E4592

GRID SOLAR AND ENERGY EFFICIENCY PROJECT

Environmental and Social Management Framework

Prepared By:

Nepal Electricity Authority

June 2014

EXECUTIVE SUMMARY

1.0 Introduction

Nepal is a land-locked country facing major development challenges. It is among the poorest countries in the world, with per capita GDP of US$ 619 (2011 prices) and an estimated 25 percent of Nepalese falling below the international poverty line (US$ 1.25 per day). Despite a decade-long armed insurgency and protracted political transition, Nepal has made exemplary progress in poverty reduction and human development. One of the key inputs for the accelerated economic growth is Power. Nepal is endowed with huge hydropower potential. Estimated theoretical power potential from its water resources is about 84,000 MW of which recent studies estimates 43,000 MW economically exploitable. But the installed hydropower generation capacity as of July 2013 is merely 746 MW, of which 704 MW is grid-connected. The power cut/ load shedding in the peak dry season reaches up to 18 hours a day. This gap between power supply and demand needs immediate attention with economically viable short term options.

Average solar radiation varies from 3.6 to 6.2 kWh/m^2 per day in Nepal; while the total sun shines days is about 300 per year. According to July 2008 assessment of solar and wind energy in Nepal, the commercial potential of solar power for grid connection is about 2,100 MW. Since solar electricity generation systems are easy and quick to install, are very attractive option in many locations in the county. Keeping in line with the GON strategies, the proposed pilot projects of grid-connected solar power generation as a short term opting is being considered for financing by the World Bank. As of the date NEA has selected few potential sites in the surroundings of the Kathmandu valley and these are Kulekhani, (1 and 2), Sunkoshi, Panauti, Sundarijal, Pharping, Trishuli and Devighat. The lands and properties within the sites are owned by NEA. Some of the sites, however, are encroached by outsiders due to poor property management by the concerned NEA management.

The Grid Solar and Energy Efficiency Project (GSEEP) development objectives (PDOs) are to: (i) increase generation capacity to supply the NEA grid through grid-connected solar farms; and (ii) reduce NEA's distribution losses in pilot distribution centers. The implementing agency for the GSEEP will be NEA. A project management Unitunit(PMU) will be established at NEA. A project manager has already been appointed and the PMUwill be staffed with necessary technical and procurement officials. Detailed organization structure will be finalized during the project preparation.

Based on the identified sample sites, the expected site specific environmental, social and cultural impacts are of limited nature. Since specific project activities are yet to be defined the exact nature and scale of their impacts will be known only later. Apart from the site specifics of the solar farm, the project area would include communities and settlements in its surroundings. A safeguard framework document will serve as a 'guiding document' the planning, design and construction elements of the project activities. Such a guidance document or a framework would help in integrating and harmonizing the environment and social management principles at the various stages of project preparation and execution. In this context, this Environment and Social Management Framework (ESMF) has been prepared for the GSEEP.

2.0 Overview of Project Area

Potential candidate project sites for the solar farm are identified by NEA and have been jointly inspected by the team of NEA and World Bank. These candidate sites were also subject to preliminary environmental and social assessment prior to the preparation of this ESMF. The identified sites for solar farm are located in the Kathmandu valley and its surroundings in the districts of Kathmandu, Makawanpur, Nuwakot, Kavrepalachouk and Sindhupalanchok in the Central Development Region of Nepal. All of the candidate sites are within the land property boundaries owned by NEA. The NEA land survey report (2014) has covered only flat or south facing areas in the candidate sites, however, the preliminary field survey for the preparation of this ESMF reveals larger NEA owned land areas within the candidate sites.

The candidate sites are located in the rural setting except for the Trishuli and Sundarijal, which are within the well developed area of urban or peri-urban setting. All sites lie outside the protected National Parks, Wildlife Reserves or Conservation areas. The Sundarijal site lies within 5 km distance of the protected site i.e. Shivapuri- Nagarjun National Park, while the other sites are more than 30 km from the nearest National Parks. The Google Images depicts the overall landscape, land use, access, built structures, settlements etc within and outside the proposal sites. The above features depicted in the images fairly capture the proposal site's physical environments with some level of information on the biological (particularly forest and vegetation cover and their distribution) and social (settlement pattern, agro-economic practices) environments.

3.0 Regulatory and Legal Framework

All investments under the GSEEP must be consistent with the applicable laws, regulations, and notifications of the GoN that are relevant in the context of the proposed interventions/activities. The NEA and the concerned line departments/agencies will ensure that the GSEEP investments proposed and executed under GSEEP are consistent with the regulatory and/or legal framework, whether national, districts or municipal/VDCs. Additionally, it is also to be ensured that activities are consistent with the World Bank's operational policies and guidelines. This section is not a legal opinion on the applicability of the law but serves as guidance in the application of the various laws and regulations to the current project context.

Environmental Assessment format of WB is used to identify, avoid, and mitigate the potential negative environmental impacts associated with the Bank's operations early on in the project cycle. The policy states that Environment Assessment (EA) and mitigation plans are required for all projects having significant adverse environmental impacts or involuntary resettlement. This assessment has included analysis of alternative designs and sites, including the "no project option" and also conducted series of public consultations and information disseminations at all project sites. It is obvious that for World Bank-funded operations, and believes that Environmental Assessment will improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted and their concerns are addressed.

4.0 Potential Environmental and Social Impacts and their Management

The GSEEP project is classified category B for environment due to limited adverse environmental impacts which are site specific, largely reversible and can be readily addressed through mitigation measures. The GSEEP sites do not locate in a sensitive ecosystem, and has avoided areas of historical and cultural significance. The land to be used for the Solar Farm development is the unused lands owned by NEA. The location of the project site coupled with the clean nature of solar power generation ensures that the GSEEP will not cause any significant adverse environmental and social impacts during construction and operation. The main project impacts are associated with clearing of shrub vegetation, waste management and management of labor camps at the site. Moreover, most of the associated impacts are limited to the construction phase and are temporary in nature. Except for the visual quality, operational phase GSEEP impact has negligible footprint.

Environmental and economic benefits of adding renewable energy to the national electrical grid can include: (i) Generating energy that produces no greenhouse gas emissions from fossil fuels and reduces some types of air pollution; (ii) Diversifying energy supply and reducing dependence on imported fuels; (ii) Creating economic development and jobs in manufacturing, installation, and more.

The potential adverse impacts and generic mitigation measures are discussed under three broad headings for environmental and social impacts as impact related to Design-Preconstruction Phase, Construction Phase, and Operation and Maintenance Phase. The Design-Preconstruction Phase is, the period before the actual project implementation when designs are being prepared. This allows the designers to avoid potential impacts in the project design, technical specifications and contract documentations. The Construction Phase is the period since the "Notice to Proceed" is given to the

Contractor until the issuing of the “Certificate of Completion”. The Contractor will implement the project following the design and technical specifications of the EMP. The Operation and Maintenance Phase is the period starting with the issuing of the “Certificate of Completion” issued by the MPWU until the end of the 20 year lifetime of the project.

The specific interventions planned for GSEEP may have some limited adverse environmental impacts in the short term. The adverse or negative impacts related environmental issues and the potential mitigation measures are required for Design-Preconstruction Phase, Construction Phase, and Operation and Maintenance Phase. Highly significant impacts are unlikely given the type of activities and locations within NEA’s own premises. High risks activity or locations are avoided through ineligibility criteria / negative list like PCBs are banned in transformers, energy efficient conducts are recommended. The tree clearance even within the NEA premises shall be obtained through district forest office to establish record that tress are cut/chopped from such premises. Each subproject was subjected to detailed environmental screening and specific Environmental Management Plan will be prepared, for site specific baseline status. The project construction will generate noise, dust, and exhaust gases and small quantities of construction waste, solid waste, and sewage. However, these impacts will not be significant as the construction and erection works involves a small number of construction workers. A large scale solar farm could be a visual obstacle, and thus this aspect will be considered during preparation of detailed site plan of the solar farm, which has been considered in this ESMF. The candidate project sites visited by the team are neither in visual impact sensitive areas nor overlooked by significantly populated area.

The social impacts would not be significant and are mostly restricted to the project area and its immediate surroundings. There will be no land acquisition and no impacts on the present land use, including natural habitats. The solar farms will be installed on NEA property and to the extent possible encroached area will be avoided to minimize adverse social impacts. Social screening however will be carried out in the project sites to identify any adverse social impact and presence of indigenous community.

5.0 Environmental and Social Screening and Management

Environmental and social considerations were envisioned right from the stage of project identification. In general, projects are identified on peoples' demand which is a good practice but when environmental and social consequences of implementation of a project are not well thought through, project implementation may lead to serious environmental and social problems. While identifying and designing sub-projects under GSEEP, all possible alternatives were examined and assessed. The Project Management Unit(PMU) has collected information on the environmental and social setting; identify possible beneficiaries and assess potential environmental and social impacts of different alternatives. The general public should be made aware of the environmental and social consequences of project implementation at later stages in GSEEP.

Each of the investments to be funded under the GSEEP will be subject to an environmental and social screening process before it is selected for inclusion in the project. The screening process establishes the level of environmental and social assessment required and will apply the exclusion criteria. The screening process intends to identify relevant possible environmental and social concerns as well as suggest any further investigation and assessment as necessary. The PMUwill fill in a screening form with assistance of the consultants, if so required, for activities funded under the GSEEP. The PMUPMUwill carry out the environmental and social screening for the investments implemented under the GSEEP.

Primarily, the environmental screening exercise will be undertaken to determine the key environmental issues/concerns and the nature and magnitude of the potential impacts that are likely to arise on account of the proposed investments interventions. The major or key environmental and social issues to be identified will be determined by the type, location, sensitivity and scale of the investment intervention. Every candidate site will be subjected to social screening process before it is selected for inclusion in the project. The screening process will establish the degree of adverse impact (if any) and also the level of social assessment required and application of exclusion criteria. The Project will make best use of its

social planning approaches and fully ensure that the potential social issues are avoided or minimized to the extent possible. This would require deploying stringent measures for site selection at the early stage of project design and planning by undertaking environmental and social screening. Ideally, the possibility of avoiding or minimizing the issues related to involuntary resettlement would be possible by taking into account the following considerations while selecting the subproject site.

Gender analysis will be an integral part of the initial social assessment carried out as part of the safeguard screening of the GSEEP investments interventions. The issues identified at the screening stage will be assessed during the preparation of the GSEEP investments interventions and adequately addressed during implementation. Since the actual project cost for each site is not known at the ESMF preparation stage, the financial criteria for conducting EA (whether IEE or EIA) is written based on the EPA/EPR ceiling.

6.0 Information and Consultation Framework

The information and consultation framework is intended to lay out the way in which information will be provided to the project implementers and beneficiaries and also how consultations will be held during GSEEP implementation. Its purpose is to ensure that social and environmental issues are effectively addressed by the project in a transparent and participatory manner. The primary responsibility for the implementation of information and communication strategies lies with the PMU.

Public consultations in each candidate sites were initiated during the survey i.e from the earliest (planning) stages of the project. Relevant stakeholders will be essential especially during the identification of GSEEP investments, proposal preparation, and implementation phases. Each stakeholders group plays a distinct role in the planning and implementation of the GSEEP. Outcomes of public consultations will help to identify all potential project stakeholders along with their specific interests and needs. Stakeholders' identification, consultation and analysis will be continued throughout the project cycle and remain dynamic. Consultations were held with special emphasis on vulnerable groups. Encouraging public participation in consultations informs the public and serves as a venue for the public to express their opinion on priorities which the Project should address.

7.0 Grievance Redress Mechanism

Through a participatory process, grievances are expected to be minimized. However, it is necessary to establish an effective grievance redress mechanism to address complaints/grievances that may arise related to the project in general including but not limited to environmental and social issues. Any grievances and objections will be referred to the project Grievances Redress Committee (GRC).

The GRC needs to be established as soon as the Project is effective. A complaint cell is designed under the site management office and at central PMU office to collect complaints and transmit them to the GRC. Any affected family or person can approach the GRC directly regarding environmental and social issues including temporary impacts and impacts during construction.

The functions of the GRC which is envisaged in this document which includes: (i) to redress grievances of project affected persons (PAPs) in all respects; (ii) rehabilitation and resettlement assistance and related activities; (iii) GRC will only deal/hear the issues related to R&R and individual grievances; (iv) GRC will give its decision/verdict within 15 days after hearing the aggrieved PAPs; (v) final verdict of the GRC will be given by the Chairman/Head of GRC in consultation with other members of the GRC and will be binding to all other members.

8.0 Monitoring And Evaluation

A Monitoring & Evaluation (M&E) system is planned and will be established for the project, and safeguard compliance will be integral part of the project M&E. Both an internal and periodic external monitoring is proposed to ensure ESMF implementation. Internal monitoring will be carried out by the candidate site Management Office regularly and periodically by central PMU office, focusing on outcomes, outputs and

implementation progress for each GSEEP candidate sites and components. The candidate site management office will submit to central PMU office NEA and World Bank regular bimonthly (once in two months) reports during implementation. Similarly, periodic external monitoring will be carried out by independent consultant or agency using quantitative and qualitative methods and review of information and site visit. The ESMF evaluation will be mid-term and end term and both have to be third party evaluation.

9.0 Capacity Building

NEA has its own Environmental and Social Studies Department (ESSD) and has experience with the implementation of World Bank-funded projects. However, due to large numbers of sub-projects within NEA, ESSD often falls short of required human resource capacity to design and implement ESMF. It is therefore, the ESMF has included capacity strengthening measures to the members of PMU and Manager of Candidate Site as installing a solar farm is a new intervention for NEA.

Training is an important component for developing capacities. Appropriate and timely training to the officials with regard to various issues can bring a positive change in the functioning of the staff. Apart from training in generic areas such as human resource management, information management, government functionaries require training in handling certain specialized tasks pertaining to environmental and social issues. The Project's consultant will identify the training need assessment for PMU and staff of Candidate Sites and suggest the training packages including their modality of operation.

LIST OF ACRONYMS

BP	Bank Procedures
BS	BikramSambat
CDG	Captive Diesel Power Generator
CDM	Cleaner Development Mechanism
CEO	Chief Executive Officer
DDC	District Development Committee
DLRMP	Distribution Loss Reduction Management Plan
DoED	Department of Electricity Development
EA	Environmental Assessment
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environment Protection Act
EPR	Environment Protection Regulation
ESMF	Environmental and Social Management Framework
FGDs	Focus Group Discussions
GDP	Gross Domestic Product
GIS	Geographical Information System
GoN	Government of Nepal
GRC	Grievances Redress Committee
GSEEP	Grid Solar and Energy Efficiency Project
IDA	International Development Association
IEE	Initial Environmental Examination
IFC	International Finance Corporation
ILO	International LaborOrganization
IPPs	Independent Power Producers
IPs	Indigenous People
IP-VCDF	Indigenous Peoples and Vulnerable Community Development Framework
kg	Kilogram
kV	Kilo Volt
kWh	Kilowatt Hours
MoE	Ministry of Energy
MV	Medium Voltage
MW	Mega Watt
NEA	Nepal Electricity Authority
NGO	Non-Government Organization
OP	Operation Policy
PCB	Polychlorinated biphenyl
PMU	Project Management Unit
PPAs	Power Purchase Agreement
RAP	Resettlement Action Plan
SAP	Social Action Plan
SIA	Social Impact Assessment
TL	Transmission Line
TYIP	Three Year Interim Plans
UN	United Nations
UNESCO	United Nation's Organization for Education, Science and Culture
VCs	Vulnerable Communities
VDC	Village Development Committee

TABLE OF CONTENTS

ANNEXES:

CHAPTER I: INTRODUCTION

1.1 Background

Nepal is a land-locked country facing major development challenges. It is among the poorest countries in the world, with per capita GDP of US$619 (2011 prices) and an estimated 25 percent of Nepalese falling below the international poverty line (US$1.25 per day). Despite a decade-long armed insurgency and protracted political transition, Nepal has made exemplary progress in poverty reduction and human development. In addition, Nepal has achieved gender parity in education and sharp reductions in infant and maternal mortality. While the country has achieved good growth rates of over the past years despite its fragile environment, the economy is yet to move towards its full growth potential. Going forward and in the absence of new endogenous sources of growth, economic activity will remain dependent on consumption (supported by remittances), and attributed to weather conditions and external developments.

One of the key inputs for the accelerated economic growth is Power. Nepal is endowed with huge hydropower potential. Estimated theoretical power potential from its water resources is about 84,000 MW of which recent studies estimates 43,000 MW economically exploitable. But the installed hydropower generation capacity as of July 2013 is merely 746 MW, of which 704 MW is grid-connected. Predominance of run off the river type hydropower projects, resulted low available energy output in the dry season, when the system demand is high, which is nearly 40 to 45% of the installed capacity. It is to be noted that 80 percent of rainfall in this Himalayan country occurs in the wet season (or the monsoon months of July, August and September), while the dry season (October through June) rainfall contribution is limited to only 20%. This variation in the rainfall in monsoon and non-monsoon months, with a hydropower generation schemes based on run off the river types, has resulted in acute power shortages in dry months with wide ranging economic implications. The power cut/ load shedding in the peak dry season reaches upto 18 hours a day. For instances, in November 2012, early post monsoon month,shortfall of nearly 470MW1 was recorded.

The other factor contributing to the gap between the power demand and supply in Nepal is also due to high power losses in the system. In 2012, accounted net energy loss was 26.4 percent of net generation nearly 15% higher than the loss accounted in the developed countries. Such high system loss is largely due to the poor quality of the power distribution system managed by NEA. Major causes of the system losses include: (i) overloading of distribution transformers; (ii) long distance and overloading (due to wrong sizes) of distribution feeder lines; (iii) high voltage drop of the distribution system due to lack of reactive power compensations; and (iv) commercial losses (poor metering, electricity theft, etc.). Owing to the high system losses, not only there is gap in the demand and supply, but also on the cost of energy supplied. This has resulted in the poor financial performance of NEA with increasing debts. It is to be noted that NEA incurs a loss of about 2 cents for every kilowatt-hour of electricity it sells. As a consequence, NEA is neither able to service its debts, nor generate funds required to invest in generation, transmission, and distribution infrastructures.

This gap between power supply and demand needs immediate attention with economically viable short term options. Accordingly Government of Nepal (GoN), to deal with the energy crises and eventually achieve sustainable, reliable and affordable electricity supply,has given priority to the strategiessuch as (i) reduce the load shedding by adding generation capacitythat can be installed in a shortterm; (ii) reach supply and demand balance in a mediumterm through commissioning of hydropower under construction and power import from India; and (iii) develop its huge hydropower resources to sustain domestic growth and earn export revenuesin a longterm. In line with the strategy are actions including: (a) pilot projects of

1*In November 2012, the available capacity was only 625 MW including 53MW thermal and about 100 MW import from India (hydro contributed only 472 MW); while, the peak demand was 1,095 MW.*

grid-connected solar power generation for the short term; (b) high voltage cross-border transmission line under construction for up to 1,000 MW power import from India (expected to be completed by 2016); and (c) development of large hydropower and cross-border transmission line for power export to India (about 4,000 MW in the pipeline with feasibility studies completed and the second cross-border high voltage transmission line to India (under feasibility study).

Keeping in line with the GON strategies, the proposed pilot projects of grid-connected solar power generation as a short term opting is being considered for financing by the World Bank.

1.2 Sectoral and Institutional Context

Average solar radiation varies from 3.6 to 6.2 kWh/m^2 per day in Nepal, while the total sun shines days is about 300 per year. According to July 2008 assessment of solar and wind energy in Nepal, the commercial potential of solar power for grid connection is about 2,100 MW2. Since solar electricity generation systems are easy and quick to install, are very attractive option in many locations in the county. Further as solar radiation are strongest during winter season, when the electricity demand is high and hydropower-based power generation is low, this option for short term measure is considered more attractive. It is therefore, solar power is considered as one of the ideal power generation sources to complement the hydropower dominated electricity generation in Nepal. Grid-connected solar power generation is technically proven, however,is nearly two times costlier than the current retail tariff.

The electricity sector in Nepal is under the responsibility of the Ministry of Energy (MoE), which is responsible for formulating sector policies, and regulations, and overseeing planning, investment and development of the power sector. The MoE is also responsible for issuing licenses for electricity generation, transmission and distribution. In addition, the Investment Board established in November 2011 was entrusted with the responsibility of facilitating the development of large infrastructure projects including hydropower projects above 500 MW. NEA was formed in August 1985, under the Nepal Electricity Authority Act of 1984, as a vertically-integrated government-owned utility responsible for generation, transmission, and distribution of electricity in Nepal. Independent Power Producers (IPPs) also invest, own, and operate power generation facilities, mostly based on hydro resources. For domestic grid-based electricity supply, NEA serves as the single buyer for the electricity generated by IPPs. NEA being the sole agency for power generation, transmission and distribution in Nepal has the obligation to meet the power demand complying with the GON strategies to fill the gap between supply and demand in short, mid and long term. Considering the escalating power crisis, NEA has keen interest for the potential short term options of power supply such as grid connected solar power generation to minimize the gap between generation and supply

Given the power crisis, availability of strongest sunshine radiation in the critical power shortage periods, and interest of concerned institutions of GoN and NEA, the proposed project is the best option among alternatives that can deal with the energy crisis in the shortterm.

1.3 Project Description

1.3.1 Broader Project Objectives

The GSEEP broad objective is to reducing gap between demand and supply of gird powerand contributing to the economic and social development of Nepal.

2*UNEP/ GEF, 2008. Solar and Wind Energy Resource Assessment in Nepal (SWERA), July 2008*.

1.3.2 Development Objectives

The project development objectives (PDOs) are to: (i) increase generation capacity to supply the NEA grid through grid-connected solar farms; and (ii) reduce NEA's distribution losses in pilot distribution centers.

1.3.3 Project Beneficiaries

1. The project beneficiaries are grid-connected electricity consumers throughout the country, who will benefit from increased power supply to the grid. The NEA is also expected to benefit from the Project mainly with increased revenue from electricity sales, improved operational efficiency and gained experience in large-sized grid-connected solar farms.

.

1.3.4 GSEEP Components

The GSEEP consists of two components: (1) Grid-connected Solar Farm Development and (2)Distribution System Loss Reduction.

1.3.4.1 Component 1: Grid-connected Solar Farm Development

This component will support (a) design, supply, construction, commissioning, operation and maintenance (O&M) of grid connected solar farms, in a total capacity of 25 MWp, to supply electricity directly to NEA's distribution network, through an engineering, procurement, and construction (EPC) contract; (b) hiring of an Owner's Engineer (OE) to support NEA to procure the EPC contract and supervise its execution; and (c) incremental operating cost and capacity building. The solar farms will be built in conventional solar photovoltaic (PV) technology nearby the Kathmandu valley. Electricity generated will be supplied directly without electricity storage facilities, at 11kV medium voltage (MV) level, to the existing substations of the NEA

As of the date NEA has selected few potential sites in the surroundings of the Kathmandu valley and these are Kulekhani, (1 and 2), Sunkoshi, Panauti, Sundarijal, Pharping, TrishuliDevighat. The lands and properties within the sites are owned by NEA. Some of the sites, however, are encroached by outsiders due to poor property management by the concerned NEA management. NEA has conducted initial load flow and system stability studies, fault level analysis, connection concept design, facility protection design, optimal site selection, environmental and social impact assessments, and bid documents preparation. Technical assistance will be provided to NEA to finalize these technical studies and the bidding document for design, supply, installation and commissioning of the solar farm. O&M services for 5 years from the date of commission, including supply of spare parts, preparation of an O&M manual and training of NEA's engineers will also be included. An Owner's Engineer (or individual consultants) will be hired by NEA to assist in construction supervision, acceptance test, commissioning, and reviewing the O&M Manuals.

1.3.4.2 Component 2: Distribution System Loss Reduction

This component will support: (a) preparing the Distribution Master Plan (DMP); (b) preparing the Distribution Loss Reduction Master Plan (DLRMP); (c) preparation and implementation of pilot loss reduction projects in selected distribution centers of NEA following recommendations of the DLRMP; and (d) capacity building for distribution system planning at both NEA's distribution center and corporate levels. The component will help redress the high system losses in the country, enhancing NEA's capacity in distribution system planning and management, and enhancing on-grid and off-grid planning coordination for rural electrification.

Following recommendations of the DLRMP, investment for system loss reduction will be piloted in two selected distribution centers of the NEA, which may include: (i) replacing conductors of distribution feeders or building new distributions lines to reduce line losses; (ii) adding or replacing distribution

transformers to maintain voltage levels and reduce transformer losses; and (iii) adding capacitor banks to compensate reactive power to manage voltage levels.

The capacity building programs may include: (i) provision of instruments and proven software and training for distribution system loss identification and reduction planning; and (ii) development of a Geographic Information System (GIS) database with information/data of locations and details regarding the NEA's existing generation, transmission, and distribution facilities (including specifications); grid connected customers (households, industries, commercials, institutional customers, etc.); potential customers in grid-covered areas; potential demands in areas not covered by national grid; among others, for distribution system / rural electrification master planning. The GIS database is critical for on-grid and off-grid rural electrification planning, loss reduction planning, and distribution system and customer management.

1.4 Project Institutional and Implementation Arrangement

The implementing agency for the GSEEP will be NEA. A project management Team (PMU) will be established at NEA. A project manager has already been appointed and the PMU will be staffed with necessary technical and procurement officials. Detailed organization structure will be finalized during the project preparation.

1.5 Type and Nature of Civil Works Supported Under the GSEEP

The component 1 is to construct a grid-connected 20MW solar farm (without having electricity storage facility). The construction works of grid connected solar project involves little civil works, such as clearing of vegetation, leveling of ground, construction of control buildings, and installation of solar panels and electro-mechanical equipment. In addition, the component also constitute establishment of short distance 11 kV transmission lines from the solar farm to the nearest sub-station. Construction works for the transmission line involves clearing of standing trees, structures along the alignment, preparation of 11 kV pole foundations and stringing of conductors.

The component 2 activities are to replace the conductors in the existing distribution feeders, add or replace the existing distribution transformers and add capacitor banks in the existing substations. This component, in actuality does not involve any civil construction works, however, entail management of the hazardous waste of the replaced transformer in case they are PCB based.

The allocated budget for component 1 is US$50million, while component 2 is US$ 33and US$ 2. The total budget estimated is US$ 83million of which GON will contribute US$ 3 million and remaining US$ 80 million will be IDA soft loan.

1.6 Activities Excluded from GSEEP

The following lists the activities that cannot be supported under the GSEEP.

1. Any activity within the protected area/UNESCO declared heritage site;
2. Protected area or critical natural habitat is excluded.

3. Any activity that requires the physical relocation of households through involuntary acquisition of land and property excluding encroachers occupying the land and property of NEA
4. Any activity that requires dismantling of the cultural resources such as temples, shrines historical and archeological objects
5. Transformers and capacitor banks based on PCBs

1.7 Need for Environment and Social Management Framework

The general thrust and broad project interventions are well understood as outlined above. Based on the identified sample sites, the expected site specific environmental, social and cultural impacts are of limited nature. Since specific project activities are yet to be defined the exact nature and scale of their impacts will be known only later. Apart from the site specifics of the solar farm, the project area would include communities and settlements in its surroundings. Besides, the 11kV medium voltage alignments to conduit the power from solar farm to sub-station and vice versa has potentials of diverse impacts, though of localized nature, which are largely unknown at this stage of planning. The component 2 including replacement of conductors, addition and or replacement of transformers and addition of capacitor banks could have issues related to community discomfort, community and occupational health and safety etc, depending upon the areas where such activities will be carried out. As these component activity sites are yet to be finalized, the nature and gravity of the impacts could only be assessed once the sites are identified and project activity foot prints are fixed.

In the above context, a safeguard framework document is needed to 'guide' the planning, design and construction elements of the project activities. Such a guidance document or a framework would help in integrating and harmonizing the environment and social management principles at the various stages of project preparation and execution. In this context, this Environment and Social Management Framework (ESMF) has been prepared for the GSEEP.

This ESMF forms part of the comprehensive environmental and social management approach that has been adopted for addressing the potential environmental and social impacts from GSEEP, even when these are considered minor in nature.

Since specific GSEEP activities will only be identified in the course of project implementation, a mechanism for screening and assessing possible adverse short-term environmental and social impacts during the project preparation is required. This ESMF defines (a) the approach for identifying the environmental and social issues associated with the GSEEP activities, (b) the requirements for conducting environmental and social screening and environment and social assessment studies, and (c) measures to prevent, mitigate and manage adverse impacts and enhance positive ones. This ESMF includes an exclusion list and a simplified screening checklist, which will be used to determine what types of environmental and social assessment are required for the proposed initiatives. Environmental Management Plans/Social Action Plans (EMP/SAP) for specific initiatives will be prepared if required. This ESMF includes a resettlement policy framework describing mechanisms for addressing the possible temporary disruption of services and income (e.g., temporary displacement of informal vendors), and temporary restrictions on access to facilities while the construction work is ongoing in the project area. The ESMF includes a vulnerable community development plan, a gender development framework, and capacity building measures and a monitoring mechanism. This ESMF specifies norms and procedures for the conservation and restoration of historic and archeological objects for dealing with chance finds during small works.

1.8 Process Adopted for Preparing the ESMF

The process adopted for the preparation of this ESMF includes: review of relevant environmental and social policies, acts, regulations and guidelines of GON, safeguard policies of World Bank, and interactions and consultations with all concerned stakeholders. Therefore, this ESMF is primarily based on the reviews of available relevant literatures and consultations with the sample project level stakeholders.

1.9 Purpose and Objectives of the ESMF

The ESMF seeks to:

1. Establish clear procedures and methodologies for screening, reviewing and managing environmental and social safeguards for the components to be financed under the GSEEP.
2. Consolidate and facilitate understanding of all essential policies and regulations of the GoN as well as the World Bank's environmental and social safeguards regime that are applicable to the Project
3. Provide practical guidance on the implementation of the environmental and social management measures.
4. Specify norms and procedures for the conservation and restoration of historic and archeological objects for dealing with chance finds during works.
5. Specify institutional arrangements, including appropriate roles and responsibilities for managing, reporting and monitoring environmental and social concerns of the GSEEP component investments.
6. Provide a framework for consultation and information disclosure.
7. Determine the other institutional requirements, including those related to training and capacity building, needed to successfully implement the provisions of the ESMF.

The application and implementation of the ESMF therefore, will:

1. Support the integration of environmental aspects into the decision making process at all stages related to planning, design, execution, operation and maintenance of GSEEP investments, by identifying, avoiding and/or minimizing adverse environmental impacts early-on in the project cycle.
2. Minimize environmental degradation to the extent possible resulting from either directly GSEEP component activities or through indirect, induced and cumulative effects of project activities.
3. Enhance the positive/sustainable environmental and social outcomes through improved/appropriate planning, design and implementation of sub-activities of the project components.
4. Consider the level of environmental and social risk of each type of GSEEP component activates in allocating time and resources to be dedicated for stakeholder consultation.
5. Build the capacity of the NEA to take-up and coordinate responsibilities related to the application and implementation of the ESMF, including the preparation of the GSEEP Component specific Environmental Assessment and Management Plans (if required).
6. Provide guidelines and procedures for further consultations during project implementation, in particular in defining and designing GSEEP component specific works.
7. Provide a systematic guidance to address potential risks and to enhance quality, targeting, and benefits to the surroundingcommunities.
8. Ensure that those stakeholders, irrespective of whether they benefit from or are adversely affected by the project interventions, are well informed and are able participate in the decision-making process.
9. Support compliance with applicable legal/regulatory requirements of GoN as well as with the requirements set forth in the relevant Bank policies.
10. Protect human health.
11. Minimize adverse impacts on cultural property.

1.10 Revision/Modification of the ESMF

The ESMF will be an 'up-to-date' or 'live document' enabling revision, when and where necessary. Unexpected situations and/or changes in the project or components design would therefore be assessed and appropriate management measures will be incorporated by updating this ESMF. Such revisions will also cover and update any change/modification introduced in the legal/regulatory regime of the country. Also, based on the experience of application and implementation of this framework, the provisions and procedures would be updated, as appropriate, in agreement with the World Bank and the NEA.

1.11 Limitations of the ESMF

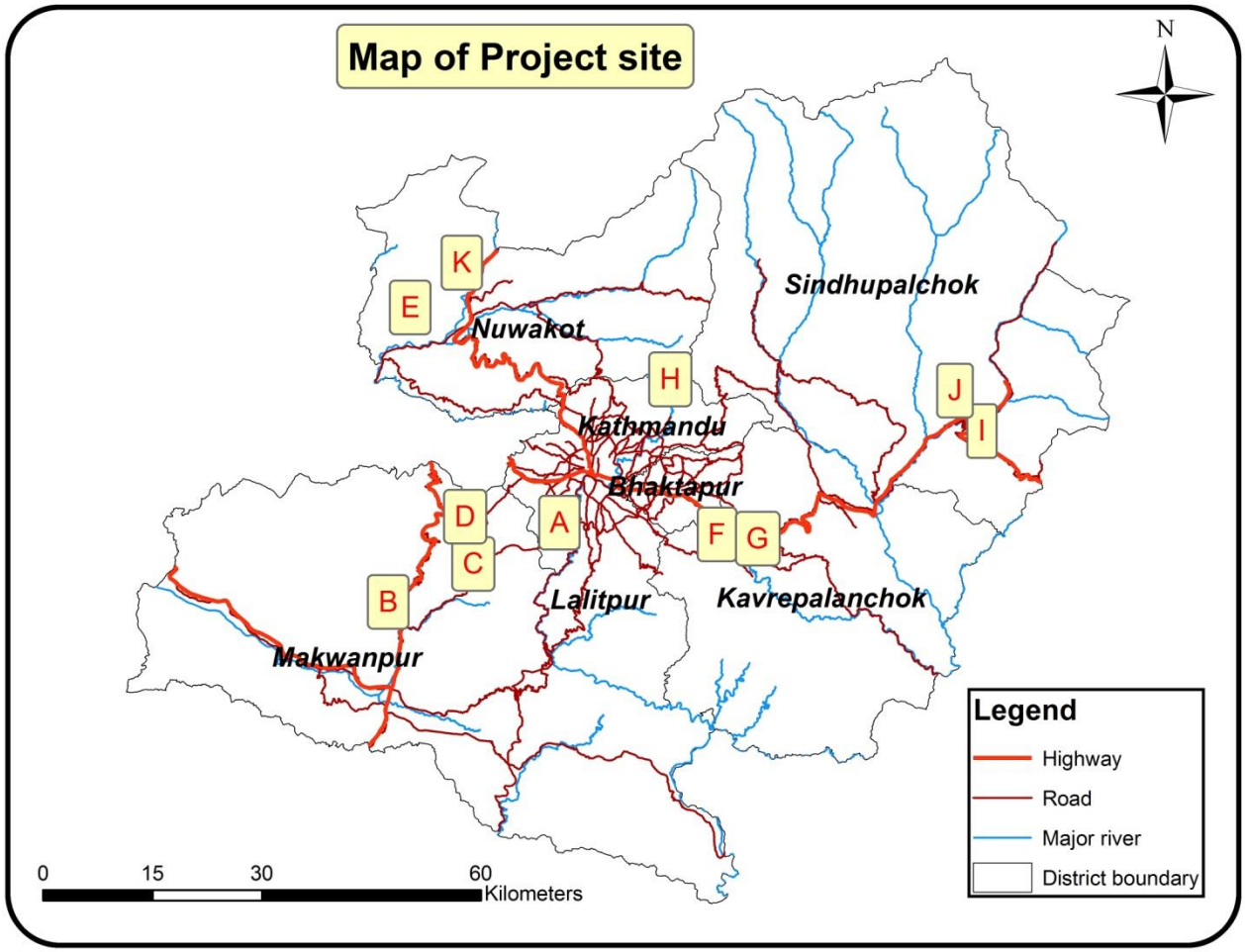
This ESMF has been developed in line with World Bank's Operational Policies (OPs) and is based on GoN laws and regulations, as applicable at the time of preparation of this document. Any proposed

modifications in the laws, regulations or guidelines that were notified as ‘draft’ at the time of preparation of this document have not been considered.

CHAPTER II: OVERVIEW OF THE PROJECT AREA

Potential candidate project sites for the solar farm related to component 1 investments are identified by NEA and have been jointly inspected by the team of NEA and World Bank. However, for the component 2 of the projectsite are still not known. Therefore, the study does not includes any site specific study for the component 2 of the project. These candidate sites were also subject to preliminary environmental and social assessment prior to the preparation of this ESMF. The identified sites for solar farm are located in the Kathmandu valley and its surroundings in the districts of Kathmandu, Makawanpur, Nuwakot, Kavrepalachouk and Sindhupalanchok in the Central Development Region of Nepal (***Figure 1***). Candidate sites for the component 2 investments are not yet identified but are envisaged to be within the geographical boundaries of the candidate solar farm districts.

Figure 1: Location Map of the Candidate GSEEP Solar Farm Sites



A	Pharping power house	G	Panauti 2
B	Kulekhani Power House	H	Sundarijal
C	Kulekhani Reservoir area 1	I	Sunkoshi 1
D	Kulekhani Reservoir area 2	J	Sunkoshi 2
E	Debighat	K	Trishuli
F	Panauti 1		

2.1 Geographical Location

Geographical locations of the candidate solar farm sites are presented in ***Table 1***.

Table 1: Geographical Locations of the Candidate Solar Farm Sites

SN	Project Site	VDC and Ward No and District	GPS Location	Land Area (m^2)*
1	Pharping Powerhouse	Setidevi VDC ward no 6,4,5; Kathmandu	Lat: 27°36'49.18'' N Long: 85°17'19.74'' E	17862.65
2	Kulekhani 2 Powerhouse	Bhainse VDC ward no.3 Makwanpur	Lat: 27°31'6.99'' N Long: 85°2'57.2'' E	6004.45
	Kulekhani 1 Reservoir area	Markhu VDC ward no 8 ; Makwanpur	Lat: 27°37'8.51'' N Long: 85°9'3.12'' E	59450.31
	Kulekhani 1B, Reservoir Area	Markhu VDC Ward no 8; Makwanpur	Lat: 27°36'40.27'' N Long: 85°9'21.65'' E	6254.07
3	Devighat	Charghare VDC ward no.2 ; Nuwakot	Lat: 27°52'56.51'' N Long: 85°7'30.65"E	23570.977
4	Panauti	Panauti municipality ward no 12, Kavre	Lat: 27°33'50.57'' N Long: 85°32'0.28E	1721.21
	Panauti 2	Panauti Municipality ward no 12, Kavre	Lat: 27°33'49.46'' N Long: 85°32'9.72"E	1575.43
5	Sundarijal	Sundarijal VDC ward no 9 ; Kathmandu	Lat: 27°45'33.74'' N Long: 85°25'12.99"E	2533.19
6	Sunkoshi 1	Pangretar VDC ward no-5, Sindhupalanchok	Lat: 27°45'14.02'' N Long: 85°50'36.82"E	11217.02
	Sunkoshi 2	Mangka VDC ward no. 6 Sindhupalanchok	Lat: 27°45'18.71'' N Long: 85°50'6.82"E	17862.65
7	Trishuli	Bidur Municipality ward no 10, Nuwakot	Lat: 27°55'19.89'' N Long: 85°8'48.26"E	2815.73

*Note: * Land area of candidate site as per NEA 2014 survey.*

All of the candidate sites are within the land property boundaries owned by NEA. The NEA land survey report (2014) has covered only flat or south facing areas in the candidate sites, however, the preliminary field survey for the preparation of this ESMF reveals larger NEA owned land areas within the candidate sites. In some of the candidate sites, parts of the NEA owned land areas are encroached by the outsiders.

Figure 2 to 9 depicts the locations of the candidate sites in the recent Google Images. White line is the approximate boundary of the candidate sites, while the yellow notation with site name is marked on the central part of the candidate site location.

Figure 2: Pharping Powerhouse site

Figure 3: Kulekhani 2 Powerhouse Site

Figure 4: Kulekhani 1 and 1B sites Kulekhani Reservoir Sites

Figure 5: Devighat Powerhouse site

Figure 6: Panauti andPanauti 2 Site

Figure 7: Sundarijal Powerhouse site

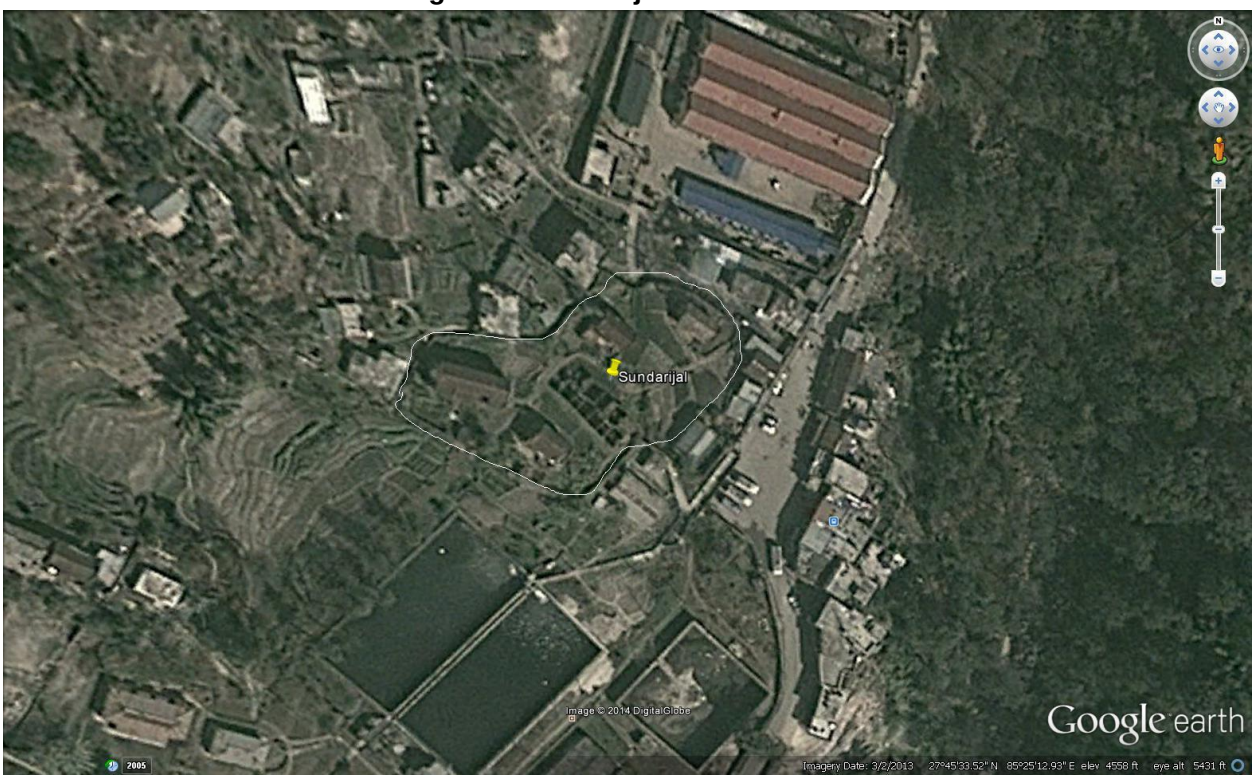


Figure 8: Sunkoshi 1 and 2SunkoshiPowerhouse Sites

Figure 9: Trishuli Powerhouse Site

2.1.2 Environmental Baseline

The candidate sites are located in the rural setting except for the Trishuli and Sundarijal, which are within the well developed area of urban or peri-urban setting.

All sites lie outside the protected National Parks, Wildlife Reserves or Conservation areas. The Sundarijal site lies within 5 km distance of the protected site i.e. Shivapuri- Nagarjun National Park, while the other sites are more than 30 km from the nearest National Parks.

The Google Images depicts the overall landscape, land use, access, built structures, settlements etc within and outside the proposal sites. The above features depicted in the images fairly capture the proposal site's physical environments with some level of information on the biological (particularly forest and vegetation cover and their distribution) and social (settlement pattern, agro-economic practices) environments. ***Table 2*** presents the environmental baseline summary of the proposal sites based on the Google image interpretation, reconnaissance field visits and available secondary literatures of the respective areas.

Table 2: Summary Environment and Social Baseline

SN	Project Site	Accessibility	Environmental and Social Baseline	Development needs
1	Pharping Powerhouse	Motorable access along the southern boundary	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas. ▪ No natural forest within the site. ▪ Lies above flood plain. ▪ Limited surface run off erosion. ▪ Land unit is sloping at 20 degree towards south. ▪ The land is terraced. Open agricultural land. No tree obstruction. ▪ Four built structures within the site along the southern boundary. ▪ Nearest settlement is about 5 m of the southern border. ▪ Not a historical and religious site and ▪ Devoid of built temples within the site boundary.	▪ Demolition of built structure; ▪ Land to be planed for flat panel PV ▪ Need 12 km of 11 kV line evacuate poweror has to free or add conductor on existing 11 kV distribution line
2	Kulekhani 2 Powerhouse	Motorable access along the southwestern boundary line	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas. ▪ No natural forest within the site. Lies above flood plain. ▪ Lower part of the site shows landslide scars, erosion prone with Moderate to high surface run off. ▪ Open land barren. Upper part represents terraced agricultural land sloping at angle greater than 20 degrees. ▪ No tree obstruction. ▪ No built structures within the site. ▪ Nearest settlement about 75 m to the northwest and about 25 m to the	▪ Land slide potential, and need protection against landslide, ▪ Land to be planned for flat panel PV, ▪ Need a 11 kV TL line to evacuate power length not known;or has to free or add conductor on existing 11 kV distribution line

SN	Project Site	Accessibility	Environmental and Social Baseline	Development needs
			southwest of the site boundary. ▪ Not a historical and religious site and ▪ Devoid of built temples within the site boundary.	
	Kulekhani 1 Reservoir area	Motorable access along the eastern boundary of the site	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas. ▪ No natural forest within the site. ▪ Lies above flood plain. ▪ Limited surface run off erosion. ▪ Southwest facing slope (<20 degree), terraced land. More than 30 trees along the border line on the south and east. ▪ 53 structures within the site. ▪ Nearest settlements and built structures from the site boundary on the north, and east within 5 to 20 m distance. ▪ Not a historical and religious site and i ▪ Devoid of built temples within the site boundary.	▪ Demolition of structures, ▪ clearance of vegetation, ▪ Land to be planned for flat PV panel, ▪ Need a 11 kV TL line length unknown or has to free or add conductor on existing 11 kV distribution line
	Kulekhani 1B, Reservoir Area	No motorable access, about 200m access road will have to be developed through the sparsely vegetated slope from the north east side from the main access road.	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas. ▪ No natural forest within the site. ▪ Lies above flood plain. ▪ Limited surface run off erosion. ▪ Terraced agricultural land mostly open. ▪ Three bamboo clumps on the northern boundary and few bushy types of vegetation on the southern side. ▪ One structure within the site. ▪ Nearest structures from the site boundary locates at the western (4 nos) and eastern boarders (2 nos). ▪ Not a historical and religious site and ▪ Devoid of built temples within the site boundary.	▪ NeedMotorable access, ▪ Demolition of structure, ▪ Clearance of vegetation, ▪ Need a TL line length not known or has to free or add conductor on existing 11 kV distribution line
3	Devighat	Motorable access along the northern boarder	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas.	▪ Landslide protection, Land to be planned for flat PV panel, ▪ Need a TL line length unknown or has to free or add conductor on existing 11 kV distribution line

SN	Project Site	Accessibility	Environmental and Social Baseline	Development needs
			▪ No natural forest within the site. ▪ Lies above flood plain. ▪ Limited surface run off erosion. Small landslide on the eastern boundary facing to Trishuliriver. ▪ A deep gully (vegetated) marks the western boundary. ▪ Site is open terraced land sloping due south at angle about 20 degree. ▪ No vegetation and trees within the site. ▪ No structures within the site. ▪ Not a historical and religious site and ▪ Devoid of built temples within the site boundary.	
4	Panauti	No motorable access to the site. About 100m access to be developed along the western embankment of the reservoir.	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas. ▪ No natural forest within the site. Lies above flood plain. ▪ It forms the part south facing slope of the reservoir embankment, approximately 15m wide and about 115 long. ▪ The site sloping about 12 degree to the south. ▪ No tree vegetation within the site. ▪ No built structures within site. ▪ A foot trail pass along the site. ▪ Not a historical and religious site and ▪ Devoid of built temples within the site boundary.	▪ Development of motorable access, ▪ Need provision of access trail, ▪ Site too narrow ▪ Need a TL line length unknown or has to free or add conductor on existing 11 kV distribution line
	Panauti 2	Motorable access to be improved (approximate length 90m, trail exists need to be developed).	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas. ▪ No natural forest within the site. ▪ Lies above flood plain. ▪ Open barren land. ▪ Moderate Surface runoff erosion. ▪ Two trees on the northern boundary line and few bushy vegetation on the east. ▪ One structure within the site. ▪ Nearest structures are within 15 m distance to the north and about 35 m to the east of the site boundary. ▪ A foot trail pass through the site. 1. Not a historical and religious site and	▪ Development of motorable access, ▪ vegetation clearance, ▪ provision of alternative access trail ▪ Site very small by area ▪ Need a TL line length unknown or has to free or add conductor on existing 11 kV distribution line ▪ Potential of NEA owned additional area

SN	Project Site	Accessibility	Environmental and Social Baseline	Development needs
			▪ Devoid of built temples within the site boundary.	
5	Sundarijal	Motorable access from the northern side	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas. ▪ No natural forest within the site. ▪ Lies above flood plain ▪ . Agricultural open land of flat nature. ▪ No tree vegetation. ▪ Four built structures within site. ▪ Sitesurrounded by built structures on three sides. ▪ Not a historical and religious site and ▪ Devoid of built temples within the site boundary.	▪ Demolition of structure.
6	Sunkoshi 1	Motorable access along the southern border.	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas. ▪ No natural forest within the site. ▪ Lies above flood plain. ▪ Limited surface runoff erosion ▪ A rolling spur forming the embankment of the reservoir on the northern and northeastern side of the reservoir. ▪ Partly afforested land with a number of small trees. ▪ The land unit slope both to the north and south at gentle angle. ▪ No built structure within the site. ▪ The nearest built structure is about 60 m to the east of the site boundary. ▪ Not a historical and religious site and ▪ Devoid of built temples within the site boundary.	▪ Vegetation clearance, ▪ Land to be developed for flat PV panel , Need 3-3.5 km of new 11 kV line or has to free or add conductor on existing 11 kV distribution line ▪ Potential of additional NEA owned land area
	Sunkoshi 2	Motorable access from the northwestern corner.	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas. ▪ No natural forest within the site. Lies above flood plain. ▪ Limited surface runoff erosion. ▪ Open land sloping due south at gentler angle, terraced agricultural land.	▪ Clearance of vegetation , ▪ Need 3-3.5 km of new 11 kV line or has to free or add conductor on existing 11 kV distribution line

SN	Project Site	Accessibility	Environmental and Social Baseline	Development needs
			▪ No built structure within the site ▪ Nearest building is about 5 m from the eastern border. ▪ One tree on the northern border. ▪ Not a historical and religious site and ▪ Devoid of built temples within the site boundary.	
7	Trishuli	Motorable access all along the northern border	▪ Sub-tropical climate, influenced by monsoon rains (June to September) ▪ Summer months (March to May) hazy with high suspended dusts in the atmosphere ▪ Sites not important from water resource point of view ▪ Lies outside national Park & conservation areas. ▪ No natural forest within the site. ▪ Lies above flood plain. ▪ Limited surface runoff erosion. ▪ More than 30 trees covering the site. ▪ Two built structure within the site. ▪ Dense settlement to the north and east of the site boundary. ▪ Not a historical and religious site and ▪ Devoid of built temples within the site boundary.	▪ Demolition of structure, ▪ clearance of vegetation, ▪ Need a TL line length unknown or has to free or add conductor on existing 11 kV distribution line

Source: Google Image 2009/2011.

All of the structures within the candidate sites surveyed by NEA 2014 are under the ownership of NEA. All of these structures are abandoned structures while some structures are being occupied by the NEA's local staff. Similarly, some land plots are also under cultivation by the NEA's local staff.

2.1.3 Social Baseline

Table 3 presents summary of the VDC level social baseline data of the candidate project sites.

Table 3: Summary of VDC Level Social Baseline

VDC Area and Demography											
SN	**Project Site**	**VDC and Ward No**	**Area***	**HH**	**Total**	**M**	**F**	**HH size**	**M/F**	**Pop. Density****	**Caste/Ethnic Group**
1	Pharping Powerhouse	Setidevi VDC ward no 6,4,5; Kathmandu	5.87	1039	4248	2117	2131	4.09	0.99	724	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamang, Magar, Gurung, Dalit, Rai, and Tharu. Chetri is dominant (48%) followed by Newar (22%). Janajati group constitute 36.85% while upper caste make up 54.83% and Dalit 8.32%

VDC Area and Demography											
SN	**Project Site**	**VDC and Ward No**	**Area***	**HH**	**Total**	**M**	**F**	**HH size**	**M/F**	**Pop. Density****	**Caste/Ethnic Group**
2	Kulekhani 2 Powerhouse	Bhainse VDC ward no.3 Makwanpur	63.01	1388	6717	3228	3489	4.84	0.93	107	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamang, Magar, Gurung, Dalit, Chepang, Rai, and Thakuri. Tamang is dominant (66%) followed by Magar (11%). Janajati group constitute 82.64% while upper caste make up 11.86% and Dalit 5.31%
	Kulekhani 1 Reservoir area	Markhu VDC ward no 8 ; Makwanpur	15.87	634	3071	1452	1619	4.84	0.90	194	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamang, Magar, and Dalit,.Tamang is dominant (52%) followed by Newar (25%). Janajati group constitute 83.48% while upper caste make up 15.50% and Dalit 1.02%
	Kulekhani 1B, Reservoir Area	Markhu VDC Ward no 8; Makwanpur	15.87	634	3071	1452	1619	4.84	0.90	194	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamang, Magar, and Dalit,.Tamang is dominant (52%) followed by Newar (25%). Janajati group constitute 83.48% while upper caste make up 15.50% and Dalit 1.02%
3	Devighat	Charghare VDC ward no.2 ; Nuwakot	18.39	1190	5419	2478	2941	4.55	0.84	295	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamang, Gurung, Dalit, Magar, Rai, Gharti/Bhujel and Thakuri. Bahun is dominant (45%) followed by Tamang (16%). Janajati group constitute 27.49% while upper caste make up 57.31% and Dalit 15.2%.
4	Panauti	Panauti municipality ward no 12, Kavre	31.73	5943	27358	13091	14267	4.60	0.92	862	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamang, Gurung, Rai, Dalit, Magar,

VDC Area and Demography											
SN	**Project Site**	**VDC and Ward No**	**Area***	**HH**	**Total**	**M**	**F**	**HH size**	**M/F**	**Pop. Density** **	**Caste/Ethnic Group**
											Shanyashi, Thakuri, Pahari, Gharti/Bhujel, Majhi, and Sherpa. Chetri is dominant (47%) followed by Newar (29%). Janajati group constitute 55.91% while upper caste make up 60.50% and Dalit 5.47%.
	Panauti 2	Panauti Municipality ward no 12, Kavre	31.73	5943	27358	13091	14267	4.60	0.92	862	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamang, Gurung, Rai, Dalit, Magar, Shanyashi, Thakuri, Pahari, Gharti/Bhujel, Majhi, and Sherpa. Chetri is dominant (47%) followed by Newar (29%). Janajati group constitute 55.91% while upper caste make up 60.50% and Dalit 5.47%.
5	Sundarijal	Sundarijal VDC ward no 9 ; Kathmandu	35.31	547	2552	1252	1300	4.67	0.96	72	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamamng, Gurung, Dalit, and Shanayshi. Tamang is dominant (64%) followed by Newar (11%). Janajati group constitute 79.51% while upper caste make up 20.05% and Dalit 0.4%.
6	Sunkoshi 1	Pangretar VDC ward no-5, Sindhupalanchok	9.62	762	2952	1428	1524	3.87	0.94	307	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamang, Gurung, Dalit, Magar, Gharti/Bhujel, Majhi, and Thami. Chetri is dominant (35%) followed by Bahun (23%). Janajati group constitute 19.54% while upper caste make up 60.50% and Dalit 19.96%.

VDC Area and Demography											
SN	**Project Site**	**VDC and Ward No**	**Area***	**HH**	**Total**	**M**	**F**	**HH size**	**M/F**	**Pop. Density** **	**Caste/Ethnic Group**
	Sunkoshi 2	Mangka VDC ward no. 6 Sindhupalanchok	15.46	1860	7752	3698	4054	4.17	0.91	501	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamang, Gurung, Dalit, Magar, Gharti/Bhujel, and Sherpa,.Tamang is dominant (37%) followed by Bahun (27%). Janajati group constitute 47.39% while upper caste make up 46.14% and Dalit 6.15%
7	Trishuli	Bidur Municipality ward no 10, Nuwakot	33.48	6270	26750	12712	14038	4.27	0.91	799	The caste ethnic groups in the VDC are Newar, Bahun. Chetri, Tamang, Gurung, Dalit, Magar, Rai, Gharti/Bhujel, Kumal, Sherpa, Bhote, Shanayshi and Thakuri. Newar is dominant (24%) followed by chhetri (22%). Janajati group constitute 45.13% while upper caste make up 46.24% and Dalit 8.63%.

Source: CBS 2012, and CBS 2001

Note: HH = Household, M= Male, F = Female, M/F – Male/Female ratio,

** = Area in Km^2, ** Population Density – Persons/km^2.*

Candidate site level detailed baseline database are presented in the ***Annex 1***, while the summary is presented in Table 4, 5, 6, and 7

Table 4: Access conditions of the candidate Solar Farm Sites

SN	Name of the Project Site	Number of Access to the site	Remarks
1	Pharping Powerhouse	2 motor able road and 1 small road from where only bikes are accessed	1 motor able road from north region (graveled) one from western region (graveled) and one small road from southern part.
2	Kulekhani 2 Powerhouse	One motor able access road from west	The site is at distance of 2 km toward Daman from Bhaise
	Kulekhani 1 Reservoir area	One motor able access road from north east	The graveled road extends 5km along the eastern side of the Kulekhani Hydropower Reservoir up to the Markhu village. Around 20m motor able graveled access road extends from main road up to the site.
	Kulekhani 1B, Reservoir Area	One motor able access road from north	The site is at distance of 500m from the simlangbazartar, where the

			kulekhhaniMarkhuroad passes
3	Debighat	One motor able access road from North	The access road to site is gravel road from Trishuli to the project site
4	Panauti 1	1 foot trail	The access road to the site is foot trail that extends 150m south from main road
	Panauti 2	1 foot trail	From the access road, the sitelies at the south- western side about 200 m in distance
5	Sundarijal	One motor able access road from East	Site is near Sundarijal bus park at about 10 meter distance
6	Sunkoshi 1	One motor able access road from North east	About 1 kilometer far from PasangLhamu highway
	Sunkoshi 2	One motor able access road from North	About 40 meter far from Araniko highway
7	Trishuli	One motor able access road from East	About 1.5km from the Trishuli Bridge, 70m above the microbus park.

Source: Field Survey 2014

Table 5: Land Use of the Candidate Solar Farm Sites

SN	**Name of the Project Site**	**Specific Land Use**	**Remarks**
1	Pharping Powerhouse	Barren land	Majority portion of land is barren and covered by grasses
2	Kulekhani 2 Powerhouse	Barrenl land	Majority portion of land is barren and covered by grasses
	Kulekhani 1 Reservoir area	Residential area (for staff of NEA)	It is basically designed as a NEA staff colony that consists of staff quarters, NEA office, planted area with several variety of tree species, kitchen garden developed by NEA staffs and fallow land covered with grasses.
	Kulekhani 1B, Reservoir Area	Agricultural land	The proposed project site is the nursery of Nepal Electricity Authority, used for growing sapling of tree.
3	Debighat	Agricultural land	Five Rai family of vultar village have been practicing agriculture on the project site
4	Panauti 1	Barren land	Majority portion of land is barren and covered by grasses
	Panauti 2	Barren land	The site is devoid of forest & natural vegetation and other infrastructures
5	Sundarijal	Residential & agricultural land	Utilized by NEA staff member
6	Sunkoshi 1	Forest land	Planted by NEA in 2046 B.S
	Sunkoshi 2	Agricultural land	Utilized by Bhakta BahadurKhadka
7	Trishuli	Barren land	Site being used as store of worn out machineries.

Source: Field Survey 2014

Table 6: Nearest Settlement and CommunitiesCandidate Solar Farm Sites

SN	Name of the Project Site	Distance from Nearest settlement	Name of the Nearest Settlements	Total HH	Population		Community Characteristics
					Male	Female	
1	Pharping Powerhouse	250 m towards south west from south western corner of site	Setidevi VDC, ward number 4	5	23	18	Majority of Newar community
		250 m towards east and south from eastern and southern corner of site respectively	Setidevi VDC, ward number 6	5	29	16	Settlement is mostly dominated by Chettri community
2	Kulekhani 2 Powerhouse	200 m north west from the site	Aapchaur	51	103	112	Settlement is mostly dominated by Magar community
	Kulekhani 1 Reservoir area	Adjacent to northern side	Markhu	48	113	123	Majority of Tamang community
	Kulekhani 1B, Reservoir Area	100 m west from the project site	Simlang	18	25	31	Majority of Newar community
		115 m north west of the site	Bazartar	16	21	23	Majority of Newar community
		130 m north of the site	Dhakyu	2	4	5	Majority of Newar community
3	Debighat	25 m north of the site	Manthala	56	178	178	Settlement dominated by Brahmin community
		200 m far north west of the site	Vultar	15	32	34	Settlement dominated by Rai community
4	Panauti 1	100 m far towards western side	Satyal Dada	50	100	90	Mainly Chhetri and Brahmin community
	Panauti 2	100 m far towards western side	Satyal Dada	50	100	90	Mainly Chhetri and Brahmin community
5	Sundarijal	Adjacent to South east of the site	Sundarijal	61	178	178	Settlement is mostly dominated by ethnic groups of Tamang.
6	Sunkoshi 1	Adjacent to East of the site	LapsiKhola	5	13	15	Settlement is mostly dominated by Chettri community
	Sunkoshi 2	Adjacent to East of the site	Aakar	3	9	10	Mixed type of settlement with ethnic groups of Chhetri, Brahmin, Tamang
7	Trishuli	200 m east from the site	Trishuli bazar	250	483	585	Majority of Tamnag community

Source: Field Survey 2014

Table 7: Built Infrastructures in the Candidate Solar Farm Sites

SN	Project Sites	Electric lines	Storm water drains and drainage	Water supply pipes through the sites	Wells, tube wells & tap	Other Structures	Religious structures
1	Pharping Powerhouse	-	-	-	-	1 cow shed 14 retaining wall	-
2	Kulekhani 2 Powerhouse	-	-	-	-	1 cowshed for cattle	-
	Kulekhani 1 Reservoir area	23 pole	-	-	-	46 house	-
	Kulekhani 1B, Reservoir Area	1 pole	-	-	-	1 house	-
3	Debighat	2 pole	-	-	-	-	-
4	Panauti 1	-	-	-	-	-	-
	Panauti 2	5 pole	-	-	-	-	1 krishna temple
5	Sundarijal	2 pole	-	-	1 tap	6 residential buildings 1 toilet 1 Building Block	-
6	Sunkoshi 1	3 pole	-	-	-	-	-
	Sunkoshi 2	1 pole	-	-	-	1 temporary stall	-
7	Trishuli	2 pole and 1 transmission pole	-	-	-	2 store building	-

Source: Field Survey 2014

Table 8: Numbers of Trees inside the Candidate Solar Farm Sites

SN	Name of the Project Site	Local Name of Tree species	Scientific name	Number
1	Pharping Powerhouse	Bakaino	Meliaazederach	4
		Uttis	Alnusnepalensis	5
		Painyu	Prunuscerasoides	1
		Aangari	Melastomamelabathricum	1
		Hadibayer	Zizyphusincurva	1
2	Kulekhani 2 Powerhouse	Chilaune	SchimaWalichi	7
		Kutmero	LitseaMonopetala	2
		Sal	Shorea Robusta	3
	Kulekhani 1 Reservoir area	Kainyo	Wendlandiapuberula	132
		Kalki	Callistemon citrinus	112
		Salla	Pinusruxburghii	18
		Kapur	Cinnamomumcamphora	13
		Naspati	Pyruscommunis	21
		LaharePeepal	Populusdeltoides	7
		Uttis	Alnusnepalensis	14
		Dhupi	Cryptomeriajoponica	66
	Kulekhani 1B, Reservoir Area	Naspati	Pyruscommunis	27
		Kaiyo	Wendlandiapuberula	5
		Khari	Celtisaustralis	2
		Kafal	Myricaesculenta	1

SN	Name of the Project Site	Local Name of Tree species	Scientific name	Number
		Salla	*Pinusruxburghii*	2
		Utis	*Alnusnepalensis*	3
		Laharepipal	*Populusdeltoides*	2
3	Debighat	Jamun	*Syzygiumcumini*	1
		Khayer	*Acacia catechu*	1
		Pipal	*Ficusreligiosa*	1
		Katahar	*Artocarpusheterophyllus*	1
		Sal	*Shorearobusta*	1
		Aap	*Mangiferaindica*	1
4	Panauti 1	Nil		
	Panauti 2	Lapsi	*Choerospondiasaxillaris*	1
		Paiyu	*Betulaalnoides*	1
5	Sundarijal	Aru tree	*Prunuspersica*	3
		Naspati tree	*Pyruscommunis*	2
		Lapsi tree	*Choerospondiasaxillaris*	1
6	Sunkoshi 1	Sissau Tree	*DalbergiaSisso*	109
		Mauwa tree	*Madhucalongifolia*	4
		Amba tree	*Psidiumguajava*	1
		Chilaune tree	*Schimawallichii*	4
		Salla	*Pinusroxburghi*	1
		Swami tree	*Ficusbenjamina*	1
	Sunkoshi 2	Pipal	*Ficusreligiosa*	2
		Kutmero	*Litseamonopelata*	5
		Aru	*Prunuspersica*	2
		bamboo	*Bambusavulgare*	1 clump (around 30 in number)
7	Trishuli	Aap	*Mangiferaindica*	3
		Sisso	*DalbergiaSisso*	8
		Chuwa	*Phlogacanthusthyrsiflorus*	1
		Bhogote	*Maesamacrophylla*	1

Source: Field Survey 2014

Table 9: Nearest Educational and Health Institutions of the Candidate Solar Farm sites

SN	Project Sites	Educational Institution	Distance from site (m)	Health Institution	Distance from site (m)
1	Pharping Powerhouse	Setidevi Lower Secondary School	500 m	Setidevi health post	1000 m
2	Kulekhani 2 Powerhouse	primary care teaching center	10 m	Health post	1500 m
	Kulekhani 1 Reservoir area	Shree SaraswotiBalbodhini High School	200 m	Health post	700 m
	Kulekhani 1B, Reservoir Area	Shree Chandra primary school	200 m	Health post	500 m
3	Debighat	Mandredhunga Primary school	1000 m	Health post	3000 m
4	Panauti 1	Shree BalAdarsha High School	60 m	Primary Health Post	50 m
	Panauti 2	Shree BalAdarsha High School	70 m	Primary Health Post	60 m
5	Sundarijal	Okhareni Higher Secondary School	400 m	Nepal Medical Hospital	2000 m
6	Sunkoshi 1	Shree	600 m	Pangretar sub	800 m

SN	Project Sites	Educational Institution	Distance from site (m)	Health Institution	Distance from site (m)
		SetideviSharda Higher Secondary School		- health post	
	Sunkoshi 2	Shree SetideviSharda Higher Secondary School	800 m	Mankha Health post	600 m
7	Trishuli	TribhuvanTrishuli Higher secondary school	300 m	Private clinic	100 m

Source: Field Survey 2014

CHAPTER III: REGULATORY AND LEGAL FRAMEWORK

All investments under the GSEEP must be consistent with the applicable laws, regulations, and notifications of the GoN that are relevant in the context of the proposed interventions/activities. The NEA and the concerned line departments/agencies will ensure that the GSEEP investments proposed and executed under GSEEP are consistent with the regulatory and/or legal framework, whether national, districts or municipal/VDCs. Additionally, it is also to be ensured that activities are consistent with the World Bank's operational policies and guidelines. This section is not a legal opinion on the applicability of the law but serves as guidance in the application of the various laws and regulations to the current project context.

3.1 Key Applicable National Environmental and Social Laws and Regulations

3.1.1 KeyApplicable National Environmental Laws and Regulations

This section highlights the salient features of selected laws that may have a bearing on the GSEEP design and implementation. A summary of such applicable policy, plan, guideline, standard and rules and regulations are furnished in the ***Table 10***:

Table 10: Applicable Environmental Policies, Acts, and Regulations

Policy/Plans/ Guidelines/standards Act/Regulation	Key Requirement/s or Salient Features	Applicability
Three Years Interim Plan 2007 (2064 BS)	Chapter 2, section 2.6, sub-section 2.6.2 (related to electricity development) and sub-section 2.6.6 (related to integration of environment with development works, environmental standards, CDM, environmental pollution); Chapter 4, section 4.7 (related to priority on electricity development), Chapter 31, section 8 (related to IEE/EIA process on electricity and energy development); Chapter 35, section 5 (related to sustainable development objective) and section 7 (related to IEE/EIA and pollution prevention);	Yes
Forest Sector Policy 2000 (2056 BS)	Section 7, sub-section 7.1 (related to land use planning and change in land use categories), sub-section 7.2 (related to conservation of bio-diversity, eco-systems and genetic resources).	The candidate project sites are located outside forest areas and are not likely to attract this policy, The new 11 kV transmission line may attract this policy
Nepal Biodiversity Strategy 2002 (2059 BS)	Chapter 5, section 5.1, sub-section 5.1.1 (relating to landscape planning), sub-section 5.1.4 (relating to in-situ conservation of habitat and species), sub-section 5.1.8 (relating to cross-sectoral co-ordination for bio-diversity conservation), sub-section 5.1.13 (relating to IEE/EIA of development projects to avoid significant impacts on bio-diversity and implement the provisions to minimize the impacts), and Section 5.2, sub-section 5.2.1 (5.2.1.2) (related to cross-sectoral co-ordination for Protected Area conservation).	The candidate project sites are located outside forest areas, National Parks and conservation are not likely to attract this policy. The new 11 kV transmission line may attract this policy in case they pass through the forest areas.
Nepal Environmental Policy and Action Plan, 1993	The five policy principles: a) to manage efficiently and sustainably natural and physical resources; b) to balance development efforts and environmental conservation for sustainable fulfilment of the basic needs of the people; c) to safeguard natural heritage; d) to mitigate the adverse environmental impacts of the	Yes

Policy/Plans/ Guidelines/standards Act/Regulation	Key Requirement/s or Salient Features	Applicability
	development projects and human actions; and e) to integrate environment and development through appropriate institutions, and adequate legislation and economic incentives, and sufficient public resources.	
National Conservation Strategy, Nepal, 1988	The policy principles a) to ensure the sustainable use of Nepal's land and renewable resources; b) to preserve the biological diversity of Nepal in order to maintain and improve the variety and quality of crops and livestock and to maintain the variety of wild species both plant and animal; and c) to maintain the essential ecological and life-support systems such as soil regeneration, nutrient recycling and the protection and cleansing of water and air.	Yes
Climate Change Policy GoN, 2001	Addresses the issues of climate adaption and disaster risk reduction. Forecasting water-induced disasters, reducing vulnerabilities and providing early warning information for disaster management are some of the key points of the policy. The policy provides some guidelines to address the issues of vulnerable infrastructure in the context of reducing their risk to climate related disasters.	Yes.
National EIA Guidelines 1993 (2049 BS)	Generic EIA guidelines related to procedures for EIA Scoping, and ToR preparation, baseline environmental studies, information disclosure, public consultation, prediction and evaluation of impacts, mitigation prescriptions, monitoring and EIA report preparation.	Yes
Department of Electricity Development Manuals	These are specific environmental manuals for hydropower development studies. All together 7 manuals have been prepared by DoED to cover different environmental aspects as under: Manual for preparing Scoping Document for Environmental Impact Assessment (EIA) of Hydropower Projects, (2001). Manual for Public Involvement in the Environmental Impact Assessment (EIA) Process of Hydropower Projects, (2001). Manual for Preparing Terms of References (ToR) for Environmental Impact Assessment (EIA) of Hydropower Projects, with Notes on EIA Report Preparation, (2001) Manual for Preparing Environmental Management Plan (EMP) for Hydropower Projects, (2002) Manual for Developing and Reviewing Water Quality Monitoring Plans and Results for Hydropower Projects, (2002) Manual for Conducting Public Hearings in the Environmental Impact Assessment Process for Hydropower Projects, 2004 Manual for Addressing Gender Issues in Environmental impact Assessment/Initial Environmental Examination for Hydropower Projects, (2005)	These guidelines are specific to Hydropower projects but are also applicable GSEEP investment particularly for Public Involvement, Preparing Terms of References (ToR), Conducting Public Hearings, and Addressing Gender Issues National Electricity Crisis Resolution Work Plan 2065 clause 5.2 highlights as follows Alternative sources Energy in Nepal has been envisaged as hydropower due to its potentiality and coverage. Till date, alternative sources of energy are taken as for rural setting where national grid takes years to connect. Harvest of solar power help even the urban dwellers to meet their household demand.

Policy/Plans/ Guidelines/standards Act/Regulation	Key Requirement/s or Salient Features	Applicability
	National electricity Crisis Resolution Work plan, 2065	
Guidelines on Land Use of Forest Area for other Purposes ("वन क्षेत्रको जग्गाअन्यप्रयोजनको लागिउपलब्ध गराउने कार्यविधि, २०६३") 2006	The guideline addresses the conditions to make forest land avail to the development project and required compensatory measures for the loss of forest land use and forest products	Yes, in case new TL lines pass through forest areas
Forest Produces Collection, Sale and Distribution Guidelines 2000 (2057 BS)	The guidelines specifies various procedure and formats for getting approval for vegetation clearance, delineation of lands for vegetation clearance, evaluation of wood volume etc.	Yes, in case new TL lines pass through forest areas
Generic Standard Part I: Tolerance Limits for Industrial Effluents to be ddischarged into Inland Surface Waters, 2058	Tolerance limits of the effluent discharged into inland surface waters.	Yes for the construction camps effluents of GSEEP investments
Nepal Ambient Air Quality Standards 2060	Limits of the ambient air quality parameters around the construction sites	Yes
Vehicle Emission Standards, 2057 for in use Vehicles	Tolerance limits for the project vehicular emissions	Yes
Drinking Water Quality Standards 2063	Quality of the drinking water supply in the project camps and construction sites.	Yes
The Interim Constitution of Nepal, 2063 (2007)	It has provisions of rights regarding environment and health. Every person shall have the right to live in a clean environment; every citizen shall have the right to get basic environmental services free of cost from the State as provided for in the law.	Yes
Environment Protection Act 1997 (2053 BS),	Article 3 mandates IEE/EIA study for development projects; Article 4 prohibits implementation of projects without approval; Article 5, and 6 describes the approval procedures; Article 7 prohibits emission of pollutants beyond the prescribed standards; Article 9 and 10 stipulates provisions for the protection of natural heritage and Environmental Protection Area; Article 17 stipulates compensation provisions arising from the discharge of waste and pollution; Article 18 has provision of punishment for actions against the Act and rules, guidelines and standards formulated under the Act; Article 19 stipulates the rights to appeal to the concerned Appellate court against the decision of concerned authority.	Yes
Environment Protection Rule 1997 (2054 BS) as amended	Rule 3 stipulates environmental screening criteria for undertaking IEE/EIA study; Rule 4, 5 and 6 stipulates procedures for determining scope for IEE/EIA including public notification and approval of IEE/EIA scope of works;Rule 7, and 10 stipulates provisions for conducting IEE/EIA assessment including public notification and public hearing for IEE/EIA works and requirement of recommendation letters from the project development VDCs/Municipalities; Rule 11 stipulates approval procedures including	Energy Sector criteria (EPR Schedule 1 and 2) excludes GSEEP including 11 kV transmission line for IEE or EIA assessment. But cross-sector provisions related to investment between 10 to 25 million Nepali Rupees attracts IEE level assessment, while investments over 25 million attracts EIA

Policy/Plans/ Guidelines/standards Act/Regulation	Key Requirement/s or Salient Features	Applicability
	disclosure of IEE/EIA report; Rule 12 mandates developer to comply with the approved IEE/EIA provisions to avoid, mitigate, and monitoring of the impacts, Rule 13 stipulates the responsibility of the concerned body to monitor the project implementation; Rule 14 stipulates the responsibility of the Ministry to conduct Environmental examination of the project after 2 years of construction completion; Rule 15, 16, 17, 18, 19 and 20 stipulates provisions to prohibition and control of pollution; Rule 26, 27, 28, 29, 30, 31, 32 and 33 stipulates procedures and provisions for the conservation of Natural Heritage and Environmental Conservation Zones; Rule 45. 46 and 47 stipulates procedures and provisions for compensation to the affected.	
Soil and Watershed Conservation Act 1982 (2039 BS)	Article 10 stipulates provisions to prohibit actions within any protected watershed area decelerated pursuant to Article 3 of this Act; Article 24 stipulates provision of no obstacle to use and developing of waters resources by the government of Nepal.	Yes
Forest Act 1993 (2049 BS)	Article17 stipulate provision of lease and permit from the government to establish right on the facilities on the national forest; Article 18 prohibits transfer of facility or any other rights on the national forest to the others; Article 22 establish government rights on the forest product of the national forest; Article 25 empower government to handover the national Forest as Community forest to develop, conserve, use and manage the Forest and sell and distribute the Forest Products independently by fixing their prices according to Work Plan; Article 31 empowers government of Nepal to grant any part of the National Forest in the form of Leasehold Forest for the forest conservation purpose; Article 49 prohibits any actions causing harm to the forest other than specified in the Act and Rules under the Act; Article 67 stipulates land rights of the government on the Community Forest, Leasehold Forest and Religious Forest; Article 68 empowers Government to give assent to use any part of the Government Managed Forest, Community Forest, Lease hold Forest or Religious Forest for the implementation of national priority plan/project if there is no alternative for the plan/project implementation.	Yes, in case new TL lines pass through forest areas
Forest Rules 1995 (2051 BS)	Rule 7 prohibit forest cutting without obtaining license; Rule 8 stipulates the procedures of licensing for forest products; Rule 65 make the national priority project developer using national forest area responsible for the compensation of the loss or harm to any local individual or community due to the project and also make the developer responsible to meet the entire expenses required for the cutting, making in to pieces and transporting the Forest Products in a	Yes, in case new TL lines pass through forest areas

Policy/Plans/ Guidelines/standards Act/Regulation	Key Requirement/s or Salient Features	Applicability
	Forest Area to be used.	
National Parks and Wildlife Conservation Act 1973 (2029 BS)	Article 5, stipulates provisions of restriction on damage to forest product and to block, divert any river or stream flowing through national park or reserve, or any other source of water, or use any harmful or explosive materials without obtaining a written permission; Article 9 lists the protected wildlife prohibited for hunting; Article 13 prohibits collection of samples from National parks and Reserves without obtaining license.	GSEEP investment are excluded in National parks and wild life reserves
Wildlife Reserve Rules 1977 (2034 BS)	Rule 4 stipulates provision of entry pass to enter into the Parks or Reserve, Rule 6 stipulates restricted activities within the Parks and Reserves, Rule 11 stipulates prior approval for any research activities or study within the parks or reserves.	GSEEP investment are excluded in National Parks and Wildlife Reserves
Electricity Act 2049 (1992)	Article 24 related to environmental impacts; Article 25 pursuant to technical standards; Article 26 related to security standards; Article 29 related to property acquisition and compensation; Article 33 relating to government assistance and support on the matter related to property acquisition for the project and compensation to affected property; Article 38 related to penalties; Article 39 on rights to appeal to the concerned Appellate court against the decision of concerned authority.	Yes
Electricity Regulations 2050 (1993)	Rule 13 related to environmental and social safeguard information requirements to submit the application for license; Rule 16 relating public notification to obtain license; Rule 40 to 47 related to the standards for power voltage, frequency, and power factors of electricity; Rule 48 to 60 safety measures to be maintained, Rule 66 regarding restriction on the utilization of house and land under transmission line; Rule 68 to 74 relating to safety measures to electric works; Rule 87 related to compensation of the affected property; and Rule 88 related to compensation fixation committee.	yes
Ancient Monument Protection Act 1956 (2013 BS)	Section 2 defines the ancient monuments; Section 3, and 17 empowers government to declare any place or area as monument site/area; Section 13 restricts transfer, transaction, export or collection of ancient monument and archaeological object or curio without prior approval of the government;	Applicable only for chance find
Local Self Governance Act 1999 (2055 BS)	Section 28 and 96 relating to functions, duties, and power of the VDCs/Municipalities on forest, sanitation and environment, soil erosion and river control, Physical development, Section 33 and 101 related to judicial power on compensation for damage crops, labour wages etc; Section 47 and 115 relating to co-ordination with the governmental and non-governmental institutions; Section 55 relating to natural resource utilization tax; section 70 and 165	Yes

Policy/Plans/ Guidelines/standards Act/Regulation	Key Requirement/s or Salient Features	Applicability
	relating to punishment against the act provisions.	
Local Self Governance Rules 1999 (2056 BS)	Rule 49 relating to approval of construction works; Rule 68 and 138 relating to approval and clearance of the project; Rule 69 and 139 relating to supervision and monitoring of the project; Rule 149 relating to application for permission.	Yes
Solid Waste Management Act 2011	Solid Waste Management Act aims to manage solid waste and mobilize resources related thereto and ensure the health convenience of the common people by controlling the adverse impact on pollution from solid waste. The commercial or industrial establishments should adhere to the clauses mentioned in the act during the construction and operation phases of the projects.	May apply – depends on type of waste generated during construction and operation of facilities supported by the project.
Information and Communication Policy, 2059 BS	The policy has developed long-term requirements for information and communication.	Yes.

3.1.2 Key Applicable National Social Laws and Regulations

There are a several laws addressing social issues in Nepal. The policies and legislative instruments relevant to the GSEEP are briefly highlighted in ***Table 11***.

Table11: Applicable Social Policies, Acts, and Regulations

Act / Regulation	Salient Feature/s	Applicability
The Interim Constitution of Nepal 2063 BS (2007)	The interim constitution of Nepal, 2007 focuses on raising the standards of living of the general public. The Article 35 (1) asserts that; The State shall pursue a policy of raising the standards of living of the general public through the development of infrastructures such as education, health, housing and employment of the people of all regions, by equitably distributing investment of economic investment for the balanced development of the country.	Yes
Labor Act 1991 (2048 BS)	Section 3 relating to classification of the posts; section 4 relating to appointment letter; Section 5 prohibition on child labour and restriction on minor and women; Section 10 on job security; section 12 related to retrenchment and reemployment, section 16, 17, 18 and 19 relating to working hours; section 20, 21, 22, 23, 25 and 26 related to remuneration; section 27 to 36 relating to occupational health and safety; section 37 to 44 relating to welfare arrangements; section 46 related to special arrangement is the construction sites; Section 50 to 60 related to conduct and penalties; section 72 to 82 related to settlements of labour disputes.	Yes
Land Acquisition Act 1977 (2034 BS)	Article 3 stipulates power to the government to acquire any land anywhere for public purpose subject to compensation under this Act; Rule 4 empower government to acquire land upon request by institutions subject to the payment of compensation and all other expenses under this Act; Rule 5, 6, 7 and 8 stipulates provisions and procedures for initiating initial land acquisition process and estimating compensation rates; Rule 9 and 8 stipulates procedures and provisions for notification to land acquisition; Rule 11 stipulates provision of right to file complain	The candidate sites are within NEA property, but may be applicable in case access to candidate project sites and footing of new 11 kV transmission line in private land is needed. If TL passes through

Act / Regulation	Salient Feature/s	Applicability
	by the affected on the public notice with regard to the land right; Rule 13, 14, 15 stipulates procedures and provisions of Compensation Fixation; Rule 16 and 17 stipulates criteria for compensation fixation; Rule 19 stipulates discloser of the compensation entitlement through public notification; Rule 25 stipulates provision of Complain against the compensation rates to the Ministry of Home affairs. The decision of the Ministry of Home affairs on the complaint is final.	structures and agricultural field land use restrictions may apply.
National Foundation for Upliftment of Adivasi/Janjati Act, 2058 (2002)	Government of Nepal has identified and legally recognized 59 indigenous communities. They are officially referred to as ***AdivasiJanajati*** in Nepali and **Indigenous Nationalities** in English as per the National Foundation for Upliftment of Adivasi/Janjati Act, 2058 (2002). One can find vast disparities in terms of socio-economic standing among the Adivasi *and Janajati* groups. According to Nepal Federation of *AdivasiJanajati* (NEFIN) 10 of the 59 *AdivasiJanajati* are "endangered", 12 "highly marginalized", 20 "marginalized", 15 "disadvantaged" and 2 are "advanced" or better off on the basis of a composite index consisting of literacy, housing, landholdings, occupation, language, graduate and above education, and population size.	Yes
ILO Convention on Indigenous and Tribal Peoples, 1989 (No.169)	In 2007, the UN Declaration on the Rights of Indigenous Peoples was adopted by the General Assembly. Nepal ratified ILO Convention No. 169 on September 14, 2007 (BS 2064/05/28). Article 1 of the convention provides a definition of tribal and indigenous peoples. Article 6 requires consultation with the peoples concerned through appropriate procedures and, in particular, through their representative institutions, whenever consideration is being given to legislative or administrative measures which may affect them directly. In Article 15, it states that indigenous and tribal peoples shall, wherever possible, participate in the benefits of natural resource utilization activities and shall receive fair compensation for any damages which they may sustain as a result of such activities. Article 16(2) clearly mentions that where the relocation of these peoples is considered necessary, such exceptional measures and such relocation shall take place only with their free and informed consent. Where their consent cannot be obtained, such relocation shall take place only following appropriate procedures established by national laws and regulations, including public inquiries where appropriate, which provide the opportunity for effective representation of the peoples concerned. Article 16(3) mentions that, whenever possible, these peoples shall have the right to return to their traditional land as soon as the grounds for relocation cease to exist. Article 16(5) specifies the persons thus relocated shall be fully compensated for any resulting loss or injury.	Yes. IAs indigenous peoples are present in the sub- project area, the convention requirements are applicable to the proposed project.

Act / Regulation	Salient Feature/s	Applicability
Right to Information Act, 2064 (2007)	The aim of this act is to make the functions of the state open and transparent in accordance with the democratic system and to make it responsible and accountable to the citizens. It intends to make the access of citizens to the information of public importance held in public bodies simple and easy and to protect sensitive information that could have an adverse impact on the interest of the nation and citizens. Clause 3 of the act ensures the Right to Information. It says that every citizen shall, subject to this Act, have the right to information and they shall have access to the information held in the public Bodies unless confidentiality has been maintained by laws. Clause 4 of the act describes the Responsibility of a Public Body to disseminate information. It mentions that each Public Body has to respect and protect the right to information of citizens. Public Bodies shall have the following responsibilities for the purpose of protecting the right to information of citizens: to classify and update information and make them public, publish and broadcast to make the citizens' access to information simple and easy to conduct its functions openly and transparently, to provide appropriate training and orientation to its staffs, Public Bodies may use different national languages and mass media while publishing, broadcasting or making information public. A Public Body shall arrange for an Information Officer for the purpose of disseminating information held in its office. The clause 7 of the act prescribes the Procedures of Acquiring Information. It states that a Nepali Citizen, who is interested to obtain any information under this Act, shall submit an application before a concerned Information Officer by stating the reason to receive such information.United Nations Declaration on the Rights of Indigenous Peoples shall be followed (as applicable)	Yes

3.2 Applicable World Bank Policies

The World Bank's environmental and social safeguard policies (ten of them) are a cornerstone of its support to sustainable poverty reduction. The objective of these policies is to prevent and mitigate undue harm to people and the environment in the development process. These policies provide guidelines for the identification, preparation, and implementation of programs and projects.

The following operational policies of the World Bank are relevant for GSEEP from an environmental and social viewpoint:

Table12: Safeguard Policies Triggered in GSEEP

Safeguard Policies Triggered by the GSEEP	Yes	Potential	No
Environmental Assessment OP/BP 4.01	X		
Natural Habitats OP/BP 4.04			X
Forests OP/BP 4.36		X	
Pest Management OP 4.09			X
Physical Cultural Resources OP/BP 4.11		X	
Indigenous Peoples OP/BP 4.10	X		
Involuntary Resettlement OP/BP 4.12		X	

Safeguard Policies Triggered by the GSEEP	Yes	Potential	No
Safety of Dams OP/BP 4.37			X
Projects on International Waters OP/BP 7.50			X
Projects in Disputed Areas OP/BP 7.60			X

3.2.1 Environmental Assessment (OP/BP 4.01)

OP/BP 4.01 is triggered because the activities/interventions proposed under GSEEP may have low impacts on the natural environment and human health. As the project during construction requires clearing up of sites, excavations, which have impacts (though minimal) to physical and biological environment within NEA premises.

Environmental Assessment is used by the World Bank to identify, avoid, and mitigate the potential negative environmental impacts associated with the Bank's operations early on in the project cycle. The policy states that Environment Assessment (EA) and mitigation plans are required for all projects having significant adverse environmental impacts or involuntary resettlement. Assessment should include analysis of alternative designs and sites, including the "no project option" and require public participation and information disclosure before the Bank approves the project.

In World Bank-funded operations, the purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted and their concerns addressed. The World Bank's environmental assessment policy and recommended processing are described in Operational Policy (OP)/Bank Procedure (BP) 4.01: Environmental Assessment.

3.2.2 Physical Cultural Resources (OP/BP 4.11)

Physical Cultural Resources (OP/BP 4.11) is triggered because there are cultural sites in the project area In Panauti-1 sites. At Panauti-1 site, the small Hindu temple (Krishna Mandir) might fall within the project areas. Though the project doesn't fall in to UNESCO or GoN registered archeological and cultural sites, all the procedures for chance find and other protocols shall be followed.

The World Bank Policy OP/BP 4.11 defines physical cultural resources as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above or below ground, or under water. Their cultural interest may be at the local, provincial or national level, or within the international community.

The Bank assists countries to avoid or mitigate adverse impacts on physical cultural resources from the development projects that it finances. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation, or its obligations under relevant international environmental treaties and agreements. The borrower addresses impacts on physical cultural resources in projects proposed for Bank financing, as an integral part of the environmental assessment (EA) process. The World Bank will also follow compliance with Nepal's chance find policy.

Norms and procedures for the conservation and restoration of historic buildings and for dealing with chance finds during small works will be specified. The conservation and restoration of historic buildings will use traditional materials and construction techniques as per the specifications of the Department of Archeology. A protocol for use by the construction contractors in conducting any excavation work will be developed, to ensure that any chance finds are recognized and measures are taken for their protection and conservation. As per the agreed protocol, all excavation work at the site would need to stop when

there are chance finds of archaeological material until the Department of Archeology determines if the site needs to be documented or scientifically excavated. The protocols and protective measures will be included in the EMPs that will be prepared for specific initiatives, with a focus on consultations and participation of the local stakeholders.

3.2.3 Indigenous People (OP/BP 4.10)

Indigenous People (OP/BP 4.10) istriggered because of the presence of janajati in the project area (See section 3.1.2 for explanation).Dalits and other vulnerable groups are also present in the project area.

This policy states that any development process under World Bank financing should fully respect the dignity, human rights, economies, and cultures of Indigenous Peoples (IPs). The project should engage in a process of free, prior, and informed consultation with IPs that should result in broad community support to the project by the affected Indigenous Peoples.

Projects should include measures to avoid potentially adverse effects on the IP's communities or when avoidance is not feasible, minimize, mitigate, or compensate for such effects. They should ensure that the IPs receive social and economic benefits that are culturally appropriate and gender and inter-generationally inclusive.

3.2.4 Involuntary Resettlement (OP/BP 4.12)

As per World Bank policy, Involuntary Resettlement (OP/BP 4.12) is triggered in case the project results into loss of private properties such as land, houses, structuresand commercial places or disruption of formal /informal sources of income and livelihoods happens due to project interventions. The GSEEP interventions are, however, not likely to involve physical displacement through involuntary land taking as the required land area for the project will be managed from NEA owned land. Nevertheless, the Project will require to comply fully with the mitigation measures specified in Table 8 to address the adverse social impacts in case the involuntary resettlement issue is triggered as a result of project's interventions.
.
OP/BP 4.12 recognizes that involuntary land-taking resulting in loss of shelter, assets or access and income or sources of income should be addressed in World Bank-financed projects. Displaced persons should be meaningfully consulted, given opportunities to participate in planning and implementing resettlement programs and assisted in their efforts to improve their livelihoods and standards of living. Absence of legal title to land should not be a bar for compensation, resettlement, and rehabilitation assistance. Vulnerable groups such as IPs, women-headed households, and senior citizens should be entitled to special benefit packages in addition to compensation and resettlement. The Operational Policy is applicable whenever there is involuntary land taking resulting in displacement of people and / or loss of livelihood or source of livelihood.

3.2.5 Forestry (OP 4.36)

There is no community or GoN forest in within the candidate site of GSEEP . However, the alignment of the TL has not been fixed or spelled out in the project document: it is uncertain which site would need new TL and what would be the route. Hence possibility of TL passing through forest may not be ruled out (this may be confirmed only during detailing of each sites after selection. Besides, NEA has planted trees such as Mango and Sissoo within the premises of several of the candidate sites. These trees need to be felled for which permits is needed from the forest authority. Hence, this policy is triggered.. In each case, EMP prepared under OP 4.01 will have mitigation measures if impact on forest is likely.

3.3 Comparison of Government of Nepal and World Bank Policies

Table 13 presents a comparison of Government of Nepal and World Bank policies, and recommendationsto bridge identified gaps.

Table 13: Comparison of GoN and World Bank Policies Gaps and Recommendations

Category	GON Policy	World Bank Policy	The GAP	Recommendations to Bridge Gaps
A. Environment (Natural Habitat , & Forest including terrestrial and aquatic	Development Project falling under EPR criteria should be subjected to IEE/EIA. According to EPR sectoral provision Solar projects are not required IEE/EIA. But cross sector provision: Forest sector and investment limits may attract IEE/EIA assessment, particularly for solar farm and 11 kV new transmission line of Component 1. In case the forest areas affected by 11 kV transmission line, which is very unlikely for the component 1, Forest regulation requires permission from related authorities (DFO, CFUGetc.) for any intervention in forested area. Compensatory re-plantation ratio is defined for commercial projects. National Park and Wildlife Conservation Act, demands permission from Ministry of Forest and Soil Conservation besides Ministry of Environment. The GSEEP is not affecting the national parks and conservation areas	Environmental Assessment has to be carried out for identifying potential risks and adverse impacts, mitigation measures and environmental management plan. When natural habitat and forest policies are triggered Environmental assessment and environmental management plan (EMP) will adequately address the relevant issues.	Activities listed in EPR Schedule I, particularly cross sectoral provisions related forest and investment limits is likely to requires an IEE, and those listed in Schedule II requires EIA. The Schedule I and II is based on activity type, Potential risk is not formally considered for screening.	In order to fill the gap between WB and GON requirements/approach, environmental screening is must for each subproject, and consider potential environmental risk : project Environmental Screening Format includes this. An Environmental Management Plan (EMP) shall be prepared for each contract during detail engineering design phase. The plan aims to address adverse environmental impacts arising due to project intervention. The project will strictly follow re-plantation as per the ratio of plantation in the forest guideline 2006..
B. Physical-Cultural Resources	Clause 28 of EPR states that physical and cultural resources shall not be disturbed or damaged without the prior approval of concerned authority.	Environmental assessment has to be carried out in case such resources are found to be affected by the subproject.	“Chance find’ is not covered by the EPR requirements but is stipulated in Ancient Monument Protection Act.	ESMP shall address such issues following GoN and WB policy.
C. Land and Structures	Clause 3 of this Land Acquisition Act states that any asset that is required for public purposes shall be acquired by providing compensation. Compensation Fixation Committee will establish the Compensation rates. Guthi Corporation Act, 2033 (1976). Section 42 of this Act states that Guthi (religious trust land) acquired for a development must be replaced with other land, rather than	Full compensation at replacement cost for lost assets shall be provided according to asset types and location. Resettlement and Rehabilitation assistance to affected people to enable them to improve their living standard. As per OP 4.12 community	The Land Acquisition Act of Nepal only provides for cash compensation based on degree of loss. It does not take into account vulnerability of the land affected person.	The proposed solar farm is to be developed within NEA owned property. Though chances are minimal, in some cases areasaccessto the project site may entail land acquisition for component 1. Similarly for 11 kV transmissions line may also have to be passed through private property. In such instances full compensation as

Category	GON Policy	World Bank Policy	The GAP	Recommendations to Bridge Gaps
	compensated in cash Land Reform Act (LRA) 2021 (1964). This Act establishes the tiller's right on the land, which he is tilling. The LRA additionally specifies the compensation entitlements of registered tenants on land sold by the owner or acquired for the development purposes	assets needs to be replaced in consultation with the community. As per OP 4.12, all those who are affected needs to be assisted including, tenants and sharecroppers. Squatters and encroachers will be provided compensation at replacement value for their structures as well as other assistances.		per the type of loss will be provided in line with WB policy, though to the extent possible roads right of way will be used for transmission line.
D. Indigenous Community	The Interim plan encourages each development program to incorporate infrastructure and income generation program targeted to indigenous community. NFDIN Act 2002, Local Self-Governance Act, 1999 and Tenth Plan (2007-10) and Three Year Interim Plan (2011-13)	Ensures free, prior, and informed consultation (FPIC) with the affected indigenous people to obtain broad community support to the project. Social Assessment will be carried out to identity potential effect and prepare plan to ensure that indigenous peoples receive social and economic benefits that are culturally appropriate. Nepal does not have a standalone policy on Indigenous Peoples and other vulnerable communities. These acts have been placed significant emphasis on delivering basic services to the disadvantaged and indigenous people, Dalits, women, disabled and other vulnerable groups These acts and plans include policies for the development of Adivasi/Janajati and other	Though GoN's interim plan encourages development programs to incorporate income generation schemes for IPs, there is no mention of broad consent from the IPs. At the same time GoN has also ratified ILO 169 and United Nations Declaration of Rights of Indigenous People (UNDRIP), and is in the process of preparing National Action Plan for implementation of these international commitments	Project will carry out free prior informed consultations with the indigenous community and other vulnerable communities to obtain broad consent for the project. Project will prepare Vulnerable Community Development Plan (VCDP) based on community needs of indigenous as well as other vulnerable communities.

Category	GON Policy	World Bank Policy	The GAP	Recommendations to Bridge Gaps
		disadvantaged groups: creating an environment for social inclusion; participation of disadvantaged groups in policy and decision making; developing special programs for disadvantaged groups; positive discrimination or reservation in education, employment, etc.; protection of their culture, language and knowledge; proportional representation in development process; and making the country's entire economic framework socially		
E. Loss of Crops andIncome Source	Compensation shall be provided for loss of crop damage/income source.	Full compensation shall be provided		Livelihood assistance shall be provided for business losses (if any, land or access required during implementation shall be fully compensated.

CHAPTER IV: POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND THEIR MANAGEMENT

The GSEEP project is classified category B for environment due to limited adverse environmental impacts which are site specific, largely reversible and can be readily addressed through mitigation measures. The GSEEP sites do not locate in a sensitive ecosystem, and has avoided areas of historical and cultural significance. The land to be used for the Solar Farm development is the unused lands owned by NEA. The location of the project site coupled with the clean nature of solar power generation ensures that the GSEEP will not cause any significant adverse environmental and social impacts during construction and operation. The main project impacts are associated with clearing of shrub vegetation, waste management and management of labor camps at the site. Moreover, most of the associated impacts are limited to the construction phase and are temporary in nature. Except for the visual quality, operational phase GSEEP impact has negligible footprint. The details of site specific environmental (physical, biological, and socio-economic) baseline status is included in ***Annex 1***

Potential impacts of the solar farm component are described in the sections below. Similarly, for the component 2 of the project related to loss reduction and rural electrification potential impacts are unlikely to be significant as it is a small scale activity. Basically the nature of work involved is rehabilitation of the existing distribution network such as replacing conductors, adding/replacing distribution transformers, replacing capacitor banks and well as extension of distribution lines to connect new households. These activities are unlikely to have social and environmental impacts asit excludes any sensitive activities that are mentioned in section 1.6 of this report. However, each of the components of the project will be subjected to environmental and social screening and other required steps as described in the framework.

4.1 Likely Beneficial Impacts

The beneficial impacts of the GSEEP project are discussed below:
Environmental and economic benefits of adding renewable energy to the national electrical grid can include:

1. Generating energy that produces no greenhouse gas emissions from fossil fuels and reduces some types of air pollution
2. Diversifying energy supply and reducing dependence on imported fuels
3. Creating economic development and jobs in manufacturing, installation, and more

The proposed solar farm is expected to generate on average 101,470kWh/day or 30.44 GWh/year of electricity. Without the project, it was assumed that electricity generated by the grid connected solar farm would be alternatively provided by captive diesel power generators (total assumed generation capacity of 400MW) existing in the country for the first 3 years and then by import from India through newly completed Nepal-India cross-border transmission line after 4th year until 30th year.

By assuming that (a) average unit generation capacity of captive diesel power generator (CDG) is 2.7kW; (b) each CDG needs to be operated additional 0.25 hours (or 15 minutes) per day; and (c) fuel cost for each CDG is US$ 0.52/kWh (= US$1.0/litter x 1.4litter/hr/2.7kW), annual cost required to the CDGs comes to US$15.8 million.Additional generation of 30.44 GWh per yearby the CDGs will result in 24,353 tons of additional CO_2 emission annually, based on the average CO_2emission factor of 0.80kg/kWh applicable to CDGs. Therefore, the global environmental benefit of CO_2 reduction not using the CDGs will be US$0.37 million per year with the unit benefit of US$15 per ton of CO_2 reduction.

It costs US$3.0 million per year to import 30.4GWh of electricity from India, with power purchase agreement cost of US$0.10 per kWh. As India's energy sector heavily relies on the coal based thermal

power plants, additional generation of 30.4GWh in India will result in 24,962 tons of additional CO_2 emission annually, based on the average emission factor of 0.82kg CO_2/kWh in India. The global environmental benefit of CO_2 reduction not using the coal based thermal power plants in India will be US$0.37 million per year with the unit benefit of US$15 per ton of CO_2 reduction.

Apart from this The PV Solar plant will save needed fuel for diesel generators during a maximum period of 30 years. It is expected to reduce fuel transport on road, and risk of road accidents with fuel trucks.

4.2 Likely Adverse Impacts and Generic Mitigation Prescriptions

The potential adverse impacts and generic mitigation measures are discussed under three broad headings for environmental and social impacts as impact related to Design-Preconstruction Phase, Construction Phase, and Operation and Maintenance Phase.

The Design-Preconstruction Phase is, the period before the actual project implementation when designs are being prepared. This allows the designers to avoid potential impacts in the project design, technical specifications and contract documentations;

The Construction Phase is the period since the "Notice to Proceed" is given to the Contractor until the issuing of the "Certificate of Completion". The Contractor will implement the project following the design and technical specifications of the EMP; and

The Operation and Maintenance Phase is the period starting with the issuing of the "Certificate of Completion" issued by the MPWU until the end of the 20 year lifetime of the project.

4.2.1 Environmental

The specific interventions planned for GSEEP may have some limited adverse environmental impacts in the short term. The adverse or negative impacts related environmental issues and the potential mitigation measures required are presented in ***Table 8*** for Design-Preconstruction Phase, Construction Phase, and Operation and Maintenance Phase. Highly significant impacts are unlikely given the type of activities (refer ***Annex 1***) and locations within NEA's own premises. High risks activity or locations are avoided through ineligibility criteria / negative list (refer section 1.6 above).Each subproject will be subjected to detailed environmental screening and specific Environmental Management Plan will be prepared, for site specific baseline status (refer ***Annex 1***).The project construction will generate noise, dust, and exhaust gases and small quantities of construction waste, solid waste, and sewage. However, these impacts will not be significant as the construction and erection works involves a small number of construction workers. A large scale solar farm could be a visual obstacle, and thus this aspect will be considered during preparation of detailed site plan of the solar farm. The candidate project sitesvisited by the team are neither in visual impact sensitive areas nor overlooked by significantly populated area. The environmental code of practices mentioned in chapter V of this report shall be an integral part of environmental mitigation aspects highlighted in ***Table 14*** and ***15***.

Potential environmental issue and likely level and type of assessment required for each of the visited candidate site are summarized below. Environmental baselines of the visited sites are summarized in Table 2.

Site	**Potential environmental and issues**	**Additional specific assessment required.**
Pharping	Historically this site is significant because it is the first hydropower plant of Nepal and second in Asia. SoThere may have some impact on historical value There is tap inside the site boundary providing the drinking water facility for the	An IEE may be requiredas per GoN requirements because of project cost. Need permission from forest authority to fell trees planted. Need to understand restrictions impose due to first hydropower site (heritage)and

Site	Potential environmental and issues	Additional specific assessment required.
	local people.Dislocation of the water source may hamper the local community Loss of some trees planted by NEA Impact in the slope stability and environment due to Dismantling of retaining walls	comply with the restrictions. Need to inform district forest office regarding number of tress to be felled (though it is not in GoN land, prior notification before felling is required). If the project cost is above 250 million Nepali rupees requires conducting EIA. If the cost is within 50-250 million Nepali Rupee the project requires IEE If the project doesn't fall in IEE/EIA category, EMP is required, site specific sensitive issues (if any) shall be assessed during the time of actual implementation of the project
Kulekhani Powerhouse	Impacts of dismantling of the old cow shed The site is in sloppy land containing loose soft soil therefore prone to erosion, therefore there is erosion risk Loss of trees may accelerate erosion	If the project cost is above 250 million Nepali rupees requires conducting EIA. If the cost is within 50-250 million Nepali Rupee the project requires IEE If the project doesn't fall in IEE/EIA category, EMP is required
Kulekhani Reservoir Area 1	There are altogether 46 built structures present within the site which include staff quarters, NEA office, garage, store house and guest house.So likely Impacts due to dismantling of those structures are expected. Loss of trees planted around the site boundary may support soil erosion and landslide	Need to inform district forest office regarding number of tress to be felled (though it is not in GoN land, prior notification before felling is required). If the project cost is above 250 million Nepali rupees requires conducting EIA. If the cost is within 50-250 million Nepali Rupee the project requires IEE If the project doesn't fall in IEE/EIA category, EMP is required, site specific sensitive issues (if any) shall be assessed during the time of actual implementation of the project
Kulekhani Reservoir Area 2	The proposed project site is the nursery of Nepal Electricity Authority, used for growing sapling of tree, The implementation of the proposed project may impact the regular support provided by the nursery to the local people by providing the trees saplings for promoting greenery. There is a small house used for the hydrological station in the project site. Removing the structure may impact daily activities of the station.	If the project cost is above 250 million Nepali rupees requires conducting EIA. If the cost is within 50-250 million Nepali Rupee the project requires IEE Best environmental practices and environmental enhancement measures shall be followed
Debighat	Erosion risks along the stream located within the site and adjacent slopes Felling of some trees located along the stream bank may enhance soil erosion	If the project cost is above 250 million Nepali rupees requires conducting EIA. If the cost is within 50-250 million Nepali Rupee the project requires IEE If the project doesn't fall in IEE/EIA category, EMP is required
Panauti 1	No such impacts comparatively	If the project cost is above 250 million Nepali rupees requires conducting EIA. If the cost is within 50-250 million Nepali Rupee the project requires IEE Best code of practices in environmental and social aspects shall be followed
Panauti 2	The site is sloppy land at the southern side therefore prone to erosion.	If the project cost is above 250 million Nepali rupees requires conducting EIA.

Site	Potential environmental and issues	Additional specific assessment required.
	There is a small Krishna Mandir (temple) inside the site boundary. The local people's feelings and aesthetic value may attached with this temple	If the cost is within 50-250 million Nepali Rupee the project requires IEE Site specific EMP is required, site specific sensitive issues (if any) shall be assessed during the time of actual implementation of the project For relocation of temple, guidelines of department of archeology (GoN) shall be followed which talks about chance find procedures etc.
Sundarijal	Impacts of dismantling of the old buildings Loss of few trees	If the project cost is above 250 million Nepali rupees requires conducting EIA. If the cost is within 50-250 million Nepali Rupee the project requires IEE Site specific EMP is required, site specific sensitive issues (if any) shall be assessed during the time of actual implementation of the project
Sunkoshi 1	Loss of trees planted by NEA The site is sloppy land at the Northern side therefore prone to erosion and landslide	If the project cost is above 250 million Nepali rupees requires conducting EIA. If the cost is within 50-250 million Nepali Rupee the project requires IEE Site specific EMP is required, site specific sensitive issues (if any) shall be assessed during the time of actual implementation of the project Need permission from forest authority for felling trees (even trees in NEA land)
Sunkoshi 2	Loss of few trees	If the project cost is above 250 million Nepali rupees requires conducting EIA. If the cost is within 50-250 million Nepali Rupee the project requires IEE Site specific EMP is required, site specific sensitive issues (if any) shall be assessed during the time of actual implementation of the project. Need to inform district forest office regarding number of tress to be felled (though it is not in GoN land, prior notification before felling is required).
Trishuli	Trishuli 1: impacts of dismantling of the workshop/ stores, felling of planted mango and/ or Sissoo trees Trishuli 2: erosion risks in the slopes between the site and reservoir Trishuli 3: felling of planted and/ or naturally grown trees (sal, simal, sissooetc)	If the project cost is above 250 million Nepali rupees requires conducting EIA. If the cost is within 50-250 million Nepali Rupee the project requires IEE Site specific EMP is required, site specific sensitive issues (if any) shall be assessed during the time of actual implementation of the project. Need to inform district forest office regarding number of tress to be felled (though it is not in GoN land, prior notification before felling is required).

4.2.2 Social

The social impacts would not be significant and are mostly restricted to the project area and its immediate surroundings. There will be no land acquisition and no impacts on the present land use, including natural habitats. The solar farms will be installed on NEA property and to the extent possible encroached area will be avoided to minimize adverse social impacts. Social screening however will be carried out in the project sites to identify any adverse social impact and presence of indigenous community. A Resettlement Action Plan (RAP) or an abbreviated RAP will be prepared as appropriate. Since there is presence of vulnerable community in the periphery of potential sites, a Vulnerable Community Development Plan (VCDP) will be prepared.

The specific interventions planned for GSEEP may lead to some loss of property (11 kV TL-component 1), component 1 and 2 upgrading works of TL such as replacing transformer, conductors etc is potential to have impacts on physical access and electricity services impairing trade/commerce/industries The adverse or negative impacts related social issues and the potential mitigation measures required are presented in ***Table 14 and 15***for Design-Preconstruction Phase, Construction Phase, and Operation and Maintenance Phase.

Table 14: Potential Environmental Impacts and Suggested Avoidance or Minimizing or Compensatory Mitigation Measures

Phase of Development	Potential Issues and Impacts	Suggested Avoidance or Minimizing or compensatory Mitigation Measures
Design/Pre-Construction Phase	Impact to Sensitive and Ecologically Important Areas	Identify environmentally sensitive or ecologically fragile areas (if any); The candidate sites identified by NEA has avoided the environmentally sensitive and ecologically fragile area.
		If the proposed construction is located close to these areas, take necessary measures to avoid/minimize disturbance The exact position of the solar PV array layout should be determined by the environmental specialist, and from specifications and design to avoid all sensitive areas in the positioning of the facility.
	Impact due to poor design and work planning	No use of gravel or sand from the onsite or surrounding areas. Consider possible alternatives for construction materials (aggregates) from the certified suppliers. The use of concrete for stabilization is to beAvoided as far as possible.
		Choice of the location that gives the best economy in terms of excavation and fill in order to avoid or minimize soil erosion during excavation works for the construction of the stand-alone PV Structures
		In case of usage of free standing structure, a proper structural design that is environmental friendly and requires less maintenance is suggested. Driven piers and screws are recommended in order to minimize the environmental impact of the facility. Driven piers and screws are recommended in order to minimize the environmental impact of the facility.
	Impacts to Cultural Heritage	Avoid the sites which have a cultural or heritage value. The NEA candidate sites have avoided sites of cultural heritage.
	Impacts to Aesthetics	Avoid the sites which have a tourism value. During site selection and site detailing, consider ways to minimize visual intrusion and improvingaesthetic qualities (including landscaping and plantation to compensate visual and aesthetic impacts).
	Impact on existing land use	The project would change the existing land use to restricted industrial use although the land will be in NEA premises
Construction Phase	Soil Erosion Impacts(clearing and grading during construction activities	Minimize work areas;
		Keep vegetation clearing at the necessary minimum
		Keep vehicles on defined tracks (internal road tracks to be determined before the construction commences)

Phase of Development	Potential Issues and Impacts	Suggested Avoidance or Minimizing or compensatory Mitigation Measures
	would disturb on-sitesoils and increase the potential for erosion)	Construct the necessary temporary/permanent control structures
		Encourage re-vegetation as soon as the construction activities finish, or plan to immediatelyrehabilitate the disturbed sites after use. Implementation of a storm water management plan developed as part of the permitting process would minimize impacts.
	Change in topography	Installing silt traps or other control structures at the outset of the construction
		Phasing and limiting ground disturbance to areas of a workable size
		Scheduling construction to limit disturbance of large areas of soil during wet seasons
		Avoid discharging of contaminated water to the nearby streams
	Impairment to existing land use changes	If there is no natural drains arrange to dispose storm water run-off from construction areas through rocks or hay traps to remove soil and petroleum-based organic pollutants before disposal
		Store oil and bituminous products at a contained location away from drainage ditches
		Provision of a good technical designed storm drainage system to be provided to capture the run-off farm to avoid scouring of the soil etc. (a good storm water management plan has to be designed)Provision of a good technical designed storm drainage system to be provided to capture the run-off farm to avoid scouring of the soil etc. (a good storm water management plan has to be designed)
	Storage of materials in sloppy , unstable areas and erosion	Discuss dumping locations with the government officials and local landowners including plans for future use of the spoil materials
		Include all drainage provisions for construction sites in the site plans
		Choose the locations of waste spoil piles to avoid blocking surface run-off or drainage ditches
		Cover all spoil heaps or stockpiles during rainy season to prevent erosion and sediment run-off
	Construction related air quality changes	Spray water on spoil-heaps if there are dust generating materials accumulated during dry periods especially near schools, hospitals, rural communities, etc
		Cover all dust generating loads carried in open trucks.
	Construction associated impacts on noise quality	Use modern and well-maintained equipment (with mufflers where appropriate)
		Use noise screens or mounds near residential areas, when appropriate
		Carry out noise construction activities and transports during normal working hours, never at night time or Saturdays
		Negotiate with schools/hospitals a schedule of noisy work, taking into account the needs of students/patients
		Inform previously, when there will be unusual or unavoidable noise
	Construction related transportation and hauling of materials	Avoid overloading trucks and cover trucks to minimize dust and loss of load from trucks during Transportation
		Use water sprays or covered chutes to reduce dust emission during loading and unloading of materials from barges
		Maintain crushing and mixing plants in good working condition so as to reduce emission from the plant
		As far as possible, plan truck trips during low traffic hours
		Implement safety procedures during transport to reduce the potential for road accidents
	Off-site and on –site construction waste during project construction.	Store wastes with respect for health and environment and being responsible for their recycling
		Contain all stored wastes within construction sites, avoid littering and runoff

Phase of Development	Potential Issues and Impacts	Suggested Avoidance or Minimizing or compensatory Mitigation Measures
		Use recycled or renewable building materials (e.g. timber) where possible
		Optimize and reduce waste production. Segregate waste into hazardous and non hazardous waste. Minimize waste disposal by promoting re-use and recycle.
		The solar is not expected to generate large amount of hazardous waste , however waste like metal parts, paints, lubricants, grease, glasses, oil from transformers will be generated. In all cases, hazardous materials would be stored and handled in accordance with standard practice.
		The old transformers to be replaced are likely to have PCB (Component 2).Therefore the transformer oil should be stored at designated location of NEA. Decontamination of distribution transformers of NEA has been recently done however the distribution transformers outside Kathmandu may contain PCB. NEA stores used oil in drums and stores at identified locations for oxen. However, now NEA has agreed not to oxen these oil which has health related implications on the users. Store hazardous waste to permitted hazardous waste management sites in compliance with the Hazardous waste management protocol of the Bank.
	Energy	Sort waste according to its type and origin. Store selected materials in safe place in order toavoid contamination,
		Encourage the recycling of waste. Follow the hierarchy: Prefer local recycling or reuse before waste disposal in the safe site
		Properly dispose of all used fuel and lubricant oils in environmentally sound manner,
		Crush and bury all inorganic solid waste in an approved solid waste disposal area
		After construction has finished, remove all disabled machinery and waste from the project area
		Compost all green or organic wastes or use as animal food
	Equipment transportation, storage and erection stages issues related to health and safety of employees	Ensure all occupational health and safety requirements are in place on construction sites
		Ensure enforcement of use of (PPE), provide PPEs and conduct training, if necessary
		Install lights and cautionary signs in hazardous areasand key locations(at the four corner of the farm)
		Ensure safety and inspection procedures
		Fencing of the construction sites with sign boards required
		Safe handling of toxic materials and other hazardous substances
		Implement a system of penalties for violation of rules and regulations (include n the EMP)
		Introduction to health and safety issues in construction sites by the Contractor (include in the EMP)
		Education on basic hygienic practices to minimize spread of tropical diseases, including information on methods of transmission and protection (include in EMP)
		Prohibition of drugs, kava and alcohol on construction sites
		Assure availability of medical assistance in emergency or non-emergency situations and availability of other health-related assistance
		Maintenance and service personnel would be trained to handle hazardous materials especially transformer oil which may contain PCB
	Loss of standing trees and vegetation	Restrict vegetation clearance to the required area
		In case trees from forest land require clearing take approval from the District Forest Office and Community Forest User Groups. Tree felling within NEA premises may also require permission from the forest

Phase of Development	Potential Issues and Impacts	Suggested Avoidance or Minimizing or compensatory Mitigation Measures
		authority. Carry out compensatory plantation as required.
		In case the forest areas are affected by 11kV new transmission line Component 1, reforest the lost trees in ration as guided by Forest guideline 2006.
Site De-commissioning	Waste, Erosion and visual Impacts	Assure all waste and remaining material for recycling has been removed from the construction
		Rake or loosen all compacted ground surfaces
		If necessary, implement re-vegetation / rehabilitation of the construction sites involving, where possible, local women's and community group
Operation and Maintenance Phase	Dust coating on the solar panel	Regularly clean the panel surface with water jet to remove the collected dusts over the solar panel. Particularly dry season, there is potential of high dust accumulation on the panel
	Trespassing of personnel and animals	Trespassing of person should be strictly banned. Free movement of wild animals on the solar panel site may destruct the installation particularly terrestrial animals and specifically monkeys.The access to the Solar Farm array would be restricted and controlled through the use of fencing or other measures.
	Occupational Health and safety	Ensure all occupational health and safety requirements are in place on sites in the operation period
		Make sure all operational staff understand the use of (PPE) and make sure that it is used properly;
		Install lights and cautionary signs in hazardous areas
		Ensure safety and inspection procedures
		Ensure the operation staff get O/M advice and training from the Post Commissioning Services experts contracted
		Ensure Operational Manual and professional training manual at all time in the facility
		Ensure sufficient funding available to carry out periodic maintenance and repairs of the PV installations
	Change in the aesthetic value	The long-term presence of the solar field would result in an unmitigable visual impact because it would create a change to the existing landscape. It would introduce blockage and glare. Site selection and site detailing would consider ways to minimize visual intrusion and aesthetic considerationincluding landscapingand plantation to compensate visual and aesthetic impacts.

Table 15: Potential Social Impacts and Suggested Avoidance or Minimizing or Compensatory Mitigation Measures

Phase of Development	Potential Issues and Impacts	Suggested Avoidance or Minimizing or compensatory Mitigation Measures
Design/Pre-Construction Phase	Social or Community Concerns (Pre-Construction)- lack of project information; lack of participation in project design and finalization of project sites	The communities surrounding the Component 1 and 2 activities will be informed during the design preparation works and prior to the actual start of construction. The information on the project actions and the likely potential impacts in the construction operation phases explained to give a general understanding of the project
		Sample sites though are a part of the NEA owned land, there are residences near the sites. The community will be consulted before finalizing sites. Any NEA land if encroached will not be considered. Private land acquisition will be discouraged..
		If the project sites are the sites of the Advsashi/Janajati and disadvantageous groups, support program in the form of Indigenous and Vulnerable Community Development Plan shall be preparedin consultation with these groups to comply with the Banks policy

Construction Phase	Noise and dust issue Employment to the local population Contractor's camp near residences	Inform local neighborhood community before construction activities start about planned civil works how they could be affected by them
		Avoid or minimize disturbances by construction activities in near living areas, e.g. avoiding works at nighttime, minimizing transports of material, noise control
		Apply adequate waste management and avoid run-off of waste, e.g. littering off packagingMaterial
		Offer employment and training opportunities for local people. (Include in EMP that the contractor has to maximize the local employment)
		Include women and other community groups in project activities whenever there is any Opportunity
		Since all the candidate sites are within the NEA owned lands, the surrounding communities will not be directly affected. In case the surrounding community constitute sizable numbers of adivashi/Janajati and disadvantageous groups, implement the VCDP as designed in the Pre-construction phase)
Operation Phase	Community Safety Benefit sharing	Inhibit unauthorized access to the PV modules on roof-top or at the free-standing structures by construction design and eventually necessary technical protection measures (fences, gates, locks)
		Cover inverters with a locked metal cage firmly attached to the wall in order to avoid unauthorized manipulation (especially by playing children with the risk of accidents) or theft
		Mark sites with comprehensive and visible signs (pictograms) indicating danger and no-go-areas
		Put the wiring underground in order to avoid accidents and damage (accidentally or intentionedby vandalism)
		Give preference to the eligible locals for employment during operations
		Provide free electricity to vulnerable houses in the immediate periphery of the project sites
		Advice to the public institutions where the PV installations are implemented about special risksand security needs (security fence, safeguard at nighttime)
		Inform the administration of the public institutions where the PV installations are implementedthat they should report immediately to the concerned authority in case of damage of any component of the PV system.

Table 16 presents the environmental issues and identified mitigation measures for the candidate solar farm sites, while ***Table 17*** presents the social issues and identified mitigation measures.

Phase of Development	Potential Issues and Impacts	Suggested Avoidance or Minimizing or compensatory Mitigation Measures	Potential Candidate Solar Farm Sites[DRG1]										
			1	2	3	4	5	6	7	8	9	10	11
Design/Pre-Construction Phase	Impact to Sensitive and Ecologically Important Areas	Identify environmentally sensitive or ecologically fragile areas (if any); The candidate sites identified by NEA has avoided the environmentally sensitive and ecologically fragile area.											
		If the proposed construction is located close to these areas, take necessary measures to avoid/minimize disturbance											
		The exact position of the solar PV array layout should be determined by the environmental specialist, and from specifications and design to avoid all sensitive areas in the positioning of the facility.											
	Impact due to poor design and work planning	No use of gravel or sand from the onsite or surrounding areas. Consider possible alternatives for construction materials (aggregates) from the certified suppliers. The use of concrete for stabilization is to be Avoided as far as possible.	√	√	√	√	√	√	√	√	√	√	√
		Choice of the location that gives the best economy in terms of excavation and fill in order to avoid or minimize soil erosion during excavation works for the construction of the stand-alone PV Structures	√	√	√	√	√	√	√	√	√	√	√
		In case of usage of free standing structure, a proper structural design that is environmental friendly and requires less maintenance is suggested. Driven piers and screws are recommended in order to minimize the environmental impact of the facility.	√	√	√	√	√	√	√	√	√	√	√
	Impacts to Cultural Heritage	Avoid the sites which have a cultural or heritage value. The NEA candidate sites have avoided sites of cultural heritage.											
	Impacts to Aesthetics	Avoid the sites which have a tourism value.Site selection and site detailing would consider ways to minimize visual intrusion and aesthetic consideration including landscaping and plantation to compensate visual and aesthetic impacts.											
Construction Phase	Impact on existing land use	The project would change the existing land use to restricted industrial use although the land will be in NEA premises.	√	√	√	√	√	√	√	√	√	√	√
	Soil Erosion Impacts(clearing and grading during construction activities would disturb on-sitesoils and increase the potential for erosion)	Minimize work areas;	√	√	√	√	√	√	√	√	√	√	√
		Keep vegetation clearing at the necessary minimum	√	√	√	√	√	√	√	√	√	√	√
		Keep vehicles on defined tracks (internal road tracks to be determined before the construction commences)	√	√	√	√	√	√	√	√	√	√	√
		Construct the necessary temporary/permanent control structures	√	√	√	√	√	√	√	√	√	√	√
		Protect the landslide and degraded areas within and adjacent to the site		√			√						
		Encourage re-vegetation as soon as the construction activities finish, or plan to immediately rehabilitate the disturbed sites after use. Implementation of a storm water management plan developed as part of the permitting process would minimize impacts.	√	√	√	√	√	√	√	√	√	√	√
	Change in topography	Installing silt traps or other control structures at the outset of the construction	√	√	√	√	√	√	√	√	√	√	√

		Phasing and limiting ground disturbance to areas of a workable size	√	√	√	√	√	√	√	√	√	√	√	
		Scheduling construction to limit disturbance of large areas of soil during wet seasons	√	√	√	√	√	√	√	√	√	√	√	
		Avoid discharging of contaminated water to the nearby streams	√	√	√	√	√	√	√	√	√	√	√	
	Impairment to existing land use changes	If there is no natural drains arrange to dispose storm water run-off from construction areas through rocks or hay traps to remove soil and petroleum-based organic pollutants before disposal	√	√	√	√	√	√	√	√	√	√	√	
		Store oil and bituminous products at a contained location away from drainage ditches	√	√	√	√	√	√	√	√	√	√	√	
		Provision of a good technical designed storm drainage system to be provided to capture the run-off farm to avoid scouring of the soil etc. (a good storm water management plan has to be designed)Provision of a good technical designed storm drainage system to be provided to capture the run-off farm to avoid scouring of the soil etc. (a good storm water management plan has to be designed)	√	√	√	√	√	√	√	√	√	√	√	
	Storage of materials in sloppy , unstable areas and erosion	Discuss dumping locations with the government officials and local landowners including plans for future use of the spoil materials	√	√	√	√	√	√	√	√	√	√	√	
		Include all drainage provisions for construction sites in the site plans	√	√	√	√	√	√	√	√	√	√	√	
		Choose the locations of waste spoil piles to avoid blocking surface run-off or drainage ditches	√	√	√	√	√	√	√	√	√	√	√	
		Cover all spoil heaps or stockpiles during rainy season to prevent erosion and sediment run-off	√	√	√	√	√	√	√	√	√	√	√	
	Construction related air quality changes	Spray water on spoil-heaps if there are dust generating materials accumulated during dry periods especially near schools, hospitals, rural communities, etc	√	√	√	√	√	√	√	√	√	√	√	
		Cover all dust generating loads carried in open trucks.	√	√	√	√	√	√	√	√	√	√	√	
	Construction associated impacts on noise quality	Use modern and well-maintained equipment (with mufflers where appropriate)	√	√	√	√	√	√	√	√	√	√	√	
		Use noise screens or mounds near residential areas, when appropriate	√	√	√	√	√	√	√	√	√	√	√	
		Carry out noise construction activities and transports during normal working hours, never at night time or Saturdays	√	√	√	√	√	√	√	√	√	√	√	
		Negotiate with schools/hospitals a schedule of noisy work, taking into account the needs of students/patients												
		Inform previously, when there will be unusual or unavoidable noise	√	√	√	√	√	√	√	√	√	√	√	
	Construction related transportation and hauling of materials	Avoid overloading trucks and cover trucks to minimize dust and loss of load from trucks during Transportation	√	√	√	√	√	√	√	√	√	√	√	
		Use water sprays or covered chutes to reduce dust emission during loading and unloading of materials from barges	√	√	√	√	√	√	√	√	√	√	√	

		Maintain crushing and mixing plants in good working condition so as to reduce emission from the plant	√	√	√	√	√	√	√	√	√	√	√
		As far as possible, plan truck trips during low traffic hours	√	√	√	√	√	√	√	√	√	√	√
		Implement safety procedures during transport to reduce the potential for road accidents	√	√	√	√	√	√	√	√	√	√	√
	Off-site and on –site construction waste during project construction.	Store wastes with respect for health and environment and being responsible for their recycling	√	√	√	√	√	√	√	√	√	√	√
		Contain all stored wastes within construction sites, avoid littering and runoff	√	√	√	√	√	√	√	√	√	√	√
		Use recycled or renewable building materials (e.g. timber) where possible	√	√	√	√	√	√	√	√	√	√	√
		Optimize and reduce waste production. Segregate waste into hazardous and non hazardous waste. Minimize waste disposal by promoting re-use and recycle.	√	√	√	√	√	√	√	√	√	√	√
		The solar is not expected to generate large amount of hazardous waste, however waste like metal parts, paints, lubricants, grease, glasses, oil from transformers will be generated. In all cases, hazardous materials would be stored and handled in accordance with standard practice.	√	√	√	√	√	√	√	√	√	√	√
		The old transformers to be replaced are likely to have PCB (Component 2).Therefore the transformer oil should be stored at designated location of NEA. Decontamination of distribution transformers of NEA has been recently done however the distribution transformers outside Kathmandu may contain PCB. NEA stores used oil in drums and stores at identified locations for oxen. However, now NEA has agreed not to oxen these oil which has health related implications on the users.											
		Store hazardous waste to permitted hazardous waste management sites in compliance with the Hazardous waste management protocol of the Bank.	√	√	√	√	√	√	√	√	√	√	√
		Sort waste according to its type and origin. Store selected materials in safe place in order to avoid contamination,	√	√	√	√	√	√	√	√	√	√	√
		Encourage the recycling of waste. Follow the hierarchy: Prefer local recycling or reuse before waste disposal in the safe site	√	√	√	√	√	√	√	√	√	√	√
		Properly dispose of all used fuel and lubricant oils in environmentally sound manner,	√	√	√	√	√	√	√	√	√	√	√
		Crush and bury all inorganic solid waste in an approved solid waste disposal area	√	√	√	√	√	√	√	√	√	√	√
		After construction has finished, remove all disabled machinery and waste from the project area	√	√	√	√	√	√	√	√	√	√	√

		Compost all green or organic wastes or use as animal food	√	√	√	√	√	√	√	√	√	√	√
	Equipment transportation, storage and erection stages issues related to health and safety of employees	Ensure all occupational health and safety requirements are in place on construction sites	√	√	√	√	√	√	√	√	√	√	√
		Ensure enforcement of use of (PPE), provide PPEs and conduct training, if necessary	√	√	√	√	√	√	√	√	√	√	√
		Install lights and cautionary signs in hazardous areas and key locations(at the four corner of the farm)	√	√	√	√	√	√	√	√	√	√	√
		Ensure safety and inspection procedures	√	√	√	√	√	√	√	√	√	√	√
		Fencing of the construction sites with sign boards required	√	√	√	√	√	√	√	√	√	√	√
		Safe handling of toxic materials and other hazardous substances	√	√	√	√	√	√	√	√	√	√	√
		Implement a system of penalties for violation of rules and regulations (include n the EMP)	√	√	√	√	√	√	√	√	√	√	√
		Introduction to health and safety issues in construction sites by the Contractor (include in the EMP)	√	√	√	√	√	√	√	√	√	√	√
		Education on basic hygienic practices to minimize spread of tropical diseases, including information on methods of transmission and protection (include in EMP)	√	√	√	√	√	√	√	√	√	√	√
		Prohibition of drugs, kava and alcohol on construction sites	√	√	√	√	√	√	√	√	√	√	√
		Assure availability of medical assistance in emergency or non-emergency situations and availability of other health-related assistance	√	√	√	√	√	√	√	√	√	√	√
		Maintenance and service personnel would be trained to handle hazardous materials especially transformer oil which may contain PCB											
	Loss of standing trees and vegetation	Restrict vegetation clearance to the required area.	√	√	√	√	√	√	√	√	√	√	√
		In case trees from forest land require clearing take approval from the District Forest Office and Community Forest User Groups											
		In case the forest areas are affected by 11kV new transmission line Component 1, reforest the lost trees in ration as guided by Forest guideline 2006.											
		Ensure that necessary permit is obtained for tree felling. Felling of tree planted by NEA within the premises may also need to obtain permission from the forest authority.											
		Compensatory plantation for the lost tree/ vegetation. This may be done within the existing NEA premises for the loss of tree/vegetation planted within the NEA premises.											
Site De-commissioning	Waste, Erosion and visual Impacts	Assure all waste and remaining material for recycling has been removed from the construction Site	√	√	√	√	√	√	√	√	√	√	√

		Rake or loosen all compacted ground surfaces	√	√	√	√	√	√	√	√	√	√	√	√	√
		If necessary, implement re-vegetation / rehabilitation of the construction sites involving local women's and community group, where possible	√	√	√	√	√	√	√	√	√	√	√	√	√
Operation and Maintenance Phase	Dust coating on the solar panel	Regularly clean the panel surface with water jet to remove the collected dusts over the solar panel. Particularly dry season, there is potential of high dust accumulation on the panel	√	√	√	√	√	√	√	√	√	√	√	√	√
	Trespassing of personnel and animals	Trespassing of person should be strictly banned. Free movement of wild animals on the solar panel site may destruct the installation particularly terrestrial animals and specifically monkeys. The access to the Solar Farm array would be restricted and controlled through the use of fencing or other measures.	√	√	√	√	√	√	√	√	√	√	√	√	√
	Occupational Health and safety	Ensure all occupational health and safety requirements are in place on sites in the operation period	√	√	√	√	√	√	√	√	√	√	√	√	√
		Make sure all operational staff understand the use of (PPE) and make sure that it is used properly;	√	√	√	√	√	√	√	√	√	√	√	√	√
		Install lights and cautionary signs in hazardous areas	√	√	√	√	√	√	√	√	√	√	√	√	√
		Ensure safety and inspection procedures	√	√	√	√	√	√	√	√	√	√	√	√	√
		Ensure the operation staff get O/M advice and training from the Post Commissioning Services experts contracted	√	√	√	√	√	√	√	√	√	√	√	√	√
		Ensure Operational Manual and professional training manual at all time in the facility	√	√	√	√	√	√	√	√	√	√	√	√	√
		Ensure sufficient funding available to carry out periodic maintenance and repairs of the PV installations	√	√	√	√	√	√	√	√	√	√	√	√	√
	Change in the aesthetic value	The long- term presence of the solar field would result in an unmitigable visual impact because it would create a change to the existing landscape . It would introduce blockage and glare.	√	√	√	√	√	√	√	√	√	√	√	√	√

Note: 1: Pharping; 2: Kulekhani Powerhouse , 3: Kulekhani Reservoir Area 1; 4: Kulekhani Reservoir Area 2; 5: Debighat; 6: Paauti 1; 7: Panauti 2; 8: Sundarijal; 9: Sunkoshi 1; 10: Sunkoshi 2; and 11: Trishuli

Table 16: Environmental Impacts and Suggested Avoidance or Minimizing or Compensatory Mitigation Measures For the Candidate Solar Farm Sites

Table 17: Social Impacts and Suggested Avoidance or Minimizing or Compensatory Mitigation Measures for the Candidate Solar Farm Sites

Phase of Development	Potential Issues and Impacts	Suggested Avoidance or Minimizing or compensatory Mitigation Measures	Potential Candidate Solar Farm Sites										
			1	2	3	4	5	6	7	8	9	10	11
Design/Pre-Construction Phase	Social or Community Concerns (Pre-Construction)- lack of project information; lack of participation in project design and finalization of project sites	The communities surrounding the candidate solar farm activities will be informed during the design preparation works and prior to the actual start of construction. The information on the project actions and the likely potential impacts in the construction operation phases explained to give a general understanding of the project	√	√	√	√	√	√	√	√	√	√	√
		Sample sites though are a part of the NEA owned land, there are residences near the sites. The community will be consulted before finalizing sites. Any NEA land if encroached will not be considered. Private land acquisition will be discouraged..	√	√	√	√	√	√	√	√	√	√	√
		Encroachers of land will be consulted and mechanism of compensation to the lost built structures will be negotiated. Similarly agricultural occupants will be given compensation for standing crops and assisted for livelihood restoration.	√	√					√			√	
		If the project sites are the sites of the Advsashi/Janajati and Disadvantageous groups, support program in the form of Indigenous and Vulnerable Community Development Plan shall be prepared in consultation with these groups to comply with the Banks policy	√	√	√	√	√			√			√
Construction Phase	Noise and dust issue	Inform local neighborhood community before construction activities start about planned civil works how they could be affected by them	√	√	√	√	√	√	√	√	√	√	√
	Employment to the local population	Avoid or minimize disturbances by construction activities in near living areas, e.g. avoiding works at nighttime, minimizing transports of material, noise control	√	√	√	√	√	√	√	√	√	√	√
	Contractor's camp near residences	Apply adequate waste management and avoid run-off of waste, e.g. littering off packaging Material	√	√	√	√	√	√	√	√	√	√	√
		Offer employment and training opportunities for local people. (Include in EMP that the contractor has to maximize the local employment)	√	√	√	√	√	√	√	√	√	√	√
		Include women and other community groups in project activities whenever there is anyOpportunity	√	√	√	√	√	√	√	√	√	√	√
		Since all candidate sites are within the NEA owned	√	√	√	√	√			√			√

		lands, the surrounding communities will not be directly affected. In case the surrounding community constitute sizable numbers of adivashi/Janajati and disadvantageous groups, implement the VCDP as designed in the Pre-construction phase)											
Operation Phase	Community Safety	Inhibit unauthorized access to the PV modules on roof-top or at the free-standing structures by	√	√	√	√	√	√	√	√	√	√	√
	Benefit sharing	construction design and eventually necessary technical protection measures (fences, gates,locks)	√	√	√	√	√	√	√	√	√	√	√
		Cover inverters with a locked metal cage firmly attached to the wall in order to avoid	√	√	√	√	√	√	√	√	√	√	√
		unauthorized manipulation (especially by playing children with the risk of accidents) or theft											
		Mark sites with comprehensive and visible signs (pictograms) indicating danger and no-go-areas	√	√	√	√	√	√	√	√	√	√	√
		Put the wiring underground in order to avoid accidents and damage (accidentally or intentionedby vandalism)	√	√	√	√	√	√	√	√	√	√	√
		Give preference to the eligible locals for employment during operations	√	√	√	√	√	√	√	√	√	√	√
		Provide free electricity to vulnerable houses in the immediate periphery of the project sites	√	√	√	√	√	√	√	√	√	√	√
		Advice to the public institutions where the PV installations are implemented about special risksand security needs (security fence, safeguard at nighttime)	√	√	√	√	√	√	√	√	√	√	√
		Inform the administration of the public institutions where the PV installations are implementedthat they should report immediately to the concerned authority in case of damage of any component of the PV system.	√	√	√	√	√	√	√	√	√	√	√

CHAPTER V: ENVIRONMENTAL AND SOCIAL SCREENING AND MANAGEMENT

Environmental and social considerations should be envisioned right from the stage of project identification. In general, projects are identified on peoples' demand which is a good practice but when environmental and social consequences of implementation of a project are not well thought through, project implementation may lead to serious environmental and social problems. While identifying and designing sub-projects under GSEEP, all possible alternatives will be examined and assessed. The Project Management Team (PMU) will collect information on the environmental and social setting; identify possible beneficiaries and assess potential environmental and social impacts of different alternatives. The general public should be made aware of the environmental and social consequences of project implementation at later stages in GSEEP.

5.1 Environmental& Social Screening

Each of the investments to be funded under the GSEEP will be subject to an environmental and social screening process before it is selected for inclusion in the project. The screening process establishes the level of environmental and social assessment required and will apply the exclusion criteria presented in Section 1.6. The screening process intends to identify relevant possible environmental and social concerns as well as suggest any further investigation and assessment as necessary. The PMU will fill in a screening form with assistance of the consultants, if so required, for activities funded under the GSEEP. The PMU will carry out the environmental and social screening for the investments implemented under the *GSEEP.*

5.2 Environmental Safeguard Categorization of GSEEP Investments

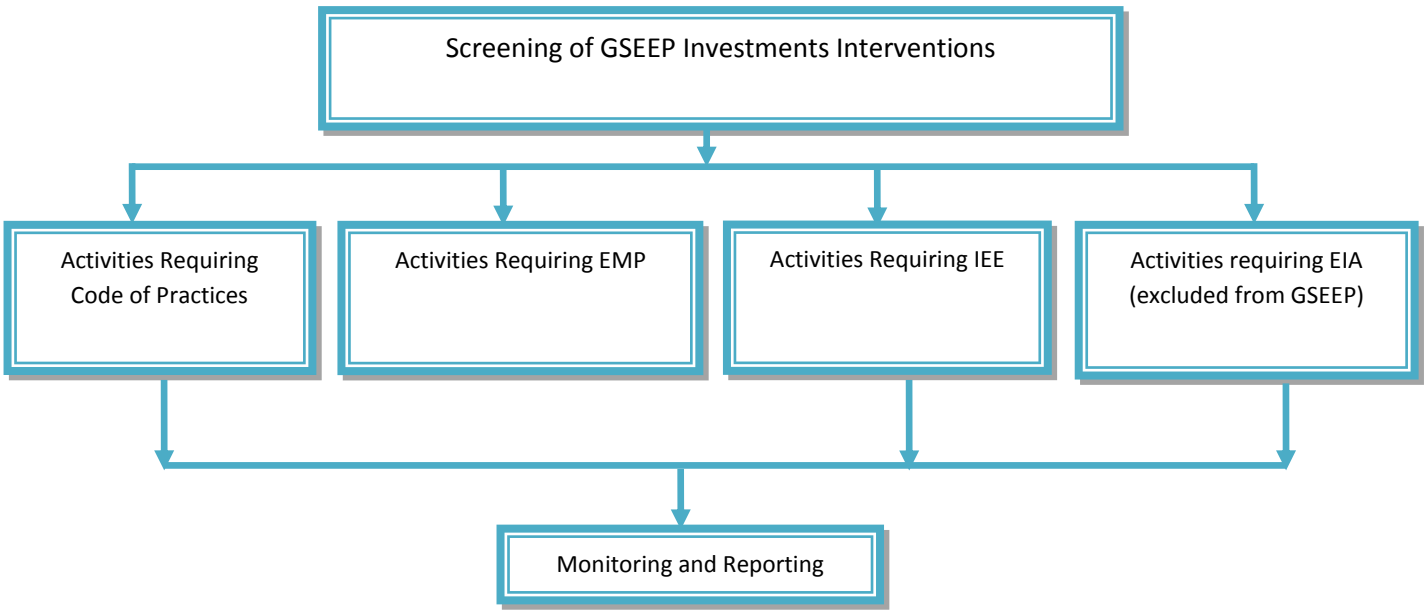
Primarily, the environmental screening exercise will be undertaken to determine the key environmental issues/concerns and the nature and magnitude of the potential impacts that are likely to arise on account of the proposed investments interventions. The major or key environmental and social issues to be identified will be determined by the type, location, sensitivity and scale of the investment intervention. The results/findings from this exercise are/will be used to determine:

1. The need for detailed assessment
2. Extent and type of Environmental Assessment (EA) required
3. The possibility of exclusion

The screening result will also be an important input for analyzing the ‘feasibility’ of the investments interventions along with engineering/economics.

Screening of the investments interventions will be done based on the prevailing legal requirements to determine whether the activities are subject to, with respect to environmental issues,(a) GoN's IEE (Initial Environmental Examination), (b) EIA (Environmental Impact Assessment),(c) No-EA (Environmental Assessment) processes, or require (d) only EMP or the code of practices. Environmental screening also determines whether investments proposals should not be included at all for funding under GSEEP should they be found to fall under the ‘negative’ list or ‘exclusion’ criteria set forth in this ESMF (section 1.6).

Flow of Safeguard Categorization for GSEEP Activities



The Environmental Protection Act (EPA)/Environmental Protection Regulations EPR), 1997 of Government of Nepal defines the projects which falls under IEE and EIA category as per schedule 1, and 2 of EPA. ***Annex 2*** outlines the environmental screening format to evaluate the GSEEP project with respect to provisions of EPA/EPR and World Bank Policies.

5.2.1 Category I: GSEEP Intervention Requiring IEE

Activities requiring IEE based on legal requirements and potential environmental and social risks (basis as per Environmental Protection Act/Regulations 1997 of GoN)3.

Threshold environmental criteria for investments requiring IEE are identified on the basis of the Environment Protection Act, 1996 and Environment Protection Regulations 1997 as well as based on potential short-to-long-term adverse environmental and social impacts and their sensitivity. Such GSEEP interventions should follow the schedules of EPA/EPR 1997. The potential GSEEP interventions requiring IEE are Component 1 activities with work boundaries expanding outside NEA owned land and properties and/or investment amounts exceeding the threshold limits of 10 million. Each project requiring IEE should have the respective assessment done prior finalizing Detailed Project Report (DPR). Such GSEEP investments should prepare Environment Management Plan (EMP) for approval. An IEE report will be prepared. In addition to thresholds defined by government regulation, potential adverse impacts and environmental sensitivity will be duly considered while conducting the IEE study and writing IEE report. The TOR for the IEE as well as the IEE report needs approval by the concerned ministry (MoE)4. The IEE report will have a built-in EMP which will fully describe appropriate preventive and curative mitigation measures and their implementation procedures. The environment experts of the PMU or consultant appointed by NEA will be responsible to ensure that safeguard requirements are met. The process for conducting IEE is shown in a flow diagram (***Annex3***). For GSEEP investments requiring IEEs, construction work will start only after the approval of IEE by the concerned ministry. The preparation of IEE and its approval from the concerned ministry normally requires 3-4 months.

3Civil works requiring EIA are excluded from this project.

4 The Initial Environmental Examination (IEE) shall be approved by the concerned ministry,i.e the project related to energy is approved by the Ministry of Energy.

5.2.2 Category II: GSEEP Intervention Requiring EMP

GSEEP investments which don't require IEE, but may involve civil construction works with some minor to moderate degree of environmental and social issues.

Such GSEP investments require EMP. The format and table of content for preparing EMP is included in ***Annex 4***. The following process will be followed to prepare the EMP:

Phase I: Preparation of EMP. The EMP is an overall plan, which addresses the minor to moderate safeguard issues arising from implementation of the GSEEP investments and suggests a strategy and action plan to mitigate the adverse environmental and social impacts and enhance the beneficial impacts of the interventions. The EMP for a GSEEP investment consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The plan also includes the actions needed to implement these measures. An EMP is required for the following activities of component 1 investmentsinterventions.

1. Solar farm development exclusively within the NEA owned land
2. Individual Solar Farm investment within 10 million rupees
3. Power evacuation through existing 11kV transmission line

The EMP includes:

1. Site Specific EMP Activity Schedule, including cost for implementation of mitigation measures.
2. Site Specific EMP Monitoring Schedule, including monitoring responsibility delineation.
3. Cost Estimate for EMP Monitoring. This can include cost required for capacity building and training activities basis as required or stated in activity

The PMU or the appointed consultant of NEA will prepare the EMP for category II in the prescribed EMP format incorporating all information and data.

Phase II:Approval of site specific EMP and Inclusion of site specific EMP Provisions in Designs/Estimates After preparation of the EMP report, it has to be endorsed by PMU (subject to review and clearance from the World Bank). After its approval the provisions of the EMP need to be included in the GSEEP investments interventions' designs and estimates before final approval..

Phase III:EMP Implementation Phase. After approval, EMP provisions along with the GSEEP investments interventions 'designs/estimates shall be implemented along with construction works. The responsibility of overall EMP implementation as well monitoring implementation for the category 2 interventions shall lie with PMU or appointed consultant.

5.2.3 Category III: GSEEP Interventions Requiring Code of Conducts

GSEEP investments interventions which don't fall into categories I and II shall follow Codes of best practices during the implementation and operation phases.

Environmental codes of practices provide technically specified solutions illustrating the general principles of environmentally sound and sustainable planning, design and construction. This will help to enhance positive impacts and to avoid or lessen adverse or negative impacts. This environmental code of practices should be applied in conjunction with the standard technical standards for preparation of designs of civil works and during implementation. The GSEEP interventions requiring application of best practice code of conducts are component 2 activities such as:

a) Replacing conductors of distribution feeders to reduce line losses;

b) Adding or replacing distribution transformers to reduce over-load of transformers; and
c) Adding capacitor banks to compensate reactive power to manage voltage levels.

The generic environmental best practices to be followed for GSEEP investments and interventions are elaborated below:

1. Solid Waste Management should be based on Reduce, Reuse, and Recycle (3R) principles: Generation of solid, semi-solid and liquid waste requires proper on site management and scientific disposal.
2. Hazardous waste Management, particularly PCB waste in the replaced transformers, should be based on the IFCs General Environmental Health and Safety Guidelines section 2.3 (Occupational Health and Safety ; Physical Hazards), IFCs General Environmental Health and Safety Guidelines section 2.3 (Occupational Health and Safety ; Chemical Hazards
3. New transformers shall not be based on banned hazardous chemicals
4. As there may be settlements around the component 2 activities, no or few nuisances to the community should be produced. Examples: use of less noisy equipment and no work during night hours as well as adoption of Environmentally Sound Technologies (energy efficient system design, selection of less polluting technology) in civil construction.
5. Health and Safety Standards (e.g., use of personal protective equipment, use of safety signs) should be adopted in replacement activities,
6. Environment, Health, and Safety (EHS) related orientation and job specific training should be provided to employees; IFCs General Environmental Health and Safety Guidelines section 2.2 (Occupational Health and Safety ; Communication and Training shall be followed
7. Adherence to GoN Rules, Regulations, Policies and World Bank policies, and compliance with formats and checklists developed by ministries
8. Correction of shortcomings, periodic review meetings, clear assignment of roles and responsibilities
9. Environmentally friendly technologies and awareness rising in environmental (including cultural and archeological) should be promoted.
10. Information dissemination and public consultations prior, during and concomitant to the garner understanding and consensus should be an integral part of all activities under GSEEP.

5.2.4 The Roles and Responsibilities of the World Bank

The role of World Bank is to ensure that the GSEEP is in compliance with GoN and World Bank requirements. For this purpose, Initial Environmental Examination (IEE) reports and EMPs of each sub-project/activity and EMP will be reviewed and “no objection letter” shall be provided by the World Bank prior to start implementation. For activities, which require code of best practices, PMU can directly approve.

5.3 Management of Social Safeguards

The key steps are the same as for dealing with the environmental issues – screening, assessment and preparation of mitigation plans. These steps are necessary to identify and address the potential social concerns or impacts of a project right from the planning stage to its implementation and post-implementation operations. ***Annex 5*** presents the social screening format in relation to GON EPA/EPR and WB policy requirements.

5.3.1 Social Screening (Including Resettlement Policy Framework, Indigenous People (IP) and Vulnerable Community Development Plan, and Gender Development Plan)

The envisaged activities and scope of GSEEP are not expected to require SIA (Social Impact Assessment) or RAP (Resettlement Action Plan). However, as part of ESMF a resettlement policy framework has been developed In case some adverse impacts are identified at a later stage. Small and limited land area required for any project component limiting to less than 200 people in some of the candidate sites will be covered by the abbreviated RAP to be developed as per the policy provisions

outlined in the entitlement matrix of the ESMF. The short-term impact on access to facilities and properties of households and energy services is very likely for component 1 and 2. Such impacts (if any) shall be well documented. In case more than 200 persons are impacted, a detailed RAP will be prepared. The above issues including the temporary land occupation for camps and facilities will be addressed by the application of the following, policy/entitlement frameworks in the ESMF (Table 10).

Screening

Every candidate site will be subjected to social screening process before it is selected for inclusion in the project.The screening process will establishthe degree of adverse impact (if any) and also the level of social assessment required and application of exclusion criteria as given under:

Avoidance and/ or Minimizing Adverse Social Impacts

The Project will make best use of its social planning approaches and fully ensure that the potential social issues are avoided or minimized to the extent possible. This would require deploying stringent measures for site selection at the early stage of project design and planning by undertaking environmental and social screening. Ideally, the possibility of avoiding or minimizing the issues related to involuntary resettlement would be possible by taking into account the following considerations while selecting the subproject site.

Considerations for the Selection of GESEEP Subprojects

1. No private land or property will be used to develop the GESEEP subprojects;
2. No land with any kind of disputes/ conflicts will be used for the subprojects;
3. No land without legal title of NEA (ownership certificate of land) will be used for the subprojects;
4. No land under protected forests/ national parks will be used; and
5. No private land donated by the owners will be accepted and used.

Based on the criteria suggested above, the screening process will:

1. Determine potential impacts of selected sub-components as to whether they are likely to cause negative social impacts
2. Determine the scope and focus of detailed social assessment
3. Helps in making appropriate decision about inclusion or exclusion of the site/ location under consideration.

5.3.2 Social Impact Assessment (SIA)

In case screening result shows adverse social impacts, the project will undertake a survey for identification of the persons and their families likely to be affected by the project. Every survey shall contain the following municipality or ward / village-wise information of, the project affected families:

1. Members of families who are residing, practicing any trade, occupation or vocation in the project affected area;
2. Project affected families who are likely to lose their house, commercial establishment, agricultural land, employment or are alienated wholly or substantially from the main source of their trade occupation or vocation or losing any other immovable property.
3. Agricultural labors and non-agriculture labors.
4. Losing access to private property or common property resources or natural resources
5. Information on socio-cultural and political situation in the project area

The project on completion of the survey will disseminate the survey results among the affected community.

5.3.3 Resettlement Action Plan

Based on the social impact assessment survey, project will prepare an action plan to mitigate or minimize the adverse impacts as identified during the survey. The draft mitigation plan in form of resettlement action plan (RAP) will be again disseminated among the affected individuals / community. The feedback received from the affected groups will be incorporated to the extent possible before finalization of the RAP.

Every-draft Resettlement Action Plan (RAP) prepared shall contain the following particulars namely:

1. The extent of area to be acquired for the project, the name(s) of the corresponding village(s) / municipality area and the method employed for acquiring land with the relevant documentation.
2. Village wise or municipality wise list of project affected families and likely number of displaced persons by impact category
3. Family-wise and the extent and nature of land and immovable property in their possession indicating the survey numbers thereof held by such persons in the affected zone;
4. Socio-economic survey of affected people including income/asset survey of PAPs.
5. A list of agricultural labourers in such area and the names of such persons whose livelihood depend on agricultural activities;
6. A list of persons who have lost or are likely to lose their employment or livelihood or who have been alienated wholly and substantially from their main sources of occupation or vocation consequent to the acquisition of land and / or structure for the project;
7. Information on vulnerable groups or persons for whom special provisions may have to be made;
8. A list of occupiers, if any
9. A list of public utilities and government buildings which are likely to be affected
10. A comprehensive list of benefits and packages which are to be provided to project affected families by impact category;
11. Details of the extent of land available which may be acquired in settlement area for resettling and allotting of land to the project affected families;
12. Details of the basic amenities and infrastructure facilities which are-to be provided for resettlement;
13. Entitlement matrix
14. Time schedule for shifting and resettling the displaced families in resettlement zones
15. Grievance redressal mechanism
16. Institutional mechanism for RAP implementation;
17. Monitoring and evaluation indicators and mechanism; and
18. Budget

5.3.4 Preparation of Resettlement Action Plan (RAP)

Having identified the potential impacts of the relevant sub-projects, the next step is to develop action plan to mitigate the impacts. The RAPs provides a link between the impacts identified and proposed mitigation measures to realize the objectives of involuntary resettlement. The RAPs will take into account magnitude of impacts and accordingly prepare a resettlement plan that is consistent with this framework for Bank approval before the sub-project is accepted for Bank financing.

1. Sub-projects that will affect more than 200 people due to land acquisition and/or physical relocation and where a full Resettlement Action Plan (RAP) must be produced.
2. Sub-projects that will affect less than 200 people will require an abbreviated RAP.
3. The above plans will be prepared as soon as subproject is finalized, prior to Bank's approval of corresponding civil works bid document.
4. Projects that are not expected to have any land acquisition or any other significant adverse social impacts; on the contrary, significant positive social impact and improved livelihoods are exempted from such interventions.

5.3.5 Sub-Project Approval

In the event that a sub-project involves land acquisition against compensation or loss of livelihood or shelter, the project shall:

1. Not approve the subproject until a satisfactory RAP has been prepared and shared with the affected person and the local community; and
2. Not allow works to start until the compensation and assistance has been made available in accordance with the framework.

Resettlement Policy Framework guidelines are prepared for addressing the issues limited to this project for resettlement and rehabilitation of the PAPs. The framework is based on the GON's legal frameworks and the World Bank OPs 4.12 on involuntary resettlement.

5.3.6 Broad Principles

The RPF aims to resettle and rehabilitate the affected persons on account of its sub projects in a manner that they do not suffer from adverse impacts and shall improve or at the minimum retain their previous standard of living, earning capacity and production levels. It is also the endeavor of the project that the resettlement shall minimize dependency and be sustainable socially, economically and institutionally. Special attention will be paid for the improvement of living standards of marginalized and vulnerable groups. The broad principles of the policy are as below:

1. The adverse impacts on persons affected by the project would be avoided to the extent possible.
2. Where the adverse impacts are unavoidable, the project-affected persons will be assisted in improving or regaining their standard of living. Vulnerable groups will be identified and assisted to improve their standard of living.
3. All information related to resettlement preparation and implementation will be disclosed to all concerned, and community participation will be ensured in planning and implementation.
4. Private negotiations will also be used for land acquisition as required.
5. The persons affected by the project who does not own land or other properties but who have economic interest or lose their livelihoods will be assisted as per the broad principles brought out in this policy.
6. Before taking possession of the acquired lands and properties, compensation and R&R assistance will be made to those who are available and willing to receive the entitlements in accordance with this policy.
7. There would be no/or minimum adverse social, economic and environmental effects of displacement on the host communities but if needed specific measures would be provided.
8. Broad entitlement framework of different categories of project-affected people has been assessed and is given in the entitlement matrix. Provision will be kept in the budget. However, anyone moving into the project area after the cut-off date will not be entitled to assistance.
9. Three tier appropriate grievance redress mechanism has been established at project level to ensure speedy resolution of disputes.
10. All activities related to resettlement planning, implementation, and monitoring would ensure involvement of women. Efforts will also be made to ensure that vulnerable groups are included.
11. All consultations with PAPs shall be documented. Consultations will continue during the implementation of resettlement and rehabilitation works.
12. As required, a Resettlement Action Plan will be prepared including a fully itemized budget and an implementation schedule.

5.3.7 Definitions

The following definitions are used in the documents:

Cut-off date: In the cases of land acquisition affecting legal titleholders, the cut-off date would be the date of issuing the preliminary notice under the Land Acquisition Act 2034. In cases where people lack title, the cut-off-date shall be the date of start of the Census survey undertaken by the project authority.

Project Affected Person: Affected persons are those who stand to lose all or part of their physical and non-physical assets including homes, productive land, community resources, commercial properties; livelihood; and socio-cultural network.

Project Displaced person: A displaced person is a person who is compelled to change his/her place of residence and/or work place or place of business, due to the project.

Affected family: A family whose primary place of residence or other property or source of livelihood is adversely affected by the acquisition of land for a project or involuntary displacement for any other reason

Wage Earner: A person who is working with a commercial establishment or working as a labour in an agriculture land, which is being affected by the project.

Encroacher: A person, who has trespassed Government land, adjacent to his/her own land or asset, to which he/she is not entitled, and deriving his/her livelihood prior to the cut-off date.

Squatter: Squatter is a person who is land less and has settled on publicly owned land without permission and has been occupying publicly owned building without authority prior to the cut-off date.

Vulnerable Person: The vulnerable person includes both socially as well as economically disadvantaged persons such as janjatis, dalits, disabled/handicapped, woman headed households, destitute, orphans, widows, unmarried girls, abandoned women ,or persons above sixty years of age; who are not provided or cannot immediately be provided with alternative livelihood, small and marginal farmers, and landless wage earners.

Entitled Person: person adversely impacted by the project and is entitled to some kind of assistance as per the project entitlement framework

Titleholders (THs): Persons who possess legal documents in support of claims made towards ownership of structure or land are titleholder.

5.3.8 R&R Benefits for Project Affected Families

The resettlement and rehabilitation (R&R) benefits shall be extended to all the Project Affected Families (PAF). The details are provided in the entitlement matrix (Table 18).

Table 18: Entitlement Matrix

Types of Lost	Application	Entitled Persons/family	Policy/ Entitlement
1. Acquisition of private, tenancy, or Guthi land	Entire or part of land to be acquired from owner of the land as recorded at cut-off date	▪ Titleholder ▪ Tenants	▪ Direct purchase of land by the Municipality through negotiation with the land owner having the Ward Committee as witness. ▪ Land of equivalent size and category (if available), or cash compensation at replacement cost, ▪ In case of vulnerable group (IPs, Dalits, socio-economically poor, women headed families), preference will be in replacing land for land, ▪ Any transfer costs, registration fees or charges to be borne by the project, ▪ In case there are legal Tenant (mohi), the land owner will have to produce consent of tenant or the purchase price or compensation as described in clauses 1 & 2 above shall be apportioned 50: 50 between the owner and the legal tenant as per the Land Reforms Act, 1964, ▪ Land compensation/registration shall be paid/done in favor of both the land owner and spouse, ▪ If remaining land becomes unviable as a result of land acquisition, land owner will have an option to relinquish unviable remaining portion of land and receive similar benefits to those losing all their land parcel(s), ▪ For loss of income due to land loss, one year of minimum agricultural wages as assistance towards loss of income shall be provisioned. ▪ Training for skill upgradation to encourage for self-employment
2. Temporary loss of land	Temporary land taken by the sub-project	▪ Titleholder ▪ Tenants	▪ One month Prior notice before civil works allowing the owners to salvage their assets and crops; ▪ Compensation for any damage caused to structure/assets or standing crops (The contractor will be responsible for compensating for any temporary damage to property business, assets, crops and trees during civil works which will be reflected in the contract agreement. ▪ Three month of minimum agricultural wages as assistance towards loss of income shall be provisioned. ▪ Training for skill upgradation to encourage for self-employment
3. Loss of residential, commercial, and other structure	Structures, buildings including cattle shed, walls, toilets etc. affected by the sub-project	▪ Owner ▪ Tenants ▪ Non-titled (encroachers and squatters)	▪ Direct purchase of structure and land by the NEA through negotiation with the land owner having the VDC representatives as witness. ▪ Compensation for full or partial loss at replacement cost of the affected structure(s) without depreciation or deduction for salvaged material, ▪ Transportation allowance of Rs. 10000.00 for residential and commercial structures to cover cost of transportation. ▪ Subsistence allowance equivalent to sixmonths of agriculture income as one time grant will be provided to AP, ▪ Prior notice of 35 days delivered to the affected family (tenants). One time grant of 3 month's rent for tenants who have to relocate from tented building ▪ Non-titled (squatters and encroachers) persons will receive compensation for structures at replacement cost without depreciation or deduction for salvaged

Types of Lost	Application	Entitled Persons/family	Policy/ Entitlement
			material. ▪ Encroachers and squatters will not be provided any compensation for land, but will be provided replacement value for the structure. ▪ Relocation assistance to all fully displaced householdsi.e additional support for vulnerable households including all titleholders as well as non titleholders in both the categories (residential as well as commercial) in form of preferential employment at project site and one time grant equivalent to three months of minimum wages.
4. Loss of community structures and/or resources	Community facilities (e.g. irrigation, water, etc.) affected by the sub-project	▪ The users of the ▪ facility or ▪ community or ▪ group	▪ Reconstruction by the sub-project leaving such facilities in an equal or better condition than they were before, or ▪ Cash compensation to the legal/community custodians at full replacement cost without depreciation of deduction for salvaged material; or ▪ Negotiated relocation in consultation with the community
5. Loss of trees and crops	Affected fruit/nut trees	▪ Owner of the ▪ affected timber and ▪ fodder trees	▪ Cash compensation based on annual value of the produce and calculated according to Department of Agriculture (DOA) norms, ▪ Resettlement Plans to confirm that the DOA norms and techniques are sufficient and are updated regularly ▪ Three months of minimum wages as assistance towards loss of income
	Affected timber and fodder trees	▪ Owner of the ▪ affected timber and ▪ fodder trees	▪ Cash compensation based on calculation of the production and calculated according to the district norms as decided by the Department of Forestry. ▪ Three months of minimum wages as assistance towards loss of income.
	Affected crops	▪ Owners and ▪ sharecroppers of ▪ affected crops	▪ Cash compensation based on local market prices for the produce of one year and calculated as per the norms of District Agriculture Development Office, ▪ 50% cash compensation of the lost crop for the sharecroppers/legal tenant (Mohi) ▪ Non-titled persons will be informed 6 months prior to construction or provide compensation for crops. ▪ Three months of minimum wages as assistance towards loss of income.
6. Loss of economic opportunity	Economic opportunity lost as result of loss of livelihood base	▪ Persons in the subproject ▪ vicinity who may be ▪ adversely affected, ▪ although they do ▪ not lose assets as such	▪ Preferential involvement in project construction works, ▪ Skills training support for economic restoration, ▪ One time grant equivalent to three months of minimum wages in case of loss of livelihood
7. Loss of time and travel expenses	Expenses incurred in traveling to fill application and making claims and time lost	▪ All sub-project ▪ affected persons ▪ eligible for ▪ compensation	▪ Program facilitates transportation in official process, ▪ Payment on the same day as other compensation
9. Additional Assistance			
9.1 Preferential treatment in		▪ All APs	▪ Construction contracts include provision that APs will

Types of Lost	Application	Entitled Persons/family	Policy/ Entitlement
employment in project activities			have priority in wage labor/employment on sub-project construction during implementation, ▪ APs shall be given priority after construction for work as maintenance workers, mandated in local body agreement
9.2 Skill training and income generation support		▪ One member of ▪ each project affected ▪ family belonging to ▪ vulnerable group/below ▪ poverty line	▪ Skills training and income generation support financed by subproject with special focus on women, dalits and IPs ▪ Resettlement Plan to include a need assessment and skills training program for APs.
9.3 Priority in Poverty reduction/social development programs		▪ All Aps	▪ Participation of APs, especially women, dalits, and IPs, with priority in saving credit scheme facilitated by the sub-project, ▪ Participation of APs with priority in life skills, income generation, and other entrepreneurship opportunities
9.4 Business disruption losses compensation		▪ Permanent business	▪ For permanent business it has been assumed that there will be no full closure of the shops during construction, although road closures restricting vehicle access is expected in some places. ▪ Pedestrian access should be maintained at all times ▪ As a result only partial disruption to some businesses is expected. There should be no need to close shops and retail outlets. However the resettlement policy makes provision for compensation for business losses during construction. A onetime grant equivalent to one week's earning (Rs. 1000.00 X 7 days) = Rs. 7000.00 shall be compensated.
9.5 Loss of permanent assets		▪ Severely affected families	▪ Severely affectedfamilies will be given 25% of the total compensation as additional assistance.

In case due to change in the scope of the land area occupancy outside NEA owned land in future date, with potential higher risk on societies involving social disruptions and/or impacts a full SIA and RAP will be carried out in compliance to the Banks policy requirements.

5.3.9 Indigenous Peoples and Vulnerable Communities Development Framework (IP-VCDF)

This Indigenous Peoples and Vulnerable Community Development Framework (IP-VCDF) is developed to guide the preparation of GSEEP investments to ensure better distribution of the benefits of the project activities with a focus on the *adivasi/janajatis*and other disadvantaged social groups located in areas in which GSEEP civil works take place. The IP-VCDF is developed based on the national policies/strategies as well as the World Bank's Indigenous Peoples Policy. The principal objectives of the IP-VCDF are to:

1. Ensure that the project engages in free, prior, and informed consultation with affected communities, leading to broad community support for the project, with particular attention to vulnerable groups;
2. Ensure that project benefits are accessible to the vulnerable communities living in the project area;
3. Avoid any kind of adverse impact on vulnerable communities to the extent possible and if unavoidable ensure that adverse impacts are minimized and mitigated;
4. Ensure vulnerable peoples' participation in the entire process of preparation; implementation and monitoring of the sub-project activities;
5. Minimize further social and economic imbalances within communities; and

6. Develop appropriate training / income generation activities in accordance to their own defined needs and priorities.

5.3.9.1 Relevant Policies on Indigenous People and other Vulnerable Communities

Nepal is a signatory to ILO convention on Indigenous and Tribal Peoples, 1989 (No.169). Besides that Nepal does not have a standalone policy on Indigenous Peoples. However in the Three Year Interim Plan (TYIP) (2007-2010), or the Tenth Plan,significant emphasis has been placed on delivering basic services to the disadvantaged and Indigenous People (IPs), women, disabled and vulnerable communities (VCs) such as *Dalits* and *Adhibasi / Janajati*. One of the main objectives of the Tenth Plan is the implementation of targeted programs for the uplifting, employment and basic security of *Dalits*, indigenous people and disabled peoples. The policy provision also outlines that the Government should pilot strong and separate packages of programsfor the basic security of the vulnerable sections of society. The Three Year Interim Plan (TYIP) (2007- 2010) includes the following policies for inclusive development of *Dalits, Adivasi/Janajatis*and other vulnerable groups*:*

1. Creating an environment for social inclusion;
2. Participation of disadvantaged groups in policy and decision making;
3. Developing special programs for disadvantaged groups;
4. Positive discrimination or reservation in education, employment, etc.;
5. Protection of their culture, language, and knowledge;
6. Proportional representation in development; and
7. Making the country's entire economic framework socially inclusive.

The National Foundation for the Upliftment of *Adivasi/Janajatis* Act, 2058 (2002), the National Human Rights Action Plan 2005, the Environmental Act 1997, and the Forest Act 1993 have emphasized protection and promotion of vulnerable groups in general, IPs' knowledge, and cultural heritage in particular. In 1999, the Local Self-Governance Act was amended to give more power to the local political bodies, including authority to promote, preserve, and protect the IPs' language, religion, culture, and their welfare.

The World Bank policy on indigenous peoples emphasizes the need to design and implement projects in a way that fosters full respect for indigenous peoples' dignity, human rights, and cultural uniqueness and so that they:

1. Receive culturally compatible social and economic benefits, and
2. Do not suffer adverse effects during the development process.

5.3.9.2 Screening and Categorization of Impacts on IPs and VCs

These steps will be followed to assess impacts on IPs and VCs:

1. A social assessment will be carried out for the entire project at the beginning of the activities as part of the pro-poor participatory planning process (only for component 1)
2. Then a social screening will be carried out to determine whether IPs and VCs will be affected by the activities as part of the environmental and social screening for the GSEEP investments carried out at the identification stage

The screening will involve identifying IPs and VCs belonging to the area where the GSEEP investments interventions for component 1 activities will be undertaken, their population (number and ratio), and their characteristics as compared to the main population in the project area through primary and secondary data collection.

The social screening will provides the necessary information to determine impact including: (i) the beneficiary population living within the impact zone of the GSEEP component 1 investments (ii) the extent of land required (even temporary) and number of land owners affected (if applicable); (iii) impacts on poor and vulnerable groups including needs and priorities for social and economic betterment; (iv) other social impacts.

The screening report for each subproject will provide adequateinformation about the potential losses and damages to the vulnerable peoples and communities which will be crucial to decide whether further works regarding impact assessment and mitigation plans including preparation of abbreviated RAP are required or not,

GSEEP investments Component 1 will be categorized according to the level of impacts on IPs and VCs. The categorization will be determined by the type, location, scale, nature, and presumed magnitude of potential impacts on IPs and VCs.TheGSEEP investments will be categorized as per the following table (***Table 19***) using the information in the IPs & Vulnerable Groups Impact Screening & Categorization Form presented in ***Annex 6***.

Table 19: Categorization of Impact on IPs and VCs for GSEEP

Category	Determination of the type of Social Assessment Needed
Category A	GSEEP component 1 investments expected to have significant impacts5 that require an Indigenous People (IP)/Vulnerable Group Development Program (VCDP)
Category B	GSEEP investments expected to have limited impacts that require specific action for IP/ Vulnerable Groups in the form of social action plans
Category C	GSEEP investments expected to have impacts on IP/ Vulnerable Groups and, therefore, do not require special provision for IP/ Vulnerable Groups

In case of significant impacts (falling in categories A and B) on IPs and VCs, the PMU by itself or through the appointed consultant will submit the IP-VCDP to the World Bank for clearance. The Outline Structure of an IP - Vulnerable Community Development Plan is presented in ***Annex 7***.Short IP-VCDPs prepared as a part of 'less impact' or 'no impact' category will be internally evaluated. The World Bank will periodically review and do random review of these documents.

5.3.9.3 Specific Measures to be followedwhile Dealingwith Vulnerable Groups

Specific measures for vulnerable groups including indigenous peoples, *Dalits*, minor ethnic communities, women, and powerless communities are outlined below:

1. Ensure awareness raising, active participation and capacity building of the vulnerable communities
2. Ensure participation in awareness campaigns, project implementation and monitoring of vulnerable groups
3. Ensure equal wages for similar work during implementation
4. Launch project information campaign to inform the target groups about the key features of the project and the GSEEP investments interventions implemented.

The impacts on IP/ Vulnerable Group will be considered 'significant' or Category A if the GSEEP affects positively or negatively:

1. Affects their customary rights of use and access to land and natural resources,
2. Changes their socio-economic status,
3. Affects their cultural and communal integrity,
4. Affects their health, education, livelihood, and social security status, and/or
5. Alters or undermines the recognition of indigenous knowledge.

5. Asses and analyze the presence of indigenous and Dalits in the areas where GSEEP component 1 investments are implemented
6. Treat and support indigenous people, Dalits and other vulnerable communities preferentially
7. Involve IPs and Dalits in beneficiary groups as needed to increase their participation.
8. Ensure the identified needs and priorities of vulnerable people are taken into account in the GSEEP investments interventions
9. Conduct project related meetings in indigenous and vulnerable community areas to encourage their participation. Ensure a quorum which includes representation from IP groups.
10. Encourage interventions providing targeted assistance/training aimed at vulnerable groups to enhance livelihoods and participation
11. Build capacity of indigenous peoples, Dalits and other vulnerable communities to enhance their knowledge and skills to participate in the project activities
12. Encourage capacity development through trainings on skill enhancement (agriculture, veterinary, vocational training in different fields) of local people as part of the GSEEP interventions.

5.3.9.4 Framework for Developing Gender Action Plan

The Gender Development Plan (GDP) framework outlines the specific gender issues and point of corresponding strategies and identify need based activities which will be given due consideration under GSEEP. This will ensure increased women's participation and gain optimal benefits from project activities both during construction and post construction. The major tools used to identify and deal with gender issues are: gender analysis, incorporation of gender issues in project design, and gender-sensitive consultations.

Gender analysis will be an integral part of the initial social assessment carried out as part of the safeguard screening of the GSEEP investments interventions. The issues identified at the screening stage will be assessed during the preparation of the GSEEP investments interventions and adequately addressed during implementation.

The project activities should be gender responsive based on the findings of the gender analysis, and agreed actions should be included in the design of the GSEEP investments interventions. The findings and recommendations from the gender analysis carried out at the screening stage and feedback on gender issues from beneficiaries during implementation must be assessed to determine the need for further action. The key action points are mentioned in ***Annex 8*** of this report.

5.3.9.5 GON Policies on Gender Mainstreaming

GON, in its national level policies and plans, has duly emphasized the importance of women in all spheres ranging from household to community and national level. Realizing the increased potentiality of women in the socio-economic and political sectors, the government has increasingly provided more space for increased participation of women. In addition, GON has established the National Women Commission, a national level well empowered body to look after the issues of women and take protective and defensive measures to address the issues and problems encountered by the women at all levels and in any forms viz domestic violence, women's right to properties and representation in the key positions with fair proportions.

The Government of Nepal (GON), since the early 1990s, has been making important commitments to gender equity, equality and the empowerment of women in its policies, plans and programs. The GON introduced a Gender Approach to Development (GAD) in 1990 to enable women and men to participate equally in public and private life and realize their full potential in development. The Tenth Plan (2002-2007) as a Poverty Reduction Strategy Paper (PRSP) identified gender and inclusion as its main strategies for reducing poverty. 'Social inclusion and targeted programs' was one of the four major pillars of the Tenth Plan/PRSP. The Plan, instead of relying only on targeted programs, tried to address gender and caste related issues by mainstreaming all of the four pillars of PRSP along with envisaged strategies

to achieve gender equality and empowerment of women. The Three Year Interim Plan (TYIP) during 2008-2010, which emphasizes post conflict reconstruction, rehabilitation and reconciliation, continued the long-term goal of poverty reduction through gender mainstreaming and social inclusion.

Similarly, Nepal is signatory of number of international human rights related conventions and declarations, which call for the elimination of all forms of gender based discrimination, including those related to access to education, health and other services. The Convention on the Elimination of all forms of Discrimination against Women (CEDAW), signed by the GoN in 1991, commits Nepal to constitutional and legal equality, particularly in the fields of education, health, citizenship, property and employment. It also guarantees freedom from all kinds of violence and sexual exploitation

5.3.9.6 Gender Inclusive Design and Preparation of GAP

The gender inclusive design criteria emphasizes on the initiatives and promotion of women focused and women friendly activities through which their potentiality could be utilized in the action. This will require targeting the women in providing the project supports that match well with their needs, interest and abilities in the following ways.

1. Targets for women's participation and / or access to project benefits viz education, skill training, forming/ strengthening beneficiary groups;
2. Women representation in different forums and local development activities inclusive working opportunities in project supported works;
3. Hiring / recruitment of females in the project both at central and field level such as local social mobilizers, trainers and facilitators;
4. Special or separate facilities for women or girls to facilitate their participation in project activities;
5. Design of gender sensitive physical facilities i.e separate sanitation facilities in school, construction site if women are employed; public places like markets, etc, and
6. Provision for women or joint ownership of assets viz land and houses
7. The cost of GAP will be included in Resettlement Action Plan.

5.3.2.4.1 Gender Development Plan

The suggested Gender Development Plan for the project is presented below (***Table 20***).

Table 20: Suggested Gender Development Plan

Gender Issues	Strategy	Proposed Activities
Lack of awareness	Awareness campaign about the project for the communities focusing on the vulnerable groups including women.	Formation of women's groups around specific interventions as required. Share information about the project benefits in Nepali language.
Excluded from Opportunities	Gender sensitization to all stakeholders including PMU. Ensure Women's participation during meetings, project implementation and monitoring.	Carry out meetings and interaction program with and orientation to women in the project area. Ensure representation of women in the grievance redress committee. Prepare clause to be included in civil work contract documents to prevent discrimination in employment on the basis of sex, caste, religion and ethnicity. Conduct leadership training for women members of commodity groups in the project area.
Disparity in Wages	Accord priority employment to women in construction activities under the project. Promote equal wages for equal work	Inform women groups regarding proposed construction works. Identify women interested to work; assess their skills and involve them as per their capabilities. Monitor women's wage rate and do the needful to ensure wage equality for similar type of construction works.

Gender Issues	Strategy	Proposed Activities
		Inclusion of the above elements in the contractors' documents.

The details of action points for the preparation of Gender Action Plan are presented in ***Annex 8***.

Table 21: General Framework for the Preparation and Monitoring of GAP

Activities	Indicators and Target	Responsible Agencies
Group formation /strengthening PAF or other groups already in existence	No. of groups	ESSD/SM
Engage women in economic activities – in project construction activities and other sources	No. of women employed against set target	Project incharge; contractor; ESSS/ SM
Skill training to women in vocational fields and support for IGAs in farm and off-farm sector	No. of women trained and engaged in different IGAs	Project; ESSS/ SM
Inputs and technologies distributed to women groups that are culturally appropriate and economically viable	Quantity of inputs/ technologies provided to the groups	Project; ESSS/ SM
Distribution of seed money by the Project and resource generation, mobilization and utilization by the groups	Savings generated and utilized by different groups by purpose (Rs)	Project; ESSS/ SM
Conduct health related trainings (Awareness on HIV/AIDS, child nutrition etc)	No. of programs launched and targeted beneficiaries covered	Project; local health functionaries; local NGOs; ESSS/ SM
Awareness raising to reduce domestic violence	No. of cases reported in the community/ police	Project; local NGOs; ESSS/ SM

5.4 Process for Managing Environmental and Social Impacts

This ESMF proposes measures to minimize and mitigate adverse environment and social impacts of the project activities. Proper integration of the findings from the safeguard studies and public consultations into the planning/decision-making process and engineering outputs (design and bidding documents) will be essential to avoid/reduce the environmental and social issues that may arise due to the project. To ensure that GSEEP investment do not cause any significant adverse impacts, a safeguard screening process will be established and made mandatory for each subproject. In case significant impacts are likely to occur, the GSEEP will require environmental and social assessment and preparation of mitigation/management plans. The key steps for managing any potential adverse impacts are outlined in the ***Table 22*** for civil works carried out under the project.

Table22: Key Steps for Managing Environmental and Social Issues

Stages in GSEEP Cycle	Steps in the Assessment Process
Sub-project Identification	PMU or appointed consultant to carry out Environmental and Social Screening to determine key potential safeguard issues. PMU to carry out field verification to determine whether exclusion criteria have been adhered to.
Project Design (for works that only require EMP)	PMU and/or appointed consultant to consult with key stakeholders PMU andor appointed consultant to prepare Environment Management Plan for sub-projects not requiring detailed assessment design alternative (Category II projects) in parallel with detailed engineering design phase PMU to ensure integration of the EMP into the Bidding Documents (if works are carried out by contractors)
(for works that require detailed assessment, i.e IEE)	PMU and/or appointed consultant to prepare ToR to carry out Initial Environmental Examination (IEE)to determine level and scope of EA. ToR for IEE and IEE should be approved by relevant line ministry (MoE). Preparation of IEE to include steps listed below
Since works requiring EIA are included in the exclusion criteria	Baseline Data Collection: Identification of environmental and socio-economic conditions.

Stages in GSEEP Cycle	Steps in the Assessment Process
for GSEEP, EIA details are not mentioned here.	*Environmental Impact Prediction/Assessment*: Assessment of impacts in terms of characteristics such as magnitude, extent, duration and significance in quantitative terms as far as possible; describing all reasonable alternatives, including preferred and 'no project' options.
	Mitigation Measures Design: Design to avoid, reduce and minimize adverse environmental impacts and enhance beneficial impacts
	Public Consultation and Participation: At various stages in the assessment process to ensure quality, comprehensiveness and effectiveness of the stakeholders' participation and to adequately reflect/address their concerns.
	Preparation of Environmental Management Plan (EMP): Determination of specific actions to be taken during engineering design and construction stages to minimize or mitigate negative impacts and enhance the positive impacts.
Project Design	Report Preparation: Summary of all information obtained, analyzed and interpreted in a report form; also include a non-technical summary including methods used, results, interpretations and conclusions made. IEE should incorporate physical, chemical, biological, social, economic and cultural aspects/environmentand alternative designs/studies to reduce the impacts.
Sub-project approval	PMU to review and approve Technical and Safeguard Report/s (for IEE review and approval will be through MoE; IEEs also need to be submitted to the Bank for No Objection). The Review of report/s to assess whether potential issues have been adequately addressed to facilitate the decision-making process- decides if project should proceed, or if further-alternatives must be examined or totally abandoned. Integrate EMP or IEE into engineering design and bidding documents if works are to be carried out by contractors.
Implementation	PMU to orient / train the Contractor/Users Committee and other field staff on EMP/IEE requirements. PMU to supervise, monitor EMP and IEE compliance (if contractor is used, environmental and social clauses should be part of bidding documents. Monitoring by the supervising engineer/or by other related entity should be mentioned) PMU to take corrective actions, as and if necessary
Post-Construction	NEA staff to carry out post-construction operations and maintenance in line with EMP/IEE

The primary responsibility of coordinating work related to social and environmental safeguards will rest with the Project assisted by the Environment and Social Studies Department (ESSD). The project will establish an Environmental and Social Management Unit (ESMU). The ESMU will be staffed with specialized social and environment professionals either hired from the marked or on deputation from ESSD. ESSD is staffed with subject specialists and ESSD also hire specialist from market as per the need. ESSD, though, operates from central office; it establishes field offices at every project site headed by senior professional as part of ESMU. ESMU model will be followed as this functioned well for the effective implementation of safeguard measures. ESSD over a period of time has acquired skill and experience to address social and environmental safeguard issues. Currently ESSD is working on several Bank funded projects. An Environmental and Social Specialist each from ESSD will be posted at the project site to monitor the implementation of environmental and social safeguards mitigation measures. The specialists will be responsible for generating monthly progress reports. The midterm and end term evaluation of implementation process will be carried out by an independent agency.

CHAPTER VI: INFORMATION AND CONSULTATION FRAMEWORK

The information and consultation framework is intended to lay out the way in which information will be provided to the project implementers and beneficiaries and also how consultations will be held during GSEEP implementation. Its purpose is to ensure social and environmental issues are effectively addressed by the project in a transparent and participatory manner. The primary responsibility for the implementation of information and communication strategies lies with the PMU. The details are elaborated below.

6.1 Information and Consultation Framework for GSEEP

Effective public consultation will be needed from the earliest (planning) stages of the project. Input from relevant stakeholders will be essential especially during the identification of GSEEP investments, proposal preparation, and implementation phases.

6.1.1 Identify and Analyze Potential Stakeholders to Understand their Interest and Needs

Each stakeholders group plays a distinct role in the planning and implementation of the GSEEP. A comprehensive participatory consultation process will be an integral part of the Project and undertaken at the start of subproject planning and design to identify all potential project stakeholders along with their specific interests and needs. Stakeholders' identification, consultation and analysis will be continued throughout the project cycle and remain dynamic. The relevant types of stakeholders are the following:

1. Users and beneficiaries of the GSEEP;
2. People likely to be adversely affected by the GSEEP investments, directly or indirectly;;
3. Poor and vulnerable groups, women groups, and professional/occupational groups;
4. Government agencies, and government officials at national, regional, and ward level; and
5. National and international non-government organizations and donor agencies, community based organizations and community leaders.

6.1.2 Engage Stakeholders Systematically Throughout the Design and Implementation Stages

Communication and consultations should include, but not limited to, the identification and record of the following:

1. Identification of stakeholder groups to be engaged in participatory processes;
2. Specific decisions being made through participation, and consultation;
3. Anticipated roles and interests of stakeholder engagement at each stage of the project cycle;
4. How will participation be linked to social and gender strategy, management plans, resettlement planning and other National/Bank and safeguard requirements;
5. How will participation be used during implementation;
6. What participation methods will be used, including timeline, sequence and roles and responsibilities for participatory activities

Important aspects of the communication strategy include communication objectives; challenges and obstacles to achieving these objectives; target audiences; nature of communication messages; communication channels; and aspects required for successful implementation of the strategy such as timelines, responsibilities and resources.

All communication products targeting communities and their representatives including civil society groups and ward officials should be available in languages appropriate and understandable by the target audience.

6.1.3 Inform Stakeholders and Accountability Mechanism

Participation is central to the safeguard policy statements and will be facilitated, as and if required, in the project sites by PMU. Specific participation requirements related to the IPs such as broad-base indigenous consent (OP 4.10) need to be observed. Participation needs to be gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups.

6.2 Present Status of Consultations Completed at GSEEP

6.2.1 Consultations during Prefeasibility Study and Preparation of ESMF

Consultations with key stakeholders have been an integral part of the ESMF preparation. During the preparation of ESMF, a series of consultations was held at the candidate sites. The details are as follows:

GSEEP Site Identifier	Location	Date of Consultation
Pharping Powerhouse	Setidevi VDC ward no 6,4,5; Kathmandu	25/02/2014
Kulekhani 2 Powerhouse	Bhainse VDC ward no.3 Makwanpur	2/04/2014
Kulekhani 1 Reservoir area	Markhu VDC ward no 8 ; Makwanpur	2/04/2014
Kulekhani 1B, Reservoir Area	Markhu VDC Ward no 8; Makwanpur	3/04/2014
Debighat	Charghare VDC ward no.2 ; Nuwakot	5/04/2014
Panauti	Panauti municipality ward no 12, Kavre	24/03/2014
Panauti 2	Panauti Municipality ward no 12, Kavre	23/03/2014
Sundarijal	Sundarijal VDC ward no 9 ; Kathmandu	25/02/2014
Sunkoshi 1	Pangretar VDC ward no-5, Sindhupalanchok	27/03/2014
Sunkoshi 2	Mangka VDC ward no. 6 Sindhupalanchok	27/03/2014
Trishuli	Bidur Municipality ward no 10, Nuwakot	5/04/2014

The list of participants and outcomes of above consultation meetings are elaborated in Candidate site level baseline database in ***Annex 1*** of this ESMF. Such type of consultations, workshops, and interactions shall be continued during the GSEEP implementation cycle. This type of consultations will be the forum for sharing information about the project's objectives, scope, alternative design options, and stakeholders' perspectives regarding GSEEP.

6.2.2 Modes of Future Consultations

A range of formal and informal consultative methods will be carried out for component 1 and 2GSEEP investments including, but not limited to: focus group discussions (FGDs), public meetings, community discussions, and in-depth and key informant interviews; in addition to the socio-economic surveys required as part of the project M&E framework. Consultations will be held with special emphasis on vulnerable groups. Encouraging public participation in consultations informs the public and serves as a venue for the public to express their opinion on priorities which the Project should address.

The key stakeholders to be consulted during GSEEP investments, RP/IP&VCDP implementation, and program implementation include:

1. all Affected Persons (APs,) including vulnerable households (AdivashiJanajati and disadvantageous groups);
2. project beneficiaries;

3. political party representatives, community leaders, and representatives of community based organizations; representatives from recipient wards
4. local NGOs;
5. Officials of NEA and relevant government agency representatives.

In the local cultural and social set up women do not play an active part in decision-making regarding energy services and their standards, although women with relatively higher awareness level (e.g., social mobilizers, GoN employees, health workers, teachers, etc.) manage to express their concerns. Ideally separate meetings will be held for women.

The PMU will ensure that views of stakeholders, particularly those who are vulnerable, related to the project are looked into and addressed. The PMU will ensure that stakeholders consulted are informed of the outcome of the decision-making process, and will confirm how their views were incorporated.

6.3 Information Disclosure and Dissemination

This ESMF will be made available in Nepali language to GSEEP component 1 and 2 candidate sites. Copies of these documents will be provided to the stakeholders upon their request and payment of minimum charge for producing the document... The draft and final ESMF will be disclosed in the websites of NEA and made available to concerned DDC/VDCs/Municipality. Information dissemination and consultation will continue throughout program implementation.

For component 1 and 2 GSEEP investments, information will be disseminated to local candidate sites at various stages. In the initial stage, the NEA will be responsible for informing potential candidate sites and the general public of the project about the components of the project through leaflets and publication in local media outlets and newspapers. The PMT will conduct consultations and disseminate information to all stakeholders during these initial stages to create awareness of the project.

CHAPTER VII: GRIEVANCE REDRESS MECHANISM

Through a participatory process, grievances are expected to be minimized. However, it is necessary to establish an effective grievance redress mechanism to address complaints/grievances that may arise related to the project in general including but not limited to environmental and social issues. Any grievances and objections will be referred to the project Grievances Redress Committee (GRC).

The structure of GRC shall be as follows:

1. Project Manager, PMU; Chairperson of GRC
2. Candidate Site manager: Member secretary of GRC
3. Representative from candidate site , member of GRC
4. Representative from VDC/Municipality of the candidate project site, member of GRC

The GRC needs to be established as soon as the Project is effective. A complaint cell will be established under the site management office and at central PMT office to collect complaints and transmit them to the GRC. The affected persons/communities can register their grievances through multiple ways including locked complaint boxes at the site project office or at central PMT office that can only be opened by a designated person, an email address, a designated telephone number, and submission of complaints in the VDCsetc. Any affected family or person can approach the GRC directly regarding environmental and social issues including temporary impacts and impacts during construction. Handouts providing details of - grievance filing and redressing mechanismwill be distributed through the candidate project office. All cases will be registered, categorized and prioritized by the complaint cell. The GRC will meet in a monthly basis to discuss the petitions submitted by the people/community. If any member (including PMT manager) is concerned, then the grievances will be forwarded to the NEA CEO for needed action. The GRC will be regularly supervised by the project, including reviews of documentation.

GRC will have its own bye-laws.

The functions of the GRC will include: (i) to redress grievances of project affected persons (PAPs) in all respects; (ii) rehabilitation and resettlement assistance and related activities; (iii) GRC will only deal/hear the issues related to R&R and individual grievances; (iv) GRC will give its decision/verdict within 15 days after hearing the aggrieved PAPs; (v) final verdict of the GRC will be given by the Chairman/Head of GRC in consultation with other members of the GRC and will be binding to all other members.

CHAPTER VIII: MONITORING AND EVALUATION

8.1 Monitoring and Evaluation

A Monitoring & Evaluation (M&E) system will be established for the project, and safeguard compliance will be integral part of the project M&E. Both an internal and periodic external monitoring is proposed to ensure ESMF implementation. Internal monitoring will be carried out by the candidate site Management Office regularly and periodically by central PMU office, focusing on outcomes, outputs and implementation progress for each GSEEP candidate sites and components. The candidate site management office will submit to central PMU office NEA and World Bank regular bimonthly (once in two months) reports during implementation.

Similarly, periodic external monitoring will be carried out by independent consultant or agency using quantitative and qualitative methods and review of information and site visit.. The ESMF evaluation will be mid-term and end term and both have to be third party evaluation.

The table showing indicators, methods, and responsibilities for social and environmental safeguard monitoring in GSEEP is highlighted in ***Table 23***.

Table 23: Indicators, Methods, and Responsibilities for Social and Environmental Safeguard Monitoring

Indicators	Methods	Responsibility
Number of land and property ownersaffected by subprojects	Review report, on the group field verification	Candidate site Management Office
Adherence to ESMF requirements including number of screening carried out for subproject selection	Review of report, direct observation	Candidate site Management Office
Adherence to mitigation measures (social and environmental) during planning and design (preparation of documents)	Review of report, field verification	Candidate site Management Office
ESMF requirements incorporated in tender and bidding documents as needed	Review of tender/contract document	PMUPMU/ Consultant
No. of complaints filed and grievances handled/ managed	Review periodic reports	PMU/ Consultant
Mitigation measures deployed to address the adverse impacts and enhance beneficial impactsincluding compensation payment, R&R assistances, skill training and livelihood restoration of APs	Review periodic reports, site visit and consultations	PMU/ Consultant
Use of internal and external/ independent experts/ agency for monitoring and reporting	Review of contract documents and published/ unpublished reports	PMU/ Consultant

Responsibility of Monitoring: The environmental and social expert of PMU is responsible for central level periodic internal monitoring of ESMF. The mid-term and end term monitoring shall be done by external experts.

CHAPTER IX: CAPACITY BUILDING

NEA has its own Environmental and Social Studies Department (ESSD) and has experience with the implementation of World Bank-funded projects. However, due to large numbers of sub-projects within NEA, ESSD often falls short of required human resource capacity to design and implement ESMF. It is therefore, the ESMF has included capacity strengthening measures to the members of PMU and Manager of Candidate Siteas installing a solar farm is a new intervention for NEA.

9.1 Training

Training is an important component for developing capacities. Appropriate and timely training to the officials with regard to various issues can bring a positive change in the functioning of the staff. Apart from training in generic areas such as human resource management, information management, government functionaries require training in handling certain specialized tasks pertaining to environmental and social issues. The Project's consultant will identify the training need assessment for PMU and staff of Candidate Sites and suggest the training packages including their modality of operation.

Potential training areas are:

1. General Introduction to EA and adverse social and environmental impacts;
2. Orientations on ESMF and awareness raising about Project and management/ mitigation of impacts;
3. Orientations on legal requirements including grievance filing by APs;
4. Preparing EMPs/Social Action Plans through participatory approach;
5. Hazardous waste management, including handling, storage and disposal, and
6. Construction related hazards in GSEEP and related occupational and safety issues and their management.

9.2 Training on Preparing Communication Strategies

A well-developed communication strategy needs to be in place to realize better results and outcomes with effective implementationof theproject activities. The PMU will have to develop and effectively implement their own consultation and communication strategy. Successful implementation of GSEEP components would depend, to a large extent, on the ability to maintain close contact with the APs, communities and other stakeholders in the candidate project sites. For this purpose, the PMU central office and site office needs to develop consultation and communication strategies and materials to help improve better communication and understanding of social problems, awareness raising about project impacts and, , effective conflict resolution and grievance redressing. Training modules may be developed to help PMU central and site office draft and implement appropriate consultation strategies. Project's Experts will assist the PMU in preparing and imparting training.

9.3 Information Dissemination and ESMF Trainings

Prior the beginning of the work, ESSD/NEA will develop an ESMF information packages and disseminated in the stakeholders of project sites. The packages include the ESMF requirements, roles and responsibilities of implementing agencies, contractors. The ESMF training will be provided to ESSD/NEA staff and contractors prior the beginning of the construction. The details of dissemination and trainings are highlighted below (***Table 24***):

Table 24: ESMF Training Package and Orientation Training Responsibility and Costs

S.N	Particulars	No of training	Responsibility	Tentative Cost	Remarks
1	ESMF information package preparation and	10	ESSD/or consultant	100000.00 100000.00/training	

S.N	Particulars	No of training	Responsibility	Tentative Cost	Remarks
	information dissemination				
2	ESMF orientation training	2 nos	ESSD/or consultant	300000.00 (Rs 150000.00 each training)	Participants includes site mangers and contract's representative

9.4 Institutional Arrangement for ESMF Implementation

Envisaged institutional arrangements for ESMF implementation is presented in the flow diagram below.