities, movement of transporting vehicles carrying the construction materials along the muddy access road will generate fugitive as well as combustion emissions and will cause temporary impact on air quality and thus may cause problem on health of construction workers and people of Gauribesi settlement. Vehicular emissions and particulate matter from project vehicles and equipment will also decrease air quality. However, this impact is low in magnitude.

b. Operation Phase

No impact on air quality is envisaged during the operation phase except minimal movement of vehicles for maintenance works.

Mitigation measures:

a. Construction Phase

- Water will be sprayed through tanker on the earthen access road during the construction period as per necessity to reduce the problem of dust during construction period, particularly when construction materials is being transported to the project site.
- Maintenance of all vehicles and construction machinery will be done.
- Appropriate protective equipment against noise (e.g. respirators) will be provided for the construction workers.

b. Operation Phase

No mitigation measures is required in this phase as there is no impact in air and noise quality at this phase.

3.3 Noise Quality

Impacts:

a. Construction Phase

During the construction phase, noise will be generated by the construction vehicles (grader, excavator, and dumper). The impacts will be felt in Gauribesi settlement. Noise sensitive receptor such as health post, school are far away from the project sites. The school (Mahindra Secondary School) is about 275m west from the proposed project site. However, the noise level measured during the site visit i.e., 45 dB is the noise level under the acceptable level in

line with the National Standards of Sound Quality. During construction phase, the noise level is predicted to increase slightly.

b. Operation

Noise generated during the operational phase will generally result from vehicular traffic which is expected to be negligible.

Mitigation measures:

a. Construction Phase

- Maintenance of all vehicles and construction machinery will be done.
- Earmuffs or plugs to the workers will be provided as per the requirement.
- The construction work will be limited to daytime as far as possible and construction nearby school will be scheduled on school off-day.

b. Operation

No mitigation measures are required during this phase.

3.4 Waste Management

Impacts

a. Construction Phase

The improper disposal of solid waste like cement bags, iron bar and other leftover construction materials and wastes from workers might cause sanitary problem to the nearby Gauribesi settlement and also to the workers involved.

The approximate quantity of waste estimated based on the is given below:

Table 3-1: Approximate Quantity of wastes during construction

Waste Materials	Total Quantity
Cement Bags	3,145 nos' (Ref: Table 1.2)
Iron Bars	50 kgs
Solar Packaging Cartoons	5800 kgs
Wrapping Plastic film	95 Kgs
Wooden Planks	6500 kgs

Source: GTSP

Mostly the domestic waste generated from the works is plastic. Approximate estimate of total quantity of plastic waste generated by workers is 8Kg per day.

b. Operation Phase

The personnel who work during operation period will generate domestic solid waste. There will be no other waste types generated during operation period. Since there will be no use of batteries for the proposed solar project, the impacts due to battery wastes will be eliminated.

Mitigation Measures

a. Construction Phase

- Domestic type solid wastes are biodegradable which will be managed by burying in pit.
- Recyclable wastes (such as glass, paper, plastics, etc.) estimated in Table 3-1 will be collected separately to be sent for recycling. Separate waste containers (drums, bins, skips or bags) will be provided for different types of wastes.

- No waste will be disposed along public road or in the surrounding area of Gauribesi settlement.
- Construction workers will be instructed for proper storage and handling procedures for construction wastes and other solid wastes.

The contractor will be responsible for the establishment of the waste management system during construction period in the area.

b. Operation Phase

The domestic wastes will primarily consist of organic food wastes because this is easily biodegradable and non-hazardous. It will be managed by burying in pits and subsequently covering with soil. Waste water treatment units will be provided to treat waste water generated from cleaning of solar panels.

3.5 Light reflection

a. Construction Phase

There is no impact of light reflection during construction phase.

b. Operation Phase

The panel of solar PV are designed to maximize absorption and minimize reflection to increase electricity production efficiency. To limit reflection, solar PV panels are constructed of dark, light-absorbing materials and covered with an anti-reflective coating. The light reflecting percentage of solar PV is as little as 2% of the incoming sunlight. Thus, there will not be significant reflection of light from solar panels. From the study of various assessments relating to solar panels installation as well as the site visit of solar installation areas of Nepal (Training center, Nepal electricity Authority and Chovar site), it is concluded that the glare and reflectance levels from a given PV system are decisively lower than the glare and reflectance generated by the standard glass and other common reflective surfaces in the environments (*Source: PV Systems: Low levels of Glare and Reflectance vs. Surrounding Environment*).

Mitigation Measures

a. Construction Phase

No mitigation measure is required at this phase.

b. Operation Phase

No mitigation measure is proposed at this phase.

3.6 Erosion and Land Stability

a. Construction Phase

As elevation difference between project area and HFL of Trisuli River is only 10m, there will be the chances of flood and landslide in eastern side. Kholi located in northern side increases the probability of flood during monsoon season.

b. Operation Phase

There is no impact on land stability during this phase.

Mitigation Measures

a. Construction Phase

- Gabion wall is needed as a river training structures in northern side (Kholshi side) and some section of eastern side (Trishuli River side). Approximately, 150*1.0*1.0 Gabion wall will be needed in northern side and 75*1.0*2.0 gabion wall will be needed in eastern side.
- Drainage structures need to be provided within the project boundary for proper management of drainage system of the project site. The main river which drains the project area is Trishuli River.

b. Operation Phase

No mitigation measures are required.

3.7 Impact on Standing Trees and Vegetation

a. Construction Phase

Standing trees and vegetation within the proposed project site will be lost during the construction of the project. A total of 726 number of trees of various species are estimated to be cleared from the project area. This comprises species mainly- Sisau, Bakaino, Ipil-Ipil, Sirish, Kutmero, among others. Site clearance comprises of removal/clearance of shrubs and herbs species in the area. Detail of the possible loss of trees is given in the following table.

Table 3-2: Estimated Loss of Trees from the project area

S.N.	Species Local Name	Scientific name	Number	Average DBH	Total Gross volume (cft)	Net volume (cft)	Fuelwood (Chatta)
1	Sisoo	<i>Dalbergia sissoo</i>	311	13	7539.50	5622.73	8.13
2	Shiris	<i>Albizia sp.</i>	56	17	1527.90	1118.47	1.61
3	Bakaino	<i>Melia azedarach</i>	75	14	1197.47	843.81	1.46
4	Ipilipi	<i>Leucaena leucocephala</i>	63	9	338.20	215.02	1.30
5	Chanp	<i>Michelia champaca</i>	11	19	654.60	514.12	0.57
6	Chilaune	<i>Schima wallichii</i>	19	13	299.23	219.25	0.47
7	Tuni	<i>Toona ciliata</i>	17	20	1122.40	864.11	1.02
8	Teak	<i>Tectona grandis</i>	3	19	122.40	96.13	0.11
9	Totala		1	6	0.00	0.00	0.02
10	Kutmero	<i>Litsea polyantha</i>	35	8	10.50	6.31	0.80
11	Aap	<i>Mangifera indica</i>	18	10	83.60	50.23	0.41
12	Amaro	<i>Sapindus spp.</i>	4	13	19.60	15.39	0.13
13	Simal	<i>Bombax ceiba</i>	10	18	334.70	254.01	0.38
14	Rittha	<i>Sapindus mukorossi</i>	1	11	0.00	0.00	0.03

S.N.	Species Local Name	Scientific name	Number	Average DBH	Total Gross volume (cft)	Net volume (cft)	Fuelwood (Chatta)
15	Gideri	<i>Premna integrifolia</i>	1	10	0.00	0.00	0.03
16	Sindure	<i>Mallotus philippensis</i>	1	13	0.00	0.00	0.04
17	Kapur	<i>Cinnamomum camphora</i>	10	11	76.70	46.08	0.21
18	Kyamuna	<i>Cleistocalyx operculatus</i>	12	12	128.80	77.38	0.23
19	Botdhairo	<i>Lagerstroemia parviflora</i>	6	11	54.10	34.44	0.10
20	Chhatiwan	<i>Alstonia scholaris</i>	8	11	83.30	51.78	0.16
21	Dumri	<i>Ficus racemosa</i>	4	24	237.62	184.97	0.21
22	Karma	<i>Adina cordifolia</i>	1	17	34.08	26.77	0.03
23	Khayer	<i>Acacia catechu</i>	1	6	0.00	0.00	0.02
24	Mahuwa	<i>Engelhardtia spicata</i>	2	18	49.90	34.08	0.06
25	Phanil	<i>Syzgyum sp.</i>	1	8	0.00	0.00	0.02
26	Pipal	<i>Ficus religiosa</i>	5	11	37.20	22.35	0.15
27	Rajbrikshya	<i>Cassia fistula</i>	2	17	44.40	26.68	0.06
28	Bhatekhiro	<i>Sapium spp.</i>	11	8	0.00	0.00	0.27
29	Khiro	<i>Sapium spp.</i>	5	13	0.00	0.00	0.20
30	Sanokhiro	<i>Sapium spp</i>	6	9	0.00	0.00	0.16
31	Taki	<i>Bauhinia purpurea</i>	1	6	0.00	0.00	0.02
32	Borighass		6	10	0.00	0.00	0.17
33	Joge		3	11	0.00	0.00	0.10
34	Kaiyo	<i>Gravellia robusta</i>	3	16	0.00	0.00	0.14
35	Phalamekada		5	7	0.00	0.00	0.10
36	Aakhatare	<i>Trichilia connaroides</i>	1	12	10.50	6.31	0.02
37	Badahar	<i>Artocarpus lakoocha</i>	1	6	0.00	0.00	0.02
38	Badkaule	<i>Casearia graveolens</i>	1	5	0.00	0.00	0.02
39	Bar	<i>Ficus bengalensis</i>	1	14	14.80	8.89	0.02
40	Baro	<i>Terminalia bellirica</i>	2	10	13.10	7.87	0.04
41	Bel	<i>Aegle marmellos</i>	1	7	0.00	0.00	0.02
42	Gayo	<i>Innula cappa</i>	1	6	0.00	0.00	0.02
	Total		726		14034.60	10347.18	19.08

Source: Field Visit, 2019

b. Operation Phase

In the operation phase of the project, the land will be occupied by panels and associated structures. Regular trimming of the shrubs and bushes will be done. No significant impacts will occur in the operation phase of the project.

Mitigation Measures

Since the removal of trees and other vegetation is within the premises of NEA owned land, the procedures specified in the section 4 of the "Standard for removing government trees, 2071" will be followed. In accordance with the Standard for removing Government Trees, 2071, the concerned agency should cut the trees in its own cost and sell the forest products in accordance with the prevailing laws and acts and deposit the income royalty. For the purpose of this standard, Examination Committee will be comprised of 7 members with District Forest Officer as a Coordinator. With the request for removing such trees, the committee will monitor the area and the trees to be cut. The cost for such monitoring will be the responsibility of related office/project.

The project will plant some trees in response to the loss of greenery in the area. A sum of NRs. 1,000,000 has been allocated for this purpose. The details of plantation plan is given in annex II of the report.

3.8 Impacts on Settlement**Impacts****a. Construction Phase**

During the project construction phase, the traffic flow will arise from the transportation of solar panels and other construction materials. Since, there is Gauribeshi settlement near the project site (within 75m), there may be the chances of road accidents and there also may be the issues of pedestrian safety. The settlement shall be disturbed due to civil works for solar panel installation activities.

b. Operation Phase

No impacts on settlement during this phase is found.

Mitigation measures**a. Construction Phase**

The impacts and possible traffic accidents will be prevented or minimized through a combination of traffic control measures.

- Consultation meeting with local community members regarding the awareness towards the safety issues by the project once prior to construction and twice during construction period,
- Placing traffic signs and limiting the maximum speed of vehicles is limited to 40km/hr
- Compensation/treatment to victims in case of accidents caused by project related works/activities.

b. Operation Phase

No mitigation measure is required at this phase.

3.9 Health and Safety

Impacts

a. Construction Phase

There is no impact on the health of the people of nearby settlement due to project activities. However, there is minimal risk of electric shock (less than 0.5%) and occupational injuries to the construction workers during wiring/fitting process. Thus, the project should take into consideration the health and safety of the workers. In peak time of construction period, 30 to 40 person/workers will work per day. Among them almost 50% will be local IPs.

b. Operation Phase

There will be no prominent impact on this phase.

Mitigation Measures

a. Construction Phase

- An on-site medical facility and first-aid will be provided in the construction phase to cater for primary health care needs of personnel.
- Personal protective equipment (hard hats, gloves and steel-toed shoes with rubber soles) for workers will be provided where necessary, to minimize health and safety risks.
- Mandatory health and safety orientation with emergency response procedures will be provided prior to works.

b. Operation Phase

No mitigation measure is required at this phase.

3.10 Labor influx and Labor camp

Impact:

a. Construction Phase

The project should make camp for construction labors. The labor camp will be established within NEA's premises (outside the project area), however the location is not still finalized. There will be the issue of health and sanitation of labors within the camp. Besides, influx of outside labor may affect the social and cultural life style of the local people.

b. Operation Phase

There is no impact during this phase as all labor force will return back and labor camp will be demolished.

Mitigation Measures

The project should take into consideration for the construction of toilets for male and female workers separately and biodegradable wastes produced by workers should be buried in pits. Project will ensure that contractor will arrange to make provisions for avoiding COVID-19 transmission among workers. Contractor provide separate living rooms from kitchens at the labor camp.

3.11 Community Support Programs

During the consultation with local people, it was reported that Gauribeshi Settlement located nearby the project site has been facing difficulties due to existing earthen road. During the rainy season, people have to face travel difficulties. Therefore, as a part of CSP, project will

provide financial support to the community for upgradation of existing road to ease the trouble of people in the area. For this, approximately NRs. 70,000,000 has been estimated. In the same way, project will allocate NRs 5,000,000 for school support, NRs 2,500,000 for health sector support and NRs 500,000 for construction of cremation site (*Maran Pati*).

3.12 Environment Mitigation Plan

The identified impacts due to project activities and the mitigation measures are explained in the given table.

Table 3-3: Environmental Impact and Mitigation Matrix

S.N	Issues	Impacts	Mitigation Measures	Location	Timing of Action	Estimated Mitigation Cost (NRs)	Institutional Responsibility	
							Implementation	Supervision
A.	Construction Phase							
1	Land use and Land take	A total of 10.59ha land will be covered by the solar farm and other facilities which is under the ownership of NEA.	No mitigation measure is required.	-	Not required	Not required	Not required	Not required
2	Air Quality	The construction activities consist of site clearance including clearance of trees cut-fill work for the levelling and grading of the land will generate dust in the surrounding area of the nearby settlement. Movement of transporting vehicles carrying the construction materials	Water will be sprayed on the earthen road along the nearby settlement once a day. Maintenance of all vehicles and construction machinery will be done. Mufflers to all vehicles will be provided. Appropriate protective equipment against noise will be provided to the workers.	Construction site.	Construction phase.	Project Cost	Contractor	ESSD/NEA
3	Noise Quality	Noise will be generated by the construction vehicles (grader, excavator, and dumper)	Maintenance of all vehicles and construction machinery will be done. Earmuffs or plugs to the workers will be provided as per the requirement.	Construction site.	Construction phase.	Project Cost	Contractor	ESSD/NEA

S.N	Issues	Impacts	Mitigation Measures	Location	Timing of Action	Estimated Mitigation Cost (NRs)	Institutional Responsibility	
							Implementation	Supervision
			The construction work will be limited to daytime as far as possible.					
4	Waste management	The improper disposal of solid waste like cement bags, iron bar and other leftover construction materials and wastes from workers might cause sanitary problem to the nearby settlement and also to workers involved.	Domestic type solid wastes will be managed by burying in pit. Recyclable wastes (such as glass, paper, plastic, etc.) will be collected separately to be sent for recycling. Separate waste containers (drums, bins, skips or bags) will be provided for different types of waste. No waste will be disposed along public road or in the surrounding area of nearby settlement. Construction workers will be instructed for proper storage and handling procedures of construction waste and other solid wastes.	Construction sites and camp site.	Construction phase.	Project Cost	Contractor	GSEEP/ESSD
5	Erosion and Land Stability	The improper management of the drainage system during construction period may further lead to the expansion	Gabion wall need to be constructed as a retaining structure Drainage structures need to be provided within the	Construction sites	Construction phase.	Project Cost	Contractor	GSEEP/ESSD

S.N	Issues	Impacts	Mitigation Measures	Location	Timing of Action	Estimated Mitigation Cost (NRs)	Institutional Responsibility	
							Implementation	Supervision
		of existing gullies, formation of new gullies and cause instability problems such as soil erosion, landslides in the project area (coffee area).	project boundary for proper management of drainage system of the project site.					
6	Impact on Settlement	Increase of traffic flow leads to the chances of road accidents and other pedestrian issues.	Consultation meeting with local community members regarding the awareness towards the safety issues by the project; Placing traffic signs and limiting the maximum speed of vehicles.	Nearby and surrounding area	Once prior to construction and twice during construction period.	Project Cost	Contractor	NEA/ESSD
7	Health and Safety	There is minimal risk of electric shock (less than 5%) and occupational injuries to the construction workers during wiring/fitting process.	An on-site medical facility will be designed to cater for primary health care needs of workers; Personal protective equipment (Hard hats, gloves and steel-toed shoes with rubber soles) for workers will be provided; weekly health and safety orientation will be provided.	Construction site and surround settlement.	Construction phase.	Included in Project Cost	Contractor	NEA/ESSD

S.N	Issues	Impacts	Mitigation Measures	Location	Timing of Action	Estimated Mitigation Cost (NRs)	Institutional Responsibility	
							Implementation	Supervision
8	Waste water discharge from cleaning of solar modules/panels	Chances of water pollution of nearby river/Kholsi.	Waste water treatment units will be provided to treat waste water. Waste water discharge from cleaning of solar modules/panels	Project Site	Operation Phase	Included in Project Cost	Project	NEA
9.	Impact due to Tree cuttings	A total of 726 number of trees of various species are estimated to be cleared from the project area.	Plantation program will be carried out.	Around Trishuli HEP area	Construction phase.	NRs. 1000,000	Contractor/Project	ESSD/NEA

4 MONITORING AND REPORTING MECHANISM

Monitoring is an essential aspect of environmental and social management plan. An effective monitoring of the whole project cycle, will assist for the implementation of monitoring plan and coordination of work of the project with concerned stakeholders as well as identify the unexpected problems/outcomes that might come in physical, biological and socio-economical sector and facilitate the correction of those. Land use pattern, settlement, health and safety, infrastructure, implementation of the mitigation measures are the few areas of monitoring.

NEA is responsible for regular monitoring and reporting of the implementation of the project. Ministry of Energy, Water Resources and Irrigation (MoEWRI), Department of Electricity Development (DoED) and local bodies will also be involved during the monitoring.

The environmental monitoring will be carried out at all the project impact areas in a regular or intermittent schedule.

The experts from ESSD will visit project site once a month for environmental monitoring of the project and prepare the monitoring report. The project manager office will be responsible for the distribution of report to the concerned agencies. The detail of monitoring parameters, schedule, method and agencies to be consulted during construction and operation phases for physical, biological and socio-economic and cultural environment is presented in table given below.

4.1.1 Environmental Monitoring Plan

A monitoring program, required for the project to evaluate the application and effectiveness of mitigation measures, is formulated in three phases.

a. Preconstruction Monitoring

Since the construction work of the project will start immediately, preconstruction monitoring is not required for the proposed project.

b. Construction Monitoring

Impact and compliance monitoring will be conducted during this phase of project development.

Impact Monitoring

Impact monitoring will be carried out to assess actual level of impact due to project construction.

The impact monitoring includes:

- monitoring of the impacts of the project on physical, biological and socio-economic & cultural environment of the area;
- monitoring of the accuracy of the predicted impacts;
- identify the emerging impacts due to project activities or natural process and develop remedial action; and
- monitoring of the effectiveness of mitigation measures.

Compliance Monitoring and reporting

The compliance monitoring will be conducted to monitor the compliance of the proposed mitigation measures and monitoring activities. The compliance monitoring will mainly focus on;

- compliance of the tender clause;
- compliance of the mitigation measures;

- timely and adequately implementation of Environmental Management Plan and
- overall environmental and social performance of the project.
- Submitting quarterly performance reports to the World Bank

Table: Table 4-1 Monitoring Plan

S.N.	Parameter	Indicators	Method	Location	Schedule /Frequency of visit
A	Construction Monitoring				
Impact Monitoring					
1	Air Quality	Dust around the project area	Observation	Construction site, Battar-Charghare-Khadgabhanjyang road along Gauribeshi settlement	Monthly during construction
2	Noise Quality	Construction vehicles	Standard of MoEST	Construction area	Monthly during construction
3	Waste Management	Unpleasant odour and visual impact	Observation	Labor camp/ construction sites	Monthly during construction
	Erosion and Land stability	Management of drainage system	Observation	Construction area	Monthly during construction
4	Health and Safety issues	Impacts on health of the workers; No. of accidents	Inspection of the construction place; Records of accidents	Project area	Continuous (monthly) during construction period
5	Employment	No. of local people employed by project	Records kept by management	Project area	Continuous during construction period and annually during operation
6	Infrastructure development		Observation, consultation with public	Project area	Construction period
Compliance Monitoring					
1	Allocation of adequate budget for implementation of environmental mitigation measures and monitoring works	Yes/No	Review, inquiry and consultation	Kathmandu Office	Preconstruction phase

4.1.2 Environment Mitigation and Monitoring Cost

Environment Mitigation Cost

Total environmental mitigation and CSP cost is estimated to be NRs 79,000,000 which is only 6.51% of the total project cost.

Table 4-2: Total Environment Mitigation Cost

S.N	Activities	Amount (NRs)
1	School Support Program	5,000,000
2	Health sector support program	2,500,000
3	Construction of <i>Maran Pati</i>	500,000
4	Road Upgrading	70,000,000
5	Plantation	1,000,000
	Total	79,000,000
	Total Project Cost	1,213,010,000
	% Project Cost	6.51%

Environment Monitoring Cost

The monitoring costs have been estimated in Table 4-2. The total cost for the monitoring activities (for construction phase) has been estimated as NRs. 3,515,000/-.

Table 4-3: Monitoring Cost of the Proposed GTSP Block No. 5, Coffee area II

S.N.	Item	No. of Persons	Man-month			Rate/Month (NRs.)	Amount (NRs.)
			Office (1.00)	Field (1.5)	Total		
	Construction Phase						
1	Manpower						
	Sr. Environment Expert	1	1	-	1	50,000	50000
	Coordinator	1	4.5	1.5	6	45000	270,000
	Civil Engineer	1	2.5	1.5	4	45000	180,000
	Environmentalist	1	2.5	1.5	4	45000	180,000
	Socio-economist	1	2.5	1.5	4	45000	180,000
	Electrical Engineer	1	2.5	1.5	4	45000	180,000
	Liaison Officer	1	1	-	1	35,000	35,000
	Support Staff	2	6		12	35,000	420,000
	Cost of line agencies monitoring					LS	20,000
Sub Total		9			36		1,515,000
2	Out of Pocket Expenses						
	TA/DA					LS	800,000
	Vehicle hire/ Maintenance					LS	600,000
	Report Production					LS	150,000
	Computer and Printer					LS	150,000
	Community Consultation					LS	150,000
	Miscellaneous					LS	150,000
Sub-Total							2,000,000
Total of Construction Phase Monitoring							3,515,000

Total environment management cost including, including monitoring cost for this project **82,515,000.**

4.2 Grievance Redress Mechanism (GRM)

Grievance redress mechanism must be established to allow project affected families/households (PAFs/HHs), community or other stakeholder to appeal any disagreeable decisions, practices and activities arising from compensation for assets, environmental and community concerns related to project. GRM for any infrastructure project provides an effective approach for complaints and resolution of issues made by the affected community in a reliable way. Considering this, a Grievance Redress Cell (GRC) must be established at project site. The GRC for the proposed project has already been established on 2072/05/11 as per the requirement of Environment and Social Management Framework (ESMF) at project site to address the social issues associated with the project. The following manpower are the members of GRC;

Project Coordinator	Coordinator
Project Manager, GTSP	Member Secretary
Officer from Bidur Municipality	Member
Secretary, the then Charghare VDC	Member

The field level GRC will be formed after the commencement of work in the site. Till then the project level GRC will look after the grievance if any. The GRC maintains registration books to look into complaints and concerns about ownership disputes, inheritance of assets, distribution of compensation among heirs, missing affected assets etc. The budget for setting up the grievance cell has been provided by the PMO itself.

In addition to the above, if there are any grievances about project related issues, , the GRC also records these grievances and suggestions and pass it on to the PMO for necessary action and follow-up.

4.3 Consultation and Communication

During site visit, two consultation meetings were conducted at Gauribeshi, involving nearby populations. Among these one consultation meeting was FPIC. Altogether eight IPs were participated in this. People are found positive towards project and they placed some demands from project;

1. Project should provide employment opportunity to IPs.
2. During project construction contractor should not hire outsider workers, if workers available locally.
3. Project should provide employment opportunity to IP women.
4. Project should provide income generating training opportunity to IP women.
5. Project should provide income generating training opportunity to disable IPs.
6. Project should provide scholarship opportunity to Intelligent IP children.

Project will address some of the demands of IPs; a. employment opportunity to IP women/men, b. as possible contractor will hire construction workers locally, c. allocated budget to school support.

4.4 Implementation of Mitigation/Enhancement Measures and Monitoring Activity

The proponent has prime responsible for implementing the proposed mitigation/enhancement measures and the monitoring activities. Proponent has an obligation to carry out all these activities along with cost.

Annex I
Project Related Photographs and
Minutes of Consultation Meeting



Figure I: Project Location



Figure II: Project Location



Figure III: Free Prior Information Consultation with nearby Settlement IPs



Figure III: Public Hearing

आयोजनाको नाम- ग्रिडमा आबद्ध सौर्य विद्युत आयोजना, ब्लक-५

बैठक संख्या/नाम	१	समय	१२:५५ PM
मिति	२०७६/०६/२०	स्थानीय सरकार	वडा
स्थान	प्रदेश	विद्युत वितरण क्षेत्र	१२
जनजाति समूह	राई, मगर, तामाङ		
सहभागिको भाषा	नेपाली भाषा		
बैठक सहजकर्ता (नाम/पद)	शैलेन्द्र शर्मा		

बैठक उद्देश्य
१) आयोजनाको वातावरणीय अहवाल गर्ने सिलसिलामा जनजाति समूहको माग तथा राय सुन्नु।

उपस्थित जनजाति समूहको प्रतिनिधिको नाम	१. नाम - भिम थापा २. नाम - सुनिल लामा ३. नाम - राम कुमार राई
आयोजना टोलीका सहभागीहरूको नाम	१. नाम - शैलेन्द्र शर्मा २. नाम - मन्जु पाण्डे ३. नाम - पुनेश पौडेल

- उठाइएका सवाल तथा छलफलका बुँदाहरू
- १) योजना अनुसार आयोजना निर्माण जाही रोजगारीको शुक्लिलाइने गर्ने।
 - २) आयोजना भित्र उपलब्ध बरिसमा बाहिर बाट कामदार आएर काम गर्ने नपाइने।
 - ३) ठुला बजार सहयोग गर्ने। जनजाति पछिल्लोको महीना पुर्ण लगे। योजना अनुसार योजनाको विवरण गर्ने।
 - ४) निर्माण सम्पन्न भएपछि शिप पुलक तथा आयोजनाको पुलक तालिम दिनु पर्ने।
 - ५) जनजातिको अपाङ्ग सदस्यहरूको शिप पुलक तालिम दिनु आयोजनाको सहयोग पुर्‍याउने।
 - ६) जनजातिको अहवाल विद्याथीहरूको छात्राङ्क गर्ने।

यस पछिको कदम
प्राची उहाँको वरिष्ठा वडा बुँदाको अख्तियार अनुसार लागु हुने।

नोट: जनजाति संलग्न बैठकको लागि कृपया माइन्सुट समूहको नेतालाई पनि दिनुहोला।

पठाइएको मिति: २०७६/०६/२०

सहभागिको सूची

नाम	जनजाति समूह/जाति	लिङ्ग	ईमेल ठेगाना (उपलब्ध भएमा)	सम्पर्क नम्बर	हस्ताक्षर
१) भिम थापा	राई	पुरुष		९८९०५५६५०५	भिम थापा
२) सुनिल लामा	लामा	पुरुष		९८९०२३५८८३	सुनिल लामा
३) राम कुमार राई	राई	पुरुष		९८९०३५५५५५	राम कुमार राई
४) पुनः लामा राई	राई	महिला			पुनः लामा
५) शैलेन्द्र राई	राई	पुरुष		९८९०५५५५५५	शैलेन्द्र राई
६) राम कुमार राई	राई	पुरुष		९८९०२९३५५५	राम कुमार राई
७) मित्रकृष्ण शर्मा	शर्मा	पुरुष		९८९०५५५५५५	मित्रकृष्ण शर्मा
८) मन्जु पाण्डे	पाण्डे	पुरुष		९८९०५५५५५५	मन्जु पाण्डे
९) शैलेन्द्र शर्मा	शर्मा	पुरुष		९८९०५५५५५५	शैलेन्द्र शर्मा



नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
लाजिम्पाट, काठमाडौं, नेपाल

नेपाल विद्युत प्राधिकरण प्रस्तावक रहेको ग्रिडमा आवद्ध सौर्य विद्युत आयोजना, ब्लक-५ कार्यान्वयन गर्दा प्रभावित वडा तथा नजिकका बस्तिका स्थानीय बासिन्दासंग त्यस क्षेत्रमा विद्यमान समसामयिक विषयवस्तुमा छलफल तथा स्थानीयबासीलाई आयोजनाको बारेमा जानकारी प्रदान गरी सामाजिक-आर्थिक बस्तुस्थितिका बारेमा नेपाल विद्युत प्राधिकरण, वातावरण तथा सामाजिक अध्ययन विभाग, काठमाडौंबाट प्रारम्भिक वातावरणीय परीक्षण तयार गर्ने सिलसिलामा खटीई आएका वातावरणीय अध्ययन टोली तथा स्थानीयबासी, सरोकारवाला बिच निम्न मिति, समय र स्थानमा छलफल गरी निम्न रायसुझाव संकलन गरियो।

स्थान : जिल्ला : बागमती नगरपालिका : चिन्मयी वडा नं. १२
ठाउँ : गोरेबारी मिति : २०७७.१०.०६

उपस्थिती

क्र.सं.	नाम थर	पद/पेशा	ठेगाना	फोन नम्बर	हस्ताक्षर
१	सीताराम आर्याल	वडा अध्यक्ष	वि.न.पा. १२	९८५९२९८०९२	
२	चिरञ्जीव भट्ट	प्र.अ. महेन्द्र मा.वि.	वि.न.पा. १२	९८५९२५८६९	
३	नवरत्न कुमाना	अध्यक्ष-सोहोदा	वि.न.पा. १२	९८२९९२५८९९	
४	गजेन्द्र खड्का	नि.प्र.अ. महेन्द्र मा.वि.	वि.न.पा. १२	९८५९-०८८५३	
५	पुरुषोत्तम रिमाल	लेखापाल महेन्द्र मा.वि.	वि.न.पा. १२	९८५९९८०६२३	
६	हरिदाम गिरी	छिन्नड	वि.न.पा. १२	९८५९२२५२८६	
७	नवरत्न भट्ट	छिन्नड	वि.न.पा. १२	९८५९६६६६५२	
८	छिन्नरत्न पन्थी	छिन्नड	वि.न.पा. १२	९८५९९२८२८५	
९	सुमित्रा पौडेल	छिन्नड	वि.न.पा. १२	९८५९६६९४०८	
१०	उदय बहादुर तमाङ	छिन्नड	वि.न.पा. १२	९८५९७९५२५५	
११	शैलजा शर्मा	नौकरी	वि.न.पा. १२	९८५९६८८०५	

रायसुझाव विद्यालयको आवद्धताबारे

१. ग्राउन्ड व्यवस्थित गर्ने
- put doors games
- sliding
- seesaw
- swing



Chiranjibi Bhatta
Head Master
2077/06/06/20



नेपाल विद्युत प्राधिकरण
वातावरण तथा सामाजिक अध्ययन विभाग
लाजिम्पाट, काठमाडौं, नेपाल

नेपाल विद्युत प्राधिकरण प्रस्तावक रहेको प्रिडमा आवद्ध सौर्य विद्युत आयोजना, ब्लक-५ कार्यान्वयन गर्दा प्रभावित वडा तथा नजिकका बस्तीका स्थानीय बासिन्दासंग त्यस क्षेत्रमा विद्यमान समसामयिक विषयवस्तुमा छलफल तथा स्थानीयबासीलाई आयोजनाको बारेमा जानकारी प्रदान गरी सामाजिक-आर्थिक बस्तुस्थितिका बारेमा नेपाल विद्युत प्राधिकरण, वातावरण तथा सामाजिक अध्ययन विभाग, काठमाडौंबाट प्रारम्भिक वातावरणीय परीक्षण तयार गर्ने सिलसिलामा खटेई आएका वातावरणीय अध्ययन टोली तथा स्थानीयबासी, सरोकारवाला बिच निम्न मिति, समय र स्थानमा छलफल गरी निम्न रायसुझाव संकलन गरियो।

स्थान: जिल्ला: बुढाढोरे नगरपालिका: बिदुर वडा नं.: ०२

ठाउँ: गौरीबेही मिति: २०७६/०६/२०

उपस्थिती

क्र.सं.	नाम वर	पद/पेशा	ठेगाना	फोन नम्बर	हस्ताक्षर
१)	सिताराम बर्वाल	वडाध्यक्ष	बिदुर-०२	९८४९४८८०२	[Signature]
२)	नवराज हुंगना	अध्यक्ष-सोला	बिदुर-०२	९८४९४८८०२	[Signature]
३)	मित्रकृष्ण तामाङ	उपस्थिति	बिदुर-०२	९८४९४८८०२	[Signature]
४)	रमेश प्रसाद	"	"	९८४९४८८०२	[Signature]
५)	देवेन्द्र बिजु	"	"	९८४९४८८०२	[Signature]
६)	रामप्रसाद	उपस्थिति	"	९८४९४८८०२	[Signature]
७)	बलराम रिमाल	"	"	९८४९४८८०२	[Signature]
८)	रमेश प्रसाद हुंगना	"	"	९८४९४८८०२	[Signature]
९)	निरञ्जन थापा	"	"	९८४९४८८०२	[Signature]
१०)	रोहन रिमाल	"	"	९८४९४८८०२	[Signature]

रायसुझाव

- १) नेपाल विद्युत प्राधिकरणले प्रयोग गरेको फाउन्डेशनको बारेमा जानकारी दिई वडा नं. ०२ को क्षेत्रमा
हरेक वडा नं. ०२ को गौरी बेही हुदै आगरे मोड लामा वार्डको पत्र
गर्नु पर्ने सुझाव। (हरिव २.५ की.मी.)

२) गौरीबेही मोड देखी अर्को ५०० मि. अरु लामो बालो पत्रो गर्नु पर्ने
(हरिव २.५ की.मी.)

३) स्थानीय प्रमुखहरूले काममा प्राथमिकता पाउनु पर्ने। रोजगारीको गौरी
गर्नु पर्ने

४) गौरी बेही लिफ्ट सिधो संचालन गर्नु पर्ने

५) चाखीरे खान्नाकोडी ठो मकन कान्छा, सोलु र कान्छा, प्रयोग गर्न निगीन,
रक उपकरण व्यवस्थापन गर्नु पर्ने।

६) गौरीबेही भएर पारी निगीन।

७) शक्ति भएर हुंगना। आगरे प्रविधिको डिप्लोमा तथा डड्रा डडो व्यवस्थापन

८) चाखीरे खान्नाकोडी रमेशले व्यवस्थापन।

[Signatures]

Issues/Demands received from Consultation meetings (translated in English):

7. Project should provide employment opportunity to IPs.
8. During project construction contractor should not hire outsider workers, if workers available locally.
9. Project should provide employment opportunity to IP women.
10. Project should provide income generating training opportunity to IP women.
11. Project should provide income generating training opportunity to disable IPs.
12. Project should provide scholarship opportunity to Intelligent IP children.
13. Project should provide financial support to Mahindra secondary School.

Annex II: Tentative Compensatory Plan

Plantation Plan		
Proposed Location of Plantation Area	Land Possessed by Trishuli HP	
Tentative area available for plantation	8500 m ²	
Number of estimated saplings	340	
Species	Cinnamomon (Tejpatta) plant, Jack Fruit (Katahar) plant, Mango plant, Leechy plant, Indian Goosebery (Amala) plant	
Plantation Schedule	After the start of construction period, preferably after the start of monsoon season	
Estimated Budget	NRs. 1000,000	
Responsible Agency	GTSSP, Contractor	
Monitoring and Evaluation	GTSSP, ESSD	

Breakdown of plantation in terms of tree plantation area

1	Headgate upstream and downstream area-	60 plants
2	Between intake to Aqueduct no. 1-	60 plants
3	Between Aqueduct 1 and Aqueduct 2-	60 plants
4	Left bank of Desander	60 plants
5	Office Area	40 plants
6	Baluwatar Quarters	60 plants

Breakdown of estimated cost for Plantation (Per unit cost for plantation)

S.N	Description of work	Unit	No	Length	Breadth	Height	Quantity	Rate	Amount	Remarks
1	Supplying Tree Plant of approved species and plantation thereof as directed by engineer.	no	1				1.00	100.00	100.00	
2	Earthwork in excavation for ditch to emplant a tree plant.	cum	1	0.5	0.5	0.6	0.15	691.74	103.76	
3	Supplying and filling manure (compost) inside ditch atleast 150mm in thick all complete.	LS	1				1.00	LS	100.00	
4	Earthwork in filling in ditch atleast 150mm heap above Ground level	cum	1	0.5	0.5	0.6	0.15	419.75	62.96	
5	Providing a complete frame of protection using 12mm dia. Rebar (4 nos) for vertical support and 8mm dia rebar for circular support (4 nos) with 1"x1" steel net to cover all complete	Set	1				1.00	1467.67	1467.67	
6	Periodic watering of plant in interval of one month for two years 15 min for one plant 7 times in year	hr	3.50				3.50	104.29	365.00	15*7*2/60
7	Periodic weeding of plant 8 times per year 10 min for one plant	hr	2.667				2.67	104.29	278.10	10*8*2/60
Total									2477.49	
VAT @ 13%									322.07	
G. Total									2799.56	